```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             MAY   1991               *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE            TIME            *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748             *
*                                      *
****************************************
```

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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    w Reclaimed Mining & wo Logging (Scenario 3), LIDAR Data
   3          ID    Storm Event
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 480389.00000 4224905.00000 1
   6          PG    Gage     4.1
   7          IN      15  1JAN94       0
              * Scrabble Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0   0.025
   9          PC    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475     0.6   0.725
  10          PC    0.85  0.9125   0.975  1.0375     1.1  1.1625   1.225  1.2875    1.35   1.725
  11          PC     2.1   2.475    2.85     3.1    3.35     3.6    3.85  3.9125   3.975  4.0375
  12          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  13          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  14          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  15          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  16          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  17          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1

  18          KK      4B
  19          KO       0       0     0.0       1      22
  20          BA  0.4012
  21          PR    Gage
  22          PW     1.0
  23          PT    Gage
  24          PW    0.45
  25          LS     0.0    70.5     0.0
  26          UD  0.2578

  27          KK      4R   CNAME      4C
  28          KO       0       0     0.0       0      22
  29          RM       1    0.34     0.2

  30          KK      5B
  31          KO       0       0     0.0       1      22
  32          BA  0.6299
  33          PR    Gage
  34          PW     1.0
  35          PT    Gage
  36          PW    0.45
  37          LS     0.0    70.5     0.0
  38          UD  0.2197

  39          KK      5R   CNAME      5C
  40          KO       0       0     0.0       0      22
  41          RM       1   0.357     0.2

  42          KK     3aB
  43          KO       0       0     0.0       1      22
  44          BA  0.4252
  45          PR    Gage
  46          PW     1.0
  47          PT    Gage
```

HEC-1 INPUT PAGE 2

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

  48          PW    0.45
```

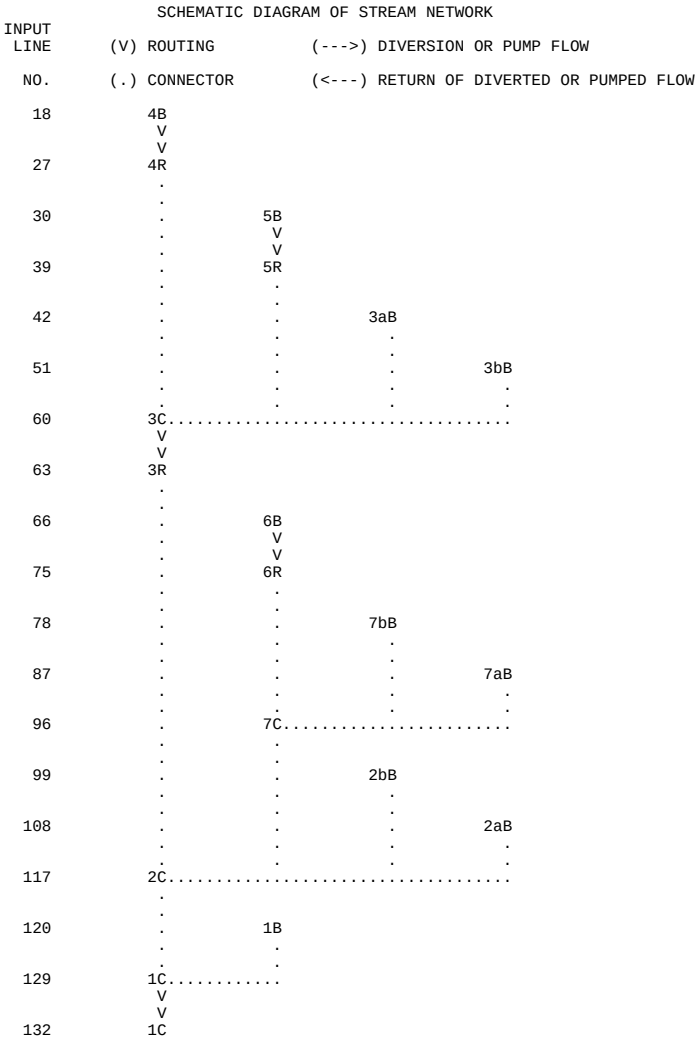
```
  49          LS     0.0   70.59     0.0
  50          UD  0.2104

  51          KK     3bB
  52          KO       0       0     0.0       1      22
  53          BA  0.4467
  54          PR    Gage
  55          PW     1.0
  56          PT    Gage
  57          PW    0.45
  58          LS     0.0   70.62     0.0
  59          UD  0.2331

  60          KK      3C   CNAME      3R
  61          KO       0       0     0.0       0      22
  62          HC       4

  63          KK      3R   CNAME      3C
  64          KO       0       0     0.0       0      22
  65          RM       2   0.641     0.2

  66          KK      6B
  67          KO       0       0     0.0       1      22
  68          BA  0.2511
  69          PR    Gage
  70          PW     1.0
  71          PT    Gage
  72          PW    0.45
  73          LS     0.0    70.5     0.0
  74          UD  0.2017

  75          KK      6R   CNAME      6C
  76          KO       0       0     0.0       0      22
  77          RM       1   0.492     0.2

  78          KK     7bB
  79          KO       0       0     0.0       1      22
  80          BA  0.2705
  81          PR    Gage
  82          PW     1.0
  83          PT    Gage
  84          PW    0.45
  85          LS     0.0    70.5     0.0
  86          UD     0.0

  87          KK     7aB
  88          KO       0       0     0.0       1      22
  89          BA  0.5681
  90          PR    Gage
  91          PW     1.0
  92          PT    Gage
  93          PW    0.45
  94          LS     0.0    70.5     0.0
  95          UD     0.0
```



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

  96          KK      7C   CNAME      7R
  97          KO       0       0     0.0       0      22
  98          HC       3

  99          KK     2bB
 100          KO       0       0     0.0       1      22
 101          BA  0.1252
 102          PR    Gage
 103          PW     1.0
 104          PT    Gage
 105          PW    0.45
 106          LS     0.0   71.61     0.0
 107          UD     0.0

 108          KK     2aB
 109          KO       0       0     0.0       1      22
 110          BA    0.49
 111          PR    Gage
 112          PW     1.0
 113          PT    Gage
 114          PW    0.45
 115          LS     0.0   70.68     0.0
 116          UD     0.0

 117          KK      2C   CNAME      2R
 118          KO       0       0     0.0       0      22
 119          HC       4

 120          KK      1B
 121          KO       0       0     0.0       1      22
 122          BA  0.5606
 123          PR    Gage
 124          PW     1.0
 125          PT    Gage
 126          PW    0.45
 127          LS     0.0   71.35     0.0
 128          UD     0.0

 129          KK      1C   CNAME      1C
```

```
          130           KO       0       0     0.0       0      22
          131           HC       2
          132           KK      1C   CNAME      1C
          133           KO       0       0     0.0       0      22
          134           RN      1C
          135           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

Scrabble Creek
w Reclaimed Mining & wo Logging (Scenario 3), LIDAR Data
Storm Event

```
    5 IO          OUTPUT CONTROL VARIABLES
                        IPRNT          1  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

    7 IN          TIME DATA FOR INPUT TIME SERIES
                         JXMIN        15  TIME INTERVAL IN MINUTES
                        JXDATE    1JAN94  STARTING DATE
                        JXTIME         0  STARTING TIME
```

```
    IT          HYDROGRAPH TIME DATA
                      NMIN          15  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1JAN94  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ,         100  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2JAN94  ENDING DATE
                    NDTIME        0045  ENDING TIME
                    ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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


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


            **************
            *            *
  18 KK     *        4B  *
            *            *
            **************

  19 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


               SUBBASIN RUNOFF DATA

  20 BA          SUBBASIN CHARACTERISTICS
                       TAREA,       0.40  SUBBASIN AREA

               PRECIPITATION DATA

  23 PT           TOTAL STORM STATIONS      Gage
  24 PW                       WEIGHTS      0.45

  21 PR             RECORDING STATIONS      Gage
  22 PW                       WEIGHTS      1.00

  25 LS          SCS LOSS RATE
                        STRTL        0.84  INITIAL ABSTRACTION
                       CRVNBR       70.50  CURVE NUMBER
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

  26 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.26  LAG

                                                        ***

               PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10         0.00         0.45

                 TEMPORAL DISTRIBUTIONS

                 STATION     Gage,  WEIGHT =   1.00
                      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                      0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                      0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                    UNIT HYDROGRAPH
                                                7 END-OF-PERIOD ORDINATES
               375.      430.      151.       53.       18.        6.        2.

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

                                                HYDROGRAPH AT STATION       4B

**********************************************************************************************************************************************
                                                                                *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                                *
        1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.00    0.00    0.00         0.
        1 JAN 0015    2    0.00    0.00    0.00         0.       *        1 JAN 1245   52    0.00    0.00    0.00         0.
        1 JAN 0030    3    0.00    0.00    0.00         0.       *        1 JAN 1300   53    0.00    0.00    0.00         0.
        1 JAN 0045    4    0.00    0.00    0.00         0.       *        1 JAN 1315   54    0.00    0.00    0.00         0.
        1 JAN 0100    5    0.00    0.00    0.00         0.       *        1 JAN 1330   55    0.00    0.00    0.00         0.
        1 JAN 0115    6    0.00    0.00    0.00         0.       *        1 JAN 1345   56    0.00    0.00    0.00         0.
```

1	JAN	0130	7	0.00	0.00	0.00	0.	*	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	*	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	*	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	*	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	*	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	*	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	*	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	*	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	*	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	*	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	*	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	*	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	*	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	*	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	*	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	2.	*	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	3.	*	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	5.	*	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	7.	*	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	8.	*	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	10.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	11.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.28	0.10	45.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	97.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	138.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	171.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	170.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	157.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	158.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	163.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	121.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	70.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	53.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	47.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	29.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	10.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	3.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 171.	8.00	62.	15.	15.	15.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 31.	31.	31.	31.

CUMULATIVE AREA = 0.40 SQ MI

*** ***

```
            **************
            *            *
27 KK       *        4R  *        CNAME      4C
            *            *
            **************
```

28 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

29 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.34	MUSKINGUM K
X	0.20	MUSKINGUM X

***

****

HYDROGRAPH AT STATION 4R

****

DA MON HRMN ORD FLOW	DA MON HRMN ORD FLOW	DA MON HRMN ORD FLOW	DA MON HRMN ORD FLOW

1	JAN	0000	1	0.	*	1	JAN	0615	26	4.	*	1	JAN	1230	51	0.	*	1	JAN	1845	76	0.	
1	JAN	0015	2	0.	*	1	JAN	0630	27	6.	*	1	JAN	1245	52	0.	*	1	JAN	1900	77	0.	
1	JAN	0030	3	0.	*	1	JAN	0645	28	8.	*	1	JAN	1300	53	0.	*	1	JAN	1915	78	0.	
1	JAN	0045	4	0.	*	1	JAN	0700	29	9.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.	
1	JAN	0100	5	0.	*	1	JAN	0715	30	15.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.	
1	JAN	0115	6	0.	*	1	JAN	0730	31	41.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.	
1	JAN	0130	7	0.	*	1	JAN	0745	32	82.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.	
1	JAN	0145	8	0.	*	1	JAN	0800	33	122.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.	
1	JAN	0200	9	0.	*	1	JAN	0815	34	153.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.	
1	JAN	0215	10	0.	*	1	JAN	0830	35	162.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.	
1	JAN	0230	11	0.	*	1	JAN	0845	36	159.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.	
1	JAN	0245	12	0.	*	1	JAN	0900	37	159.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.	
1	JAN	0300	13	0.	*	1	JAN	0915	38	155.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.	
1	JAN	0315	14	0.	*	1	JAN	0930	39	126.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.	
1	JAN	0330	15	0.	*	1	JAN	0945	40	89.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.	
1	JAN	0345	16	0.	*	1	JAN	1000	41	65.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.	
1	JAN	0400	17	0.	*	1	JAN	1015	42	51.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.	
1	JAN	0415	18	0.	*	1	JAN	1030	43	35.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.	
1	JAN	0430	19	0.	*	1	JAN	1045	44	18.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.	
1	JAN	0445	20	0.	*	1	JAN	1100	45	9.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.	
1	JAN	0500	21	0.	*	1	JAN	1115	46	4.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.	
1	JAN	0515	22	0.	*	1	JAN	1130	47	2.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.	
1	JAN	0530	23	1.	*	1	JAN	1145	48	1.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.	
1	JAN	0545	24	2.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.	
1	JAN	0600	25	3.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.	
					*						*						*						

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 162.	8.50	62.	15.	15.	15.
		(INCHES) 1.428	1.430	1.430	1.430
		(AC-FT) 31.	31.	31.	31.

CUMULATIVE AREA = 0.40 SQ MI

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          **************
          *            *
30 KK     *        5B  *
          *            *
          **************
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31 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

32 BA SUBBASIN CHARACTERISTICS

TAREA,	0.63	SUBBASIN AREA

PRECIPITATION DATA

35 PT TOTAL STORM STATIONS Gage
36 PW WEIGHTS 0.45

33 PR RECORDING STATIONS Gage
34 PW WEIGHTS 1.00

37 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

38 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.22	LAG

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.45

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

731. 629. 186. 57. 17. 6.

HYDROGRAPH AT STATION 5B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	3.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	6.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	8.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	11.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	13.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	16.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	18.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.28	0.10	83.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	166.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	229.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	278.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	265.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	245.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	248.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	257.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	174.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	99.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	78.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	72.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	39.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	11.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	3.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
278.	8.00	97.	24.	23.	23.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 48.	48.	48.	48.

CUMULATIVE AREA = 0.63 SQ MI

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          **************
          *            *
39 KK     *        5R  *        CNAME      5C
          *            *
          **************
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40 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS
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HYDROGRAPH ROUTING DATA

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  41 RM          MUSKINGUM ROUTING
                       NSTPS         1 NUMBER OF SUBREACHES
                       AMSKK      0.36 MUSKINGUM K
                           X      0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 5R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	7.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	10.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	12.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	15.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	25.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	71.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	137.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	199.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	246.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	255.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	249.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	250.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	243.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	191.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	132.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	98.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	78.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	50.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	26.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	12.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	0.	1	JAN	1115	46	5.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	0.	1	JAN	1130	47	2.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	1.	1	JAN	1145	48	1.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	3.	1	JAN	1200	49	0.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	5.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
255.	8.50	97.	24.	23.	23.
		(INCHES) 1.428	1.430	1.430	1.430
		(AC-FT) 48.	48.	48.	48.

CUMULATIVE AREA = 0.63 SQ MI

*** ***

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              **************
              *            *
  42 KK       *       3aB  *
              *            *
              **************

  43 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                        IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT      0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

  44 BA          SUBBASIN CHARACTERISTICS
                       TAREA,      0.43  SUBBASIN AREA

                 PRECIPITATION DATA

  47 PT           TOTAL STORM STATIONS      Gage
  48 PW                       WEIGHTS      0.45

  45 PR             RECORDING STATIONS      Gage
  46 PW                       WEIGHTS      1.00

  49 LS          SCS LOSS RATE
                       STRTL       0.83  INITIAL ABSTRACTION
                      CRVNBR      70.59  CURVE NUMBER
                       RTIMP       0.00  PERCENT IMPERVIOUS AREA

  50 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.21  LAG
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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.45

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

520.	412.	117.	34.	10.	3.

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HYDROGRAPH AT STATION 3aB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	2.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	4.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	6.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	8.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	9.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	11.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	12.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.27	0.10	59.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.24	0.14	115.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.21	0.17	157.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.19	190.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	179.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	166.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	168.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.09	0.16	174.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	114.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	65.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	52.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	48.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	25.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	7.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	2.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	1.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
190.	8.00	66.	16.	16.	16.
		(INCHES) 1.435	1.436	1.436	1.436
		(AC-FT) 33.	33.	33.	33.

CUMULATIVE AREA = 0.43 SQ MI

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          **************
          *            *
 51 KK    *       3bB  *
          *            *
          **************

 52 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 53 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.45  SUBBASIN AREA

                PRECIPITATION DATA

 56 PT           TOTAL STORM STATIONS      Gage
 57 PW                       WEIGHTS      0.45

 54 PR             RECORDING STATIONS      Gage
 55 PW                       WEIGHTS      1.00

 58 LS          SCS LOSS RATE
                       STRTL        0.83  INITIAL ABSTRACTION
                      CRVNBR       70.62  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

 59 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.23  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10         0.00         0.45

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
             481.      461.      145.       46.       15.        5.        1.
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HYDROGRAPH AT STATION 3bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	2.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	4.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	6.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	8.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	10.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	11.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	13.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.10	56.	1	JAN	1945	80	0.00	0.00	0.00	0.

1	JAN	0730	31	0.37	0.24	0.14	115.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	160.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	196.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	190.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	175.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	177.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	182.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	128.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	73.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	56.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	51.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	29.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	9.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	3.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*									

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TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR	
+ (CFS)	(HR)					
		(CFS)				
+ 196.	8.00	69.	17.	17.	17.	
		(INCHES)	1.437	1.438	1.438	1.438
		(AC-FT)	34.	34.	34.	34.

CUMULATIVE AREA = 0.45 SQ MI

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          **************
          *            *
60 KK     *        3C  *        CNAME      3R
          *            *
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61 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

62 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	27.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	35.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	42.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	49.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	156.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	343.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	537.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	708.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	767.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	758.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	753.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	765.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	641.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	456.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	329.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	263.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	183.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	101.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	49.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	22.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	0.	1	JAN	1115	46	9.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	2.	1	JAN	1130	47	4.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	6.	1	JAN	1145	48	1.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	12.	1	JAN	1200	49	1.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	19.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

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  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+     767.      8.25                293.         73.         71.          71.
                (INCHES)          1.431       1.433       1.433        1.433
                 (AC-FT)            145.        145.        145.         145.

                          CUMULATIVE AREA =    1.90 SQ MI
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            **************
            *            *
   63 KK    *        3R  *        CNAME      3C
            *            *
            **************

   64 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

   65 RM          MUSKINGUM ROUTING
                       NSTPS         2 NUMBER OF SUBREACHES
                       AMSKK      0.64 MUSKINGUM K
                           X      0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 3R

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	10.	1 JAN 1230	51	3.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	16.	1 JAN 1245	52	2.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	23.	1 JAN 1300	53	1.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	31.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	40.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	70.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	150.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	282.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	440.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	585.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	678.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	723.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	740.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	726.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	650.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	533.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	417.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	321.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	234.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	156.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	95.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	54.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	29.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	2.	1 JAN 1200	49	15.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	5.	1 JAN 1215	50	7.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

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  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+     740.      9.25                292.         73.         71.          71.
                (INCHES)          1.428       1.433       1.433        1.433
                 (AC-FT)            145.        145.        145.         145.

                          CUMULATIVE AREA =    1.90 SQ MI
```

*** ***

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            **************
            *            *
   66 KK    *        6B  *
            *            *
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 67 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 68 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.25  SUBBASIN AREA

                PRECIPITATION DATA

 71 PT           TOTAL STORM STATIONS      Gage
 72 PW                       WEIGHTS      0.45

 69 PR             RECORDING STATIONS      Gage
 70 PW                       WEIGHTS      1.00

 73 LS          SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

 74 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.20  LAG
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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.45

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

324. 234. 65. 18. 5. 1.

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HYDROGRAPH AT STATION 6B

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	0.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	1.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	2.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	3.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	4.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	5.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	6.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	7.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.28	0.10	36.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.24	0.14	69.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.21	0.17	93.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.19	113.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	105.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	98.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	99.	1 JAN 2115	86	0.00	0.00	0.00	0.

1 JAN 0900	37	0.25	0.09	0.16	103.	*	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	65.	*	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	38.	*	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	30.	*	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	28.	*	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	14.	*	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	4.	*	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	*	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	*	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	*	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	*	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	*	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	*	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
113.	8.00	39.	10.	9.	9.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 19.	19.	19.	19.

CUMULATIVE AREA = 0.25 SQ MI

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          **************
          *            *
75 KK     *        6R  *        CNAME      6C
          *            *
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76 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

77 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.49	MUSKINGUM K
X	0.20	MUSKINGUM X

***

HYDROGRAPH AT STATION 6R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	3.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	4.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	4.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	5.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	8.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	23.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	46.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	70.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	90.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	97.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	97.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	98.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	98.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	81.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	60.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	45.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	36.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	25.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	15.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	8.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	4.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	2.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	1.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	1.	1 JAN 1200	49	1.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	2.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR

```
+   (CFS)       (HR)
                  (CFS)
+      98.      9.25                39.         10.          9.          9.
                (INCHES)     1.426       1.430       1.430       1.430
                 (AC-FT)       19.         19.         19.         19.

                 CUMULATIVE AREA =    0.25 SQ MI


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


          **************
          *            *
  78 KK   *       7bB  *
          *            *
          **************

  79 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

  80 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.27  SUBBASIN AREA

               PRECIPITATION DATA

  83 PT           TOTAL STORM STATIONS      Gage
  84 PW                       WEIGHTS      0.45

  81 PR             RECORDING STATIONS      Gage
  82 PW                       WEIGHTS      1.00

  85 LS          SCS LOSS RATE
                       STRTL       0.84  INITIAL ABSTRACTION
                      CRVNBR      70.50  CURVE NUMBER
                       RTIMP       0.00  PERCENT IMPERVIOUS AREA

  86 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                          ***

             PRECIPITATION STATION DATA

                      STATION    TOTAL    AVG. ANNUAL    WEIGHT
                         Gage     4.10        0.00         0.45

               TEMPORAL DISTRIBUTIONS

               STATION     Gage,  WEIGHT =   1.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                    0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                    0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                    0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
             519.      145.       29.        6.        0.

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

                                                HYDROGRAPH AT STATION      7bB

*****************************************************************************************************************************************
                                                                    *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q        *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                    *
        1 JAN 0000    1    0.00    0.00    0.00         0.        *        1 JAN 1230   51    0.00    0.00    0.00         0.
        1 JAN 0015    2    0.00    0.00    0.00         0.        *        1 JAN 1245   52    0.00    0.00    0.00         0.
        1 JAN 0030    3    0.00    0.00    0.00         0.        *        1 JAN 1300   53    0.00    0.00    0.00         0.
        1 JAN 0045    4    0.00    0.00    0.00         0.        *        1 JAN 1315   54    0.00    0.00    0.00         0.
        1 JAN 0100    5    0.00    0.00    0.00         0.        *        1 JAN 1330   55    0.00    0.00    0.00         0.
        1 JAN 0115    6    0.00    0.00    0.00         0.        *        1 JAN 1345   56    0.00    0.00    0.00         0.
        1 JAN 0130    7    0.00    0.00    0.00         0.        *        1 JAN 1400   57    0.00    0.00    0.00         0.
        1 JAN 0145    8    0.00    0.00    0.00         0.        *        1 JAN 1415   58    0.00    0.00    0.00         0.
        1 JAN 0200    9    0.00    0.00    0.00         0.        *        1 JAN 1430   59    0.00    0.00    0.00         0.
        1 JAN 0215   10    0.03    0.03    0.00         0.        *        1 JAN 1445   60    0.00    0.00    0.00         0.
        1 JAN 0230   11    0.03    0.03    0.00         0.        *        1 JAN 1500   61    0.00    0.00    0.00         0.
        1 JAN 0245   12    0.03    0.03    0.00         0.        *        1 JAN 1515   62    0.00    0.00    0.00         0.
        1 JAN 0300   13    0.02    0.02    0.00         0.        *        1 JAN 1530   63    0.00    0.00    0.00         0.
        1 JAN 0315   14    0.06    0.06    0.00         0.        *        1 JAN 1545   64    0.00    0.00    0.00         0.
        1 JAN 0330   15    0.06    0.06    0.00         0.        *        1 JAN 1600   65    0.00    0.00    0.00         0.
        1 JAN 0345   16    0.06    0.06    0.00         0.        *        1 JAN 1615   66    0.00    0.00    0.00         0.
        1 JAN 0400   17    0.06    0.06    0.00         0.        *        1 JAN 1630   67    0.00    0.00    0.00         0.
        1 JAN 0415   18    0.12    0.12    0.00         0.        *        1 JAN 1645   68    0.00    0.00    0.00         0.
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1	JAN 0430	19	0.13	0.13	0.00	0.	*	1	JAN 1700	69	0.00	0.00	0.00	0.
1	JAN 0445	20	0.12	0.12	0.00	0.	*	1	JAN 1715	70	0.00	0.00	0.00	0.
1	JAN 0500	21	0.12	0.12	0.00	0.	*	1	JAN 1730	71	0.00	0.00	0.00	0.
1	JAN 0515	22	0.06	0.06	0.00	1.	*	1	JAN 1745	72	0.00	0.00	0.00	0.
1	JAN 0530	23	0.06	0.06	0.00	2.	*	1	JAN 1800	73	0.00	0.00	0.00	0.
1	JAN 0545	24	0.06	0.06	0.00	3.	*	1	JAN 1815	74	0.00	0.00	0.00	0.
1	JAN 0600	25	0.06	0.06	0.01	4.	*	1	JAN 1830	75	0.00	0.00	0.00	0.
1	JAN 0615	26	0.06	0.05	0.01	5.	*	1	JAN 1845	76	0.00	0.00	0.00	0.
1	JAN 0630	27	0.06	0.05	0.01	6.	*	1	JAN 1900	77	0.00	0.00	0.00	0.
1	JAN 0645	28	0.06	0.05	0.01	7.	*	1	JAN 1915	78	0.00	0.00	0.00	0.
1	JAN 0700	29	0.06	0.05	0.01	8.	*	1	JAN 1930	79	0.00	0.00	0.00	0.
1	JAN 0715	30	0.38	0.28	0.10	54.	*	1	JAN 1945	80	0.00	0.00	0.00	0.
1	JAN 0730	31	0.37	0.24	0.14	86.	*	1	JAN 2000	81	0.00	0.00	0.00	0.
1	JAN 0745	32	0.38	0.21	0.17	110.	*	1	JAN 2015	82	0.00	0.00	0.00	0.
1	JAN 0800	33	0.38	0.18	0.19	129.	*	1	JAN 2030	83	0.00	0.00	0.00	0.
1	JAN 0815	34	0.25	0.11	0.14	106.	*	1	JAN 2045	84	0.00	0.00	0.00	0.
1	JAN 0830	35	0.25	0.10	0.15	104.	*	1	JAN 2100	85	0.00	0.00	0.00	0.
1	JAN 0845	36	0.25	0.09	0.16	108.	*	1	JAN 2115	86	0.00	0.00	0.00	0.
1	JAN 0900	37	0.25	0.09	0.16	112.	*	1	JAN 2130	87	0.00	0.00	0.00	0.
1	JAN 0915	38	0.06	0.02	0.04	50.	*	1	JAN 2145	88	0.00	0.00	0.00	0.
1	JAN 0930	39	0.06	0.02	0.04	33.	*	1	JAN 2200	89	0.00	0.00	0.00	0.
1	JAN 0945	40	0.06	0.02	0.04	30.	*	1	JAN 2215	90	0.00	0.00	0.00	0.
1	JAN 1000	41	0.06	0.02	0.04	30.	*	1	JAN 2230	91	0.00	0.00	0.00	0.
1	JAN 1015	42	0.00	0.00	0.00	8.	*	1	JAN 2245	92	0.00	0.00	0.00	0.
1	JAN 1030	43	0.00	0.00	0.00	1.	*	1	JAN 2300	93	0.00	0.00	0.00	0.
1	JAN 1045	44	0.00	0.00	0.00	0.	*	1	JAN 2315	94	0.00	0.00	0.00	0.
1	JAN 1100	45	0.00	0.00	0.00	0.	*	1	JAN 2330	95	0.00	0.00	0.00	0.
1	JAN 1115	46	0.00	0.00	0.00	0.	*	1	JAN 2345	96	0.00	0.00	0.00	0.
1	JAN 1130	47	0.00	0.00	0.00	0.	*	2	JAN 0000	97	0.00	0.00	0.00	0.
1	JAN 1145	48	0.00	0.00	0.00	0.	*	2	JAN 0015	98	0.00	0.00	0.00	0.
1	JAN 1200	49	0.00	0.00	0.00	0.	*	2	JAN 0030	99	0.00	0.00	0.00	0.
1	JAN 1215	50	0.00	0.00	0.00	0.	*	2	JAN 0045	100	0.00	0.00	0.00	0.
							*							

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 129.	8.00	42.	10.	10.	10.
		(INCHES) 1.430	1.430	1.430	1.430
		(AC-FT) 21.	21.	21.	21.

CUMULATIVE AREA = 0.27 SQ MI

*** ***

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          **************
          *            *
87 KK     *       7aB  *
          *            *
          **************

88 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                    IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

89 BA          SUBBASIN CHARACTERISTICS
                    TAREA,       0.57  SUBBASIN AREA

               PRECIPITATION DATA

92 PT           TOTAL STORM STATIONS      Gage
93 PW                       WEIGHTS      0.45

90 PR             RECORDING STATIONS      Gage
91 PW                       WEIGHTS      1.00

94 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                    CRVNBR       70.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

95 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.00  LAG

                                                        ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10        0.00         0.45

              TEMPORAL DISTRIBUTIONS
```

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1089.	305.	60.	12.	0.

HYDROGRAPH AT STATION 7aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	4.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	6.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	9.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	11.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	13.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	15.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	17.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.28	0.10	113.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.24	0.14	181.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.21	0.17	231.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.19	271.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	224.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	218.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	226.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.09	0.16	235.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	106.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	70.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	63.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	62.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	16.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	3.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
271.	8.00	87.	22.	21.	21.
		(INCHES) 1.430	1.430	1.430	1.430
		(AC-FT) 43.	43.	43.	43.

CUMULATIVE AREA = 0.57 SQ MI

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          **************
          *            *
 96 KK    *        7C  *        CNAME      7R
          *            *
          **************
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97 KO OUTPUT CONTROL VARIABLES

```
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.250  TIME INTERVAL IN HOURS


  98 HC          HYDROGRAPH COMBINATION
                    ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***
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HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	19.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	23.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	27.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	31.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	174.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	290.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	387.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	470.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	420.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	419.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	431.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	445.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	255.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	184.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	153.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	137.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	60.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	30.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	15.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	8.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	0.	1	JAN	1115	46	4.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	2.	1	JAN	1130	47	2.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	6.	1	JAN	1145	48	1.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	10.	1	JAN	1200	49	1.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	14.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
470.	8.00	167.	42.	41.	41.
		(INCHES) 1.427	1.430	1.430	1.430
		(AC-FT) 83.	83.	83.	83.

CUMULATIVE AREA = 1.09 SQ MI

*** ***

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            **************
            *            *
  99 KK     *       2bB  *
            *            *
            **************

 100 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

 101 BA          SUBBASIN CHARACTERISTICS
                    TAREA,       0.13  SUBBASIN AREA

                 PRECIPITATION DATA

 104 PT           TOTAL STORM STATIONS      Gage
 105 PW                       WEIGHTS      0.45

 102 PR             RECORDING STATIONS      Gage
 103 PW                       WEIGHTS      1.00

 106 LS          SCS LOSS RATE
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```
                    STRTL        0.79  INITIAL ABSTRACTION
                   CRVNBR       71.61  CURVE NUMBER
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

 107 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        0.00  LAG

                                                    ***

               PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10         0.00         0.45

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
                240.       67.       13.        3.        0.
```

****

HYDROGRAPH AT STATION 2bB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	1.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.01	2.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.05	0.01	2.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	3.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	3.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	4.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	4.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.27	0.11	27.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.23	0.15	43.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.20	0.18	54.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.17	0.20	63.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.10	0.15	51.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	50.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	51.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.08	0.17	53.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	24.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	16.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	14.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	14.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	4.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	1.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	0.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

****

```
    TOTAL RAINFALL =    4.10, TOTAL LOSS =    2.60, TOTAL EXCESS =    1.50

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                     (CFS)
+      63.      8.00                20.          5.          5.          5.
                     (INCHES)     1.504       1.504       1.504       1.504
                      (AC-FT)       10.         10.         10.         10.
```

CUMULATIVE AREA = 0.13 SQ MI

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          **************
          *            *
108 KK    *       2aB  *
          *            *
          **************

109 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

110 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.49  SUBBASIN AREA

                PRECIPITATION DATA

113 PT           TOTAL STORM STATIONS      Gage
114 PW                       WEIGHTS      0.45

111 PR             RECORDING STATIONS      Gage
112 PW                       WEIGHTS      1.00

115 LS          SCS LOSS RATE
                     STRTL       0.83  INITIAL ABSTRACTION
                    CRVNBR      70.68  CURVE NUMBER
                     RTIMP       0.00  PERCENT IMPERVIOUS AREA

116 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG       0.00  LAG

                                                        ***

              PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10        0.00         0.45

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
              940.      263.       52.       10.        0.
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HYDROGRAPH AT STATION 2aB

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	4.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	6.	1 JAN 1815	74	0.00	0.00	0.00	0.

1	JAN	0600	25	0.06	0.06	0.01	8.	*	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	10.	*	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	12.	*	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	13.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	15.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.10	99.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	158.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	201.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	236.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	194.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	189.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	196.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	204.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	92.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	61.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	55.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	54.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	14.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	3.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	0.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

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TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 236.	8.00	76.	19.	18.	18.
		(INCHES) 1.442	1.442	1.442	1.442
		(AC-FT) 38.	38.	38.	38.

CUMULATIVE AREA = 0.49 SQ MI

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          **************
          *            *
117 KK    *        2C  *        CNAME      2R
          *            *
          **************
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118 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

119 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	*	1	JAN	0615	26	41.	*	1	JAN	1230	51	3.	*	1	JAN	1845	76	0.
1	JAN	0015	2	0.	*	1	JAN	0630	27	54.	*	1	JAN	1245	52	2.	*	1	JAN	1900	77	0.
1	JAN	0030	3	0.	*	1	JAN	0645	28	68.	*	1	JAN	1300	53	1.	*	1	JAN	1915	78	0.
1	JAN	0045	4	0.	*	1	JAN	0700	29	81.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.
1	JAN	0100	5	0.	*	1	JAN	0715	30	341.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.
1	JAN	0115	6	0.	*	1	JAN	0730	31	560.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.
1	JAN	0130	7	0.	*	1	JAN	0745	32	792.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	1050.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	1106.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	1243.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	1356.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	1426.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1111.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.
1	JAN	0315	14	0.	*	1	JAN	0930	39	986.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	873.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	739.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	495.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	354.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	250.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	164.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	0.	*	1	JAN	1115	46	100.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.

1 JAN 0515	22	4.	*	1 JAN 1130	47	56.	*	1 JAN 1745	72	0.	*	2 JAN 0000	97	0.
1 JAN 0530	23	11.	*	1 JAN 1145	48	30.	*	1 JAN 1800	73	0.	*	2 JAN 0015	98	0.
1 JAN 0545	24	19.	*	1 JAN 1200	49	15.	*	1 JAN 1815	74	0.	*	2 JAN 0030	99	0.
1 JAN 0600	25	30.	*	1 JAN 1215	50	7.	*	1 JAN 1830	75	0.	*	2 JAN 0045	100	0.
			*				*				*			

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1426.	9.00	554.	139.	135.	135.
		(INCHES) 1.428	1.436	1.436	1.436
		(AC-FT) 275.	276.	276.	276.

CUMULATIVE AREA = 3.61 SQ MI

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          **************
          *            *
120 KK    *        1B  *
          *            *
          **************
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121 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

122 BA SUBBASIN CHARACTERISTICS

TAREA,	0.56	SUBBASIN AREA

PRECIPITATION DATA

125 PT TOTAL STORM STATIONS Gage
126 PW WEIGHTS 0.45

123 PR RECORDING STATIONS Gage
124 PW WEIGHTS 1.00

127 LS SCS LOSS RATE

STRTL	0.80	INITIAL ABSTRACTION
CRVNBR	71.35	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

128 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.45

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1075.	301.	59.	12.	0.

HYDROGRAPH AT STATION 1B

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.

1 JAN 0215	10	0.03	0.03	0.00	0.	*	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	*	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	*	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	*	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	*	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	*	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	*	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	*	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	*	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	*	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	*	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	1.	*	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	3.	*	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	5.	*	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.01	8.	*	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.05	0.01	10.	*	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	12.	*	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	15.	*	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	17.	*	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	19.	*	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.27	0.11	119.	*	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.23	0.14	188.	*	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.20	0.17	238.	*	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.20	277.	*	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	228.	*	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	222.	*	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	229.	*	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.08	0.17	238.	*	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	107.	*	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	71.	*	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	64.	*	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	63.	*	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	16.	*	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	3.	*	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	*	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	*	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	*	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	*	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	*	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	*	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

*

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.61, TOTAL EXCESS = 1.49

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 277.	8.00	90.	22.	22.	22.
		(INCHES) 1.486	1.486	1.486	1.486
		(AC-FT) 44.	44.	44.	44.

CUMULATIVE AREA = 0.56 SQ MI

*** ***

```
            **************
            *            *
129 KK      *        1C  *        CNAME      1C
            *            *
            **************
```

130 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

131 HC HYDROGRAPH COMBINATION

ICOMP	2	NUMBER OF HYDROGRAPHS TO COMBINE

***

****

HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

****

DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	*	1 JAN 0615	26	54.	*	1 JAN 1230	51	3.	*	1 JAN 1845	76	0.
1 JAN 0015	2	0.	*	1 JAN 0630	27	69.	*	1 JAN 1245	52	2.	*	1 JAN 1900	77	0.
1 JAN 0030	3	0.	*	1 JAN 0645	28	84.	*	1 JAN 1300	53	1.	*	1 JAN 1915	78	0.
1 JAN 0045	4	0.	*	1 JAN 0700	29	100.	*	1 JAN 1315	54	0.	*	1 JAN 1930	79	0.
1 JAN 0100	5	0.	*	1 JAN 0715	30	460.	*	1 JAN 1330	55	0.	*	1 JAN 1945	80	0.
1 JAN 0115	6	0.	*	1 JAN 0730	31	749.	*	1 JAN 1345	56	0.	*	1 JAN 2000	81	0.

1	JAN	0130	7	0.	*	1	JAN	0745	32	1030.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	1327.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	1334.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	1465.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	1585.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	1663.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1218.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.
1	JAN	0315	14	0.	*	1	JAN	0930	39	1057.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	936.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	801.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	511.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	357.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	250.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	164.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	1.	*	1	JAN	1115	46	100.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	7.	*	1	JAN	1130	47	56.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	16.	*	1	JAN	1145	48	30.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	27.	*	1	JAN	1200	49	15.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.
1	JAN	0600	25	40.	*	1	JAN	1215	50	7.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1663.	9.00	643.	162.	157.	157.
		(INCHES) 1.435	1.442	1.442	1.442
		(AC-FT) 319.	321.	321.	321.

CUMULATIVE AREA = 4.17 SQ MI

*** ***

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**************
*            *
*        1C  *        CNAME      1C
*            *
**************
```

132 KK

133 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

134 RN NO ROUTING

***

HYDROGRAPH AT STATION 1C

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	54.	1	JAN	1230	51	3.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	69.	1	JAN	1245	52	2.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	84.	1	JAN	1300	53	1.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	100.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	460.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	749.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	1030.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	1327.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	1334.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	1465.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	1585.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	1663.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	1218.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	1057.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	936.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	801.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	511.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	357.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	250.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	164.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	1.	1	JAN	1115	46	100.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	7.	1	JAN	1130	47	56.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	16.	1	JAN	1145	48	30.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	27.	1	JAN	1200	49	15.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	40.	1	JAN	1215	50	7.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR

(CFS)	(HR)	(CFS)				
1663.	9.00		643.	162.	157.	157.
		(INCHES)	1.435	1.442	1.442	1.442
		(AC-FT)	319.	321.	321.	321.

CUMULATIVE AREA = 4.17 SQ MI

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	4B	171.	8.00	62.	15.	15.	0.40		
ROUTED TO	4R	162.	8.50	62.	15.	15.	0.40		
HYDROGRAPH AT	5B	278.	8.00	97.	24.	23.	0.63		
ROUTED TO	5R	255.	8.50	97.	24.	23.	0.63		
HYDROGRAPH AT	3aB	190.	8.00	66.	16.	16.	0.43		
HYDROGRAPH AT	3bB	196.	8.00	69.	17.	17.	0.45		
4 COMBINED AT	3C	767.	8.25	293.	73.	71.	1.90		
ROUTED TO	3R	740.	9.25	292.	73.	71.	1.90		
HYDROGRAPH AT	6B	113.	8.00	39.	10.	9.	0.25		
ROUTED TO	6R	98.	9.25	39.	10.	9.	0.25		
HYDROGRAPH AT	7bB	129.	8.00	42.	10.	10.	0.27		
HYDROGRAPH AT	7aB	271.	8.00	87.	22.	21.	0.57		
3 COMBINED AT	7C	470.	8.00	167.	42.	41.	1.09		
HYDROGRAPH AT	2bB	63.	8.00	20.	5.	5.	0.13		
HYDROGRAPH AT	2aB	236.	8.00	76.	19.	18.	0.49		
4 COMBINED AT	2C	1426.	9.00	554.	139.	135.	3.61		
HYDROGRAPH AT	1B	277.	8.00	90.	22.	22.	0.56		
2 COMBINED AT	1C	1663.	9.00	643.	162.	157.	4.17		
ROUTED TO	1C	1663.	9.00	643.	162.	157.	4.17		

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    w Reclaimed Mining & wo Logging (Scenario 3), LIDAR Data
   3          ID    25 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 480389.00000 4224905.00000 1
   6          PG    Gage     4.1
   7          IN      15  1JAN94       0
              * Scrabble Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0   0.025
   9          PC    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475     0.6   0.725
  10          PC    0.85  0.9125   0.975  1.0375     1.1  1.1625   1.225  1.2875    1.35   1.725
  11          PC     2.1   2.475    2.85     3.1    3.35     3.6    3.85  3.9125   3.975  4.0375
  12          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  13          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  14          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  15          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  16          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  17          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1

  18          KK      4B
  19          KO       0       0     0.0       1      22
  20          BA  0.4012
  21          PB    4.75
  22          IN       6  1JAN94       0
              * typeII-24hour
  23          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  24          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  25          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  26          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  27          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  28          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  29          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  30          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  31          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  32          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  33          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  34          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  35          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  36          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  37          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  38          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  39          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  40          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  41          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  42          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  43          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  44          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  45          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  46          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  47          PC     1.0
  48          LS     0.0    70.5     0.0
  49          UD  0.2578
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HEC-1 INPUT PAGE 2

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

  50          KK      4R   CNAME      4C
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```
 51          KO       0       0     0.0       0      22
 52          RM       1    0.34     0.2

 53          KK      5B
 54          KO       0       0     0.0       1      22
 55          BA  0.6299
 56          PB    4.75
 57          IN       6  1JAN94       0
             * typeII-24hour
 58          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 59          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 60          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 61          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 62          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 63          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 64          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 65          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 66          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 67          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 68          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 69          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 70          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 71          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 72          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 73          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 74          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 75          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 76          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 77          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 78          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 79          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 80          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 81          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 82          PC     1.0
 83          LS     0.0    70.5     0.0
 84          UD  0.2197

 85          KK      5R   CNAME      5C
 86          KO       0       0     0.0       0      22
 87          RM       1   0.357     0.2

 88          KK     3aB
 89          KO       0       0     0.0       1      22
 90          BA  0.4252
 91          PB    4.75
 92          IN       6  1JAN94       0
             * typeII-24hour
 93          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 94          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 95          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 96          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 97          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 98          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
```



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

 99          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
100          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
101          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
102          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
103          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
104          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
105          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
106          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
107          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
108          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
109          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
110          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
111          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
112          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
113          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
114          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
115          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
116          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
117          PC     1.0
118          LS     0.0   70.59     0.0
119          UD  0.2104

120          KK     3bB
121          KO       0       0     0.0       1      22
122          BA  0.4467
123          PB    4.75
124          IN       6  1JAN94       0
             * typeII-24hour
125          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
126          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
127          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
128          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
129          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
130          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
131          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
132          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
133          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
134          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
135          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
136          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
137          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
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 138          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 139          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 140          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 141          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 142          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 143          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 144          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 145          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 146          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 147          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 148          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 149          PC     1.0
 150          LS     0.0   70.62     0.0
 151          UD  0.2331
```



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

 152          KK      3C   CNAME      3R
 153          KO       0       0     0.0       0      22
 154          HC       4

 155          KK      3R   CNAME      3C
 156          KO       0       0     0.0       0      22
 157          RM       2   0.641     0.2

 158          KK      6B
 159          KO       0       0     0.0       1      22
 160          BA  0.2511
 161          PB    4.75
 162          IN       6  1JAN94       0
              * typeII-24hour
 163          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 164          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 165          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 166          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 167          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 168          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 169          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 170          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 171          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 172          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 173          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 174          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 175          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 176          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 177          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 178          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 179          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 180          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 181          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 182          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 183          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 184          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 185          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 186          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 187          PC     1.0
 188          LS     0.0    70.5     0.0
 189          UD  0.2017

 190          KK      6R   CNAME      6C
 191          KO       0       0     0.0       0      22
 192          RM       1   0.492     0.2

 193          KK     7bB
 194          KO       0       0     0.0       1      22
 195          BA  0.2705
 196          PB    4.75
 197          IN       6  1JAN94       0
              * typeII-24hour
 198          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 199          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 200          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 201          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 202          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 203          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 204          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 205          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 206          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 207          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 208          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 209          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 210          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 211          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 212          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 213          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 214          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 215          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 216          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 217          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 218          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 219          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
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 220          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 221          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 222          PC     1.0
 223          LS     0.0    70.5     0.0
 224          UD     0.0

 225          KK     7aB
 226          KO       0       0     0.0       1      22
 227          BA  0.5681
 228          PB    4.75
 229          IN       6  1JAN94       0
              * typeII-24hour
 230          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 231          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 232          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 233          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 234          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 235          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 236          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 237          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 238          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 239          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 240          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 241          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 242          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 243          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 244          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 245          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 246          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 247          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 248          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 249          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 250          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 251          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 252          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```



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

 253          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 254          PC     1.0
 255          LS     0.0    70.5     0.0
 256          UD     0.0

 257          KK      7C   CNAME      7R
 258          KO       0       0     0.0       0      22
 259          HC       3

 260          KK     2bB
 261          KO       0       0     0.0       1      22
 262          BA  0.1252
 263          PB    4.75
 264          IN       6  1JAN94       0
              * typeII-24hour
 265          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 266          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 267          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 268          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 269          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 270          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 271          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 272          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 273          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 274          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 275          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 276          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 277          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 278          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 279          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 280          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 281          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 282          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 283          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 284          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 285          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 286          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 287          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 288          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 289          PC     1.0
 290          LS     0.0   71.61     0.0
 291          UD     0.0

 292          KK     2aB
 293          KO       0       0     0.0       1      22
 294          BA    0.49
 295          PB    4.75
 296          IN       6  1JAN94       0
              * typeII-24hour
 297          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 298          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 299          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 300          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 301          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 302          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
```

```
 303          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 304          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 305          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 306          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 307          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 308          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 309          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 310          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 311          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 312          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 313          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 314          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 315          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 316          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 317          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 318          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 319          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 320          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 321          PC     1.0
 322          LS     0.0   70.68     0.0
 323          UD     0.0

 324          KK      2C   CNAME      2R
 325          KO       0       0     0.0       0      22
 326          HC       4

 327          KK      1B
 328          KO       0       0     0.0       1      22
 329          BA  0.5606
 330          PB    4.75
 331          IN       6  1JAN94       0
              * typeII-24hour
 332          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 333          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 334          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 335          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 336          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 337          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 338          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 339          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 340          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 341          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 342          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 343          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 344          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 345          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 346          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 347          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 348          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 349          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 350          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 351          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 352          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 353          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 354          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```



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

 355          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 356          PC     1.0
 357          LS     0.0   71.35     0.0
 358          UD     0.0

 359          KK      1C   CNAME      1C
 360          KO       0       0     0.0       0      22
 361          HC       2

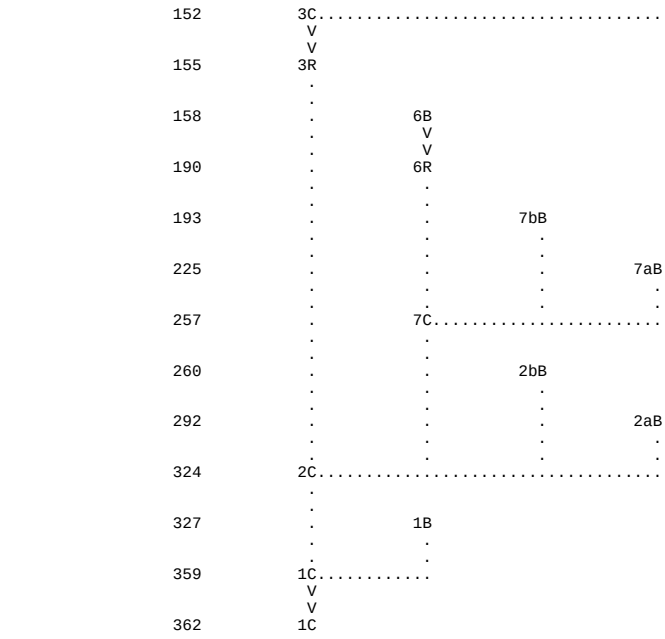
 362          KK      1C   CNAME      1C
 363          KO       0       0     0.0       0      22
 364          RN      1C
 365          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   18          4B
                V
                V
   50          4R
               .
               .
   53          .          5B
               .           V
               .           V
   85          .          5R
               .          .
               .          .
   88          .          .         3aB
               .          .           .
               .          .           .
  120          .          .           .         3bB
               .          .           .           .
               .          .           .           .
```



```
  152         3C.................................
               V
               V
  155         3R
               .
               .
  158          .          6B
               .           V
               .           V
  190          .          6R
               .           .
               .           .
  193          .           .         7bB
               .           .           .
               .           .           .
  225          .           .           .         7aB
               .           .           .           .
               .           .           .           .
  257          .          7C.......................
               .           .
               .           .
  260          .           .         2bB
               .           .           .
               .           .           .
  292          .           .           .         2aB
               .           .           .           .
               .           .           .           .
  324         2C.................................
               .
               .
  327          .          1B
               .           .
               .           .
  359         1C............
               V
               V
  362         1C

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************                                                  ****************************************
 *                                       *                                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                  *    U.S. ARMY CORPS OF ENGINEERS     *
 *               MAY   1991              *                                                  *    HYDROLOGIC ENGINEERING CENTER    *
 *            VERSION 4.0.1E             *                                                  *          609 SECOND STREET          *
 *                                       *                                                  *       DAVIS, CALIFORNIA 95616       *
 *  RUN DATE            TIME             *                                                  *           (916) 551-1748            *
 *                                       *                                                  *                                      *
 *****************************************                                                  ****************************************
```

```
                          Scrabble Creek
                          w Reclaimed Mining & wo Logging (Scenario 3), LIDAR Data
                          25 yr Storm

   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

   7 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

     IT          HYDROGRAPH TIME DATA
                       NMIN          15  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN94  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN94  ENDING DATE
                     NDTIME        0045  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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


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


           **************
           *            *
  18 KK    *        4B  *
           *            *
           **************
```

```
 19 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


 22 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

 20 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.40  SUBBASIN AREA

             PRECIPITATION DATA

 21 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

 23 PI           INCREMENTAL 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      0.01      0.01
                   0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                   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      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00

 48 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

 49 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.26  LAG

                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
                375.      430.      151.       53.       18.        6.        2.
```

****

HYDROGRAPH AT STATION 4B

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	186.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	113.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	77.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	59.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	48.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	41.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	36.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	33.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	30.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	29.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	27.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	26.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	24.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	23.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	22.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	20.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	20.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	19.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	18.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	18.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	17.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	17.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	16.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	16.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	15.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	15.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	14.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	14.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	13.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	13.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	12.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	12.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	11.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	11.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	11.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	11.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	11.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	11.

1 JAN 0930	39	0.04	0.04	0.00	0.	*	1 JAN 2200	89	0.01	0.00	0.01	11.
1 JAN 0945	40	0.04	0.04	0.00	0.	*	1 JAN 2215	90	0.01	0.00	0.01	11.
1 JAN 1000	41	0.05	0.05	0.00	0.	*	1 JAN 2230	91	0.01	0.00	0.01	11.
1 JAN 1015	42	0.05	0.05	0.00	0.	*	1 JAN 2245	92	0.01	0.00	0.01	11.
1 JAN 1030	43	0.06	0.06	0.00	2.	*	1 JAN 2300	93	0.01	0.00	0.01	11.
1 JAN 1045	44	0.07	0.06	0.01	3.	*	1 JAN 2315	94	0.01	0.00	0.01	10.
1 JAN 1100	45	0.08	0.07	0.01	6.	*	1 JAN 2330	95	0.01	0.00	0.01	10.
1 JAN 1115	46	0.10	0.09	0.01	10.	*	1 JAN 2345	96	0.01	0.00	0.01	10.
1 JAN 1130	47	0.13	0.10	0.02	16.	*	2 JAN 0000	97	0.01	0.00	0.01	10.
1 JAN 1145	48	0.52	0.37	0.15	68.	*	2 JAN 0015	98	0.00	0.00	0.00	6.
1 JAN 1200	49	1.28	0.66	0.62	300.	*	2 JAN 0030	99	0.00	0.00	0.00	2.
1 JAN 1215	50	0.20	0.08	0.12	336.	*	2 JAN 0045	100	0.00	0.00	0.00	1.
						*						

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
336.	12.25	66.	20.	20.	20.
		(INCHES) 1.537	1.890	1.890	1.890
		(AC-FT) 33.	40.	40.	40.

CUMULATIVE AREA = 0.40 SQ MI

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          **************
          *            *
 50 KK    *        4R  *        CNAME      4C
          *            *
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51 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

52 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.34	MUSKINGUM K
X	0.20	MUSKINGUM X

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HYDROGRAPH AT STATION 4R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	274.	1 JAN 1845	76	16.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	208.	1 JAN 1900	77	15.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	143.	1 JAN 1915	78	14.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	99.	1 JAN 1930	79	14.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	72.	1 JAN 1945	80	14.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	56.	1 JAN 2000	81	13.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	46.	1 JAN 2015	82	12.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	39.	1 JAN 2030	83	12.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	35.	1 JAN 2045	84	12.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	32.	1 JAN 2100	85	11.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	30.	1 JAN 2115	86	11.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	28.	1 JAN 2130	87	11.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	26.	1 JAN 2145	88	11.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	25.	1 JAN 2200	89	11.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	24.	1 JAN 2215	90	11.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	22.	1 JAN 2230	91	11.
1 JAN 0400	17	0.	1 JAN 1015	42	0.	1 JAN 1630	67	21.	1 JAN 2245	92	11.
1 JAN 0415	18	0.	1 JAN 1030	43	0.	1 JAN 1645	68	20.	1 JAN 2300	93	11.
1 JAN 0430	19	0.	1 JAN 1045	44	1.	1 JAN 1700	69	19.	1 JAN 2315	94	11.
1 JAN 0445	20	0.	1 JAN 1100	45	3.	1 JAN 1715	70	19.	1 JAN 2330	95	10.
1 JAN 0500	21	0.	1 JAN 1115	46	5.	1 JAN 1730	71	18.	1 JAN 2345	96	10.
1 JAN 0515	22	0.	1 JAN 1130	47	9.	1 JAN 1745	72	18.	2 JAN 0000	97	10.
1 JAN 0530	23	0.	1 JAN 1145	48	21.	1 JAN 1800	73	17.	2 JAN 0015	98	10.
1 JAN 0545	24	0.	1 JAN 1200	49	84.	1 JAN 1815	74	17.	2 JAN 0030	99	7.
1 JAN 0600	25	0.	1 JAN 1215	50	225.	1 JAN 1830	75	16.	2 JAN 0045	100	4.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			

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+     274.     12.50                   66.         20.         20.          20.
                          (INCHES)     1.530       1.886       1.886        1.886
                           (AC-FT)       33.         40.         40.          40.

                          CUMULATIVE AREA =    0.40 SQ MI


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


            **************
            *            *
   53 KK    *        5B  *
            *            *
            **************

   54 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


   57 IN          TIME DATA FOR INPUT TIME SERIES
                        JXMIN           6  TIME INTERVAL IN MINUTES
                       JXDATE      1JAN94  STARTING DATE
                       JXTIME           0  STARTING TIME

                SUBBASIN RUNOFF DATA

   55 BA          SUBBASIN CHARACTERISTICS
                       TAREA,        0.63  SUBBASIN AREA

                  PRECIPITATION DATA

   56 PB               STORM         4.75  BASIN TOTAL PRECIPITATION

   58 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

   83 LS          SCS LOSS RATE
                        STRTL        0.84  INITIAL ABSTRACTION
                       CRVNBR       70.50  CURVE NUMBER
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

   84 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.22  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             6 END-OF-PERIOD ORDINATES
                731.      629.      186.       57.       17.        6.
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HYDROGRAPH AT STATION 5B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	263.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	158.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	110.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	86.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	72.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	63.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	56.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	50.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	47.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	44.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	42.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	40.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	38.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	36.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	34.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	32.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	30.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	30.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	29.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	28.

1 JAN 0500	21	0.02	0.02	0.00	0.	*	1 JAN 1730	71	0.02	0.01	0.02	27.
1 JAN 0515	22	0.02	0.02	0.00	0.	*	1 JAN 1745	72	0.02	0.01	0.02	26.
1 JAN 0530	23	0.02	0.02	0.00	0.	*	1 JAN 1800	73	0.02	0.01	0.02	26.
1 JAN 0545	24	0.02	0.02	0.00	0.	*	1 JAN 1815	74	0.02	0.01	0.01	25.
1 JAN 0600	25	0.02	0.02	0.00	0.	*	1 JAN 1830	75	0.02	0.01	0.01	24.
1 JAN 0615	26	0.02	0.02	0.00	0.	*	1 JAN 1845	76	0.02	0.01	0.01	23.
1 JAN 0630	27	0.02	0.02	0.00	0.	*	1 JAN 1900	77	0.02	0.01	0.01	22.
1 JAN 0645	28	0.02	0.02	0.00	0.	*	1 JAN 1915	78	0.02	0.01	0.01	22.
1 JAN 0700	29	0.02	0.02	0.00	0.	*	1 JAN 1930	79	0.02	0.00	0.01	21.
1 JAN 0715	30	0.02	0.02	0.00	0.	*	1 JAN 1945	80	0.02	0.00	0.01	20.
1 JAN 0730	31	0.02	0.02	0.00	0.	*	1 JAN 2000	81	0.02	0.00	0.01	19.
1 JAN 0745	32	0.02	0.02	0.00	0.	*	1 JAN 2015	82	0.02	0.00	0.01	18.
1 JAN 0800	33	0.03	0.03	0.00	0.	*	1 JAN 2030	83	0.01	0.00	0.01	18.
1 JAN 0815	34	0.03	0.03	0.00	0.	*	1 JAN 2045	84	0.02	0.00	0.01	18.
1 JAN 0830	35	0.03	0.03	0.00	0.	*	1 JAN 2100	85	0.02	0.00	0.01	18.
1 JAN 0845	36	0.03	0.03	0.00	0.	*	1 JAN 2115	86	0.01	0.00	0.01	17.
1 JAN 0900	37	0.04	0.04	0.00	0.	*	1 JAN 2130	87	0.01	0.00	0.01	17.
1 JAN 0915	38	0.04	0.04	0.00	0.	*	1 JAN 2145	88	0.01	0.00	0.01	17.
1 JAN 0930	39	0.04	0.04	0.00	0.	*	1 JAN 2200	89	0.01	0.00	0.01	17.
1 JAN 0945	40	0.04	0.04	0.00	0.	*	1 JAN 2215	90	0.01	0.00	0.01	17.
1 JAN 1000	41	0.05	0.05	0.00	0.	*	1 JAN 2230	91	0.01	0.00	0.01	17.
1 JAN 1015	42	0.05	0.05	0.00	1.	*	1 JAN 2245	92	0.01	0.00	0.01	17.
1 JAN 1030	43	0.06	0.06	0.00	3.	*	1 JAN 2300	93	0.01	0.00	0.01	17.
1 JAN 1045	44	0.07	0.06	0.01	6.	*	1 JAN 2315	94	0.01	0.00	0.01	16.
1 JAN 1100	45	0.08	0.07	0.01	10.	*	1 JAN 2330	95	0.01	0.00	0.01	16.
1 JAN 1115	46	0.10	0.09	0.01	17.	*	1 JAN 2345	96	0.01	0.00	0.01	16.
1 JAN 1130	47	0.13	0.10	0.02	28.	*	2 JAN 0000	97	0.01	0.00	0.01	16.
1 JAN 1145	48	0.52	0.37	0.15	126.	*	2 JAN 0015	98	0.00	0.00	0.00	9.
1 JAN 1200	49	1.28	0.66	0.62	552.	*	2 JAN 0030	99	0.00	0.00	0.00	3.
1 JAN 1215	50	0.20	0.08	0.12	508.	*	2 JAN 0045	100	0.00	0.00	0.00	1.
						*						

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TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 552.	12.00	104.	32.	31.	31.
		(INCHES) 1.538	1.891	1.891	1.891
		(AC-FT) 52.	64.	64.	64.

CUMULATIVE AREA = 0.63 SQ MI

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          **************
          *            *
 85 KK    *        5R  *        CNAME      5C
          *            *
          **************

 86 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

 87 RM          MUSKINGUM ROUTING
                     NSTPS          1 NUMBER OF SUBREACHES
                     AMSKK       0.36 MUSKINGUM K
                         X       0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 5R

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	*	1 JAN 0615	26	0.	*	1 JAN 1230	51	429.	*	1 JAN 1845	76	24.
1 JAN 0015	2	0.	*	1 JAN 0630	27	0.	*	1 JAN 1245	52	314.	*	1 JAN 1900	77	24.
1 JAN 0030	3	0.	*	1 JAN 0645	28	0.	*	1 JAN 1300	53	213.	*	1 JAN 1915	78	23.
1 JAN 0045	4	0.	*	1 JAN 0700	29	0.	*	1 JAN 1315	54	147.	*	1 JAN 1930	79	22.
1 JAN 0100	5	0.	*	1 JAN 0715	30	0.	*	1 JAN 1330	55	108.	*	1 JAN 1945	80	21.
1 JAN 0115	6	0.	*	1 JAN 0730	31	0.	*	1 JAN 1345	56	85.	*	1 JAN 2000	81	20.
1 JAN 0130	7	0.	*	1 JAN 0745	32	0.	*	1 JAN 1400	57	71.	*	1 JAN 2015	82	19.
1 JAN 0145	8	0.	*	1 JAN 0800	33	0.	*	1 JAN 1415	58	61.	*	1 JAN 2030	83	19.
1 JAN 0200	9	0.	*	1 JAN 0815	34	0.	*	1 JAN 1430	59	54.	*	1 JAN 2045	84	18.
1 JAN 0215	10	0.	*	1 JAN 0830	35	0.	*	1 JAN 1445	60	49.	*	1 JAN 2100	85	18.
1 JAN 0230	11	0.	*	1 JAN 0845	36	0.	*	1 JAN 1500	61	46.	*	1 JAN 2115	86	18.
1 JAN 0245	12	0.	*	1 JAN 0900	37	0.	*	1 JAN 1515	62	43.	*	1 JAN 2130	87	18.
1 JAN 0300	13	0.	*	1 JAN 0915	38	0.	*	1 JAN 1530	63	41.	*	1 JAN 2145	88	17.
1 JAN 0315	14	0.	*	1 JAN 0930	39	0.	*	1 JAN 1545	64	39.	*	1 JAN 2200	89	17.

1	JAN	0330	15	0.	*	1	JAN	0945	40	0.	*	1	JAN	1600	65	37.	*	1	JAN	2215	90	17.
1	JAN	0345	16	0.	*	1	JAN	1000	41	0.	*	1	JAN	1615	66	34.	*	1	JAN	2230	91	17.
1	JAN	0400	17	0.	*	1	JAN	1015	42	0.	*	1	JAN	1630	67	33.	*	1	JAN	2245	92	17.
1	JAN	0415	18	0.	*	1	JAN	1030	43	1.	*	1	JAN	1645	68	31.	*	1	JAN	2300	93	17.
1	JAN	0430	19	0.	*	1	JAN	1045	44	2.	*	1	JAN	1700	69	30.	*	1	JAN	2315	94	17.
1	JAN	0445	20	0.	*	1	JAN	1100	45	5.	*	1	JAN	1715	70	29.	*	1	JAN	2330	95	16.
1	JAN	0500	21	0.	*	1	JAN	1115	46	9.	*	1	JAN	1730	71	28.	*	1	JAN	2345	96	16.
1	JAN	0515	22	0.	*	1	JAN	1130	47	15.	*	1	JAN	1745	72	27.	*	2	JAN	0000	97	16.
1	JAN	0530	23	0.	*	1	JAN	1145	48	36.	*	1	JAN	1800	73	27.	*	2	JAN	0015	98	15.
1	JAN	0545	24	0.	*	1	JAN	1200	49	146.	*	1	JAN	1815	74	26.	*	2	JAN	0030	99	10.
1	JAN	0600	25	0.	*	1	JAN	1215	50	387.	*	1	JAN	1830	75	25.	*	2	JAN	0045	100	5.
					*						*						*					

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	24.75-HR	
+ (CFS)	(HR)					
		(CFS)				
+ 429.	12.50	104.	32.	31.	31.	
		(INCHES) 1.530	1.887	1.887	1.887	
		(AC-FT) 51.	63.	63.	63.	

CUMULATIVE AREA = 0.63 SQ MI

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          **************
          *            *
 88 KK    *       3aB  *
          *            *
          **************
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 89 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


 92 IN          TIME DATA FOR INPUT TIME SERIES
                       JXMIN           6  TIME INTERVAL IN MINUTES
                      JXDATE      1JAN94  STARTING DATE
                      JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 90 BA          SUBBASIN CHARACTERISTICS
                      TAREA,        0.43  SUBBASIN AREA

                PRECIPITATION DATA

 91 PB               STORM         4.75  BASIN TOTAL PRECIPITATION

 93 PI           INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

118 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                     CRVNBR      70.59  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

119 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.21  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

520.	412.	117.	34.	10.	3.

HYDROGRAPH AT STATION 3aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	173.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	104.

1	JAN	0030	3	0.01	0.01	0.00	0.	*	1	JAN	1300	53	0.08	0.03	0.05	73.
1	JAN	0045	4	0.01	0.01	0.00	0.	*	1	JAN	1315	54	0.07	0.02	0.04	57.
1	JAN	0100	5	0.01	0.01	0.00	0.	*	1	JAN	1330	55	0.06	0.02	0.04	48.
1	JAN	0115	6	0.01	0.01	0.00	0.	*	1	JAN	1345	56	0.05	0.02	0.03	42.
1	JAN	0130	7	0.01	0.01	0.00	0.	*	1	JAN	1400	57	0.05	0.02	0.03	38.
1	JAN	0145	8	0.01	0.01	0.00	0.	*	1	JAN	1415	58	0.04	0.01	0.03	34.
1	JAN	0200	9	0.01	0.01	0.00	0.	*	1	JAN	1430	59	0.04	0.01	0.03	32.
1	JAN	0215	10	0.01	0.01	0.00	0.	*	1	JAN	1445	60	0.04	0.01	0.03	30.
1	JAN	0230	11	0.01	0.01	0.00	0.	*	1	JAN	1500	61	0.04	0.01	0.02	28.
1	JAN	0245	12	0.02	0.02	0.00	0.	*	1	JAN	1515	62	0.03	0.01	0.02	27.
1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.03	0.01	0.02	25.
1	JAN	0315	14	0.02	0.02	0.00	0.	*	1	JAN	1545	64	0.03	0.01	0.02	24.
1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.02	23.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	21.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	21.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	20.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.02	0.01	0.02	19.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.02	0.01	0.02	19.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.02	0.01	0.02	18.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.02	0.01	0.02	18.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	17.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	17.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	16.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	16.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	15.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	15.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	14.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	13.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	13.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	12.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	12.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	12.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	12.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	12.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	12.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	12.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	12.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	11.
1	JAN	1000	41	0.05	0.04	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	11.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	11.
1	JAN	1030	43	0.06	0.06	0.00	2.	*	1	JAN	2300	93	0.01	0.00	0.01	11.
1	JAN	1045	44	0.07	0.06	0.01	4.	*	1	JAN	2315	94	0.01	0.00	0.01	11.
1	JAN	1100	45	0.08	0.07	0.01	7.	*	1	JAN	2330	95	0.01	0.00	0.01	11.
1	JAN	1115	46	0.10	0.09	0.01	12.	*	1	JAN	2345	96	0.01	0.00	0.01	11.
1	JAN	1130	47	0.13	0.10	0.02	19.	*	2	JAN	0000	97	0.01	0.00	0.01	11.
1	JAN	1145	48	0.52	0.37	0.15	89.	*	2	JAN	0015	98	0.00	0.00	0.00	6.
1	JAN	1200	49	1.28	0.66	0.62	389.	*	2	JAN	0030	99	0.00	0.00	0.00	2.
1	JAN	1215	50	0.20	0.08	0.12	339.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.85, TOTAL EXCESS = 1.90

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
389.	12.00	71.	22.	21.	21.
		(INCHES) 1.543	1.898	1.898	1.898
		(AC-FT) 35.	43.	43.	43.

CUMULATIVE AREA = 0.43 SQ MI

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          **************
          *            *
120 KK    *       3bB  *
          *            *
          **************
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121 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


124 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

               SUBBASIN RUNOFF DATA

122 BA          SUBBASIN CHARACTERISTICS
                     TAREA,      0.45  SUBBASIN AREA

               PRECIPITATION DATA

123 PB               STORM       4.75  BASIN TOTAL PRECIPITATION
```

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 125 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

 150 LS          SCS LOSS RATE
                      STRTL       0.83  INITIAL ABSTRACTION
                     CRVNBR      70.62  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

 151 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.23  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               7 END-OF-PERIOD ORDINATES
               481.      461.      145.       46.       15.        5.        1.

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

                                                HYDROGRAPH AT STATION      3bB

*****************************************************************************************************************************************
                                                                                *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                                *
         1 JAN 0000    1    0.00    0.00    0.00         0.       *         1 JAN 1230   51    0.14    0.05    0.09       195.
         1 JAN 0015    2    0.01    0.01    0.00         0.       *         1 JAN 1245   52    0.10    0.04    0.06       117.
         1 JAN 0030    3    0.01    0.01    0.00         0.       *         1 JAN 1300   53    0.08    0.03    0.05        81.
         1 JAN 0045    4    0.01    0.01    0.00         0.       *         1 JAN 1315   54    0.07    0.02    0.04        63.
         1 JAN 0100    5    0.01    0.01    0.00         0.       *         1 JAN 1330   55    0.06    0.02    0.04        52.
         1 JAN 0115    6    0.01    0.01    0.00         0.       *         1 JAN 1345   56    0.05    0.02    0.03        45.
         1 JAN 0130    7    0.01    0.01    0.00         0.       *         1 JAN 1400   57    0.05    0.02    0.03        40.
         1 JAN 0145    8    0.01    0.01    0.00         0.       *         1 JAN 1415   58    0.04    0.01    0.03        36.
         1 JAN 0200    9    0.01    0.01    0.00         0.       *         1 JAN 1430   59    0.04    0.01    0.03        33.
         1 JAN 0215   10    0.01    0.01    0.00         0.       *         1 JAN 1445   60    0.04    0.01    0.03        32.
         1 JAN 0230   11    0.01    0.01    0.00         0.       *         1 JAN 1500   61    0.04    0.01    0.02        30.
         1 JAN 0245   12    0.02    0.02    0.00         0.       *         1 JAN 1515   62    0.03    0.01    0.02        29.
         1 JAN 0300   13    0.02    0.02    0.00         0.       *         1 JAN 1530   63    0.03    0.01    0.02        27.
         1 JAN 0315   14    0.02    0.02    0.00         0.       *         1 JAN 1545   64    0.03    0.01    0.02        26.
         1 JAN 0330   15    0.02    0.02    0.00         0.       *         1 JAN 1600   65    0.03    0.01    0.02        24.
         1 JAN 0345   16    0.02    0.02    0.00         0.       *         1 JAN 1615   66    0.03    0.01    0.02        23.
         1 JAN 0400   17    0.02    0.02    0.00         0.       *         1 JAN 1630   67    0.03    0.01    0.02        22.
         1 JAN 0415   18    0.02    0.02    0.00         0.       *         1 JAN 1645   68    0.03    0.01    0.02        21.
         1 JAN 0430   19    0.02    0.02    0.00         0.       *         1 JAN 1700   69    0.02    0.01    0.02        21.
         1 JAN 0445   20    0.02    0.02    0.00         0.       *         1 JAN 1715   70    0.02    0.01    0.02        20.
         1 JAN 0500   21    0.02    0.02    0.00         0.       *         1 JAN 1730   71    0.02    0.01    0.02        19.
         1 JAN 0515   22    0.02    0.02    0.00         0.       *         1 JAN 1745   72    0.02    0.01    0.02        19.
         1 JAN 0530   23    0.02    0.02    0.00         0.       *         1 JAN 1800   73    0.02    0.01    0.02        18.
         1 JAN 0545   24    0.02    0.02    0.00         0.       *         1 JAN 1815   74    0.02    0.01    0.01        18.
         1 JAN 0600   25    0.02    0.02    0.00         0.       *         1 JAN 1830   75    0.02    0.01    0.01        17.
         1 JAN 0615   26    0.02    0.02    0.00         0.       *         1 JAN 1845   76    0.02    0.01    0.01        17.
         1 JAN 0630   27    0.02    0.02    0.00         0.       *         1 JAN 1900   77    0.02    0.01    0.01        16.
         1 JAN 0645   28    0.02    0.02    0.00         0.       *         1 JAN 1915   78    0.02    0.01    0.01        15.
         1 JAN 0700   29    0.02    0.02    0.00         0.       *         1 JAN 1930   79    0.02    0.00    0.01        15.
         1 JAN 0715   30    0.02    0.02    0.00         0.       *         1 JAN 1945   80    0.02    0.00    0.01        14.
         1 JAN 0730   31    0.02    0.02    0.00         0.       *         1 JAN 2000   81    0.02    0.00    0.01        14.
         1 JAN 0745   32    0.02    0.02    0.00         0.       *         1 JAN 2015   82    0.02    0.00    0.01        13.
         1 JAN 0800   33    0.03    0.03    0.00         0.       *         1 JAN 2030   83    0.01    0.00    0.01        13.
         1 JAN 0815   34    0.03    0.03    0.00         0.       *         1 JAN 2045   84    0.02    0.00    0.01        13.
         1 JAN 0830   35    0.03    0.03    0.00         0.       *         1 JAN 2100   85    0.02    0.00    0.01        13.
         1 JAN 0845   36    0.03    0.03    0.00         0.       *         1 JAN 2115   86    0.01    0.00    0.01        12.
         1 JAN 0900   37    0.04    0.04    0.00         0.       *         1 JAN 2130   87    0.01    0.00    0.01        12.
         1 JAN 0915   38    0.04    0.04    0.00         0.       *         1 JAN 2145   88    0.01    0.00    0.01        12.
         1 JAN 0930   39    0.04    0.04    0.00         0.       *         1 JAN 2200   89    0.01    0.00    0.01        12.
         1 JAN 0945   40    0.04    0.04    0.00         0.       *         1 JAN 2215   90    0.01    0.00    0.01        12.
         1 JAN 1000   41    0.05    0.04    0.00         0.       *         1 JAN 2230   91    0.01    0.00    0.01        12.
         1 JAN 1015   42    0.05    0.05    0.00         1.       *         1 JAN 2245   92    0.01    0.00    0.01        12.
         1 JAN 1030   43    0.06    0.06    0.00         2.       *         1 JAN 2300   93    0.01    0.00    0.01        12.
         1 JAN 1045   44    0.07    0.06    0.01         4.       *         1 JAN 2315   94    0.01    0.00    0.01        12.
         1 JAN 1100   45    0.08    0.07    0.01         7.       *         1 JAN 2330   95    0.01    0.00    0.01        11.
         1 JAN 1115   46    0.10    0.09    0.01        12.       *         1 JAN 2345   96    0.01    0.00    0.01        11.
         1 JAN 1130   47    0.13    0.10    0.02        20.       *         2 JAN 0000   97    0.01    0.00    0.01        11.
         1 JAN 1145   48    0.52    0.37    0.15        85.       *         2 JAN 0015   98    0.00    0.00    0.00         7.
         1 JAN 1200   49    1.28    0.66    0.62       373.       *         2 JAN 0030   99    0.00    0.00    0.00         2.
         1 JAN 1215   50    0.20    0.08    0.12       369.       *         2 JAN 0045  100    0.00    0.00    0.00         1.
                                                                                *
*****************************************************************************************************************************************

    TOTAL RAINFALL =    4.75, TOTAL LOSS =    2.85, TOTAL EXCESS =    1.90

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                          (CFS)
+     373.      12.00         74.         23.         22.          22.
                        (INCHES)      1.545       1.900       1.900       1.900
                         (AC-FT)        37.         45.         45.         45.
```

CUMULATIVE AREA = 0.45 SQ MI

*** ***

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          **************
          *            *
152 KK    *        3C  *        CNAME      3R
          *            *
          **************
```

153 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

154 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1071.	1 JAN 1845	76	72.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	744.	1 JAN 1900	77	69.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	510.	1 JAN 1915	78	67.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	366.	1 JAN 1930	79	65.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	280.	1 JAN 1945	80	62.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	228.	1 JAN 2000	81	60.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	194.	1 JAN 2015	82	57.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	170.	1 JAN 2030	83	56.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	154.	1 JAN 2045	84	54.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	143.	1 JAN 2100	85	54.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	134.	1 JAN 2115	86	53.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	127.	1 JAN 2130	87	53.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	120.	1 JAN 2145	88	52.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	113.	1 JAN 2200	89	52.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	107.	1 JAN 2215	90	51.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	100.	1 JAN 2230	91	51.
1 JAN 0400	17	0.	1 JAN 1015	42	2.	1 JAN 1630	67	96.	1 JAN 2245	92	50.
1 JAN 0415	18	0.	1 JAN 1030	43	5.	1 JAN 1645	68	92.	1 JAN 2300	93	50.
1 JAN 0430	19	0.	1 JAN 1045	44	12.	1 JAN 1700	69	89.	1 JAN 2315	94	50.
1 JAN 0445	20	0.	1 JAN 1100	45	22.	1 JAN 1715	70	86.	1 JAN 2330	95	49.
1 JAN 0500	21	0.	1 JAN 1115	46	38.	1 JAN 1730	71	84.	1 JAN 2345	96	49.
1 JAN 0515	22	0.	1 JAN 1130	47	63.	1 JAN 1745	72	82.	2 JAN 0000	97	48.
1 JAN 0530	23	0.	1 JAN 1145	48	231.	1 JAN 1800	73	79.	2 JAN 0015	98	37.
1 JAN 0545	24	0.	1 JAN 1200	49	992.	1 JAN 1815	74	77.	2 JAN 0030	99	21.
1 JAN 0600	25	0.	1 JAN 1215	50	1320.	1 JAN 1830	75	74.	2 JAN 0045	100	10.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1320.	12.25	314.	97.	94.	94.
		(INCHES) 1.536	1.892	1.892	1.892
		(AC-FT) 156.	192.	192.	192.

CUMULATIVE AREA = 1.90 SQ MI

*** ***

```
          **************
          *            *
155 KK    *        3R  *        CNAME      3C
          *            *
          **************
```

156 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

```
157 RM          MUSKINGUM ROUTING
                      NSTPS         2 NUMBER OF SUBREACHES
                      AMSKK      0.64 MUSKINGUM K
                          X      0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 3R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	684.	1	JAN	1845	76	78.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	947.	1	JAN	1900	77	76.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	966.	1	JAN	1915	78	73.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	826.	1	JAN	1930	79	71.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	645.	1	JAN	1945	80	68.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	487.	1	JAN	2000	81	66.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	369.	1	JAN	2015	82	64.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	288.	1	JAN	2030	83	61.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	233.	1	JAN	2045	84	59.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	196.	1	JAN	2100	85	57.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	171.	1	JAN	2115	86	56.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	154.	1	JAN	2130	87	55.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	142.	1	JAN	2145	88	54.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	133.	1	JAN	2200	89	53.
1	JAN	0330	15	0.	1	JAN	0945	40	0.	1	JAN	1600	65	125.	1	JAN	2215	90	53.
1	JAN	0345	16	0.	1	JAN	1000	41	0.	1	JAN	1615	66	117.	1	JAN	2230	91	52.
1	JAN	0400	17	0.	1	JAN	1015	42	0.	1	JAN	1630	67	111.	1	JAN	2245	92	52.
1	JAN	0415	18	0.	1	JAN	1030	43	1.	1	JAN	1645	68	105.	1	JAN	2300	93	51.
1	JAN	0430	19	0.	1	JAN	1045	44	2.	1	JAN	1700	69	99.	1	JAN	2315	94	51.
1	JAN	0445	20	0.	1	JAN	1100	45	5.	1	JAN	1715	70	95.	1	JAN	2330	95	50.
1	JAN	0500	21	0.	1	JAN	1115	46	11.	1	JAN	1730	71	91.	1	JAN	2345	96	50.
1	JAN	0515	22	0.	1	JAN	1130	47	20.	1	JAN	1745	72	88.	2	JAN	0000	97	49.
1	JAN	0530	23	0.	1	JAN	1145	48	37.	1	JAN	1800	73	86.	2	JAN	0015	98	49.
1	JAN	0545	24	0.	1	JAN	1200	49	101.	1	JAN	1815	74	83.	2	JAN	0030	99	46.
1	JAN	0600	25	0.	1	JAN	1215	50	313.	1	JAN	1830	75	81.	2	JAN	0045	100	38.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
966.	13.00	312.	96.	93.	93.
		(INCHES) 1.522	1.877	1.877	1.877
		(AC-FT) 154.	191.	191.	191.

CUMULATIVE AREA = 1.90 SQ MI

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          **************
          *            *
158 KK    *        6B  *
          *            *
          **************
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159 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


162 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          6  TIME INTERVAL IN MINUTES
                     JXDATE     1JAN94  STARTING DATE
                     JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

160 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.25  SUBBASIN AREA

                PRECIPITATION DATA

161 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

163 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

188 LS SCS LOSS RATE
STRTL 0.84 INITIAL ABSTRACTION
CRVNBR 70.50 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

189 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.20 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

324.	234.	65.	18.	5.	1.

HYDROGRAPH AT STATION 6B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	99.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	60.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	42.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	33.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	28.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	25.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	22.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	20.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	19.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	18.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	17.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	16.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	15.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	14.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	13.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	13.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	12.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	12.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	11.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	11.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	11.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	10.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	10.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	10.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	10.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	9.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	9.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	9.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	8.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	8.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	8.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	7.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	7.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	7.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	7.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	7.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	7.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	7.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	7.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	7.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	7.
1	JAN	1015	42	0.05	0.05	0.00	0.	1	JAN	2245	92	0.01	0.00	0.01	7.
1	JAN	1030	43	0.06	0.06	0.00	1.	1	JAN	2300	93	0.01	0.00	0.01	7.
1	JAN	1045	44	0.07	0.06	0.01	2.	1	JAN	2315	94	0.01	0.00	0.01	6.
1	JAN	1100	45	0.08	0.07	0.01	4.	1	JAN	2330	95	0.01	0.00	0.01	6.
1	JAN	1115	46	0.10	0.09	0.01	7.	1	JAN	2345	96	0.01	0.00	0.01	6.
1	JAN	1130	47	0.13	0.10	0.02	12.	2	JAN	0000	97	0.01	0.00	0.01	6.
1	JAN	1145	48	0.52	0.37	0.15	54.	2	JAN	0015	98	0.00	0.00	0.00	3.
1	JAN	1200	49	1.28	0.66	0.62	238.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	195.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 238.	12.00		42.	13.	12.	12.
		(INCHES)	1.538	1.891	1.891	1.891
		(AC-FT)	21.	25.	25.	25.

CUMULATIVE AREA = 0.25 SQ MI

*** *** *** *

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                    JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

195 BA           SUBBASIN CHARACTERISTICS
                      TAREA,       0.27  SUBBASIN AREA

               PRECIPITATION DATA

196 PB                STORM        4.75  BASIN TOTAL PRECIPITATION

198 PI             INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

223 LS           SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

224 UD           SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.00  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
                    519.      145.       29.        6.        0.
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****

HYDROGRAPH AT STATION 7bB

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	81.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	51.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	39.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	32.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	29.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	25.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	23.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	21.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	19.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	19.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	18.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	17.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	16.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	15.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	14.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	13.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	13.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	12.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	12.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	12.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	11.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	11.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	11.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	10.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	10.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	10.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	9.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	9.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	9.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	8.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	8.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	8.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	8.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	8.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	8.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	7.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	7.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	7.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	7.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	7.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	7.
1	JAN	1015	42	0.05	0.05	0.00	1.	1	JAN	2245	92	0.01	0.00	0.01	7.
1	JAN	1030	43	0.06	0.06	0.00	2.	1	JAN	2300	93	0.01	0.00	0.01	7.
1	JAN	1045	44	0.07	0.06	0.01	3.	1	JAN	2315	94	0.01	0.00	0.01	7.
1	JAN	1100	45	0.08	0.07	0.01	5.	1	JAN	2330	95	0.01	0.00	0.01	7.
1	JAN	1115	46	0.10	0.09	0.01	9.	1	JAN	2345	96	0.01	0.00	0.01	7.
1	JAN	1130	47	0.13	0.10	0.02	14.	2	JAN	0000	97	0.01	0.00	0.01	7.
1	JAN	1145	48	0.52	0.37	0.15	81.	2	JAN	0015	98	0.00	0.00	0.00	2.
1	JAN	1200	49	1.28	0.66	0.62	344.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.20	0.08	0.12	157.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR	
+ (CFS)	(HR)					
		(CFS)				
+ 344.	12.00	45.	14.	13.	13.	
		(INCHES)	1.539	1.891	1.891	1.891
		(AC-FT)	22.	27.	27.	27.

CUMULATIVE AREA = 0.27 SQ MI

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225 KK    *       7aB  *
          *            *
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226 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


229 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

227 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.57  SUBBASIN AREA

                PRECIPITATION DATA

228 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

230 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

255 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                    CRVNBR       70.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

256 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.00  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1089. 305. 60. 12. 0.

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HYDROGRAPH AT STATION 7aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	169.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	106.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	81.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	68.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	60.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	53.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	48.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	43.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	41.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	39.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	37.

1	JAN	0245	12	0.02	0.02	0.00	0.	*	1	JAN	1515	62	0.03	0.01	0.02	35.
1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.03	0.01	0.02	33.
1	JAN	0315	14	0.02	0.02	0.00	0.	*	1	JAN	1545	64	0.03	0.01	0.02	31.
1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.02	29.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	28.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	27.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	26.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.02	0.01	0.02	26.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.02	0.01	0.02	25.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.02	0.01	0.02	24.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.02	0.01	0.02	23.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	23.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	22.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	21.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	21.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	20.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	19.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	18.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	18.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	17.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	16.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	16.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	16.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	16.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	16.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	15.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	16.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	15.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	15.
1	JAN	1000	41	0.05	0.05	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	15.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	15.
1	JAN	1030	43	0.06	0.06	0.00	3.	*	1	JAN	2300	93	0.01	0.00	0.01	15.
1	JAN	1045	44	0.07	0.06	0.01	6.	*	1	JAN	2315	94	0.01	0.00	0.01	14.
1	JAN	1100	45	0.08	0.07	0.01	11.	*	1	JAN	2330	95	0.01	0.00	0.01	14.
1	JAN	1115	46	0.10	0.09	0.01	18.	*	1	JAN	2345	96	0.01	0.00	0.01	14.
1	JAN	1130	47	0.13	0.10	0.02	30.	*	2	JAN	0000	97	0.01	0.00	0.01	14.
1	JAN	1145	48	0.52	0.37	0.15	169.	*	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.28	0.66	0.62	722.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	331.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

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TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
	(CFS)				
+ 722.	12.00	94.	29.	28.	28.
	(INCHES)	1.539	1.891	1.891	1.891
	(AC-FT)	47.	57.	57.	57.

CUMULATIVE AREA = 0.57 SQ MI

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            *            *
257 KK      *        7C  *        CNAME      7R
            *            *
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258 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

259 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	*	1	JAN	0615	26	0.	*	1	JAN	1230	51	408.	*	1	JAN	1845	76	40.
1	JAN	0015	2	0.	*	1	JAN	0630	27	0.	*	1	JAN	1245	52	285.	*	1	JAN	1900	77	38.
1	JAN	0030	3	0.	*	1	JAN	0645	28	0.	*	1	JAN	1300	53	213.	*	1	JAN	1915	78	38.
1	JAN	0045	4	0.	*	1	JAN	0700	29	0.	*	1	JAN	1315	54	169.	*	1	JAN	1930	79	36.
1	JAN	0100	5	0.	*	1	JAN	0715	30	0.	*	1	JAN	1330	55	140.	*	1	JAN	1945	80	35.
1	JAN	0115	6	0.	*	1	JAN	0730	31	0.	*	1	JAN	1345	56	118.	*	1	JAN	2000	81	33.
1	JAN	0130	7	0.	*	1	JAN	0745	32	0.	*	1	JAN	1400	57	103.	*	1	JAN	2015	82	32.
1	JAN	0145	8	0.	*	1	JAN	0800	33	0.	*	1	JAN	1415	58	91.	*	1	JAN	2030	83	31.

| | | |

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	39.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	24.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	18.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	15.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	14.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	12.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.01	0.03	11.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	10.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	9.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	9.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	8.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	8.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	7.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	7.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	7.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	6.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	6.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	6.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	6.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	6.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	5.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	5.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	5.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	5.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	5.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	5.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	4.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.00	0.01	4.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	4.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	4.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	4.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	4.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	4.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	4.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	4.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	4.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	3.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	4.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	3.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	3.
1	JAN	1000	41	0.05	0.04	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	3.
1	JAN	1015	42	0.05	0.05	0.00	1.	1	JAN	2245	92	0.01	0.00	0.01	3.
1	JAN	1030	43	0.06	0.05	0.00	1.	1	JAN	2300	93	0.01	0.00	0.01	3.
1	JAN	1045	44	0.07	0.06	0.01	2.	1	JAN	2315	94	0.01	0.00	0.01	3.
1	JAN	1100	45	0.08	0.07	0.01	3.	1	JAN	2330	95	0.01	0.00	0.01	3.
1	JAN	1115	46	0.10	0.08	0.02	5.	1	JAN	2345	96	0.01	0.00	0.01	3.
1	JAN	1130	47	0.13	0.10	0.03	8.	2	JAN	0000	97	0.01	0.00	0.01	3.
1	JAN	1145	48	0.52	0.36	0.16	41.	2	JAN	0015	98	0.00	0.00	0.00	1.
1	JAN	1200	49	1.28	0.63	0.65	167.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.20	0.08	0.13	76.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.77, TOTAL EXCESS = 1.98

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
167.	12.00	22.	7.	6.	6.
		(INCHES) 1.609	1.977	1.977	1.977
		(AC-FT) 11.	13.	13.	13.

CUMULATIVE AREA = 0.13 SQ MI

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          **************
          *            *
292 KK    *       2aB  *
          *            *
          **************
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293 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

296 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

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294 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.49  SUBBASIN AREA

                PRECIPITATION DATA

295 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

297 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

322 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                    CRVNBR       70.68  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

323 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
                940.      263.       52.       10.        0.
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HYDROGRAPH AT STATION 2aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	147.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	92.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	70.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	59.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	52.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	46.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	41.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	38.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	35.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	34.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	32.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	31.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	29.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	27.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	25.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	24.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	23.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	23.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	22.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	21.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	21.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	20.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	20.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	19.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	19.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	18.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	17.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	17.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	16.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	15.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	15.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	14.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	14.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	14.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	14.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	13.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	13.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	13.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	13.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	13.
1	JAN	1000	41	0.05	0.04	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	13.
1	JAN	1015	42	0.05	0.05	0.00	1.	1	JAN	2245	92	0.01	0.00	0.01	13.
1	JAN	1030	43	0.06	0.05	0.00	3.	1	JAN	2300	93	0.01	0.00	0.01	13.
1	JAN	1045	44	0.07	0.06	0.01	6.	1	JAN	2315	94	0.01	0.00	0.01	12.
1	JAN	1100	45	0.08	0.07	0.01	10.	1	JAN	2330	95	0.01	0.00	0.01	12.
1	JAN	1115	46	0.10	0.09	0.01	16.	1	JAN	2345	96	0.01	0.00	0.01	13.
1	JAN	1130	47	0.13	0.10	0.02	27.	2	JAN	0000	97	0.01	0.00	0.01	12.
1	JAN	1145	48	0.52	0.37	0.15	148.	2	JAN	0015	98	0.00	0.00	0.00	3.
1	JAN	1200	49	1.28	0.66	0.63	628.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	287.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.85, TOTAL EXCESS = 1.90

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
	(CFS)				
+ 628.	12.00	82.	25.	24.	24.
	(INCHES)	1.550	1.905	1.905	1.905
	(AC-FT)	40.	50.	50.	50.

CUMULATIVE AREA = 0.49 SQ MI

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          *            *
324 KK    *        2C  *        CNAME      2R
          *            *
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325 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

326 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1278.	1 JAN 1845	76	141.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1349.	1 JAN 1900	77	136.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1268.	1 JAN 1915	78	132.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	1070.	1 JAN 1930	79	127.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	851.	1 JAN 1945	80	122.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	663.	1 JAN 2000	81	117.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	523.	1 JAN 2015	82	114.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	426.	1 JAN 2030	83	110.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	361.	1 JAN 2045	84	107.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	318.	1 JAN 2100	85	105.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	286.	1 JAN 2115	86	103.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	263.	1 JAN 2130	87	101.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	244.	1 JAN 2145	88	101.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	229.	1 JAN 2200	89	99.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	215.	1 JAN 2215	90	98.
1 JAN 0345	16	0.	1 JAN 1000	41	1.	1 JAN 1615	66	203.	1 JAN 2230	91	97.
1 JAN 0400	17	0.	1 JAN 1015	42	4.	1 JAN 1630	67	193.	1 JAN 2245	92	97.
1 JAN 0415	18	0.	1 JAN 1030	43	10.	1 JAN 1645	68	185.	1 JAN 2300	93	96.
1 JAN 0430	19	0.	1 JAN 1045	44	20.	1 JAN 1700	69	177.	1 JAN 2315	94	94.
1 JAN 0445	20	0.	1 JAN 1100	45	35.	1 JAN 1715	70	170.	1 JAN 2330	95	93.
1 JAN 0500	21	0.	1 JAN 1115	46	61.	1 JAN 1730	71	165.	1 JAN 2345	96	93.
1 JAN 0515	22	0.	1 JAN 1130	47	104.	1 JAN 1745	72	160.	2 JAN 0000	97	92.
1 JAN 0530	23	0.	1 JAN 1145	48	486.	1 JAN 1800	73	155.	2 JAN 0015	98	64.
1 JAN 0545	24	0.	1 JAN 1200	49	2004.	1 JAN 1815	74	150.	2 JAN 0030	99	52.
1 JAN 0600	25	0.	1 JAN 1215	50	1298.	1 JAN 1830	75	146.	2 JAN 0045	100	41.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
	(CFS)				
+ 2004.	12.00	591.	183.	178.	178.
	(INCHES)	1.524	1.888	1.888	1.888
	(AC-FT)	293.	363.	363.	363.

CUMULATIVE AREA = 3.61 SQ MI

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          *            *
327 KK    *        1B  *
          *            *
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328 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL

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                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1.  PUNCH COMPUTED HYDROGRAPH
                    IOUT          22.  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1.  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100.  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


331 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6.  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME          0.  STARTING TIME

              SUBBASIN RUNOFF DATA

329 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.56  SUBBASIN AREA

                PRECIPITATION DATA

330 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

332 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

357 LS          SCS LOSS RATE
                     STRTL        0.80  INITIAL ABSTRACTION
                    CRVNBR       71.35  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

358 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
              1075.      301.       59.       12.        0.
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HYDROGRAPH AT STATION 1B

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	172.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.03	0.06	108.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	82.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.05	69.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	61.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.04	54.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.02	0.03	48.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	44.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	41.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	39.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	37.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	35.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	33.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	32.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	29.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	28.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	27.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	26.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	26.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	25.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	24.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	24.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	23.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.02	22.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	22.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	21.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.01	0.01	20.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.01	0.01	19.
1 JAN 0700	29	0.02	0.02	0.00	0.	1 JAN 1930	79	0.02	0.00	0.01	19.
1 JAN 0715	30	0.02	0.02	0.00	0.	1 JAN 1945	80	0.02	0.00	0.01	18.
1 JAN 0730	31	0.02	0.02	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	17.
1 JAN 0745	32	0.02	0.02	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	16.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.01	0.00	0.01	16.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	16.
1 JAN 0830	35	0.03	0.03	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	16.
1 JAN 0845	36	0.03	0.03	0.00	0.	1 JAN 2115	86	0.01	0.00	0.01	16.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.01	0.00	0.01	15.
1 JAN 0915	38	0.04	0.04	0.00	0.	1 JAN 2145	88	0.01	0.00	0.01	16.
1 JAN 0930	39	0.04	0.04	0.00	0.	1 JAN 2200	89	0.01	0.00	0.01	15.
1 JAN 0945	40	0.04	0.04	0.00	0.	1 JAN 2215	90	0.01	0.00	0.01	15.
1 JAN 1000	41	0.05	0.04	0.00	1.	1 JAN 2230	91	0.01	0.00	0.01	15.

1 JAN 1015	42	0.05	0.05	0.00	2.	*	1 JAN 2245	92	0.01	0.00	0.01	15.
1 JAN 1030	43	0.06	0.05	0.00	5.	*	1 JAN 2300	93	0.01	0.00	0.01	15.
1 JAN 1045	44	0.07	0.06	0.01	8.	*	1 JAN 2315	94	0.01	0.00	0.01	14.
1 JAN 1100	45	0.08	0.07	0.01	13.	*	1 JAN 2330	95	0.01	0.00	0.01	14.
1 JAN 1115	46	0.10	0.08	0.02	20.	*	1 JAN 2345	96	0.01	0.00	0.01	15.
1 JAN 1130	47	0.13	0.10	0.03	33.	*	2 JAN 0000	97	0.01	0.00	0.01	14.
1 JAN 1145	48	0.52	0.36	0.16	178.	*	2 JAN 0015	98	0.00	0.00	0.00	4.
1 JAN 1200	49	1.28	0.64	0.64	741.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.20	0.08	0.12	337.	*	2 JAN 0045	100	0.00	0.00	0.00	0.
						*						

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.79, TOTAL EXCESS = 1.96

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 741.	12.00	96.	29.	29.	29.
		(INCHES) 1.592	1.956	1.956	1.956
		(AC-FT) 48.	58.	58.	58.

CUMULATIVE AREA = 0.56 SQ MI

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```
          **************
          *            *
359 KK    *        1C  *        CNAME      1C
          *            *
          **************
```

360 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

361 HC HYDROGRAPH COMBINATION

ICOMP	2	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	*	1 JAN 0615	26	0.	*	1 JAN 1230	51	1449.	*	1 JAN 1845	76	161.
1 JAN 0015	2	0.	*	1 JAN 0630	27	0.	*	1 JAN 1245	52	1456.	*	1 JAN 1900	77	155.
1 JAN 0030	3	0.	*	1 JAN 0645	28	0.	*	1 JAN 1300	53	1349.	*	1 JAN 1915	78	151.
1 JAN 0045	4	0.	*	1 JAN 0700	29	0.	*	1 JAN 1315	54	1139.	*	1 JAN 1930	79	146.
1 JAN 0100	5	0.	*	1 JAN 0715	30	0.	*	1 JAN 1330	55	912.	*	1 JAN 1945	80	140.
1 JAN 0115	6	0.	*	1 JAN 0730	31	0.	*	1 JAN 1345	56	717.	*	1 JAN 2000	81	134.
1 JAN 0130	7	0.	*	1 JAN 0745	32	0.	*	1 JAN 1400	57	571.	*	1 JAN 2015	82	130.
1 JAN 0145	8	0.	*	1 JAN 0800	33	0.	*	1 JAN 1415	58	470.	*	1 JAN 2030	83	126.
1 JAN 0200	9	0.	*	1 JAN 0815	34	0.	*	1 JAN 1430	59	403.	*	1 JAN 2045	84	123.
1 JAN 0215	10	0.	*	1 JAN 0830	35	0.	*	1 JAN 1445	60	357.	*	1 JAN 2100	85	122.
1 JAN 0230	11	0.	*	1 JAN 0845	36	0.	*	1 JAN 1500	61	323.	*	1 JAN 2115	86	118.
1 JAN 0245	12	0.	*	1 JAN 0900	37	0.	*	1 JAN 1515	62	298.	*	1 JAN 2130	87	117.
1 JAN 0300	13	0.	*	1 JAN 0915	38	0.	*	1 JAN 1530	63	277.	*	1 JAN 2145	88	116.
1 JAN 0315	14	0.	*	1 JAN 0930	39	0.	*	1 JAN 1545	64	261.	*	1 JAN 2200	89	115.
1 JAN 0330	15	0.	*	1 JAN 0945	40	0.	*	1 JAN 1600	65	244.	*	1 JAN 2215	90	114.
1 JAN 0345	16	0.	*	1 JAN 1000	41	1.	*	1 JAN 1615	66	231.	*	1 JAN 2230	91	112.
1 JAN 0400	17	0.	*	1 JAN 1015	42	6.	*	1 JAN 1630	67	221.	*	1 JAN 2245	92	112.
1 JAN 0415	18	0.	*	1 JAN 1030	43	15.	*	1 JAN 1645	68	211.	*	1 JAN 2300	93	111.
1 JAN 0430	19	0.	*	1 JAN 1045	44	28.	*	1 JAN 1700	69	203.	*	1 JAN 2315	94	109.
1 JAN 0445	20	0.	*	1 JAN 1100	45	48.	*	1 JAN 1715	70	195.	*	1 JAN 2330	95	108.
1 JAN 0500	21	0.	*	1 JAN 1115	46	82.	*	1 JAN 1730	71	189.	*	1 JAN 2345	96	108.
1 JAN 0515	22	0.	*	1 JAN 1130	47	137.	*	1 JAN 1745	72	183.	*	2 JAN 0000	97	106.
1 JAN 0530	23	0.	*	1 JAN 1145	48	665.	*	1 JAN 1800	73	177.	*	2 JAN 0015	98	68.
1 JAN 0545	24	0.	*	1 JAN 1200	49	2745.	*	1 JAN 1815	74	172.	*	2 JAN 0030	99	53.
1 JAN 0600	25	0.	*	1 JAN 1215	50	1635.	*	1 JAN 1830	75	167.	*	2 JAN 0045	100	42.
			*				*				*			

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2745.	12.00	687.	213.	206.	206.
		(INCHES) 1.533	1.897	1.897	1.897
		(AC-FT) 341.	422.	422.	422.

CUMULATIVE AREA = 4.17 SQ MI

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           **************
           *            *
362 KK     *        1C  *        CNAME      1C
           *            *
           **************

363 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

364 RN          NO ROUTING
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HYDROGRAPH AT STATION 1C

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1449.	1 JAN 1845	76	161.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1456.	1 JAN 1900	77	155.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1349.	1 JAN 1915	78	151.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	1139.	1 JAN 1930	79	146.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	912.	1 JAN 1945	80	140.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	717.	1 JAN 2000	81	134.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	571.	1 JAN 2015	82	130.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	470.	1 JAN 2030	83	126.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	403.	1 JAN 2045	84	123.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	357.	1 JAN 2100	85	122.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	323.	1 JAN 2115	86	118.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	298.	1 JAN 2130	87	117.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	277.	1 JAN 2145	88	116.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	261.	1 JAN 2200	89	115.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	244.	1 JAN 2215	90	114.
1 JAN 0345	16	0.	1 JAN 1000	41	1.	1 JAN 1615	66	231.	1 JAN 2230	91	112.
1 JAN 0400	17	0.	1 JAN 1015	42	6.	1 JAN 1630	67	221.	1 JAN 2245	92	112.
1 JAN 0415	18	0.	1 JAN 1030	43	15.	1 JAN 1645	68	211.	1 JAN 2300	93	111.
1 JAN 0430	19	0.	1 JAN 1045	44	28.	1 JAN 1700	69	203.	1 JAN 2315	94	109.
1 JAN 0445	20	0.	1 JAN 1100	45	48.	1 JAN 1715	70	195.	1 JAN 2330	95	108.
1 JAN 0500	21	0.	1 JAN 1115	46	82.	1 JAN 1730	71	189.	1 JAN 2345	96	108.
1 JAN 0515	22	0.	1 JAN 1130	47	137.	1 JAN 1745	72	183.	2 JAN 0000	97	106.
1 JAN 0530	23	0.	1 JAN 1145	48	665.	1 JAN 1800	73	177.	2 JAN 0015	98	68.
1 JAN 0545	24	0.	1 JAN 1200	49	2745.	1 JAN 1815	74	172.	2 JAN 0030	99	53.
1 JAN 0600	25	0.	1 JAN 1215	50	1635.	1 JAN 1830	75	167.	2 JAN 0045	100	42.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)				
2745.	12.00		687.	213.	206.	206.
		(INCHES)	1.533	1.897	1.897	1.897
		(AC-FT)	341.	422.	422.	422.

CUMULATIVE AREA = 4.17 SQ MI

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	4B	336.	12.25	66.	20.	20.	0.40		
ROUTED TO	4R	274.	12.50	66.	20.	20.	0.40		
HYDROGRAPH AT	5B	552.	12.00	104.	32.	31.	0.63		
ROUTED TO	5R	429.	12.50	104.	32.	31.	0.63		
HYDROGRAPH AT	3aB	389.	12.00	71.	22.	21.	0.43		

+	HYDROGRAPH AT	3bB	373.	12.00	74.	23.	22.	0.45
+	4 COMBINED AT	3C	1320.	12.25	314.	97.	94.	1.90
+	ROUTED TO	3R	966.	13.00	312.	96.	93.	1.90
+	HYDROGRAPH AT	6B	238.	12.00	42.	13.	12.	0.25
+	ROUTED TO	6R	158.	12.50	41.	13.	12.	0.25
+	HYDROGRAPH AT	7bB	344.	12.00	45.	14.	13.	0.27
+	HYDROGRAPH AT	7aB	722.	12.00	94.	29.	28.	0.57
+	3 COMBINED AT	7C	1108.	12.00	180.	55.	54.	1.09
+	HYDROGRAPH AT	2bB	167.	12.00	22.	7.	6.	0.13
+	HYDROGRAPH AT	2aB	628.	12.00	82.	25.	24.	0.49
+	4 COMBINED AT	2C	2004.	12.00	591.	183.	178.	3.61
+	HYDROGRAPH AT	1B	741.	12.00	96.	29.	29.	0.56
+	2 COMBINED AT	1C	2745.	12.00	687.	213.	206.	4.17
+	ROUTED TO	1C	2745.	12.00	687.	213.	206.	4.17

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

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1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
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*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    w Reclaimed Mining & wo Logging (Scenario 3), LIDAR Data
   3          ID    100 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 480389.00000 4224905.00000 1
   6          PG    Gage     4.1
   7          IN      15  1JAN94       0
              * Scrabble Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0   0.025
   9          PC    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475     0.6   0.725
  10          PC    0.85  0.9125   0.975  1.0375     1.1  1.1625   1.225  1.2875    1.35   1.725
  11          PC     2.1   2.475    2.85     3.1    3.35     3.6    3.85  3.9125   3.975  4.0375
  12          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  13          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  14          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  15          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  16          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  17          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1

  18          KK      4B
  19          KO       0       0     0.0       1      22
  20          BA  0.4012
  21          PB     5.7
  22          IN       6  1JAN94       0
              * typeII-24hour
  23          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  24          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  25          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  26          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  27          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  28          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  29          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  30          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  31          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  32          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  33          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  34          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  35          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  36          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  37          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  38          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  39          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  40          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  41          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  42          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  43          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  44          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  45          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  46          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  47          PC     1.0
  48          LS     0.0    70.5     0.0
  49          UD  0.2578
```

HEC-1 INPUT PAGE 2

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

  50          KK      4R   CNAME      4C
```

```
  51          KO       0       0     0.0       0      22
  52          RM       1    0.34     0.2

  53          KK      5B
  54          KO       0       0     0.0       1      22
  55          BA  0.6299
  56          PB     5.7
  57          IN       6  1JAN94       0
              * typeII-24hour
  58          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  59          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  60          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  61          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  62          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  63          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  64          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  65          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  66          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  67          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  68          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  69          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  70          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  71          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  72          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  73          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  74          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  75          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  76          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  77          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  78          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  79          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  80          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  81          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  82          PC     1.0
  83          LS     0.0    70.5     0.0
  84          UD  0.2197

  85          KK      5R   CNAME      5C
  86          KO       0       0     0.0       0      22
  87          RM       1   0.357     0.2

  88          KK     3aB
  89          KO       0       0     0.0       1      22
  90          BA  0.4252
  91          PB     5.7
  92          IN       6  1JAN94       0
              * typeII-24hour
  93          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  94          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  95          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  96          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  97          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  98          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
```



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

  99          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 100          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 101          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 102          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 103          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 104          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 105          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 106          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 107          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 108          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 109          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 110          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 111          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 112          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 113          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 114          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 115          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 116          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 117          PC     1.0
 118          LS     0.0   70.59     0.0
 119          UD  0.2104

 120          KK     3bB
 121          KO       0       0     0.0       1      22
 122          BA  0.4467
 123          PB     5.7
 124          IN       6  1JAN94       0
              * typeII-24hour
 125          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 126          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 127          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 128          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 129          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 130          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 131          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 132          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 133          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 134          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 135          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 136          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 137          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
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 138          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 139          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 140          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 141          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 142          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 143          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 144          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 145          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 146          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 147          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 148          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 149          PC     1.0
 150          LS     0.0   70.62     0.0
 151          UD  0.2331
```



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

 152          KK      3C   CNAME      3R
 153          KO       0       0     0.0       0      22
 154          HC       4

 155          KK      3R   CNAME      3C
 156          KO       0       0     0.0       0      22
 157          RM       2   0.641     0.2

 158          KK      6B
 159          KO       0       0     0.0       1      22
 160          BA  0.2511
 161          PB     5.7
 162          IN       6  1JAN94       0
              * typeII-24hour
 163          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 164          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 165          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 166          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 167          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 168          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 169          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 170          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 171          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 172          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 173          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 174          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 175          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 176          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 177          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 178          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 179          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 180          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 181          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 182          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 183          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 184          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 185          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 186          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 187          PC     1.0
 188          LS     0.0    70.5     0.0
 189          UD  0.2017

 190          KK      6R   CNAME      6C
 191          KO       0       0     0.0       0      22
 192          RM       1   0.492     0.2

 193          KK     7bB
 194          KO       0       0     0.0       1      22
 195          BA  0.2705
 196          PB     5.7
 197          IN       6  1JAN94       0
              * typeII-24hour
 198          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 199          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
```



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

 200          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 201          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 202          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 203          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 204          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 205          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 206          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 207          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 208          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 209          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 210          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 211          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 212          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 213          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 214          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 215          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 216          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 217          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 218          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 219          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
```

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 220          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 221          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 222          PC     1.0
 223          LS     0.0    70.5     0.0
 224          UD     0.0

 225          KK     7aB
 226          KO       0       0     0.0       1      22
 227          BA  0.5681
 228          PB     5.7
 229          IN       6  1JAN94       0
              * typeII-24hour
 230          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 231          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 232          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 233          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 234          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 235          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 236          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 237          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 238          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 239          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 240          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 241          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 242          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 243          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 244          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 245          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 246          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 247          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 248          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 249          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 250          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 251          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 252          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```



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

 253          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 254          PC     1.0
 255          LS     0.0    70.5     0.0
 256          UD     0.0

 257          KK      7C   CNAME      7R
 258          KO       0       0     0.0       0      22
 259          HC       3

 260          KK     2bB
 261          KO       0       0     0.0       1      22
 262          BA  0.1252
 263          PB     5.7
 264          IN       6  1JAN94       0
              * typeII-24hour
 265          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 266          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 267          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 268          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 269          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 270          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 271          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 272          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 273          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 274          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 275          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 276          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 277          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 278          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 279          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 280          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 281          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 282          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 283          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 284          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 285          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 286          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 287          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 288          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 289          PC     1.0
 290          LS     0.0   71.61     0.0
 291          UD     0.0

 292          KK     2aB
 293          KO       0       0     0.0       1      22
 294          BA    0.49
 295          PB     5.7
 296          IN       6  1JAN94       0
              * typeII-24hour
 297          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 298          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 299          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 300          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 301          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 302          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
```



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

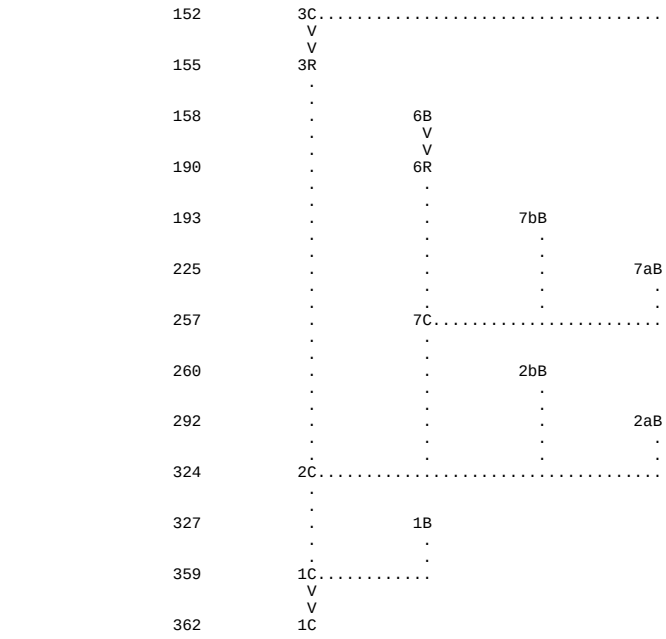
```
 303          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 304          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 305          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 306          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 307          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 308          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 309          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 310          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 311          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 312          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 313          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 314          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 315          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 316          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 317          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 318          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 319          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 320          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 321          PC     1.0
 322          LS     0.0   70.68     0.0
 323          UD     0.0

 324          KK      2C   CNAME      2R
 325          KO       0       0     0.0       0      22
 326          HC       4

 327          KK      1B
 328          KO       0       0     0.0       1      22
 329          BA  0.5606
 330          PB     5.7
 331          IN       6  1JAN94       0
              * typeII-24hour
 332          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 333          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 334          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 335          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 336          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 337          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 338          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 339          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 340          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 341          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 342          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 343          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 344          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 345          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 346          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 347          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 348          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 349          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 350          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 351          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 352          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 353          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 354          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```



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

 355          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 356          PC     1.0
 357          LS     0.0   71.35     0.0
 358          UD     0.0

 359          KK      1C   CNAME      1C
 360          KO       0       0     0.0       0      22
 361          HC       2

 362          KK      1C   CNAME      1C
 363          KO       0       0     0.0       0      22
 364          RN      1C
 365          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   18          4B
                V
                V
   50          4R
               .
               .
   53          .          5B
               .           V
               .           V
   85          .          5R
               .          .
               .          .
   88          .          .         3aB
               .          .           .
               .          .           .
  120          .          .           .         3bB
               .          .           .           .
               .          .           .           .
```



```
  152          3C.....................................
                V
                V
  155          3R
                .
                .
  158           .          6B
                .           V
                .           V
  190           .          6R
                .           .
                .           .
  193           .           .         7bB
                .           .           .
                .           .           .
  225           .           .           .         7aB
                .           .           .           .
                .           .           .           .
  257           .          7C.......................
                .           .
                .           .
  260           .           .         2bB
                .           .           .
                .           .           .
  292           .           .           .         2aB
                .           .           .           .
                .           .           .           .
  324          2C.....................................
                .
                .
  327           .          1B
                .           .
                .           .
  359          1C............
                V
                V
  362          1C

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************                                                  ****************************************
 *                                       *                                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                  *    U.S. ARMY CORPS OF ENGINEERS     *
 *               MAY   1991              *                                                  *    HYDROLOGIC ENGINEERING CENTER    *
 *            VERSION 4.0.1E             *                                                  *          609 SECOND STREET          *
 *                                       *                                                  *       DAVIS, CALIFORNIA 95616       *
 *  RUN DATE            TIME             *                                                  *           (916) 551-1748            *
 *                                       *                                                  *                                      *
 *****************************************                                                  ****************************************
```

```
                          Scrabble Creek
                          w Reclaimed Mining & wo Logging (Scenario 3), LIDAR Data
                          100 yr Storm

   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

   7 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

     IT          HYDROGRAPH TIME DATA
                       NMIN          15  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN94  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN94  ENDING DATE
                     NDTIME        0045  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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


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


           **************
           *            *
  18 KK    *        4B  *
           *            *
           **************
```

```
 19 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


 22 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          6  TIME INTERVAL IN MINUTES
                     JXDATE     1JAN94  STARTING DATE
                     JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

 20 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.40  SUBBASIN AREA

              PRECIPITATION DATA

 21 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

 23 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

 48 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

 49 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.26  LAG

                                                ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                            UNIT HYDROGRAPH
                                         7 END-OF-PERIOD ORDINATES
              375.      430.      151.       53.       18.        6.        2.
```

****

HYDROGRAPH AT STATION 4B

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	256.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	154.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	103.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	78.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	64.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	54.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	48.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	43.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	40.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	37.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	35.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	34.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	32.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	30.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	28.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	26.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	25.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	25.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	24.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	23.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	23.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	22.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	21.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	21.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	20.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	19.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	18.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	18.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	17.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	17.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	16.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	15.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	15.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	15.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	15.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	14.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	14.
1 JAN 0915	38	0.05	0.05	0.00	0.	1 JAN 2145	88	0.02	0.00	0.01	14.

1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	14.
1	JAN	0945	40	0.05	0.05	0.00	2.	*	1	JAN	2215	90	0.02	0.00	0.01	14.
1	JAN	1000	41	0.05	0.05	0.00	3.	*	1	JAN	2230	91	0.02	0.00	0.01	14.
1	JAN	1015	42	0.06	0.06	0.01	5.	*	1	JAN	2245	92	0.02	0.00	0.01	14.
1	JAN	1030	43	0.07	0.06	0.01	7.	*	1	JAN	2300	93	0.02	0.00	0.01	14.
1	JAN	1045	44	0.08	0.07	0.01	10.	*	1	JAN	2315	94	0.02	0.00	0.01	13.
1	JAN	1100	45	0.10	0.08	0.02	14.	*	1	JAN	2330	95	0.02	0.00	0.01	13.
1	JAN	1115	46	0.12	0.09	0.03	20.	*	1	JAN	2345	96	0.02	0.00	0.01	13.
1	JAN	1130	47	0.15	0.11	0.04	30.	*	2	JAN	0000	97	0.02	0.00	0.01	13.
1	JAN	1145	48	0.62	0.39	0.23	109.	*	2	JAN	0015	98	0.00	0.00	0.00	8.
1	JAN	1200	49	1.54	0.68	0.86	430.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.24	0.08	0.16	470.	*	2	JAN	0045	100	0.00	0.00	0.00	1.
								*								

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
470.	12.25	92.	28.	27.	27.
		(INCHES) 2.122	2.613	2.613	2.613
		(AC-FT) 45.	56.	56.	56.

CUMULATIVE AREA = 0.40 SQ MI

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          **************
          *            *
 50 KK    *        4R  *        CNAME      4C
          *            *
          **************

 51 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

 52 RM          MUSKINGUM ROUTING
                      NSTPS         1 NUMBER OF SUBREACHES
                      AMSKK      0.34 MUSKINGUM K
                          X      0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 4R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	385.	1	JAN	1845	76	20.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	289.	1	JAN	1900	77	19.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	197.	1	JAN	1915	78	19.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	134.	1	JAN	1930	79	18.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	97.	1	JAN	1945	80	18.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	75.	1	JAN	2000	81	17.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	61.	1	JAN	2015	82	16.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	52.	1	JAN	2030	83	16.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	46.	1	JAN	2045	84	15.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	42.	1	JAN	2100	85	15.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	39.	1	JAN	2115	86	15.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	36.	1	JAN	2130	87	14.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	34.	1	JAN	2145	88	14.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	33.	1	JAN	2200	89	14.
1	JAN	0330	15	0.	1	JAN	0945	40	1.	1	JAN	1600	65	31.	1	JAN	2215	90	14.
1	JAN	0345	16	0.	1	JAN	1000	41	1.	1	JAN	1615	66	29.	1	JAN	2230	91	14.
1	JAN	0400	17	0.	1	JAN	1015	42	3.	1	JAN	1630	67	27.	1	JAN	2245	92	14.
1	JAN	0415	18	0.	1	JAN	1030	43	4.	1	JAN	1645	68	26.	1	JAN	2300	93	14.
1	JAN	0430	19	0.	1	JAN	1045	44	6.	1	JAN	1700	69	25.	1	JAN	2315	94	14.
1	JAN	0445	20	0.	1	JAN	1100	45	9.	1	JAN	1715	70	24.	1	JAN	2330	95	13.
1	JAN	0500	21	0.	1	JAN	1115	46	13.	1	JAN	1730	71	23.	1	JAN	2345	96	13.
1	JAN	0515	22	0.	1	JAN	1130	47	19.	1	JAN	1745	72	23.	2	JAN	0000	97	13.
1	JAN	0530	23	0.	1	JAN	1145	48	37.	1	JAN	1800	73	22.	2	JAN	0015	98	12.
1	JAN	0545	24	0.	1	JAN	1200	49	129.	1	JAN	1815	74	21.	2	JAN	0030	99	9.
1	JAN	0600	25	0.	1	JAN	1215	50	324.	1	JAN	1830	75	21.	2	JAN	0045	100	5.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			

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+     385.     12.50                   91.         28.         27.          27.
                        (INCHES)     2.117       2.608       2.608        2.608
                         (AC-FT)       45.         56.         56.          56.

                         CUMULATIVE AREA =    0.40 SQ MI


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


            **************
            *            *
   53 KK    *        5B  *
            *            *
            **************

   54 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


   57 IN          TIME DATA FOR INPUT TIME SERIES
                        JXMIN           6  TIME INTERVAL IN MINUTES
                       JXDATE      1JAN94  STARTING DATE
                       JXTIME           0  STARTING TIME

                SUBBASIN RUNOFF DATA

   55 BA          SUBBASIN CHARACTERISTICS
                       TAREA,        0.63  SUBBASIN AREA

                  PRECIPITATION DATA

   56 PB               STORM         5.70  BASIN TOTAL PRECIPITATION

   58 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

   83 LS          SCS LOSS RATE
                       STRTL        0.84  INITIAL ABSTRACTION
                      CRVNBR       70.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

   84 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.22  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             6 END-OF-PERIOD ORDINATES
                731.      629.      186.       57.       17.        6.

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

                                                HYDROGRAPH AT STATION       5B

*****************************************************************************************************************************************
                                                                    *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q        *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                    *
        1 JAN 0000    1    0.00    0.00    0.00         0.        *        1 JAN 1230   51    0.17    0.05    0.11       360.
        1 JAN 0015    2    0.01    0.01    0.00         0.        *        1 JAN 1245   52    0.11    0.03    0.08       214.
        1 JAN 0030    3    0.01    0.01    0.00         0.        *        1 JAN 1300   53    0.10    0.03    0.07       147.
        1 JAN 0045    4    0.02    0.02    0.00         0.        *        1 JAN 1315   54    0.08    0.02    0.06       114.
        1 JAN 0100    5    0.02    0.02    0.00         0.        *        1 JAN 1330   55    0.07    0.02    0.05        95.
        1 JAN 0115    6    0.02    0.02    0.00         0.        *        1 JAN 1345   56    0.06    0.02    0.05        83.
        1 JAN 0130    7    0.02    0.02    0.00         0.        *        1 JAN 1400   57    0.06    0.02    0.04        73.
        1 JAN 0145    8    0.02    0.02    0.00         0.        *        1 JAN 1415   58    0.05    0.01    0.04        66.
        1 JAN 0200    9    0.02    0.02    0.00         0.        *        1 JAN 1430   59    0.05    0.01    0.04        61.
        1 JAN 0215   10    0.02    0.02    0.00         0.        *        1 JAN 1445   60    0.05    0.01    0.03        58.
        1 JAN 0230   11    0.02    0.02    0.00         0.        *        1 JAN 1500   61    0.04    0.01    0.03        55.
        1 JAN 0245   12    0.02    0.02    0.00         0.        *        1 JAN 1515   62    0.04    0.01    0.03        52.
        1 JAN 0300   13    0.02    0.02    0.00         0.        *        1 JAN 1530   63    0.04    0.01    0.03        49.
        1 JAN 0315   14    0.02    0.02    0.00         0.        *        1 JAN 1545   64    0.04    0.01    0.03        47.
        1 JAN 0330   15    0.02    0.02    0.00         0.        *        1 JAN 1600   65    0.03    0.01    0.03        44.
        1 JAN 0345   16    0.02    0.02    0.00         0.        *        1 JAN 1615   66    0.03    0.01    0.02        41.
        1 JAN 0400   17    0.02    0.02    0.00         0.        *        1 JAN 1630   67    0.03    0.01    0.02        40.
        1 JAN 0415   18    0.02    0.02    0.00         0.        *        1 JAN 1645   68    0.03    0.01    0.02        38.
        1 JAN 0430   19    0.02    0.02    0.00         0.        *        1 JAN 1700   69    0.03    0.01    0.02        37.
        1 JAN 0445   20    0.02    0.02    0.00         0.        *        1 JAN 1715   70    0.03    0.01    0.02        36.
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1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.03	0.01	0.02	35.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.03	0.01	0.02	34.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.03	0.01	0.02	33.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.03	0.01	0.02	32.
1	JAN	0600	25	0.03	0.03	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.02	31.
1	JAN	0615	26	0.03	0.03	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.02	30.
1	JAN	0630	27	0.03	0.03	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.02	29.
1	JAN	0645	28	0.03	0.03	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.02	28.
1	JAN	0700	29	0.03	0.03	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.02	27.
1	JAN	0715	30	0.03	0.03	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.02	26.
1	JAN	0730	31	0.03	0.03	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	25.
1	JAN	0745	32	0.03	0.03	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	24.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.02	0.00	0.01	23.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	23.
1	JAN	0830	35	0.04	0.04	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	23.
1	JAN	0845	36	0.04	0.04	0.00	0.	*	1	JAN	2115	86	0.02	0.00	0.01	23.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	22.
1	JAN	0915	38	0.05	0.05	0.00	0.	*	1	JAN	2145	88	0.02	0.00	0.01	22.
1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	22.
1	JAN	0945	40	0.05	0.05	0.00	3.	*	1	JAN	2215	90	0.02	0.00	0.01	22.
1	JAN	1000	41	0.05	0.05	0.00	5.	*	1	JAN	2230	91	0.02	0.00	0.01	21.
1	JAN	1015	42	0.06	0.06	0.01	8.	*	1	JAN	2245	92	0.02	0.00	0.01	21.
1	JAN	1030	43	0.07	0.06	0.01	11.	*	1	JAN	2300	93	0.02	0.00	0.01	21.
1	JAN	1045	44	0.08	0.07	0.01	16.	*	1	JAN	2315	94	0.02	0.00	0.01	21.
1	JAN	1100	45	0.10	0.08	0.02	23.	*	1	JAN	2330	95	0.02	0.00	0.01	21.
1	JAN	1115	46	0.12	0.09	0.03	34.	*	1	JAN	2345	96	0.02	0.00	0.01	21.
1	JAN	1130	47	0.15	0.11	0.04	51.	*	2	JAN	0000	97	0.02	0.00	0.01	20.
1	JAN	1145	48	0.62	0.39	0.23	200.	*	2	JAN	0015	98	0.00	0.00	0.00	11.
1	JAN	1200	49	1.54	0.68	0.86	785.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.24	0.08	0.16	707.	*	2	JAN	0045	100	0.00	0.00	0.00	1.
								*								

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
785.	12.00	144.	44.	43.	43.
		(INCHES) 2.123	2.613	2.613	2.613
		(AC-FT) 71.	88.	88.	88.

CUMULATIVE AREA = 0.63 SQ MI

```
          **************
          *            *
 85 KK    *        5R  *        CNAME      5C
          *            *
          **************

 86 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

 87 RM          MUSKINGUM ROUTING
                     NSTPS          1 NUMBER OF SUBREACHES
                     AMSKK       0.36 MUSKINGUM K
                         X       0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 5R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	602.	1	JAN	1845	76	32.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	436.	1	JAN	1900	77	30.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	292.	1	JAN	1915	78	29.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	199.	1	JAN	1930	79	28.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	145.	1	JAN	1945	80	27.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	113.	1	JAN	2000	81	26.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	93.	1	JAN	2015	82	25.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	80.	1	JAN	2030	83	24.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	71.	1	JAN	2045	84	24.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	65.	1	JAN	2100	85	23.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	60.	1	JAN	2115	86	23.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	57.	1	JAN	2130	87	23.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	54.	1	JAN	2145	88	22.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	51.	1	JAN	2200	89	22.

1	JAN	0330	15	0.	*	1	JAN	0945	40	1.	*	1	JAN	1600	65	48.	*	1	JAN	2215	90	22.
1	JAN	0345	16	0.	*	1	JAN	1000	41	3.	*	1	JAN	1615	66	45.	*	1	JAN	2230	91	22.
1	JAN	0400	17	0.	*	1	JAN	1015	42	4.	*	1	JAN	1630	67	42.	*	1	JAN	2245	92	22.
1	JAN	0415	18	0.	*	1	JAN	1030	43	7.	*	1	JAN	1645	68	41.	*	1	JAN	2300	93	21.
1	JAN	0430	19	0.	*	1	JAN	1045	44	10.	*	1	JAN	1700	69	39.	*	1	JAN	2315	94	21.
1	JAN	0445	20	0.	*	1	JAN	1100	45	15.	*	1	JAN	1715	70	38.	*	1	JAN	2330	95	21.
1	JAN	0500	21	0.	*	1	JAN	1115	46	21.	*	1	JAN	1730	71	37.	*	1	JAN	2345	96	21.
1	JAN	0515	22	0.	*	1	JAN	1130	47	31.	*	1	JAN	1745	72	36.	*	2	JAN	0000	97	21.
1	JAN	0530	23	0.	*	1	JAN	1145	48	63.	*	1	JAN	1800	73	35.	*	2	JAN	0015	98	19.
1	JAN	0545	24	0.	*	1	JAN	1200	49	223.	*	1	JAN	1815	74	34.	*	2	JAN	0030	99	13.
1	JAN	0600	25	0.	*	1	JAN	1215	50	555.	*	1	JAN	1830	75	32.	*	2	JAN	0045	100	7.
					*						*						*						

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	24.75-HR	
+ (CFS)	(HR)					
	(CFS)					
+ 602.	12.50	143.	44.	43.	43.	
	(INCHES)	2.118	2.608	2.608	2.608	
	(AC-FT)	71.	88.	88.	88.	

CUMULATIVE AREA = 0.63 SQ MI

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          **************
          *            *
88 KK     *       3aB  *
          *            *
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89 KO — OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

92 IN — TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

90 BA — SUBBASIN CHARACTERISTICS

TAREA,	0.43	SUBBASIN AREA

PRECIPITATION DATA

91 PB — STORM 5.70 BASIN TOTAL PRECIPITATION

93 PI — INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

118 LS — SCS LOSS RATE

STRTL	0.83	INITIAL ABSTRACTION
CRVNBR	70.59	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

119 UD — SCS DIMENSIONLESS UNITGRAPH

TLAG	0.21	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

520.	412.	117.	34.	10.	3.

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HYDROGRAPH AT STATION 3aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	237.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	140.

1	JAN	0030	3	0.01	0.01	0.00	0.	*	1	JAN	1300	53	0.10	0.03	0.07	97.
1	JAN	0045	4	0.02	0.02	0.00	0.	*	1	JAN	1315	54	0.08	0.02	0.06	76.
1	JAN	0100	5	0.02	0.02	0.00	0.	*	1	JAN	1330	55	0.07	0.02	0.05	63.
1	JAN	0115	6	0.02	0.02	0.00	0.	*	1	JAN	1345	56	0.06	0.02	0.05	56.
1	JAN	0130	7	0.02	0.02	0.00	0.	*	1	JAN	1400	57	0.06	0.02	0.04	49.
1	JAN	0145	8	0.02	0.02	0.00	0.	*	1	JAN	1415	58	0.05	0.01	0.04	45.
1	JAN	0200	9	0.02	0.02	0.00	0.	*	1	JAN	1430	59	0.05	0.01	0.04	41.
1	JAN	0215	10	0.02	0.02	0.00	0.	*	1	JAN	1445	60	0.05	0.01	0.03	39.
1	JAN	0230	11	0.02	0.02	0.00	0.	*	1	JAN	1500	61	0.04	0.01	0.03	37.
1	JAN	0245	12	0.02	0.02	0.00	0.	*	1	JAN	1515	62	0.04	0.01	0.03	35.
1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.04	0.01	0.03	33.
1	JAN	0315	14	0.02	0.02	0.00	0.	*	1	JAN	1545	64	0.04	0.01	0.03	31.
1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.03	29.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	28.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	27.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	26.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.03	0.01	0.02	25.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.03	0.01	0.02	24.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.03	0.01	0.02	24.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.03	0.01	0.02	23.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.03	0.01	0.02	22.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.03	0.01	0.02	22.
1	JAN	0600	25	0.03	0.03	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.02	21.
1	JAN	0615	26	0.03	0.03	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.02	20.
1	JAN	0630	27	0.03	0.03	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.02	19.
1	JAN	0645	28	0.03	0.03	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.02	19.
1	JAN	0700	29	0.03	0.03	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.02	18.
1	JAN	0715	30	0.03	0.03	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.02	17.
1	JAN	0730	31	0.03	0.03	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	17.
1	JAN	0745	32	0.03	0.03	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	16.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.02	0.00	0.01	16.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	15.
1	JAN	0830	35	0.04	0.04	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	16.
1	JAN	0845	36	0.04	0.04	0.00	0.	*	1	JAN	2115	86	0.02	0.00	0.01	15.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	15.
1	JAN	0915	38	0.05	0.05	0.00	0.	*	1	JAN	2145	88	0.02	0.00	0.01	15.
1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	15.
1	JAN	0945	40	0.05	0.05	0.00	2.	*	1	JAN	2215	90	0.02	0.00	0.01	15.
1	JAN	1000	41	0.05	0.05	0.00	3.	*	1	JAN	2230	91	0.02	0.00	0.01	14.
1	JAN	1015	42	0.06	0.06	0.01	5.	*	1	JAN	2245	92	0.02	0.00	0.01	14.
1	JAN	1030	43	0.07	0.06	0.01	8.	*	1	JAN	2300	93	0.02	0.00	0.01	14.
1	JAN	1045	44	0.08	0.07	0.01	11.	*	1	JAN	2315	94	0.02	0.00	0.01	14.
1	JAN	1100	45	0.10	0.08	0.02	16.	*	1	JAN	2330	95	0.02	0.00	0.01	14.
1	JAN	1115	46	0.12	0.09	0.03	23.	*	1	JAN	2345	96	0.02	0.00	0.01	14.
1	JAN	1130	47	0.15	0.11	0.04	35.	*	2	JAN	0000	97	0.02	0.00	0.01	14.
1	JAN	1145	48	0.62	0.39	0.23	141.	*	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.54	0.68	0.87	552.	*	2	JAN	0030	99	0.00	0.00	0.00	2.
1	JAN	1215	50	0.24	0.08	0.16	471.	*	2	JAN	0045	100	0.00	0.00	0.00	1.
								*								

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TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.62

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
552.	12.00		97.	30.	29.	29.
		(INCHES)	2.130	2.622	2.622	2.622
		(AC-FT)	48.	59.	59.	59.

CUMULATIVE AREA = 0.43 SQ MI

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          **************
          *            *
120 KK    *       3bB  *
          *            *
          **************
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121 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

124 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

122 BA SUBBASIN CHARACTERISTICS

TAREA,	0.45	SUBBASIN AREA

PRECIPITATION DATA

123 PB STORM 5.70 BASIN TOTAL PRECIPITATION

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 125 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

 150 LS          SCS LOSS RATE
                      STRTL       0.83  INITIAL ABSTRACTION
                     CRVNBR      70.62  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

 151 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.23  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                              7 END-OF-PERIOD ORDINATES
               481.      461.      145.       46.       15.        5.        1.

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

                                                HYDROGRAPH AT STATION      3bB

*****************************************************************************************************************************************
                                                                                *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q        *        DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                                *
         1 JAN 0000    1    0.00    0.00    0.00         0.        *         1 JAN 1230   51    0.17    0.05    0.11       267.
         1 JAN 0015    2    0.01    0.01    0.00         0.        *         1 JAN 1245   52    0.11    0.03    0.08       158.
         1 JAN 0030    3    0.01    0.01    0.00         0.        *         1 JAN 1300   53    0.10    0.03    0.07       108.
         1 JAN 0045    4    0.02    0.02    0.00         0.        *         1 JAN 1315   54    0.08    0.02    0.06        83.
         1 JAN 0100    5    0.02    0.02    0.00         0.        *         1 JAN 1330   55    0.07    0.02    0.05        68.
         1 JAN 0115    6    0.02    0.02    0.00         0.        *         1 JAN 1345   56    0.06    0.02    0.05        59.
         1 JAN 0130    7    0.02    0.02    0.00         0.        *         1 JAN 1400   57    0.06    0.02    0.04        53.
         1 JAN 0145    8    0.02    0.02    0.00         0.        *         1 JAN 1415   58    0.05    0.01    0.04        47.
         1 JAN 0200    9    0.02    0.02    0.00         0.        *         1 JAN 1430   59    0.05    0.01    0.04        44.
         1 JAN 0215   10    0.02    0.02    0.00         0.        *         1 JAN 1445   60    0.05    0.01    0.03        41.
         1 JAN 0230   11    0.02    0.02    0.00         0.        *         1 JAN 1500   61    0.04    0.01    0.03        39.
         1 JAN 0245   12    0.02    0.02    0.00         0.        *         1 JAN 1515   62    0.04    0.01    0.03        37.
         1 JAN 0300   13    0.02    0.02    0.00         0.        *         1 JAN 1530   63    0.04    0.01    0.03        35.
         1 JAN 0315   14    0.02    0.02    0.00         0.        *         1 JAN 1545   64    0.04    0.01    0.03        33.
         1 JAN 0330   15    0.02    0.02    0.00         0.        *         1 JAN 1600   65    0.03    0.01    0.03        31.
         1 JAN 0345   16    0.02    0.02    0.00         0.        *         1 JAN 1615   66    0.03    0.01    0.02        29.
         1 JAN 0400   17    0.02    0.02    0.00         0.        *         1 JAN 1630   67    0.03    0.01    0.02        28.
         1 JAN 0415   18    0.02    0.02    0.00         0.        *         1 JAN 1645   68    0.03    0.01    0.02        27.
         1 JAN 0430   19    0.02    0.02    0.00         0.        *         1 JAN 1700   69    0.03    0.01    0.02        27.
         1 JAN 0445   20    0.02    0.02    0.00         0.        *         1 JAN 1715   70    0.03    0.01    0.02        26.
         1 JAN 0500   21    0.02    0.02    0.00         0.        *         1 JAN 1730   71    0.03    0.01    0.02        25.
         1 JAN 0515   22    0.02    0.02    0.00         0.        *         1 JAN 1745   72    0.03    0.01    0.02        24.
         1 JAN 0530   23    0.02    0.02    0.00         0.        *         1 JAN 1800   73    0.03    0.01    0.02        24.
         1 JAN 0545   24    0.02    0.02    0.00         0.        *         1 JAN 1815   74    0.03    0.01    0.02        23.
         1 JAN 0600   25    0.03    0.03    0.00         0.        *         1 JAN 1830   75    0.02    0.01    0.02        22.
         1 JAN 0615   26    0.03    0.03    0.00         0.        *         1 JAN 1845   76    0.02    0.01    0.02        21.
         1 JAN 0630   27    0.03    0.03    0.00         0.        *         1 JAN 1900   77    0.02    0.01    0.02        21.
         1 JAN 0645   28    0.03    0.03    0.00         0.        *         1 JAN 1915   78    0.02    0.01    0.02        20.
         1 JAN 0700   29    0.03    0.03    0.00         0.        *         1 JAN 1930   79    0.02    0.00    0.02        19.
         1 JAN 0715   30    0.03    0.03    0.00         0.        *         1 JAN 1945   80    0.02    0.00    0.02        18.
         1 JAN 0730   31    0.03    0.03    0.00         0.        *         1 JAN 2000   81    0.02    0.00    0.01        18.
         1 JAN 0745   32    0.03    0.03    0.00         0.        *         1 JAN 2015   82    0.02    0.00    0.01        17.
         1 JAN 0800   33    0.03    0.03    0.00         0.        *         1 JAN 2030   83    0.02    0.00    0.01        16.
         1 JAN 0815   34    0.03    0.03    0.00         0.        *         1 JAN 2045   84    0.02    0.00    0.01        16.
         1 JAN 0830   35    0.04    0.04    0.00         0.        *         1 JAN 2100   85    0.02    0.00    0.01        16.
         1 JAN 0845   36    0.04    0.04    0.00         0.        *         1 JAN 2115   86    0.02    0.00    0.01        16.
         1 JAN 0900   37    0.04    0.04    0.00         0.        *         1 JAN 2130   87    0.02    0.00    0.01        16.
         1 JAN 0915   38    0.05    0.04    0.00         0.        *         1 JAN 2145   88    0.02    0.00    0.01        16.
         1 JAN 0930   39    0.05    0.04    0.00         1.        *         1 JAN 2200   89    0.02    0.00    0.01        16.
         1 JAN 0945   40    0.05    0.05    0.00         2.        *         1 JAN 2215   90    0.02    0.00    0.01        15.
         1 JAN 1000   41    0.05    0.05    0.00         4.        *         1 JAN 2230   91    0.02    0.00    0.01        15.
         1 JAN 1015   42    0.06    0.06    0.01         5.        *         1 JAN 2245   92    0.02    0.00    0.01        15.
         1 JAN 1030   43    0.07    0.06    0.01         8.        *         1 JAN 2300   93    0.02    0.00    0.01        15.
         1 JAN 1045   44    0.08    0.07    0.01        11.        *         1 JAN 2315   94    0.02    0.00    0.01        15.
         1 JAN 1100   45    0.10    0.08    0.02        16.        *         1 JAN 2330   95    0.02    0.00    0.01        15.
         1 JAN 1115   46    0.12    0.09    0.03        24.        *         1 JAN 2345   96    0.02    0.00    0.01        15.
         1 JAN 1130   47    0.15    0.11    0.04        36.        *         2 JAN 0000   97    0.02    0.00    0.01        14.
         1 JAN 1145   48    0.62    0.39    0.23       135.        *         2 JAN 0015   98    0.00    0.00    0.00         8.
         1 JAN 1200   49    1.54    0.67    0.87       531.        *         2 JAN 0030   99    0.00    0.00    0.00         3.
         1 JAN 1215   50    0.24    0.08    0.16       514.        *         2 JAN 0045  100    0.00    0.00    0.00         1.
                                                                                *
*****************************************************************************************************************************************

    TOTAL RAINFALL =    5.70, TOTAL LOSS =    3.08, TOTAL EXCESS =    2.62

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                          (CFS)
+     531.      12.00         102.          32.         31.          31.
                        (INCHES)      2.132       2.624       2.624       2.624
                         (AC-FT)        51.         63.         63.         63.
```

CUMULATIVE AREA = 0.45 SQ MI

*** ***

```
          **************
          *            *
152 KK    *        3C  *        CNAME      3R
          *            *
          **************
```

```
153 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS
```

```
154 HC          HYDROGRAPH COMBINATION
                     ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE
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***

HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1491.	1 JAN 1845	76	93.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1023.	1 JAN 1900	77	90.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	693.	1 JAN 1915	78	87.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	492.	1 JAN 1930	79	84.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	373.	1 JAN 1945	80	81.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	302.	1 JAN 2000	81	77.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	256.	1 JAN 2015	82	74.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	224.	1 JAN 2030	83	72.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	202.	1 JAN 2045	84	70.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	187.	1 JAN 2100	85	70.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	175.	1 JAN 2115	86	69.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	166.	1 JAN 2130	87	68.
1 JAN 0300	13	0.	1 JAN 0915	38	1.	1 JAN 1530	63	157.	1 JAN 2145	88	67.
1 JAN 0315	14	0.	1 JAN 0930	39	3.	1 JAN 1545	64	148.	1 JAN 2200	89	67.
1 JAN 0330	15	0.	1 JAN 0945	40	6.	1 JAN 1600	65	139.	1 JAN 2215	90	66.
1 JAN 0345	16	0.	1 JAN 1000	41	11.	1 JAN 1615	66	131.	1 JAN 2230	91	65.
1 JAN 0400	17	0.	1 JAN 1015	42	18.	1 JAN 1630	67	125.	1 JAN 2245	92	65.
1 JAN 0415	18	0.	1 JAN 1030	43	27.	1 JAN 1645	68	120.	1 JAN 2300	93	65.
1 JAN 0430	19	0.	1 JAN 1045	44	39.	1 JAN 1700	69	116.	1 JAN 2315	94	64.
1 JAN 0445	20	0.	1 JAN 1100	45	56.	1 JAN 1715	70	112.	1 JAN 2330	95	63.
1 JAN 0500	21	0.	1 JAN 1115	46	81.	1 JAN 1730	71	109.	1 JAN 2345	96	62.
1 JAN 0515	22	0.	1 JAN 1130	47	121.	1 JAN 1745	72	106.	2 JAN 0000	97	62.
1 JAN 0530	23	0.	1 JAN 1145	48	376.	1 JAN 1800	73	103.	2 JAN 0015	98	47.
1 JAN 0545	24	0.	1 JAN 1200	49	1434.	1 JAN 1815	74	99.	2 JAN 0030	99	27.
1 JAN 0600	25	0.	1 JAN 1215	50	1864.	1 JAN 1830	75	96.	2 JAN 0045	100	13.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1864.	12.25	434.	134.	130.	130.
		(INCHES) 2.122	2.615	2.615	2.615
		(AC-FT) 215.	265.	265.	265.

CUMULATIVE AREA = 1.90 SQ MI

*** ***

```
          **************
          *            *
155 KK    *        3R  *        CNAME      3C
          *            *
          **************
```

```
156 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS
```

HYDROGRAPH ROUTING DATA

```
157 RM          MUSKINGUM ROUTING
                      NSTPS         2 NUMBER OF SUBREACHES
                      AMSKK      0.64 MUSKINGUM K
                          X      0.20 MUSKINGUM X
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***

HYDROGRAPH AT STATION 3R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	994.	1	JAN	1845	76	101.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	1349.	1	JAN	1900	77	98.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	1358.	1	JAN	1915	78	95.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	1149.	1	JAN	1930	79	92.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	889.	1	JAN	1945	80	89.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	664.	1	JAN	2000	81	86.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	498.	1	JAN	2015	82	82.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	385.	1	JAN	2030	83	79.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	310.	1	JAN	2045	84	76.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	259.	1	JAN	2100	85	74.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	226.	1	JAN	2115	86	72.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	203.	1	JAN	2130	87	71.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	186.	1	JAN	2145	88	69.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	174.	1	JAN	2200	89	69.
1	JAN	0330	15	0.	1	JAN	0945	40	1.	1	JAN	1600	65	163.	1	JAN	2215	90	68.
1	JAN	0345	16	0.	1	JAN	1000	41	2.	1	JAN	1615	66	153.	1	JAN	2230	91	67.
1	JAN	0400	17	0.	1	JAN	1015	42	5.	1	JAN	1630	67	144.	1	JAN	2245	92	67.
1	JAN	0415	18	0.	1	JAN	1030	43	10.	1	JAN	1645	68	136.	1	JAN	2300	93	66.
1	JAN	0430	19	0.	1	JAN	1045	44	16.	1	JAN	1700	69	129.	1	JAN	2315	94	65.
1	JAN	0445	20	0.	1	JAN	1100	45	24.	1	JAN	1715	70	124.	1	JAN	2330	95	65.
1	JAN	0500	21	0.	1	JAN	1115	46	35.	1	JAN	1730	71	119.	1	JAN	2345	96	64.
1	JAN	0515	22	0.	1	JAN	1130	47	51.	1	JAN	1745	72	115.	2	JAN	0000	97	63.
1	JAN	0530	23	0.	1	JAN	1145	48	80.	1	JAN	1800	73	111.	2	JAN	0015	98	62.
1	JAN	0545	24	0.	1	JAN	1200	49	175.	1	JAN	1815	74	108.	2	JAN	0030	99	59.
1	JAN	0600	25	0.	1	JAN	1215	50	478.	1	JAN	1830	75	105.	2	JAN	0045	100	49.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1358.	13.00	432.	133.	129.	129.
		(INCHES) 2.109	2.596	2.596	2.596
		(AC-FT) 214.	263.	263.	263.

CUMULATIVE AREA = 1.90 SQ MI

*** ***

```
158 KK     **********
           *        *
           *    6B  *
           *        *
           **********
```

```
159 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


162 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

160 BA          SUBBASIN CHARACTERISTICS
                     TAREA,      0.25  SUBBASIN AREA

              PRECIPITATION DATA

161 PB               STORM       5.70  BASIN TOTAL PRECIPITATION

163 PI            INCREMENTAL 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  0.01  0.01
                  0.01  0.01  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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

188 LS SCS LOSS RATE
STRTL 0.84 INITIAL ABSTRACTION
CRVNBR 70.50 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

189 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.20 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES

324.	234.	65.	18.	5.	1.

HYDROGRAPH AT STATION 6B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	135.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	80.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	56.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	44.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	37.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	33.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	29.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	26.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	24.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	23.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	22.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	21.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	20.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	18.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	17.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	16.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	16.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	15.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	15.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	14.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	14.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	14.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	13.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	13.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	12.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	12.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.01	0.02	11.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.01	0.02	11.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	11.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	10.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	10.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	9.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	9.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	9.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	9.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	9.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	9.
1	JAN	0915	38	0.05	0.05	0.00	0.	1	JAN	2145	88	0.02	0.00	0.01	9.
1	JAN	0930	39	0.05	0.04	0.00	1.	1	JAN	2200	89	0.02	0.00	0.01	9.
1	JAN	0945	40	0.05	0.05	0.00	1.	1	JAN	2215	90	0.02	0.00	0.01	9.
1	JAN	1000	41	0.05	0.05	0.00	2.	1	JAN	2230	91	0.02	0.00	0.01	9.
1	JAN	1015	42	0.06	0.06	0.01	3.	1	JAN	2245	92	0.02	0.00	0.01	8.
1	JAN	1030	43	0.07	0.06	0.01	5.	1	JAN	2300	93	0.02	0.00	0.01	9.
1	JAN	1045	44	0.08	0.07	0.01	7.	1	JAN	2315	94	0.02	0.00	0.01	8.
1	JAN	1100	45	0.10	0.08	0.02	9.	1	JAN	2330	95	0.02	0.00	0.01	8.
1	JAN	1115	46	0.12	0.09	0.03	14.	1	JAN	2345	96	0.02	0.00	0.01	8.
1	JAN	1130	47	0.15	0.11	0.04	21.	2	JAN	0000	97	0.02	0.00	0.01	8.
1	JAN	1145	48	0.62	0.39	0.23	86.	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.54	0.68	0.86	337.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.24	0.08	0.16	271.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 337.	12.00		57.	18.	17.	17.
		(INCHES)	2.124	2.614	2.614	2.614
		(AC-FT)	28.	35.	35.	35.

CUMULATIVE AREA = 0.25 SQ MI

*** *** *** *

```
                    JXMIN           6  TIME INTERVAL IN MINUTES
                   JXDATE      1JAN94  STARTING DATE
                   JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

195 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.27  SUBBASIN AREA

                PRECIPITATION DATA

196 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

198 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

223 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                    CRVNBR       70.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

224 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                        ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
                519.      145.       29.        6.        0.
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HYDROGRAPH AT STATION 7bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	109.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	68.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	51.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	43.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	38.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	33.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	30.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	27.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	25.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	24.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	23.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	22.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	21.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	19.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	18.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	17.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	17.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	16.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	16.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	15.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	15.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	15.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	14.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	14.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	13.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	13.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.01	0.02	12.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.01	0.02	12.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	11.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	11.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	10.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	10.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	10.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	10.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	10.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	10.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	9.
1	JAN	0915	38	0.05	0.05	0.00	0.	1	JAN	2145	88	0.02	0.00	0.01	10.
1	JAN	0930	39	0.05	0.04	0.00	1.	1	JAN	2200	89	0.02	0.00	0.01	9.
1	JAN	0945	40	0.05	0.05	0.00	2.	1	JAN	2215	90	0.02	0.00	0.01	9.
1	JAN	1000	41	0.05	0.05	0.00	3.	1	JAN	2230	91	0.02	0.00	0.01	9.
1	JAN	1015	42	0.06	0.06	0.01	4.	1	JAN	2245	92	0.02	0.00	0.01	9.
1	JAN	1030	43	0.07	0.06	0.01	6.	1	JAN	2300	93	0.02	0.00	0.01	9.
1	JAN	1045	44	0.08	0.07	0.01	8.	1	JAN	2315	94	0.02	0.00	0.01	9.
1	JAN	1100	45	0.10	0.08	0.02	11.	1	JAN	2330	95	0.02	0.00	0.01	9.
1	JAN	1115	46	0.12	0.09	0.03	17.	1	JAN	2345	96	0.02	0.00	0.01	9.
1	JAN	1130	47	0.15	0.11	0.04	26.	2	JAN	0000	97	0.02	0.00	0.01	9.
1	JAN	1145	48	0.62	0.39	0.23	126.	2	JAN	0015	98	0.00	0.00	0.00	2.
1	JAN	1200	49	1.54	0.68	0.86	483.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.24	0.08	0.16	217.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)				
483.	12.00		62.	19.	18.	18.
		(INCHES)	2.125	2.614	2.614	2.614
		(AC-FT)	31.	38.	38.	38.

CUMULATIVE AREA = 0.27 SQ MI

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225 KK     **********
           *        *
           *   7aB  *
           *        *
           **********

226 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


229 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

227 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.57  SUBBASIN AREA

                PRECIPITATION DATA

228 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

230 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

255 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                    CRVNBR       70.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

256 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.00  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1089. 305. 60. 12. 0.

HYDROGRAPH AT STATION 7aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	228.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	142.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	107.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	90.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	79.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	70.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	62.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	57.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	53.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	51.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	48.

| | | |

1	JAN	0200	9	0.	*	1	JAN	0815	34	0.	*	1	JAN	1430	59	110.	*	1	JAN	2045	84	40.
1	JAN	0215	10	0.	*	1	JAN	0830	35	0.	*	1	JAN	1445	60	103.	*	1	JAN	2100	85	40.
1	JAN	0230	11	0.	*	1	JAN	0845	36	0.	*	1	JAN	1500	61	97.	*	1	JAN	2115	86	39.
1	JAN	0245	12	0.	*	1	JAN	0900	37	0.	*	1	JAN	1515	62	92.	*	1	JAN	2130	87	38.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1.	*	1	JAN	1530	63	86.	*	1	JAN	2145	88	39.
1	JAN	0315	14	0.	*	1	JAN	0930	39	3.	*	1	JAN	1545	64	81.	*	1	JAN	2200	89	38.
1	JAN	0330	15	0.	*	1	JAN	0945	40	5.	*	1	JAN	1600	65	76.	*	1	JAN	2215	90	38.
1	JAN	0345	16	0.	*	1	JAN	1000	41	9.	*	1	JAN	1615	66	72.	*	1	JAN	2230	91	37.
1	JAN	0400	17	0.	*	1	JAN	1015	42	13.	*	1	JAN	1630	67	69.	*	1	JAN	2245	92	37.
1	JAN	0415	18	0.	*	1	JAN	1030	43	20.	*	1	JAN	1645	68	67.	*	1	JAN	2300	93	37.
1	JAN	0430	19	0.	*	1	JAN	1045	44	28.	*	1	JAN	1700	69	65.	*	1	JAN	2315	94	36.
1	JAN	0445	20	0.	*	1	JAN	1100	45	40.	*	1	JAN	1715	70	63.	*	1	JAN	2330	95	36.
1	JAN	0500	21	0.	*	1	JAN	1115	46	60.	*	1	JAN	1730	71	61.	*	1	JAN	2345	96	36.
1	JAN	0515	22	0.	*	1	JAN	1130	47	90.	*	1	JAN	1745	72	59.	*	2	JAN	0000	97	35.
1	JAN	0530	23	0.	*	1	JAN	1145	48	410.	*	1	JAN	1800	73	57.	*	2	JAN	0015	98	15.
1	JAN	0545	24	0.	*	1	JAN	1200	49	1560.	*	1	JAN	1815	74	55.	*	2	JAN	0030	99	7.
1	JAN	0600	25	0.	*	1	JAN	1215	50	864.	*	1	JAN	1830	75	54.	*	2	JAN	0045	100	4.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1560.	12.00		248.	77.	74.	74.
		(INCHES)	2.120	2.612	2.612	2.612
		(AC-FT)	123.	152.	152.	152.

CUMULATIVE AREA = 1.09 SQ MI

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          **************
          *            *
260 KK    *       2bB  *
          *            *
          **************
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261 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

264 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

262 BA SUBBASIN CHARACTERISTICS

TAREA,	0.13	SUBBASIN AREA

PRECIPITATION DATA

263 PB

STORM	5.70	BASIN TOTAL PRECIPITATION

265 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

290 LS SCS LOSS RATE

STRTL	0.79	INITIAL ABSTRACTION
CRVNBR	71.61	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

291 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

240.	67.	13.	3.	0.

*** ***

HYDROGRAPH AT STATION 2bB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.12	52.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	32.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	24.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	20.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	18.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	16.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.01	0.04	14.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	13.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	12.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.04	12.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	11.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	10.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	10.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	9.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	9.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	8.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	8.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	8.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	8.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	7.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	7.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	7.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	7.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	6.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	6.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	6.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.00	0.02	6.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.00	0.02	6.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	5.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	5.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	5.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	5.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	5.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	5.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	5.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	5.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	4.
1	JAN	0915	38	0.05	0.04	0.00	0.	1	JAN	2145	88	0.02	0.00	0.01	5.
1	JAN	0930	39	0.05	0.04	0.00	1.	1	JAN	2200	89	0.02	0.00	0.01	4.
1	JAN	0945	40	0.05	0.04	0.00	1.	1	JAN	2215	90	0.02	0.00	0.01	4.
1	JAN	1000	41	0.05	0.05	0.01	2.	1	JAN	2230	91	0.02	0.00	0.01	4.
1	JAN	1015	42	0.06	0.05	0.01	2.	1	JAN	2245	92	0.02	0.00	0.01	4.
1	JAN	1030	43	0.07	0.06	0.01	3.	1	JAN	2300	93	0.02	0.00	0.01	4.
1	JAN	1045	44	0.08	0.07	0.01	4.	1	JAN	2315	94	0.02	0.00	0.01	4.
1	JAN	1100	45	0.10	0.08	0.02	6.	1	JAN	2330	95	0.02	0.00	0.01	4.
1	JAN	1115	46	0.12	0.09	0.03	9.	1	JAN	2345	96	0.02	0.00	0.01	4.
1	JAN	1130	47	0.15	0.11	0.04	13.	2	JAN	0000	97	0.02	0.00	0.01	4.
1	JAN	1145	48	0.62	0.38	0.25	62.	2	JAN	0015	98	0.00	0.00	0.00	1.
1	JAN	1200	49	1.54	0.64	0.90	233.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.24	0.08	0.17	104.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 2.99, TOTAL EXCESS = 2.71

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
233.	12.00		30.	9.	9.	9.
		(INCHES)	2.204	2.714	2.714	2.714
		(AC-FT)	15.	18.	18.	18.

CUMULATIVE AREA = 0.13 SQ MI

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          **************
          *            *
292 KK    *       2aB  *
          *            *
          **************
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293 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

296 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

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294 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.49  SUBBASIN AREA

                PRECIPITATION DATA

295 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

297 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

322 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                    CRVNBR       70.68  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

323 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                      ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
                940.      263.       52.       10.        0.
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HYDROGRAPH AT STATION 2aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	198.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	123.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	93.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	78.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	69.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	61.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	54.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	49.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	46.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	44.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	42.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	40.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	37.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	35.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	33.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	31.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	30.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	29.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	29.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	28.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	27.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	26.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	25.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	25.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	24.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	23.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.01	0.02	22.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.01	0.02	22.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	21.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	20.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	19.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	18.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	18.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	18.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	18.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	17.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	17.
1	JAN	0915	38	0.05	0.04	0.00	1.	1	JAN	2145	88	0.02	0.00	0.01	17.
1	JAN	0930	39	0.05	0.04	0.00	2.	1	JAN	2200	89	0.02	0.00	0.01	17.
1	JAN	0945	40	0.05	0.05	0.00	3.	1	JAN	2215	90	0.02	0.00	0.01	17.
1	JAN	1000	41	0.05	0.05	0.00	5.	1	JAN	2230	91	0.02	0.00	0.01	17.
1	JAN	1015	42	0.06	0.06	0.01	7.	1	JAN	2245	92	0.02	0.00	0.01	17.
1	JAN	1030	43	0.07	0.06	0.01	10.	1	JAN	2300	93	0.02	0.00	0.01	17.
1	JAN	1045	44	0.08	0.07	0.01	15.	1	JAN	2315	94	0.02	0.00	0.01	16.
1	JAN	1100	45	0.10	0.08	0.02	21.	1	JAN	2330	95	0.02	0.00	0.01	16.
1	JAN	1115	46	0.12	0.09	0.03	31.	1	JAN	2345	96	0.02	0.00	0.01	16.
1	JAN	1130	47	0.15	0.11	0.04	47.	2	JAN	0000	97	0.02	0.00	0.01	16.
1	JAN	1145	48	0.62	0.39	0.23	231.	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.54	0.67	0.87	880.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.24	0.08	0.16	395.	2	JAN	0045	100	0.00	0.00	0.00	0.

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TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.07, TOTAL EXCESS = 2.63

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

+ (CFS)	(HR)		6-HR	24-HR	72-HR	24.75-HR
		(CFS)				
+ 880.	12.00		113.	35.	34.	34.
		(INCHES)	2.138	2.630	2.630	2.630
		(AC-FT)	56.	69.	69.	69.

CUMULATIVE AREA = 0.49 SQ MI

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            *            *
 324 KK     *        2C  *        CNAME      2R
            *            *
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 325 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

 326 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1804.	1 JAN 1845	76	182.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1891.	1 JAN 1900	77	176.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1762.	1 JAN 1915	78	171.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	1474.	1 JAN 1930	79	164.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	1161.	1 JAN 1945	80	158.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	897.	1 JAN 2000	81	152.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	701.	1 JAN 2015	82	147.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	567.	1 JAN 2030	83	142.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	478.	1 JAN 2045	84	139.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	419.	1 JAN 2100	85	136.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	375.	1 JAN 2115	86	132.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	344.	1 JAN 2130	87	131.
1 JAN 0300	13	0.	1 JAN 0915	38	2.	1 JAN 1530	63	319.	1 JAN 2145	88	130.
1 JAN 0315	14	0.	1 JAN 0930	39	5.	1 JAN 1545	64	299.	1 JAN 2200	89	128.
1 JAN 0330	15	0.	1 JAN 0945	40	10.	1 JAN 1600	65	280.	1 JAN 2215	90	127.
1 JAN 0345	16	0.	1 JAN 1000	41	18.	1 JAN 1615	66	264.	1 JAN 2230	91	125.
1 JAN 0400	17	0.	1 JAN 1015	42	28.	1 JAN 1630	67	252.	1 JAN 2245	92	125.
1 JAN 0415	18	0.	1 JAN 1030	43	43.	1 JAN 1645	68	240.	1 JAN 2300	93	124.
1 JAN 0430	19	0.	1 JAN 1045	44	63.	1 JAN 1700	69	231.	1 JAN 2315	94	122.
1 JAN 0445	20	0.	1 JAN 1100	45	91.	1 JAN 1715	70	221.	1 JAN 2330	95	120.
1 JAN 0500	21	0.	1 JAN 1115	46	135.	1 JAN 1730	71	214.	1 JAN 2345	96	120.
1 JAN 0515	22	0.	1 JAN 1130	47	201.	1 JAN 1745	72	208.	2 JAN 0000	97	118.
1 JAN 0530	23	0.	1 JAN 1145	48	783.	1 JAN 1800	73	201.	2 JAN 0015	98	82.
1 JAN 0545	24	0.	1 JAN 1200	49	2848.	1 JAN 1815	74	194.	2 JAN 0030	99	67.
1 JAN 0600	25	0.	1 JAN 1215	50	1840.	1 JAN 1830	75	189.	2 JAN 0045	100	53.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2848.	12.00		819.	253.	245.	245.
		(INCHES)	2.111	2.609	2.609	2.609
		(AC-FT)	406.	502.	502.	502.

CUMULATIVE AREA = 3.61 SQ MI

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            *            *
 327 KK     *        1B  *
            *            *
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 328 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL

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                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1   PUNCH COMPUTED HYDROGRAPH
                    IOUT          22   SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1   FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100   LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


331 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

329 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.56  SUBBASIN AREA

                PRECIPITATION DATA

330 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

332 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

357 LS          SCS LOSS RATE
                     STRTL        0.80  INITIAL ABSTRACTION
                    CRVNBR       71.35  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

358 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                                ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
             1075.      301.       59.       12.        0.
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HYDROGRAPH AT STATION 1B

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.12	231.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	143.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	108.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	91.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	80.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	70.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.01	0.04	63.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	57.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	54.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	51.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	49.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	46.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	43.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	41.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	38.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	36.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	35.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	34.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	33.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	32.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	31.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	31.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	29.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	28.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	28.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	27.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.00	0.02	25.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.00	0.02	25.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	24.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	23.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	22.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	21.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	21.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	21.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	21.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	20.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	20.
1 JAN 0915	38	0.05	0.04	0.00	1.	1 JAN 2145	88	0.02	0.00	0.01	20.
1 JAN 0930	39	0.05	0.04	0.00	3.	1 JAN 2200	89	0.02	0.00	0.01	20.
1 JAN 0945	40	0.05	0.05	0.00	4.	1 JAN 2215	90	0.02	0.00	0.01	20.
1 JAN 1000	41	0.05	0.05	0.01	7.	1 JAN 2230	91	0.02	0.00	0.01	19.

1 JAN 1015	42	0.06	0.05	0.01	10.	*	1 JAN 2245	92	0.02	0.00	0.01	19.
1 JAN 1030	43	0.07	0.06	0.01	13.	*	1 JAN 2300	93	0.02	0.00	0.01	19.
1 JAN 1045	44	0.08	0.07	0.01	19.	*	1 JAN 2315	94	0.02	0.00	0.01	19.
1 JAN 1100	45	0.10	0.08	0.02	26.	*	1 JAN 2330	95	0.02	0.00	0.01	18.
1 JAN 1115	46	0.12	0.09	0.03	38.	*	1 JAN 2345	96	0.02	0.00	0.01	19.
1 JAN 1130	47	0.15	0.11	0.04	57.	*	2 JAN 0000	97	0.02	0.00	0.01	18.
1 JAN 1145	48	0.62	0.38	0.24	275.	*	2 JAN 0015	98	0.00	0.00	0.00	5.
1 JAN 1200	49	1.54	0.65	0.89	1032.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.24	0.08	0.17	461.	*	2 JAN 0045	100	0.00	0.00	0.00	0.
						*						

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.01, TOTAL EXCESS = 2.69

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1032.	12.00	132.	41.	39.	39.
		(INCHES) 2.185	2.691	2.691	2.691
		(AC-FT) 65.	80.	80.	80.

CUMULATIVE AREA = 0.56 SQ MI

*** ***

```
            **************
            *            *
359 KK      *        1C  *        CNAME      1C
            *            *
            **************
```

360 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

361 HC HYDROGRAPH COMBINATION

ICOMP	2	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2035.	1 JAN 1845	76	209.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	2034.	1 JAN 1900	77	201.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1870.	1 JAN 1915	78	196.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	1564.	1 JAN 1930	79	188.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	1241.	1 JAN 1945	80	181.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	967.	1 JAN 2000	81	174.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	764.	1 JAN 2015	82	168.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	624.	1 JAN 2030	83	162.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	532.	1 JAN 2045	84	159.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	470.	1 JAN 2100	85	157.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	424.	1 JAN 2115	86	153.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	391.	1 JAN 2130	87	150.
1 JAN 0300	13	0.	1 JAN 0915	38	3.	1 JAN 1530	63	363.	1 JAN 2145	88	150.
1 JAN 0315	14	0.	1 JAN 0930	39	8.	1 JAN 1545	64	341.	1 JAN 2200	89	148.
1 JAN 0330	15	0.	1 JAN 0945	40	15.	1 JAN 1600	65	319.	1 JAN 2215	90	147.
1 JAN 0345	16	0.	1 JAN 1000	41	24.	1 JAN 1615	66	301.	1 JAN 2230	91	144.
1 JAN 0400	17	0.	1 JAN 1015	42	38.	1 JAN 1630	67	287.	1 JAN 2245	92	144.
1 JAN 0415	18	0.	1 JAN 1030	43	56.	1 JAN 1645	68	274.	1 JAN 2300	93	143.
1 JAN 0430	19	0.	1 JAN 1045	44	82.	1 JAN 1700	69	264.	1 JAN 2315	94	140.
1 JAN 0445	20	0.	1 JAN 1100	45	117.	1 JAN 1715	70	254.	1 JAN 2330	95	139.
1 JAN 0500	21	0.	1 JAN 1115	46	173.	1 JAN 1730	71	246.	1 JAN 2345	96	139.
1 JAN 0515	22	0.	1 JAN 1130	47	258.	1 JAN 1745	72	238.	2 JAN 0000	97	137.
1 JAN 0530	23	0.	1 JAN 1145	48	1058.	1 JAN 1800	73	230.	2 JAN 0015	98	87.
1 JAN 0545	24	0.	1 JAN 1200	49	3879.	1 JAN 1815	74	223.	2 JAN 0030	99	68.
1 JAN 0600	25	0.	1 JAN 1215	50	2301.	1 JAN 1830	75	217.	2 JAN 0045	100	53.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3879.	12.00	950.	294.	285.	285.
		(INCHES) 2.120	2.620	2.620	2.620
		(AC-FT) 471.	583.	583.	583.

CUMULATIVE AREA = 4.17 SQ MI

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           **************
           *            *
362 KK     *        1C  *        CNAME      1C
           *            *
           **************

363 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

364 RN          NO ROUTING
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HYDROGRAPH AT STATION 1C

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2035.	1 JAN 1845	76	209.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	2034.	1 JAN 1900	77	201.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1870.	1 JAN 1915	78	196.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	1564.	1 JAN 1930	79	188.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	1241.	1 JAN 1945	80	181.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	967.	1 JAN 2000	81	174.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	764.	1 JAN 2015	82	168.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	624.	1 JAN 2030	83	162.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	532.	1 JAN 2045	84	159.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	470.	1 JAN 2100	85	157.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	424.	1 JAN 2115	86	153.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	391.	1 JAN 2130	87	150.
1 JAN 0300	13	0.	1 JAN 0915	38	3.	1 JAN 1530	63	363.	1 JAN 2145	88	150.
1 JAN 0315	14	0.	1 JAN 0930	39	8.	1 JAN 1545	64	341.	1 JAN 2200	89	148.
1 JAN 0330	15	0.	1 JAN 0945	40	15.	1 JAN 1600	65	319.	1 JAN 2215	90	147.
1 JAN 0345	16	0.	1 JAN 1000	41	24.	1 JAN 1615	66	301.	1 JAN 2230	91	144.
1 JAN 0400	17	0.	1 JAN 1015	42	38.	1 JAN 1630	67	287.	1 JAN 2245	92	144.
1 JAN 0415	18	0.	1 JAN 1030	43	56.	1 JAN 1645	68	274.	1 JAN 2300	93	143.
1 JAN 0430	19	0.	1 JAN 1045	44	82.	1 JAN 1700	69	264.	1 JAN 2315	94	140.
1 JAN 0445	20	0.	1 JAN 1100	45	117.	1 JAN 1715	70	254.	1 JAN 2330	95	139.
1 JAN 0500	21	0.	1 JAN 1115	46	173.	1 JAN 1730	71	246.	1 JAN 2345	96	139.
1 JAN 0515	22	0.	1 JAN 1130	47	258.	1 JAN 1745	72	238.	2 JAN 0000	97	137.
1 JAN 0530	23	0.	1 JAN 1145	48	1058.	1 JAN 1800	73	230.	2 JAN 0015	98	87.
1 JAN 0545	24	0.	1 JAN 1200	49	3879.	1 JAN 1815	74	223.	2 JAN 0030	99	68.
1 JAN 0600	25	0.	1 JAN 1215	50	2301.	1 JAN 1830	75	217.	2 JAN 0045	100	53.

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)				
3879.	12.00		950.	294.	285.	285.
		(INCHES)	2.120	2.620	2.620	2.620
		(AC-FT)	471.	583.	583.	583.

CUMULATIVE AREA = 4.17 SQ MI

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	4B	470.	12.25	92.	28.	27.	0.40		
ROUTED TO	4R	385.	12.50	91.	28.	27.	0.40		
HYDROGRAPH AT	5B	785.	12.00	144.	44.	43.	0.63		
ROUTED TO	5R	602.	12.50	143.	44.	43.	0.63		
HYDROGRAPH AT	3aB	552.	12.00	97.	30.	29.	0.43		

	HYDROGRAPH AT						
+		3bB	531.	12.00	102.	32.	31.	0.45
	4 COMBINED AT						
+		3C	1864.	12.25	434.	134.	130.	1.90
	ROUTED TO						
+		3R	1358.	13.00	432.	133.	129.	1.90
	HYDROGRAPH AT						
+		6B	337.	12.00	57.	18.	17.	0.25
	ROUTED TO						
+		6R	223.	12.50	57.	18.	17.	0.25
	HYDROGRAPH AT						
+		7bB	483.	12.00	62.	19.	18.	0.27
	HYDROGRAPH AT						
+		7aB	1013.	12.00	130.	40.	39.	0.57
	3 COMBINED AT						
+		7C	1560.	12.00	248.	77.	74.	1.09
	HYDROGRAPH AT						
+		2bB	233.	12.00	30.	9.	9.	0.13
	HYDROGRAPH AT						
+		2aB	880.	12.00	113.	35.	34.	0.49
	4 COMBINED AT						
+		2C	2848.	12.00	819.	253.	245.	3.61
	HYDROGRAPH AT						
+		1B	1032.	12.00	132.	41.	39.	0.56
	2 COMBINED AT						
+		1C	3879.	12.00	950.	294.	285.	4.17
	ROUTED TO						
+		1C	3879.	12.00	950.	294.	285.	4.17

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

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1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
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*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    wo Mining & wo Logging (Scenario 4), 10m DEM Data
   3          ID    Storm Event
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 480389.00000 4224905.00000 1
   6          PG    Gage     4.1
   7          IN      15  1JAN94       0
              * Scrabble Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0   0.025
   9          PC    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475     0.6   0.725
  10          PC    0.85  0.9125   0.975  1.0375     1.1  1.1625   1.225  1.2875    1.35   1.725
  11          PC     2.1   2.475    2.85     3.1    3.35     3.6    3.85  3.9125   3.975  4.0375
  12          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  13          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  14          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  15          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  16          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  17          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1

  18          KK      6B
  19          KO       0       0     0.0       1      22
  20          BA  0.2503
  21          PR    Gage
  22          PW     1.0
  23          PT    Gage
  24          PW   0.258
  25          LS     0.0    70.5     0.0
  26          UD    0.21

  27          KK      6R   CNAME      6C
  28          KO       0       0     0.0       0      22
  29          RM       1   0.037     0.2

  30          KK     7bB
  31          KO       0       0     0.0       1      22
  32          BA  0.2668
  33          PR    Gage
  34          PW     1.0
  35          PT    Gage
  36          PW   0.275
  37          LS     0.0    70.5     0.0
  38          UD     0.0

  39          KK     7aB
  40          KO       0       0     0.0       1      22
  41          BA  0.5585
  42          PR    Gage
  43          PW     1.0
  44          PT    Gage
  45          PW   0.564
  46          LS     0.0    70.5     0.0
  47          UD     0.0
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HEC-1 INPUT PAGE 2

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

  48          KK      7C   CNAME      7R
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 49          KO       0       0     0.0       0      22
 50          HC       3

 51          KK      7R   CNAME      7C
 52          KO       0       0     0.0       0      22
 53          RM       1   0.087     0.2

 54          KK      5B
 55          KO       0       0     0.0       1      22
 56          BA  0.6425
 57          PR    Gage
 58          PW     1.0
 59          PT    Gage
 60          PW   0.656
 61          LS     0.0    70.5     0.0
 62          UD  0.2376

 63          KK      5R   CNAME      5C
 64          KO       0       0     0.0       0      22
 65          RM       1   0.099     0.2

 66          KK      4B
 67          KO       0       0     0.0       1      22
 68          BA  0.4066
 69          PR    Gage
 70          PW     1.0
 71          PT    Gage
 72          PW   0.416
 73          LS     0.0    70.5     0.0
 74          UD  0.2643

 75          KK      4R   CNAME      4C
 76          KO       0       0     0.0       0      22
 77          RM       1   0.091     0.2

 78          KK     3aB
 79          KO       0       0     0.0       1      22
 80          BA  0.4142
 81          PR    Gage
 82          PW     1.0
 83          PT    Gage
 84          PW   0.425
 85          LS     0.0   70.59     0.0
 86          UD  0.2705

 87          KK     3bB
 88          KO       0       0     0.0       1      22
 89          BA  0.4375
 90          PR    Gage
 91          PW     1.0
 92          PT    Gage
 93          PW   0.447
 94          LS     0.0   70.62     0.0
```


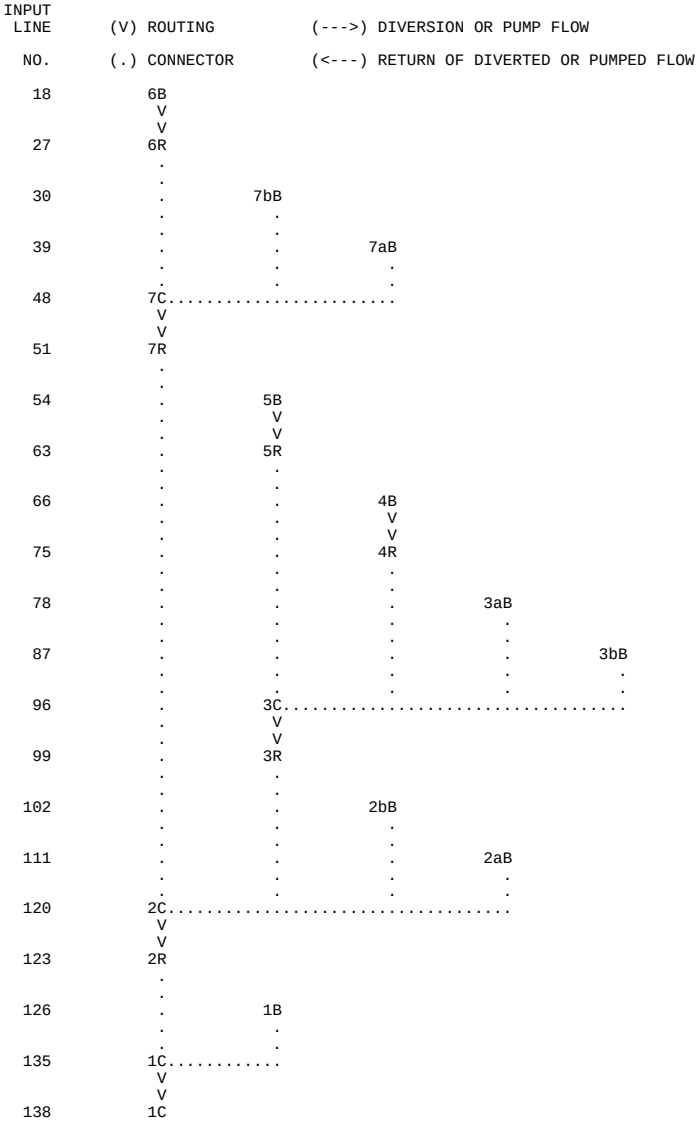

```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 95          UD  0.2643

 96          KK      3C   CNAME      3R
 97          KO       0       0     0.0       0      22
 98          HC       4

 99          KK      3R   CNAME      3C
100          KO       0       0     0.0       0      22
101          RM       1   0.041     0.2

102          KK     2bB
103          KO       0       0     0.0       1      22
104          BA  0.1177
105          PR    Gage
106          PW     1.0
107          PT    Gage
108          PW    0.12
109          LS     0.0   71.67     0.0
110          UD     0.0

111          KK     2aB
112          KO       0       0     0.0       1      22
113          BA  0.4804
114          PR    Gage
115          PW     1.0
116          PT    Gage
117          PW   0.491
118          LS     0.0   70.67     0.0
119          UD     0.0

120          KK      2C   CNAME      2R
121          KO       0       0     0.0       0      22
122          HC       4

123          KK      2R   CNAME      2C
124          KO       0       0     0.0       0      22
125          RM       1   0.134     0.2

126          KK      1B
127          KO       0       0     0.0       1      22
128          BA  0.6484
```

```
          129           PR    Gage
          130           PW     1.0
          131           PT    Gage
          132           PW   0.662
          133           LS     0.0   71.35     0.0
          134           UD     0.0

          135           KK      1C   CNAME      1C
          136           KO       0       0     0.0       0      22
          137           HC       2
```



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


          138           KK      1C   CNAME      1C
          139           KO       0       0     0.0       0      22
          140           RN      1C
          141           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
                         Scrabble Creek
                         wo Mining & wo Logging (Scenario 4), 10m DEM Data
                         Storm Event

   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

   7 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

     IT          HYDROGRAPH TIME DATA
                       NMIN          15  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN94  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN94  ENDING DATE
                     NDTIME        0045  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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


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


           **************
           *            *
  18 KK    *        6B  *
           *            *
           **************

  19 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

  20 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.25  SUBBASIN AREA

                PRECIPITATION DATA

  23 PT           TOTAL STORM STATIONS      Gage
  24 PW                       WEIGHTS      0.26

  21 PR             RECORDING STATIONS      Gage
  22 PW                       WEIGHTS      1.00

  25 LS          SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

  26 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.21  LAG

                                                                  ***

              PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10        0.00         0.26

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG
```

UNIT HYDROGRAPH
6 END-OF-PERIOD ORDINATES
307. 242. 69. 20. 6. 2.

HYDROGRAPH AT STATION 6B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	0.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	1.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	2.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	3.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	4.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	5.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	6.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	7.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.28	0.10	34.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	67.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	92.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	112.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	105.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	97.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	99.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	102.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	67.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	38.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	30.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	28.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	15.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	4.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	1.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
112.	8.00	38.	10.	9.	9.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 19.	19.	19.	19.

CUMULATIVE AREA = 0.25 SQ MI

```
          **************
          *            *
27 KK     *        6R  *        CNAME      6C
          *            *
          **************

28 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.250  TIME INTERVAL IN HOURS
```

HYDROGRAPH ROUTING DATA

29 RM MUSKINGUM ROUTING
NSTPS 1 NUMBER OF SUBREACHES
AMSKK 0.04 MUSKINGUM K
X 0.20 MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 6R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 6R

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	4.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	5.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	6.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	7.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	28.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	64.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	89.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	109.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	108.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	97.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	98.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	101.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	76.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	40.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	31.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	28.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	18.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	5.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	2.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	0.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	0.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	1.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	2.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	3.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 109.	8.00	38.	10.	9.	9.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 19.	19.	19.	19.

CUMULATIVE AREA = 0.25 SQ MI

*** ***

****
* *
30 KK * 7bB *
* *
****

31 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
IPNCH 1 PUNCH COMPUTED HYDROGRAPH
IOUT 22 SAVE HYDROGRAPH ON THIS UNIT
ISAV1 1 FIRST ORDINATE PUNCHED OR SAVED
ISAV2 100 LAST ORDINATE PUNCHED OR SAVED
TIMINT 0.250 TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

32 BA SUBBASIN CHARACTERISTICS
TAREA, 0.27 SUBBASIN AREA

PRECIPITATION DATA

35 PT TOTAL STORM STATIONS Gage
36 PW WEIGHTS 0.28

33 PR RECORDING STATIONS Gage
34 PW WEIGHTS 1.00

37 LS SCS LOSS RATE
STRTL 0.84 INITIAL ABSTRACTION
CRVNBR 70.50 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

38 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.00 LAG

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.28

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
512. 143. 28. 6. 0.

****

HYDROGRAPH AT STATION 7bB

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	2.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	3.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	4.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	5.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	6.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	7.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	8.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.28	0.10	53.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	85.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	109.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	127.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	105.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	103.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	106.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	110.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	50.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	33.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	30.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	29.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	8.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	1.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	0.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
127.	8.00	41.	10.	10.	10.
		(INCHES) 1.430	1.430	1.430	1.430
		(AC-FT) 20.	20.	20.	20.

CUMULATIVE AREA = 0.27 SQ MI

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          **************
          *            *
 39 KK    *       7aB  *
          *            *
          **************

 40 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 41 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.56  SUBBASIN AREA

                PRECIPITATION DATA

 44 PT           TOTAL STORM STATIONS      Gage
 45 PW                       WEIGHTS      0.56

 42 PR             RECORDING STATIONS      Gage
 43 PW                       WEIGHTS      1.00

 46 LS          SCS LOSS RATE
                       STRTL        0.84  INITIAL ABSTRACTION
                      CRVNBR       70.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

 47 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.00  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10        0.00         0.56

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                              5 END-OF-PERIOD ORDINATES
             1071.      300.       59.       12.        0.
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HYDROGRAPH AT STATION 7aB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	4.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	6.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	8.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	11.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	13.	1 JAN 1900	77	0.00	0.00	0.00	0.

1	JAN	0645	28	0.06	0.05	0.01	15.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	17.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.28	0.10	111.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	178.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	227.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	266.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	220.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	215.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	222.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	231.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	104.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	69.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	62.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	61.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	16.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	3.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	1.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 266.	8.00	86.	21.	21.	21.
		(INCHES) 1.430	1.430	1.430	1.430
		(AC-FT) 43.	43.	43.	43.

CUMULATIVE AREA = 0.56 SQ MI

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          **************
          *            *
48 KK     *        7C  *        CNAME      7R
          *            *
          **************
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49 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

50 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	*	1	JAN	0615	26	20.	*	1	JAN	1230	51	0.	*	1	JAN	1845	76	0.
1	JAN	0015	2	0.	*	1	JAN	0630	27	24.	*	1	JAN	1245	52	0.	*	1	JAN	1900	77	0.
1	JAN	0030	3	0.	*	1	JAN	0645	28	28.	*	1	JAN	1300	53	0.	*	1	JAN	1915	78	0.
1	JAN	0045	4	0.	*	1	JAN	0700	29	32.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.
1	JAN	0100	5	0.	*	1	JAN	0715	30	192.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.
1	JAN	0115	6	0.	*	1	JAN	0730	31	326.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.
1	JAN	0130	7	0.	*	1	JAN	0745	32	424.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	503.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	433.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	414.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	427.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	443.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	230.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.
1	JAN	0315	14	0.	*	1	JAN	0930	39	141.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	123.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	119.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	41.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	9.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	2.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	0.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	0.	*	1	JAN	1115	46	0.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	2.	*	1	JAN	1130	47	0.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	7.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	11.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.

1 JAN 0600	25	16.	*	1 JAN 1215	50	0.	*	1 JAN 1830	75	0.	*	2 JAN 0045	100	0.					

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
503.	8.00		165.	41.	40.	40.
		(INCHES)	1.430	1.430	1.430	1.430
		(AC-FT)	82.	82.	82.	82.

CUMULATIVE AREA = 1.08 SQ MI

51 KK 7R CNAME 7C

52 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

53 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.09	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 7R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 7R

DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	*	1 JAN 0615	26	19.	*	1 JAN 1230	51	0.	*	1 JAN 1845	76	0.
1 JAN 0015	2	0.	*	1 JAN 0630	27	23.	*	1 JAN 1245	52	0.	*	1 JAN 1900	77	0.
1 JAN 0030	3	0.	*	1 JAN 0645	28	27.	*	1 JAN 1300	53	0.	*	1 JAN 1915	78	0.
1 JAN 0045	4	0.	*	1 JAN 0700	29	31.	*	1 JAN 1315	54	0.	*	1 JAN 1930	79	0.
1 JAN 0100	5	0.	*	1 JAN 0715	30	121.	*	1 JAN 1330	55	0.	*	1 JAN 1945	80	0.
1 JAN 0115	6	0.	*	1 JAN 0730	31	286.	*	1 JAN 1345	56	0.	*	1 JAN 2000	81	0.
1 JAN 0130	7	0.	*	1 JAN 0745	32	392.	*	1 JAN 1400	57	0.	*	1 JAN 2015	82	0.
1 JAN 0145	8	0.	*	1 JAN 0800	33	477.	*	1 JAN 1415	58	0.	*	1 JAN 2030	83	0.
1 JAN 0200	9	0.	*	1 JAN 0815	34	471.	*	1 JAN 1430	59	0.	*	1 JAN 2045	84	0.
1 JAN 0215	10	0.	*	1 JAN 0830	35	412.	*	1 JAN 1445	60	0.	*	1 JAN 2100	85	0.
1 JAN 0230	11	0.	*	1 JAN 0845	36	422.	*	1 JAN 1500	61	0.	*	1 JAN 2115	86	0.
1 JAN 0245	12	0.	*	1 JAN 0900	37	437.	*	1 JAN 1515	62	0.	*	1 JAN 2130	87	0.
1 JAN 0300	13	0.	*	1 JAN 0915	38	327.	*	1 JAN 1530	63	0.	*	1 JAN 2145	88	0.
1 JAN 0315	14	0.	*	1 JAN 0930	39	153.	*	1 JAN 1545	64	0.	*	1 JAN 2200	89	0.
1 JAN 0330	15	0.	*	1 JAN 0945	40	128.	*	1 JAN 1600	65	0.	*	1 JAN 2215	90	0.
1 JAN 0345	16	0.	*	1 JAN 1000	41	119.	*	1 JAN 1615	66	0.	*	1 JAN 2230	91	0.
1 JAN 0400	17	0.	*	1 JAN 1015	42	76.	*	1 JAN 1630	67	0.	*	1 JAN 2245	92	0.
1 JAN 0415	18	0.	*	1 JAN 1030	43	14.	*	1 JAN 1645	68	0.	*	1 JAN 2300	93	0.
1 JAN 0430	19	0.	*	1 JAN 1045	44	4.	*	1 JAN 1700	69	0.	*	1 JAN 2315	94	0.
1 JAN 0445	20	0.	*	1 JAN 1100	45	1.	*	1 JAN 1715	70	0.	*	1 JAN 2330	95	0.
1 JAN 0500	21	0.	*	1 JAN 1115	46	0.	*	1 JAN 1730	71	0.	*	1 JAN 2345	96	0.
1 JAN 0515	22	1.	*	1 JAN 1130	47	0.	*	1 JAN 1745	72	0.	*	2 JAN 0000	97	0.
1 JAN 0530	23	5.	*	1 JAN 1145	48	0.	*	1 JAN 1800	73	0.	*	2 JAN 0015	98	0.
1 JAN 0545	24	10.	*	1 JAN 1200	49	0.	*	1 JAN 1815	74	0.	*	2 JAN 0030	99	0.
1 JAN 0600	25	14.	*	1 JAN 1215	50	0.	*	1 JAN 1830	75	0.	*	2 JAN 0045	100	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
477.	8.00		165.	41.	40.	40.
		(INCHES)	1.430	1.430	1.430	1.430
		(AC-FT)	82.	82.	82.	82.

CUMULATIVE AREA = 1.08 SQ MI

```
          **************
          *            *
 54 KK    *        5B  *
          *            *
          **************

 55 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 56 BA         SUBBASIN CHARACTERISTICS
                     TAREA,       0.64  SUBBASIN AREA

               PRECIPITATION DATA

 59 PT          TOTAL STORM STATIONS      Gage
 60 PW                      WEIGHTS      0.66

 57 PR            RECORDING STATIONS      Gage
 58 PW                      WEIGHTS      1.00

 61 LS         SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

 62 UD         SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.24  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10        0.00         0.66

               TEMPORAL DISTRIBUTIONS

               STATION     Gage,  WEIGHT =   1.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                    0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                    0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                    0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
             674.      669.      214.       70.       23.        8.        1.

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

                                                HYDROGRAPH AT STATION       5B

*****************************************************************************************************************************************
                                                      *
      DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                      *
       1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.00    0.00    0.00         0.
       1 JAN 0015    2    0.00    0.00    0.00         0.       *        1 JAN 1245   52    0.00    0.00    0.00         0.
       1 JAN 0030    3    0.00    0.00    0.00         0.       *        1 JAN 1300   53    0.00    0.00    0.00         0.
       1 JAN 0045    4    0.00    0.00    0.00         0.       *        1 JAN 1315   54    0.00    0.00    0.00         0.
       1 JAN 0100    5    0.00    0.00    0.00         0.       *        1 JAN 1330   55    0.00    0.00    0.00         0.
       1 JAN 0115    6    0.00    0.00    0.00         0.       *        1 JAN 1345   56    0.00    0.00    0.00         0.
       1 JAN 0130    7    0.00    0.00    0.00         0.       *        1 JAN 1400   57    0.00    0.00    0.00         0.
       1 JAN 0145    8    0.00    0.00    0.00         0.       *        1 JAN 1415   58    0.00    0.00    0.00         0.
       1 JAN 0200    9    0.00    0.00    0.00         0.       *        1 JAN 1430   59    0.00    0.00    0.00         0.
       1 JAN 0215   10    0.03    0.03    0.00         0.       *        1 JAN 1445   60    0.00    0.00    0.00         0.
       1 JAN 0230   11    0.03    0.03    0.00         0.       *        1 JAN 1500   61    0.00    0.00    0.00         0.
       1 JAN 0245   12    0.03    0.03    0.00         0.       *        1 JAN 1515   62    0.00    0.00    0.00         0.
       1 JAN 0300   13    0.02    0.02    0.00         0.       *        1 JAN 1530   63    0.00    0.00    0.00         0.
       1 JAN 0315   14    0.06    0.06    0.00         0.       *        1 JAN 1545   64    0.00    0.00    0.00         0.
       1 JAN 0330   15    0.06    0.06    0.00         0.       *        1 JAN 1600   65    0.00    0.00    0.00         0.
       1 JAN 0345   16    0.06    0.06    0.00         0.       *        1 JAN 1615   66    0.00    0.00    0.00         0.
       1 JAN 0400   17    0.06    0.06    0.00         0.       *        1 JAN 1630   67    0.00    0.00    0.00         0.
       1 JAN 0415   18    0.12    0.12    0.00         0.       *        1 JAN 1645   68    0.00    0.00    0.00         0.
       1 JAN 0430   19    0.13    0.13    0.00         0.       *        1 JAN 1700   69    0.00    0.00    0.00         0.
       1 JAN 0445   20    0.12    0.12    0.00         0.       *        1 JAN 1715   70    0.00    0.00    0.00         0.
       1 JAN 0500   21    0.12    0.12    0.00         0.       *        1 JAN 1730   71    0.00    0.00    0.00         0.
       1 JAN 0515   22    0.06    0.06    0.00         1.       *        1 JAN 1745   72    0.00    0.00    0.00         0.
       1 JAN 0530   23    0.06    0.06    0.00         3.       *        1 JAN 1800   73    0.00    0.00    0.00         0.
       1 JAN 0545   24    0.06    0.06    0.00         6.       *        1 JAN 1815   74    0.00    0.00    0.00         0.
       1 JAN 0600   25    0.06    0.06    0.01         8.       *        1 JAN 1830   75    0.00    0.00    0.00         0.
       1 JAN 0615   26    0.06    0.05    0.01        11.       *        1 JAN 1845   76    0.00    0.00    0.00         0.
       1 JAN 0630   27    0.06    0.05    0.01        13.       *        1 JAN 1900   77    0.00    0.00    0.00         0.
       1 JAN 0645   28    0.06    0.05    0.01        16.       *        1 JAN 1915   78    0.00    0.00    0.00         0.
       1 JAN 0700   29    0.06    0.05    0.01        18.       *        1 JAN 1930   79    0.00    0.00    0.00         0.
       1 JAN 0715   30    0.38    0.28    0.10        78.       *        1 JAN 1945   80    0.00    0.00    0.00         0.
       1 JAN 0730   31    0.37    0.24    0.14       163.       *        1 JAN 2000   81    0.00    0.00    0.00         0.
```

1	JAN	0745	32	0.38	0.21	0.17	228.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	279.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	272.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	251.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	253.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	261.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	185.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	106.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	82.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	74.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	43.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	14.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	4.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	24.75-HR	
(CFS)	(HR)					
		(CFS)				
279.	8.00	99.	25.	24.	24.	
		(INCHES) 1.429	1.430	1.430	1.430	
		(AC-FT) 49.	49.	49.	49.	

CUMULATIVE AREA = 0.64 SQ MI

*** ***

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          **************
          *            *
63 KK     *        5R  *        CNAME      5C
          *            *
          **************
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64 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

65 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.10	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 5R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 5R

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	10.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	12.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	15.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	17.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	49.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	128.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	204.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	259.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	280.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	259.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	250.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	258.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	223.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	136.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	87.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	77.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	57.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	25.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	6.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	2.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	0.	1	JAN	1115	46	1.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	0.	1	JAN	1130	47	0.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	2.	1	JAN	1145	48	0.	1	JAN	1800	73	0.	2	JAN	0015	98	0.

```
    1 JAN 0545   24        4.   *    1 JAN 1200   49        0.   *    1 JAN 1815   74        0.   *    2 JAN 0030   99        0.
    1 JAN 0600   25        7.   *    1 JAN 1215   50        0.   *    1 JAN 1830   75        0.   *    2 JAN 0045  100        0.
                                *                                *                                *
*****************************************************************************************************************************

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                          (CFS)
+     280.      8.25                   99.         25.         24.          24.
                       (INCHES)     1.429       1.430       1.430        1.430
                        (AC-FT)       49.         49.         49.          49.

                        CUMULATIVE AREA =    0.64 SQ MI



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


            **************
            *            *
   66 KK    *        4B  *
            *            *
            **************

   67 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           1  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
                        IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                         IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       0.250  TIME INTERVAL IN HOURS


               SUBBASIN RUNOFF DATA

   68 BA          SUBBASIN CHARACTERISTICS
                        TAREA,       0.41  SUBBASIN AREA

                  PRECIPITATION DATA

   71 PT           TOTAL STORM STATIONS      Gage
   72 PW                        WEIGHTS      0.42

   69 PR             RECORDING STATIONS      Gage
   70 PW                        WEIGHTS      1.00

   73 LS          SCS LOSS RATE
                        STRTL        0.84  INITIAL ABSTRACTION
                       CRVNBR       70.50  CURVE NUMBER
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

   74 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.26  LAG

                                                                  ***

               PRECIPITATION STATION DATA

                         STATION    TOTAL    AVG. ANNUAL    WEIGHT
                            Gage     4.10        0.00         0.42

                  TEMPORAL DISTRIBUTIONS

                  STATION     Gage,  WEIGHT =   1.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                       0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                       0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                       0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                        UNIT HYDROGRAPH
                                                     7 END-OF-PERIOD ORDINATES
               366.      438.      159.       57.       20.        7.        3.

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

                                                  HYDROGRAPH AT STATION       4B

*****************************************************************************************************************************
                                                                  *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                  *
        1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.00    0.00    0.00         0.
        1 JAN 0015    2    0.00    0.00    0.00         0.       *        1 JAN 1245   52    0.00    0.00    0.00         0.
        1 JAN 0030    3    0.00    0.00    0.00         0.       *        1 JAN 1300   53    0.00    0.00    0.00         0.
        1 JAN 0045    4    0.00    0.00    0.00         0.       *        1 JAN 1315   54    0.00    0.00    0.00         0.
        1 JAN 0100    5    0.00    0.00    0.00         0.       *        1 JAN 1330   55    0.00    0.00    0.00         0.
        1 JAN 0115    6    0.00    0.00    0.00         0.       *        1 JAN 1345   56    0.00    0.00    0.00         0.
        1 JAN 0130    7    0.00    0.00    0.00         0.       *        1 JAN 1400   57    0.00    0.00    0.00         0.
        1 JAN 0145    8    0.00    0.00    0.00         0.       *        1 JAN 1415   58    0.00    0.00    0.00         0.
        1 JAN 0200    9    0.00    0.00    0.00         0.       *        1 JAN 1430   59    0.00    0.00    0.00         0.
        1 JAN 0215   10    0.03    0.03    0.00         0.       *        1 JAN 1445   60    0.00    0.00    0.00         0.
        1 JAN 0230   11    0.03    0.03    0.00         0.       *        1 JAN 1500   61    0.00    0.00    0.00         0.
```

1 JAN 0245	12	0.03	0.03	0.00	0.	*	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	*	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	*	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	*	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	*	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	*	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	*	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	*	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	*	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	*	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	0.	*	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	2.	*	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	3.	*	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	5.	*	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	7.	*	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	8.	*	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	10.	*	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	11.	*	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.28	0.10	44.	*	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.24	0.14	97.	*	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.21	0.17	138.	*	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.19	172.	*	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	173.	*	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	160.	*	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	160.	*	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.09	0.16	165.	*	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	124.	*	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	73.	*	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	54.	*	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	48.	*	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	30.	*	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	11.	*	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	4.	*	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	1.	*	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	*	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	*	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	*	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	*	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	*	2 JAN 0045	100	0.00	0.00	0.00	0.
						*						

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 173.	8.25	63.	16.	15.	15.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 31.	31.	31.	31.

CUMULATIVE AREA = 0.41 SQ MI

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            **************
            *            *
  75 KK     *        4R  *        CNAME      4C
            *            *
            **************

  76 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

  77 RM         MUSKINGUM ROUTING
                      NSTPS        1 NUMBER OF SUBREACHES
                      AMSKK     0.09 MUSKINGUM K
                          X     0.20 MUSKINGUM X

                                                        ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      4R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 4R

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	6.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	8.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	9.	1 JAN 1300	53	0.	1 JAN 1915	78	0.

1	JAN	0045	4	0.	*	1	JAN	0700	29	11.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.	
1	JAN	0100	5	0.	*	1	JAN	0715	30	29.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.	
1	JAN	0115	6	0.	*	1	JAN	0730	31	76.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.	
1	JAN	0130	7	0.	*	1	JAN	0745	32	125.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.	
1	JAN	0145	8	0.	*	1	JAN	0800	33	160.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.	
1	JAN	0200	9	0.	*	1	JAN	0815	34	176.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.	
1	JAN	0215	10	0.	*	1	JAN	0830	35	165.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.	
1	JAN	0230	11	0.	*	1	JAN	0845	36	159.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.	
1	JAN	0245	12	0.	*	1	JAN	0900	37	163.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.	
1	JAN	0300	13	0.	*	1	JAN	0915	38	143.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.	
1	JAN	0315	14	0.	*	1	JAN	0930	39	91.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.	
1	JAN	0330	15	0.	*	1	JAN	0945	40	58.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.	
1	JAN	0345	16	0.	*	1	JAN	1000	41	50.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.	
1	JAN	0400	17	0.	*	1	JAN	1015	42	38.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.	
1	JAN	0415	18	0.	*	1	JAN	1030	43	18.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.	
1	JAN	0430	19	0.	*	1	JAN	1045	44	5.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.	
1	JAN	0445	20	0.	*	1	JAN	1100	45	2.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.	
1	JAN	0500	21	0.	*	1	JAN	1115	46	1.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.	
1	JAN	0515	22	0.	*	1	JAN	1130	47	0.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.	
1	JAN	0530	23	1.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.	
1	JAN	0545	24	3.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.	
1	JAN	0600	25	4.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.	

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
176.	8.25	62.	16.	15.	15.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 31.	31.	31.	31.

CUMULATIVE AREA = 0.41 SQ MI

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78 KK     **************
          *            *
          *       3aB  *
          *            *
          **************

79 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.250  TIME INTERVAL IN HOURS


               SUBBASIN RUNOFF DATA

80 BA            SUBBASIN CHARACTERISTICS
                      TAREA,       0.41  SUBBASIN AREA

                 PRECIPITATION DATA

83 PT             TOTAL STORM STATIONS      Gage
84 PW                         WEIGHTS      0.43

81 PR               RECORDING STATIONS      Gage
82 PW                         WEIGHTS      1.00

85 LS            SCS LOSS RATE
                      STRTL       0.83  INITIAL ABSTRACTION
                     CRVNBR      70.59  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

86 UD            SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.27  LAG

                                                      ***

               PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10         0.00         0.43

                 TEMPORAL DISTRIBUTIONS

                 STATION     Gage,  WEIGHT =   1.00
                      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                      0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                      0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               7 END-OF-PERIOD ORDINATES
               360.      448.      168.       61.       22.        8.        3.
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HYDROGRAPH AT STATION 3aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	2.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	3.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	5.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	7.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	9.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	10.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	12.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.10	44.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	98.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	140.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	175.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	177.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	163.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	164.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	168.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	128.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	76.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	56.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	49.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	31.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	11.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	4.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
177.	8.25	64.	16.	16.	16.
		(INCHES) 1.435	1.436	1.436	1.436
		(AC-FT) 32.	32.	32.	32.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
 87 KK    *       3bB  *
          *            *
          **************
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88 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

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 89 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.44  SUBBASIN AREA

                PRECIPITATION DATA

 92 PT           TOTAL STORM STATIONS      Gage
 93 PW                       WEIGHTS      0.45

 90 PR             RECORDING STATIONS      Gage
 91 PW                       WEIGHTS      1.00

 94 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                    CRVNBR       70.62  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

 95 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.26  LAG

                                                    ***

              PRECIPITATION STATION DATA

                      STATION    TOTAL    AVG. ANNUAL    WEIGHT
                         Gage     4.10        0.00         0.45

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
                394.      471.      171.       61.       21.        8.        3.

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

                                                HYDROGRAPH AT STATION      3bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	2.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	4.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	6.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	7.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	9.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	11.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	12.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.10	48.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	105.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	150.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	186.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	187.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	173.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	173.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	178.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	134.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	79.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	58.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	52.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	33.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	12.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	4.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 187.	8.25		68.	17.	16.	16.
		(INCHES)	1.437	1.438	1.438	1.438
		(AC-FT)	34.	34.	34.	34.

CUMULATIVE AREA = 0.44 SQ MI

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            **************
            *            *
  96 KK     *        3C  *        CNAME      3R
            *            *
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97 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

98 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	30.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	38.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	45.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	52.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	171.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	407.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	619.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	781.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	818.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	760.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	745.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	767.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	629.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	382.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	259.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	227.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	159.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	65.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	19.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	7.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	2.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	2.	1 JAN 1130	47	1.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	7.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	14.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	22.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 818.	8.25		293.	73.	71.	71.
		(INCHES)	1.432	1.433	1.433	1.433
		(AC-FT)	145.	145.	145.	145.

CUMULATIVE AREA = 1.90 SQ MI

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            **************
            *            *
  99 KK     *        3R  *        CNAME      3C
            *            *
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          **************

 100 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 101 RM          MUSKINGUM ROUTING
                       NSTPS         1 NUMBER OF SUBREACHES
                       AMSKK      0.04 MUSKINGUM K
                           X      0.20 MUSKINGUM X

                                                          ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      3R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

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                                              HYDROGRAPH AT STATION       3R

********************************************************************************************************************************************
                                *                                *                                *                                *
   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW
                                *                                *                                *
    1 JAN 0000    1        0.   *    1 JAN 0615   26       29.   *    1 JAN 1230   51        0.   *    1 JAN 1845   76        0.
    1 JAN 0015    2        0.   *    1 JAN 0630   27       37.   *    1 JAN 1245   52        0.   *    1 JAN 1900   77        0.
    1 JAN 0030    3        0.   *    1 JAN 0645   28       44.   *    1 JAN 1300   53        0.   *    1 JAN 1915   78        0.
    1 JAN 0045    4        0.   *    1 JAN 0700   29       51.   *    1 JAN 1315   54        0.   *    1 JAN 1930   79        0.
    1 JAN 0100    5        0.   *    1 JAN 0715   30      141.   *    1 JAN 1330   55        0.   *    1 JAN 1945   80        0.
    1 JAN 0115    6        0.   *    1 JAN 0730   31      364.   *    1 JAN 1345   56        0.   *    1 JAN 2000   81        0.
    1 JAN 0130    7        0.   *    1 JAN 0745   32      589.   *    1 JAN 1400   57        0.   *    1 JAN 2015   82        0.
    1 JAN 0145    8        0.   *    1 JAN 0800   33      756.   *    1 JAN 1415   58        0.   *    1 JAN 2030   83        0.
    1 JAN 0200    9        0.   *    1 JAN 0815   34      823.   *    1 JAN 1430   59        0.   *    1 JAN 2045   84        0.
    1 JAN 0215   10        0.   *    1 JAN 0830   35      772.   *    1 JAN 1445   60        0.   *    1 JAN 2100   85        0.
    1 JAN 0230   11        0.   *    1 JAN 0845   36      742.   *    1 JAN 1500   61        0.   *    1 JAN 2115   86        0.
    1 JAN 0245   12        0.   *    1 JAN 0900   37      763.   *    1 JAN 1515   62        0.   *    1 JAN 2130   87        0.
    1 JAN 0300   13        0.   *    1 JAN 0915   38      667.   *    1 JAN 1530   63        0.   *    1 JAN 2145   88        0.
    1 JAN 0315   14        0.   *    1 JAN 0930   39      424.   *    1 JAN 1545   64        0.   *    1 JAN 2200   89        0.
    1 JAN 0330   15        0.   *    1 JAN 0945   40      267.   *    1 JAN 1600   65        0.   *    1 JAN 2215   90        0.
    1 JAN 0345   16        0.   *    1 JAN 1000   41      231.   *    1 JAN 1615   66        0.   *    1 JAN 2230   91        0.
    1 JAN 0400   17        0.   *    1 JAN 1015   42      174.   *    1 JAN 1630   67        0.   *    1 JAN 2245   92        0.
    1 JAN 0415   18        0.   *    1 JAN 1030   43       81.   *    1 JAN 1645   68        0.   *    1 JAN 2300   93        0.
    1 JAN 0430   19        0.   *    1 JAN 1045   44       22.   *    1 JAN 1700   69        0.   *    1 JAN 2315   94        0.
    1 JAN 0445   20        0.   *    1 JAN 1100   45        9.   *    1 JAN 1715   70        0.   *    1 JAN 2330   95        0.
    1 JAN 0500   21        0.   *    1 JAN 1115   46        3.   *    1 JAN 1730   71        0.   *    1 JAN 2345   96        0.
    1 JAN 0515   22        1.   *    1 JAN 1130   47        1.   *    1 JAN 1745   72        0.   *    2 JAN 0000   97        0.
    1 JAN 0530   23        6.   *    1 JAN 1145   48        0.   *    1 JAN 1800   73        0.   *    2 JAN 0015   98        0.
    1 JAN 0545   24       13.   *    1 JAN 1200   49        0.   *    1 JAN 1815   74        0.   *    2 JAN 0030   99        0.
    1 JAN 0600   25       21.   *    1 JAN 1215   50        0.   *    1 JAN 1830   75        0.   *    2 JAN 0045  100        0.
                                *                                *                                *
********************************************************************************************************************************************

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                        (CFS)
+     823.      8.25                293.          73.         71.          71.
                        (INCHES)   1.432        1.433       1.433        1.433
                         (AC-FT)     145.         145.        145.         145.

                         CUMULATIVE AREA =    1.90 SQ MI



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


          **************
          *            *
 102 KK   *       2bB  *
          *            *
          **************

 103 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

 104 BA          SUBBASIN CHARACTERISTICS
                       TAREA,       0.12  SUBBASIN AREA

                 PRECIPITATION DATA
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 107 PT           TOTAL STORM STATIONS      Gage
 108 PW                       WEIGHTS      0.12

 105 PR             RECORDING STATIONS      Gage
 106 PW                       WEIGHTS      1.00

 109 LS          SCS LOSS RATE
                       STRTL        0.79  INITIAL ABSTRACTION
                      CRVNBR       71.67  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

 110 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.00  LAG

                                                  ***

              PRECIPITATION STATION DATA

                      STATION    TOTAL    AVG. ANNUAL    WEIGHT
                         Gage     4.10        0.00         0.12

               TEMPORAL DISTRIBUTIONS

               STATION     Gage,  WEIGHT =   1.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                    0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                    0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.38      0.37
                    0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                              5 END-OF-PERIOD ORDINATES
              226.       63.       12.        2.        0.
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HYDROGRAPH AT STATION 2bB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	1.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.01	2.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.05	0.01	2.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	3.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	3.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	4.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	4.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.27	0.11	26.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.23	0.15	40.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.20	0.18	51.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.17	0.20	59.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.10	0.15	48.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	47.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	48.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.08	0.17	50.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	23.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	15.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	13.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	13.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	3.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	1.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	0.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.59, TOTAL EXCESS = 1.51

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
59.	8.00	19.	5.	5.	5.
		(INCHES) 1.508	1.508	1.508	1.508
		(AC-FT) 9.	9.	9.	9.

CUMULATIVE AREA = 0.12 SQ MI

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          **************
          *            *
111 KK    *       2aB  *
          *            *
          **************
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112 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

113 BA SUBBASIN CHARACTERISTICS

TAREA,	0.48	SUBBASIN AREA

PRECIPITATION DATA

116 PT	TOTAL STORM STATIONS	Gage
117 PW	WEIGHTS	0.49
114 PR	RECORDING STATIONS	Gage
115 PW	WEIGHTS	1.00

118 LS SCS LOSS RATE

STRTL	0.83	INITIAL ABSTRACTION
CRVNBR	70.67	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

119 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.49

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

921. 258. 51. 10. 0.

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HYDROGRAPH AT STATION 2aB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.

1	JAN	0400	17	0.06	0.06	0.00	0.	*	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	*	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	*	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	*	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	*	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	*	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	3.	*	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	6.	*	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	8.	*	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	10.	*	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	11.	*	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	13.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	15.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.10	97.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	155.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	197.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	231.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	190.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	186.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	192.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	200.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	90.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	59.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	54.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	53.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	14.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	3.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	0.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

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TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
231.	8.00	74.	19.	18.	18.
		(INCHES) 1.441	1.441	1.441	1.441
		(AC-FT) 37.	37.	37.	37.

CUMULATIVE AREA = 0.48 SQ MI

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          **************
          *            *
120 KK    *       2C   *       CNAME      2R
          *            *
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121 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

122 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	*	1	JAN	0615	26	60.	*	1	JAN	1230	51	0.	*	1	JAN	1845	76	0.
1	JAN	0015	2	0.	*	1	JAN	0630	27	74.	*	1	JAN	1245	52	0.	*	1	JAN	1900	77	0.
1	JAN	0030	3	0.	*	1	JAN	0645	28	88.	*	1	JAN	1300	53	0.	*	1	JAN	1915	78	0.
1	JAN	0045	4	0.	*	1	JAN	0700	29	101.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.
1	JAN	0100	5	0.	*	1	JAN	0715	30	384.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.
1	JAN	0115	6	0.	*	1	JAN	0730	31	845.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.
1	JAN	0130	7	0.	*	1	JAN	0745	32	1229.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	1523.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	1533.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	1417.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	1404.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	1451.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1106.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.

1	JAN	0315	14	0.	*	1	JAN	0930	39	651.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	462.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	417.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	267.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	98.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	27.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	9.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	0.	*	1	JAN	1115	46	3.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	5.	*	1	JAN	1130	47	1.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	16.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	30.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.
1	JAN	0600	25	45.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1533.	8.25		552.	138.	134.	134.
		(INCHES)	1.435	1.435	1.435	1.435
		(AC-FT)	274.	274.	274.	274.

CUMULATIVE AREA = 3.57 SQ MI

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          **************
          *            *
123 KK    *        2R  *        CNAME      2C
          *            *
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124 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

125 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.13	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 2R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 2R

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	*	1	JAN	0615	26	52.	*	1	JAN	1230	51	0.	*	1	JAN	1845	76	0.
1	JAN	0015	2	0.	*	1	JAN	0630	27	66.	*	1	JAN	1245	52	0.	*	1	JAN	1900	77	0.
1	JAN	0030	3	0.	*	1	JAN	0645	28	80.	*	1	JAN	1300	53	0.	*	1	JAN	1915	78	0.
1	JAN	0045	4	0.	*	1	JAN	0700	29	94.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.
1	JAN	0100	5	0.	*	1	JAN	0715	30	221.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.
1	JAN	0115	6	0.	*	1	JAN	0730	31	592.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.
1	JAN	0130	7	0.	*	1	JAN	0745	32	1027.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	1369.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	1539.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	1484.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	1406.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	1424.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1307.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.
1	JAN	0315	14	0.	*	1	JAN	0930	39	899.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	552.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	436.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	352.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	189.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	61.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	17.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	0.	*	1	JAN	1115	46	6.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	2.	*	1	JAN	1130	47	2.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	10.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	22.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.
1	JAN	0600	25	37.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				

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+    1539.      8.25                  552.        138.        134.         134.
                          (INCHES)     1.435       1.435       1.435        1.435
                           (AC-FT)      274.        274.        274.         274.

                          CUMULATIVE AREA =    3.57 SQ MI


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


              **************
              *            *
 126 KK       *        1B  *
              *            *
              **************

 127 KO           OUTPUT CONTROL VARIABLES
                        IPRNT           1  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
                        IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                         IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       0.250  TIME INTERVAL IN HOURS


                 SUBBASIN RUNOFF DATA

 128 BA            SUBBASIN CHARACTERISTICS
                         TAREA,       0.65  SUBBASIN AREA

                   PRECIPITATION DATA

 131 PT             TOTAL STORM STATIONS      Gage
 132 PW                         WEIGHTS      0.66

 129 PR               RECORDING STATIONS      Gage
 130 PW                         WEIGHTS      1.00

 133 LS            SCS LOSS RATE
                          STRTL        0.80  INITIAL ABSTRACTION
                         CRVNBR       71.35  CURVE NUMBER
                          RTIMP        0.00  PERCENT IMPERVIOUS AREA

 134 UD            SCS DIMENSIONLESS UNITGRAPH
                           TLAG        0.00  LAG

                                                        ***

                 PRECIPITATION STATION DATA

                          STATION    TOTAL    AVG. ANNUAL    WEIGHT
                             Gage     4.10         0.00         0.66

                   TEMPORAL DISTRIBUTIONS

                   STATION     Gage,  WEIGHT =   1.00
                        0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                        0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                        0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                        0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                    UNIT HYDROGRAPH
                                                5 END-OF-PERIOD ORDINATES
                 1243.      348.       68.       14.        0.
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HYDROGRAPH AT STATION 1B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.

1	JAN	0500	21	0.12	0.12	0.00	1.	*	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	3.	*	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	6.	*	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.01	9.	*	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.05	0.01	12.	*	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	14.	*	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	17.	*	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	19.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	22.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.11	138.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.23	0.14	218.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.20	0.17	275.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.20	320.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	263.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	256.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	265.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.08	0.17	275.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	124.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	82.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	74.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	73.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	19.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	4.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	1.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

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TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.61, TOTAL EXCESS = 1.49

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 320.	8.00	104.	26.	25.	25.
		(INCHES) 1.486	1.486	1.486	1.486
		(AC-FT) 51.	51.	51.	51.

CUMULATIVE AREA = 0.65 SQ MI

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          **************
          *            *
135 KK    *        1C  *        CNAME      1C
          *            *
          **************

136 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS

137 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	66.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	83.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	100.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	116.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	360.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	810.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	1302.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	1689.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	1802.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	1740.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	1671.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	1699.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	1431.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	980.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	626.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	509.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	371.	1	JAN	1630	67	0.	1	JAN	2245	92	0.

1	JAN	0415	18	0.	*	1	JAN	1030	43	192.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	61.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	17.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	1.	*	1	JAN	1115	46	6.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	5.	*	1	JAN	1130	47	2.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	16.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	31.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.
1	JAN	0600	25	48.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1802.	8.25	655.	164.	159.	159.
		(INCHES) 1.443	1.443	1.443	1.443
		(AC-FT) 325.	325.	325.	325.

CUMULATIVE AREA = 4.22 SQ MI

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138 KK     1C  *        CNAME      1C
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139 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

140 RN NO ROUTING

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HYDROGRAPH AT STATION 1C

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	66.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	83.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	100.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	116.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	360.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	810.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	1302.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	1689.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	1802.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	1740.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	1671.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	1699.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	1431.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	980.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	626.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	509.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	371.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	192.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	61.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	17.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	1.	1	JAN	1115	46	6.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	5.	1	JAN	1130	47	2.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	16.	1	JAN	1145	48	0.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	31.	1	JAN	1200	49	0.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	48.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1802.	8.25	655.	164.	159.	159.
		(INCHES) 1.443	1.443	1.443	1.443
		(AC-FT) 325.	325.	325.	325.

CUMULATIVE AREA = 4.22 SQ MI

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	6B	112.	8.00	38.	10.	9.	0.25		
+	ROUTED TO	6R	109.	8.00	38.	10.	9.	0.25		
+	HYDROGRAPH AT	7bB	127.	8.00	41.	10.	10.	0.27		
+	HYDROGRAPH AT	7aB	266.	8.00	86.	21.	21.	0.56		
+	3 COMBINED AT	7C	503.	8.00	165.	41.	40.	1.08		
+	ROUTED TO	7R	477.	8.00	165.	41.	40.	1.08		
+	HYDROGRAPH AT	5B	279.	8.00	99.	25.	24.	0.64		
+	ROUTED TO	5R	280.	8.25	99.	25.	24.	0.64		
+	HYDROGRAPH AT	4B	173.	8.25	63.	16.	15.	0.41		
+	ROUTED TO	4R	176.	8.25	62.	16.	15.	0.41		
+	HYDROGRAPH AT	3aB	177.	8.25	64.	16.	16.	0.41		
+	HYDROGRAPH AT	3bB	187.	8.25	68.	17.	16.	0.44		
+	4 COMBINED AT	3C	818.	8.25	293.	73.	71.	1.90		
+	ROUTED TO	3R	823.	8.25	293.	73.	71.	1.90		
+	HYDROGRAPH AT	2bB	59.	8.00	19.	5.	5.	0.12		
+	HYDROGRAPH AT	2aB	231.	8.00	74.	19.	18.	0.48		
+	4 COMBINED AT	2C	1533.	8.25	552.	138.	134.	3.57		
+	ROUTED TO	2R	1539.	8.25	552.	138.	134.	3.57		
+	HYDROGRAPH AT	1B	320.	8.00	104.	26.	25.	0.65		
+	2 COMBINED AT	1C	1802.	8.25	655.	164.	159.	4.22		
+	ROUTED TO	1C	1802.	8.25	655.	164.	159.	4.22		

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    wo Mining & wo Logging (Scenario 4), 10m DEM Data
   3          ID    25 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1

   6          KK      6B
   7          KO       0       0     0.0       1      22
   8          BA  0.2503
   9          PB    4.75
  10          IN       6  1JAN94       0
              * typeII-24hour
  11          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  12          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  13          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  14          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  15          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  16          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  17          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  18          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  19          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  20          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  21          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  22          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  23          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  24          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  25          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  26          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  27          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  28          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  29          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  30          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  31          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  32          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  33          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  34          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  35          PC     1.0
  36          LS     0.0    70.5     0.0
  37          UD    0.21

  38          KK      6R   CNAME      6C
  39          KO       0       0     0.0       0      22
  40          RM       1   0.037     0.2

  41          KK     7bB
  42          KO       0       0     0.0       1      22
  43          BA  0.2668
  44          PB    4.75
  45          IN       6  1JAN94       0
              * typeII-24hour
  46          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  47          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  48          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  49          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
```

HEC-1 INPUT PAGE 2

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

  50          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
```

```
 51          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 52          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 53          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 54          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 55          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 56          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 57          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 58          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 59          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 60          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 61          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 62          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 63          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 64          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 65          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 66          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 67          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 68          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 69          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 70          PC     1.0
 71          LS     0.0    70.5     0.0
 72          UD     0.0

 73          KK     7aB
 74          KO       0       0     0.0       1      22
 75          BA  0.5585
 76          PB    4.75
 77          IN       6  1JAN94       0
             * typeII-24hour
 78          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 79          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 80          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 81          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 82          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 83          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 84          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 85          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 86          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 87          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 88          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 89          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 90          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 91          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 92          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 93          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 94          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 95          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 96          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 97          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 98          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 99          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
100          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
101          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
102          PC     1.0
```



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

103          LS     0.0    70.5     0.0
104          UD     0.0

105          KK      7C   CNAME      7R
106          KO       0       0     0.0       0      22
107          HC       3

108          KK      7R   CNAME      7C
109          KO       0       0     0.0       0      22
110          RM       1   0.087     0.2

111          KK      5B
112          KO       0       0     0.0       1      22
113          BA  0.6425
114          PB    4.75
115          IN       6  1JAN94       0
             * typeII-24hour
116          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
117          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
118          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
119          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
120          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
121          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
122          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
123          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
124          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
125          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
126          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
127          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
128          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
129          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
130          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
131          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
132          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
133          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
134          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
135          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
136          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
137          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
138          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```

```
 139          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 140          PC     1.0
 141          LS     0.0    70.5     0.0
 142          UD  0.2376

 143          KK      5R   CNAME      5C
 144          KO       0       0     0.0       0      22
 145          RM       1   0.099     0.2

 146          KK      4B
 147          KO       0       0     0.0       1      22
 148          BA  0.4066
 149          PB    4.75
 150          IN       6  1JAN94       0
              * typeII-24hour
```



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

 151          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 152          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 153          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 154          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 155          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 156          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 157          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 158          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 159          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 160          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 161          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 162          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 163          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 164          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 165          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 166          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 167          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 168          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 169          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 170          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 171          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 172          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 173          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 174          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 175          PC     1.0
 176          LS     0.0    70.5     0.0
 177          UD  0.2643

 178          KK      4R   CNAME      4C
 179          KO       0       0     0.0       0      22
 180          RM       1   0.091     0.2

 181          KK     3aB
 182          KO       0       0     0.0       1      22
 183          BA  0.4142
 184          PB    4.75
 185          IN       6  1JAN94       0
              * typeII-24hour
 186          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 187          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 188          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 189          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 190          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 191          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 192          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 193          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 194          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 195          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 196          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 197          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 198          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 199          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 200          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 201          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 202          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
```



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

 203          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 204          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 205          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 206          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 207          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 208          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 209          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 210          PC     1.0
 211          LS     0.0   70.59     0.0
 212          UD  0.2705

 213          KK     3bB
 214          KO       0       0     0.0       1      22
 215          BA  0.4375
 216          PB    4.75
 217          IN       6  1JAN94       0
              * typeII-24hour
 218          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 219          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
```

```
 220          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 221          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 222          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 223          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 224          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 225          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 226          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 227          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 228          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 229          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 230          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 231          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 232          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 233          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 234          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 235          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 236          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 237          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 238          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 239          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 240          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 241          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 242          PC     1.0
 243          LS     0.0   70.62     0.0
 244          UD  0.2643

 245          KK      3C   CNAME      3R
 246          KO       0       0     0.0       0      22
 247          HC       4

 248          KK      3R   CNAME      3C
 249          KO       0       0     0.0       0      22
 250          RM       1   0.041     0.2
```



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

 251          KK     2bB
 252          KO       0       0     0.0       1      22
 253          BA  0.1177
 254          PB    4.75
 255          IN       6  1JAN94       0
              * typeII-24hour
 256          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 257          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 258          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 259          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 260          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 261          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 262          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 263          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 264          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 265          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 266          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 267          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 268          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 269          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 270          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 271          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 272          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 273          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 274          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 275          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 276          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 277          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 278          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 279          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 280          PC     1.0
 281          LS     0.0   71.67     0.0
 282          UD     0.0

 283          KK     2aB
 284          KO       0       0     0.0       1      22
 285          BA  0.4804
 286          PB    4.75
 287          IN       6  1JAN94       0
              * typeII-24hour
 288          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 289          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 290          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 291          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 292          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 293          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 294          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 295          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 296          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 297          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 298          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 299          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 300          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 301          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
```



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

 302          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
```

```
 303           PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 304           PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 305           PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 306           PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 307           PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 308           PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 309           PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 310           PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 311           PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 312           PC     1.0
 313           LS     0.0   70.67     0.0
 314           UD     0.0

 315           KK      2C   CNAME      2R
 316           KO       0       0     0.0       0      22
 317           HC       4

 318           KK      2R   CNAME      2C
 319           KO       0       0     0.0       0      22
 320           RM       1   0.134     0.2

 321           KK      1B
 322           KO       0       0     0.0       1      22
 323           BA  0.6484
 324           PB    4.75
 325           IN       6  1JAN94       0
               * typeII-24hour
 326           PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 327           PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 328           PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 329           PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 330           PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 331           PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 332           PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 333           PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 334           PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 335           PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 336           PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 337           PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 338           PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 339           PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 340           PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 341           PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 342           PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 343           PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 344           PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 345           PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 346           PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 347           PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 348           PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 349           PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 350           PC     1.0
 351           LS     0.0   71.35     0.0
 352           UD     0.0
```

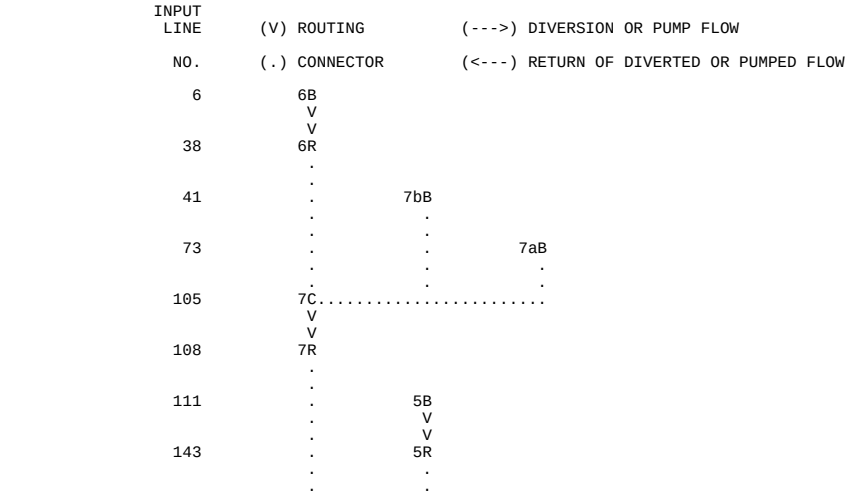


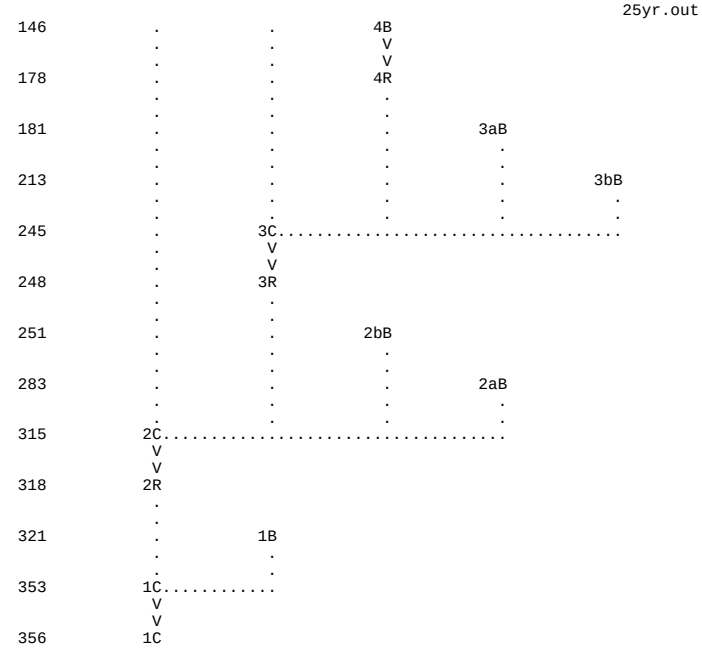
```
LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 353           KK      1C   CNAME      1C
 354           KO       0       0     0.0       0      22
 355           HC       2

 356           KK      1C   CNAME      1C
 357           KO       0       0     0.0       0      22
 358           RN      1C
 359           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*************************************                    *************************************
*                                   *                    *                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                *    U.S. ARMY CORPS OF ENGINEERS     *
*              MAY   1991           *                    *    HYDROLOGIC ENGINEERING CENTER    *
*            VERSION 4.0.1E         *                    *          609 SECOND STREET          *
*                                   *                    *       DAVIS, CALIFORNIA 95616       *
*  RUN DATE           TIME          *                    *           (916) 551-1748            *
*                                   *                    *                                     *
*************************************                    *************************************
```

Scrabble Creek
wo Mining & wo Logging (Scenario 4), 10m DEM Data
25 yr Storm

```
   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                       NMIN         15  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN94  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN94  ENDING DATE
                     NDTIME        0045  ENDING TIME
                     ICENT           19  CENTURY MARK

                   COMPUTATION INTERVAL    0.25 HOURS
                        TOTAL TIME BASE   24.75 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 KK    *        6B  *
           *            *
           **************

   7 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
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                  IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                  ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                  ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                 TIMINT      0.250  TIME INTERVAL IN HOURS


 10 IN          TIME DATA FOR INPUT TIME SERIES
                   JXMIN          6  TIME INTERVAL IN MINUTES
                  JXDATE     1JAN94  STARTING DATE
                  JXTIME          0  STARTING TIME

             SUBBASIN RUNOFF DATA

  8 BA          SUBBASIN CHARACTERISTICS
                   TAREA,       0.25  SUBBASIN AREA

             PRECIPITATION DATA

  9 PB             STORM        4.75  BASIN TOTAL PRECIPITATION

 11 PI           INCREMENTAL 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      0.01      0.01
                   0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                   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      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00

 36 LS          SCS LOSS RATE
                   STRTL        0.84  INITIAL ABSTRACTION
                  CRVNBR       70.50  CURVE NUMBER
                   RTIMP        0.00  PERCENT IMPERVIOUS AREA

 37 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        0.21  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            6 END-OF-PERIOD ORDINATES
              307.      242.       69.       20.        6.        2.
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HYDROGRAPH AT STATION 6B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	102.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	61.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	43.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	34.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	28.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	25.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	22.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	20.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	19.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	18.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	17.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	16.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	15.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	14.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	13.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	13.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	12.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	12.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	11.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	11.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	11.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	10.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	10.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	10.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	10.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	9.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	9.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	9.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	8.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	8.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	8.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	7.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	7.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	7.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	7.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	7.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	7.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	7.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	7.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	7.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	7.
1	JAN	1015	42	0.05	0.05	0.00	0.	1	JAN	2245	92	0.01	0.00	0.01	7.
1	JAN	1030	43	0.06	0.06	0.00	1.	1	JAN	2300	93	0.01	0.00	0.01	7.

1 JAN 1045	44	0.07	0.06	0.01	2.	*	1 JAN 2315	94	0.01	0.00	0.01	6.
1 JAN 1100	45	0.08	0.07	0.01	4.	*	1 JAN 2330	95	0.01	0.00	0.01	6.
1 JAN 1115	46	0.10	0.09	0.01	7.	*	1 JAN 2345	96	0.01	0.00	0.01	6.
1 JAN 1130	47	0.13	0.10	0.02	11.	*	2 JAN 0000	97	0.01	0.00	0.01	6.
1 JAN 1145	48	0.52	0.37	0.15	52.	*	2 JAN 0015	98	0.00	0.00	0.00	3.
1 JAN 1200	49	1.28	0.66	0.62	228.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.20	0.08	0.12	198.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
228.	12.00	41.	13.	12.	12.
		(INCHES) 1.538	1.891	1.891	1.891
		(AC-FT) 21.	25.	25.	25.

CUMULATIVE AREA = 0.25 SQ MI

```
38 KK     *********
          *       *
          *  6R   *     CNAME      6C
          *       *
          *********

39 KO        OUTPUT CONTROL VARIABLES
                IPRNT        1  PRINT CONTROL
                IPLOT        0  PLOT CONTROL
                QSCAL        0.  HYDROGRAPH PLOT SCALE
                IPNCH        0  PUNCH COMPUTED HYDROGRAPH
                 IOUT       22  SAVE HYDROGRAPH ON THIS UNIT
                ISAV1        1  FIRST ORDINATE PUNCHED OR SAVED
                ISAV2      100  LAST ORDINATE PUNCHED OR SAVED
               TIMINT    0.250  TIME INTERVAL IN HOURS


           HYDROGRAPH ROUTING DATA

40 RM        MUSKINGUM ROUTING
                NSTPS        1 NUMBER OF SUBREACHES
                AMSKK     0.04 MUSKINGUM K
                    X     0.20 MUSKINGUM X
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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 6R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 6R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	107.	1 JAN 1845	76	9.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	68.	1 JAN 1900	77	9.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	43.	1 JAN 1915	78	9.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	36.	1 JAN 1930	79	8.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	28.	1 JAN 1945	80	8.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	26.	1 JAN 2000	81	8.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	22.	1 JAN 2015	82	7.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	20.	1 JAN 2030	83	7.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	19.	1 JAN 2045	84	7.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	18.	1 JAN 2100	85	7.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	17.	1 JAN 2115	86	7.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	16.	1 JAN 2130	87	7.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	15.	1 JAN 2145	88	7.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	14.	1 JAN 2200	89	7.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	13.	1 JAN 2215	90	7.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	13.	1 JAN 2230	91	7.
1 JAN 0400	17	0.	1 JAN 1015	42	0.	1 JAN 1630	67	12.	1 JAN 2245	92	7.
1 JAN 0415	18	0.	1 JAN 1030	43	1.	1 JAN 1645	68	12.	1 JAN 2300	93	7.
1 JAN 0430	19	0.	1 JAN 1045	44	2.	1 JAN 1700	69	11.	1 JAN 2315	94	6.
1 JAN 0445	20	0.	1 JAN 1100	45	4.	1 JAN 1715	70	11.	1 JAN 2330	95	6.
1 JAN 0500	21	0.	1 JAN 1115	46	6.	1 JAN 1730	71	11.	1 JAN 2345	96	6.
1 JAN 0515	22	0.	1 JAN 1130	47	10.	1 JAN 1745	72	11.	2 JAN 0000	97	6.
1 JAN 0530	23	0.	1 JAN 1145	48	43.	1 JAN 1800	73	10.	2 JAN 0015	98	4.
1 JAN 0545	24	0.	1 JAN 1200	49	192.	1 JAN 1815	74	10.	2 JAN 0030	99	1.
1 JAN 0600	25	0.	1 JAN 1215	50	228.	1 JAN 1830	75	10.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
228.	12.25	41.	13.	12.	12.
		(INCHES) 1.538	1.891	1.891	1.891
		(AC-FT) 21.	25.	25.	25.

CUMULATIVE AREA = 0.25 SQ MI

*** ***

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          **************
          *            *
 41 KK    *       7bB  *
          *            *
          **************
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 42 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

 45 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

 43 BA SUBBASIN CHARACTERISTICS

TAREA,	0.27	SUBBASIN AREA

PRECIPITATION DATA

 44 PB STORM 4.75 BASIN TOTAL PRECIPITATION

 46 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

 71 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

 72 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

512. 143. 28. 6. 0.

****

HYDROGRAPH AT STATION 7bB

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	80.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	50.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	38.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	32.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	28.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	25.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	22.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	20.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	19.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	18.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	17.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	17.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	16.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	15.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	14.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	13.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	13.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	12.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	12.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	12.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	11.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	11.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	11.

1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	10.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	10.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	10.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	9.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	9.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	9.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	8.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	8.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	8.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	7.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	8.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	8.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	7.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	7.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	7.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	7.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	7.
1	JAN	1000	41	0.05	0.05	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	7.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	7.
1	JAN	1030	43	0.06	0.06	0.00	2.	*	1	JAN	2300	93	0.01	0.00	0.01	7.
1	JAN	1045	44	0.07	0.06	0.01	3.	*	1	JAN	2315	94	0.01	0.00	0.01	7.
1	JAN	1100	45	0.08	0.07	0.01	5.	*	1	JAN	2330	95	0.01	0.00	0.01	7.
1	JAN	1115	46	0.10	0.09	0.01	9.	*	1	JAN	2345	96	0.01	0.00	0.01	7.
1	JAN	1130	47	0.13	0.10	0.02	14.	*	2	JAN	0000	97	0.01	0.00	0.01	7.
1	JAN	1145	48	0.52	0.37	0.15	79.	*	2	JAN	0015	98	0.00	0.00	0.00	2.
1	JAN	1200	49	1.28	0.66	0.62	339.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.20	0.08	0.12	155.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*									

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
339.	12.00	44.	14.	13.	13.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 22.	27.	27.	27.

CUMULATIVE AREA = 0.27 SQ MI

*** ***

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            **************
            *            *
 73 KK      *       7aB  *
            *            *
            **************

 74 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


 77 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 75 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.56  SUBBASIN AREA

                PRECIPITATION DATA

 76 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

 78 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

103 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

104 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.00  LAG
```

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
1071. 300. 59. 12. 0.

HYDROGRAPH AT STATION 7aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	167.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.04	0.06	105.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	80.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.04	67.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	59.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.03	52.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.02	0.03	47.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	43.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	40.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	38.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.02	36.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	35.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	33.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	31.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	29.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	27.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	27.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	26.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	25.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	24.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	24.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	23.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	22.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.01	22.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	21.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	20.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.01	0.01	19.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.01	0.01	19.
1 JAN 0700	29	0.02	0.02	0.00	0.	1 JAN 1930	79	0.02	0.00	0.01	18.
1 JAN 0715	30	0.02	0.02	0.00	0.	1 JAN 1945	80	0.02	0.00	0.01	17.
1 JAN 0730	31	0.02	0.02	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	16.
1 JAN 0745	32	0.02	0.02	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	16.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.01	0.00	0.01	16.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	16.
1 JAN 0830	35	0.03	0.03	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	16.
1 JAN 0845	36	0.03	0.03	0.00	0.	1 JAN 2115	86	0.01	0.00	0.01	15.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.01	0.00	0.01	15.
1 JAN 0915	38	0.04	0.04	0.00	0.	1 JAN 2145	88	0.01	0.00	0.01	15.
1 JAN 0930	39	0.04	0.04	0.00	0.	1 JAN 2200	89	0.01	0.00	0.01	15.
1 JAN 0945	40	0.04	0.04	0.00	0.	1 JAN 2215	90	0.01	0.00	0.01	15.
1 JAN 1000	41	0.05	0.05	0.00	0.	1 JAN 2230	91	0.01	0.00	0.01	15.
1 JAN 1015	42	0.05	0.05	0.00	1.	1 JAN 2245	92	0.01	0.00	0.01	15.
1 JAN 1030	43	0.06	0.06	0.00	3.	1 JAN 2300	93	0.01	0.00	0.01	15.
1 JAN 1045	44	0.07	0.06	0.01	6.	1 JAN 2315	94	0.01	0.00	0.01	14.
1 JAN 1100	45	0.08	0.07	0.01	11.	1 JAN 2330	95	0.01	0.00	0.01	14.
1 JAN 1115	46	0.10	0.09	0.01	18.	1 JAN 2345	96	0.01	0.00	0.01	14.
1 JAN 1130	47	0.13	0.10	0.02	30.	2 JAN 0000	97	0.01	0.00	0.01	14.
1 JAN 1145	48	0.52	0.37	0.15	166.	2 JAN 0015	98	0.00	0.00	0.00	4.
1 JAN 1200	49	1.28	0.66	0.62	710.	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.20	0.08	0.12	325.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
710.	12.00	92.	28.	28.	28.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 46.	56.	56.	56.

CUMULATIVE AREA = 0.56 SQ MI

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105 KK 7C CNAME 7R

106 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT

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                    ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


 107 HC          HYDROGRAPH COMBINATION
                    ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***
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HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	353.	1 JAN 1845	76	39.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	222.	1 JAN 1900	77	37.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	161.	1 JAN 1915	78	37.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	135.	1 JAN 1930	79	35.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	116.	1 JAN 1945	80	34.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	103.	1 JAN 2000	81	32.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	91.	1 JAN 2015	82	31.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	83.	1 JAN 2030	83	30.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	78.	1 JAN 2045	84	30.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	75.	1 JAN 2100	85	30.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	71.	1 JAN 2115	86	30.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	67.	1 JAN 2130	87	29.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	63.	1 JAN 2145	88	29.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	60.	1 JAN 2200	89	29.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	56.	1 JAN 2215	90	29.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	53.	1 JAN 2230	91	28.
1 JAN 0400	17	0.	1 JAN 1015	42	2.	1 JAN 1630	67	51.	1 JAN 2245	92	28.
1 JAN 0415	18	0.	1 JAN 1030	43	6.	1 JAN 1645	68	50.	1 JAN 2300	93	28.
1 JAN 0430	19	0.	1 JAN 1045	44	11.	1 JAN 1700	69	49.	1 JAN 2315	94	27.
1 JAN 0445	20	0.	1 JAN 1100	45	19.	1 JAN 1715	70	47.	1 JAN 2330	95	27.
1 JAN 0500	21	0.	1 JAN 1115	46	33.	1 JAN 1730	71	46.	1 JAN 2345	96	27.
1 JAN 0515	22	0.	1 JAN 1130	47	54.	1 JAN 1745	72	45.	2 JAN 0000	97	27.
1 JAN 0530	23	0.	1 JAN 1145	48	289.	1 JAN 1800	73	43.	2 JAN 0015	98	9.
1 JAN 0545	24	0.	1 JAN 1200	49	1241.	1 JAN 1815	74	42.	2 JAN 0030	99	2.
1 JAN 0600	25	0.	1 JAN 1215	50	708.	1 JAN 1830	75	41.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1241.	12.00	178.	55.	53.	53.
		(INCHES) 1.538	1.891	1.891	1.891
		(AC-FT) 88.	108.	108.	108.

CUMULATIVE AREA = 1.08 SQ MI

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


           **************
           *            *
 108 KK    *        7R  *        CNAME      7C
           *            *
           **************

 109 KO          OUTPUT CONTROL VARIABLES
                    IPRNT           1  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                     IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 110 RM          MUSKINGUM ROUTING
                    NSTPS           1 NUMBER OF SUBREACHES
                    AMSKK        0.09 MUSKINGUM K
                        X        0.20 MUSKINGUM X

                                                      ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      7R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 7R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW

1	JAN	0000	1	0.	*	1	JAN	0615	26	0.	*	1	JAN	1230	51	412.	*	1	JAN	1845	76	40.
1	JAN	0015	2	0.	*	1	JAN	0630	27	0.	*	1	JAN	1245	52	264.	*	1	JAN	1900	77	38.
1	JAN	0030	3	0.	*	1	JAN	0645	28	0.	*	1	JAN	1300	53	176.	*	1	JAN	1915	78	37.
1	JAN	0045	4	0.	*	1	JAN	0700	29	0.	*	1	JAN	1315	54	142.	*	1	JAN	1930	79	36.
1	JAN	0100	5	0.	*	1	JAN	0715	30	0.	*	1	JAN	1330	55	122.	*	1	JAN	1945	80	34.
1	JAN	0115	6	0.	*	1	JAN	0730	31	0.	*	1	JAN	1345	56	107.	*	1	JAN	2000	81	33.
1	JAN	0130	7	0.	*	1	JAN	0745	32	0.	*	1	JAN	1400	57	95.	*	1	JAN	2015	82	31.
1	JAN	0145	8	0.	*	1	JAN	0800	33	0.	*	1	JAN	1415	58	86.	*	1	JAN	2030	83	31.
1	JAN	0200	9	0.	*	1	JAN	0815	34	0.	*	1	JAN	1430	59	80.	*	1	JAN	2045	84	30.
1	JAN	0215	10	0.	*	1	JAN	0830	35	0.	*	1	JAN	1445	60	76.	*	1	JAN	2100	85	30.
1	JAN	0230	11	0.	*	1	JAN	0845	36	0.	*	1	JAN	1500	61	72.	*	1	JAN	2115	86	30.
1	JAN	0245	12	0.	*	1	JAN	0900	37	0.	*	1	JAN	1515	62	68.	*	1	JAN	2130	87	29.
1	JAN	0300	13	0.	*	1	JAN	0915	38	0.	*	1	JAN	1530	63	65.	*	1	JAN	2145	88	29.
1	JAN	0315	14	0.	*	1	JAN	0930	39	0.	*	1	JAN	1545	64	61.	*	1	JAN	2200	89	29.
1	JAN	0330	15	0.	*	1	JAN	0945	40	0.	*	1	JAN	1600	65	57.	*	1	JAN	2215	90	29.
1	JAN	0345	16	0.	*	1	JAN	1000	41	0.	*	1	JAN	1615	66	54.	*	1	JAN	2230	91	28.
1	JAN	0400	17	0.	*	1	JAN	1015	42	1.	*	1	JAN	1630	67	52.	*	1	JAN	2245	92	28.
1	JAN	0415	18	0.	*	1	JAN	1030	43	4.	*	1	JAN	1645	68	50.	*	1	JAN	2300	93	28.
1	JAN	0430	19	0.	*	1	JAN	1045	44	9.	*	1	JAN	1700	69	49.	*	1	JAN	2315	94	28.
1	JAN	0445	20	0.	*	1	JAN	1100	45	16.	*	1	JAN	1715	70	48.	*	1	JAN	2330	95	27.
1	JAN	0500	21	0.	*	1	JAN	1115	46	28.	*	1	JAN	1730	71	46.	*	1	JAN	2345	96	27.
1	JAN	0515	22	0.	*	1	JAN	1130	47	46.	*	1	JAN	1745	72	45.	*	2	JAN	0000	97	27.
1	JAN	0530	23	0.	*	1	JAN	1145	48	186.	*	1	JAN	1800	73	44.	*	2	JAN	0015	98	17.
1	JAN	0545	24	0.	*	1	JAN	1200	49	845.	*	1	JAN	1815	74	42.	*	2	JAN	0030	99	3.
1	JAN	0600	25	0.	*	1	JAN	1215	50	1060.	*	1	JAN	1830	75	41.	*	2	JAN	0045	100	1.
					*						*						*						

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1060.	12.25	178.	55.	53.	53.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 88.	108.	108.	108.

CUMULATIVE AREA = 1.08 SQ MI

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          **************
          *            *
111 KK    *        5B  *
          *            *
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112 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

115 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

113 BA SUBBASIN CHARACTERISTICS

TAREA,	0.64	SUBBASIN AREA

PRECIPITATION DATA

114 PB

STORM	4.75	BASIN TOTAL PRECIPITATION

116 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

141 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

142 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.24	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

674. 669. 214. 70. 23. 8. 1.

HYDROGRAPH AT STATION 5B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	283.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	171.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	117.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	91.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	75.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	65.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	58.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	52.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	48.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	45.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	43.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	41.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	39.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	37.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	34.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	32.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	31.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	30.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	29.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	29.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	28.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	27.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	26.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	25.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	25.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	24.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	23.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	22.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	21.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	20.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	20.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	19.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	18.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	18.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	18.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	18.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	18.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	18.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	17.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	17.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	17.
1	JAN	1015	42	0.05	0.05	0.00	1.	1	JAN	2245	92	0.01	0.00	0.01	17.
1	JAN	1030	43	0.06	0.06	0.00	3.	1	JAN	2300	93	0.01	0.00	0.01	17.
1	JAN	1045	44	0.07	0.06	0.01	6.	1	JAN	2315	94	0.01	0.00	0.01	17.
1	JAN	1100	45	0.08	0.07	0.01	10.	1	JAN	2330	95	0.01	0.00	0.01	16.
1	JAN	1115	46	0.10	0.09	0.01	16.	1	JAN	2345	96	0.01	0.00	0.01	16.
1	JAN	1130	47	0.13	0.10	0.02	27.	2	JAN	0000	97	0.01	0.00	0.01	16.
1	JAN	1145	48	0.52	0.37	0.15	119.	2	JAN	0015	98	0.00	0.00	0.00	10.
1	JAN	1200	49	1.28	0.66	0.62	523.	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.20	0.08	0.12	530.	2	JAN	0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
530.	12.25	106.	33.	32.	32.
		(INCHES) 1.537	1.890	1.890	1.890
		(AC-FT) 53.	65.	65.	65.

CUMULATIVE AREA = 0.64 SQ MI

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          **************
          *            *
143 KK    *        5R  *        CNAME      5C
          *            *
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144 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

145 RM MUSKINGUM ROUTING
NSTPS 1 NUMBER OF SUBREACHES
AMSKK 0.10 MUSKINGUM K
X 0.20 MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 5R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 5R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	394.	1 JAN 1845	76	24.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	200.	1 JAN 1900	77	23.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	137.	1 JAN 1915	78	22.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	99.	1 JAN 1930	79	22.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	81.	1 JAN 1945	80	21.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	69.	1 JAN 2000	81	20.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	60.	1 JAN 2015	82	19.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	54.	1 JAN 2030	83	18.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	49.	1 JAN 2045	84	18.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	46.	1 JAN 2100	85	18.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	44.	1 JAN 2115	86	18.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	42.	1 JAN 2130	87	18.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	40.	1 JAN 2145	88	18.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	37.	1 JAN 2200	89	17.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	35.	1 JAN 2215	90	17.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	33.	1 JAN 2230	91	17.
1 JAN 0400	17	0.	1 JAN 1015	42	0.	1 JAN 1630	67	32.	1 JAN 2245	92	17.
1 JAN 0415	18	0.	1 JAN 1030	43	2.	1 JAN 1645	68	31.	1 JAN 2300	93	17.
1 JAN 0430	19	0.	1 JAN 1045	44	4.	1 JAN 1700	69	30.	1 JAN 2315	94	17.
1 JAN 0445	20	0.	1 JAN 1100	45	8.	1 JAN 1715	70	29.	1 JAN 2330	95	16.
1 JAN 0500	21	0.	1 JAN 1115	46	14.	1 JAN 1730	71	28.	1 JAN 2345	96	16.
1 JAN 0515	22	0.	1 JAN 1130	47	23.	1 JAN 1745	72	27.	2 JAN 0000	97	16.
1 JAN 0530	23	0.	1 JAN 1145	48	76.	1 JAN 1800	73	26.	2 JAN 0015	98	13.
1 JAN 0545	24	0.	1 JAN 1200	49	337.	1 JAN 1815	74	26.	2 JAN 0030	99	5.
1 JAN 0600	25	0.	1 JAN 1215	50	569.	1 JAN 1830	75	25.	2 JAN 0045	100	1.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.75-HR
569.	12.25	106.	33.	32.	32.
	(INCHES)	1.536	1.890	1.890	1.890
	(AC-FT)	53.	65.	65.	65.

CUMULATIVE AREA = 0.64 SQ MI

*** ***

146 KK
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* *
* 4B *
* *
****

147 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
IPNCH 1 PUNCH COMPUTED HYDROGRAPH
IOUT 22 SAVE HYDROGRAPH ON THIS UNIT
ISAV1 1 FIRST ORDINATE PUNCHED OR SAVED
ISAV2 100 LAST ORDINATE PUNCHED OR SAVED
TIMINT 0.250 TIME INTERVAL IN HOURS

150 IN TIME DATA FOR INPUT TIME SERIES
JXMIN 6 TIME INTERVAL IN MINUTES
JXDATE 1JAN94 STARTING DATE
JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

148 BA SUBBASIN CHARACTERISTICS
TAREA, 0.41 SUBBASIN AREA

PRECIPITATION DATA

149 PB STORM 4.75 BASIN TOTAL PRECIPITATION

151 PI INCREMENTAL 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	0.01	0.01

0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

176 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

177 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.26	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

366. 438. 159. 57. 20. 7. 3.

HYDROGRAPH AT STATION 4B

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	192.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.04	0.06	117.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	79.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.04	60.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	49.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.03	42.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.02	0.03	37.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	33.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	31.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	29.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.02	28.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	26.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	25.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	23.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	22.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	21.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	20.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	19.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	19.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	18.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	18.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	17.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	17.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.01	16.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	16.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	15.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.01	0.01	14.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.01	0.01	14.
1 JAN 0700	29	0.02	0.02	0.00	0.	1 JAN 1930	79	0.02	0.00	0.01	14.
1 JAN 0715	30	0.02	0.02	0.00	0.	1 JAN 1945	80	0.02	0.00	0.01	13.
1 JAN 0730	31	0.02	0.02	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	12.
1 JAN 0745	32	0.02	0.02	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	12.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.01	0.00	0.01	12.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	11.
1 JAN 0830	35	0.03	0.03	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	11.
1 JAN 0845	36	0.03	0.03	0.00	0.	1 JAN 2115	86	0.01	0.00	0.01	11.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.01	0.00	0.01	11.
1 JAN 0915	38	0.04	0.04	0.00	0.	1 JAN 2145	88	0.01	0.00	0.01	11.
1 JAN 0930	39	0.04	0.04	0.00	0.	1 JAN 2200	89	0.01	0.00	0.01	11.
1 JAN 0945	40	0.04	0.04	0.00	0.	1 JAN 2215	90	0.01	0.00	0.01	11.
1 JAN 1000	41	0.05	0.05	0.00	0.	1 JAN 2230	91	0.01	0.00	0.01	11.
1 JAN 1015	42	0.05	0.05	0.00	0.	1 JAN 2245	92	0.01	0.00	0.01	11.
1 JAN 1030	43	0.06	0.06	0.00	2.	1 JAN 2300	93	0.01	0.00	0.01	11.
1 JAN 1045	44	0.07	0.06	0.01	3.	1 JAN 2315	94	0.01	0.00	0.01	11.
1 JAN 1100	45	0.08	0.07	0.01	6.	1 JAN 2330	95	0.01	0.00	0.01	10.
1 JAN 1115	46	0.10	0.09	0.01	10.	1 JAN 2345	96	0.01	0.00	0.01	10.
1 JAN 1130	47	0.13	0.10	0.02	16.	2 JAN 0000	97	0.01	0.00	0.01	10.
1 JAN 1145	48	0.52	0.37	0.15	67.	2 JAN 0015	98	0.00	0.00	0.00	7.
1 JAN 1200	49	1.28	0.66	0.62	296.	2 JAN 0030	99	0.00	0.00	0.00	2.
1 JAN 1215	50	0.20	0.08	0.12	341.	2 JAN 0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 341.	12.25	67.	21.	20.	20.
		(INCHES) 1.537	1.890	1.890	1.890
		(AC-FT) 33.	41.	41.	41.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
178 KK    *        4R  *        CNAME      4C
          *            *
          **************

179 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

180 RM          MUSKINGUM ROUTING
                     NSTPS         1 NUMBER OF SUBREACHES
                     AMSKK      0.09 MUSKINGUM K
                         X      0.20 MUSKINGUM X
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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 4R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	259.	1 JAN 1845	76	15.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	134.	1 JAN 1900	77	15.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	92.	1 JAN 1915	78	14.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	65.	1 JAN 1930	79	14.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	53.	1 JAN 1945	80	13.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	45.	1 JAN 2000	81	13.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	39.	1 JAN 2015	82	12.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	35.	1 JAN 2030	83	12.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	32.	1 JAN 2045	84	12.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	30.	1 JAN 2100	85	11.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	28.	1 JAN 2115	86	11.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	27.	1 JAN 2130	87	11.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	25.	1 JAN 2145	88	11.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	24.	1 JAN 2200	89	11.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	22.	1 JAN 2215	90	11.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	21.	1 JAN 2230	91	11.
1 JAN 0400	17	0.	1 JAN 1015	42	0.	1 JAN 1630	67	20.	1 JAN 2245	92	11.
1 JAN 0415	18	0.	1 JAN 1030	43	1.	1 JAN 1645	68	19.	1 JAN 2300	93	11.
1 JAN 0430	19	0.	1 JAN 1045	44	3.	1 JAN 1700	69	19.	1 JAN 2315	94	11.
1 JAN 0445	20	0.	1 JAN 1100	45	5.	1 JAN 1715	70	18.	1 JAN 2330	95	10.
1 JAN 0500	21	0.	1 JAN 1115	46	8.	1 JAN 1730	71	18.	1 JAN 2345	96	10.
1 JAN 0515	22	0.	1 JAN 1130	47	14.	1 JAN 1745	72	17.	2 JAN 0000	97	10.
1 JAN 0530	23	0.	1 JAN 1145	48	44.	1 JAN 1800	73	17.	2 JAN 0015	98	8.
1 JAN 0545	24	0.	1 JAN 1200	49	197.	1 JAN 1815	74	16.	2 JAN 0030	99	4.
1 JAN 0600	25	0.	1 JAN 1215	50	347.	1 JAN 1830	75	16.	2 JAN 0045	100	1.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
347.	12.25	67.	21.	20.	20.
		(INCHES) 1.536	1.890	1.890	1.890
		(AC-FT) 33.	41.	41.	41.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
181 KK    *       3aB  *
          *            *
          **************

182 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS
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185 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

183 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.41  SUBBASIN AREA

                PRECIPITATION DATA

184 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

186 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

211 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                    CRVNBR       70.59  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

212 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.27  LAG

                                                      ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
                360.      448.      168.       61.       22.        8.        3.
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HYDROGRAPH AT STATION 3aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	200.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	122.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	82.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	62.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	51.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	43.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	38.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	34.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	31.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	30.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	28.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	27.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	25.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	24.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	22.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	21.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	20.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	20.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	19.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	19.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	18.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	18.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	17.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	16.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	16.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	15.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	15.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	14.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	14.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	13.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	13.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	12.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	12.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	12.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	12.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	12.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	11.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	11.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	11.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	11.
1	JAN	1000	41	0.05	0.04	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	11.
1	JAN	1015	42	0.05	0.05	0.00	1.	1	JAN	2245	92	0.01	0.00	0.01	11.
1	JAN	1030	43	0.06	0.06	0.00	2.	1	JAN	2300	93	0.01	0.00	0.01	11.
1	JAN	1045	44	0.07	0.06	0.01	3.	1	JAN	2315	94	0.01	0.00	0.01	11.
1	JAN	1100	45	0.08	0.07	0.01	6.	1	JAN	2330	95	0.01	0.00	0.01	11.
1	JAN	1115	46	0.10	0.09	0.01	10.	1	JAN	2345	96	0.01	0.00	0.01	11.
1	JAN	1130	47	0.13	0.10	0.02	17.	2	JAN	0000	97	0.01	0.00	0.01	10.

1	JAN	1145	48	0.52	0.37	0.15	67.	*	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.28	0.66	0.62	296.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.20	0.08	0.12	349.	*	2	JAN	0045	100	0.00	0.00	0.00	1.

*

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.85, TOTAL EXCESS = 1.90

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
349.	12.25	69.	21.	20.	20.
		(INCHES) 1.542	1.897	1.897	1.897
		(AC-FT) 34.	42.	42.	42.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
213 KK    *       3bB  *
          *            *
          **************
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214 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

217 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

215 BA SUBBASIN CHARACTERISTICS

TAREA,	0.44	SUBBASIN AREA

PRECIPITATION DATA

216 PB

STORM	4.75	BASIN TOTAL PRECIPITATION

218 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

243 LS SCS LOSS RATE

STRTL	0.83	INITIAL ABSTRACTION
CRVNBR	70.62	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

244 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.26	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

394.	471.	171.	61.	21.	8.	3.

HYDROGRAPH AT STATION 3bB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	*	1	JAN	1230	51	0.14	0.05	0.09	208.
1	JAN	0015	2	0.01	0.01	0.00	0.	*	1	JAN	1245	52	0.10	0.04	0.06	127.
1	JAN	0030	3	0.01	0.01	0.00	0.	*	1	JAN	1300	53	0.08	0.03	0.05	85.
1	JAN	0045	4	0.01	0.01	0.00	0.	*	1	JAN	1315	54	0.07	0.02	0.04	65.
1	JAN	0100	5	0.01	0.01	0.00	0.	*	1	JAN	1330	55	0.06	0.02	0.04	53.
1	JAN	0115	6	0.01	0.01	0.00	0.	*	1	JAN	1345	56	0.05	0.02	0.03	45.
1	JAN	0130	7	0.01	0.01	0.00	0.	*	1	JAN	1400	57	0.05	0.02	0.03	40.
1	JAN	0145	8	0.01	0.01	0.00	0.	*	1	JAN	1415	58	0.04	0.01	0.03	36.

1	JAN	0200	9	0.01	0.01	0.00	0.	*	1	JAN	1430	59	0.04	0.01	0.03	33.
1	JAN	0215	10	0.01	0.01	0.00	0.	*	1	JAN	1445	60	0.04	0.01	0.03	31.
1	JAN	0230	11	0.01	0.01	0.00	0.	*	1	JAN	1500	61	0.04	0.01	0.02	30.
1	JAN	0245	12	0.02	0.02	0.00	0.	*	1	JAN	1515	62	0.03	0.01	0.02	28.
1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.03	0.01	0.02	27.
1	JAN	0315	14	0.02	0.02	0.00	0.	*	1	JAN	1545	64	0.03	0.01	0.02	25.
1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.02	24.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	22.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	21.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	21.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.02	0.01	0.02	20.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.02	0.01	0.02	20.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.02	0.01	0.02	19.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.02	0.01	0.02	18.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	18.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	17.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	17.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	16.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	16.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	15.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	15.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	14.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	13.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	13.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	13.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	12.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	12.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	12.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	12.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	12.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	12.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	12.
1	JAN	1000	41	0.05	0.04	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	12.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	12.
1	JAN	1030	43	0.06	0.06	0.00	2.	*	1	JAN	2300	93	0.01	0.00	0.01	12.
1	JAN	1045	44	0.07	0.06	0.01	4.	*	1	JAN	2315	94	0.01	0.00	0.01	11.
1	JAN	1100	45	0.08	0.07	0.01	6.	*	1	JAN	2330	95	0.01	0.00	0.01	11.
1	JAN	1115	46	0.10	0.09	0.01	11.	*	1	JAN	2345	96	0.01	0.00	0.01	11.
1	JAN	1130	47	0.13	0.10	0.02	18.	*	2	JAN	0000	97	0.01	0.00	0.01	11.
1	JAN	1145	48	0.52	0.37	0.15	73.	*	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.28	0.66	0.62	321.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.20	0.08	0.12	369.	*	2	JAN	0045	100	0.00	0.00	0.00	1.
								*								

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.85, TOTAL EXCESS = 1.90

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 369.	12.25	73.	22.	22.	22.
		(INCHES) 1.544	1.899	1.899	1.899
		(AC-FT) 36.	44.	44.	44.

CUMULATIVE AREA = 0.44 SQ MI

*** ***

245 KK
```
**************
*            *
*        3C  *        CNAME      3R
*            *
**************
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246 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

247 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	1062.	1	JAN	1845	76	71.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	583.	1	JAN	1900	77	68.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	397.	1	JAN	1915	78	66.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	292.	1	JAN	1930	79	64.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	238.	1	JAN	1945	80	61.

1 JAN 0115	6	0.	*	1 JAN 0730	31	0.	*	1 JAN 1345	56	202.	*	1 JAN 2000	81	59.
1 JAN 0130	7	0.	*	1 JAN 0745	32	0.	*	1 JAN 1400	57	177.	*	1 JAN 2015	82	56.
1 JAN 0145	8	0.	*	1 JAN 0800	33	0.	*	1 JAN 1415	58	159.	*	1 JAN 2030	83	55.
1 JAN 0200	9	0.	*	1 JAN 0815	34	0.	*	1 JAN 1430	59	146.	*	1 JAN 2045	84	54.
1 JAN 0215	10	0.	*	1 JAN 0830	35	0.	*	1 JAN 1445	60	137.	*	1 JAN 2100	85	54.
1 JAN 0230	11	0.	*	1 JAN 0845	36	0.	*	1 JAN 1500	61	130.	*	1 JAN 2115	86	53.
1 JAN 0245	12	0.	*	1 JAN 0900	37	0.	*	1 JAN 1515	62	124.	*	1 JAN 2130	87	52.
1 JAN 0300	13	0.	*	1 JAN 0915	38	0.	*	1 JAN 1530	63	117.	*	1 JAN 2145	88	52.
1 JAN 0315	14	0.	*	1 JAN 0930	39	0.	*	1 JAN 1545	64	110.	*	1 JAN 2200	89	52.
1 JAN 0330	15	0.	*	1 JAN 0945	40	0.	*	1 JAN 1600	65	104.	*	1 JAN 2215	90	51.
1 JAN 0345	16	0.	*	1 JAN 1000	41	0.	*	1 JAN 1615	66	98.	*	1 JAN 2230	91	50.
1 JAN 0400	17	0.	*	1 JAN 1015	42	2.	*	1 JAN 1630	67	93.	*	1 JAN 2245	92	50.
1 JAN 0415	18	0.	*	1 JAN 1030	43	6.	*	1 JAN 1645	68	90.	*	1 JAN 2300	93	50.
1 JAN 0430	19	0.	*	1 JAN 1045	44	14.	*	1 JAN 1700	69	88.	*	1 JAN 2315	94	49.
1 JAN 0445	20	0.	*	1 JAN 1100	45	25.	*	1 JAN 1715	70	85.	*	1 JAN 2330	95	48.
1 JAN 0500	21	0.	*	1 JAN 1115	46	43.	*	1 JAN 1730	71	83.	*	1 JAN 2345	96	48.
1 JAN 0515	22	0.	*	1 JAN 1130	47	71.	*	1 JAN 1745	72	81.	*	2 JAN 0000	97	48.
1 JAN 0530	23	0.	*	1 JAN 1145	48	260.	*	1 JAN 1800	73	78.	*	2 JAN 0015	98	35.
1 JAN 0545	24	0.	*	1 JAN 1200	49	1151.	*	1 JAN 1815	74	76.	*	2 JAN 0030	99	14.
1 JAN 0600	25	0.	*	1 JAN 1215	50	1634.	*	1 JAN 1830	75	73.	*	2 JAN 0045	100	4.
			*				*				*			

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1634.	12.25	315.	97.	94.	94.
		(INCHES) 1.539	1.894	1.894	1.894
		(AC-FT) 156.	192.	192.	192.

CUMULATIVE AREA = 1.90 SQ MI

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          **************
          *            *
248 KK    *        3R  *        CNAME      3C
          *            *
          **************
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249 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

250 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.04	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 3R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 3R

DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	*	1 JAN 0615	26	0.	*	1 JAN 1230	51	1214.	*	1 JAN 1845	76	71.
1 JAN 0015	2	0.	*	1 JAN 0630	27	0.	*	1 JAN 1245	52	619.	*	1 JAN 1900	77	69.
1 JAN 0030	3	0.	*	1 JAN 0645	28	0.	*	1 JAN 1300	53	425.	*	1 JAN 1915	78	66.
1 JAN 0045	4	0.	*	1 JAN 0700	29	0.	*	1 JAN 1315	54	303.	*	1 JAN 1930	79	64.
1 JAN 0100	5	0.	*	1 JAN 0715	30	0.	*	1 JAN 1330	55	246.	*	1 JAN 1945	80	62.
1 JAN 0115	6	0.	*	1 JAN 0730	31	0.	*	1 JAN 1345	56	207.	*	1 JAN 2000	81	59.
1 JAN 0130	7	0.	*	1 JAN 0745	32	0.	*	1 JAN 1400	57	181.	*	1 JAN 2015	82	57.
1 JAN 0145	8	0.	*	1 JAN 0800	33	0.	*	1 JAN 1415	58	162.	*	1 JAN 2030	83	55.
1 JAN 0200	9	0.	*	1 JAN 0815	34	0.	*	1 JAN 1430	59	147.	*	1 JAN 2045	84	54.
1 JAN 0215	10	0.	*	1 JAN 0830	35	0.	*	1 JAN 1445	60	138.	*	1 JAN 2100	85	54.
1 JAN 0230	11	0.	*	1 JAN 0845	36	0.	*	1 JAN 1500	61	131.	*	1 JAN 2115	86	53.
1 JAN 0245	12	0.	*	1 JAN 0900	37	0.	*	1 JAN 1515	62	125.	*	1 JAN 2130	87	52.
1 JAN 0300	13	0.	*	1 JAN 0915	38	0.	*	1 JAN 1530	63	118.	*	1 JAN 2145	88	52.
1 JAN 0315	14	0.	*	1 JAN 0930	39	0.	*	1 JAN 1545	64	111.	*	1 JAN 2200	89	52.
1 JAN 0330	15	0.	*	1 JAN 0945	40	0.	*	1 JAN 1600	65	105.	*	1 JAN 2215	90	51.
1 JAN 0345	16	0.	*	1 JAN 1000	41	0.	*	1 JAN 1615	66	99.	*	1 JAN 2230	91	51.
1 JAN 0400	17	0.	*	1 JAN 1015	42	1.	*	1 JAN 1630	67	94.	*	1 JAN 2245	92	50.
1 JAN 0415	18	0.	*	1 JAN 1030	43	5.	*	1 JAN 1645	68	91.	*	1 JAN 2300	93	50.
1 JAN 0430	19	0.	*	1 JAN 1045	44	13.	*	1 JAN 1700	69	88.	*	1 JAN 2315	94	50.
1 JAN 0445	20	0.	*	1 JAN 1100	45	23.	*	1 JAN 1715	70	86.	*	1 JAN 2330	95	49.
1 JAN 0500	21	0.	*	1 JAN 1115	46	39.	*	1 JAN 1730	71	83.	*	1 JAN 2345	96	48.
1 JAN 0515	22	0.	*	1 JAN 1130	47	66.	*	1 JAN 1745	72	81.	*	2 JAN 0000	97	48.
1 JAN 0530	23	0.	*	1 JAN 1145	48	214.	*	1 JAN 1800	73	79.	*	2 JAN 0015	98	38.
1 JAN 0545	24	0.	*	1 JAN 1200	49	946.	*	1 JAN 1815	74	76.	*	2 JAN 0030	99	18.

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    1 JAN 0600   25        0.   *    1 JAN 1215   50     1628.   *    1 JAN 1830   75       74.   *    2 JAN 0045  100        5.
                                 *                                *                                *
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  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+    1628.     12.25                315.         97.         94.          94.
                    (INCHES)      1.539       1.894       1.894        1.894
                     (AC-FT)      156.         192.        192.         192.

                     CUMULATIVE AREA =    1.90 SQ MI
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            **************
            *            *
  251 KK    *       2bB  *
            *            *
            **************

  252 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


  255 IN          TIME DATA FOR INPUT TIME SERIES
                        JXMIN           6  TIME INTERVAL IN MINUTES
                       JXDATE      1JAN94  STARTING DATE
                       JXTIME           0  STARTING TIME

                SUBBASIN RUNOFF DATA

  253 BA          SUBBASIN CHARACTERISTICS
                       TAREA,        0.12  SUBBASIN AREA

                PRECIPITATION DATA

  254 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

  256 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

  281 LS          SCS LOSS RATE
                       STRTL        0.79  INITIAL ABSTRACTION
                      CRVNBR       71.67  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  282 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.00  LAG

                                                          ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
                226.       63.       12.        2.         0.
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HYDROGRAPH AT STATION 2bB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	36.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.03	0.06	23.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	17.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.05	15.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	13.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.04	11.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.01	0.03	10.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	9.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	9.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	8.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	8.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	8.

1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.03	0.01	0.02	7.
1	JAN	0315	14	0.02	0.02	0.00	0.	*	1	JAN	1545	64	0.03	0.01	0.02	7.
1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.02	6.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	6.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	6.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	6.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.02	0.01	0.02	5.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.02	0.01	0.02	5.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.02	0.01	0.02	5.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.02	0.01	0.02	5.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	5.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.02	5.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	5.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	4.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	4.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.00	0.01	4.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	4.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	4.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	4.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	3.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	3.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	3.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	3.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	3.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	3.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	3.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	3.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	3.
1	JAN	1000	41	0.05	0.04	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	3.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	3.
1	JAN	1030	43	0.06	0.05	0.00	1.	*	1	JAN	2300	93	0.01	0.00	0.01	3.
1	JAN	1045	44	0.07	0.06	0.01	2.	*	1	JAN	2315	94	0.01	0.00	0.01	3.
1	JAN	1100	45	0.08	0.07	0.01	3.	*	1	JAN	2330	95	0.01	0.00	0.01	3.
1	JAN	1115	46	0.10	0.08	0.02	5.	*	1	JAN	2345	96	0.01	0.00	0.01	3.
1	JAN	1130	47	0.13	0.10	0.03	7.	*	2	JAN	0000	97	0.01	0.00	0.01	3.
1	JAN	1145	48	0.52	0.36	0.16	38.	*	2	JAN	0015	98	0.00	0.00	0.00	1.
1	JAN	1200	49	1.28	0.63	0.65	158.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.20	0.08	0.13	72.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*									

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.77, TOTAL EXCESS = 1.98

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 158.	12.00	20.	6.	6.	6.
		(INCHES) 1.612	1.981	1.981	1.981
		(AC-FT) 10.	12.	12.	12.

CUMULATIVE AREA = 0.12 SQ MI

*** ***

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          **************
          *            *
283 KK    *       2aB  *
          *            *
          **************

284 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


287 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

285 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.48  SUBBASIN AREA

                PRECIPITATION DATA

286 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

288 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
```

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

313 LS SCS LOSS RATE
STRTL 0.83 INITIAL ABSTRACTION
CRVNBR 70.67 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

314 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.00 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
921. 258. 51. 10. 0.

HYDROGRAPH AT STATION 2aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	144.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.03	0.06	91.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	69.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.04	58.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	51.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.03	45.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.02	0.03	40.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	37.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	35.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	33.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.02	31.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	30.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	28.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	27.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	25.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	24.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	23.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	22.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	22.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	21.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	20.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	20.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	19.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.01	19.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	18.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	17.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.01	0.01	17.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.01	0.01	16.
1 JAN 0700	29	0.02	0.02	0.00	0.	1 JAN 1930	79	0.02	0.00	0.01	16.
1 JAN 0715	30	0.02	0.02	0.00	0.	1 JAN 1945	80	0.02	0.00	0.01	15.
1 JAN 0730	31	0.02	0.02	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	14.
1 JAN 0745	32	0.02	0.02	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	14.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.01	0.00	0.01	14.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	14.
1 JAN 0830	35	0.03	0.03	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	14.
1 JAN 0845	36	0.03	0.03	0.00	0.	1 JAN 2115	86	0.01	0.00	0.01	13.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.01	0.00	0.01	13.
1 JAN 0915	38	0.04	0.04	0.00	0.	1 JAN 2145	88	0.01	0.00	0.01	13.
1 JAN 0930	39	0.04	0.04	0.00	0.	1 JAN 2200	89	0.01	0.00	0.01	13.
1 JAN 0945	40	0.04	0.04	0.00	0.	1 JAN 2215	90	0.01	0.00	0.01	13.
1 JAN 1000	41	0.05	0.04	0.00	0.	1 JAN 2230	91	0.01	0.00	0.01	13.
1 JAN 1015	42	0.05	0.05	0.00	1.	1 JAN 2245	92	0.01	0.00	0.01	13.
1 JAN 1030	43	0.06	0.05	0.00	3.	1 JAN 2300	93	0.01	0.00	0.01	13.
1 JAN 1045	44	0.07	0.06	0.01	6.	1 JAN 2315	94	0.01	0.00	0.01	12.
1 JAN 1100	45	0.08	0.07	0.01	9.	1 JAN 2330	95	0.01	0.00	0.01	12.
1 JAN 1115	46	0.10	0.09	0.01	16.	1 JAN 2345	96	0.01	0.00	0.01	12.
1 JAN 1130	47	0.13	0.10	0.02	26.	2 JAN 0000	97	0.01	0.00	0.01	12.
1 JAN 1145	48	0.52	0.37	0.15	145.	2 JAN 0015	98	0.00	0.00	0.00	3.
1 JAN 1200	49	1.28	0.66	0.62	616.	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.20	0.08	0.12	282.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.85, TOTAL EXCESS = 1.90

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 616.	12.00	80.	25.	24.	24.
		(INCHES) 1.549	1.904	1.904	1.904
		(AC-FT) 40.	49.	49.	49.

CUMULATIVE AREA = 0.48 SQ MI

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```
          *           *
315 KK    *       2C  *       CNAME      2R
          *           *
          *************

316 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


317 HC          HYDROGRAPH COMBINATION
                     ICOMP          4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***
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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1806.	1 JAN 1845	76	133.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	996.	1 JAN 1900	77	128.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	687.	1 JAN 1915	78	123.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	517.	1 JAN 1930	79	119.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	432.	1 JAN 1945	80	115.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	370.	1 JAN 2000	81	109.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	326.	1 JAN 2015	82	105.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	293.	1 JAN 2030	83	102.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	270.	1 JAN 2045	84	101.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	255.	1 JAN 2100	85	101.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	243.	1 JAN 2115	86	100.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	230.	1 JAN 2130	87	98.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	218.	1 JAN 2145	88	98.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	206.	1 JAN 2200	89	97.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	194.	1 JAN 2215	90	96.
1 JAN 0345	16	0.	1 JAN 1000	41	1.	1 JAN 1615	66	182.	1 JAN 2230	91	95.
1 JAN 0400	17	0.	1 JAN 1015	42	5.	1 JAN 1630	67	174.	1 JAN 2245	92	94.
1 JAN 0415	18	0.	1 JAN 1030	43	14.	1 JAN 1645	68	169.	1 JAN 2300	93	94.
1 JAN 0430	19	0.	1 JAN 1045	44	29.	1 JAN 1700	69	165.	1 JAN 2315	94	93.
1 JAN 0445	20	0.	1 JAN 1100	45	52.	1 JAN 1715	70	160.	1 JAN 2330	95	91.
1 JAN 0500	21	0.	1 JAN 1115	46	87.	1 JAN 1730	71	155.	1 JAN 2345	96	91.
1 JAN 0515	22	0.	1 JAN 1130	47	145.	1 JAN 1745	72	151.	2 JAN 0000	97	90.
1 JAN 0530	23	0.	1 JAN 1145	48	584.	1 JAN 1800	73	146.	2 JAN 0015	98	59.
1 JAN 0545	24	0.	1 JAN 1200	49	2564.	1 JAN 1815	74	141.	2 JAN 0030	99	22.
1 JAN 0600	25	0.	1 JAN 1215	50	3041.	1 JAN 1830	75	137.	2 JAN 0045	100	6.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
3041.	12.25	593.	182.	177.	177.
		(INCHES) 1.542	1.897	1.897	1.897
		(AC-FT) 294.	362.	362.	362.

CUMULATIVE AREA = 3.57 SQ MI

*** ***

```
          *************
          *           *
318 KK    *       2R  *       CNAME      2C
          *           *
          *************

319 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

320 RM          MUSKINGUM ROUTING
                     NSTPS          1 NUMBER OF SUBREACHES
                     AMSKK       0.13 MUSKINGUM K
                         X       0.20 MUSKINGUM X

                                                        ***
```

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   2R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION   2R

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2533.	1 JAN 1845	76	135.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1408.	1 JAN 1900	77	131.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	834.	1 JAN 1915	78	126.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	604.	1 JAN 1930	79	122.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	474.	1 JAN 1945	80	117.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	403.	1 JAN 2000	81	112.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	349.	1 JAN 2015	82	108.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	311.	1 JAN 2030	83	104.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	282.	1 JAN 2045	84	102.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	263.	1 JAN 2100	85	101.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	249.	1 JAN 2115	86	101.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	237.	1 JAN 2130	87	99.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	225.	1 JAN 2145	88	98.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	212.	1 JAN 2200	89	97.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	200.	1 JAN 2215	90	97.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	188.	1 JAN 2230	91	96.
1 JAN 0400	17	0.	1 JAN 1015	42	2.	1 JAN 1630	67	178.	1 JAN 2245	92	94.
1 JAN 0415	18	0.	1 JAN 1030	43	9.	1 JAN 1645	68	172.	1 JAN 2300	93	94.
1 JAN 0430	19	0.	1 JAN 1045	44	21.	1 JAN 1700	69	167.	1 JAN 2315	94	94.
1 JAN 0445	20	0.	1 JAN 1100	45	40.	1 JAN 1715	70	162.	1 JAN 2330	95	92.
1 JAN 0500	21	0.	1 JAN 1115	46	68.	1 JAN 1730	71	158.	1 JAN 2345	96	91.
1 JAN 0515	22	0.	1 JAN 1130	47	113.	1 JAN 1745	72	153.	2 JAN 0000	97	90.
1 JAN 0530	23	0.	1 JAN 1145	48	333.	1 JAN 1800	73	149.	2 JAN 0015	98	77.
1 JAN 0545	24	0.	1 JAN 1200	49	1441.	1 JAN 1815	74	144.	2 JAN 0030	99	42.
1 JAN 0600	25	0.	1 JAN 1215	50	2852.	1 JAN 1830	75	139.	2 JAN 0045	100	13.

****

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR (CFS)	24-HR	72-HR	24.75-HR
2852.	12.25	592.	182.	177.	177.
		(INCHES) 1.540	1.896	1.896	1.896
		(AC-FT) 294.	362.	362.	362.

CUMULATIVE AREA =   3.57 SQ MI

*** ***

```
          **************
          *            *
321 KK    *       1B   *
          *            *
          **************

322 KO         OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.250  TIME INTERVAL IN HOURS


325 IN         TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

             SUBBASIN RUNOFF DATA

323 BA         SUBBASIN CHARACTERISTICS
                    TAREA,       0.65  SUBBASIN AREA

               PRECIPITATION DATA

324 PB              STORM        4.75  BASIN TOTAL PRECIPITATION

326 PI           INCREMENTAL 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      0.01      0.01
                   0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                   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      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00

351 LS         SCS LOSS RATE
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                  STRTL        0.80  INITIAL ABSTRACTION
                 CRVNBR       71.35  CURVE NUMBER
                  RTIMP        0.00  PERCENT IMPERVIOUS AREA

352 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        0.00  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
             1243.      348.       68.       14.        0.
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HYDROGRAPH AT STATION 1B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	199.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	125.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	95.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	80.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	70.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	62.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	55.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	51.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	48.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	46.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	43.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	41.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	39.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	37.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	34.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	32.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	31.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	31.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	30.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	29.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	28.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	27.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	26.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	25.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	25.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	24.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	23.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	22.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	21.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	21.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	19.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	19.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	18.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	19.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	19.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	18.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	18.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	18.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	18.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	18.
1	JAN	1000	41	0.05	0.04	0.00	1.	1	JAN	2230	91	0.01	0.00	0.01	17.
1	JAN	1015	42	0.05	0.05	0.00	3.	1	JAN	2245	92	0.01	0.00	0.01	17.
1	JAN	1030	43	0.06	0.05	0.00	5.	1	JAN	2300	93	0.01	0.00	0.01	17.
1	JAN	1045	44	0.07	0.06	0.01	9.	1	JAN	2315	94	0.01	0.00	0.01	17.
1	JAN	1100	45	0.08	0.07	0.01	15.	1	JAN	2330	95	0.01	0.00	0.01	17.
1	JAN	1115	46	0.10	0.08	0.02	24.	1	JAN	2345	96	0.01	0.00	0.01	17.
1	JAN	1130	47	0.13	0.10	0.03	38.	2	JAN	0000	97	0.01	0.00	0.01	16.
1	JAN	1145	48	0.52	0.36	0.16	206.	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.28	0.64	0.64	857.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	390.	2	JAN	0045	100	0.00	0.00	0.00	0.

```
    TOTAL RAINFALL =    4.75, TOTAL LOSS =    2.79, TOTAL EXCESS =    1.96

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                     (CFS)
+     857.     12.00                111.         34.         33.         33.
                     (INCHES)     1.592       1.956       1.956       1.956
                      (AC-FT)       55.         68.         68.         68.

                     CUMULATIVE AREA =    0.65 SQ MI


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


           **************
           *            *
 353 KK    *        1C  *        CNAME      1C
           *            *
           **************
```

```
 354 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
                       IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                        IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT      0.250  TIME INTERVAL IN HOURS


 355 HC          HYDROGRAPH COMBINATION
                       ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***
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HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2732.	1 JAN 1845	76	159.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1532.	1 JAN 1900	77	153.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	928.	1 JAN 1915	78	148.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	684.	1 JAN 1930	79	143.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	545.	1 JAN 1945	80	138.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	465.	1 JAN 2000	81	132.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	404.	1 JAN 2015	82	127.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	361.	1 JAN 2030	83	122.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	330.	1 JAN 2045	84	120.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	309.	1 JAN 2100	85	120.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	292.	1 JAN 2115	86	119.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	278.	1 JAN 2130	87	117.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	263.	1 JAN 2145	88	116.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	249.	1 JAN 2200	89	115.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	234.	1 JAN 2215	90	114.
1 JAN 0345	16	0.	1 JAN 1000	41	1.	1 JAN 1615	66	220.	1 JAN 2230	91	113.
1 JAN 0400	17	0.	1 JAN 1015	42	5.	1 JAN 1630	67	210.	1 JAN 2245	92	112.
1 JAN 0415	18	0.	1 JAN 1030	43	14.	1 JAN 1645	68	202.	1 JAN 2300	93	111.
1 JAN 0430	19	0.	1 JAN 1045	44	30.	1 JAN 1700	69	197.	1 JAN 2315	94	110.
1 JAN 0445	20	0.	1 JAN 1100	45	54.	1 JAN 1715	70	191.	1 JAN 2330	95	108.
1 JAN 0500	21	0.	1 JAN 1115	46	91.	1 JAN 1730	71	186.	1 JAN 2345	96	108.
1 JAN 0515	22	0.	1 JAN 1130	47	151.	1 JAN 1745	72	180.	2 JAN 0000	97	107.
1 JAN 0530	23	0.	1 JAN 1145	48	539.	1 JAN 1800	73	175.	2 JAN 0015	98	81.
1 JAN 0545	24	0.	1 JAN 1200	49	2297.	1 JAN 1815	74	169.	2 JAN 0030	99	43.
1 JAN 0600	25	0.	1 JAN 1215	50	3242.	1 JAN 1830	75	164.	2 JAN 0045	100	14.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
3242.	12.25	703.	216.	210.	210.
		(INCHES) 1.548	1.906	1.906	1.906
		(AC-FT) 349.	429.	429.	429.

CUMULATIVE AREA = 4.22 SQ MI

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


           **************
           *            *
 356 KK    *        1C  *        CNAME      1C
           *            *
           **************

 357 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
                       IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                        IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

 358 RN          NO ROUTING

                                                    ***
```

HYDROGRAPH AT STATION 1C

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	2732.	1	JAN	1845	76	159.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	1532.	1	JAN	1900	77	153.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	928.	1	JAN	1915	78	148.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	684.	1	JAN	1930	79	143.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	545.	1	JAN	1945	80	138.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	465.	1	JAN	2000	81	132.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	404.	1	JAN	2015	82	127.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	361.	1	JAN	2030	83	122.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	330.	1	JAN	2045	84	120.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	309.	1	JAN	2100	85	120.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	292.	1	JAN	2115	86	119.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	278.	1	JAN	2130	87	117.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	263.	1	JAN	2145	88	116.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	249.	1	JAN	2200	89	115.
1	JAN	0330	15	0.	1	JAN	0945	40	0.	1	JAN	1600	65	234.	1	JAN	2215	90	114.
1	JAN	0345	16	0.	1	JAN	1000	41	1.	1	JAN	1615	66	220.	1	JAN	2230	91	113.
1	JAN	0400	17	0.	1	JAN	1015	42	5.	1	JAN	1630	67	210.	1	JAN	2245	92	112.
1	JAN	0415	18	0.	1	JAN	1030	43	14.	1	JAN	1645	68	202.	1	JAN	2300	93	111.
1	JAN	0430	19	0.	1	JAN	1045	44	30.	1	JAN	1700	69	197.	1	JAN	2315	94	110.
1	JAN	0445	20	0.	1	JAN	1100	45	54.	1	JAN	1715	70	191.	1	JAN	2330	95	108.
1	JAN	0500	21	0.	1	JAN	1115	46	91.	1	JAN	1730	71	186.	1	JAN	2345	96	108.
1	JAN	0515	22	0.	1	JAN	1130	47	151.	1	JAN	1745	72	180.	2	JAN	0000	97	107.
1	JAN	0530	23	0.	1	JAN	1145	48	539.	1	JAN	1800	73	175.	2	JAN	0015	98	81.
1	JAN	0545	24	0.	1	JAN	1200	49	2297.	1	JAN	1815	74	169.	2	JAN	0030	99	43.
1	JAN	0600	25	0.	1	JAN	1215	50	3242.	1	JAN	1830	75	164.	2	JAN	0045	100	14.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
3242.	12.25	703.	216.	210.	210.
		(INCHES) 1.548	1.906	1.906	1.906
		(AC-FT) 349.	429.	429.	429.

CUMULATIVE AREA = 4.22 SQ MI

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	6B	228.	12.00	41.	13.	12.	0.25		
ROUTED TO	6R	228.	12.25	41.	13.	12.	0.25		
HYDROGRAPH AT	7bB	339.	12.00	44.	14.	13.	0.27		
HYDROGRAPH AT	7aB	710.	12.00	92.	28.	28.	0.56		
3 COMBINED AT	7C	1241.	12.00	178.	55.	53.	1.08		
ROUTED TO	7R	1060.	12.25	178.	55.	53.	1.08		
HYDROGRAPH AT	5B	530.	12.25	106.	33.	32.	0.64		
ROUTED TO	5R	569.	12.25	106.	33.	32.	0.64		
HYDROGRAPH AT	4B	341.	12.25	67.	21.	20.	0.41		
ROUTED TO	4R	347.	12.25	67.	21.	20.	0.41		
HYDROGRAPH AT	3aB	349.	12.25	69.	21.	20.	0.41		
HYDROGRAPH AT	3bB	369.	12.25	73.	22.	22.	0.44		
4 COMBINED AT	3C	1634.	12.25	315.	97.	94.	1.90		
ROUTED TO	3R	1628.	12.25	315.	97.	94.	1.90		
HYDROGRAPH AT	2bB	158.	12.00	20.	6.	6.	0.12		
HYDROGRAPH AT	2aB	616.	12.00	80.	25.	24.	0.48		
4 COMBINED AT	2C	3041.	12.25	593.	182.	177.	3.57		

	ROUTED TO							
+		2R	2852.	12.25	592.	182.	177.	3.57
	HYDROGRAPH AT							
+		1B	857.	12.00	111.	34.	33.	0.65
	2 COMBINED AT							
+		1C	3242.	12.25	703.	216.	210.	4.22
	ROUTED TO							
+		1C	3242.	12.25	703.	216.	210.	4.22

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

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*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    wo Mining & wo Logging (Scenario 4), 10m DEM Data
   3          ID    100 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1

   6          KK      6B
   7          KO       0       0     0.0       1      22
   8          BA  0.2503
   9          PB     5.7
  10          IN       6  1JAN94       0
              * typeII-24hour
  11          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  12          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  13          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  14          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  15          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  16          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  17          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  18          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  19          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  20          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  21          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  22          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  23          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  24          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  25          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  26          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  27          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  28          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  29          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  30          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  31          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  32          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  33          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  34          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  35          PC     1.0
  36          LS     0.0    70.5     0.0
  37          UD    0.21

  38          KK      6R   CNAME      6C
  39          KO       0       0     0.0       0      22
  40          RM       1   0.037     0.2

  41          KK     7bB
  42          KO       0       0     0.0       1      22
  43          BA  0.2668
  44          PB     5.7
  45          IN       6  1JAN94       0
              * typeII-24hour
  46          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  47          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  48          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  49          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
```

HEC-1 INPUT PAGE 2

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

  50          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
```

```
 51          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 52          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 53          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 54          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 55          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 56          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 57          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 58          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 59          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 60          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 61          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 62          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 63          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 64          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 65          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 66          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 67          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 68          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 69          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 70          PC     1.0
 71          LS     0.0    70.5     0.0
 72          UD     0.0

 73          KK     7aB
 74          KO       0       0     0.0       1      22
 75          BA  0.5585
 76          PB     5.7
 77          IN       6  1JAN94       0
             * typeII-24hour
 78          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 79          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 80          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 81          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 82          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 83          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 84          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 85          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 86          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 87          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 88          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 89          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 90          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 91          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 92          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 93          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 94          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 95          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 96          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 97          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 98          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 99          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
100          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
101          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
102          PC     1.0
```



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

103          LS     0.0    70.5     0.0
104          UD     0.0

105          KK      7C   CNAME      7R
106          KO       0       0     0.0       0      22
107          HC       3

108          KK      7R   CNAME      7C
109          KO       0       0     0.0       0      22
110          RM       1   0.087     0.2

111          KK      5B
112          KO       0       0     0.0       1      22
113          BA  0.6425
114          PB     5.7
115          IN       6  1JAN94       0
             * typeII-24hour
116          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
117          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
118          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
119          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
120          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
121          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
122          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
123          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
124          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
125          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
126          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
127          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
128          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
129          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
130          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
131          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
132          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
133          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
134          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
135          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
136          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
137          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
138          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```

```
 139          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 140          PC     1.0
 141          LS     0.0    70.5     0.0
 142          UD  0.2376

 143          KK      5R   CNAME      5C
 144          KO       0       0     0.0       0      22
 145          RM       1   0.099     0.2

 146          KK      4B
 147          KO       0       0     0.0       1      22
 148          BA  0.4066
 149          PB     5.7
 150          IN       6  1JAN94       0
              * typeII-24hour
```



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

 151          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 152          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 153          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 154          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 155          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 156          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 157          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 158          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 159          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 160          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 161          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 162          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 163          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 164          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 165          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 166          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 167          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 168          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 169          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 170          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 171          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 172          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 173          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 174          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 175          PC     1.0
 176          LS     0.0    70.5     0.0
 177          UD  0.2643

 178          KK      4R   CNAME      4C
 179          KO       0       0     0.0       0      22
 180          RM       1   0.091     0.2

 181          KK     3aB
 182          KO       0       0     0.0       1      22
 183          BA  0.4142
 184          PB     5.7
 185          IN       6  1JAN94       0
              * typeII-24hour
 186          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 187          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 188          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 189          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 190          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 191          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 192          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 193          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 194          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 195          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 196          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 197          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 198          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 199          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 200          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 201          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 202          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
```



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

 203          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 204          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 205          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 206          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 207          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 208          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 209          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 210          PC     1.0
 211          LS     0.0   70.59     0.0
 212          UD  0.2705

 213          KK     3bB
 214          KO       0       0     0.0       1      22
 215          BA  0.4375
 216          PB     5.7
 217          IN       6  1JAN94       0
              * typeII-24hour
 218          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 219          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
```

```
 220          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 221          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 222          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 223          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 224          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 225          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 226          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 227          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 228          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 229          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 230          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 231          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 232          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 233          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 234          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 235          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 236          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 237          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 238          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 239          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 240          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 241          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 242          PC     1.0
 243          LS     0.0   70.62     0.0
 244          UD  0.2643

 245          KK      3C   CNAME      3R
 246          KO       0       0     0.0       0      22
 247          HC       4

 248          KK      3R   CNAME      3C
 249          KO       0       0     0.0       0      22
 250          RM       1   0.041     0.2
```



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

 251          KK     2bB
 252          KO       0       0     0.0       1      22
 253          BA  0.1177
 254          PB     5.7
 255          IN       6  1JAN94       0
              * typeII-24hour
 256          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 257          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 258          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 259          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 260          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 261          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 262          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 263          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 264          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 265          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 266          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 267          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 268          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 269          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 270          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 271          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 272          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 273          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 274          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 275          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 276          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 277          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 278          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 279          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 280          PC     1.0
 281          LS     0.0   71.67     0.0
 282          UD     0.0

 283          KK     2aB
 284          KO       0       0     0.0       1      22
 285          BA  0.4804
 286          PB     5.7
 287          IN       6  1JAN94       0
              * typeII-24hour
 288          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 289          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 290          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 291          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 292          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 293          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 294          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 295          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 296          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 297          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 298          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 299          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 300          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 301          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
```



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

 302          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
```

```
303           PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
304           PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
305           PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
306           PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
307           PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
308           PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
309           PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
310           PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
311           PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
312           PC     1.0
313           LS     0.0   70.67     0.0
314           UD     0.0

315           KK      2C   CNAME      2R
316           KO       0       0     0.0       0      22
317           HC       4

318           KK      2R   CNAME      2C
319           KO       0       0     0.0       0      22
320           RM       1   0.134     0.2

321           KK      1B
322           KO       0       0     0.0       1      22
323           BA  0.6484
324           PB     5.7
325           IN       6  1JAN94       0
              * typeII-24hour
326           PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
327           PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
328           PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
329           PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
330           PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
331           PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
332           PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
333           PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
334           PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
335           PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
336           PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
337           PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
338           PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
339           PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
340           PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
341           PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
342           PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
343           PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
344           PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
345           PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
346           PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
347           PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
348           PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
349           PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
350           PC     1.0
351           LS     0.0   71.35     0.0
352           UD     0.0
```

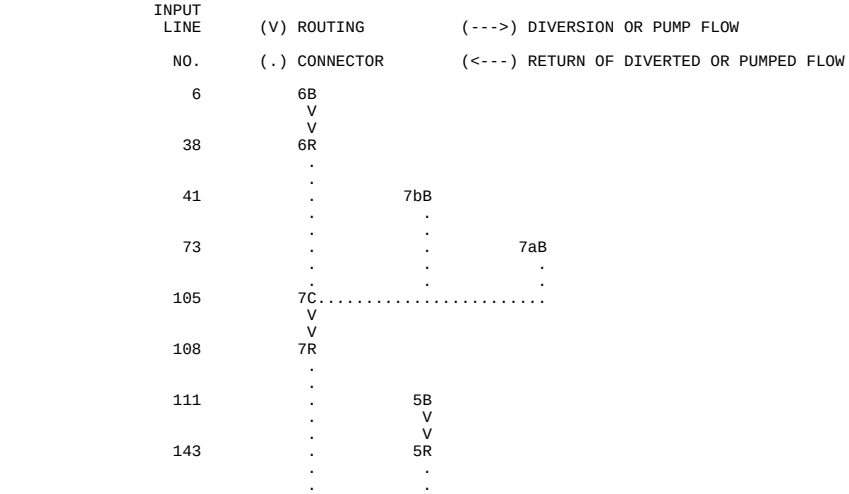


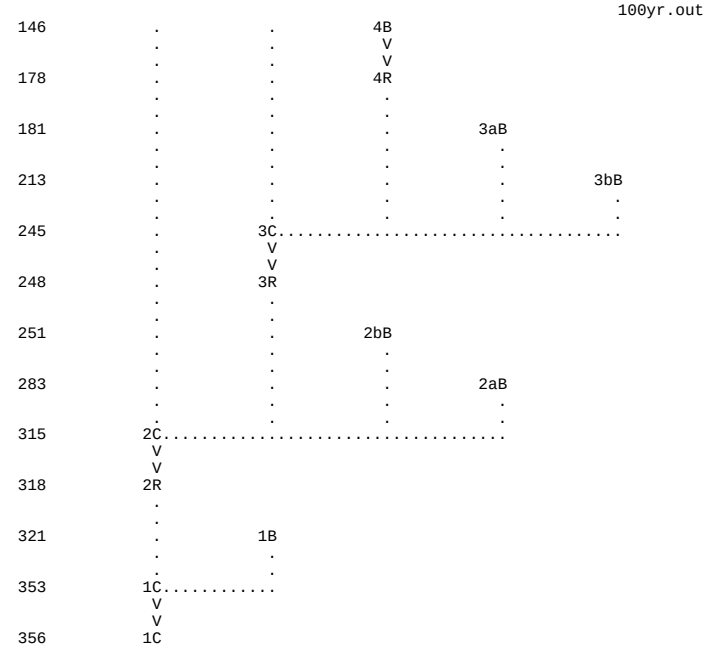
```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

353           KK      1C   CNAME      1C
354           KO       0       0     0.0       0      22
355           HC       2

356           KK      1C   CNAME      1C
357           KO       0       0     0.0       0      22
358           RN      1C
359           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*************************************                 *************************************
*                                   *                 *                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *             *    U.S. ARMY CORPS OF ENGINEERS     *
*              MAY   1991           *                 *    HYDROLOGIC ENGINEERING CENTER    *
*            VERSION 4.0.1E         *                 *          609 SECOND STREET          *
*                                   *                 *       DAVIS, CALIFORNIA 95616       *
*  RUN DATE           TIME          *                 *           (916) 551-1748            *
*                                   *                 *                                   *
*************************************                 *************************************
```

Scrabble Creek
wo Mining & wo Logging (Scenario 4), 10m DEM Data
100 yr Storm

```
  5 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                      NMIN         15  MINUTES IN COMPUTATION INTERVAL
                     IDATE     1JAN94  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     2JAN94  ENDING DATE
                    NDTIME       0045  ENDING TIME
                    ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                      TOTAL TIME BASE   24.75 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 KK    *        6B  *
          *            *
          **************

  7 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
```

```
                  IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                  ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                  ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                 TIMINT      0.250  TIME INTERVAL IN HOURS


 10 IN          TIME DATA FOR INPUT TIME SERIES
                   JXMIN          6  TIME INTERVAL IN MINUTES
                  JXDATE      1JAN94  STARTING DATE
                  JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

  8 BA          SUBBASIN CHARACTERISTICS
                   TAREA,       0.25  SUBBASIN AREA

              PRECIPITATION DATA

  9 PB               STORM       5.70  BASIN TOTAL PRECIPITATION

 11 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

 36 LS          SCS LOSS RATE
                   STRTL        0.84  INITIAL ABSTRACTION
                  CRVNBR       70.50  CURVE NUMBER
                   RTIMP        0.00  PERCENT IMPERVIOUS AREA

 37 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        0.21  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            6 END-OF-PERIOD ORDINATES
              307.      242.       69.       20.        6.        2.
```

****

HYDROGRAPH AT STATION 6B

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	139.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	82.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	57.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	45.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	37.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	33.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	29.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	26.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	24.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	23.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	22.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	21.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	20.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	18.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	17.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	16.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	16.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	15.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	15.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	14.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	14.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	14.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	13.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	13.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	12.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	12.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	11.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	11.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	11.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	10.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	10.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	9.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	9.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	9.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	9.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	9.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	9.
1 JAN 0915	38	0.05	0.05	0.00	0.	1 JAN 2145	88	0.02	0.00	0.01	9.
1 JAN 0930	39	0.05	0.04	0.00	1.	1 JAN 2200	89	0.02	0.00	0.01	9.
1 JAN 0945	40	0.05	0.05	0.00	1.	1 JAN 2215	90	0.02	0.00	0.01	9.
1 JAN 1000	41	0.05	0.05	0.00	2.	1 JAN 2230	91	0.02	0.00	0.01	8.
1 JAN 1015	42	0.06	0.06	0.01	3.	1 JAN 2245	92	0.02	0.00	0.01	8.
1 JAN 1030	43	0.07	0.06	0.01	5.	1 JAN 2300	93	0.02	0.00	0.01	8.

1 JAN 1045	44	0.08	0.07	0.01	7.	*	1 JAN 2315	94	0.02	0.00	0.01	8.
1 JAN 1100	45	0.10	0.08	0.02	9.	*	1 JAN 2330	95	0.02	0.00	0.01	8.
1 JAN 1115	46	0.12	0.09	0.03	14.	*	1 JAN 2345	96	0.02	0.00	0.01	8.
1 JAN 1130	47	0.15	0.11	0.04	21.	*	2 JAN 0000	97	0.02	0.00	0.01	8.
1 JAN 1145	48	0.62	0.39	0.23	83.	*	2 JAN 0015	98	0.00	0.00	0.00	4.
1 JAN 1200	49	1.54	0.68	0.86	324.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.24	0.08	0.16	276.	*	2 JAN 0045	100	0.00	0.00	0.00	0.
						*						

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)				
324.	12.00		57.	18.	17.	17.
		(INCHES)	2.123	2.614	2.614	2.614
		(AC-FT)	28.	35.	35.	35.

CUMULATIVE AREA = 0.25 SQ MI

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38 KK     **************
          *            *
          *        6R  *        CNAME      6C
          *            *
          **************
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39 KO — OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

40 RM — MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.04	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 6R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 6R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	146.	1 JAN 1845	76	12.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	91.	1 JAN 1900	77	11.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	57.	1 JAN 1915	78	11.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	47.	1 JAN 1930	79	11.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	37.	1 JAN 1945	80	10.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	34.	1 JAN 2000	81	10.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	29.	1 JAN 2015	82	9.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	27.	1 JAN 2030	83	9.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	24.	1 JAN 2045	84	9.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	23.	1 JAN 2100	85	9.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	22.	1 JAN 2115	86	9.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	21.	1 JAN 2130	87	9.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	20.	1 JAN 2145	88	9.
1 JAN 0315	14	0.	1 JAN 0930	39	1.	1 JAN 1545	64	19.	1 JAN 2200	89	9.
1 JAN 0330	15	0.	1 JAN 0945	40	1.	1 JAN 1600	65	17.	1 JAN 2215	90	9.
1 JAN 0345	16	0.	1 JAN 1000	41	2.	1 JAN 1615	66	16.	1 JAN 2230	91	9.
1 JAN 0400	17	0.	1 JAN 1015	42	3.	1 JAN 1630	67	16.	1 JAN 2245	92	8.
1 JAN 0415	18	0.	1 JAN 1030	43	4.	1 JAN 1645	68	15.	1 JAN 2300	93	8.
1 JAN 0430	19	0.	1 JAN 1045	44	6.	1 JAN 1700	69	15.	1 JAN 2315	94	8.
1 JAN 0445	20	0.	1 JAN 1100	45	9.	1 JAN 1715	70	14.	1 JAN 2330	95	8.
1 JAN 0500	21	0.	1 JAN 1115	46	13.	1 JAN 1730	71	14.	1 JAN 2345	96	8.
1 JAN 0515	22	0.	1 JAN 1130	47	19.	1 JAN 1745	72	14.	2 JAN 0000	97	8.
1 JAN 0530	23	0.	1 JAN 1145	48	69.	1 JAN 1800	73	13.	2 JAN 0015	98	5.
1 JAN 0545	24	0.	1 JAN 1200	49	275.	1 JAN 1815	74	13.	2 JAN 0030	99	1.
1 JAN 0600	25	0.	1 JAN 1215	50	318.	1 JAN 1830	75	12.	2 JAN 0045	100	0.

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)				
318.	12.25		57.	18.	17.	17.
		(INCHES)	2.123	2.613	2.613	2.613
		(AC-FT)	28.	35.	35.	35.

CUMULATIVE AREA = 0.25 SQ MI

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          **************
          *            *
 41 KK    *       7bB  *
          *            *
          **************
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 42 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

 45 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

 43 BA SUBBASIN CHARACTERISTICS

TAREA,	0.27	SUBBASIN AREA

PRECIPITATION DATA

 44 PB STORM 5.70 BASIN TOTAL PRECIPITATION

 46 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

 71 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

 72 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

512. 143. 28. 6. 0.

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HYDROGRAPH AT STATION 7bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	107.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	67.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	50.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	42.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	37.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	33.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	29.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	27.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	25.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	24.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	23.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	22.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	20.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	19.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	18.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	17.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	17.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	16.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	16.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	15.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	15.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	14.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	14.

1	JAN 0545	24	0.02	0.02	0.00	0.	*	1	JAN 1815	74	0.03	0.01	0.02	13.
1	JAN 0600	25	0.03	0.03	0.00	0.	*	1	JAN 1830	75	0.02	0.01	0.02	13.
1	JAN 0615	26	0.03	0.03	0.00	0.	*	1	JAN 1845	76	0.02	0.01	0.02	13.
1	JAN 0630	27	0.03	0.03	0.00	0.	*	1	JAN 1900	77	0.02	0.01	0.02	12.
1	JAN 0645	28	0.03	0.03	0.00	0.	*	1	JAN 1915	78	0.02	0.01	0.02	12.
1	JAN 0700	29	0.03	0.03	0.00	0.	*	1	JAN 1930	79	0.02	0.00	0.02	11.
1	JAN 0715	30	0.03	0.03	0.00	0.	*	1	JAN 1945	80	0.02	0.00	0.02	11.
1	JAN 0730	31	0.03	0.03	0.00	0.	*	1	JAN 2000	81	0.02	0.00	0.01	10.
1	JAN 0745	32	0.03	0.03	0.00	0.	*	1	JAN 2015	82	0.02	0.00	0.01	10.
1	JAN 0800	33	0.03	0.03	0.00	0.	*	1	JAN 2030	83	0.02	0.00	0.01	10.
1	JAN 0815	34	0.03	0.03	0.00	0.	*	1	JAN 2045	84	0.02	0.00	0.01	10.
1	JAN 0830	35	0.04	0.04	0.00	0.	*	1	JAN 2100	85	0.02	0.00	0.01	10.
1	JAN 0845	36	0.04	0.04	0.00	0.	*	1	JAN 2115	86	0.02	0.00	0.01	9.
1	JAN 0900	37	0.04	0.04	0.00	0.	*	1	JAN 2130	87	0.02	0.00	0.01	9.
1	JAN 0915	38	0.05	0.05	0.00	0.	*	1	JAN 2145	88	0.02	0.00	0.01	9.
1	JAN 0930	39	0.05	0.04	0.00	1.	*	1	JAN 2200	89	0.02	0.00	0.01	9.
1	JAN 0945	40	0.05	0.05	0.00	2.	*	1	JAN 2215	90	0.02	0.00	0.01	9.
1	JAN 1000	41	0.05	0.05	0.00	3.	*	1	JAN 2230	91	0.02	0.00	0.01	9.
1	JAN 1015	42	0.06	0.06	0.01	4.	*	1	JAN 2245	92	0.02	0.00	0.01	9.
1	JAN 1030	43	0.07	0.06	0.01	5.	*	1	JAN 2300	93	0.02	0.00	0.01	9.
1	JAN 1045	44	0.08	0.07	0.01	8.	*	1	JAN 2315	94	0.02	0.00	0.01	9.
1	JAN 1100	45	0.10	0.08	0.02	11.	*	1	JAN 2330	95	0.02	0.00	0.01	9.
1	JAN 1115	46	0.12	0.09	0.03	17.	*	1	JAN 2345	96	0.02	0.00	0.01	9.
1	JAN 1130	47	0.15	0.11	0.04	25.	*	2	JAN 0000	97	0.02	0.00	0.01	9.
1	JAN 1145	48	0.62	0.39	0.23	124.	*	2	JAN 0015	98	0.00	0.00	0.00	2.
1	JAN 1200	49	1.54	0.68	0.86	476.	*	2	JAN 0030	99	0.00	0.00	0.00	0.
1	JAN 1215	50	0.24	0.08	0.16	214.	*	2	JAN 0045	100	0.00	0.00	0.00	0.
							*							

****

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
476.	12.00	61.	19.	18.	18.
		(INCHES) 2.125	2.614	2.614	2.614
		(AC-FT) 30.	37.	37.	37.

CUMULATIVE AREA = 0.27 SQ MI

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            **************
            *            *
 73 KK      *       7aB  *
            *            *
            **************

 74 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


 77 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 75 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.56  SUBBASIN AREA

              PRECIPITATION DATA

 76 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

 78 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

103 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

104 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.00  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1071. 300. 59. 12. 0.

HYDROGRAPH AT STATION 7aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	224.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	139.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	105.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	89.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	78.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	69.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	61.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	56.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	52.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	50.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	48.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	45.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	42.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	40.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	37.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	35.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	35.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	34.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	33.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	32.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	31.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	30.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	29.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	28.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	27.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	26.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	25.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	24.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	23.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	22.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	21.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	21.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	20.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	20.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	20.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	20.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	20.
1 JAN 0915	38	0.05	0.05	0.00	1.	1 JAN 2145	88	0.02	0.00	0.01	20.
1 JAN 0930	39	0.05	0.04	0.00	2.	1 JAN 2200	89	0.02	0.00	0.01	19.
1 JAN 0945	40	0.05	0.05	0.00	3.	1 JAN 2215	90	0.02	0.00	0.01	19.
1 JAN 1000	41	0.05	0.05	0.00	5.	1 JAN 2230	91	0.02	0.00	0.01	19.
1 JAN 1015	42	0.06	0.06	0.01	8.	1 JAN 2245	92	0.02	0.00	0.01	19.
1 JAN 1030	43	0.07	0.06	0.01	11.	1 JAN 2300	93	0.02	0.00	0.01	19.
1 JAN 1045	44	0.08	0.07	0.01	17.	1 JAN 2315	94	0.02	0.00	0.01	18.
1 JAN 1100	45	0.10	0.08	0.02	23.	1 JAN 2330	95	0.02	0.00	0.01	18.
1 JAN 1115	46	0.12	0.09	0.03	35.	1 JAN 2345	96	0.02	0.00	0.01	18.
1 JAN 1130	47	0.15	0.11	0.04	53.	2 JAN 0000	97	0.02	0.00	0.01	18.
1 JAN 1145	48	0.62	0.39	0.23	260.	2 JAN 0015	98	0.00	0.00	0.00	5.
1 JAN 1200	49	1.54	0.68	0.86	996.	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.24	0.08	0.16	447.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 996.	12.00	128.	39.	38.	38.
		(INCHES) 2.125	2.614	2.614	2.614
		(AC-FT) 63.	78.	78.	78.

CUMULATIVE AREA = 0.56 SQ MI

*** ***

105 KK * 7C * CNAME 7R

106 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT

ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

107 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	477.	1 JAN 1845	76	51.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	297.	1 JAN 1900	77	48.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	213.	1 JAN 1915	78	47.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	178.	1 JAN 1930	79	45.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	152.	1 JAN 1945	80	44.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	135.	1 JAN 2000	81	41.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	120.	1 JAN 2015	82	40.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	109.	1 JAN 2030	83	39.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	102.	1 JAN 2045	84	39.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	97.	1 JAN 2100	85	39.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	92.	1 JAN 2115	86	38.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	88.	1 JAN 2130	87	38.
1 JAN 0300	13	0.	1 JAN 0915	38	1.	1 JAN 1530	63	82.	1 JAN 2145	88	38.
1 JAN 0315	14	0.	1 JAN 0930	39	3.	1 JAN 1545	64	78.	1 JAN 2200	89	37.
1 JAN 0330	15	0.	1 JAN 0945	40	6.	1 JAN 1600	65	73.	1 JAN 2215	90	37.
1 JAN 0345	16	0.	1 JAN 1000	41	10.	1 JAN 1615	66	69.	1 JAN 2230	91	36.
1 JAN 0400	17	0.	1 JAN 1015	42	15.	1 JAN 1630	67	67.	1 JAN 2245	92	36.
1 JAN 0415	18	0.	1 JAN 1030	43	21.	1 JAN 1645	68	65.	1 JAN 2300	93	37.
1 JAN 0430	19	0.	1 JAN 1045	44	31.	1 JAN 1700	69	63.	1 JAN 2315	94	35.
1 JAN 0445	20	0.	1 JAN 1100	45	43.	1 JAN 1715	70	61.	1 JAN 2330	95	35.
1 JAN 0500	21	0.	1 JAN 1115	46	64.	1 JAN 1730	71	60.	1 JAN 2345	96	35.
1 JAN 0515	22	0.	1 JAN 1130	47	98.	1 JAN 1745	72	58.	2 JAN 0000	97	35.
1 JAN 0530	23	0.	1 JAN 1145	48	453.	1 JAN 1800	73	56.	2 JAN 0015	98	12.
1 JAN 0545	24	0.	1 JAN 1200	49	1748.	1 JAN 1815	74	54.	2 JAN 0030	99	3.
1 JAN 0600	25	0.	1 JAN 1215	50	979.	1 JAN 1830	75	53.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
1748.	12.00	246.	76.	73.	73.
		(INCHES) 2.125	2.614	2.614	2.614
		(AC-FT) 122.	150.	150.	150.

CUMULATIVE AREA = 1.08 SQ MI

*** ***

108 KK
****
* *
* 7R *
* *
****
CNAME 7C

109 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

110 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.09	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 7R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 7R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW

1	JAN	0000	1	0.	*	1	JAN	0615	26	0.	*	1	JAN	1230	51	560.	*	1	JAN	1845	76	51.
1	JAN	0015	2	0.	*	1	JAN	0630	27	0.	*	1	JAN	1245	52	354.	*	1	JAN	1900	77	49.
1	JAN	0030	3	0.	*	1	JAN	0645	28	0.	*	1	JAN	1300	53	234.	*	1	JAN	1915	78	48.
1	JAN	0045	4	0.	*	1	JAN	0700	29	0.	*	1	JAN	1315	54	187.	*	1	JAN	1930	79	46.
1	JAN	0100	5	0.	*	1	JAN	0715	30	0.	*	1	JAN	1330	55	161.	*	1	JAN	1945	80	44.
1	JAN	0115	6	0.	*	1	JAN	0730	31	0.	*	1	JAN	1345	56	140.	*	1	JAN	2000	81	42.
1	JAN	0130	7	0.	*	1	JAN	0745	32	0.	*	1	JAN	1400	57	125.	*	1	JAN	2015	82	40.
1	JAN	0145	8	0.	*	1	JAN	0800	33	0.	*	1	JAN	1415	58	112.	*	1	JAN	2030	83	39.
1	JAN	0200	9	0.	*	1	JAN	0815	34	0.	*	1	JAN	1430	59	104.	*	1	JAN	2045	84	39.
1	JAN	0215	10	0.	*	1	JAN	0830	35	0.	*	1	JAN	1445	60	99.	*	1	JAN	2100	85	39.
1	JAN	0230	11	0.	*	1	JAN	0845	36	0.	*	1	JAN	1500	61	94.	*	1	JAN	2115	86	39.
1	JAN	0245	12	0.	*	1	JAN	0900	37	0.	*	1	JAN	1515	62	89.	*	1	JAN	2130	87	38.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1.	*	1	JAN	1530	63	84.	*	1	JAN	2145	88	38.
1	JAN	0315	14	0.	*	1	JAN	0930	39	2.	*	1	JAN	1545	64	79.	*	1	JAN	2200	89	38.
1	JAN	0330	15	0.	*	1	JAN	0945	40	5.	*	1	JAN	1600	65	75.	*	1	JAN	2215	90	37.
1	JAN	0345	16	0.	*	1	JAN	1000	41	8.	*	1	JAN	1615	66	70.	*	1	JAN	2230	91	37.
1	JAN	0400	17	0.	*	1	JAN	1015	42	13.	*	1	JAN	1630	67	67.	*	1	JAN	2245	92	36.
1	JAN	0415	18	0.	*	1	JAN	1030	43	19.	*	1	JAN	1645	68	66.	*	1	JAN	2300	93	36.
1	JAN	0430	19	0.	*	1	JAN	1045	44	27.	*	1	JAN	1700	69	64.	*	1	JAN	2315	94	36.
1	JAN	0445	20	0.	*	1	JAN	1100	45	39.	*	1	JAN	1715	70	62.	*	1	JAN	2330	95	35.
1	JAN	0500	21	0.	*	1	JAN	1115	46	56.	*	1	JAN	1730	71	60.	*	1	JAN	2345	96	35.
1	JAN	0515	22	0.	*	1	JAN	1130	47	85.	*	1	JAN	1745	72	59.	*	2	JAN	0000	97	35.
1	JAN	0530	23	0.	*	1	JAN	1145	48	298.	*	1	JAN	1800	73	57.	*	2	JAN	0015	98	22.
1	JAN	0545	24	0.	*	1	JAN	1200	49	1213.	*	1	JAN	1815	74	55.	*	2	JAN	0030	99	4.
1	JAN	0600	25	0.	*	1	JAN	1215	50	1474.	*	1	JAN	1830	75	53.	*	2	JAN	0045	100	1.
					*						*						*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1474.	12.25		246.	76.	73.	73.
		(INCHES)	2.124	2.614	2.614	2.614
		(AC-FT)	122.	150.	150.	150.

CUMULATIVE AREA = 1.08 SQ MI

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          **************
          *            *
111 KK    *        5B  *
          *            *
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112 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

115 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

113 BA SUBBASIN CHARACTERISTICS

TAREA,	0.64	SUBBASIN AREA

PRECIPITATION DATA

114 PB

STORM	5.70	BASIN TOTAL PRECIPITATION

116 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

141 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

142 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.24	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

674. 669. 214. 70. 23. 8. 1.

HYDROGRAPH AT STATION 5B

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	388.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	231.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	156.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	120.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	99.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	86.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	76.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	68.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	63.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	60.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	57.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	54.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	51.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	48.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	45.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	42.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	41.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	39.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	38.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	37.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	36.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	35.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	34.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	33.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	32.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	31.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	29.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	29.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	28.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	26.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	25.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	24.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	24.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	23.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	23.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	23.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	23.
1 JAN 0915	38	0.05	0.05	0.00	0.	1 JAN 2145	88	0.02	0.00	0.01	23.
1 JAN 0930	39	0.05	0.04	0.00	1.	1 JAN 2200	89	0.02	0.00	0.01	22.
1 JAN 0945	40	0.05	0.05	0.00	3.	1 JAN 2215	90	0.02	0.00	0.01	22.
1 JAN 1000	41	0.05	0.05	0.00	5.	1 JAN 2230	91	0.02	0.00	0.01	22.
1 JAN 1015	42	0.06	0.06	0.01	8.	1 JAN 2245	92	0.02	0.00	0.01	22.
1 JAN 1030	43	0.07	0.06	0.01	11.	1 JAN 2300	93	0.02	0.00	0.01	22.
1 JAN 1045	44	0.08	0.07	0.01	16.	1 JAN 2315	94	0.02	0.00	0.01	21.
1 JAN 1100	45	0.10	0.08	0.02	23.	1 JAN 2330	95	0.02	0.00	0.01	21.
1 JAN 1115	46	0.12	0.09	0.03	33.	1 JAN 2345	96	0.02	0.00	0.01	21.
1 JAN 1130	47	0.15	0.11	0.04	50.	2 JAN 0000	97	0.02	0.00	0.01	21.
1 JAN 1145	48	0.62	0.39	0.23	190.	2 JAN 0015	98	0.00	0.00	0.00	12.
1 JAN 1200	49	1.54	0.68	0.86	747.	2 JAN 0030	99	0.00	0.00	0.00	4.
1 JAN 1215	50	0.24	0.08	0.16	740.	2 JAN 0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
747.	12.00	147.	45.	44.	44.
		(INCHES) 2.123	2.613	2.613	2.613
		(AC-FT) 73.	90.	90.	90.

CUMULATIVE AREA = 0.64 SQ MI

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          **************
          *            *
143 KK    *        5R  *        CNAME      5C
          *            *
          **************
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144 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS
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HYDROGRAPH ROUTING DATA

145 RM MUSKINGUM ROUTING
NSTPS 1 NUMBER OF SUBREACHES
AMSKK 0.10 MUSKINGUM K
X 0.20 MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 5R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

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HYDROGRAPH AT STATION 5R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	545.	1 JAN 1845	76	31.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	272.	1 JAN 1900	77	30.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	183.	1 JAN 1915	78	29.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	132.	1 JAN 1930	79	28.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	107.	1 JAN 1945	80	27.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	90.	1 JAN 2000	81	26.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	79.	1 JAN 2015	82	25.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	71.	1 JAN 2030	83	24.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	65.	1 JAN 2045	84	23.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	61.	1 JAN 2100	85	23.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	58.	1 JAN 2115	86	23.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	55.	1 JAN 2130	87	23.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	52.	1 JAN 2145	88	23.
1 JAN 0315	14	0.	1 JAN 0930	39	1.	1 JAN 1545	64	49.	1 JAN 2200	89	23.
1 JAN 0330	15	0.	1 JAN 0945	40	2.	1 JAN 1600	65	46.	1 JAN 2215	90	22.
1 JAN 0345	16	0.	1 JAN 1000	41	4.	1 JAN 1615	66	43.	1 JAN 2230	91	22.
1 JAN 0400	17	0.	1 JAN 1015	42	6.	1 JAN 1630	67	41.	1 JAN 2245	92	22.
1 JAN 0415	18	0.	1 JAN 1030	43	10.	1 JAN 1645	68	40.	1 JAN 2300	93	22.
1 JAN 0430	19	0.	1 JAN 1045	44	14.	1 JAN 1700	69	39.	1 JAN 2315	94	22.
1 JAN 0445	20	0.	1 JAN 1100	45	20.	1 JAN 1715	70	38.	1 JAN 2330	95	21.
1 JAN 0500	21	0.	1 JAN 1115	46	29.	1 JAN 1730	71	36.	1 JAN 2345	96	21.
1 JAN 0515	22	0.	1 JAN 1130	47	43.	1 JAN 1745	72	35.	2 JAN 0000	97	21.
1 JAN 0530	23	0.	1 JAN 1145	48	124.	1 JAN 1800	73	34.	2 JAN 0015	98	16.
1 JAN 0545	24	0.	1 JAN 1200	49	491.	1 JAN 1815	74	33.	2 JAN 0030	99	7.
1 JAN 0600	25	0.	1 JAN 1215	50	800.	1 JAN 1830	75	32.	2 JAN 0045	100	2.

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 800.	12.25		147.	45.	44.	44.
		(INCHES)	2.122	2.613	2.613	2.613
		(AC-FT)	73.	90.	90.	90.

CUMULATIVE AREA = 0.64 SQ MI

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* *
146 KK * 4B *
* *
****

147 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
IPNCH 1 PUNCH COMPUTED HYDROGRAPH
IOUT 22 SAVE HYDROGRAPH ON THIS UNIT
ISAV1 1 FIRST ORDINATE PUNCHED OR SAVED
ISAV2 100 LAST ORDINATE PUNCHED OR SAVED
TIMINT 0.250 TIME INTERVAL IN HOURS

150 IN TIME DATA FOR INPUT TIME SERIES
JXMIN 6 TIME INTERVAL IN MINUTES
JXDATE 1JAN94 STARTING DATE
JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

148 BA SUBBASIN CHARACTERISTICS
TAREA, 0.41 SUBBASIN AREA

PRECIPITATION DATA

149 PB STORM 5.70 BASIN TOTAL PRECIPITATION

151 PI INCREMENTAL 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	0.01	0.01

0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

176 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

177 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.26	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

366. 438. 159. 57. 20. 7. 3.

HYDROGRAPH AT STATION 4B

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	265.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	159.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	106.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	80.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	65.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	55.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	49.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	44.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	40.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	38.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	36.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	34.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	32.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	30.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	29.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	27.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	26.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	25.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	24.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	24.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	23.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	22.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	22.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	21.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	20.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	20.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	19.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	18.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	18.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	17.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	16.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	15.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	15.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	15.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	15.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	15.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	14.
1 JAN 0915	38	0.05	0.05	0.00	0.	1 JAN 2145	88	0.02	0.00	0.01	14.
1 JAN 0930	39	0.05	0.04	0.00	1.	1 JAN 2200	89	0.02	0.00	0.01	14.
1 JAN 0945	40	0.05	0.05	0.00	2.	1 JAN 2215	90	0.02	0.00	0.01	14.
1 JAN 1000	41	0.05	0.05	0.00	3.	1 JAN 2230	91	0.02	0.00	0.01	14.
1 JAN 1015	42	0.06	0.06	0.01	5.	1 JAN 2245	92	0.02	0.00	0.01	14.
1 JAN 1030	43	0.07	0.06	0.01	7.	1 JAN 2300	93	0.02	0.00	0.01	14.
1 JAN 1045	44	0.08	0.07	0.01	10.	1 JAN 2315	94	0.02	0.00	0.01	14.
1 JAN 1100	45	0.10	0.08	0.02	14.	1 JAN 2330	95	0.02	0.00	0.01	13.
1 JAN 1115	46	0.12	0.09	0.03	20.	1 JAN 2345	96	0.02	0.00	0.01	13.
1 JAN 1130	47	0.15	0.11	0.04	30.	2 JAN 0000	97	0.02	0.00	0.01	13.
1 JAN 1145	48	0.62	0.39	0.23	108.	2 JAN 0015	98	0.00	0.00	0.00	9.
1 JAN 1200	49	1.54	0.68	0.86	425.	2 JAN 0030	99	0.00	0.00	0.00	3.
1 JAN 1215	50	0.24	0.08	0.16	477.	2 JAN 0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
477.	12.25	93.	29.	28.	28.
		(INCHES) 2.122	2.613	2.613	2.613
		(AC-FT) 46.	57.	57.	57.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
178 KK    *        4R  *        CNAME      4C
          *            *
          **************

179 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

180 RM          MUSKINGUM ROUTING
                     NSTPS         1 NUMBER OF SUBREACHES
                     AMSKK      0.09 MUSKINGUM K
                         X      0.20 MUSKINGUM X
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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

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HYDROGRAPH AT STATION 4R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	359.	1 JAN 1845	76	20.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	183.	1 JAN 1900	77	19.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	124.	1 JAN 1915	78	18.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	87.	1 JAN 1930	79	18.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	70.	1 JAN 1945	80	17.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	59.	1 JAN 2000	81	16.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	51.	1 JAN 2015	82	16.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	46.	1 JAN 2030	83	15.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	41.	1 JAN 2045	84	15.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	39.	1 JAN 2100	85	15.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	37.	1 JAN 2115	86	15.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	35.	1 JAN 2130	87	14.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	33.	1 JAN 2145	88	14.
1 JAN 0315	14	0.	1 JAN 0930	39	1.	1 JAN 1545	64	31.	1 JAN 2200	89	14.
1 JAN 0330	15	0.	1 JAN 0945	40	1.	1 JAN 1600	65	29.	1 JAN 2215	90	14.
1 JAN 0345	16	0.	1 JAN 1000	41	2.	1 JAN 1615	66	28.	1 JAN 2230	91	14.
1 JAN 0400	17	0.	1 JAN 1015	42	4.	1 JAN 1630	67	26.	1 JAN 2245	92	14.
1 JAN 0415	18	0.	1 JAN 1030	43	6.	1 JAN 1645	68	25.	1 JAN 2300	93	14.
1 JAN 0430	19	0.	1 JAN 1045	44	9.	1 JAN 1700	69	25.	1 JAN 2315	94	14.
1 JAN 0445	20	0.	1 JAN 1100	45	12.	1 JAN 1715	70	24.	1 JAN 2330	95	13.
1 JAN 0500	21	0.	1 JAN 1115	46	18.	1 JAN 1730	71	23.	1 JAN 2345	96	13.
1 JAN 0515	22	0.	1 JAN 1130	47	26.	1 JAN 1745	72	22.	2 JAN 0000	97	13.
1 JAN 0530	23	0.	1 JAN 1145	48	73.	1 JAN 1800	73	22.	2 JAN 0015	98	11.
1 JAN 0545	24	0.	1 JAN 1200	49	288.	1 JAN 1815	74	21.	2 JAN 0030	99	5.
1 JAN 0600	25	0.	1 JAN 1215	50	489.	1 JAN 1830	75	20.	2 JAN 0045	100	1.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
489.	12.25	93.	29.	28.	28.
		(INCHES) 2.121	2.612	2.612	2.612
		(AC-FT) 46.	57.	57.	57.

CUMULATIVE AREA = 0.41 SQ MI

*** ***

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          **************
          *            *
181 KK    *       3aB  *
          *            *
          **************

182 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS
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 185 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 183 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.41  SUBBASIN AREA

                 PRECIPITATION DATA

 184 PB                STORM        5.70  BASIN TOTAL PRECIPITATION

 186 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

 211 LS          SCS LOSS RATE
                      STRTL        0.83  INITIAL ABSTRACTION
                     CRVNBR       70.59  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

 212 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.27  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
               360.      448.      168.       61.       22.        8.        3.
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HYDROGRAPH AT STATION 3aB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	275.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	166.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	110.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	83.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	67.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	57.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	50.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	45.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	41.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	39.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	37.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	35.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	33.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	31.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	29.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	28.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	26.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	26.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	25.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	24.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	23.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	23.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	22.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	21.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	21.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	20.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	19.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	19.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	18.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	17.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	16.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	16.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	15.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	15.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	15.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	15.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	15.
1 JAN 0915	38	0.05	0.05	0.00	0.	1 JAN 2145	88	0.02	0.00	0.01	15.
1 JAN 0930	39	0.05	0.04	0.00	1.	1 JAN 2200	89	0.02	0.00	0.01	15.
1 JAN 0945	40	0.05	0.05	0.00	2.	1 JAN 2215	90	0.02	0.00	0.01	14.
1 JAN 1000	41	0.05	0.05	0.00	3.	1 JAN 2230	91	0.02	0.00	0.01	14.
1 JAN 1015	42	0.06	0.06	0.01	5.	1 JAN 2245	92	0.02	0.00	0.01	14.
1 JAN 1030	43	0.07	0.06	0.01	7.	1 JAN 2300	93	0.02	0.00	0.01	14.
1 JAN 1045	44	0.08	0.07	0.01	10.	1 JAN 2315	94	0.02	0.00	0.01	14.
1 JAN 1100	45	0.10	0.08	0.02	14.	1 JAN 2330	95	0.02	0.00	0.01	14.
1 JAN 1115	46	0.12	0.09	0.03	21.	1 JAN 2345	96	0.02	0.00	0.01	14.
1 JAN 1130	47	0.15	0.11	0.04	31.	2 JAN 0000	97	0.02	0.00	0.01	13.

1	JAN	1145	48	0.62	0.39	0.23	108.	*	2	JAN	0015	98	0.00	0.00	0.00	9.
1	JAN	1200	49	1.54	0.68	0.87	424.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.24	0.08	0.16	488.	*	2	JAN	0045	100	0.00	0.00	0.00	1.

*

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.62

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR (CFS)	24-HR	72-HR	24.75-HR
488.	12.25	95.	29.	28.	28.
	(INCHES)	2.128	2.621	2.621	2.621
	(AC-FT)	47.	58.	58.	58.

CUMULATIVE AREA = 0.41 SQ MI

*** ***

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          **************
          *            *
213 KK    *       3bB  *
          *            *
          **************
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214 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

217 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

215 BA SUBBASIN CHARACTERISTICS

TAREA,	0.44	SUBBASIN AREA

PRECIPITATION DATA

216 PB

STORM	5.70	BASIN TOTAL PRECIPITATION

218 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

243 LS SCS LOSS RATE

STRTL	0.83	INITIAL ABSTRACTION
CRVNBR	70.62	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

244 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.26	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

394.	471.	171.	61.	21.	8.	3.

HYDROGRAPH AT STATION 3bB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	286.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	172.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	114.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	86.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	71.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	60.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	53.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	47.

| | | |

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	265.	1	JAN	2000	81	76.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	233.	1	JAN	2015	82	73.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	208.	1	JAN	2030	83	71.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	191.	1	JAN	2045	84	69.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	179.	1	JAN	2100	85	69.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	170.	1	JAN	2115	86	69.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	161.	1	JAN	2130	87	67.
1	JAN	0300	13	0.	1	JAN	0915	38	1.	1	JAN	1530	63	153.	1	JAN	2145	88	67.
1	JAN	0315	14	0.	1	JAN	0930	39	3.	1	JAN	1545	64	144.	1	JAN	2200	89	67.
1	JAN	0330	15	0.	1	JAN	0945	40	7.	1	JAN	1600	65	136.	1	JAN	2215	90	66.
1	JAN	0345	16	0.	1	JAN	1000	41	13.	1	JAN	1615	66	127.	1	JAN	2230	91	65.
1	JAN	0400	17	0.	1	JAN	1015	42	20.	1	JAN	1630	67	121.	1	JAN	2245	92	64.
1	JAN	0415	18	0.	1	JAN	1030	43	30.	1	JAN	1645	68	117.	1	JAN	2300	93	64.
1	JAN	0430	19	0.	1	JAN	1045	44	43.	1	JAN	1700	69	114.	1	JAN	2315	94	64.
1	JAN	0445	20	0.	1	JAN	1100	45	62.	1	JAN	1715	70	111.	1	JAN	2330	95	62.
1	JAN	0500	21	0.	1	JAN	1115	46	89.	1	JAN	1730	71	107.	1	JAN	2345	96	62.
1	JAN	0515	22	0.	1	JAN	1130	47	134.	1	JAN	1745	72	105.	2	JAN	0000	97	62.
1	JAN	0530	23	0.	1	JAN	1145	48	421.	1	JAN	1800	73	101.	2	JAN	0015	98	45.
1	JAN	0545	24	0.	1	JAN	1200	49	1663.	1	JAN	1815	74	98.	2	JAN	0030	99	19.
1	JAN	0600	25	0.	1	JAN	1215	50	2294.	1	JAN	1830	75	95.	2	JAN	0045	100	6.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
2294.	12.25	434.	134.	130.	130.
		(INCHES) 2.125	2.617	2.617	2.617
		(AC-FT) 215.	265.	265.	265.

CUMULATIVE AREA = 1.90 SQ MI

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 248 KK          3R          CNAME      3C

 249 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

 250 RM          MUSKINGUM ROUTING
                      NSTPS         1 NUMBER OF SUBREACHES
                      AMSKK      0.04 MUSKINGUM K
                          X      0.20 MUSKINGUM X

                                                          ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      3R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 3R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	1680.	1	JAN	1845	76	93.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	841.	1	JAN	1900	77	89.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	571.	1	JAN	1915	78	86.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	403.	1	JAN	1930	79	83.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	325.	1	JAN	1945	80	80.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	272.	1	JAN	2000	81	76.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	237.	1	JAN	2015	82	73.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	212.	1	JAN	2030	83	71.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	193.	1	JAN	2045	84	70.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	181.	1	JAN	2100	85	69.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	172.	1	JAN	2115	86	69.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	163.	1	JAN	2130	87	67.
1	JAN	0300	13	0.	1	JAN	0915	38	1.	1	JAN	1530	63	154.	1	JAN	2145	88	67.
1	JAN	0315	14	0.	1	JAN	0930	39	3.	1	JAN	1545	64	145.	1	JAN	2200	89	67.
1	JAN	0330	15	0.	1	JAN	0945	40	6.	1	JAN	1600	65	137.	1	JAN	2215	90	66.
1	JAN	0345	16	0.	1	JAN	1000	41	12.	1	JAN	1615	66	129.	1	JAN	2230	91	65.
1	JAN	0400	17	0.	1	JAN	1015	42	19.	1	JAN	1630	67	122.	1	JAN	2245	92	64.
1	JAN	0415	18	0.	1	JAN	1030	43	28.	1	JAN	1645	68	118.	1	JAN	2300	93	64.
1	JAN	0430	19	0.	1	JAN	1045	44	41.	1	JAN	1700	69	115.	1	JAN	2315	94	64.
1	JAN	0445	20	0.	1	JAN	1100	45	58.	1	JAN	1715	70	111.	1	JAN	2330	95	63.
1	JAN	0500	21	0.	1	JAN	1115	46	84.	1	JAN	1730	71	108.	1	JAN	2345	96	62.
1	JAN	0515	22	0.	1	JAN	1130	47	125.	1	JAN	1745	72	105.	2	JAN	0000	97	62.
1	JAN	0530	23	0.	1	JAN	1145	48	351.	1	JAN	1800	73	102.	2	JAN	0015	98	49.
1	JAN	0545	24	0.	1	JAN	1200	49	1381.	1	JAN	1815	74	99.	2	JAN	0030	99	23.

```
    1 JAN 0600   25        0.   *    1 JAN 1215   50     2295.   *    1 JAN 1830   75       95.   *    2 JAN 0045  100        6.
                                 *                                 *                               *
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  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+    2295.     12.25                434.        134.        130.         130.
                  (INCHES)         2.125       2.617       2.617        2.617
                   (AC-FT)           215.        265.        265.         265.

                   CUMULATIVE AREA =    1.90 SQ MI
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*** ***

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            **************
            *            *
  251 KK    *       2bB  *
            *            *
            **************

  252 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


  255 IN          TIME DATA FOR INPUT TIME SERIES
                        JXMIN           6  TIME INTERVAL IN MINUTES
                       JXDATE      1JAN94  STARTING DATE
                       JXTIME           0  STARTING TIME

                SUBBASIN RUNOFF DATA

  253 BA          SUBBASIN CHARACTERISTICS
                       TAREA,        0.12  SUBBASIN AREA

                PRECIPITATION DATA

  254 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

  256 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

  281 LS          SCS LOSS RATE
                       STRTL        0.79  INITIAL ABSTRACTION
                      CRVNBR       71.67  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  282 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.00  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

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                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
               226.       63.       12.        2.        0.
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HYDROGRAPH AT STATION 2bB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.12	49.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	30.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	23.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	19.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	17.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	15.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.01	0.04	13.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	12.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	11.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.04	11.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	10.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	10.

1 JAN 0300	13	0.02	0.02	0.00	0.	*	1 JAN 1530	63	0.04	0.01	0.03	9.
1 JAN 0315	14	0.02	0.02	0.00	0.	*	1 JAN 1545	64	0.04	0.01	0.03	9.
1 JAN 0330	15	0.02	0.02	0.00	0.	*	1 JAN 1600	65	0.03	0.01	0.03	8.
1 JAN 0345	16	0.02	0.02	0.00	0.	*	1 JAN 1615	66	0.03	0.01	0.02	8.
1 JAN 0400	17	0.02	0.02	0.00	0.	*	1 JAN 1630	67	0.03	0.01	0.02	7.
1 JAN 0415	18	0.02	0.02	0.00	0.	*	1 JAN 1645	68	0.03	0.01	0.02	7.
1 JAN 0430	19	0.02	0.02	0.00	0.	*	1 JAN 1700	69	0.03	0.01	0.02	7.
1 JAN 0445	20	0.02	0.02	0.00	0.	*	1 JAN 1715	70	0.03	0.01	0.02	7.
1 JAN 0500	21	0.02	0.02	0.00	0.	*	1 JAN 1730	71	0.03	0.01	0.02	7.
1 JAN 0515	22	0.02	0.02	0.00	0.	*	1 JAN 1745	72	0.03	0.01	0.02	6.
1 JAN 0530	23	0.02	0.02	0.00	0.	*	1 JAN 1800	73	0.03	0.01	0.02	6.
1 JAN 0545	24	0.02	0.02	0.00	0.	*	1 JAN 1815	74	0.03	0.01	0.02	6.
1 JAN 0600	25	0.03	0.03	0.00	0.	*	1 JAN 1830	75	0.02	0.01	0.02	6.
1 JAN 0615	26	0.03	0.03	0.00	0.	*	1 JAN 1845	76	0.02	0.01	0.02	6.
1 JAN 0630	27	0.03	0.03	0.00	0.	*	1 JAN 1900	77	0.02	0.00	0.02	5.
1 JAN 0645	28	0.03	0.03	0.00	0.	*	1 JAN 1915	78	0.02	0.00	0.02	5.
1 JAN 0700	29	0.03	0.03	0.00	0.	*	1 JAN 1930	79	0.02	0.00	0.02	5.
1 JAN 0715	30	0.03	0.03	0.00	0.	*	1 JAN 1945	80	0.02	0.00	0.02	5.
1 JAN 0730	31	0.03	0.03	0.00	0.	*	1 JAN 2000	81	0.02	0.00	0.01	5.
1 JAN 0745	32	0.03	0.03	0.00	0.	*	1 JAN 2015	82	0.02	0.00	0.01	4.
1 JAN 0800	33	0.03	0.03	0.00	0.	*	1 JAN 2030	83	0.02	0.00	0.01	4.
1 JAN 0815	34	0.03	0.03	0.00	0.	*	1 JAN 2045	84	0.02	0.00	0.01	4.
1 JAN 0830	35	0.04	0.04	0.00	0.	*	1 JAN 2100	85	0.02	0.00	0.01	4.
1 JAN 0845	36	0.04	0.04	0.00	0.	*	1 JAN 2115	86	0.02	0.00	0.01	4.
1 JAN 0900	37	0.04	0.04	0.00	0.	*	1 JAN 2130	87	0.02	0.00	0.01	4.
1 JAN 0915	38	0.05	0.04	0.00	0.	*	1 JAN 2145	88	0.02	0.00	0.01	4.
1 JAN 0930	39	0.05	0.04	0.00	1.	*	1 JAN 2200	89	0.02	0.00	0.01	4.
1 JAN 0945	40	0.05	0.04	0.00	1.	*	1 JAN 2215	90	0.02	0.00	0.01	4.
1 JAN 1000	41	0.05	0.05	0.01	1.	*	1 JAN 2230	91	0.02	0.00	0.01	4.
1 JAN 1015	42	0.06	0.05	0.01	2.	*	1 JAN 2245	92	0.02	0.00	0.01	4.
1 JAN 1030	43	0.07	0.06	0.01	3.	*	1 JAN 2300	93	0.02	0.00	0.01	4.
1 JAN 1045	44	0.08	0.07	0.01	4.	*	1 JAN 2315	94	0.02	0.00	0.01	4.
1 JAN 1100	45	0.10	0.07	0.02	6.	*	1 JAN 2330	95	0.02	0.00	0.01	4.
1 JAN 1115	46	0.12	0.09	0.03	8.	*	1 JAN 2345	96	0.02	0.00	0.01	4.
1 JAN 1130	47	0.15	0.11	0.04	12.	*	2 JAN 0000	97	0.02	0.00	0.01	4.
1 JAN 1145	48	0.62	0.38	0.25	59.	*	2 JAN 0015	98	0.00	0.00	0.00	1.
1 JAN 1200	49	1.54	0.64	0.90	219.	*	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.24	0.08	0.17	98.	*	2 JAN 0045	100	0.00	0.00	0.00	0.
						*						

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TOTAL RAINFALL = 5.70, TOTAL LOSS = 2.98, TOTAL EXCESS = 2.72

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 219.	12.00		28.	9.	8.	8.
		(INCHES)	2.208	2.720	2.720	2.720
		(AC-FT)	14.	17.	17.	17.

CUMULATIVE AREA = 0.12 SQ MI

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          **************
          *            *
283 KK    *       2aB  *
          *            *
          **************

284 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


287 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

285 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.48  SUBBASIN AREA

                PRECIPITATION DATA

286 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

288 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
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0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00

313 LS SCS LOSS RATE
STRTL 0.83 INITIAL ABSTRACTION
CRVNBR 70.67 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

314 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.00 LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
921. 258. 51. 10. 0.

HYDROGRAPH AT STATION 2aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	194.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	120.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	91.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	76.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	67.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	59.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	53.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	48.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	45.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	43.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	41.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	39.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	37.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	35.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	32.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	31.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	30.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	29.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	28.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	27.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	27.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	26.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	25.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	24.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	24.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	23.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	22.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	21.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	20.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	19.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	18.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	18.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	17.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	18.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	18.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	17.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	17.
1 JAN 0915	38	0.05	0.04	0.00	1.	1 JAN 2145	88	0.02	0.00	0.01	17.
1 JAN 0930	39	0.05	0.04	0.00	2.	1 JAN 2200	89	0.02	0.00	0.01	17.
1 JAN 0945	40	0.05	0.05	0.00	3.	1 JAN 2215	90	0.02	0.00	0.01	17.
1 JAN 1000	41	0.05	0.05	0.00	5.	1 JAN 2230	91	0.02	0.00	0.01	16.
1 JAN 1015	42	0.06	0.06	0.01	7.	1 JAN 2245	92	0.02	0.00	0.01	16.
1 JAN 1030	43	0.07	0.06	0.01	10.	1 JAN 2300	93	0.02	0.00	0.01	16.
1 JAN 1045	44	0.08	0.07	0.01	15.	1 JAN 2315	94	0.02	0.00	0.01	16.
1 JAN 1100	45	0.10	0.08	0.02	21.	1 JAN 2330	95	0.02	0.00	0.01	16.
1 JAN 1115	46	0.12	0.09	0.03	31.	1 JAN 2345	96	0.02	0.00	0.01	16.
1 JAN 1130	47	0.15	0.11	0.04	46.	2 JAN 0000	97	0.02	0.00	0.01	15.
1 JAN 1145	48	0.62	0.39	0.23	226.	2 JAN 0015	98	0.00	0.00	0.00	4.
1 JAN 1200	49	1.54	0.67	0.87	862.	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.24	0.08	0.16	387.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.07, TOTAL EXCESS = 2.63

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 862.	12.00	110.	34.	33.	33.
		(INCHES) 2.137	2.629	2.629	2.629
		(AC-FT) 55.	67.	67.	67.

CUMULATIVE AREA = 0.48 SQ MI

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          *           *
315 KK    *       2C  *       CNAME      2R
          *           *
          *************

316 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


317 HC          HYDROGRAPH COMBINATION
                     ICOMP          4  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2483.	1 JAN 1845	76	172.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1346.	1 JAN 1900	77	165.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	919.	1 JAN 1915	78	160.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	686.	1 JAN 1930	79	154.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	571.	1 JAN 1945	80	148.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	487.	1 JAN 2000	81	142.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	429.	1 JAN 2015	82	136.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	385.	1 JAN 2030	83	132.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	354.	1 JAN 2045	84	130.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	334.	1 JAN 2100	85	131.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	317.	1 JAN 2115	86	129.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	301.	1 JAN 2130	87	126.
1 JAN 0300	13	0.	1 JAN 0915	38	2.	1 JAN 1530	63	284.	1 JAN 2145	88	126.
1 JAN 0315	14	0.	1 JAN 0930	39	7.	1 JAN 1545	64	268.	1 JAN 2200	89	125.
1 JAN 0330	15	0.	1 JAN 0945	40	15.	1 JAN 1600	65	252.	1 JAN 2215	90	124.
1 JAN 0345	16	0.	1 JAN 1000	41	26.	1 JAN 1615	66	237.	1 JAN 2230	91	122.
1 JAN 0400	17	0.	1 JAN 1015	42	41.	1 JAN 1630	67	227.	1 JAN 2245	92	121.
1 JAN 0415	18	0.	1 JAN 1030	43	60.	1 JAN 1645	68	220.	1 JAN 2300	93	121.
1 JAN 0430	19	0.	1 JAN 1045	44	86.	1 JAN 1700	69	214.	1 JAN 2315	94	119.
1 JAN 0445	20	0.	1 JAN 1100	45	123.	1 JAN 1715	70	207.	1 JAN 2330	95	117.
1 JAN 0500	21	0.	1 JAN 1115	46	179.	1 JAN 1730	71	201.	1 JAN 2345	96	117.
1 JAN 0515	22	0.	1 JAN 1130	47	269.	1 JAN 1745	72	196.	2 JAN 0000	97	116.
1 JAN 0530	23	0.	1 JAN 1145	48	934.	1 JAN 1800	73	190.	2 JAN 0015	98	76.
1 JAN 0545	24	0.	1 JAN 1200	49	3676.	1 JAN 1815	74	183.	2 JAN 0030	99	28.
1 JAN 0600	25	0.	1 JAN 1215	50	4254.	1 JAN 1830	75	178.	2 JAN 0045	100	8.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
4254.	12.25	818.	252.	244.	244.
		(INCHES) 2.128	2.621	2.621	2.621
		(AC-FT) 406.	500.	500.	500.

CUMULATIVE AREA = 3.57 SQ MI

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


          **************
          *            *
318 KK    *        2R  *       CNAME      2C
          *            *
          **************

319 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

320 RM          MUSKINGUM ROUTING
                     NSTPS          1 NUMBER OF SUBREACHES
                     AMSKK       0.13 MUSKINGUM K
                         X       0.20 MUSKINGUM X

                                                        ***
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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   2R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION   2R

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	3521.	1 JAN 1845	76	175.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1922.	1 JAN 1900	77	169.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1121.	1 JAN 1915	78	163.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	805.	1 JAN 1930	79	157.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	628.	1 JAN 1945	80	152.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	531.	1 JAN 2000	81	145.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	459.	1 JAN 2015	82	139.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	408.	1 JAN 2030	83	134.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	370.	1 JAN 2045	84	131.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	344.	1 JAN 2100	85	130.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	326.	1 JAN 2115	86	130.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	310.	1 JAN 2130	87	128.
1 JAN 0300	13	0.	1 JAN 0915	38	1.	1 JAN 1530	63	293.	1 JAN 2145	88	126.
1 JAN 0315	14	0.	1 JAN 0930	39	4.	1 JAN 1545	64	277.	1 JAN 2200	89	126.
1 JAN 0330	15	0.	1 JAN 0945	40	11.	1 JAN 1600	65	261.	1 JAN 2215	90	125.
1 JAN 0345	16	0.	1 JAN 1000	41	20.	1 JAN 1615	66	245.	1 JAN 2230	91	123.
1 JAN 0400	17	0.	1 JAN 1015	42	33.	1 JAN 1630	67	232.	1 JAN 2245	92	122.
1 JAN 0415	18	0.	1 JAN 1030	43	50.	1 JAN 1645	68	223.	1 JAN 2300	93	121.
1 JAN 0430	19	0.	1 JAN 1045	44	72.	1 JAN 1700	69	217.	1 JAN 2315	94	121.
1 JAN 0445	20	0.	1 JAN 1100	45	103.	1 JAN 1715	70	211.	1 JAN 2330	95	118.
1 JAN 0500	21	0.	1 JAN 1115	46	148.	1 JAN 1730	71	205.	1 JAN 2345	96	117.
1 JAN 0515	22	0.	1 JAN 1130	47	219.	1 JAN 1745	72	199.	2 JAN 0000	97	116.
1 JAN 0530	23	0.	1 JAN 1145	48	554.	1 JAN 1800	73	193.	2 JAN 0015	98	99.
1 JAN 0545	24	0.	1 JAN 1200	49	2123.	1 JAN 1815	74	187.	2 JAN 0030	99	54.
1 JAN 0600	25	0.	1 JAN 1215	50	4039.	1 JAN 1830	75	181.	2 JAN 0045	100	17.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
4039.	12.25	818.	252.	244.	244.
		(INCHES) 2.128	2.620	2.620	2.620
		(AC-FT) 406.	499.	499.	499.

CUMULATIVE AREA =   3.57 SQ MI

*** ***

```
          **************
          *            *
321 KK    *        1B  *
          *            *
          **************

322 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


325 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

323 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.65  SUBBASIN AREA

                PRECIPITATION DATA

324 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

326 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

351 LS          SCS LOSS RATE
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                    STRTL        0.80  INITIAL ABSTRACTION
                   CRVNBR       71.35  CURVE NUMBER
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

 352 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        0.00  LAG

                                                                ***

 WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
              1243.      348.       68.       14.        0.
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****

HYDROGRAPH AT STATION 1B

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.12	267.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	165.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	125.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	105.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	92.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	81.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.01	0.04	72.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	66.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	62.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	59.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	56.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	53.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	50.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	47.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	44.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	42.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	41.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	40.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	39.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	37.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	36.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	35.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	34.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	33.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	32.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	31.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.00	0.02	29.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.00	0.02	29.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	28.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	26.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	25.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	24.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	24.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	24.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	24.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	23.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	23.
1	JAN	0915	38	0.05	0.04	0.00	2.	1	JAN	2145	88	0.02	0.00	0.01	23.
1	JAN	0930	39	0.05	0.04	0.00	3.	1	JAN	2200	89	0.02	0.00	0.01	23.
1	JAN	0945	40	0.05	0.05	0.00	5.	1	JAN	2215	90	0.02	0.00	0.01	23.
1	JAN	1000	41	0.05	0.05	0.01	8.	1	JAN	2230	91	0.02	0.00	0.01	22.
1	JAN	1015	42	0.06	0.05	0.01	11.	1	JAN	2245	92	0.02	0.00	0.01	22.
1	JAN	1030	43	0.07	0.06	0.01	15.	1	JAN	2300	93	0.02	0.00	0.01	22.
1	JAN	1045	44	0.08	0.07	0.01	22.	1	JAN	2315	94	0.02	0.00	0.01	22.
1	JAN	1100	45	0.10	0.08	0.02	30.	1	JAN	2330	95	0.02	0.00	0.01	21.
1	JAN	1115	46	0.12	0.09	0.03	44.	1	JAN	2345	96	0.02	0.00	0.01	22.
1	JAN	1130	47	0.15	0.11	0.04	66.	2	JAN	0000	97	0.02	0.00	0.01	21.
1	JAN	1145	48	0.62	0.38	0.24	318.	2	JAN	0015	98	0.00	0.00	0.00	5.
1	JAN	1200	49	1.54	0.65	0.89	1193.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.24	0.08	0.17	533.	2	JAN	0045	100	0.00	0.00	0.00	0.

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    TOTAL RAINFALL =    5.70, TOTAL LOSS =    3.01, TOTAL EXCESS =    2.69

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                         (CFS)
+    1193.     12.00          152.          47.         45.          45.
                       (INCHES)     2.185       2.691       2.691       2.691
                        (AC-FT)      76.         93.         93.         93.

                       CUMULATIVE AREA =    0.65 SQ MI


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


            **************
            *            *
 353 KK     *        1C  *        CNAME      1C
            *            *
            **************
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```
 354 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
                       IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                        IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT      0.250  TIME INTERVAL IN HOURS


 355 HC          HYDROGRAPH COMBINATION
                       ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                 ***
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HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	3788.	1 JAN 1845	76	206.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	2088.	1 JAN 1900	77	198.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1246.	1 JAN 1915	78	191.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	909.	1 JAN 1930	79	185.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	720.	1 JAN 1945	80	178.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	612.	1 JAN 2000	81	170.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	531.	1 JAN 2015	82	163.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	474.	1 JAN 2030	83	158.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	432.	1 JAN 2045	84	155.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	404.	1 JAN 2100	85	154.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	382.	1 JAN 2115	86	153.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	363.	1 JAN 2130	87	151.
1 JAN 0300	13	0.	1 JAN 0915	38	3.	1 JAN 1530	63	343.	1 JAN 2145	88	149.
1 JAN 0315	14	0.	1 JAN 0930	39	8.	1 JAN 1545	64	324.	1 JAN 2200	89	149.
1 JAN 0330	15	0.	1 JAN 0945	40	16.	1 JAN 1600	65	305.	1 JAN 2215	90	147.
1 JAN 0345	16	0.	1 JAN 1000	41	28.	1 JAN 1615	66	287.	1 JAN 2230	91	145.
1 JAN 0400	17	0.	1 JAN 1015	42	44.	1 JAN 1630	67	273.	1 JAN 2245	92	144.
1 JAN 0415	18	0.	1 JAN 1030	43	65.	1 JAN 1645	68	263.	1 JAN 2300	93	143.
1 JAN 0430	19	0.	1 JAN 1045	44	94.	1 JAN 1700	69	256.	1 JAN 2315	94	142.
1 JAN 0445	20	0.	1 JAN 1100	45	133.	1 JAN 1715	70	248.	1 JAN 2330	95	140.
1 JAN 0500	21	0.	1 JAN 1115	46	192.	1 JAN 1730	71	241.	1 JAN 2345	96	138.
1 JAN 0515	22	0.	1 JAN 1130	47	285.	1 JAN 1745	72	234.	2 JAN 0000	97	138.
1 JAN 0530	23	0.	1 JAN 1145	48	872.	1 JAN 1800	73	227.	2 JAN 0015	98	105.
1 JAN 0545	24	0.	1 JAN 1200	49	3316.	1 JAN 1815	74	220.	2 JAN 0030	99	55.
1 JAN 0600	25	0.	1 JAN 1215	50	4573.	1 JAN 1830	75	213.	2 JAN 0045	100	18.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR (CFS)	24-HR	72-HR	24.75-HR
4573.	12.25	970.	299.	290.	290.
		(INCHES) 2.135	2.631	2.631	2.631
		(AC-FT) 481.	593.	593.	593.

CUMULATIVE AREA = 4.22 SQ MI

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


            **************
            *            *
 356 KK     *        1C  *        CNAME      1C
            *            *
            **************

 357 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
                       IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                        IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT      0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 358 RN          NO ROUTING

                                                 ***
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HYDROGRAPH AT STATION 1C

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	3788.	1	JAN	1845	76	206.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	2088.	1	JAN	1900	77	198.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	1246.	1	JAN	1915	78	191.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	909.	1	JAN	1930	79	185.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	720.	1	JAN	1945	80	178.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	612.	1	JAN	2000	81	170.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	531.	1	JAN	2015	82	163.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	474.	1	JAN	2030	83	158.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	432.	1	JAN	2045	84	155.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	404.	1	JAN	2100	85	154.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	382.	1	JAN	2115	86	153.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	363.	1	JAN	2130	87	151.
1	JAN	0300	13	0.	1	JAN	0915	38	3.	1	JAN	1530	63	343.	1	JAN	2145	88	149.
1	JAN	0315	14	0.	1	JAN	0930	39	8.	1	JAN	1545	64	324.	1	JAN	2200	89	149.
1	JAN	0330	15	0.	1	JAN	0945	40	16.	1	JAN	1600	65	305.	1	JAN	2215	90	147.
1	JAN	0345	16	0.	1	JAN	1000	41	28.	1	JAN	1615	66	287.	1	JAN	2230	91	145.
1	JAN	0400	17	0.	1	JAN	1015	42	44.	1	JAN	1630	67	273.	1	JAN	2245	92	144.
1	JAN	0415	18	0.	1	JAN	1030	43	65.	1	JAN	1645	68	263.	1	JAN	2300	93	143.
1	JAN	0430	19	0.	1	JAN	1045	44	94.	1	JAN	1700	69	256.	1	JAN	2315	94	142.
1	JAN	0445	20	0.	1	JAN	1100	45	133.	1	JAN	1715	70	248.	1	JAN	2330	95	140.
1	JAN	0500	21	0.	1	JAN	1115	46	192.	1	JAN	1730	71	241.	1	JAN	2345	96	138.
1	JAN	0515	22	0.	1	JAN	1130	47	285.	1	JAN	1745	72	234.	2	JAN	0000	97	138.
1	JAN	0530	23	0.	1	JAN	1145	48	872.	1	JAN	1800	73	227.	2	JAN	0015	98	105.
1	JAN	0545	24	0.	1	JAN	1200	49	3316.	1	JAN	1815	74	220.	2	JAN	0030	99	55.
1	JAN	0600	25	0.	1	JAN	1215	50	4573.	1	JAN	1830	75	213.	2	JAN	0045	100	18.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)				
4573.	12.25		970.	299.	290.	290.
		(INCHES)	2.135	2.631	2.631	2.631
		(AC-FT)	481.	593.	593.	593.

CUMULATIVE AREA = 4.22 SQ MI

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	6B	324.	12.00	57.	18.	17.	0.25		
	ROUTED TO	6R	318.	12.25	57.	18.	17.	0.25		
	HYDROGRAPH AT	7bB	476.	12.00	61.	19.	18.	0.27		
	HYDROGRAPH AT	7aB	996.	12.00	128.	39.	38.	0.56		
	3 COMBINED AT	7C	1748.	12.00	246.	76.	73.	1.08		
	ROUTED TO	7R	1474.	12.25	246.	76.	73.	1.08		
	HYDROGRAPH AT	5B	747.	12.00	147.	45.	44.	0.64		
	ROUTED TO	5R	800.	12.25	147.	45.	44.	0.64		
	HYDROGRAPH AT	4B	477.	12.25	93.	29.	28.	0.41		
	ROUTED TO	4R	489.	12.25	93.	29.	28.	0.41		
	HYDROGRAPH AT	3aB	488.	12.25	95.	29.	28.	0.41		
	HYDROGRAPH AT	3bB	516.	12.25	100.	31.	30.	0.44		
	4 COMBINED AT	3C	2294.	12.25	434.	134.	130.	1.90		
	ROUTED TO	3R	2295.	12.25	434.	134.	130.	1.90		
	HYDROGRAPH AT	2bB	219.	12.00	28.	9.	8.	0.12		
	HYDROGRAPH AT	2aB	862.	12.00	110.	34.	33.	0.48		
	4 COMBINED AT	2C	4254.	12.25	818.	252.	244.	3.57		

	ROUTED TO							
+		2R	4039.	12.25	818.	252.	244.	3.57
	HYDROGRAPH AT							
+		1B	1193.	12.00	152.	47.	45.	0.65
	2 COMBINED AT							
+		1C	4573.	12.25	970.	299.	290.	4.22
	ROUTED TO							
+		1C	4573.	12.25	970.	299.	290.	4.22

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991           *
 *            VERSION 4.0.1E         *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```


```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```


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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    wo Mining & w Logging (Scenario 5), 10m DEM Data
   3          ID    Storm Event
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 480389.00000 4224905.00000 1
   6          PG    Gage     4.1
   7          IN      15  1JAN94       0
              * Scrabble Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0   0.025
   9          PC    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475     0.6   0.725
  10          PC    0.85  0.9125   0.975  1.0375     1.1  1.1625   1.225  1.2875    1.35   1.725
  11          PC     2.1   2.475    2.85     3.1    3.35     3.6    3.85  3.9125   3.975  4.0375
  12          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  13          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  14          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  15          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  16          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1     4.1
  17          PC     4.1     4.1     4.1     4.1     4.1     4.1     4.1

  18          KK      6B
  19          KO       0       0     0.0       1      22
  20          BA  0.2503
  21          PR    Gage
  22          PW     1.0
  23          PT    Gage
  24          PW   0.258
  25          LS     0.0    70.5     0.0
  26          UD    0.21

  27          KK      6R   CNAME      6C
  28          KO       0       0     0.0       0      22
  29          RM       1   0.037     0.2

  30          KK     7bB
  31          KO       0       0     0.0       1      22
  32          BA  0.2668
  33          LS     0.0   71.37     0.0
  34          UD     0.0

  35          KK     7aB
  36          KO       0       0     0.0       1      22
  37          BA  0.5585
  38          LS     0.0   72.08     0.0
  39          UD     0.0

  40          KK      7C   CNAME      7R
  41          KO       0       0     0.0       0      22
  42          HC       3
```

HEC-1 INPUT PAGE 2

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

  43          KK      7R   CNAME      7C
  44          KO       0       0     0.0       0      22
  45          RM       1   0.087     0.2
```

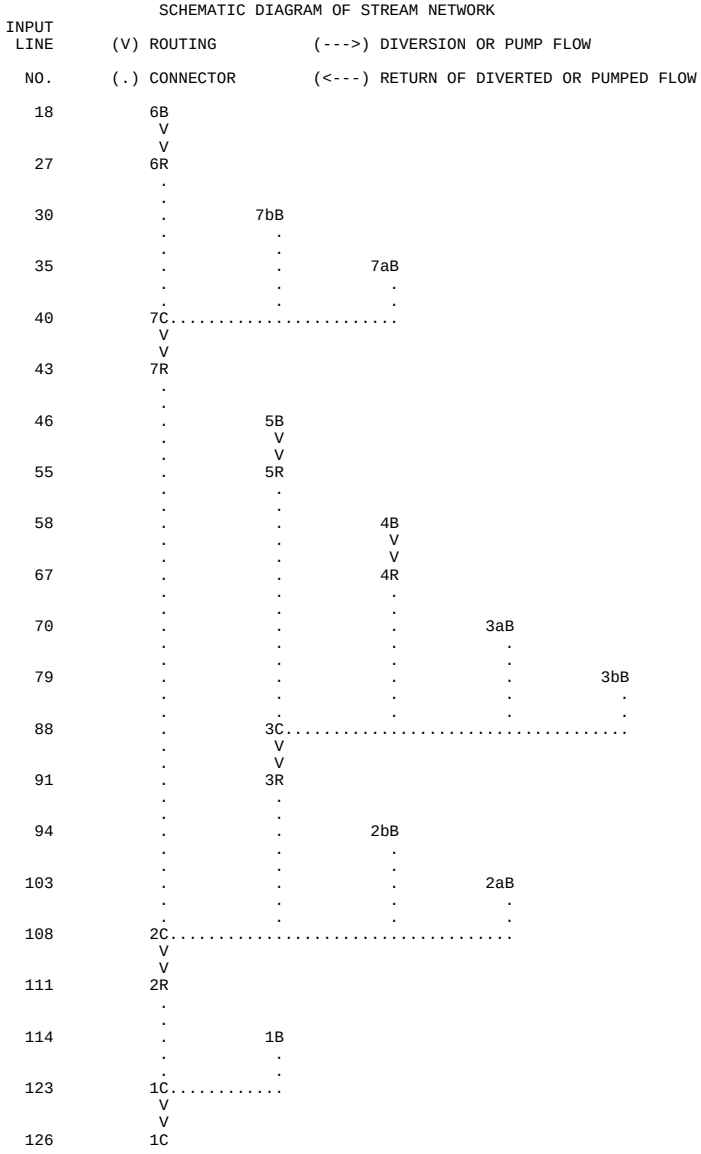
```
 46          KK      5B
 47          KO       0       0     0.0       1      22
 48          BA  0.6425
 49          PR    Gage
 50          PW     1.0
 51          PT    Gage
 52          PW   0.656
 53          LS     0.0    70.5     0.0
 54          UD  0.2376

 55          KK      5R   CNAME      5C
 56          KO       0       0     0.0       0      22
 57          RM       1   0.099     0.2

 58          KK      4B
 59          KO       0       0     0.0       1      22
 60          BA  0.4066
 61          PR    Gage
 62          PW     1.0
 63          PT    Gage
 64          PW   0.416
 65          LS     0.0    70.5     0.0
 66          UD  0.2643

 67          KK      4R   CNAME      4C
 68          KO       0       0     0.0       0      22
 69          RM       1   0.091     0.2

 70          KK     3aB
 71          KO       0       0     0.0       1      22
 72          BA  0.4142
 73          PR    Gage
 74          PW     1.0
 75          PT    Gage
 76          PW   0.425
 77          LS     0.0   70.59     0.0
 78          UD  0.2705

 79          KK     3bB
 80          KO       0       0     0.0       1      22
 81          BA  0.4375
 82          PR    Gage
 83          PW     1.0
 84          PT    Gage
 85          PW   0.447
 86          LS     0.0   71.79     0.0
 87          UD  0.2643
```



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

 88          KK      3C   CNAME      3R
 89          KO       0       0     0.0       0      22
 90          HC       4

 91          KK      3R   CNAME      3C
 92          KO       0       0     0.0       0      22
 93          RM       1   0.041     0.2

 94          KK     2bB
 95          KO       0       0     0.0       1      22
 96          BA  0.1177
 97          PR    Gage
 98          PW     1.0
 99          PT    Gage
100          PW    0.12
101          LS     0.0   72.42     0.0
102          UD     0.0

103          KK     2aB
104          KO       0       0     0.0       1      22
105          BA  0.4804
106          LS     0.0    73.5     0.0
107          UD     0.0

108          KK      2C   CNAME      2R
109          KO       0       0     0.0       0      22
110          HC       4

111          KK      2R   CNAME      2C
112          KO       0       0     0.0       0      22
113          RM       1   0.134     0.2

114          KK      1B
115          KO       0       0     0.0       1      22
116          BA  0.6484
117          PR    Gage
118          PW     1.0
119          PT    Gage
120          PW   0.662
121          LS     0.0   73.13     0.0
122          UD     0.0

123          KK      1C   CNAME      1C
124          KO       0       0     0.0       0      22
125          HC       2
```

```
          126          KK      1C   CNAME      1C
          127          KO       0       0     0.0       0      22
          128          RN      1C
          129          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY   1991              *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

Scrabble Creek
wo Mining & w Logging (Scenario 5), 10m DEM Data
Storm Event

```
    5 IO          OUTPUT CONTROL VARIABLES
                        IPRNT           1  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
```

```
  7 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

    IT          HYDROGRAPH TIME DATA
                      NMIN          15  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1JAN94  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ,         100  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2JAN94  ENDING DATE
                    NDTIME        0045  ENDING TIME
                     ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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


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


           **************
           *            *
  18 KK    *        6B  *
           *            *
           **************

  19 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

  20 BA          SUBBASIN CHARACTERISTICS
                      TAREA,        0.25  SUBBASIN AREA

                 PRECIPITATION DATA

  23 PT           TOTAL STORM STATIONS      Gage
  24 PW                        WEIGHTS      0.26

  21 PR             RECORDING STATIONS      Gage
  22 PW                        WEIGHTS      1.00

  25 LS          SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

  26 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.21  LAG

                                                                  ***

              PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10        0.00         0.26

                 TEMPORAL DISTRIBUTIONS

                 STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                          UNIT HYDROGRAPH
                                                       6 END-OF-PERIOD ORDINATES
              307.      242.       69.       20.        6.        2.

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

                                                HYDROGRAPH AT STATION       6B

*************************************************************************************************************************
                                                                  *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                  *
```

1 JAN 0000	1	0.00	0.00	0.00	0.	*	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	*	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	*	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	*	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	*	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	*	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	*	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	*	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	*	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	*	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	*	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	*	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	*	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	*	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	*	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	*	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	*	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	*	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	*	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	*	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	*	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	0.	*	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	1.	*	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	2.	*	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	3.	*	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	4.	*	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	5.	*	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	6.	*	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	7.	*	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.28	0.10	34.	*	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.24	0.14	67.	*	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.21	0.17	92.	*	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.19	112.	*	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	105.	*	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	97.	*	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	99.	*	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.09	0.16	102.	*	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	67.	*	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	38.	*	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	30.	*	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	28.	*	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	15.	*	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	4.	*	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	*	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	*	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	*	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	*	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	*	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	*	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

*

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 112.	8.00	38.	10.	9.	9.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 19.	19.	19.	19.

CUMULATIVE AREA = 0.25 SQ MI

*** ***

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            **************
            *            *
   27 KK    *        6R  *        CNAME      6C
            *            *
            **************
```

28 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

29 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.04	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 6R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 6R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	4.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	5.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	6.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	7.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	28.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	64.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	89.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	109.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	108.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	97.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	98.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	101.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	76.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	40.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	31.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	28.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	18.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	5.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	2.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	0.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	0.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	1.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	2.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	3.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
109.	8.00	38.	10.	9.	9.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 19.	19.	19.	19.

CUMULATIVE AREA = 0.25 SQ MI

*** ***

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          **************
          *            *
30 KK     *       7bB  *
          *            *
          **************

31 KO          OUTPUT CONTROL VARIABLES
                    IPRNT           1  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                     IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

32 BA          SUBBASIN CHARACTERISTICS
                    TAREA,        0.27  SUBBASIN AREA

               PRECIPITATION DATA

23 PT           TOTAL STORM STATIONS      Gage
24 PW                       WEIGHTS      0.26

21 PR             RECORDING STATIONS      Gage
22 PW                       WEIGHTS      1.00

33 LS          SCS LOSS RATE
                    STRTL        0.80  INITIAL ABSTRACTION
                   CRVNBR       71.37  CURVE NUMBER
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

34 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        0.00  LAG

                                                        ***

             PRECIPITATION STATION DATA

                      STATION    TOTAL    AVG. ANNUAL    WEIGHT
                         Gage     4.10        0.00         0.26
```

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

512. 143. 28. 6. 0.

HYDROGRAPH AT STATION 7bB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	1.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	2.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.01	4.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.05	0.01	5.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	6.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	7.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	8.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	9.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.27	0.11	57.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.23	0.14	90.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.20	0.18	113.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.20	132.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	108.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	106.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	109.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.08	0.17	113.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	51.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	34.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	30.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	30.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	8.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	1.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	0.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.61, TOTAL EXCESS = 1.49

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 132.	8.00	43.	11.	10.	10.
		(INCHES) 1.488	1.488	1.488	1.488
		(AC-FT) 21.	21.	21.	21.

CUMULATIVE AREA = 0.27 SQ MI

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            **************
            *            *
   35 KK    *       7aB  *
            *            *
            **************
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 36 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 37 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.56  SUBBASIN AREA

                PRECIPITATION DATA

 23 PT           TOTAL STORM STATIONS      Gage
 24 PW                       WEIGHTS      0.26

 21 PR             RECORDING STATIONS      Gage
 22 PW                       WEIGHTS      1.00

 38 LS          SCS LOSS RATE
                       STRTL       0.77  INITIAL ABSTRACTION
                      CRVNBR      72.08  CURVE NUMBER
                       RTIMP       0.00  PERCENT IMPERVIOUS AREA

 39 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.00  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10         0.00         0.26

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
             1071.      300.       59.       12.        0.
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HYDROGRAPH AT STATION 7aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	2.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	4.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.01	7.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.01	9.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.05	0.01	12.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	14.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	16.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	18.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	20.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.26	0.11	126.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.22	0.15	196.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.19	0.18	246.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.17	0.21	284.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.10	0.15	233.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.09	0.16	226.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	233.	1	JAN	2115	86	0.00	0.00	0.00	0.

1	JAN	0900	37	0.25	0.08	0.17	241.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	109.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	72.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	65.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	64.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	16.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	3.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	1.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.56, TOTAL EXCESS = 1.54

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 284.	8.00	92.	23.	22.	22.
		(INCHES) 1.536	1.536	1.536	1.536
		(AC-FT) 46.	46.	46.	46.

CUMULATIVE AREA = 0.56 SQ MI

*** ***

40 KK — 7C — CNAME — 7R

41 KO — OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

42 HC — HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	24.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	28.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	32.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	36.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	211.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	349.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	448.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	525.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	449.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	429.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	440.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	456.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	235.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	145.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	127.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	122.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	42.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	9.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	2.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	0.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	2.	1	JAN	1115	46	0.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	6.	1	JAN	1130	47	0.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	10.	1	JAN	1145	48	0.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	15.	1	JAN	1200	49	0.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	20.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			

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+     525.      8.00                  173.         43.         42.          42.
                          (INCHES)     1.499       1.499       1.499        1.499
                           (AC-FT)       86.         86.         86.          86.

                          CUMULATIVE AREA =    1.08 SQ MI


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


              **************
              *            *
   43 KK      *        7R  *        CNAME      7C
              *            *
              **************

   44 KO           OUTPUT CONTROL VARIABLES
                        IPRNT          1  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT      0.250  TIME INTERVAL IN HOURS


                 HYDROGRAPH ROUTING DATA

   45 RM           MUSKINGUM ROUTING
                        NSTPS          1 NUMBER OF SUBREACHES
                        AMSKK       0.09 MUSKINGUM K
                            X       0.20 MUSKINGUM X

                                                                  ***
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      7R.
       REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

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

                                                HYDROGRAPH AT STATION       7R

 ********************************************************************************************************************************************************
                                  *                                   *                                   *
    DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW     *   DA MON HRMN  ORD      FLOW     *   DA MON HRMN  ORD      FLOW
                                  *                                   *                                   *
     1 JAN 0000    1         0.   *    1 JAN 0615   26        22.    *    1 JAN 1230   51         0.    *    1 JAN 1845   76         0.
     1 JAN 0015    2         0.   *    1 JAN 0630   27        27.    *    1 JAN 1245   52         0.    *    1 JAN 1900   77         0.
     1 JAN 0030    3         0.   *    1 JAN 0645   28        31.    *    1 JAN 1300   53         0.    *    1 JAN 1915   78         0.
     1 JAN 0045    4         0.   *    1 JAN 0700   29        35.    *    1 JAN 1315   54         0.    *    1 JAN 1930   79         0.
     1 JAN 0100    5         0.   *    1 JAN 0715   30       133.    *    1 JAN 1330   55         0.    *    1 JAN 1945   80         0.
     1 JAN 0115    6         0.   *    1 JAN 0730   31       310.    *    1 JAN 1345   56         0.    *    1 JAN 2000   81         0.
     1 JAN 0130    7         0.   *    1 JAN 0745   32       415.    *    1 JAN 1400   57         0.    *    1 JAN 2015   82         0.
     1 JAN 0145    8         0.   *    1 JAN 0800   33       500.    *    1 JAN 1415   58         0.    *    1 JAN 2030   83         0.
     1 JAN 0200    9         0.   *    1 JAN 0815   34       491.    *    1 JAN 1430   59         0.    *    1 JAN 2045   84         0.
     1 JAN 0215   10         0.   *    1 JAN 0830   35       426.    *    1 JAN 1445   60         0.    *    1 JAN 2100   85         0.
     1 JAN 0230   11         0.   *    1 JAN 0845   36       436.    *    1 JAN 1500   61         0.    *    1 JAN 2115   86         0.
     1 JAN 0245   12         0.   *    1 JAN 0900   37       450.    *    1 JAN 1515   62         0.    *    1 JAN 2130   87         0.
     1 JAN 0300   13         0.   *    1 JAN 0915   38       336.    *    1 JAN 1530   63         0.    *    1 JAN 2145   88         0.
     1 JAN 0315   14         0.   *    1 JAN 0930   39       157.    *    1 JAN 1545   64         0.    *    1 JAN 2200   89         0.
     1 JAN 0330   15         0.   *    1 JAN 0945   40       131.    *    1 JAN 1600   65         0.    *    1 JAN 2215   90         0.
     1 JAN 0345   16         0.   *    1 JAN 1000   41       122.    *    1 JAN 1615   66         0.    *    1 JAN 2230   91         0.
     1 JAN 0400   17         0.   *    1 JAN 1015   42        77.    *    1 JAN 1630   67         0.    *    1 JAN 2245   92         0.
     1 JAN 0415   18         0.   *    1 JAN 1030   43        14.    *    1 JAN 1645   68         0.    *    1 JAN 2300   93         0.
     1 JAN 0430   19         0.   *    1 JAN 1045   44         4.    *    1 JAN 1700   69         0.    *    1 JAN 2315   94         0.
     1 JAN 0445   20         0.   *    1 JAN 1100   45         1.    *    1 JAN 1715   70         0.    *    1 JAN 2330   95         0.
     1 JAN 0500   21         1.   *    1 JAN 1115   46         0.    *    1 JAN 1730   71         0.    *    1 JAN 2345   96         0.
     1 JAN 0515   22         4.   *    1 JAN 1130   47         0.    *    1 JAN 1745   72         0.    *    2 JAN 0000   97         0.
     1 JAN 0530   23         9.   *    1 JAN 1145   48         0.    *    1 JAN 1800   73         0.    *    2 JAN 0015   98         0.
     1 JAN 0545   24        13.   *    1 JAN 1200   49         0.    *    1 JAN 1815   74         0.    *    2 JAN 0030   99         0.
     1 JAN 0600   25        18.   *    1 JAN 1215   50         0.    *    1 JAN 1830   75         0.    *    2 JAN 0045  100         0.
                                  *                                   *                                   *
 ********************************************************************************************************************************************************

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR       72-HR     24.75-HR
+    (CFS)       (HR)
                    (CFS)
+     500.      8.00                  173.         43.         42.          42.
                          (INCHES)     1.499       1.499       1.499        1.499
                           (AC-FT)       86.         86.         86.          86.

                          CUMULATIVE AREA =    1.08 SQ MI


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


              **************
              *            *
   46 KK      *        5B  *
              *            *
              **************
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 47 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 48 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.64  SUBBASIN AREA

                PRECIPITATION DATA

 51 PT           TOTAL STORM STATIONS      Gage
 52 PW                       WEIGHTS      0.66

 49 PR             RECORDING STATIONS      Gage
 50 PW                       WEIGHTS      1.00

 53 LS          SCS LOSS RATE
                      STRTL       0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

 54 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.24  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10        0.00         0.66

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                     0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                     0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                     0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
             674.      669.      214.       70.       23.        8.        1.
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HYDROGRAPH AT STATION 5B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	3.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	6.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	8.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	11.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	13.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	16.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	18.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.28	0.10	78.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	163.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	228.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	279.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	272.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	251.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	253.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	261.	1	JAN	2130	87	0.00	0.00	0.00	0.

1	JAN	0915	38	0.06	0.02	0.04	185.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	106.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	82.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	74.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	43.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	14.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	4.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

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    TOTAL RAINFALL =    4.10, TOTAL LOSS =    2.67, TOTAL EXCESS =    1.43

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                   (CFS)
+     279.      8.00                99.          25.         24.          24.
                          (INCHES)     1.429       1.430       1.430        1.430
                           (AC-FT)      49.         49.         49.          49.

                          CUMULATIVE AREA =    0.64 SQ MI
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*** ***

```
            **************
            *            *
  55 KK     *        5R  *        CNAME      5C
            *            *
            **************

  56 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

  57 RM          MUSKINGUM ROUTING
                      NSTPS         1 NUMBER OF SUBREACHES
                      AMSKK      0.10 MUSKINGUM K
                          X      0.20 MUSKINGUM X

                                                    ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      5R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 5R

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	10.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	12.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	15.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	17.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	49.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	128.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	204.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	259.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	280.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	259.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	250.	1	JAN	1500	61	0.	1	JAN	2115	86	0.
1	JAN	0245	12	0.	1	JAN	0900	37	258.	1	JAN	1515	62	0.	1	JAN	2130	87	0.
1	JAN	0300	13	0.	1	JAN	0915	38	223.	1	JAN	1530	63	0.	1	JAN	2145	88	0.
1	JAN	0315	14	0.	1	JAN	0930	39	136.	1	JAN	1545	64	0.	1	JAN	2200	89	0.
1	JAN	0330	15	0.	1	JAN	0945	40	87.	1	JAN	1600	65	0.	1	JAN	2215	90	0.
1	JAN	0345	16	0.	1	JAN	1000	41	77.	1	JAN	1615	66	0.	1	JAN	2230	91	0.
1	JAN	0400	17	0.	1	JAN	1015	42	57.	1	JAN	1630	67	0.	1	JAN	2245	92	0.
1	JAN	0415	18	0.	1	JAN	1030	43	25.	1	JAN	1645	68	0.	1	JAN	2300	93	0.
1	JAN	0430	19	0.	1	JAN	1045	44	6.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	2.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	0.	1	JAN	1115	46	1.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	0.	1	JAN	1130	47	0.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	2.	1	JAN	1145	48	0.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	4.	1	JAN	1200	49	0.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	7.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

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  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                         (CFS)
+     280.      8.25                 99.         25.         24.          24.
                        (INCHES)    1.429       1.430       1.430        1.430
                         (AC-FT)     49.         49.         49.          49.

                         CUMULATIVE AREA =    0.64 SQ MI


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


            **************
            *            *
   58 KK    *        4B  *
            *            *
            **************

   59 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          1  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                         IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT      0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

   60 BA          SUBBASIN CHARACTERISTICS
                        TAREA,       0.41  SUBBASIN AREA

                  PRECIPITATION DATA

   63 PT           TOTAL STORM STATIONS      Gage
   64 PW                       WEIGHTS      0.42

   61 PR             RECORDING STATIONS      Gage
   62 PW                       WEIGHTS      1.00

   65 LS          SCS LOSS RATE
                         STRTL       0.84  INITIAL ABSTRACTION
                        CRVNBR      70.50  CURVE NUMBER
                         RTIMP       0.00  PERCENT IMPERVIOUS AREA

   66 UD          SCS DIMENSIONLESS UNITGRAPH
                          TLAG       0.26  LAG

                                                                  ***

              PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     4.10        0.00         0.42

                  TEMPORAL DISTRIBUTIONS

                  STATION     Gage,  WEIGHT =   1.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                       0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                       0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                       0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                        UNIT HYDROGRAPH
                                                    7 END-OF-PERIOD ORDINATES
              366.      438.      159.       57.       20.        7.        3.

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

                                                HYDROGRAPH AT STATION       4B

*****************************************************************************************************************************
                                                                                 *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q                       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                                 *
        1 JAN 0000    1    0.00    0.00    0.00         0.                       *        1 JAN 1230   51    0.00    0.00    0.00         0.
        1 JAN 0015    2    0.00    0.00    0.00         0.                       *        1 JAN 1245   52    0.00    0.00    0.00         0.
        1 JAN 0030    3    0.00    0.00    0.00         0.                       *        1 JAN 1300   53    0.00    0.00    0.00         0.
        1 JAN 0045    4    0.00    0.00    0.00         0.                       *        1 JAN 1315   54    0.00    0.00    0.00         0.
        1 JAN 0100    5    0.00    0.00    0.00         0.                       *        1 JAN 1330   55    0.00    0.00    0.00         0.
        1 JAN 0115    6    0.00    0.00    0.00         0.                       *        1 JAN 1345   56    0.00    0.00    0.00         0.
        1 JAN 0130    7    0.00    0.00    0.00         0.                       *        1 JAN 1400   57    0.00    0.00    0.00         0.
        1 JAN 0145    8    0.00    0.00    0.00         0.                       *        1 JAN 1415   58    0.00    0.00    0.00         0.
        1 JAN 0200    9    0.00    0.00    0.00         0.                       *        1 JAN 1430   59    0.00    0.00    0.00         0.
        1 JAN 0215   10    0.03    0.03    0.00         0.                       *        1 JAN 1445   60    0.00    0.00    0.00         0.
        1 JAN 0230   11    0.03    0.03    0.00         0.                       *        1 JAN 1500   61    0.00    0.00    0.00         0.
        1 JAN 0245   12    0.03    0.03    0.00         0.                       *        1 JAN 1515   62    0.00    0.00    0.00         0.
        1 JAN 0300   13    0.02    0.02    0.00         0.                       *        1 JAN 1530   63    0.00    0.00    0.00         0.
        1 JAN 0315   14    0.06    0.06    0.00         0.                       *        1 JAN 1545   64    0.00    0.00    0.00         0.
        1 JAN 0330   15    0.06    0.06    0.00         0.                       *        1 JAN 1600   65    0.00    0.00    0.00         0.
```

1 JAN 0345	16	0.06	0.06	0.00	0.	*	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	*	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	*	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	*	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	*	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	*	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	0.	*	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	2.	*	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.00	3.	*	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.06	0.01	5.	*	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	7.	*	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	8.	*	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	10.	*	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	11.	*	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.28	0.10	44.	*	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.24	0.14	97.	*	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.21	0.17	138.	*	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.18	0.19	172.	*	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.11	0.14	173.	*	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	160.	*	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	160.	*	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.09	0.16	165.	*	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	124.	*	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	73.	*	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	54.	*	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	48.	*	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	30.	*	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	11.	*	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	4.	*	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	1.	*	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	*	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	*	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	*	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	*	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

*

****

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.67, TOTAL EXCESS = 1.43

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 173.	8.25	63.	16.	15.	15.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 31.	31.	31.	31.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
 67 KK    *        4R  *        CNAME      4C
          *            *
          **************
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68 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

69 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.09	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 4R

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	6.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	8.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	9.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	11.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	29.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	76.	1 JAN 1345	56	0.	1 JAN 2000	81	0.

1	JAN	0130	7	0.	*	1	JAN	0745	32	125.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	160.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	176.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	165.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	159.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	163.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	143.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.
1	JAN	0315	14	0.	*	1	JAN	0930	39	91.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	58.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	50.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	38.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	18.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	5.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	2.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	0.	*	1	JAN	1115	46	1.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	0.	*	1	JAN	1130	47	0.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	1.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	3.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.
1	JAN	0600	25	4.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.
					*						*						*						

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 176.	8.25	62.	16.	15.	15.
		(INCHES) 1.429	1.430	1.430	1.430
		(AC-FT) 31.	31.	31.	31.

CUMULATIVE AREA = 0.41 SQ MI

*** ***

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          **************
          *            *
70 KK     *       3aB  *
          *            *
          **************
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71 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

72 BA SUBBASIN CHARACTERISTICS

TAREA,	0.41	SUBBASIN AREA

PRECIPITATION DATA

75 PT	TOTAL STORM STATIONS	Gage	
76 PW	WEIGHTS	0.43	

73 PR	RECORDING STATIONS	Gage	
74 PW	WEIGHTS	1.00	

77 LS SCS LOSS RATE

STRTL	0.83	INITIAL ABSTRACTION
CRVNBR	70.59	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

78 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.27	LAG

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.43

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
7 END-OF-PERIOD ORDINATES

360.	448.	168.	61.	22.	8.	3.

****

HYDROGRAPH AT STATION 3aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.00	2.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.00	3.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.06	0.01	5.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	7.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	9.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	10.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	12.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.27	0.10	44.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.24	0.14	98.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.21	0.17	140.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.18	0.19	175.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.11	0.14	177.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.10	0.15	163.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	164.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.09	0.16	168.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	128.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	76.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	56.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	49.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	31.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	11.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	4.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	1.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.66, TOTAL EXCESS = 1.44

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
177.	8.25	64.	16.	16.	16.
		(INCHES) 1.435	1.436	1.436	1.436
		(AC-FT) 32.	32.	32.	32.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
79 KK     *       3bB  *
          *            *
          **************
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80 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

81 BA SUBBASIN CHARACTERISTICS

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                    TAREA,       0.44  SUBBASIN AREA

               PRECIPITATION DATA

  84 PT           TOTAL STORM STATIONS      Gage
  85 PW                       WEIGHTS      0.45

  82 PR             RECORDING STATIONS      Gage
  83 PW                       WEIGHTS      1.00

  86 LS          SCS LOSS RATE
                       STRTL        0.79  INITIAL ABSTRACTION
                      CRVNBR       71.79  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  87 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.26  LAG

                                                  ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10        0.00         0.45

               TEMPORAL DISTRIBUTIONS

               STATION     Gage,  WEIGHT =   1.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                    0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                    0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                    0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
               394.      471.      171.       61.       21.        8.        3.

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

                                              HYDROGRAPH AT STATION      3bB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.03	0.03	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.03	0.03	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.03	0.03	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.06	0.06	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.06	0.06	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.06	0.06	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.06	0.06	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.12	0.12	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.13	0.13	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.12	0.12	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.12	0.12	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.06	0.06	0.00	2.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.06	0.06	0.00	3.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.06	0.06	0.01	5.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.06	0.05	0.01	7.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.05	0.01	9.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.05	0.01	11.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.05	0.01	13.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.05	0.01	14.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.38	0.26	0.11	53.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.37	0.23	0.15	114.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.38	0.20	0.18	160.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.38	0.17	0.20	197.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.25	0.10	0.15	196.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.25	0.10	0.15	180.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.25	0.09	0.16	180.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.25	0.08	0.17	184.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.06	0.02	0.04	139.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.06	0.02	0.04	81.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.06	0.02	0.04	60.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.06	0.02	0.04	53.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	33.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	12.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	4.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	1.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.58, TOTAL EXCESS = 1.52

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
197.	8.00		71.	18.	17.	17.
		(INCHES)	1.515	1.516	1.516	1.516
		(AC-FT)	35.	35.	35.	35.

CUMULATIVE AREA = 0.44 SQ MI

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88 KK     **************
          *            *
          *        3C  *        CNAME      3R
          *            *
          **************
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89 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS
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90 HC          HYDROGRAPH COMBINATION
                     ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	32.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	40.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	47.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	54.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	176.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	416.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	629.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	791.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	827.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	767.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	752.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	773.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	633.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	384.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	261.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	229.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	160.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	66.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	20.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	7.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	2.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	3.	1 JAN 1130	47	1.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	8.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	16.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	24.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
827.	8.25		296.	74.	72.	72.
		(INCHES)	1.450	1.451	1.451	1.451
		(AC-FT)	147.	147.	147.	147.

CUMULATIVE AREA = 1.90 SQ MI

```
91 KK     **************
          *            *
          *        3R  *        CNAME      3C
```

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

  92 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

  93 RM          MUSKINGUM ROUTING
                      NSTPS           1 NUMBER OF SUBREACHES
                      AMSKK        0.04 MUSKINGUM K
                          X        0.20 MUSKINGUM X

                                                                  ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      3R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 3R

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	31.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	38.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	46.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	53.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	145.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	372.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	600.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	766.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	833.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	780.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	749.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	770.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	672.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	426.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	268.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	233.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	175.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	81.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	22.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	9.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	3.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	2.	1 JAN 1130	47	1.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	7.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	15.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	23.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
833.	8.25	296.	74.	72.	72.
		(INCHES) 1.450	1.451	1.451	1.451
		(AC-FT) 147.	147.	147.	147.

CUMULATIVE AREA = 1.90 SQ MI

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          **************
          *            *
  94 KK   *       2bB  *
          *            *
          **************

  95 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

  96 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.12  SUBBASIN AREA
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               PRECIPITATION DATA

 99 PT           TOTAL STORM STATIONS      Gage
100 PW                       WEIGHTS      0.12

 97 PR             RECORDING STATIONS      Gage
 98 PW                       WEIGHTS      1.00

101 LS          SCS LOSS RATE
                     STRTL        0.76  INITIAL ABSTRACTION
                    CRVNBR       72.42  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

102 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.00  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     4.10         0.00         0.12

               TEMPORAL DISTRIBUTIONS

               STATION     Gage,  WEIGHT =   1.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                    0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                    0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                    0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
               226.       63.       12.        2.        0.
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HYDROGRAPH AT STATION 2bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	0.	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	1.	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.01	2.	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.06	0.01	2.	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.05	0.01	3.	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	3.	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	4.	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	4.	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.01	4.	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.26	0.12	27.	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.22	0.15	42.	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.19	0.18	53.	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.17	0.21	61.	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.10	0.15	50.	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.09	0.16	48.	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.09	0.16	50.	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.08	0.17	51.	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	23.	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	15.	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.04	14.	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.04	14.	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	3.	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	1.	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	0.	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	2	JAN	0045	100	0.00	0.00	0.00	0.

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    TOTAL RAINFALL =    4.10, TOTAL LOSS =    2.54, TOTAL EXCESS =    1.56

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                          (CFS)
+      61.      8.00                  20.          5.          5.           5.
                       (INCHES)     1.559       1.559       1.559        1.559
                        (AC-FT)       10.         10.         10.          10.

                        CUMULATIVE AREA =    0.12 SQ MI


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


            **************
            *            *
  103 KK    *       2aB  *
            *            *
            **************

  104 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


               SUBBASIN RUNOFF DATA

  105 BA          SUBBASIN CHARACTERISTICS
                       TAREA,       0.48  SUBBASIN AREA

                  PRECIPITATION DATA

   99 PT           TOTAL STORM STATIONS      Gage
  100 PW                        WEIGHTS      0.12

   97 PR             RECORDING STATIONS      Gage
   98 PW                        WEIGHTS      1.00

  106 LS          SCS LOSS RATE
                       STRTL        0.72  INITIAL ABSTRACTION
                      CRVNBR       73.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  107 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.00  LAG

                                                                  ***

               PRECIPITATION STATION DATA

                        STATION    TOTAL    AVG. ANNUAL    WEIGHT
                           Gage     4.10        0.00         0.12

                  TEMPORAL DISTRIBUTIONS

                  STATION     Gage,  WEIGHT =   1.00
                      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.03      0.03
                      0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13      0.12      0.12
                      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.06      0.38      0.37
                      0.38      0.38      0.25      0.25      0.25      0.25      0.06      0.06      0.06      0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                          UNIT HYDROGRAPH
                                                       5 END-OF-PERIOD ORDINATES
               921.      258.       51.       10.        0.

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

                                                  HYDROGRAPH AT STATION      2aB

*******************************************************************************************************************************
                                                                  *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                  *
        1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.00    0.00    0.00         0.
        1 JAN 0015    2    0.00    0.00    0.00         0.       *        1 JAN 1245   52    0.00    0.00    0.00         0.
        1 JAN 0030    3    0.00    0.00    0.00         0.       *        1 JAN 1300   53    0.00    0.00    0.00         0.
        1 JAN 0045    4    0.00    0.00    0.00         0.       *        1 JAN 1315   54    0.00    0.00    0.00         0.
        1 JAN 0100    5    0.00    0.00    0.00         0.       *        1 JAN 1330   55    0.00    0.00    0.00         0.
        1 JAN 0115    6    0.00    0.00    0.00         0.       *        1 JAN 1345   56    0.00    0.00    0.00         0.
        1 JAN 0130    7    0.00    0.00    0.00         0.       *        1 JAN 1400   57    0.00    0.00    0.00         0.
        1 JAN 0145    8    0.00    0.00    0.00         0.       *        1 JAN 1415   58    0.00    0.00    0.00         0.
        1 JAN 0200    9    0.00    0.00    0.00         0.       *        1 JAN 1430   59    0.00    0.00    0.00         0.
        1 JAN 0215   10    0.03    0.03    0.00         0.       *        1 JAN 1445   60    0.00    0.00    0.00         0.
        1 JAN 0230   11    0.03    0.03    0.00         0.       *        1 JAN 1500   61    0.00    0.00    0.00         0.
        1 JAN 0245   12    0.03    0.03    0.00         0.       *        1 JAN 1515   62    0.00    0.00    0.00         0.
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1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.06	0.06	0.00	0.	*	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	*	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	*	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	*	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	*	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	*	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	*	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	4.	*	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.01	6.	*	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.01	8.	*	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.05	0.01	10.	*	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.05	0.01	12.	*	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	14.	*	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	16.	*	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.02	18.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.02	20.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.25	0.13	121.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.21	0.16	183.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.18	0.19	226.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.16	0.22	259.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.09	0.16	210.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.09	0.16	203.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.08	0.17	208.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.07	0.18	215.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	97.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.05	64.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.05	57.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.05	57.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	15.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	3.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	0.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

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TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.47, TOTAL EXCESS = 1.63

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
259.	8.00	84.	21.	20.	20.
		(INCHES) 1.634	1.635	1.635	1.635
		(AC-FT) 42.	42.	42.	42.

CUMULATIVE AREA = 0.48 SQ MI

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            **************
            *            *
 108 KK     *        2C  *        CNAME      2R
            *            *
            **************
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109 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

110 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	*	1	JAN	0615	26	70.	*	1	JAN	1230	51	0.	*	1	JAN	1845	76	0.
1	JAN	0015	2	0.	*	1	JAN	0630	27	85.	*	1	JAN	1245	52	0.	*	1	JAN	1900	77	0.
1	JAN	0030	3	0.	*	1	JAN	0645	28	99.	*	1	JAN	1300	53	0.	*	1	JAN	1915	78	0.
1	JAN	0045	4	0.	*	1	JAN	0700	29	112.	*	1	JAN	1315	54	0.	*	1	JAN	1930	79	0.
1	JAN	0100	5	0.	*	1	JAN	0715	30	426.	*	1	JAN	1330	55	0.	*	1	JAN	1945	80	0.
1	JAN	0115	6	0.	*	1	JAN	0730	31	907.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.
1	JAN	0130	7	0.	*	1	JAN	0745	32	1293.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	1586.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.

1 JAN 0200	9	0.	*	1 JAN 0815	34	1583.	*	1 JAN 1430	59	0.	*	1 JAN 2045	84	0.
1 JAN 0215	10	0.	*	1 JAN 0830	35	1457.	*	1 JAN 1445	60	0.	*	1 JAN 2100	85	0.
1 JAN 0230	11	0.	*	1 JAN 0845	36	1442.	*	1 JAN 1500	61	0.	*	1 JAN 2115	86	0.
1 JAN 0245	12	0.	*	1 JAN 0900	37	1486.	*	1 JAN 1515	62	0.	*	1 JAN 2130	87	0.
1 JAN 0300	13	0.	*	1 JAN 0915	38	1127.	*	1 JAN 1530	63	0.	*	1 JAN 2145	88	0.
1 JAN 0315	14	0.	*	1 JAN 0930	39	662.	*	1 JAN 1545	64	0.	*	1 JAN 2200	89	0.
1 JAN 0330	15	0.	*	1 JAN 0945	40	471.	*	1 JAN 1600	65	0.	*	1 JAN 2215	90	0.
1 JAN 0345	16	0.	*	1 JAN 1000	41	425.	*	1 JAN 1615	66	0.	*	1 JAN 2230	91	0.
1 JAN 0400	17	0.	*	1 JAN 1015	42	271.	*	1 JAN 1630	67	0.	*	1 JAN 2245	92	0.
1 JAN 0415	18	0.	*	1 JAN 1030	43	98.	*	1 JAN 1645	68	0.	*	1 JAN 2300	93	0.
1 JAN 0430	19	0.	*	1 JAN 1045	44	27.	*	1 JAN 1700	69	0.	*	1 JAN 2315	94	0.
1 JAN 0445	20	0.	*	1 JAN 1100	45	9.	*	1 JAN 1715	70	0.	*	1 JAN 2330	95	0.
1 JAN 0500	21	6.	*	1 JAN 1115	46	3.	*	1 JAN 1730	71	0.	*	1 JAN 2345	96	0.
1 JAN 0515	22	13.	*	1 JAN 1130	47	1.	*	1 JAN 1745	72	0.	*	2 JAN 0000	97	0.
1 JAN 0530	23	25.	*	1 JAN 1145	48	0.	*	1 JAN 1800	73	0.	*	2 JAN 0015	98	0.
1 JAN 0545	24	40.	*	1 JAN 1200	49	0.	*	1 JAN 1815	74	0.	*	2 JAN 0030	99	0.
1 JAN 0600	25	55.	*	1 JAN 1215	50	0.	*	1 JAN 1830	75	0.	*	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1586.	8.00	574.	144.	139.	139.
		(INCHES) 1.493	1.494	1.494	1.494
		(AC-FT) 285.	285.	285.	285.

CUMULATIVE AREA = 3.57 SQ MI

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            **************
            *            *
 111 KK     *        2R  *        CNAME      2C
            *            *
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112 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

113 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.13	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 2R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 2R

DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	*	1 JAN 0615	26	62.	*	1 JAN 1230	51	0.	*	1 JAN 1845	76	0.
1 JAN 0015	2	0.	*	1 JAN 0630	27	77.	*	1 JAN 1245	52	0.	*	1 JAN 1900	77	0.
1 JAN 0030	3	0.	*	1 JAN 0645	28	91.	*	1 JAN 1300	53	0.	*	1 JAN 1915	78	0.
1 JAN 0045	4	0.	*	1 JAN 0700	29	105.	*	1 JAN 1315	54	0.	*	1 JAN 1930	79	0.
1 JAN 0100	5	0.	*	1 JAN 0715	30	246.	*	1 JAN 1330	55	0.	*	1 JAN 1945	80	0.
1 JAN 0115	6	0.	*	1 JAN 0730	31	644.	*	1 JAN 1345	56	0.	*	1 JAN 2000	81	0.
1 JAN 0130	7	0.	*	1 JAN 0745	32	1091.	*	1 JAN 1400	57	0.	*	1 JAN 2015	82	0.
1 JAN 0145	8	0.	*	1 JAN 0800	33	1432.	*	1 JAN 1415	58	0.	*	1 JAN 2030	83	0.
1 JAN 0200	9	0.	*	1 JAN 0815	34	1596.	*	1 JAN 1430	59	0.	*	1 JAN 2045	84	0.
1 JAN 0215	10	0.	*	1 JAN 0830	35	1529.	*	1 JAN 1445	60	0.	*	1 JAN 2100	85	0.
1 JAN 0230	11	0.	*	1 JAN 0845	36	1445.	*	1 JAN 1500	61	0.	*	1 JAN 2115	86	0.
1 JAN 0245	12	0.	*	1 JAN 0900	37	1461.	*	1 JAN 1515	62	0.	*	1 JAN 2130	87	0.
1 JAN 0300	13	0.	*	1 JAN 0915	38	1336.	*	1 JAN 1530	63	0.	*	1 JAN 2145	88	0.
1 JAN 0315	14	0.	*	1 JAN 0930	39	914.	*	1 JAN 1545	64	0.	*	1 JAN 2200	89	0.
1 JAN 0330	15	0.	*	1 JAN 0945	40	562.	*	1 JAN 1600	65	0.	*	1 JAN 2215	90	0.
1 JAN 0345	16	0.	*	1 JAN 1000	41	445.	*	1 JAN 1615	66	0.	*	1 JAN 2230	91	0.
1 JAN 0400	17	0.	*	1 JAN 1015	42	359.	*	1 JAN 1630	67	0.	*	1 JAN 2245	92	0.
1 JAN 0415	18	0.	*	1 JAN 1030	43	191.	*	1 JAN 1645	68	0.	*	1 JAN 2300	93	0.
1 JAN 0430	19	0.	*	1 JAN 1045	44	61.	*	1 JAN 1700	69	0.	*	1 JAN 2315	94	0.
1 JAN 0445	20	0.	*	1 JAN 1100	45	17.	*	1 JAN 1715	70	0.	*	1 JAN 2330	95	0.
1 JAN 0500	21	2.	*	1 JAN 1115	46	6.	*	1 JAN 1730	71	0.	*	1 JAN 2345	96	0.
1 JAN 0515	22	9.	*	1 JAN 1130	47	2.	*	1 JAN 1745	72	0.	*	2 JAN 0000	97	0.
1 JAN 0530	23	19.	*	1 JAN 1145	48	0.	*	1 JAN 1800	73	0.	*	2 JAN 0015	98	0.
1 JAN 0545	24	32.	*	1 JAN 1200	49	0.	*	1 JAN 1815	74	0.	*	2 JAN 0030	99	0.
1 JAN 0600	25	47.	*	1 JAN 1215	50	0.	*	1 JAN 1830	75	0.	*	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1596.	8.25	574.	144.	139.	139.
		(INCHES) 1.492	1.494	1.494	1.494
		(AC-FT) 285.	285.	285.	285.

CUMULATIVE AREA = 3.57 SQ MI

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          **************
          *            *
114 KK    *        1B  *
          *            *
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115 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

116 BA SUBBASIN CHARACTERISTICS

TAREA,	0.65	SUBBASIN AREA

PRECIPITATION DATA

119 PT	TOTAL STORM STATIONS		Gage
120 PW		WEIGHTS	0.66
117 PR	RECORDING STATIONS		Gage
118 PW		WEIGHTS	1.00

121 LS SCS LOSS RATE

STRTL	0.73	INITIAL ABSTRACTION
CRVNBR	73.13	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

122 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	4.10	0.00	0.66

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.38	0.37
0.38	0.38	0.25	0.25	0.25	0.25	0.06	0.06	0.06	0.06

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1243.	348.	68.	14.	0.

HYDROGRAPH AT STATION 1B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.03	0.03	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.03	0.03	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.03	0.03	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.

1	JAN	0315	14	0.06	0.06	0.00	0.	*	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.06	0.06	0.00	0.	*	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.06	0.06	0.00	0.	*	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.06	0.06	0.00	0.	*	1	JAN	1630	67	0.00	0.00	0.00	0.
1	JAN	0415	18	0.12	0.12	0.00	0.	*	1	JAN	1645	68	0.00	0.00	0.00	0.
1	JAN	0430	19	0.13	0.13	0.00	0.	*	1	JAN	1700	69	0.00	0.00	0.00	0.
1	JAN	0445	20	0.12	0.12	0.00	0.	*	1	JAN	1715	70	0.00	0.00	0.00	0.
1	JAN	0500	21	0.12	0.12	0.00	4.	*	1	JAN	1730	71	0.00	0.00	0.00	0.
1	JAN	0515	22	0.06	0.06	0.00	7.	*	1	JAN	1745	72	0.00	0.00	0.00	0.
1	JAN	0530	23	0.06	0.06	0.01	10.	*	1	JAN	1800	73	0.00	0.00	0.00	0.
1	JAN	0545	24	0.06	0.05	0.01	13.	*	1	JAN	1815	74	0.00	0.00	0.00	0.
1	JAN	0600	25	0.06	0.05	0.01	16.	*	1	JAN	1830	75	0.00	0.00	0.00	0.
1	JAN	0615	26	0.06	0.05	0.01	19.	*	1	JAN	1845	76	0.00	0.00	0.00	0.
1	JAN	0630	27	0.06	0.05	0.01	21.	*	1	JAN	1900	77	0.00	0.00	0.00	0.
1	JAN	0645	28	0.06	0.05	0.01	24.	*	1	JAN	1915	78	0.00	0.00	0.00	0.
1	JAN	0700	29	0.06	0.05	0.02	26.	*	1	JAN	1930	79	0.00	0.00	0.00	0.
1	JAN	0715	30	0.38	0.25	0.12	158.	*	1	JAN	1945	80	0.00	0.00	0.00	0.
1	JAN	0730	31	0.37	0.22	0.16	242.	*	1	JAN	2000	81	0.00	0.00	0.00	0.
1	JAN	0745	32	0.38	0.19	0.19	300.	*	1	JAN	2015	82	0.00	0.00	0.00	0.
1	JAN	0800	33	0.38	0.16	0.21	344.	*	1	JAN	2030	83	0.00	0.00	0.00	0.
1	JAN	0815	34	0.25	0.10	0.15	280.	*	1	JAN	2045	84	0.00	0.00	0.00	0.
1	JAN	0830	35	0.25	0.09	0.16	271.	*	1	JAN	2100	85	0.00	0.00	0.00	0.
1	JAN	0845	36	0.25	0.08	0.17	278.	*	1	JAN	2115	86	0.00	0.00	0.00	0.
1	JAN	0900	37	0.25	0.08	0.17	288.	*	1	JAN	2130	87	0.00	0.00	0.00	0.
1	JAN	0915	38	0.06	0.02	0.04	129.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.06	0.02	0.04	85.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.06	0.02	0.05	77.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.06	0.02	0.05	76.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	19.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	4.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	1.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

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TOTAL RAINFALL = 4.10, TOTAL LOSS = 2.49, TOTAL EXCESS = 1.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
	(CFS)				
+ 344.	8.00	112.	28.	27.	27.
	(INCHES)	1.608	1.609	1.609	1.609
	(AC-FT)	56.	56.	56.	56.

CUMULATIVE AREA = 0.65 SQ MI

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123 KK 1C CNAME 1C

124 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

125 HC HYDROGRAPH COMBINATION

ICOMP	2	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 1C
SUM OF 2 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	81.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	98.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	115.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	131.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	404.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	886.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	1390.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	1776.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	1877.	1	JAN	1430	59	0.	1	JAN	2045	84	0.

1 JAN 0215	10	0.	*	1 JAN 0830	35	1800.	*	1 JAN 1445	60	0.	*	1 JAN 2100	85	0.					
1 JAN 0230	11	0.	*	1 JAN 0845	36	1724.	*	1 JAN 1500	61	0.	*	1 JAN 2115	86	0.					
1 JAN 0245	12	0.	*	1 JAN 0900	37	1749.	*	1 JAN 1515	62	0.	*	1 JAN 2130	87	0.					
1 JAN 0300	13	0.	*	1 JAN 0915	38	1466.	*	1 JAN 1530	63	0.	*	1 JAN 2145	88	0.					
1 JAN 0315	14	0.	*	1 JAN 0930	39	1000.	*	1 JAN 1545	64	0.	*	1 JAN 2200	89	0.					
1 JAN 0330	15	0.	*	1 JAN 0945	40	639.	*	1 JAN 1600	65	0.	*	1 JAN 2215	90	0.					
1 JAN 0345	16	0.	*	1 JAN 1000	41	520.	*	1 JAN 1615	66	0.	*	1 JAN 2230	91	0.					
1 JAN 0400	17	0.	*	1 JAN 1015	42	378.	*	1 JAN 1630	67	0.	*	1 JAN 2245	92	0.					
1 JAN 0415	18	0.	*	1 JAN 1030	43	195.	*	1 JAN 1645	68	0.	*	1 JAN 2300	93	0.					
1 JAN 0430	19	0.	*	1 JAN 1045	44	62.	*	1 JAN 1700	69	0.	*	1 JAN 2315	94	0.					
1 JAN 0445	20	0.	*	1 JAN 1100	45	17.	*	1 JAN 1715	70	0.	*	1 JAN 2330	95	0.					
1 JAN 0500	21	7.	*	1 JAN 1115	46	6.	*	1 JAN 1730	71	0.	*	1 JAN 2345	96	0.					
1 JAN 0515	22	16.	*	1 JAN 1130	47	2.	*	1 JAN 1745	72	0.	*	2 JAN 0000	97	0.					
1 JAN 0530	23	29.	*	1 JAN 1145	48	0.	*	1 JAN 1800	73	0.	*	2 JAN 0015	98	0.					
1 JAN 0545	24	45.	*	1 JAN 1200	49	0.	*	1 JAN 1815	74	0.	*	2 JAN 0030	99	0.					
1 JAN 0600	25	63.	*	1 JAN 1215	50	0.	*	1 JAN 1830	75	0.	*	2 JAN 0045	100	0.					

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1877.	8.25	686.	172.	166.	166.
		(INCHES) 1.510	1.511	1.511	1.511
		(AC-FT) 340.	340.	340.	340.

CUMULATIVE AREA = 4.22 SQ MI

*** ***

```
          **************
          *            *
126 KK    *       1C   *       CNAME      1C
          *            *
          **************
```

127 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

128 RN NO ROUTING

***

HYDROGRAPH AT STATION 1C

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	81.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	98.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	115.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	131.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	404.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	886.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	1390.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	1776.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	1877.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	1800.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	1724.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	1749.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	1466.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	1000.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	639.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	520.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	378.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	195.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	62.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	17.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	7.	1 JAN 1115	46	6.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	16.	1 JAN 1130	47	2.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	29.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	45.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	63.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			

+	1877.	8.25		686.	172.	166.	166.
			(INCHES)	1.510	1.511	1.511	1.511
			(AC-FT)	340.	340.	340.	340.

CUMULATIVE AREA = 4.22 SQ MI

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	6B	112.	8.00	38.	10.	9.	0.25		
+	ROUTED TO	6R	109.	8.00	38.	10.	9.	0.25		
+	HYDROGRAPH AT	7bB	132.	8.00	43.	11.	10.	0.27		
+	HYDROGRAPH AT	7aB	284.	8.00	92.	23.	22.	0.56		
+	3 COMBINED AT	7C	525.	8.00	173.	43.	42.	1.08		
+	ROUTED TO	7R	500.	8.00	173.	43.	42.	1.08		
+	HYDROGRAPH AT	5B	279.	8.00	99.	25.	24.	0.64		
+	ROUTED TO	5R	280.	8.25	99.	25.	24.	0.64		
+	HYDROGRAPH AT	4B	173.	8.25	63.	16.	15.	0.41		
+	ROUTED TO	4R	176.	8.25	62.	16.	15.	0.41		
+	HYDROGRAPH AT	3aB	177.	8.25	64.	16.	16.	0.41		
+	HYDROGRAPH AT	3bB	197.	8.00	71.	18.	17.	0.44		
+	4 COMBINED AT	3C	827.	8.25	296.	74.	72.	1.90		
+	ROUTED TO	3R	833.	8.25	296.	74.	72.	1.90		
+	HYDROGRAPH AT	2bB	61.	8.00	20.	5.	5.	0.12		
+	HYDROGRAPH AT	2aB	259.	8.00	84.	21.	20.	0.48		
+	4 COMBINED AT	2C	1586.	8.00	574.	144.	139.	3.57		
+	ROUTED TO	2R	1596.	8.25	574.	144.	139.	3.57		
+	HYDROGRAPH AT	1B	344.	8.00	112.	28.	27.	0.65		
+	2 COMBINED AT	1C	1877.	8.25	686.	172.	166.	4.22		
+	ROUTED TO	1C	1877.	8.25	686.	172.	166.	4.22		

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991           *
 *            VERSION 4.0.1E         *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
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*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Scrabble Creek
   2          ID    wo Mining & w Logging (Scenario 5), 10m DEM Data
   3          ID    25 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1

   6          KK      6B
   7          KO       0       0     0.0       1      22
   8          BA  0.2503
   9          PB    4.75
  10          IN       6  1JAN94       0
              * typeII-24hour
  11          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  12          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  13          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  14          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  15          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  16          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  17          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  18          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  19          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  20          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  21          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  22          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  23          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  24          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  25          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  26          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  27          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  28          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  29          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  30          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  31          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  32          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  33          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  34          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  35          PC     1.0
  36          LS     0.0    70.5     0.0
  37          UD    0.21

  38          KK      6R   CNAME      6C
  39          KO       0       0     0.0       0      22
  40          RM       1   0.037     0.2

  41          KK     7bB
  42          KO       0       0     0.0       1      22
  43          BA  0.2668
  44          PB    4.75
  45          IN       6  1JAN94       0
              * typeII-24hour
  46          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  47          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  48          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  49          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
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HEC-1 INPUT PAGE 2

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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 50          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 51          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 52          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 53          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 54          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 55          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 56          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 57          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 58          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 59          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 60          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 61          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 62          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 63          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 64          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 65          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 66          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 67          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 68          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 69          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 70          PC     1.0
 71          LS     0.0   71.37     0.0
 72          UD     0.0

 73          KK      7aB
 74          KO        0       0     0.0       1      22
 75          BA   0.5585
 76          PB     4.75
 77          IN        6  1JAN94       0
             * typeII-24hour
 78          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 79          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 80          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 81          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 82          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 83          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 84          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 85          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 86          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 87          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 88          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 89          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 90          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 91          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 92          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 93          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 94          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 95          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 96          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 97          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 98          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 99          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
100          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
101          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
102          PC     1.0
```



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

103          LS     0.0   72.08     0.0
104          UD     0.0

105          KK      7C   CNAME      7R
106          KO       0       0     0.0       0      22
107          HC       3

108          KK      7R   CNAME      7C
109          KO       0       0     0.0       0      22
110          RM       1   0.087     0.2

111          KK      5B
112          KO       0       0     0.0       1      22
113          BA   0.6425
114          PB     4.75
115          IN        6  1JAN94       0
             * typeII-24hour
116          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
117          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
118          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
119          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
120          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
121          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
122          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
123          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
124          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
125          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
126          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
127          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
128          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
129          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
130          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
131          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
132          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
133          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
134          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
135          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
136          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
```

```
 137          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 138          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 139          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 140          PC     1.0
 141          LS     0.0    70.5     0.0
 142          UD  0.2376

 143          KK      5R   CNAME      5C
 144          KO       0       0     0.0       0      22
 145          RM       1   0.099     0.2

 146          KK      4B
 147          KO       0       0     0.0       1      22
 148          BA  0.4066
 149          PB    4.75
 150          IN       6  1JAN94       0
              * typeII-24hour
```



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

 151          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 152          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 153          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 154          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 155          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 156          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 157          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 158          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 159          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 160          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 161          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 162          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 163          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 164          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 165          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 166          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 167          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 168          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 169          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 170          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 171          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 172          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 173          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 174          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 175          PC     1.0
 176          LS     0.0    70.5     0.0
 177          UD  0.2643

 178          KK      4R   CNAME      4C
 179          KO       0       0     0.0       0      22
 180          RM       1   0.091     0.2

 181          KK     3aB
 182          KO       0       0     0.0       1      22
 183          BA  0.4142
 184          PB    4.75
 185          IN       6  1JAN94       0
              * typeII-24hour
 186          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 187          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 188          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 189          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 190          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 191          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 192          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 193          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 194          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 195          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 196          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 197          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 198          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 199          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 200          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 201          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 202          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
```



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

 203          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 204          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 205          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 206          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 207          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 208          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 209          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 210          PC     1.0
 211          LS     0.0   70.59     0.0
 212          UD  0.2705

 213          KK     3bB
 214          KO       0       0     0.0       1      22
 215          BA  0.4375
 216          PB    4.75
 217          IN       6  1JAN94       0
```

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            * typeII-24hour
 218        PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 219        PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 220        PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 221        PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 222        PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 223        PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 224        PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 225        PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 226        PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 227        PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 228        PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 229        PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 230        PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 231        PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 232        PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 233        PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 234        PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 235        PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 236        PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 237        PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 238        PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 239        PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 240        PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 241        PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 242        PC     1.0
 243        LS     0.0   71.79     0.0
 244        UD  0.2643

 245        KK      3C   CNAME      3R
 246        KO       0       0     0.0       0      22
 247        HC       4

 248        KK      3R   CNAME      3C
 249        KO       0       0     0.0       0      22
 250        RM       1   0.041     0.2
```



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

 251        KK     2bB
 252        KO       0       0     0.0       1      22
 253        BA  0.1177
 254        PB    4.75
 255        IN       6  1JAN94       0
            * typeII-24hour
 256        PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 257        PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 258        PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 259        PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 260        PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 261        PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 262        PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 263        PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 264        PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 265        PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 266        PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 267        PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 268        PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 269        PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 270        PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 271        PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 272        PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 273        PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 274        PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 275        PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 276        PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 277        PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 278        PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 279        PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 280        PC     1.0
 281        LS     0.0   72.42     0.0
 282        UD     0.0

 283        KK     2aB
 284        KO       0       0     0.0       1      22
 285        BA  0.4804
 286        PB    4.75
 287        IN       6  1JAN94       0
            * typeII-24hour
 288        PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 289        PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 290        PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 291        PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 292        PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 293        PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 294        PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 295        PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 296        PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 297        PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 298        PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 299        PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 300        PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 301        PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 302          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 303          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 304          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 305          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 306          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 307          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 308          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 309          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 310          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 311          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 312          PC     1.0
 313          LS     0.0    73.5     0.0
 314          UD     0.0

 315          KK      2C   CNAME      2R
 316          KO       0       0     0.0       0      22
 317          HC       4

 318          KK      2R   CNAME      2C
 319          KO       0       0     0.0       0      22
 320          RM       1   0.134     0.2

 321          KK      1B
 322          KO       0       0     0.0       1      22
 323          BA  0.6484
 324          PB    4.75
 325          IN       6  1JAN94       0
              * typeII-24hour
 326          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 327          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 328          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 329          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 330          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 331          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 332          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 333          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 334          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 335          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 336          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 337          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 338          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 339          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 340          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 341          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 342          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 343          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 344          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 345          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 346          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 347          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 348          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 349          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 350          PC     1.0
 351          LS     0.0   73.13     0.0
 352          UD     0.0
```



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


 353          KK      1C   CNAME      1C
 354          KO       0       0     0.0       0      22
 355          HC       2

 356          KK      1C   CNAME      1C
 357          KO       0       0     0.0       0      22
 358          RN      1C
 359          ZZ
```

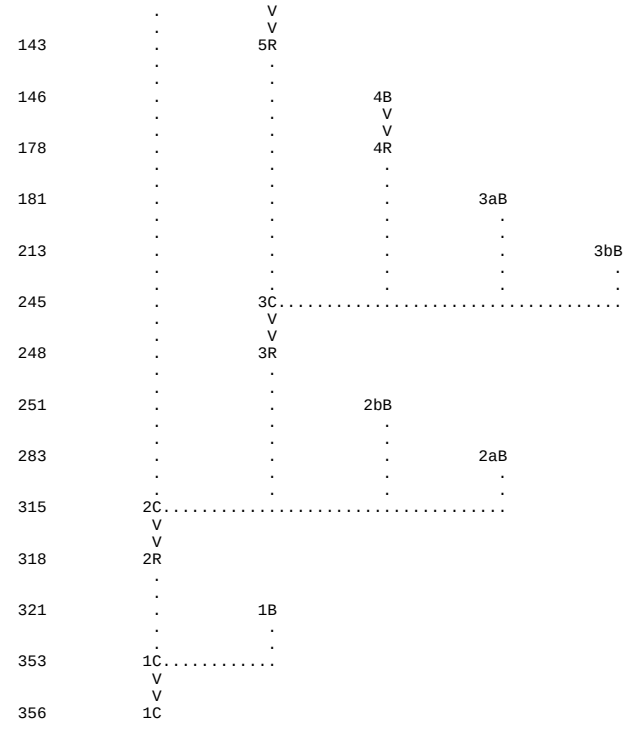
SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    6          6B
                V
                V
   38          6R
                .
                .
   41           .         7bB
                .          .
                .          .
   73           .          .         7aB
                .          .          .
                .          .          .
  105          7C.......................
                V
                V
  108          7R
                .
                .
  111           .          5B
```

```
                .          V
                .          V
   143          .          5R
                .           .
                .           .
   146          .           .          4B
                .           .           V
                .           .           V
   178          .           .          4R
                .           .           .
                .           .           .
   181          .           .           .         3aB
                .           .           .           .
                .           .           .           .
   213          .           .           .           .         3bB
                .           .           .           .           .
                .           .           .           .           .
   245          .          3C.................................
                .           V
                .           V
   248          .          3R
                .           .
                .           .
   251          .           .         2bB
                .           .           .
                .           .           .
   283          .           .           .         2aB
                .           .           .           .
                .           .           .           .
   315         2C.................................
                V
                V
   318         2R
                .
                .
   321          .          1B
                .           .
                .           .
   353         1C............
                V
                V
   356         1C
```



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************                                    ****************************************
 *                                      *                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              MAY   1991              *                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.0.1E            *                                    *          609 SECOND STREET           *
 *                                      *                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE            TIME            *                                    *           (916) 551-1748             *
 *                                      *                                    *                                      *
 ****************************************                                    ****************************************
```

```
                         Scrabble Creek
                         wo Mining & w Logging (Scenario 5), 10m DEM Data
                         25 yr Storm

   5 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN          15  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1JAN94  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2JAN94  ENDING DATE
                      NDTIME        0045  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL    0.25 HOURS
                     TOTAL TIME BASE   24.75 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 KK     *        6B  *
            *            *
            **************
```

```
  7 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


 10 IN          TIME DATA FOR INPUT TIME SERIES
                       JXMIN          6  TIME INTERVAL IN MINUTES
                      JXDATE     1JAN94  STARTING DATE
                      JXTIME          0  STARTING TIME

             SUBBASIN RUNOFF DATA

  8 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.25  SUBBASIN AREA

             PRECIPITATION DATA

  9 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

 11 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

 36 LS          SCS LOSS RATE
                      STRTL       0.84  INITIAL ABSTRACTION
                      CRVNBR     70.50  CURVE NUMBER
                       RTIMP      0.00  PERCENT IMPERVIOUS AREA

 37 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.21  LAG

                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             6 END-OF-PERIOD ORDINATES
                307.      242.       69.       20.        6.        2.
```

****

HYDROGRAPH AT STATION 6B

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	102.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	61.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	43.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	34.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	28.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	25.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	22.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	20.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	19.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	18.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	17.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	16.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	15.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	14.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	13.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	13.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	12.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	12.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	11.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	11.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	11.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	10.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	10.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	10.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	10.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	9.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	9.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	9.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	8.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	8.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	8.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	7.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	7.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	7.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	7.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	7.

1 JAN 0900	37	0.04	0.04	0.00	0.	*	1 JAN 2130	87	0.01	0.00	0.01	7.
1 JAN 0915	38	0.04	0.04	0.00	0.	*	1 JAN 2145	88	0.01	0.00	0.01	7.
1 JAN 0930	39	0.04	0.04	0.00	0.	*	1 JAN 2200	89	0.01	0.00	0.01	7.
1 JAN 0945	40	0.04	0.04	0.00	0.	*	1 JAN 2215	90	0.01	0.00	0.01	7.
1 JAN 1000	41	0.05	0.05	0.00	0.	*	1 JAN 2230	91	0.01	0.00	0.01	7.
1 JAN 1015	42	0.05	0.05	0.00	0.	*	1 JAN 2245	92	0.01	0.00	0.01	7.
1 JAN 1030	43	0.06	0.06	0.00	1.	*	1 JAN 2300	93	0.01	0.00	0.01	7.
1 JAN 1045	44	0.07	0.06	0.01	2.	*	1 JAN 2315	94	0.01	0.00	0.01	6.
1 JAN 1100	45	0.08	0.07	0.01	4.	*	1 JAN 2330	95	0.01	0.00	0.01	6.
1 JAN 1115	46	0.10	0.09	0.01	7.	*	1 JAN 2345	96	0.01	0.00	0.01	6.
1 JAN 1130	47	0.13	0.10	0.02	11.	*	2 JAN 0000	97	0.01	0.00	0.01	6.
1 JAN 1145	48	0.52	0.37	0.15	52.	*	2 JAN 0015	98	0.00	0.00	0.00	3.
1 JAN 1200	49	1.28	0.66	0.62	228.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.20	0.08	0.12	198.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

*

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 228.	12.00	41.	13.	12.	12.
		(INCHES) 1.538	1.891	1.891	1.891
		(AC-FT) 21.	25.	25.	25.

CUMULATIVE AREA = 0.25 SQ MI

*** ***

****
*
38 KK * 6R * CNAME 6C
*
****

39 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

40 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.04	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 6R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 6R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	107.	1 JAN 1845	76	9.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	68.	1 JAN 1900	77	9.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	43.	1 JAN 1915	78	9.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	36.	1 JAN 1930	79	8.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	28.	1 JAN 1945	80	8.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	26.	1 JAN 2000	81	8.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	22.	1 JAN 2015	82	7.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	20.	1 JAN 2030	83	7.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	19.	1 JAN 2045	84	7.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	18.	1 JAN 2100	85	7.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	17.	1 JAN 2115	86	7.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	16.	1 JAN 2130	87	7.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	15.	1 JAN 2145	88	7.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	14.	1 JAN 2200	89	7.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	13.	1 JAN 2215	90	7.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	13.	1 JAN 2230	91	7.
1 JAN 0400	17	0.	1 JAN 1015	42	0.	1 JAN 1630	67	12.	1 JAN 2245	92	7.
1 JAN 0415	18	0.	1 JAN 1030	43	1.	1 JAN 1645	68	12.	1 JAN 2300	93	7.
1 JAN 0430	19	0.	1 JAN 1045	44	2.	1 JAN 1700	69	11.	1 JAN 2315	94	6.
1 JAN 0445	20	0.	1 JAN 1100	45	4.	1 JAN 1715	70	11.	1 JAN 2330	95	6.
1 JAN 0500	21	0.	1 JAN 1115	46	6.	1 JAN 1730	71	11.	1 JAN 2345	96	6.
1 JAN 0515	22	0.	1 JAN 1130	47	10.	1 JAN 1745	72	11.	2 JAN 0000	97	6.
1 JAN 0530	23	0.	1 JAN 1145	48	43.	1 JAN 1800	73	10.	2 JAN 0015	98	4.
1 JAN 0545	24	0.	1 JAN 1200	49	192.	1 JAN 1815	74	10.	2 JAN 0030	99	1.
1 JAN 0600	25	0.	1 JAN 1215	50	228.	1 JAN 1830	75	10.	2 JAN 0045	100	0.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR (CFS)	24-HR	72-HR	24.75-HR
228.	12.25	41.	13.	12.	12.
	(INCHES)	1.538	1.891	1.891	1.891
	(AC-FT)	21.	25.	25.	25.

CUMULATIVE AREA = 0.25 SQ MI

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          **************
          *            *
  41 KK   *       7bB  *
          *            *
          **************
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  42 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

  45 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

  43 BA SUBBASIN CHARACTERISTICS

TAREA,	0.27	SUBBASIN AREA

PRECIPITATION DATA

  44 PB STORM 4.75 BASIN TOTAL PRECIPITATION

  46 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

  71 LS SCS LOSS RATE

STRTL	0.80	INITIAL ABSTRACTION
CRVNBR	71.37	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

  72 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

512.	143.	28.	6.	0.

****

HYDROGRAPH AT STATION 7bB

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	82.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	51.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	39.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	33.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	29.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	26.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	23.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	21.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	20.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	19.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	18.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	17.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	16.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	15.

| | | |

0.00 0.00 0.00 0.00 0.00 0.00

103 LS SCS LOSS RATE
STRTL 0.77 INITIAL ABSTRACTION
CRVNBR 72.08 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

104 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.00 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
1071. 300. 59. 12. 0.

HYDROGRAPH AT STATION 7aB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	175.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	110.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	83.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	70.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	62.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	54.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.01	0.03	49.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	44.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	42.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	40.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	38.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	36.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	34.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	32.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	30.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	28.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	28.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	27.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	26.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	25.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	25.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	24.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	23.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	22.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	22.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	21.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.00	0.01	20.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.00	0.01	20.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	19.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	18.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	17.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	17.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	16.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	16.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	16.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	16.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	16.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	16.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	16.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	15.
1	JAN	1000	41	0.05	0.04	0.00	2.	1	JAN	2230	91	0.01	0.00	0.01	15.
1	JAN	1015	42	0.05	0.05	0.00	3.	1	JAN	2245	92	0.01	0.00	0.01	15.
1	JAN	1030	43	0.06	0.05	0.00	6.	1	JAN	2300	93	0.01	0.00	0.01	15.
1	JAN	1045	44	0.07	0.06	0.01	9.	1	JAN	2315	94	0.01	0.00	0.01	15.
1	JAN	1100	45	0.08	0.07	0.01	14.	1	JAN	2330	95	0.01	0.00	0.01	14.
1	JAN	1115	46	0.10	0.08	0.02	23.	1	JAN	2345	96	0.01	0.00	0.01	15.
1	JAN	1130	47	0.13	0.10	0.03	36.	2	JAN	0000	97	0.01	0.00	0.01	14.
1	JAN	1145	48	0.52	0.35	0.17	188.	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.28	0.62	0.66	762.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.13	346.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.74, TOTAL EXCESS = 2.01

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 762.	12.00	98.	30.	29.	29.
		(INCHES) 1.639	2.013	2.013	2.013
		(AC-FT) 49.	60.	60.	60.

CUMULATIVE AREA = 0.56 SQ MI

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          *            *
105 KK    *        7C  *        CNAME      7R
          *            *
          **************

106 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


107 HC          HYDROGRAPH COMBINATION
                     ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***
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HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	364.	1 JAN 1845	76	40.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	229.	1 JAN 1900	77	38.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	165.	1 JAN 1915	78	37.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	139.	1 JAN 1930	79	36.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	119.	1 JAN 1945	80	34.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	106.	1 JAN 2000	81	33.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	94.	1 JAN 2015	82	32.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	86.	1 JAN 2030	83	31.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	80.	1 JAN 2045	84	31.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	76.	1 JAN 2100	85	31.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	72.	1 JAN 2115	86	30.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	69.	1 JAN 2130	87	30.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	65.	1 JAN 2145	88	30.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	61.	1 JAN 2200	89	30.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	57.	1 JAN 2215	90	29.
1 JAN 0345	16	0.	1 JAN 1000	41	2.	1 JAN 1615	66	54.	1 JAN 2230	91	29.
1 JAN 0400	17	0.	1 JAN 1015	42	5.	1 JAN 1630	67	53.	1 JAN 2245	92	29.
1 JAN 0415	18	0.	1 JAN 1030	43	9.	1 JAN 1645	68	51.	1 JAN 2300	93	29.
1 JAN 0430	19	0.	1 JAN 1045	44	15.	1 JAN 1700	69	50.	1 JAN 2315	94	28.
1 JAN 0445	20	0.	1 JAN 1100	45	24.	1 JAN 1715	70	48.	1 JAN 2330	95	28.
1 JAN 0500	21	0.	1 JAN 1115	46	39.	1 JAN 1730	71	47.	1 JAN 2345	96	28.
1 JAN 0515	22	0.	1 JAN 1130	47	62.	1 JAN 1745	72	46.	2 JAN 0000	97	27.
1 JAN 0530	23	0.	1 JAN 1145	48	316.	1 JAN 1800	73	44.	2 JAN 0015	98	9.
1 JAN 0545	24	0.	1 JAN 1200	49	1307.	1 JAN 1815	74	43.	2 JAN 0030	99	2.
1 JAN 0600	25	0.	1 JAN 1215	50	734.	1 JAN 1830	75	42.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1307.	12.00	185.	57.	55.	55.
		(INCHES) 1.603	1.971	1.971	1.971
		(AC-FT) 92.	113.	113.	113.

CUMULATIVE AREA = 1.08 SQ MI

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          **************
          *            *
108 KK    *        7R  *        CNAME      7C
          *            *
          **************

109 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

110 RM          MUSKINGUM ROUTING
                     NSTPS           1 NUMBER OF SUBREACHES
                     AMSKK        0.09 MUSKINGUM K
                         X        0.20 MUSKINGUM X
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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   7R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 7R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	423.	1 JAN 1845	76	41.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	272.	1 JAN 1900	77	39.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	181.	1 JAN 1915	78	38.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	146.	1 JAN 1930	79	36.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	126.	1 JAN 1945	80	35.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	110.	1 JAN 2000	81	33.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	98.	1 JAN 2015	82	32.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	88.	1 JAN 2030	83	31.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	82.	1 JAN 2045	84	31.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	77.	1 JAN 2100	85	31.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	74.	1 JAN 2115	86	31.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	70.	1 JAN 2130	87	30.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	66.	1 JAN 2145	88	30.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	62.	1 JAN 2200	89	30.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	59.	1 JAN 2215	90	29.
1 JAN 0345	16	0.	1 JAN 1000	41	1.	1 JAN 1615	66	55.	1 JAN 2230	91	29.
1 JAN 0400	17	0.	1 JAN 1015	42	4.	1 JAN 1630	67	53.	1 JAN 2245	92	29.
1 JAN 0415	18	0.	1 JAN 1030	43	8.	1 JAN 1645	68	52.	1 JAN 2300	93	29.
1 JAN 0430	19	0.	1 JAN 1045	44	13.	1 JAN 1700	69	50.	1 JAN 2315	94	28.
1 JAN 0445	20	0.	1 JAN 1100	45	21.	1 JAN 1715	70	49.	1 JAN 2330	95	28.
1 JAN 0500	21	0.	1 JAN 1115	46	33.	1 JAN 1730	71	47.	1 JAN 2345	96	28.
1 JAN 0515	22	0.	1 JAN 1130	47	53.	1 JAN 1745	72	46.	2 JAN 0000	97	28.
1 JAN 0530	23	0.	1 JAN 1145	48	205.	1 JAN 1800	73	45.	2 JAN 0015	98	17.
1 JAN 0545	24	0.	1 JAN 1200	49	895.	1 JAN 1815	74	43.	2 JAN 0030	99	3.
1 JAN 0600	25	0.	1 JAN 1215	50	1107.	1 JAN 1830	75	42.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1107.	12.25	185.	57.	55.	55.
		(INCHES) 1.603	1.971	1.971	1.971
		(AC-FT) 92.	113.	113.	113.

CUMULATIVE AREA = 1.08 SQ MI

*** ***

```
          **************
          *            *
111 KK    *        5B  *
          *            *
          **************
```

112 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

115 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

113 BA SUBBASIN CHARACTERISTICS

TAREA,	0.64	SUBBASIN AREA

PRECIPITATION DATA

114 PB STORM 4.75 BASIN TOTAL PRECIPITATION

116 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

```
 141 LS          SCS LOSS RATE
                      STRTL       0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

 142 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.24  LAG

                                                      ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
              674.      669.      214.       70.       23.        8.        1.

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

                                                HYDROGRAPH AT STATION       5B

*****************************************************************************************************************************************
                                                                                *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                                *
        1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.14    0.05    0.09       283.
        1 JAN 0015    2    0.01    0.01    0.00         0.       *        1 JAN 1245   52    0.10    0.04    0.06       171.
        1 JAN 0030    3    0.01    0.01    0.00         0.       *        1 JAN 1300   53    0.08    0.03    0.05       117.
        1 JAN 0045    4    0.01    0.01    0.00         0.       *        1 JAN 1315   54    0.07    0.02    0.04        91.
        1 JAN 0100    5    0.01    0.01    0.00         0.       *        1 JAN 1330   55    0.06    0.02    0.04        75.
        1 JAN 0115    6    0.01    0.01    0.00         0.       *        1 JAN 1345   56    0.05    0.02    0.03        65.
        1 JAN 0130    7    0.01    0.01    0.00         0.       *        1 JAN 1400   57    0.05    0.02    0.03        58.
        1 JAN 0145    8    0.01    0.01    0.00         0.       *        1 JAN 1415   58    0.04    0.01    0.03        52.
        1 JAN 0200    9    0.01    0.01    0.00         0.       *        1 JAN 1430   59    0.04    0.01    0.03        48.
        1 JAN 0215   10    0.01    0.01    0.00         0.       *        1 JAN 1445   60    0.04    0.01    0.03        45.
        1 JAN 0230   11    0.01    0.01    0.00         0.       *        1 JAN 1500   61    0.04    0.01    0.02        43.
        1 JAN 0245   12    0.02    0.02    0.00         0.       *        1 JAN 1515   62    0.03    0.01    0.02        41.
        1 JAN 0300   13    0.02    0.02    0.00         0.       *        1 JAN 1530   63    0.03    0.01    0.02        39.
        1 JAN 0315   14    0.02    0.02    0.00         0.       *        1 JAN 1545   64    0.03    0.01    0.02        37.
        1 JAN 0330   15    0.02    0.02    0.00         0.       *        1 JAN 1600   65    0.03    0.01    0.02        34.
        1 JAN 0345   16    0.02    0.02    0.00         0.       *        1 JAN 1615   66    0.03    0.01    0.02        32.
        1 JAN 0400   17    0.02    0.02    0.00         0.       *        1 JAN 1630   67    0.03    0.01    0.02        31.
        1 JAN 0415   18    0.02    0.02    0.00         0.       *        1 JAN 1645   68    0.03    0.01    0.02        30.
        1 JAN 0430   19    0.02    0.02    0.00         0.       *        1 JAN 1700   69    0.02    0.01    0.02        29.
        1 JAN 0445   20    0.02    0.02    0.00         0.       *        1 JAN 1715   70    0.02    0.01    0.02        29.
        1 JAN 0500   21    0.02    0.02    0.00         0.       *        1 JAN 1730   71    0.02    0.01    0.02        28.
        1 JAN 0515   22    0.02    0.02    0.00         0.       *        1 JAN 1745   72    0.02    0.01    0.02        27.
        1 JAN 0530   23    0.02    0.02    0.00         0.       *        1 JAN 1800   73    0.02    0.01    0.02        26.
        1 JAN 0545   24    0.02    0.02    0.00         0.       *        1 JAN 1815   74    0.02    0.01    0.01        25.
        1 JAN 0600   25    0.02    0.02    0.00         0.       *        1 JAN 1830   75    0.02    0.01    0.01        25.
        1 JAN 0615   26    0.02    0.02    0.00         0.       *        1 JAN 1845   76    0.02    0.01    0.01        24.
        1 JAN 0630   27    0.02    0.02    0.00         0.       *        1 JAN 1900   77    0.02    0.01    0.01        23.
        1 JAN 0645   28    0.02    0.02    0.00         0.       *        1 JAN 1915   78    0.02    0.01    0.01        22.
        1 JAN 0700   29    0.02    0.02    0.00         0.       *        1 JAN 1930   79    0.02    0.00    0.01        21.
        1 JAN 0715   30    0.02    0.02    0.00         0.       *        1 JAN 1945   80    0.02    0.00    0.01        20.
        1 JAN 0730   31    0.02    0.02    0.00         0.       *        1 JAN 2000   81    0.02    0.00    0.01        20.
        1 JAN 0745   32    0.02    0.02    0.00         0.       *        1 JAN 2015   82    0.02    0.00    0.01        19.
        1 JAN 0800   33    0.03    0.03    0.00         0.       *        1 JAN 2030   83    0.01    0.00    0.01        18.
        1 JAN 0815   34    0.03    0.03    0.00         0.       *        1 JAN 2045   84    0.02    0.00    0.01        18.
        1 JAN 0830   35    0.03    0.03    0.00         0.       *        1 JAN 2100   85    0.02    0.00    0.01        18.
        1 JAN 0845   36    0.03    0.03    0.00         0.       *        1 JAN 2115   86    0.01    0.00    0.01        18.
        1 JAN 0900   37    0.04    0.04    0.00         0.       *        1 JAN 2130   87    0.01    0.00    0.01        18.
        1 JAN 0915   38    0.04    0.04    0.00         0.       *        1 JAN 2145   88    0.01    0.00    0.01        18.
        1 JAN 0930   39    0.04    0.04    0.00         0.       *        1 JAN 2200   89    0.01    0.00    0.01        17.
        1 JAN 0945   40    0.04    0.04    0.00         0.       *        1 JAN 2215   90    0.01    0.00    0.01        17.
        1 JAN 1000   41    0.05    0.05    0.00         0.       *        1 JAN 2230   91    0.01    0.00    0.01        17.
        1 JAN 1015   42    0.05    0.05    0.00         1.       *        1 JAN 2245   92    0.01    0.00    0.01        17.
        1 JAN 1030   43    0.06    0.06    0.00         3.       *        1 JAN 2300   93    0.01    0.00    0.01        17.
        1 JAN 1045   44    0.07    0.06    0.01         6.       *        1 JAN 2315   94    0.01    0.00    0.01        17.
        1 JAN 1100   45    0.08    0.07    0.01        10.       *        1 JAN 2330   95    0.01    0.00    0.01        16.
        1 JAN 1115   46    0.10    0.09    0.01        16.       *        1 JAN 2345   96    0.01    0.00    0.01        16.
        1 JAN 1130   47    0.13    0.10    0.02        27.       *        2 JAN 0000   97    0.01    0.00    0.01        16.
        1 JAN 1145   48    0.52    0.37    0.15       119.       *        2 JAN 0015   98    0.00    0.00    0.00        10.
        1 JAN 1200   49    1.28    0.66    0.62       523.       *        2 JAN 0030   99    0.00    0.00    0.00         3.
        1 JAN 1215   50    0.20    0.08    0.12       530.       *        2 JAN 0045  100    0.00    0.00    0.00         1.
                                                                                *
*****************************************************************************************************************************************

     TOTAL RAINFALL =    4.75, TOTAL LOSS =    2.86, TOTAL EXCESS =    1.89

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                          (CFS)
+     530.      12.25                106.          33.         32.          32.
                          (INCHES)    1.537       1.890       1.890        1.890
                           (AC-FT)      53.         65.         65.          65.

                          CUMULATIVE AREA =    0.64 SQ MI


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


              **************
              *            *
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 143 KK     *        5R  *        CNAME      5C
            *            *
            **************

 144 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 145 RM          MUSKINGUM ROUTING
                      NSTPS         1 NUMBER OF SUBREACHES
                      AMSKK      0.10 MUSKINGUM K
                          X      0.20 MUSKINGUM X

                                                          ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      5R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

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

                                                HYDROGRAPH AT STATION       5R

********************************************************************************************************************************************
                                  *                                 *                                 *                                 *
   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW
                                  *                                 *                                 *
    1 JAN 0000    1        0.   *    1 JAN 0615   26        0.   *    1 JAN 1230   51      394.   *    1 JAN 1845   76       24.
    1 JAN 0015    2        0.   *    1 JAN 0630   27        0.   *    1 JAN 1245   52      200.   *    1 JAN 1900   77       23.
    1 JAN 0030    3        0.   *    1 JAN 0645   28        0.   *    1 JAN 1300   53      137.   *    1 JAN 1915   78       22.
    1 JAN 0045    4        0.   *    1 JAN 0700   29        0.   *    1 JAN 1315   54       99.   *    1 JAN 1930   79       22.
    1 JAN 0100    5        0.   *    1 JAN 0715   30        0.   *    1 JAN 1330   55       81.   *    1 JAN 1945   80       21.
    1 JAN 0115    6        0.   *    1 JAN 0730   31        0.   *    1 JAN 1345   56       69.   *    1 JAN 2000   81       20.
    1 JAN 0130    7        0.   *    1 JAN 0745   32        0.   *    1 JAN 1400   57       60.   *    1 JAN 2015   82       19.
    1 JAN 0145    8        0.   *    1 JAN 0800   33        0.   *    1 JAN 1415   58       54.   *    1 JAN 2030   83       18.
    1 JAN 0200    9        0.   *    1 JAN 0815   34        0.   *    1 JAN 1430   59       49.   *    1 JAN 2045   84       18.
    1 JAN 0215   10        0.   *    1 JAN 0830   35        0.   *    1 JAN 1445   60       46.   *    1 JAN 2100   85       18.
    1 JAN 0230   11        0.   *    1 JAN 0845   36        0.   *    1 JAN 1500   61       44.   *    1 JAN 2115   86       18.
    1 JAN 0245   12        0.   *    1 JAN 0900   37        0.   *    1 JAN 1515   62       42.   *    1 JAN 2130   87       18.
    1 JAN 0300   13        0.   *    1 JAN 0915   38        0.   *    1 JAN 1530   63       40.   *    1 JAN 2145   88       18.
    1 JAN 0315   14        0.   *    1 JAN 0930   39        0.   *    1 JAN 1545   64       37.   *    1 JAN 2200   89       17.
    1 JAN 0330   15        0.   *    1 JAN 0945   40        0.   *    1 JAN 1600   65       35.   *    1 JAN 2215   90       17.
    1 JAN 0345   16        0.   *    1 JAN 1000   41        0.   *    1 JAN 1615   66       33.   *    1 JAN 2230   91       17.
    1 JAN 0400   17        0.   *    1 JAN 1015   42        0.   *    1 JAN 1630   67       32.   *    1 JAN 2245   92       17.
    1 JAN 0415   18        0.   *    1 JAN 1030   43        2.   *    1 JAN 1645   68       31.   *    1 JAN 2300   93       17.
    1 JAN 0430   19        0.   *    1 JAN 1045   44        4.   *    1 JAN 1700   69       30.   *    1 JAN 2315   94       17.
    1 JAN 0445   20        0.   *    1 JAN 1100   45        8.   *    1 JAN 1715   70       29.   *    1 JAN 2330   95       16.
    1 JAN 0500   21        0.   *    1 JAN 1115   46       14.   *    1 JAN 1730   71       28.   *    1 JAN 2345   96       16.
    1 JAN 0515   22        0.   *    1 JAN 1130   47       23.   *    1 JAN 1745   72       27.   *    2 JAN 0000   97       16.
    1 JAN 0530   23        0.   *    1 JAN 1145   48       76.   *    1 JAN 1800   73       26.   *    2 JAN 0015   98       13.
    1 JAN 0545   24        0.   *    1 JAN 1200   49      337.   *    1 JAN 1815   74       26.   *    2 JAN 0030   99        5.
    1 JAN 0600   25        0.   *    1 JAN 1215   50      569.   *    1 JAN 1830   75       25.   *    2 JAN 0045  100        1.
                                  *                                 *                                 *
********************************************************************************************************************************************

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+     569.     12.25                106.         33.         32.          32.
                          (INCHES)     1.536       1.890       1.890        1.890
                           (AC-FT)      53.         65.         65.          65.

                          CUMULATIVE AREA =    0.64 SQ MI


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


            **************
            *            *
 146 KK     *        4B  *
            *            *
            **************

 147 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


 150 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
```

```
                JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

148 BA        SUBBASIN CHARACTERISTICS
                TAREA,       0.41  SUBBASIN AREA

            PRECIPITATION DATA

149 PB              STORM        4.75  BASIN TOTAL PRECIPITATION

151 PI          INCREMENTAL 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      0.01      0.01
                  0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                  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      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00

176 LS        SCS LOSS RATE
                STRTL        0.84  INITIAL ABSTRACTION
                CRVNBR      70.50  CURVE NUMBER
                RTIMP        0.00  PERCENT IMPERVIOUS AREA

177 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG        0.26  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
            366.      438.      159.       57.       20.        7.        3.
```

****

HYDROGRAPH AT STATION 4B

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	192.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	117.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	79.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	60.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	49.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	42.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	37.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	33.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	31.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	29.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	28.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	26.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	25.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	23.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	22.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	21.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	20.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	19.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	19.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	18.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	18.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	17.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	17.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	16.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	16.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	15.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	14.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	14.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	14.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	13.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	12.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	12.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	12.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	11.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	11.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	11.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	11.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	11.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	11.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	11.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	11.
1	JAN	1015	42	0.05	0.05	0.00	0.	1	JAN	2245	92	0.01	0.00	0.01	11.
1	JAN	1030	43	0.06	0.06	0.00	2.	1	JAN	2300	93	0.01	0.00	0.01	11.
1	JAN	1045	44	0.07	0.06	0.01	3.	1	JAN	2315	94	0.01	0.00	0.01	11.
1	JAN	1100	45	0.08	0.07	0.01	6.	1	JAN	2330	95	0.01	0.00	0.01	10.
1	JAN	1115	46	0.10	0.09	0.01	10.	1	JAN	2345	96	0.01	0.00	0.01	10.
1	JAN	1130	47	0.13	0.10	0.02	16.	2	JAN	0000	97	0.01	0.00	0.01	10.
1	JAN	1145	48	0.52	0.37	0.15	67.	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.28	0.66	0.62	296.	2	JAN	0030	99	0.00	0.00	0.00	2.
1	JAN	1215	50	0.20	0.08	0.12	341.	2	JAN	0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
341.	12.25		67.	21.	20.	20.
		(INCHES)	1.537	1.890	1.890	1.890
		(AC-FT)	33.	41.	41.	41.

CUMULATIVE AREA = 0.41 SQ MI

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178 KK     **************
           *            *
           *        4R  *        CNAME      4C
           *            *
           **************
```

179 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

180 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.09	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 4R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	259.	1 JAN 1845	76	15.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	134.	1 JAN 1900	77	15.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	92.	1 JAN 1915	78	14.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	65.	1 JAN 1930	79	14.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	53.	1 JAN 1945	80	13.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	45.	1 JAN 2000	81	13.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	39.	1 JAN 2015	82	12.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	35.	1 JAN 2030	83	12.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	32.	1 JAN 2045	84	12.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	30.	1 JAN 2100	85	11.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	28.	1 JAN 2115	86	11.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	27.	1 JAN 2130	87	11.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	25.	1 JAN 2145	88	11.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	24.	1 JAN 2200	89	11.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	22.	1 JAN 2215	90	11.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	21.	1 JAN 2230	91	11.
1 JAN 0400	17	0.	1 JAN 1015	42	0.	1 JAN 1630	67	20.	1 JAN 2245	92	11.
1 JAN 0415	18	0.	1 JAN 1030	43	1.	1 JAN 1645	68	19.	1 JAN 2300	93	11.
1 JAN 0430	19	0.	1 JAN 1045	44	3.	1 JAN 1700	69	19.	1 JAN 2315	94	11.
1 JAN 0445	20	0.	1 JAN 1100	45	5.	1 JAN 1715	70	18.	1 JAN 2330	95	10.
1 JAN 0500	21	0.	1 JAN 1115	46	8.	1 JAN 1730	71	18.	1 JAN 2345	96	10.
1 JAN 0515	22	0.	1 JAN 1130	47	14.	1 JAN 1745	72	17.	2 JAN 0000	97	10.
1 JAN 0530	23	0.	1 JAN 1145	48	44.	1 JAN 1800	73	17.	2 JAN 0015	98	8.
1 JAN 0545	24	0.	1 JAN 1200	49	197.	1 JAN 1815	74	16.	2 JAN 0030	99	4.
1 JAN 0600	25	0.	1 JAN 1215	50	347.	1 JAN 1830	75	16.	2 JAN 0045	100	1.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)					
		(CFS)				
347.	12.25		67.	21.	20.	20.
		(INCHES)	1.536	1.890	1.890	1.890
		(AC-FT)	33.	41.	41.	41.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
181 KK    *       3aB  *
          *            *
          **************

182 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


185 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

183 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.41  SUBBASIN AREA

                PRECIPITATION DATA

184 PB               STORM         4.75  BASIN TOTAL PRECIPITATION

186 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

211 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                     CRVNBR      70.59  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

212 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.27  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
               360.      448.      168.       61.       22.        8.        3.
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HYDROGRAPH AT STATION 3aB

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	200.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.04	0.06	122.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	82.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.04	62.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	51.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.03	43.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.02	0.03	38.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	34.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	31.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	30.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.02	28.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	27.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	25.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	24.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	22.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	21.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	20.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	20.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	19.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	19.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	18.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	18.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	17.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.01	16.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	16.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	15.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.01	0.01	15.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.01	0.01	14.
1 JAN 0700	29	0.02	0.02	0.00	0.	1 JAN 1930	79	0.02	0.00	0.01	14.

1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	13.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	13.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	12.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	12.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	12.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	12.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	12.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	11.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	11.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	11.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	11.
1	JAN	1000	41	0.05	0.04	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	11.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	11.
1	JAN	1030	43	0.06	0.06	0.00	2.	*	1	JAN	2300	93	0.01	0.00	0.01	11.
1	JAN	1045	44	0.07	0.06	0.01	3.	*	1	JAN	2315	94	0.01	0.00	0.01	11.
1	JAN	1100	45	0.08	0.07	0.01	6.	*	1	JAN	2330	95	0.01	0.00	0.01	11.
1	JAN	1115	46	0.10	0.09	0.01	10.	*	1	JAN	2345	96	0.01	0.00	0.01	11.
1	JAN	1130	47	0.13	0.10	0.02	17.	*	2	JAN	0000	97	0.01	0.00	0.01	10.
1	JAN	1145	48	0.52	0.37	0.15	67.	*	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.28	0.62	0.62	296.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.20	0.08	0.12	349.	*	2	JAN	0045	100	0.00	0.00	0.00	1.
								*								

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.85, TOTAL EXCESS = 1.90

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
349.	12.25	69.	21.	20.	20.
		(INCHES) 1.542	1.897	1.897	1.897
		(AC-FT) 34.	42.	42.	42.

CUMULATIVE AREA = 0.41 SQ MI

*** ***

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          **************
          *            *
213 KK    *       3bB  *
          *            *
          **************

214 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


217 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

215 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.44  SUBBASIN AREA

                PRECIPITATION DATA

216 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

218 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

243 LS          SCS LOSS RATE
                     STRTL        0.79  INITIAL ABSTRACTION
                    CRVNBR       71.79  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

244 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.26  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG
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7 END-OF-PERIOD ORDINATES

394. 471. 171. 61. 21. 8. 3.

HYDROGRAPH AT STATION 3bB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	218.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.03	0.06	132.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	89.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.05	67.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	55.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.04	47.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.01	0.03	41.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	37.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	34.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	32.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	31.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	29.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	27.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	26.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	24.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	23.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	22.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	21.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	21.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	20.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	19.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	19.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	18.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.02	18.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	17.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	17.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.00	0.01	16.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.00	0.01	16.
1 JAN 0700	29	0.02	0.02	0.00	0.	1 JAN 1930	79	0.02	0.00	0.01	15.
1 JAN 0715	30	0.02	0.02	0.00	0.	1 JAN 1945	80	0.02	0.00	0.01	14.
1 JAN 0730	31	0.02	0.02	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	14.
1 JAN 0745	32	0.02	0.02	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	13.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.01	0.00	0.01	13.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	13.
1 JAN 0830	35	0.03	0.03	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	13.
1 JAN 0845	36	0.03	0.03	0.00	0.	1 JAN 2115	86	0.01	0.00	0.01	13.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.01	0.00	0.01	12.
1 JAN 0915	38	0.04	0.04	0.00	0.	1 JAN 2145	88	0.01	0.00	0.01	12.
1 JAN 0930	39	0.04	0.04	0.00	0.	1 JAN 2200	89	0.01	0.00	0.01	12.
1 JAN 0945	40	0.04	0.04	0.00	0.	1 JAN 2215	90	0.01	0.00	0.01	12.
1 JAN 1000	41	0.05	0.04	0.00	1.	1 JAN 2230	91	0.01	0.00	0.01	12.
1 JAN 1015	42	0.05	0.05	0.00	2.	1 JAN 2245	92	0.01	0.00	0.01	12.
1 JAN 1030	43	0.06	0.05	0.00	3.	1 JAN 2300	93	0.01	0.00	0.01	12.
1 JAN 1045	44	0.07	0.06	0.01	5.	1 JAN 2315	94	0.01	0.00	0.01	12.
1 JAN 1100	45	0.08	0.07	0.01	8.	1 JAN 2330	95	0.01	0.00	0.01	11.
1 JAN 1115	46	0.10	0.08	0.02	13.	1 JAN 2345	96	0.01	0.00	0.01	11.
1 JAN 1130	47	0.13	0.10	0.03	21.	2 JAN 0000	97	0.01	0.00	0.01	11.
1 JAN 1145	48	0.52	0.36	0.16	81.	2 JAN 0015	98	0.00	0.00	0.00	7.
1 JAN 1200	49	1.28	0.63	0.66	341.	2 JAN 0030	99	0.00	0.00	0.00	3.
1 JAN 1215	50	0.20	0.08	0.13	389.	2 JAN 0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.76, TOTAL EXCESS = 1.99

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
389.	12.25	76.	23.	23.	23.
		(INCHES) 1.618	1.990	1.990	1.990
		(AC-FT) 38.	46.	46.	46.

CUMULATIVE AREA = 0.44 SQ MI

245 KK 3C CNAME 3R

246 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

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 247 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE
                                                
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1	JAN	0045	4	0.	*	1	JAN	0700	29	0.	*	1	JAN	1315	54	305.	*	1	JAN	1930	79	65.
1	JAN	0100	5	0.	*	1	JAN	0715	30	0.	*	1	JAN	1330	55	248.	*	1	JAN	1945	80	62.
1	JAN	0115	6	0.	*	1	JAN	0730	31	0.	*	1	JAN	1345	56	208.	*	1	JAN	2000	81	59.
1	JAN	0130	7	0.	*	1	JAN	0745	32	0.	*	1	JAN	1400	57	182.	*	1	JAN	2015	82	57.
1	JAN	0145	8	0.	*	1	JAN	0800	33	0.	*	1	JAN	1415	58	163.	*	1	JAN	2030	83	55.
1	JAN	0200	9	0.	*	1	JAN	0815	34	0.	*	1	JAN	1430	59	149.	*	1	JAN	2045	84	54.
1	JAN	0215	10	0.	*	1	JAN	0830	35	0.	*	1	JAN	1445	60	139.	*	1	JAN	2100	85	54.
1	JAN	0230	11	0.	*	1	JAN	0845	36	0.	*	1	JAN	1500	61	132.	*	1	JAN	2115	86	54.
1	JAN	0245	12	0.	*	1	JAN	0900	37	0.	*	1	JAN	1515	62	125.	*	1	JAN	2130	87	53.
1	JAN	0300	13	0.	*	1	JAN	0915	38	0.	*	1	JAN	1530	63	119.	*	1	JAN	2145	88	52.
1	JAN	0315	14	0.	*	1	JAN	0930	39	0.	*	1	JAN	1545	64	112.	*	1	JAN	2200	89	52.
1	JAN	0330	15	0.	*	1	JAN	0945	40	0.	*	1	JAN	1600	65	106.	*	1	JAN	2215	90	52.
1	JAN	0345	16	0.	*	1	JAN	1000	41	1.	*	1	JAN	1615	66	99.	*	1	JAN	2230	91	51.
1	JAN	0400	17	0.	*	1	JAN	1015	42	2.	*	1	JAN	1630	67	94.	*	1	JAN	2245	92	50.
1	JAN	0415	18	0.	*	1	JAN	1030	43	7.	*	1	JAN	1645	68	91.	*	1	JAN	2300	93	50.
1	JAN	0430	19	0.	*	1	JAN	1045	44	14.	*	1	JAN	1700	69	89.	*	1	JAN	2315	94	50.
1	JAN	0445	20	0.	*	1	JAN	1100	45	25.	*	1	JAN	1715	70	86.	*	1	JAN	2330	95	49.
1	JAN	0500	21	0.	*	1	JAN	1115	46	42.	*	1	JAN	1730	71	84.	*	1	JAN	2345	96	48.
1	JAN	0515	22	0.	*	1	JAN	1130	47	68.	*	1	JAN	1745	72	81.	*	2	JAN	0000	97	48.
1	JAN	0530	23	0.	*	1	JAN	1145	48	221.	*	1	JAN	1800	73	79.	*	2	JAN	0015	98	39.
1	JAN	0545	24	0.	*	1	JAN	1200	49	963.	*	1	JAN	1815	74	76.	*	2	JAN	0030	99	18.
1	JAN	0600	25	0.	*	1	JAN	1215	50	1649.	*	1	JAN	1830	75	74.	*	2	JAN	0045	100	5.
					*						*						*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1649.	12.25		318.	98.	95.	95.
		(INCHES)	1.556	1.914	1.914	1.914
		(AC-FT)	158.	194.	194.	194.

CUMULATIVE AREA = 1.90 SQ MI

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          **************
          *            *
251 KK    *       2bB  *
          *            *
          **************
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252 KO — OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

255 IN — TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

253 BA — SUBBASIN CHARACTERISTICS

TAREA,	0.12	SUBBASIN AREA

PRECIPITATION DATA

254 PB

STORM	4.75	BASIN TOTAL PRECIPITATION

256 PI — INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

281 LS — SCS LOSS RATE

STRTL	0.76	INITIAL ABSTRACTION
CRVNBR	72.42	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

282 UD — SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

226. 63. 12. 2. 0.

HYDROGRAPH AT STATION 2bB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	37.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	23.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	18.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	15.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	13.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	12.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.01	0.03	10.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	9.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	9.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	8.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	8.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	8.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	7.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	7.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	6.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	6.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	6.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	6.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	6.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	5.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	5.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	5.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	5.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	5.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	5.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	4.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.00	0.01	4.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.00	0.01	4.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	4.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	4.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	4.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	4.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	3.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	3.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	3.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	3.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	3.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	3.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	3.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	3.
1	JAN	1000	41	0.05	0.04	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	3.
1	JAN	1015	42	0.05	0.05	0.00	1.	1	JAN	2245	92	0.01	0.00	0.01	3.
1	JAN	1030	43	0.06	0.05	0.01	1.	1	JAN	2300	93	0.01	0.00	0.01	3.
1	JAN	1045	44	0.07	0.06	0.01	2.	1	JAN	2315	94	0.01	0.00	0.01	3.
1	JAN	1100	45	0.08	0.07	0.01	3.	1	JAN	2330	95	0.01	0.00	0.01	3.
1	JAN	1115	46	0.10	0.08	0.02	5.	1	JAN	2345	96	0.01	0.00	0.01	3.
1	JAN	1130	47	0.13	0.10	0.03	8.	2	JAN	0000	97	0.01	0.00	0.01	3.
1	JAN	1145	48	0.52	0.35	0.17	41.	2	JAN	0015	98	0.00	0.00	0.00	1.
1	JAN	1200	49	1.28	0.61	0.67	163.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.20	0.07	0.13	74.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.71, TOTAL EXCESS = 2.04

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
163.	12.00	21.	6.	6.	6.
		(INCHES) 1.660	2.040	2.040	2.040
		(AC-FT) 10.	13.	13.	13.

CUMULATIVE AREA = 0.12 SQ MI

283 KK 2aB

284 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

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287 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

285 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.48  SUBBASIN AREA

                PRECIPITATION DATA

286 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

288 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

313 LS          SCS LOSS RATE
                     STRTL        0.72  INITIAL ABSTRACTION
                    CRVNBR       73.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

314 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.00  LAG

                                                      ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
                921.      258.       51.       10.        0.
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HYDROGRAPH AT STATION 2aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	158.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.07	98.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.02	0.06	74.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	62.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	55.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	48.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.01	0.03	43.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	39.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	37.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	36.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	34.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.03	32.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	30.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	28.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	27.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	25.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	24.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	24.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	23.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	22.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	22.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	21.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	20.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	20.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.00	0.02	19.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.00	0.01	19.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.00	0.01	18.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.00	0.01	17.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	17.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	16.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	15.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	15.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	14.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	14.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	14.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	14.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	14.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	14.
1	JAN	0930	39	0.04	0.04	0.00	1.	1	JAN	2200	89	0.01	0.00	0.01	14.
1	JAN	0945	40	0.04	0.04	0.00	2.	1	JAN	2215	90	0.01	0.00	0.01	14.
1	JAN	1000	41	0.05	0.04	0.00	3.	1	JAN	2230	91	0.01	0.00	0.01	13.
1	JAN	1015	42	0.05	0.05	0.00	5.	1	JAN	2245	92	0.01	0.00	0.01	13.
1	JAN	1030	43	0.06	0.05	0.01	7.	1	JAN	2300	93	0.01	0.00	0.01	13.
1	JAN	1045	44	0.07	0.06	0.01	11.	1	JAN	2315	94	0.01	0.00	0.01	13.
1	JAN	1100	45	0.08	0.07	0.01	15.	1	JAN	2330	95	0.01	0.00	0.01	13.
1	JAN	1115	46	0.10	0.08	0.02	23.	1	JAN	2345	96	0.01	0.00	0.01	13.
1	JAN	1130	47	0.13	0.10	0.03	36.	2	JAN	0000	97	0.01	0.00	0.01	13.
1	JAN	1145	48	0.52	0.34	0.18	179.	2	JAN	0015	98	0.00	0.00	0.00	3.

1 JAN 1200	49	1.28	0.58	0.70	696.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.20	0.07	0.13	313.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.62, TOTAL EXCESS = 2.13

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
696.	12.00	89.	27.	27.	27.
		(INCHES) 1.729	2.126	2.126	2.126
		(AC-FT) 44.	54.	54.	54.

CUMULATIVE AREA = 0.48 SQ MI

315 KK 2C CNAME 2R

316 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

317 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1844.	1 JAN 1845	76	135.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1018.	1 JAN 1900	77	130.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	701.	1 JAN 1915	78	126.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	528.	1 JAN 1930	79	122.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	441.	1 JAN 1945	80	117.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	378.	1 JAN 2000	81	111.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	333.	1 JAN 2015	82	107.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	300.	1 JAN 2030	83	104.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	276.	1 JAN 2045	84	103.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	261.	1 JAN 2100	85	103.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	248.	1 JAN 2115	86	101.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	235.	1 JAN 2130	87	100.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	222.	1 JAN 2145	88	99.
1 JAN 0315	14	0.	1 JAN 0930	39	1.	1 JAN 1545	64	210.	1 JAN 2200	89	99.
1 JAN 0330	15	0.	1 JAN 0945	40	2.	1 JAN 1600	65	197.	1 JAN 2215	90	98.
1 JAN 0345	16	0.	1 JAN 1000	41	5.	1 JAN 1615	66	186.	1 JAN 2230	91	96.
1 JAN 0400	17	0.	1 JAN 1015	42	12.	1 JAN 1630	67	178.	1 JAN 2245	92	96.
1 JAN 0415	18	0.	1 JAN 1030	43	23.	1 JAN 1645	68	172.	1 JAN 2300	93	96.
1 JAN 0430	19	0.	1 JAN 1045	44	40.	1 JAN 1700	69	168.	1 JAN 2315	94	94.
1 JAN 0445	20	0.	1 JAN 1100	45	64.	1 JAN 1715	70	163.	1 JAN 2330	95	92.
1 JAN 0500	21	0.	1 JAN 1115	46	103.	1 JAN 1730	71	158.	1 JAN 2345	96	92.
1 JAN 0515	22	0.	1 JAN 1130	47	165.	1 JAN 1745	72	154.	2 JAN 0000	97	92.
1 JAN 0530	23	0.	1 JAN 1145	48	645.	1 JAN 1800	73	149.	2 JAN 0015	98	60.
1 JAN 0545	24	0.	1 JAN 1200	49	2717.	1 JAN 1815	74	144.	2 JAN 0030	99	22.
1 JAN 0600	25	0.	1 JAN 1215	50	3143.	1 JAN 1830	75	140.	2 JAN 0045	100	6.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
3143.	12.25	614.	189.	183.	183.
		(INCHES) 1.596	1.964	1.964	1.964
		(AC-FT) 304.	374.	374.	374.

CUMULATIVE AREA = 3.57 SQ MI

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            **************
            *            *
 318 KK     *        2R  *        CNAME      2C
            *            *
            **************


 319 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


                HYDROGRAPH ROUTING DATA

 320 RM           MUSKINGUM ROUTING
                       NSTPS         1 NUMBER OF SUBREACHES
                       AMSKK      0.13 MUSKINGUM K
                           X      0.20 MUSKINGUM X
                                                                  ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      2R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 2R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2606.	1 JAN 1845	76	138.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1436.	1 JAN 1900	77	133.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	852.	1 JAN 1915	78	128.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	616.	1 JAN 1930	79	124.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	485.	1 JAN 1945	80	119.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	411.	1 JAN 2000	81	114.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	356.	1 JAN 2015	82	109.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	317.	1 JAN 2030	83	106.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	288.	1 JAN 2045	84	104.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	269.	1 JAN 2100	85	103.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	255.	1 JAN 2115	86	102.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	242.	1 JAN 2130	87	101.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	229.	1 JAN 2145	88	99.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	216.	1 JAN 2200	89	99.
1 JAN 0330	15	0.	1 JAN 0945	40	1.	1 JAN 1600	65	204.	1 JAN 2215	90	98.
1 JAN 0345	16	0.	1 JAN 1000	41	4.	1 JAN 1615	66	192.	1 JAN 2230	91	97.
1 JAN 0400	17	0.	1 JAN 1015	42	8.	1 JAN 1630	67	182.	1 JAN 2245	92	96.
1 JAN 0415	18	0.	1 JAN 1030	43	17.	1 JAN 1645	68	175.	1 JAN 2300	93	96.
1 JAN 0430	19	0.	1 JAN 1045	44	31.	1 JAN 1700	69	170.	1 JAN 2315	94	95.
1 JAN 0445	20	0.	1 JAN 1100	45	51.	1 JAN 1715	70	166.	1 JAN 2330	95	93.
1 JAN 0500	21	0.	1 JAN 1115	46	82.	1 JAN 1730	71	161.	1 JAN 2345	96	92.
1 JAN 0515	22	0.	1 JAN 1130	47	131.	1 JAN 1745	72	156.	2 JAN 0000	97	92.
1 JAN 0530	23	0.	1 JAN 1145	48	371.	1 JAN 1800	73	152.	2 JAN 0015	98	78.
1 JAN 0545	24	0.	1 JAN 1200	49	1542.	1 JAN 1815	74	147.	2 JAN 0030	99	42.
1 JAN 0600	25	0.	1 JAN 1215	50	2987.	1 JAN 1830	75	142.	2 JAN 0045	100	14.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.75-HR
2987.	12.25	613.	189.	183.	183.
		(INCHES) 1.595	1.963	1.963	1.963
		(AC-FT) 304.	374.	374.	374.

CUMULATIVE AREA = 3.57 SQ MI

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            **************
            *            *
 321 KK     *        1B  *
            *            *
            **************


 322 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


 325 IN          TIME DATA FOR INPUT TIME SERIES
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                    JXMIN           6  TIME INTERVAL IN MINUTES
                   JXDATE      1JAN94  STARTING DATE
                   JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

323 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.65  SUBBASIN AREA

              PRECIPITATION DATA

324 PB                STORM        4.75  BASIN TOTAL PRECIPITATION

326 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

351 LS          SCS LOSS RATE
                      STRTL        0.73  INITIAL ABSTRACTION
                     CRVNBR       73.13  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

352 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.00  LAG

                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
              1243.      348.       68.       14.        0.
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HYDROGRAPH AT STATION 1B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	211.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.03	0.06	131.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.06	99.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.05	83.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	74.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.04	65.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.01	0.03	58.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	53.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	50.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	48.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	45.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.03	43.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	40.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	38.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	35.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	34.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	33.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	32.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	31.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	30.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	29.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	28.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	27.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	26.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	26.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.00	0.01	25.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.00	0.01	24.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.00	0.01	23.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	22.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	21.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	20.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	20.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	19.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	19.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	19.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	19.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	19.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	19.
1	JAN	0930	39	0.04	0.04	0.00	1.	1	JAN	2200	89	0.01	0.00	0.01	18.
1	JAN	0945	40	0.04	0.04	0.00	2.	1	JAN	2215	90	0.01	0.00	0.01	18.
1	JAN	1000	41	0.05	0.04	0.00	3.	1	JAN	2230	91	0.01	0.00	0.01	18.
1	JAN	1015	42	0.05	0.05	0.00	6.	1	JAN	2245	92	0.01	0.00	0.01	18.
1	JAN	1030	43	0.06	0.05	0.01	9.	1	JAN	2300	93	0.01	0.00	0.01	18.
1	JAN	1045	44	0.07	0.06	0.01	13.	1	JAN	2315	94	0.01	0.00	0.01	17.
1	JAN	1100	45	0.08	0.07	0.01	20.	1	JAN	2330	95	0.01	0.00	0.01	17.
1	JAN	1115	46	0.10	0.08	0.02	30.	1	JAN	2345	96	0.01	0.00	0.01	17.
1	JAN	1130	47	0.13	0.10	0.03	46.	2	JAN	0000	97	0.01	0.00	0.01	17.
1	JAN	1145	48	0.52	0.34	0.18	235.	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.28	0.59	0.69	925.	2	JAN	0030	99	0.00	0.00	0.00	1.

```
        1 JAN 1215   50    0.20    0.07    0.13       417.       *        2 JAN 0045  100    0.00    0.00    0.00         0.
                                                                  *
 ********************************************************************************************************************************************

    TOTAL RAINFALL =    4.75, TOTAL LOSS =    2.65, TOTAL EXCESS =    2.10

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                     (CFS)
+     925.     12.00                119.         37.         35.          35.
                     (INCHES)     1.706       2.097       2.097        2.097
                      (AC-FT)       59.         73.         73.          73.

                     CUMULATIVE AREA =    0.65 SQ MI


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


            **************
            *            *
  353 KK    *        1C  *        CNAME      1C
            *            *
            **************

  354 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


  355 HC          HYDROGRAPH COMBINATION
                       ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

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

                                                HYDROGRAPH AT STATION       1C
                                                     SUM OF  2 HYDROGRAPHS

 ********************************************************************************************************************************************
                                  *                                 *                                 *                                 *
    DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW
                                  *                                 *                                 *                                 *
     1 JAN 0000    1        0.    *    1 JAN 0615   26        0.   *    1 JAN 1230   51     2816.   *    1 JAN 1845   76       163.
     1 JAN 0015    2        0.    *    1 JAN 0630   27        0.   *    1 JAN 1245   52     1567.   *    1 JAN 1900   77       157.
     1 JAN 0030    3        0.    *    1 JAN 0645   28        0.   *    1 JAN 1300   53      951.   *    1 JAN 1915   78       151.
     1 JAN 0045    4        0.    *    1 JAN 0700   29        0.   *    1 JAN 1315   54      700.   *    1 JAN 1930   79       146.
     1 JAN 0100    5        0.    *    1 JAN 0715   30        0.   *    1 JAN 1330   55      558.   *    1 JAN 1945   80       141.
     1 JAN 0115    6        0.    *    1 JAN 0730   31        0.   *    1 JAN 1345   56      476.   *    1 JAN 2000   81       135.
     1 JAN 0130    7        0.    *    1 JAN 0745   32        0.   *    1 JAN 1400   57      414.   *    1 JAN 2015   82       129.
     1 JAN 0145    8        0.    *    1 JAN 0800   33        0.   *    1 JAN 1415   58      370.   *    1 JAN 2030   83       125.
     1 JAN 0200    9        0.    *    1 JAN 0815   34        0.   *    1 JAN 1430   59      338.   *    1 JAN 2045   84       123.
     1 JAN 0215   10        0.    *    1 JAN 0830   35        0.   *    1 JAN 1445   60      316.   *    1 JAN 2100   85       122.
     1 JAN 0230   11        0.    *    1 JAN 0845   36        0.   *    1 JAN 1500   61      300.   *    1 JAN 2115   86       121.
     1 JAN 0245   12        0.    *    1 JAN 0900   37        0.   *    1 JAN 1515   62      285.   *    1 JAN 2130   87       119.
     1 JAN 0300   13        0.    *    1 JAN 0915   38        0.   *    1 JAN 1530   63      269.   *    1 JAN 2145   88       118.
     1 JAN 0315   14        0.    *    1 JAN 0930   39        1.   *    1 JAN 1545   64      255.   *    1 JAN 2200   89       118.
     1 JAN 0330   15        0.    *    1 JAN 0945   40        3.   *    1 JAN 1600   65      240.   *    1 JAN 2215   90       117.
     1 JAN 0345   16        0.    *    1 JAN 1000   41        7.   *    1 JAN 1615   66      225.   *    1 JAN 2230   91       115.
     1 JAN 0400   17        0.    *    1 JAN 1015   42       14.   *    1 JAN 1630   67      215.   *    1 JAN 2245   92       114.
     1 JAN 0415   18        0.    *    1 JAN 1030   43       26.   *    1 JAN 1645   68      207.   *    1 JAN 2300   93       114.
     1 JAN 0430   19        0.    *    1 JAN 1045   44       44.   *    1 JAN 1700   69      201.   *    1 JAN 2315   94       113.
     1 JAN 0445   20        0.    *    1 JAN 1100   45       71.   *    1 JAN 1715   70      195.   *    1 JAN 2330   95       111.
     1 JAN 0500   21        0.    *    1 JAN 1115   46      112.   *    1 JAN 1730   71      190.   *    1 JAN 2345   96       110.
     1 JAN 0515   22        0.    *    1 JAN 1130   47      177.   *    1 JAN 1745   72      184.   *    2 JAN 0000   97       109.
     1 JAN 0530   23        0.    *    1 JAN 1145   48      606.   *    1 JAN 1800   73      179.   *    2 JAN 0015   98        83.
     1 JAN 0545   24        0.    *    1 JAN 1200   49     2467.   *    1 JAN 1815   74      173.   *    2 JAN 0030   99        43.
     1 JAN 0600   25        0.    *    1 JAN 1215   50     3405.   *    1 JAN 1830   75      168.   *    2 JAN 0045  100        14.
                                  *                                 *                                 *
 ********************************************************************************************************************************************

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                     (CFS)
+    3405.     12.25                732.        225.        218.         218.
                     (INCHES)     1.611       1.984       1.984        1.984
                      (AC-FT)      363.        447.        447.         447.

                     CUMULATIVE AREA =    4.22 SQ MI


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


            **************
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```
          *            *
356 KK    *       1C   *       CNAME      1C
          *            *
          **************

357 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

358 RN          NO ROUTING
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***

HYDROGRAPH AT STATION 1C

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2816.	1 JAN 1845	76	163.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1567.	1 JAN 1900	77	157.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	951.	1 JAN 1915	78	151.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	700.	1 JAN 1930	79	146.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	558.	1 JAN 1945	80	141.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	476.	1 JAN 2000	81	135.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	414.	1 JAN 2015	82	129.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	370.	1 JAN 2030	83	125.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	338.	1 JAN 2045	84	123.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	316.	1 JAN 2100	85	122.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	300.	1 JAN 2115	86	121.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	285.	1 JAN 2130	87	119.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	269.	1 JAN 2145	88	118.
1 JAN 0315	14	0.	1 JAN 0930	39	1.	1 JAN 1545	64	255.	1 JAN 2200	89	118.
1 JAN 0330	15	0.	1 JAN 0945	40	3.	1 JAN 1600	65	240.	1 JAN 2215	90	117.
1 JAN 0345	16	0.	1 JAN 1000	41	7.	1 JAN 1615	66	225.	1 JAN 2230	91	115.
1 JAN 0400	17	0.	1 JAN 1015	42	14.	1 JAN 1630	67	215.	1 JAN 2245	92	114.
1 JAN 0415	18	0.	1 JAN 1030	43	26.	1 JAN 1645	68	207.	1 JAN 2300	93	114.
1 JAN 0430	19	0.	1 JAN 1045	44	44.	1 JAN 1700	69	201.	1 JAN 2315	94	113.
1 JAN 0445	20	0.	1 JAN 1100	45	71.	1 JAN 1715	70	195.	1 JAN 2330	95	111.
1 JAN 0500	21	0.	1 JAN 1115	46	112.	1 JAN 1730	71	190.	1 JAN 2345	96	110.
1 JAN 0515	22	0.	1 JAN 1130	47	177.	1 JAN 1745	72	184.	2 JAN 0000	97	109.
1 JAN 0530	23	0.	1 JAN 1145	48	606.	1 JAN 1800	73	179.	2 JAN 0015	98	83.
1 JAN 0545	24	0.	1 JAN 1200	49	2467.	1 JAN 1815	74	173.	2 JAN 0030	99	43.
1 JAN 0600	25	0.	1 JAN 1215	50	3405.	1 JAN 1830	75	168.	2 JAN 0045	100	14.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
3405.	12.25	732.	225.	218.	218.
		(INCHES) 1.611	1.984	1.984	1.984
		(AC-FT) 363.	447.	447.	447.

CUMULATIVE AREA = 4.22 SQ MI

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	6B	228.	12.00	41.	13.	12.	0.25		
ROUTED TO	6R	228.	12.25	41.	13.	12.	0.25		
HYDROGRAPH AT	7bB	353.	12.00	46.	14.	14.	0.27		
HYDROGRAPH AT	7aB	762.	12.00	98.	30.	29.	0.56		
3 COMBINED AT	7C	1307.	12.00	185.	57.	55.	1.08		
ROUTED TO	7R	1107.	12.25	185.	57.	55.	1.08		
HYDROGRAPH AT	5B	530.	12.25	106.	33.	32.	0.64		

	ROUTED TO							
+		5R	569.	12.25	106.	33.	32.	0.64
	HYDROGRAPH AT							
+		4B	341.	12.25	67.	21.	20.	0.41
	ROUTED TO							
+		4R	347.	12.25	67.	21.	20.	0.41
	HYDROGRAPH AT							
+		3aB	349.	12.25	69.	21.	20.	0.41
	HYDROGRAPH AT							
+		3bB	389.	12.25	76.	23.	23.	0.44
	4 COMBINED AT							
+		3C	1654.	12.25	318.	98.	95.	1.90
	ROUTED TO							
+		3R	1649.	12.25	318.	98.	95.	1.90
	HYDROGRAPH AT							
+		2bB	163.	12.00	21.	6.	6.	0.12
	HYDROGRAPH AT							
+		2aB	696.	12.00	89.	27.	27.	0.48
	4 COMBINED AT							
+		2C	3143.	12.25	614.	189.	183.	3.57
	ROUTED TO							
+		2R	2987.	12.25	613.	189.	183.	3.57
	HYDROGRAPH AT							
+		1B	925.	12.00	119.	37.	35.	0.65
	2 COMBINED AT							
+		1C	3405.	12.25	732.	225.	218.	4.22
	ROUTED TO							
+		1C	3405.	12.25	732.	225.	218.	4.22

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991           *
 *            VERSION 4.0.1E         *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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

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

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


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

   1          ID    Scrabble Creek
   2          ID    wo Mining & w Logging (Scenario 5), 10m DEM Data
   3          ID    100 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1

   6          KK      6B
   7          KO       0       0     0.0       1      22
   8          BA  0.2503
   9          PB     5.7
  10          IN       6  1JAN94       0
              * typeII-24hour
  11          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  12          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  13          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  14          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  15          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  16          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  17          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  18          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  19          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  20          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  21          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  22          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  23          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  24          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  25          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  26          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  27          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  28          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  29          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  30          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  31          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  32          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  33          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  34          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  35          PC     1.0
  36          LS     0.0    70.5     0.0
  37          UD    0.21

  38          KK      6R   CNAME      6C
  39          KO       0       0     0.0       0      22
  40          RM       1   0.037     0.2

  41          KK     7bB
  42          KO       0       0     0.0       1      22
  43          BA  0.2668
  44          PB     5.7
  45          IN       6  1JAN94       0
              * typeII-24hour
  46          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  47          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  48          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  49          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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 50          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 51          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 52          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 53          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 54          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 55          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 56          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 57          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 58          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 59          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 60          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 61          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 62          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 63          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 64          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 65          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 66          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 67          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 68          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 69          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 70          PC     1.0
 71          LS     0.0   71.37     0.0
 72          UD     0.0

 73          KK      7aB
 74          KO        0       0     0.0       1      22
 75          BA   0.5585
 76          PB      5.7
 77          IN        6  1JAN94       0
             * typeII-24hour
 78          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 79          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 80          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 81          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 82          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 83          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 84          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 85          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 86          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 87          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 88          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 89          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 90          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 91          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 92          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 93          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 94          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 95          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 96          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 97          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 98          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 99          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
100          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
101          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
102          PC     1.0
```



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

103          LS     0.0   72.08     0.0
104          UD     0.0

105          KK      7C   CNAME      7R
106          KO       0       0     0.0       0      22
107          HC       3

108          KK      7R   CNAME      7C
109          KO       0       0     0.0       0      22
110          RM       1   0.087     0.2

111          KK      5B
112          KO       0       0     0.0       1      22
113          BA   0.6425
114          PB      5.7
115          IN        6  1JAN94       0
             * typeII-24hour
116          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
117          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
118          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
119          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
120          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
121          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
122          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
123          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
124          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
125          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
126          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
127          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
128          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
129          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
130          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
131          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
132          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
133          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
134          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
135          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
136          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
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 137          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 138          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 139          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 140          PC     1.0
 141          LS     0.0    70.5     0.0
 142          UD  0.2376

 143          KK      5R   CNAME      5C
 144          KO       0       0     0.0       0      22
 145          RM       1   0.099     0.2

 146          KK      4B
 147          KO       0       0     0.0       1      22
 148          BA  0.4066
 149          PB     5.7
 150          IN       6  1JAN94       0
              * typeII-24hour
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 151          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 152          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 153          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 154          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 155          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 156          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 157          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 158          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 159          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 160          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 161          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 162          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 163          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 164          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 165          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 166          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 167          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 168          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 169          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 170          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 171          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 172          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 173          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 174          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 175          PC     1.0
 176          LS     0.0    70.5     0.0
 177          UD  0.2643

 178          KK      4R   CNAME      4C
 179          KO       0       0     0.0       0      22
 180          RM       1   0.091     0.2

 181          KK     3aB
 182          KO       0       0     0.0       1      22
 183          BA  0.4142
 184          PB     5.7
 185          IN       6  1JAN94       0
              * typeII-24hour
 186          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 187          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 188          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 189          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 190          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 191          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 192          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 193          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 194          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 195          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 196          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 197          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 198          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 199          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 200          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 201          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 202          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
```



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

 203          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 204          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 205          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 206          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 207          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 208          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 209          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 210          PC     1.0
 211          LS     0.0   70.59     0.0
 212          UD  0.2705

 213          KK     3bB
 214          KO       0       0     0.0       1      22
 215          BA  0.4375
 216          PB     5.7
 217          IN       6  1JAN94       0
```

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            * typeII-24hour
 218        PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 219        PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 220        PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 221        PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 222        PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 223        PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 224        PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 225        PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 226        PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 227        PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 228        PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 229        PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 230        PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 231        PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 232        PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 233        PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 234        PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 235        PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 236        PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 237        PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 238        PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 239        PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 240        PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 241        PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 242        PC     1.0
 243        LS     0.0   71.79     0.0
 244        UD  0.2643

 245        KK      3C   CNAME      3R
 246        KO       0       0     0.0       0      22
 247        HC       4

 248        KK      3R   CNAME      3C
 249        KO       0       0     0.0       0      22
 250        RM       1   0.041     0.2
```



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

 251        KK     2bB
 252        KO       0       0     0.0       1      22
 253        BA  0.1177
 254        PB     5.7
 255        IN       6  1JAN94       0
            * typeII-24hour
 256        PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 257        PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 258        PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 259        PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 260        PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 261        PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 262        PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 263        PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 264        PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 265        PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 266        PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 267        PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 268        PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 269        PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 270        PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 271        PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 272        PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 273        PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 274        PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 275        PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 276        PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 277        PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 278        PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 279        PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 280        PC     1.0
 281        LS     0.0   72.42     0.0
 282        UD     0.0

 283        KK     2aB
 284        KO       0       0     0.0       1      22
 285        BA  0.4804
 286        PB     5.7
 287        IN       6  1JAN94       0
            * typeII-24hour
 288        PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 289        PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 290        PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 291        PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 292        PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 293        PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 294        PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 295        PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 296        PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 297        PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 298        PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 299        PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 300        PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 301        PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
```

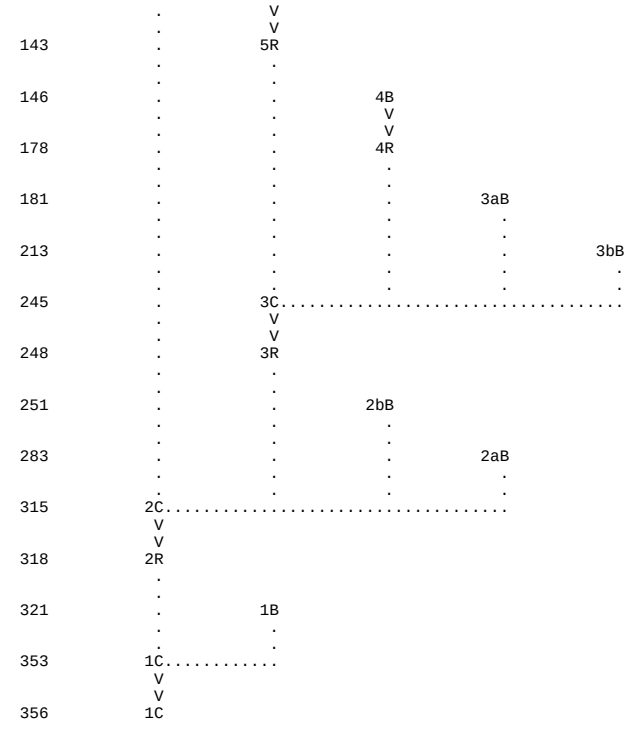
```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 302          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 303          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 304          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 305          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 306          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 307          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 308          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 309          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 310          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 311          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 312          PC     1.0
 313          LS     0.0    73.5     0.0
 314          UD     0.0

 315          KK      2C   CNAME      2R
 316          KO       0       0     0.0       0      22
 317          HC       4

 318          KK      2R   CNAME      2C
 319          KO       0       0     0.0       0      22
 320          RM       1   0.134     0.2

 321          KK      1B
 322          KO       0       0     0.0       1      22
 323          BA  0.6484
 324          PB     5.7
 325          IN       6  1JAN94       0
              * typeII-24hour
 326          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 327          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 328          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 329          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 330          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 331          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 332          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 333          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 334          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 335          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 336          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 337          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 338          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 339          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 340          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 341          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 342          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 343          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 344          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 345          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 346          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 347          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 348          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 349          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 350          PC     1.0
 351          LS     0.0   73.13     0.0
 352          UD     0.0
```



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


 353          KK      1C   CNAME      1C
 354          KO       0       0     0.0       0      22
 355          HC       2

 356          KK      1C   CNAME      1C
 357          KO       0       0     0.0       0      22
 358          RN      1C
 359          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    6          6B
                V
                V
   38          6R
                .
                .
   41           .         7bB
                .           .
                .           .
   73           .           .         7aB
                .           .           .
                .           .           .
  105          7C.......................
                V
                V
  108          7R
                .
                .
  111           .          5B
```



```
                .          V
                .          V
  143           .         5R
                .          .
                .          .
  146           .          .         4B
                .          .          V
                .          .          V
  178           .          .         4R
                .          .          .
                .          .          .
  181           .          .          .        3aB
                .          .          .          .
                .          .          .          .
  213           .          .          .          .        3bB
                .          .          .          .          .
                .          .          .          .          .
  245           .         3C.................................
                .          V
                .          V
  248           .         3R
                .          .
                .          .
  251           .          .        2bB
                .          .          .
                .          .          .
  283           .          .          .        2aB
                .          .          .          .
                .          .          .          .
  315          2C.................................
                V
                V
  318          2R
                .
                .
  321           .         1B
                .          .
                .          .
  353          1C...........
                V
                V
  356          1C

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************                                                  ***************************************
 *                                       *                                                  *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                  *    U.S. ARMY CORPS OF ENGINEERS     *
 *              MAY   1991               *                                                  *    HYDROLOGIC ENGINEERING CENTER    *
 *            VERSION 4.0.1E             *                                                  *          609 SECOND STREET          *
 *                                       *                                                  *       DAVIS, CALIFORNIA 95616       *
 *  RUN DATE            TIME             *                                                  *           (916) 551-1748            *
 *                                       *                                                  *                                     *
 *****************************************                                                  ***************************************
```

```
                          Scrabble Creek
                          wo Mining & w Logging (Scenario 5), 10m DEM Data
                          100 yr Storm

   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                       NMIN          15  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN94  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN94  ENDING DATE
                     NDTIME        0045  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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 KK     *        6B  *
            *            *
            **************
```

```
  7 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


 10 IN          TIME DATA FOR INPUT TIME SERIES
                       JXMIN          6  TIME INTERVAL IN MINUTES
                      JXDATE     1JAN94  STARTING DATE
                      JXTIME          0  STARTING TIME

             SUBBASIN RUNOFF DATA

  8 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.25  SUBBASIN AREA

             PRECIPITATION DATA

  9 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

 11 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

 36 LS          SCS LOSS RATE
                      STRTL       0.84  INITIAL ABSTRACTION
                      CRVNBR     70.50  CURVE NUMBER
                       RTIMP      0.00  PERCENT IMPERVIOUS AREA

 37 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG       0.21  LAG

                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             6 END-OF-PERIOD ORDINATES
                307.      242.       69.       20.        6.        2.
```

****

HYDROGRAPH AT STATION 6B

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	139.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	82.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	57.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	45.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	37.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	33.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	29.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	26.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	24.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	23.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	22.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	21.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	20.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	18.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	17.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	16.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	16.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	15.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	15.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	14.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	14.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	14.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	13.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	13.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	12.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	12.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	11.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	11.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	11.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	10.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	10.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	9.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	9.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	9.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	9.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	9.

1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	9.
1	JAN	0915	38	0.05	0.05	0.00	0.	*	1	JAN	2145	88	0.02	0.00	0.01	9.
1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	9.
1	JAN	0945	40	0.05	0.05	0.00	1.	*	1	JAN	2215	90	0.02	0.00	0.01	9.
1	JAN	1000	41	0.05	0.05	0.00	2.	*	1	JAN	2230	91	0.02	0.00	0.01	8.
1	JAN	1015	42	0.06	0.06	0.01	3.	*	1	JAN	2245	92	0.02	0.00	0.01	8.
1	JAN	1030	43	0.07	0.06	0.01	5.	*	1	JAN	2300	93	0.02	0.00	0.01	8.
1	JAN	1045	44	0.08	0.07	0.01	7.	*	1	JAN	2315	94	0.02	0.00	0.01	8.
1	JAN	1100	45	0.10	0.08	0.02	9.	*	1	JAN	2330	95	0.02	0.00	0.01	8.
1	JAN	1115	46	0.12	0.09	0.03	14.	*	1	JAN	2345	96	0.02	0.00	0.01	8.
1	JAN	1130	47	0.15	0.11	0.04	21.	*	2	JAN	0000	97	0.02	0.00	0.01	8.
1	JAN	1145	48	0.62	0.39	0.23	83.	*	2	JAN	0015	98	0.00	0.00	0.00	4.
1	JAN	1200	49	1.54	0.68	0.86	324.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.24	0.08	0.16	276.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 324.	12.00	57.	18.	17.	17.
		(INCHES) 2.123	2.614	2.614	2.614
		(AC-FT) 28.	35.	35.	35.

CUMULATIVE AREA = 0.25 SQ MI

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          **************
          *            *
38 KK     *        6R  *        CNAME      6C
          *            *
          **************
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39 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

40 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.04	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 6R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 6R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	146.	1	JAN	1845	76	12.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	91.	1	JAN	1900	77	11.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	57.	1	JAN	1915	78	11.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	47.	1	JAN	1930	79	11.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	37.	1	JAN	1945	80	10.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	34.	1	JAN	2000	81	10.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	29.	1	JAN	2015	82	9.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	27.	1	JAN	2030	83	9.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	24.	1	JAN	2045	84	9.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	23.	1	JAN	2100	85	9.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	22.	1	JAN	2115	86	9.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	21.	1	JAN	2130	87	9.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	20.	1	JAN	2145	88	9.
1	JAN	0315	14	0.	1	JAN	0930	39	1.	1	JAN	1545	64	19.	1	JAN	2200	89	9.
1	JAN	0330	15	0.	1	JAN	0945	40	1.	1	JAN	1600	65	17.	1	JAN	2215	90	9.
1	JAN	0345	16	0.	1	JAN	1000	41	2.	1	JAN	1615	66	16.	1	JAN	2230	91	9.
1	JAN	0400	17	0.	1	JAN	1015	42	3.	1	JAN	1630	67	16.	1	JAN	2245	92	8.
1	JAN	0415	18	0.	1	JAN	1030	43	4.	1	JAN	1645	68	15.	1	JAN	2300	93	8.
1	JAN	0430	19	0.	1	JAN	1045	44	6.	1	JAN	1700	69	15.	1	JAN	2315	94	8.
1	JAN	0445	20	0.	1	JAN	1100	45	9.	1	JAN	1715	70	14.	1	JAN	2330	95	8.
1	JAN	0500	21	0.	1	JAN	1115	46	13.	1	JAN	1730	71	14.	1	JAN	2345	96	8.
1	JAN	0515	22	0.	1	JAN	1130	47	19.	1	JAN	1745	72	14.	2	JAN	0000	97	8.
1	JAN	0530	23	0.	1	JAN	1145	48	69.	1	JAN	1800	73	13.	2	JAN	0015	98	5.
1	JAN	0545	24	0.	1	JAN	1200	49	275.	1	JAN	1815	74	13.	2	JAN	0030	99	1.
1	JAN	0600	25	0.	1	JAN	1215	50	318.	1	JAN	1830	75	12.	2	JAN	0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
318.	12.25	57.	18.	17.	17.
		(INCHES) 2.123	2.613	2.613	2.613
		(AC-FT) 28.	35.	35.	35.

CUMULATIVE AREA = 0.25 SQ MI

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          **************
          *            *
41 KK     *       7bB  *
          *            *
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42 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

45 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

43 BA SUBBASIN CHARACTERISTICS

TAREA,	0.27	SUBBASIN AREA

PRECIPITATION DATA

44 PB

STORM	5.70	BASIN TOTAL PRECIPITATION

46 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

71 LS SCS LOSS RATE

STRTL	0.80	INITIAL ABSTRACTION
CRVNBR	71.37	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

72 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

512. 143. 28. 6. 0.

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HYDROGRAPH AT STATION 7bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.12	110.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	68.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	51.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	43.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	38.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	33.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.01	0.04	30.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	27.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	26.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.04	24.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	23.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	22.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	21.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	20.

1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.03	18.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	17.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	17.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	16.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.03	0.01	0.02	16.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.03	0.01	0.02	15.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.03	0.01	0.02	15.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.03	0.01	0.02	15.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.03	0.01	0.02	14.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.03	0.01	0.02	14.
1	JAN	0600	25	0.03	0.03	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.02	13.
1	JAN	0615	26	0.03	0.03	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.02	13.
1	JAN	0630	27	0.03	0.03	0.00	0.	*	1	JAN	1900	77	0.02	0.00	0.02	12.
1	JAN	0645	28	0.03	0.03	0.00	0.	*	1	JAN	1915	78	0.02	0.00	0.02	12.
1	JAN	0700	29	0.03	0.03	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.02	11.
1	JAN	0715	30	0.03	0.03	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.02	11.
1	JAN	0730	31	0.03	0.03	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	10.
1	JAN	0745	32	0.03	0.03	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	10.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.02	0.00	0.01	10.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	10.
1	JAN	0830	35	0.04	0.04	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	10.
1	JAN	0845	36	0.04	0.04	0.00	0.	*	1	JAN	2115	86	0.02	0.00	0.01	10.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	9.
1	JAN	0915	38	0.05	0.04	0.00	1.	*	1	JAN	2145	88	0.02	0.00	0.01	10.
1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	9.
1	JAN	0945	40	0.05	0.04	0.00	2.	*	1	JAN	2215	90	0.02	0.00	0.01	9.
1	JAN	1000	41	0.05	0.05	0.01	3.	*	1	JAN	2230	91	0.02	0.00	0.01	9.
1	JAN	1015	42	0.06	0.05	0.01	5.	*	1	JAN	2245	92	0.02	0.00	0.01	9.
1	JAN	1030	43	0.07	0.06	0.01	6.	*	1	JAN	2300	93	0.02	0.00	0.01	9.
1	JAN	1045	44	0.08	0.07	0.01	9.	*	1	JAN	2315	94	0.02	0.00	0.01	9.
1	JAN	1100	45	0.10	0.08	0.02	12.	*	1	JAN	2330	95	0.02	0.00	0.01	9.
1	JAN	1115	46	0.12	0.09	0.03	18.	*	1	JAN	2345	96	0.02	0.00	0.01	9.
1	JAN	1130	47	0.15	0.11	0.04	27.	*	2	JAN	0000	97	0.02	0.00	0.01	9.
1	JAN	1145	48	0.62	0.38	0.24	131.	*	2	JAN	0015	98	0.00	0.00	0.00	2.
1	JAN	1200	49	1.54	0.65	0.89	491.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.24	0.08	0.17	220.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*										

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TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.01, TOTAL EXCESS = 2.69

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 491.	12.00		63.	19.	19.	19.
		(INCHES)	2.187	2.692	2.692	2.692
		(AC-FT)	31.	38.	38.	38.

CUMULATIVE AREA = 0.27 SQ MI

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          **************
          *            *
 73 KK    *       7aB  *
          *            *
          **************

 74 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


 77 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

             SUBBASIN RUNOFF DATA

 75 BA          SUBBASIN CHARACTERISTICS
                     TAREA,      0.56  SUBBASIN AREA

             PRECIPITATION DATA

 76 PB               STORM       5.70  BASIN TOTAL PRECIPITATION

 78 PI           INCREMENTAL 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      0.01      0.01
                   0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                   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      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
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0.00 0.00 0.00 0.00 0.00 0.00

103 LS SCS LOSS RATE
STRTL 0.77 INITIAL ABSTRACTION
CRVNBR 72.08 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

104 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.00 LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
1071. 300. 59. 12. 0.

****

HYDROGRAPH AT STATION 7aB

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.12	234.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	145.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	109.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	92.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	81.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	71.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.01	0.04	63.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	58.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	54.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.04	52.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	49.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	47.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	44.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	41.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	39.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	37.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	36.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	34.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	34.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	32.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	32.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	31.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	30.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	29.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	28.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.00	0.02	27.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.00	0.02	26.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.00	0.02	25.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	24.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	23.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	22.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	21.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	21.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	21.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	21.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	20.
1 JAN 0900	37	0.04	0.04	0.00	1.	1 JAN 2130	87	0.02	0.00	0.01	20.
1 JAN 0915	38	0.05	0.04	0.00	2.	1 JAN 2145	88	0.02	0.00	0.01	20.
1 JAN 0930	39	0.05	0.04	0.00	4.	1 JAN 2200	89	0.02	0.00	0.01	20.
1 JAN 0945	40	0.05	0.04	0.00	5.	1 JAN 2215	90	0.02	0.00	0.01	20.
1 JAN 1000	41	0.05	0.05	0.01	8.	1 JAN 2230	91	0.02	0.00	0.01	19.
1 JAN 1015	42	0.06	0.05	0.01	11.	1 JAN 2245	92	0.02	0.00	0.01	19.
1 JAN 1030	43	0.07	0.06	0.01	15.	1 JAN 2300	93	0.02	0.00	0.01	19.
1 JAN 1045	44	0.08	0.07	0.02	20.	1 JAN 2315	94	0.02	0.00	0.01	19.
1 JAN 1100	45	0.10	0.07	0.02	28.	1 JAN 2330	95	0.02	0.00	0.01	19.
1 JAN 1115	46	0.12	0.09	0.03	41.	1 JAN 2345	96	0.02	0.00	0.01	19.
1 JAN 1130	47	0.15	0.11	0.05	60.	2 JAN 0000	97	0.02	0.00	0.01	18.
1 JAN 1145	48	0.62	0.37	0.25	286.	2 JAN 0015	98	0.00	0.00	0.00	5.
1 JAN 1200	49	1.54	0.63	0.91	1055.	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.24	0.07	0.17	470.	2 JAN 0045	100	0.00	0.00	0.00	0.

****

TOTAL RAINFALL = 5.70, TOTAL LOSS = 2.94, TOTAL EXCESS = 2.76

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1055.	12.00	134.	41.	40.	40.
		(INCHES) 2.238	2.757	2.757	2.757
		(AC-FT) 67.	82.	82.	82.

CUMULATIVE AREA = 0.56 SQ MI

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          *            *
105 KK    *        7C  *        CNAME      7R
          *            *
          **************

106 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


107 HC          HYDROGRAPH COMBINATION
                     ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***
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HYDROGRAPH AT STATION 7C
SUM OF 3 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	490.	1 JAN 1845	76	52.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	304.	1 JAN 1900	77	49.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	218.	1 JAN 1915	78	48.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	182.	1 JAN 1930	79	46.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	156.	1 JAN 1945	80	44.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	138.	1 JAN 2000	81	42.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	122.	1 JAN 2015	82	41.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	112.	1 JAN 2030	83	40.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	104.	1 JAN 2045	84	40.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	100.	1 JAN 2100	85	40.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	94.	1 JAN 2115	86	39.
1 JAN 0245	12	0.	1 JAN 0900	37	1.	1 JAN 1515	62	90.	1 JAN 2130	87	38.
1 JAN 0300	13	0.	1 JAN 0915	38	3.	1 JAN 1530	63	84.	1 JAN 2145	88	39.
1 JAN 0315	14	0.	1 JAN 0930	39	6.	1 JAN 1545	64	80.	1 JAN 2200	89	38.
1 JAN 0330	15	0.	1 JAN 0945	40	9.	1 JAN 1600	65	74.	1 JAN 2215	90	38.
1 JAN 0345	16	0.	1 JAN 1000	41	13.	1 JAN 1615	66	70.	1 JAN 2230	91	37.
1 JAN 0400	17	0.	1 JAN 1015	42	18.	1 JAN 1630	67	68.	1 JAN 2245	92	37.
1 JAN 0415	18	0.	1 JAN 1030	43	25.	1 JAN 1645	68	66.	1 JAN 2300	93	37.
1 JAN 0430	19	0.	1 JAN 1045	44	36.	1 JAN 1700	69	65.	1 JAN 2315	94	36.
1 JAN 0445	20	0.	1 JAN 1100	45	49.	1 JAN 1715	70	62.	1 JAN 2330	95	35.
1 JAN 0500	21	0.	1 JAN 1115	46	72.	1 JAN 1730	71	61.	1 JAN 2345	96	36.
1 JAN 0515	22	0.	1 JAN 1130	47	107.	1 JAN 1745	72	59.	2 JAN 0000	97	35.
1 JAN 0530	23	0.	1 JAN 1145	48	485.	1 JAN 1800	73	57.	2 JAN 0015	98	12.
1 JAN 0545	24	0.	1 JAN 1200	49	1821.	1 JAN 1815	74	55.	2 JAN 0030	99	3.
1 JAN 0600	25	0.	1 JAN 1215	50	1007.	1 JAN 1830	75	54.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1821.	12.00	254.	78.	76.	76.
		(INCHES) 2.198	2.708	2.708	2.708
		(AC-FT) 126.	155.	155.	155.

CUMULATIVE AREA = 1.08 SQ MI

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


          **************
          *            *
108 KK    *        7R  *        CNAME      7C
          *            *
          **************

109 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

110 RM          MUSKINGUM ROUTING
                     NSTPS         1 NUMBER OF SUBREACHES
                     AMSKK      0.09 MUSKINGUM K
                         X      0.20 MUSKINGUM X
```

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   7R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 7R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	573.	1 JAN 1845	76	52.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	363.	1 JAN 1900	77	50.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	239.	1 JAN 1915	78	48.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	192.	1 JAN 1930	79	47.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	165.	1 JAN 1945	80	45.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	143.	1 JAN 2000	81	43.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	128.	1 JAN 2015	82	41.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	115.	1 JAN 2030	83	40.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	107.	1 JAN 2045	84	40.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	101.	1 JAN 2100	85	40.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	96.	1 JAN 2115	86	39.
1 JAN 0245	12	0.	1 JAN 0900	37	1.	1 JAN 1515	62	91.	1 JAN 2130	87	38.
1 JAN 0300	13	0.	1 JAN 0915	38	2.	1 JAN 1530	63	86.	1 JAN 2145	88	38.
1 JAN 0315	14	0.	1 JAN 0930	39	5.	1 JAN 1545	64	81.	1 JAN 2200	89	38.
1 JAN 0330	15	0.	1 JAN 0945	40	8.	1 JAN 1600	65	76.	1 JAN 2215	90	38.
1 JAN 0345	16	0.	1 JAN 1000	41	11.	1 JAN 1615	66	71.	1 JAN 2230	91	37.
1 JAN 0400	17	0.	1 JAN 1015	42	16.	1 JAN 1630	67	69.	1 JAN 2245	92	37.
1 JAN 0415	18	0.	1 JAN 1030	43	23.	1 JAN 1645	68	67.	1 JAN 2300	93	37.
1 JAN 0430	19	0.	1 JAN 1045	44	32.	1 JAN 1700	69	65.	1 JAN 2315	94	36.
1 JAN 0445	20	0.	1 JAN 1100	45	44.	1 JAN 1715	70	63.	1 JAN 2330	95	36.
1 JAN 0500	21	0.	1 JAN 1115	46	63.	1 JAN 1730	71	61.	1 JAN 2345	96	36.
1 JAN 0515	22	0.	1 JAN 1130	47	94.	1 JAN 1745	72	60.	2 JAN 0000	97	35.
1 JAN 0530	23	0.	1 JAN 1145	48	320.	1 JAN 1800	73	58.	2 JAN 0015	98	22.
1 JAN 0545	24	0.	1 JAN 1200	49	1271.	1 JAN 1815	74	56.	2 JAN 0030	99	4.
1 JAN 0600	25	0.	1 JAN 1215	50	1528.	1 JAN 1830	75	54.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1528.	12.25	254.	78.	76.	76.
		(INCHES) 2.198	2.707	2.707	2.707
		(AC-FT) 126.	155.	155.	155.

CUMULATIVE AREA = 1.08 SQ MI

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          **************
          *            *
111 KK    *        5B  *
          *            *
          **************

112 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


115 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

113 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.64  SUBBASIN AREA

                PRECIPITATION DATA

114 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

116 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00
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 141 LS          SCS LOSS RATE
                      STRTL       0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

 142 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.24  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               7 END-OF-PERIOD ORDINATES
              674.      669.      214.       70.       23.        8.        1.

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

                                                HYDROGRAPH AT STATION       5B

*************************************************************************************************************************************************
                                                                                *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                  *
        1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.17    0.05    0.11       388.
        1 JAN 0015    2    0.01    0.01    0.00         0.       *        1 JAN 1245   52    0.11    0.03    0.08       231.
        1 JAN 0030    3    0.01    0.01    0.00         0.       *        1 JAN 1300   53    0.10    0.03    0.07       156.
        1 JAN 0045    4    0.02    0.02    0.00         0.       *        1 JAN 1315   54    0.08    0.02    0.06       120.
        1 JAN 0100    5    0.02    0.02    0.00         0.       *        1 JAN 1330   55    0.07    0.02    0.05        99.
        1 JAN 0115    6    0.02    0.02    0.00         0.       *        1 JAN 1345   56    0.06    0.02    0.05        86.
        1 JAN 0130    7    0.02    0.02    0.00         0.       *        1 JAN 1400   57    0.06    0.02    0.04        76.
        1 JAN 0145    8    0.02    0.02    0.00         0.       *        1 JAN 1415   58    0.05    0.01    0.04        68.
        1 JAN 0200    9    0.02    0.02    0.00         0.       *        1 JAN 1430   59    0.05    0.01    0.04        63.
        1 JAN 0215   10    0.02    0.02    0.00         0.       *        1 JAN 1445   60    0.05    0.01    0.03        60.
        1 JAN 0230   11    0.02    0.02    0.00         0.       *        1 JAN 1500   61    0.04    0.01    0.03        57.
        1 JAN 0245   12    0.02    0.02    0.00         0.       *        1 JAN 1515   62    0.04    0.01    0.03        54.
        1 JAN 0300   13    0.02    0.02    0.00         0.       *        1 JAN 1530   63    0.04    0.01    0.03        51.
        1 JAN 0315   14    0.02    0.02    0.00         0.       *        1 JAN 1545   64    0.04    0.01    0.03        48.
        1 JAN 0330   15    0.02    0.02    0.00         0.       *        1 JAN 1600   65    0.03    0.01    0.03        45.
        1 JAN 0345   16    0.02    0.02    0.00         0.       *        1 JAN 1615   66    0.03    0.01    0.02        42.
        1 JAN 0400   17    0.02    0.02    0.00         0.       *        1 JAN 1630   67    0.03    0.01    0.02        41.
        1 JAN 0415   18    0.02    0.02    0.00         0.       *        1 JAN 1645   68    0.03    0.01    0.02        39.
        1 JAN 0430   19    0.02    0.02    0.00         0.       *        1 JAN 1700   69    0.03    0.01    0.02        38.
        1 JAN 0445   20    0.02    0.02    0.00         0.       *        1 JAN 1715   70    0.03    0.01    0.02        37.
        1 JAN 0500   21    0.02    0.02    0.00         0.       *        1 JAN 1730   71    0.03    0.01    0.02        36.
        1 JAN 0515   22    0.02    0.02    0.00         0.       *        1 JAN 1745   72    0.03    0.01    0.02        35.
        1 JAN 0530   23    0.02    0.02    0.00         0.       *        1 JAN 1800   73    0.03    0.01    0.02        34.
        1 JAN 0545   24    0.02    0.02    0.00         0.       *        1 JAN 1815   74    0.03    0.01    0.02        33.
        1 JAN 0600   25    0.03    0.03    0.00         0.       *        1 JAN 1830   75    0.02    0.01    0.02        32.
        1 JAN 0615   26    0.03    0.03    0.00         0.       *        1 JAN 1845   76    0.02    0.01    0.02        31.
        1 JAN 0630   27    0.03    0.03    0.00         0.       *        1 JAN 1900   77    0.02    0.01    0.02        29.
        1 JAN 0645   28    0.03    0.03    0.00         0.       *        1 JAN 1915   78    0.02    0.01    0.02        29.
        1 JAN 0700   29    0.03    0.03    0.00         0.       *        1 JAN 1930   79    0.02    0.00    0.02        28.
        1 JAN 0715   30    0.03    0.03    0.00         0.       *        1 JAN 1945   80    0.02    0.00    0.02        26.
        1 JAN 0730   31    0.03    0.03    0.00         0.       *        1 JAN 2000   81    0.02    0.00    0.01        25.
        1 JAN 0745   32    0.03    0.03    0.00         0.       *        1 JAN 2015   82    0.02    0.00    0.01        24.
        1 JAN 0800   33    0.03    0.03    0.00         0.       *        1 JAN 2030   83    0.02    0.00    0.01        24.
        1 JAN 0815   34    0.03    0.03    0.00         0.       *        1 JAN 2045   84    0.02    0.00    0.01        23.
        1 JAN 0830   35    0.04    0.04    0.00         0.       *        1 JAN 2100   85    0.02    0.00    0.01        23.
        1 JAN 0845   36    0.04    0.04    0.00         0.       *        1 JAN 2115   86    0.02    0.00    0.01        23.
        1 JAN 0900   37    0.04    0.04    0.00         0.       *        1 JAN 2130   87    0.02    0.00    0.01        23.
        1 JAN 0915   38    0.05    0.05    0.00         0.       *        1 JAN 2145   88    0.02    0.00    0.01        23.
        1 JAN 0930   39    0.05    0.04    0.00         1.       *        1 JAN 2200   89    0.02    0.00    0.01        22.
        1 JAN 0945   40    0.05    0.05    0.00         3.       *        1 JAN 2215   90    0.02    0.00    0.01        22.
        1 JAN 1000   41    0.05    0.05    0.00         5.       *        1 JAN 2230   91    0.02    0.00    0.01        22.
        1 JAN 1015   42    0.06    0.06    0.01         8.       *        1 JAN 2245   92    0.02    0.00    0.01        22.
        1 JAN 1030   43    0.07    0.06    0.01        11.       *        1 JAN 2300   93    0.02    0.00    0.01        22.
        1 JAN 1045   44    0.08    0.07    0.01        16.       *        1 JAN 2315   94    0.02    0.00    0.01        21.
        1 JAN 1100   45    0.10    0.08    0.02        23.       *        1 JAN 2330   95    0.02    0.00    0.01        21.
        1 JAN 1115   46    0.12    0.09    0.03        33.       *        1 JAN 2345   96    0.02    0.00    0.01        21.
        1 JAN 1130   47    0.15    0.11    0.04        50.       *        2 JAN 0000   97    0.02    0.00    0.01        21.
        1 JAN 1145   48    0.62    0.39    0.23       190.       *        2 JAN 0015   98    0.00    0.00    0.00        12.
        1 JAN 1200   49    1.54    0.68    0.86       747.       *        2 JAN 0030   99    0.00    0.00    0.00         4.
        1 JAN 1215   50    0.24    0.08    0.16       740.       *        2 JAN 0045  100    0.00    0.00    0.00         1.
                                                                  *
*************************************************************************************************************************************************

     TOTAL RAINFALL =    5.70, TOTAL LOSS =    3.09, TOTAL EXCESS =    2.61

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                          (CFS)
+     747.      12.00                147.          45.         44.          44.
                         (INCHES)    2.123        2.613       2.613        2.613
                          (AC-FT)      73.          90.         90.          90.

                         CUMULATIVE AREA =    0.64 SQ MI


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


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            *            *
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 143 KK     *        5R  *        CNAME      5C
            *            *
            **************

 144 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 145 RM          MUSKINGUM ROUTING
                      NSTPS         1 NUMBER OF SUBREACHES
                      AMSKK      0.10 MUSKINGUM K
                          X      0.20 MUSKINGUM X

                                                          ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      5R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

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

                                                HYDROGRAPH AT STATION       5R

********************************************************************************************************************************************
                                  *                                 *                                 *                                 *
   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW
                                  *                                 *                                 *
    1 JAN 0000    1        0.   *    1 JAN 0615   26        0.   *    1 JAN 1230   51      545.   *    1 JAN 1845   76       31.
    1 JAN 0015    2        0.   *    1 JAN 0630   27        0.   *    1 JAN 1245   52      272.   *    1 JAN 1900   77       30.
    1 JAN 0030    3        0.   *    1 JAN 0645   28        0.   *    1 JAN 1300   53      183.   *    1 JAN 1915   78       29.
    1 JAN 0045    4        0.   *    1 JAN 0700   29        0.   *    1 JAN 1315   54      132.   *    1 JAN 1930   79       28.
    1 JAN 0100    5        0.   *    1 JAN 0715   30        0.   *    1 JAN 1330   55      107.   *    1 JAN 1945   80       27.
    1 JAN 0115    6        0.   *    1 JAN 0730   31        0.   *    1 JAN 1345   56       90.   *    1 JAN 2000   81       26.
    1 JAN 0130    7        0.   *    1 JAN 0745   32        0.   *    1 JAN 1400   57       79.   *    1 JAN 2015   82       25.
    1 JAN 0145    8        0.   *    1 JAN 0800   33        0.   *    1 JAN 1415   58       71.   *    1 JAN 2030   83       24.
    1 JAN 0200    9        0.   *    1 JAN 0815   34        0.   *    1 JAN 1430   59       65.   *    1 JAN 2045   84       23.
    1 JAN 0215   10        0.   *    1 JAN 0830   35        0.   *    1 JAN 1445   60       61.   *    1 JAN 2100   85       23.
    1 JAN 0230   11        0.   *    1 JAN 0845   36        0.   *    1 JAN 1500   61       58.   *    1 JAN 2115   86       23.
    1 JAN 0245   12        0.   *    1 JAN 0900   37        0.   *    1 JAN 1515   62       55.   *    1 JAN 2130   87       23.
    1 JAN 0300   13        0.   *    1 JAN 0915   38        0.   *    1 JAN 1530   63       52.   *    1 JAN 2145   88       23.
    1 JAN 0315   14        0.   *    1 JAN 0930   39        1.   *    1 JAN 1545   64       49.   *    1 JAN 2200   89       23.
    1 JAN 0330   15        0.   *    1 JAN 0945   40        2.   *    1 JAN 1600   65       46.   *    1 JAN 2215   90       22.
    1 JAN 0345   16        0.   *    1 JAN 1000   41        4.   *    1 JAN 1615   66       43.   *    1 JAN 2230   91       22.
    1 JAN 0400   17        0.   *    1 JAN 1015   42        6.   *    1 JAN 1630   67       41.   *    1 JAN 2245   92       22.
    1 JAN 0415   18        0.   *    1 JAN 1030   43       10.   *    1 JAN 1645   68       40.   *    1 JAN 2300   93       22.
    1 JAN 0430   19        0.   *    1 JAN 1045   44       14.   *    1 JAN 1700   69       39.   *    1 JAN 2315   94       22.
    1 JAN 0445   20        0.   *    1 JAN 1100   45       20.   *    1 JAN 1715   70       38.   *    1 JAN 2330   95       21.
    1 JAN 0500   21        0.   *    1 JAN 1115   46       29.   *    1 JAN 1730   71       36.   *    1 JAN 2345   96       21.
    1 JAN 0515   22        0.   *    1 JAN 1130   47       43.   *    1 JAN 1745   72       35.   *    2 JAN 0000   97       21.
    1 JAN 0530   23        0.   *    1 JAN 1145   48      124.   *    1 JAN 1800   73       34.   *    2 JAN 0015   98       16.
    1 JAN 0545   24        0.   *    1 JAN 1200   49      491.   *    1 JAN 1815   74       33.   *    2 JAN 0030   99        7.
    1 JAN 0600   25        0.   *    1 JAN 1215   50      800.   *    1 JAN 1830   75       32.   *    2 JAN 0045  100        2.
                                  *                                 *                                 *
********************************************************************************************************************************************

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                 6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                  (CFS)
+     800.     12.25              147.         45.         44.          44.
                (INCHES)        2.122       2.613       2.613        2.613
                 (AC-FT)         73.         90.         90.          90.

                 CUMULATIVE AREA =    0.64 SQ MI


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


            **************
            *            *
 146 KK     *        4B  *
            *            *
            **************

 147 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


 150 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
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                JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

148 BA        SUBBASIN CHARACTERISTICS
                TAREA,       0.41  SUBBASIN AREA

            PRECIPITATION DATA

149 PB              STORM        5.70  BASIN TOTAL PRECIPITATION

151 PI          INCREMENTAL 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      0.01      0.01
                  0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                  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      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00

176 LS        SCS LOSS RATE
                STRTL        0.84  INITIAL ABSTRACTION
                CRVNBR      70.50  CURVE NUMBER
                RTIMP        0.00  PERCENT IMPERVIOUS AREA

177 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG        0.26  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
            366.      438.      159.       57.       20.        7.        3.
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HYDROGRAPH AT STATION 4B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	265.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	159.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	106.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	80.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	65.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	55.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	49.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	44.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	40.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	38.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	36.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	34.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	32.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	30.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	29.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	27.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	26.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	25.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	24.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	24.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	23.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	22.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	22.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	21.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	20.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	20.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.01	0.02	19.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.01	0.02	18.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	18.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	17.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	16.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	15.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	15.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	15.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	15.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	15.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	14.
1	JAN	0915	38	0.05	0.05	0.00	0.	1	JAN	2145	88	0.02	0.00	0.01	14.
1	JAN	0930	39	0.05	0.04	0.00	1.	1	JAN	2200	89	0.02	0.00	0.01	14.
1	JAN	0945	40	0.05	0.05	0.00	2.	1	JAN	2215	90	0.02	0.00	0.01	14.
1	JAN	1000	41	0.05	0.05	0.00	3.	1	JAN	2230	91	0.02	0.00	0.01	14.
1	JAN	1015	42	0.06	0.06	0.01	5.	1	JAN	2245	92	0.02	0.00	0.01	14.
1	JAN	1030	43	0.07	0.06	0.01	7.	1	JAN	2300	93	0.02	0.00	0.01	14.
1	JAN	1045	44	0.08	0.07	0.01	10.	1	JAN	2315	94	0.02	0.00	0.01	14.
1	JAN	1100	45	0.10	0.08	0.02	14.	1	JAN	2330	95	0.02	0.00	0.01	13.
1	JAN	1115	46	0.12	0.09	0.03	20.	1	JAN	2345	96	0.02	0.00	0.01	13.
1	JAN	1130	47	0.15	0.11	0.04	30.	2	JAN	0000	97	0.02	0.00	0.01	13.
1	JAN	1145	48	0.62	0.39	0.23	108.	2	JAN	0015	98	0.00	0.00	0.00	9.
1	JAN	1200	49	1.54	0.68	0.86	425.	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.24	0.08	0.16	477.	2	JAN	0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.09, TOTAL EXCESS = 2.61

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
	(CFS)	93.	29.	28.	28.
477.	12.25				
	(INCHES)	2.122	2.613	2.613	2.613
	(AC-FT)	46.	57.	57.	57.

CUMULATIVE AREA = 0.41 SQ MI

178 KK 4R CNAME 4C

179 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

180 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.09	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 4R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	359.	1 JAN 1845	76	20.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	183.	1 JAN 1900	77	19.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	124.	1 JAN 1915	78	18.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	87.	1 JAN 1930	79	18.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	70.	1 JAN 1945	80	17.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	59.	1 JAN 2000	81	16.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	51.	1 JAN 2015	82	16.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	46.	1 JAN 2030	83	15.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	41.	1 JAN 2045	84	15.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	39.	1 JAN 2100	85	15.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	37.	1 JAN 2115	86	15.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	35.	1 JAN 2130	87	14.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	33.	1 JAN 2145	88	14.
1 JAN 0315	14	0.	1 JAN 0930	39	1.	1 JAN 1545	64	31.	1 JAN 2200	89	14.
1 JAN 0330	15	0.	1 JAN 0945	40	1.	1 JAN 1600	65	29.	1 JAN 2215	90	14.
1 JAN 0345	16	0.	1 JAN 1000	41	2.	1 JAN 1615	66	28.	1 JAN 2230	91	14.
1 JAN 0400	17	0.	1 JAN 1015	42	4.	1 JAN 1630	67	26.	1 JAN 2245	92	14.
1 JAN 0415	18	0.	1 JAN 1030	43	6.	1 JAN 1645	68	25.	1 JAN 2300	93	14.
1 JAN 0430	19	0.	1 JAN 1045	44	9.	1 JAN 1700	69	25.	1 JAN 2315	94	14.
1 JAN 0445	20	0.	1 JAN 1100	45	12.	1 JAN 1715	70	24.	1 JAN 2330	95	13.
1 JAN 0500	21	0.	1 JAN 1115	46	18.	1 JAN 1730	71	23.	1 JAN 2345	96	13.
1 JAN 0515	22	0.	1 JAN 1130	47	26.	1 JAN 1745	72	22.	2 JAN 0000	97	13.
1 JAN 0530	23	0.	1 JAN 1145	48	73.	1 JAN 1800	73	22.	2 JAN 0015	98	11.
1 JAN 0545	24	0.	1 JAN 1200	49	288.	1 JAN 1815	74	21.	2 JAN 0030	99	5.
1 JAN 0600	25	0.	1 JAN 1215	50	489.	1 JAN 1830	75	20.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
	(CFS)	93.	29.	28.	28.
489.	12.25				
	(INCHES)	2.121	2.612	2.612	2.612
	(AC-FT)	46.	57.	57.	57.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
181 KK    *       3aB  *
          *            *
          **************

182 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


185 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

183 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.41  SUBBASIN AREA

                PRECIPITATION DATA

184 PB               STORM         5.70  BASIN TOTAL PRECIPITATION

186 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

211 LS          SCS LOSS RATE
                     STRTL        0.83  INITIAL ABSTRACTION
                     CRVNBR      70.59  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

212 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.27  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
               360.      448.      168.       61.       22.        8.        3.
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HYDROGRAPH AT STATION 3aB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	275.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	166.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	110.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	83.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	67.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	57.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	50.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	45.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	41.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	39.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	37.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	35.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	33.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	31.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	29.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	28.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	26.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	26.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	25.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	24.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	23.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	23.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	22.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	21.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	21.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	20.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	19.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	19.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	18.

1	JAN	0715	30	0.03	0.03	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.02	17.
1	JAN	0730	31	0.03	0.03	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	16.
1	JAN	0745	32	0.03	0.03	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	16.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.02	0.00	0.01	15.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	15.
1	JAN	0830	35	0.04	0.04	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	15.
1	JAN	0845	36	0.04	0.04	0.00	0.	*	1	JAN	2115	86	0.02	0.00	0.01	15.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	15.
1	JAN	0915	38	0.05	0.05	0.00	0.	*	1	JAN	2145	88	0.02	0.00	0.01	15.
1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	15.
1	JAN	0945	40	0.05	0.05	0.00	2.	*	1	JAN	2215	90	0.02	0.00	0.01	14.
1	JAN	1000	41	0.05	0.05	0.00	3.	*	1	JAN	2230	91	0.02	0.00	0.01	14.
1	JAN	1015	42	0.06	0.06	0.01	5.	*	1	JAN	2245	92	0.02	0.00	0.01	14.
1	JAN	1030	43	0.07	0.06	0.01	7.	*	1	JAN	2300	93	0.02	0.00	0.01	14.
1	JAN	1045	44	0.08	0.07	0.01	10.	*	1	JAN	2315	94	0.02	0.00	0.01	14.
1	JAN	1100	45	0.10	0.08	0.02	14.	*	1	JAN	2330	95	0.02	0.00	0.01	14.
1	JAN	1115	46	0.12	0.09	0.03	21.	*	1	JAN	2345	96	0.02	0.00	0.01	14.
1	JAN	1130	47	0.15	0.11	0.04	31.	*	2	JAN	0000	97	0.02	0.00	0.01	13.
1	JAN	1145	48	0.62	0.39	0.23	108.	*	2	JAN	0015	98	0.00	0.00	0.00	9.
1	JAN	1200	49	1.54	0.68	0.87	424.	*	2	JAN	0030	99	0.00	0.00	0.00	3.
1	JAN	1215	50	0.24	0.08	0.16	488.	*	2	JAN	0045	100	0.00	0.00	0.00	1.
								*								

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TOTAL RAINFALL = 5.70, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.62

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
488.	12.25	95.	29.	28.	28.
		(INCHES) 2.128	2.621	2.621	2.621
		(AC-FT) 47.	58.	58.	58.

CUMULATIVE AREA = 0.41 SQ MI

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          **************
          *            *
213 KK    *       3bB  *
          *            *
          **************
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214 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

217 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

215 BA SUBBASIN CHARACTERISTICS

TAREA,	0.44	SUBBASIN AREA

PRECIPITATION DATA

216 PB

STORM	5.70	BASIN TOTAL PRECIPITATION

218 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

243 LS SCS LOSS RATE

STRTL	0.79	INITIAL ABSTRACTION
CRVNBR	71.79	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

244 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.26	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

7 END-OF-PERIOD ORDINATES

394. 471. 171. 61. 21. 8. 3.

HYDROGRAPH AT STATION 3bB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.12	297.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	178.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	118.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	89.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	72.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	61.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.01	0.04	54.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	48.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	45.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.04	42.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	40.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	38.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	36.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	34.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	32.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	30.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	28.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	28.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	27.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	26.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	25.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	24.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	24.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.03	0.01	0.02	23.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	22.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	22.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.00	0.02	21.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.00	0.02	20.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	19.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	19.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	18.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	17.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	17.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	16.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	16.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	16.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	16.
1 JAN 0915	38	0.05	0.04	0.00	1.	1 JAN 2145	88	0.02	0.00	0.01	16.
1 JAN 0930	39	0.05	0.04	0.00	2.	1 JAN 2200	89	0.02	0.00	0.01	16.
1 JAN 0945	40	0.05	0.04	0.00	3.	1 JAN 2215	90	0.02	0.00	0.01	15.
1 JAN 1000	41	0.05	0.05	0.01	5.	1 JAN 2230	91	0.02	0.00	0.01	15.
1 JAN 1015	42	0.06	0.05	0.01	7.	1 JAN 2245	92	0.02	0.00	0.01	15.
1 JAN 1030	43	0.07	0.06	0.01	9.	1 JAN 2300	93	0.02	0.00	0.01	15.
1 JAN 1045	44	0.08	0.07	0.01	13.	1 JAN 2315	94	0.02	0.00	0.01	15.
1 JAN 1100	45	0.10	0.07	0.02	18.	1 JAN 2330	95	0.02	0.00	0.01	15.
1 JAN 1115	46	0.12	0.09	0.03	25.	1 JAN 2345	96	0.02	0.00	0.01	15.
1 JAN 1130	47	0.15	0.11	0.05	37.	2 JAN 0000	97	0.02	0.00	0.01	14.
1 JAN 1145	48	0.62	0.38	0.25	126.	2 JAN 0015	98	0.00	0.00	0.00	9.
1 JAN 1200	49	1.54	0.64	0.90	482.	2 JAN 0030	99	0.00	0.00	0.00	3.
1 JAN 1215	50	0.24	0.08	0.17	538.	2 JAN 0045	100	0.00	0.00	0.00	1.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 2.97, TOTAL EXCESS = 2.73

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
538.	12.25	104.	32.	31.	31.
		(INCHES) 2.215	2.730	2.730	2.730
		(AC-FT) 52.	64.	64.	64.

CUMULATIVE AREA = 0.44 SQ MI

245 KK
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* *
* 3C *
* *
****
CNAME 3R

246 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

247 HC HYDROGRAPH COMBINATION
ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 3C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1475.	1 JAN 1845	76	92.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	798.	1 JAN 1900	77	89.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	536.	1 JAN 1915	78	86.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	390.	1 JAN 1930	79	83.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	317.	1 JAN 1945	80	80.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	267.	1 JAN 2000	81	76.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	234.	1 JAN 2015	82	73.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	210.	1 JAN 2030	83	71.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	192.	1 JAN 2045	84	70.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	180.	1 JAN 2100	85	70.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	171.	1 JAN 2115	86	69.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	162.	1 JAN 2130	87	68.
1 JAN 0300	13	0.	1 JAN 0915	38	1.	1 JAN 1530	63	153.	1 JAN 2145	88	67.
1 JAN 0315	14	0.	1 JAN 0930	39	4.	1 JAN 1545	64	145.	1 JAN 2200	89	67.
1 JAN 0330	15	0.	1 JAN 0945	40	8.	1 JAN 1600	65	136.	1 JAN 2215	90	66.
1 JAN 0345	16	0.	1 JAN 1000	41	14.	1 JAN 1615	66	128.	1 JAN 2230	91	65.
1 JAN 0400	17	0.	1 JAN 1015	42	22.	1 JAN 1630	67	122.	1 JAN 2245	92	65.
1 JAN 0415	18	0.	1 JAN 1030	43	32.	1 JAN 1645	68	118.	1 JAN 2300	93	65.
1 JAN 0430	19	0.	1 JAN 1045	44	45.	1 JAN 1700	69	115.	1 JAN 2315	94	64.
1 JAN 0445	20	0.	1 JAN 1100	45	64.	1 JAN 1715	70	111.	1 JAN 2330	95	63.
1 JAN 0500	21	0.	1 JAN 1115	46	92.	1 JAN 1730	71	108.	1 JAN 2345	96	62.
1 JAN 0515	22	0.	1 JAN 1130	47	137.	1 JAN 1745	72	105.	2 JAN 0000	97	62.
1 JAN 0530	23	0.	1 JAN 1145	48	430.	1 JAN 1800	73	102.	2 JAN 0015	98	45.
1 JAN 0545	24	0.	1 JAN 1200	49	1686.	1 JAN 1815	74	98.	2 JAN 0030	99	19.
1 JAN 0600	25	0.	1 JAN 1215	50	2316.	1 JAN 1830	75	95.	2 JAN 0045	100	6.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
2316.	12.25	438.	135.	131.	131.
		(INCHES) 2.144	2.641	2.641	2.641
		(AC-FT) 217.	268.	268.	268.

CUMULATIVE AREA = 1.90 SQ MI

*** ***

248 KK 3R CNAME 3C

249 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

250 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.04	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 3R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

HYDROGRAPH AT STATION 3R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	1692.	1 JAN 1845	76	93.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	847.	1 JAN 1900	77	90.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	575.	1 JAN 1915	78	86.

1	JAN	0045	4	0.	*	1	JAN	0700	29	0.	*	1	JAN	1315	54	405.	*	1	JAN	1930	79	83.
1	JAN	0100	5	0.	*	1	JAN	0715	30	0.	*	1	JAN	1330	55	327.	*	1	JAN	1945	80	80.
1	JAN	0115	6	0.	*	1	JAN	0730	31	0.	*	1	JAN	1345	56	274.	*	1	JAN	2000	81	77.
1	JAN	0130	7	0.	*	1	JAN	0745	32	0.	*	1	JAN	1400	57	239.	*	1	JAN	2015	82	74.
1	JAN	0145	8	0.	*	1	JAN	0800	33	0.	*	1	JAN	1415	58	213.	*	1	JAN	2030	83	71.
1	JAN	0200	9	0.	*	1	JAN	0815	34	0.	*	1	JAN	1430	59	194.	*	1	JAN	2045	84	70.
1	JAN	0215	10	0.	*	1	JAN	0830	35	0.	*	1	JAN	1445	60	182.	*	1	JAN	2100	85	70.
1	JAN	0230	11	0.	*	1	JAN	0845	36	0.	*	1	JAN	1500	61	172.	*	1	JAN	2115	86	69.
1	JAN	0245	12	0.	*	1	JAN	0900	37	0.	*	1	JAN	1515	62	164.	*	1	JAN	2130	87	68.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1.	*	1	JAN	1530	63	155.	*	1	JAN	2145	88	67.
1	JAN	0315	14	0.	*	1	JAN	0930	39	4.	*	1	JAN	1545	64	146.	*	1	JAN	2200	89	67.
1	JAN	0330	15	0.	*	1	JAN	0945	40	8.	*	1	JAN	1600	65	138.	*	1	JAN	2215	90	66.
1	JAN	0345	16	0.	*	1	JAN	1000	41	13.	*	1	JAN	1615	66	129.	*	1	JAN	2230	91	66.
1	JAN	0400	17	0.	*	1	JAN	1015	42	20.	*	1	JAN	1630	67	123.	*	1	JAN	2245	92	65.
1	JAN	0415	18	0.	*	1	JAN	1030	43	30.	*	1	JAN	1645	68	119.	*	1	JAN	2300	93	65.
1	JAN	0430	19	0.	*	1	JAN	1045	44	43.	*	1	JAN	1700	69	115.	*	1	JAN	2315	94	64.
1	JAN	0445	20	0.	*	1	JAN	1100	45	61.	*	1	JAN	1715	70	112.	*	1	JAN	2330	95	63.
1	JAN	0500	21	0.	*	1	JAN	1115	46	87.	*	1	JAN	1730	71	109.	*	1	JAN	2345	96	62.
1	JAN	0515	22	0.	*	1	JAN	1130	47	129.	*	1	JAN	1745	72	105.	*	2	JAN	0000	97	62.
1	JAN	0530	23	0.	*	1	JAN	1145	48	359.	*	1	JAN	1800	73	102.	*	2	JAN	0015	98	50.
1	JAN	0545	24	0.	*	1	JAN	1200	49	1401.	*	1	JAN	1815	74	99.	*	2	JAN	0030	99	23.
1	JAN	0600	25	0.	*	1	JAN	1215	50	2318.	*	1	JAN	1830	75	96.	*	2	JAN	0045	100	6.
					*						*						*					

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2318.	12.25	438.	135.	131.	131.
		(INCHES) 2.144	2.641	2.641	2.641
		(AC-FT) 217.	268.	268.	268.

CUMULATIVE AREA = 1.90 SQ MI

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          **************
          *            *
251 KK    *       2bB  *
          *            *
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252 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

255 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

253 BA SUBBASIN CHARACTERISTICS

TAREA,	0.12	SUBBASIN AREA

PRECIPITATION DATA

254 PB

STORM	5.70	BASIN TOTAL PRECIPITATION

256 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

281 LS SCS LOSS RATE

STRTL	0.76	INITIAL ABSTRACTION
CRVNBR	72.42	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

282 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.00	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

226. 63. 12. 2. 0.

HYDROGRAPH AT STATION 2bB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.12	50.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	31.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	23.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	19.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	17.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	15.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.01	0.04	13.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	12.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	11.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.04	11.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	10.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	10.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	9.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	9.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	8.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.03	8.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	8.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	7.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	7.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	7.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	7.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	7.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	6.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	6.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	6.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.00	0.02	6.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.00	0.02	5.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.00	0.02	5.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	5.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	5.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.02	5.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	5.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	4.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	4.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	4.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	4.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	4.
1	JAN	0915	38	0.05	0.04	0.00	1.	1	JAN	2145	88	0.02	0.00	0.01	4.
1	JAN	0930	39	0.05	0.04	0.00	1.	1	JAN	2200	89	0.02	0.00	0.01	4.
1	JAN	0945	40	0.05	0.04	0.00	1.	1	JAN	2215	90	0.02	0.00	0.01	4.
1	JAN	1000	41	0.05	0.05	0.01	2.	1	JAN	2230	91	0.02	0.00	0.01	4.
1	JAN	1015	42	0.06	0.05	0.01	2.	1	JAN	2245	92	0.02	0.00	0.01	4.
1	JAN	1030	43	0.07	0.06	0.01	3.	1	JAN	2300	93	0.02	0.00	0.01	4.
1	JAN	1045	44	0.08	0.07	0.02	4.	1	JAN	2315	94	0.02	0.00	0.01	4.
1	JAN	1100	45	0.10	0.07	0.02	6.	1	JAN	2330	95	0.02	0.00	0.01	4.
1	JAN	1115	46	0.12	0.09	0.03	9.	1	JAN	2345	96	0.02	0.00	0.01	4.
1	JAN	1130	47	0.15	0.11	0.05	13.	2	JAN	0000	97	0.02	0.00	0.01	4.
1	JAN	1145	48	0.62	0.37	0.26	61.	2	JAN	0015	98	0.00	0.00	0.00	1.
1	JAN	1200	49	1.54	0.62	0.92	225.	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.24	0.07	0.17	100.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 2.91, TOTAL EXCESS = 2.79

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
225.	12.00	29.	9.	9.	9.
		(INCHES) 2.263	2.788	2.788	2.788
		(AC-FT) 14.	18.	18.	18.

CUMULATIVE AREA = 0.12 SQ MI

283 KK 2aB

284 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

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287 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           6  TIME INTERVAL IN MINUTES
                    JXDATE      1JAN94  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

285 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       0.48  SUBBASIN AREA

                PRECIPITATION DATA

286 PB               STORM        5.70  BASIN TOTAL PRECIPITATION

288 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

313 LS          SCS LOSS RATE
                     STRTL        0.72  INITIAL ABSTRACTION
                    CRVNBR       73.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

314 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.00  LAG

                                                      ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
                 921.      258.       51.       10.        0.
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HYDROGRAPH AT STATION 2aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.04	0.12	209.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.09	129.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.02	0.07	97.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	81.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.06	71.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.01	0.05	63.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.01	0.04	56.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	51.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	48.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.04	46.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	43.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	41.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	39.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	37.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	34.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.03	32.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.03	31.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	30.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	30.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	29.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	28.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	27.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	26.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.00	0.02	25.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.00	0.02	25.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.00	0.02	24.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.00	0.02	23.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.00	0.02	22.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	21.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	20.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.02	19.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.02	19.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	18.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	18.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	18.
1	JAN	0845	36	0.04	0.04	0.00	1.	1	JAN	2115	86	0.02	0.00	0.01	18.
1	JAN	0900	37	0.04	0.04	0.00	2.	1	JAN	2130	87	0.02	0.00	0.01	18.
1	JAN	0915	38	0.05	0.04	0.00	4.	1	JAN	2145	88	0.02	0.00	0.01	18.
1	JAN	0930	39	0.05	0.04	0.00	5.	1	JAN	2200	89	0.02	0.00	0.01	17.
1	JAN	0945	40	0.05	0.04	0.01	7.	1	JAN	2215	90	0.02	0.00	0.01	17.
1	JAN	1000	41	0.05	0.05	0.01	9.	1	JAN	2230	91	0.02	0.00	0.01	17.
1	JAN	1015	42	0.06	0.05	0.01	12.	1	JAN	2245	92	0.02	0.00	0.01	17.
1	JAN	1030	43	0.07	0.06	0.01	15.	1	JAN	2300	93	0.02	0.00	0.01	17.
1	JAN	1045	44	0.08	0.06	0.02	21.	1	JAN	2315	94	0.02	0.00	0.01	16.
1	JAN	1100	45	0.10	0.07	0.02	28.	1	JAN	2330	95	0.02	0.00	0.01	16.
1	JAN	1115	46	0.12	0.09	0.04	40.	1	JAN	2345	96	0.02	0.00	0.01	16.
1	JAN	1130	47	0.15	0.10	0.05	58.	2	JAN	0000	97	0.02	0.00	0.01	16.
1	JAN	1145	48	0.62	0.35	0.27	266.	2	JAN	0015	98	0.00	0.00	0.00	4.

1 JAN 1200	49	1.54	0.59	0.95	952.	*	2 JAN 0030	99	0.00	0.00	0.00	1.
1 JAN 1215	50	0.24	0.07	0.18	422.	*	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.70, TOTAL LOSS = 2.81, TOTAL EXCESS = 2.89

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)			
952.	12.00	121.	37.	36.	36.
		(INCHES) 2.342	2.888	2.888	2.888
		(AC-FT) 60.	74.	74.	74.

CUMULATIVE AREA = 0.48 SQ MI

315 KK 2C CNAME 2R

316 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

317 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 2C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	2524.	1 JAN 1845	76	175.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1370.	1 JAN 1900	77	168.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	934.	1 JAN 1915	78	162.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	698.	1 JAN 1930	79	157.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	580.	1 JAN 1945	80	150.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	495.	1 JAN 2000	81	144.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	436.	1 JAN 2015	82	138.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	391.	1 JAN 2030	83	134.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	360.	1 JAN 2045	84	132.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	340.	1 JAN 2100	85	132.
1 JAN 0230	11	0.	1 JAN 0845	36	1.	1 JAN 1500	61	322.	1 JAN 2115	86	131.
1 JAN 0245	12	0.	1 JAN 0900	37	4.	1 JAN 1515	62	306.	1 JAN 2130	87	128.
1 JAN 0300	13	0.	1 JAN 0915	38	8.	1 JAN 1530	63	289.	1 JAN 2145	88	128.
1 JAN 0315	14	0.	1 JAN 0930	39	14.	1 JAN 1545	64	273.	1 JAN 2200	89	127.
1 JAN 0330	15	0.	1 JAN 0945	40	23.	1 JAN 1600	65	256.	1 JAN 2215	90	126.
1 JAN 0345	16	0.	1 JAN 1000	41	35.	1 JAN 1615	66	241.	1 JAN 2230	91	124.
1 JAN 0400	17	0.	1 JAN 1015	42	51.	1 JAN 1630	67	230.	1 JAN 2245	92	123.
1 JAN 0415	18	0.	1 JAN 1030	43	71.	1 JAN 1645	68	223.	1 JAN 2300	93	123.
1 JAN 0430	19	0.	1 JAN 1045	44	100.	1 JAN 1700	69	217.	1 JAN 2315	94	121.
1 JAN 0445	20	0.	1 JAN 1100	45	139.	1 JAN 1715	70	211.	1 JAN 2330	95	119.
1 JAN 0500	21	0.	1 JAN 1115	46	198.	1 JAN 1730	71	204.	1 JAN 2345	96	118.
1 JAN 0515	22	0.	1 JAN 1130	47	293.	1 JAN 1745	72	199.	2 JAN 0000	97	118.
1 JAN 0530	23	0.	1 JAN 1145	48	1006.	1 JAN 1800	73	193.	2 JAN 0015	98	77.
1 JAN 0545	24	0.	1 JAN 1200	49	3850.	1 JAN 1815	74	186.	2 JAN 0030	99	28.
1 JAN 0600	25	0.	1 JAN 1215	50	4368.	1 JAN 1830	75	181.	2 JAN 0045	100	8.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
		(CFS)			
4368.	12.25	842.	259.	252.	252.
		(INCHES) 2.190	2.699	2.699	2.699
		(AC-FT) 417.	515.	515.	515.

CUMULATIVE AREA = 3.57 SQ MI

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            **************
            *            *
 318 KK     *        2R  *        CNAME      2C
            *            *
            **************


 319 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 320 RM          MUSKINGUM ROUTING
                       NSTPS         1 NUMBER OF SUBREACHES
                       AMSKK      0.13 MUSKINGUM K
                           X      0.20 MUSKINGUM X
                                                                  ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      2R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 2R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	3602.	1 JAN 1845	76	178.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1953.	1 JAN 1900	77	172.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1141.	1 JAN 1915	78	165.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	818.	1 JAN 1930	79	160.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	639.	1 JAN 1945	80	154.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	540.	1 JAN 2000	81	147.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	467.	1 JAN 2015	82	141.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	415.	1 JAN 2030	83	136.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	376.	1 JAN 2045	84	133.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	350.	1 JAN 2100	85	132.
1 JAN 0230	11	0.	1 JAN 0845	36	1.	1 JAN 1500	61	332.	1 JAN 2115	86	132.
1 JAN 0245	12	0.	1 JAN 0900	37	2.	1 JAN 1515	62	315.	1 JAN 2130	87	129.
1 JAN 0300	13	0.	1 JAN 0915	38	6.	1 JAN 1530	63	298.	1 JAN 2145	88	128.
1 JAN 0315	14	0.	1 JAN 0930	39	11.	1 JAN 1545	64	281.	1 JAN 2200	89	128.
1 JAN 0330	15	0.	1 JAN 0945	40	18.	1 JAN 1600	65	265.	1 JAN 2215	90	127.
1 JAN 0345	16	0.	1 JAN 1000	41	28.	1 JAN 1615	66	249.	1 JAN 2230	91	125.
1 JAN 0400	17	0.	1 JAN 1015	42	42.	1 JAN 1630	67	236.	1 JAN 2245	92	123.
1 JAN 0415	18	0.	1 JAN 1030	43	60.	1 JAN 1645	68	227.	1 JAN 2300	93	123.
1 JAN 0430	19	0.	1 JAN 1045	44	84.	1 JAN 1700	69	220.	1 JAN 2315	94	122.
1 JAN 0445	20	0.	1 JAN 1100	45	117.	1 JAN 1715	70	214.	1 JAN 2330	95	120.
1 JAN 0500	21	0.	1 JAN 1115	46	165.	1 JAN 1730	71	208.	1 JAN 2345	96	118.
1 JAN 0515	22	0.	1 JAN 1130	47	241.	1 JAN 1745	72	202.	2 JAN 0000	97	118.
1 JAN 0530	23	0.	1 JAN 1145	48	599.	1 JAN 1800	73	196.	2 JAN 0015	98	100.
1 JAN 0545	24	0.	1 JAN 1200	49	2240.	1 JAN 1815	74	190.	2 JAN 0030	99	54.
1 JAN 0600	25	0.	1 JAN 1215	50	4192.	1 JAN 1830	75	183.	2 JAN 0045	100	17.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
4192.	12.25	841.	259.	251.	251.
		(INCHES) 2.188	2.698	2.698	2.698
		(AC-FT) 417.	514.	514.	514.

CUMULATIVE AREA = 3.57 SQ MI

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            **************
            *            *
 321 KK     *        1B  *
            *            *
            **************


 322 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


 325 IN          TIME DATA FOR INPUT TIME SERIES
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                JXMIN          6  TIME INTERVAL IN MINUTES
               JXDATE      1JAN94  STARTING DATE
               JXTIME           0  STARTING TIME

          SUBBASIN RUNOFF DATA

323 BA      SUBBASIN CHARACTERISTICS
                TAREA,       0.65  SUBBASIN AREA

          PRECIPITATION DATA

324 PB            STORM        5.70  BASIN TOTAL PRECIPITATION

326 PI        INCREMENTAL 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      0.01      0.01
                0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                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      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00

351 LS      SCS LOSS RATE
                STRTL        0.73  INITIAL ABSTRACTION
               CRVNBR       73.13  CURVE NUMBER
                RTIMP        0.00  PERCENT IMPERVIOUS AREA

352 UD      SCS DIMENSIONLESS UNITGRAPH
                TLAG         0.00  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
             1243.      348.       68.       14.        0.
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HYDROGRAPH AT STATION 1B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.12	279.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	172.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.02	0.07	129.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	109.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	96.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	84.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.01	0.04	75.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	68.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	64.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.04	61.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	58.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	55.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	52.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	49.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	46.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.03	43.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	42.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	41.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	40.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	38.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	37.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	36.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	35.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.03	0.01	0.02	34.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.00	0.02	33.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.00	0.02	32.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.00	0.02	30.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.00	0.02	30.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	28.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	27.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.02	26.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	25.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	25.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	25.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	25.
1	JAN	0845	36	0.04	0.04	0.00	1.	1	JAN	2115	86	0.02	0.00	0.01	24.
1	JAN	0900	37	0.04	0.04	0.00	3.	1	JAN	2130	87	0.02	0.00	0.01	24.
1	JAN	0915	38	0.05	0.04	0.00	4.	1	JAN	2145	88	0.02	0.00	0.01	24.
1	JAN	0930	39	0.05	0.04	0.00	6.	1	JAN	2200	89	0.02	0.00	0.01	23.
1	JAN	0945	40	0.05	0.04	0.01	8.	1	JAN	2215	90	0.02	0.00	0.01	23.
1	JAN	1000	41	0.05	0.05	0.01	11.	1	JAN	2230	91	0.02	0.00	0.01	23.
1	JAN	1015	42	0.06	0.05	0.01	15.	1	JAN	2245	92	0.02	0.00	0.01	23.
1	JAN	1030	43	0.07	0.06	0.01	20.	1	JAN	2300	93	0.02	0.00	0.01	23.
1	JAN	1045	44	0.08	0.06	0.02	27.	1	JAN	2315	94	0.02	0.00	0.01	22.
1	JAN	1100	45	0.10	0.07	0.02	36.	1	JAN	2330	95	0.02	0.00	0.01	22.
1	JAN	1115	46	0.12	0.09	0.03	52.	1	JAN	2345	96	0.02	0.00	0.01	22.
1	JAN	1130	47	0.15	0.10	0.05	76.	2	JAN	0000	97	0.02	0.00	0.01	22.
1	JAN	1145	48	0.62	0.36	0.27	352.	2	JAN	0015	98	0.00	0.00	0.00	6.
1	JAN	1200	49	1.54	0.60	0.94	1270.	2	JAN	0030	99	0.00	0.00	0.00	1.

```
        1 JAN 1215   50    0.24    0.07    0.17       563.       *        2 JAN 0045  100    0.00    0.00    0.00         0.
                                                                  *
 ********************************************************************************************************************************************

    TOTAL RAINFALL =    5.70, TOTAL LOSS =    2.85, TOTAL EXCESS =    2.85

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                 6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+    1270.     12.00                161.         50.         48.          48.
                          (INCHES)     2.315       2.853       2.853        2.853
                           (AC-FT)      80.         99.         99.          99.

                          CUMULATIVE AREA =    0.65 SQ MI


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


             **************
             *            *
  353 KK     *        1C  *        CNAME      1C
             *            *
             **************

  354 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           1  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
                        IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                         IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       0.250  TIME INTERVAL IN HOURS


  355 HC          HYDROGRAPH COMBINATION
                        ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                 ***

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

                                                HYDROGRAPH AT STATION       1C
                                                     SUM OF  2 HYDROGRAPHS

 ********************************************************************************************************************************************
                                  *                                 *                                 *                                 *
    DA MON HRMN  ORD      FLOW    *    DA MON HRMN  ORD      FLOW   *    DA MON HRMN  ORD      FLOW   *    DA MON HRMN  ORD      FLOW
                                  *                                 *                                 *                                 *
     1 JAN 0000    1        0.    *     1 JAN 0615   26        0.   *     1 JAN 1230   51     3881.   *     1 JAN 1845   76       210.
     1 JAN 0015    2        0.    *     1 JAN 0630   27        0.   *     1 JAN 1245   52     2125.   *     1 JAN 1900   77       202.
     1 JAN 0030    3        0.    *     1 JAN 0645   28        0.   *     1 JAN 1300   53     1270.   *     1 JAN 1915   78       195.
     1 JAN 0045    4        0.    *     1 JAN 0700   29        0.   *     1 JAN 1315   54      927.   *     1 JAN 1930   79       188.
     1 JAN 0100    5        0.    *     1 JAN 0715   30        0.   *     1 JAN 1330   55      734.   *     1 JAN 1945   80       181.
     1 JAN 0115    6        0.    *     1 JAN 0730   31        0.   *     1 JAN 1345   56      624.   *     1 JAN 2000   81       173.
     1 JAN 0130    7        0.    *     1 JAN 0745   32        0.   *     1 JAN 1400   57      542.   *     1 JAN 2015   82       166.
     1 JAN 0145    8        0.    *     1 JAN 0800   33        0.   *     1 JAN 1415   58      483.   *     1 JAN 2030   83       161.
     1 JAN 0200    9        0.    *     1 JAN 0815   34        0.   *     1 JAN 1430   59      441.   *     1 JAN 2045   84       158.
     1 JAN 0215   10        0.    *     1 JAN 0830   35        0.   *     1 JAN 1445   60      412.   *     1 JAN 2100   85       157.
     1 JAN 0230   11        0.    *     1 JAN 0845   36        2.   *     1 JAN 1500   61      390.   *     1 JAN 2115   86       155.
     1 JAN 0245   12        0.    *     1 JAN 0900   37        5.   *     1 JAN 1515   62      370.   *     1 JAN 2130   87       153.
     1 JAN 0300   13        0.    *     1 JAN 0915   38       10.   *     1 JAN 1530   63      350.   *     1 JAN 2145   88       152.
     1 JAN 0315   14        0.    *     1 JAN 0930   39       17.   *     1 JAN 1545   64      330.   *     1 JAN 2200   89       151.
     1 JAN 0330   15        0.    *     1 JAN 0945   40       26.   *     1 JAN 1600   65      311.   *     1 JAN 2215   90       150.
     1 JAN 0345   16        0.    *     1 JAN 1000   41       39.   *     1 JAN 1615   66      292.   *     1 JAN 2230   91       148.
     1 JAN 0400   17        0.    *     1 JAN 1015   42       57.   *     1 JAN 1630   67      278.   *     1 JAN 2245   92       146.
     1 JAN 0415   18        0.    *     1 JAN 1030   43       80.   *     1 JAN 1645   68      268.   *     1 JAN 2300   93       146.
     1 JAN 0430   19        0.    *     1 JAN 1045   44      111.   *     1 JAN 1700   69      260.   *     1 JAN 2315   94       144.
     1 JAN 0445   20        0.    *     1 JAN 1100   45      153.   *     1 JAN 1715   70      253.   *     1 JAN 2330   95       142.
     1 JAN 0500   21        0.    *     1 JAN 1115   46      217.   *     1 JAN 1730   71      245.   *     1 JAN 2345   96       141.
     1 JAN 0515   22        0.    *     1 JAN 1130   47      317.   *     1 JAN 1745   72      238.   *     2 JAN 0000   97       140.
     1 JAN 0530   23        0.    *     1 JAN 1145   48      951.   *     1 JAN 1800   73      231.   *     2 JAN 0015   98       106.
     1 JAN 0545   24        0.    *     1 JAN 1200   49     3510.   *     1 JAN 1815   74      223.   *     2 JAN 0030   99        56.
     1 JAN 0600   25        0.    *     1 JAN 1215   50     4755.   *     1 JAN 1830   75      216.   *     2 JAN 0045  100        18.
                                  *                                 *                                 *                                 *
 ********************************************************************************************************************************************

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                 6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                    (CFS)
+    4755.     12.25                1002.        309.        300.         300.
                          (INCHES)     2.207       2.722       2.722        2.722
                           (AC-FT)     497.         613.        613.         613.

                          CUMULATIVE AREA =    4.22 SQ MI


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


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

```
          *           *
356 KK    *       1C  *       CNAME      1C
          *           *
          *************

357 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

358 RN          NO ROUTING
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***

HYDROGRAPH AT STATION 1C

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	3881.	1 JAN 1845	76	210.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	2125.	1 JAN 1900	77	202.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1270.	1 JAN 1915	78	195.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	927.	1 JAN 1930	79	188.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	734.	1 JAN 1945	80	181.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	624.	1 JAN 2000	81	173.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	542.	1 JAN 2015	82	166.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	483.	1 JAN 2030	83	161.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	441.	1 JAN 2045	84	158.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	412.	1 JAN 2100	85	157.
1 JAN 0230	11	0.	1 JAN 0845	36	2.	1 JAN 1500	61	390.	1 JAN 2115	86	155.
1 JAN 0245	12	0.	1 JAN 0900	37	5.	1 JAN 1515	62	370.	1 JAN 2130	87	153.
1 JAN 0300	13	0.	1 JAN 0915	38	10.	1 JAN 1530	63	350.	1 JAN 2145	88	152.
1 JAN 0315	14	0.	1 JAN 0930	39	17.	1 JAN 1545	64	330.	1 JAN 2200	89	151.
1 JAN 0330	15	0.	1 JAN 0945	40	26.	1 JAN 1600	65	311.	1 JAN 2215	90	150.
1 JAN 0345	16	0.	1 JAN 1000	41	39.	1 JAN 1615	66	292.	1 JAN 2230	91	148.
1 JAN 0400	17	0.	1 JAN 1015	42	57.	1 JAN 1630	67	278.	1 JAN 2245	92	146.
1 JAN 0415	18	0.	1 JAN 1030	43	80.	1 JAN 1645	68	268.	1 JAN 2300	93	146.
1 JAN 0430	19	0.	1 JAN 1045	44	111.	1 JAN 1700	69	260.	1 JAN 2315	94	144.
1 JAN 0445	20	0.	1 JAN 1100	45	153.	1 JAN 1715	70	253.	1 JAN 2330	95	142.
1 JAN 0500	21	0.	1 JAN 1115	46	217.	1 JAN 1730	71	245.	1 JAN 2345	96	141.
1 JAN 0515	22	0.	1 JAN 1130	47	317.	1 JAN 1745	72	238.	2 JAN 0000	97	140.
1 JAN 0530	23	0.	1 JAN 1145	48	951.	1 JAN 1800	73	231.	2 JAN 0015	98	106.
1 JAN 0545	24	0.	1 JAN 1200	49	3510.	1 JAN 1815	74	223.	2 JAN 0030	99	56.
1 JAN 0600	25	0.	1 JAN 1215	50	4755.	1 JAN 1830	75	216.	2 JAN 0045	100	18.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
4755.	12.25	1002.	309.	300.	300.
		(INCHES) 2.207	2.722	2.722	2.722
		(AC-FT) 497.	613.	613.	613.

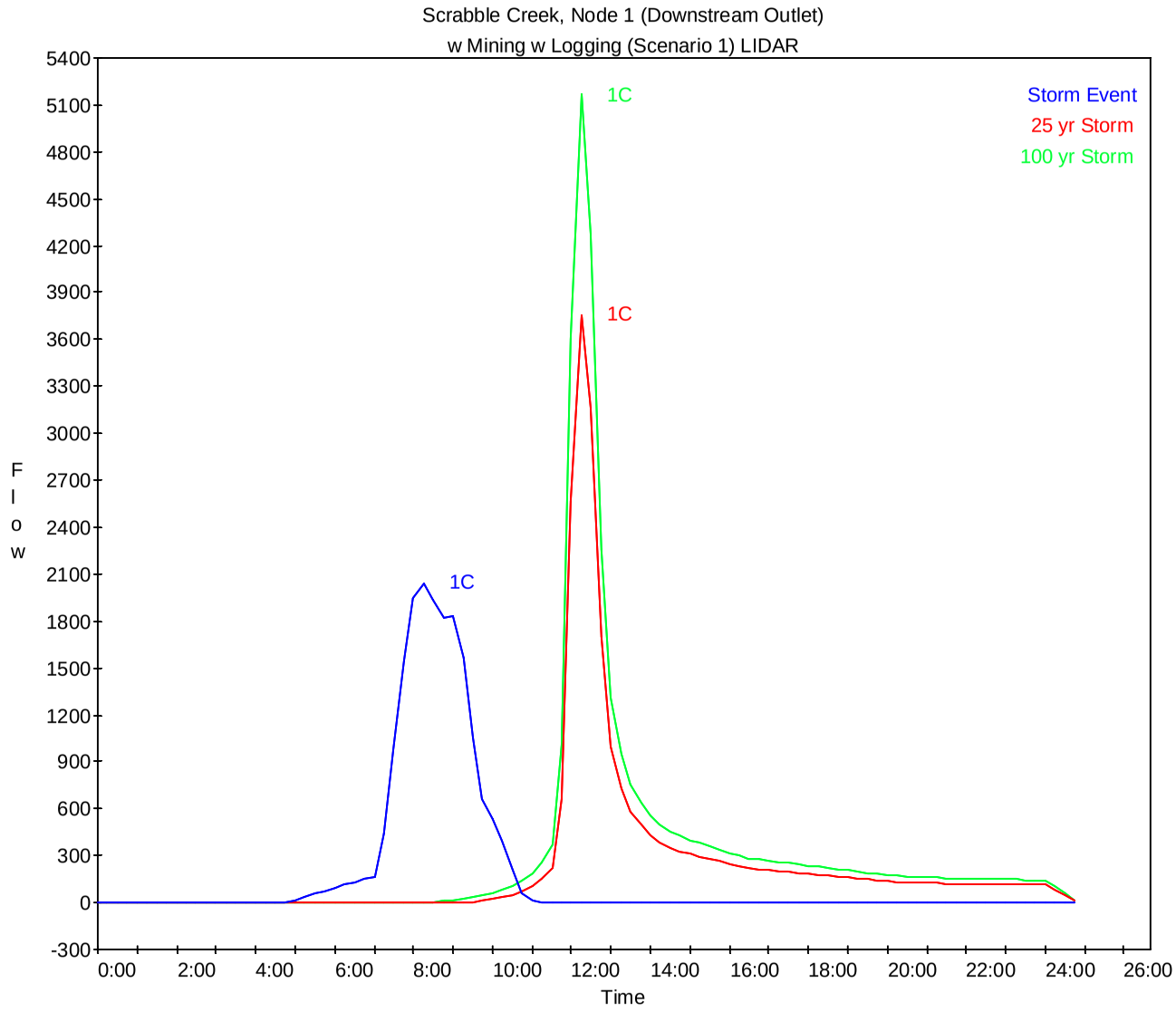
CUMULATIVE AREA = 4.22 SQ MI

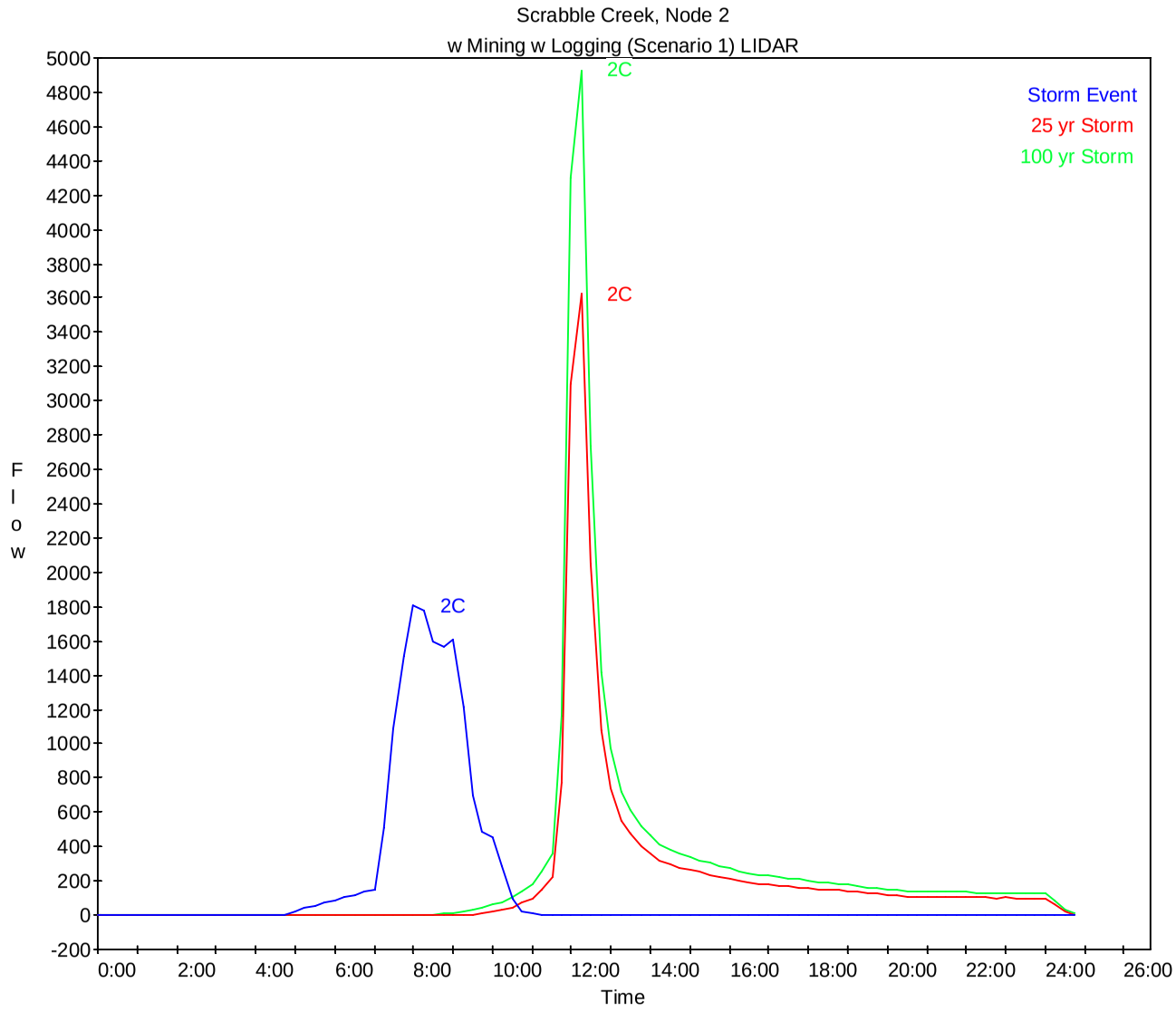
RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

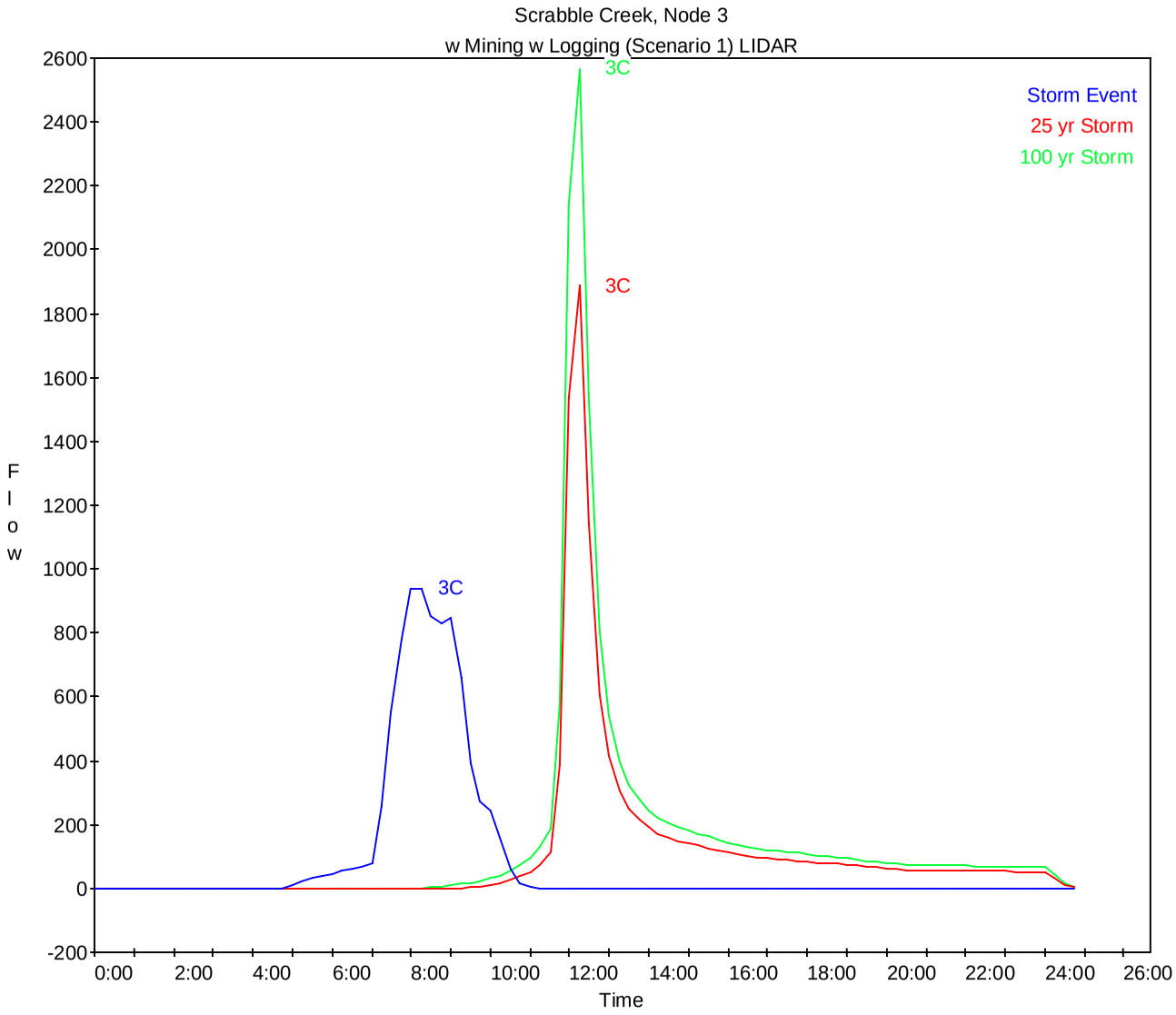
OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	6B	324.	12.00	57.	18.	17.	0.25		
ROUTED TO	6R	318.	12.25	57.	18.	17.	0.25		
HYDROGRAPH AT	7bB	491.	12.00	63.	19.	19.	0.27		
HYDROGRAPH AT	7aB	1055.	12.00	134.	41.	40.	0.56		
3 COMBINED AT	7C	1821.	12.00	254.	78.	76.	1.08		
ROUTED TO	7R	1528.	12.25	254.	78.	76.	1.08		
HYDROGRAPH AT	5B	747.	12.00	147.	45.	44.	0.64		

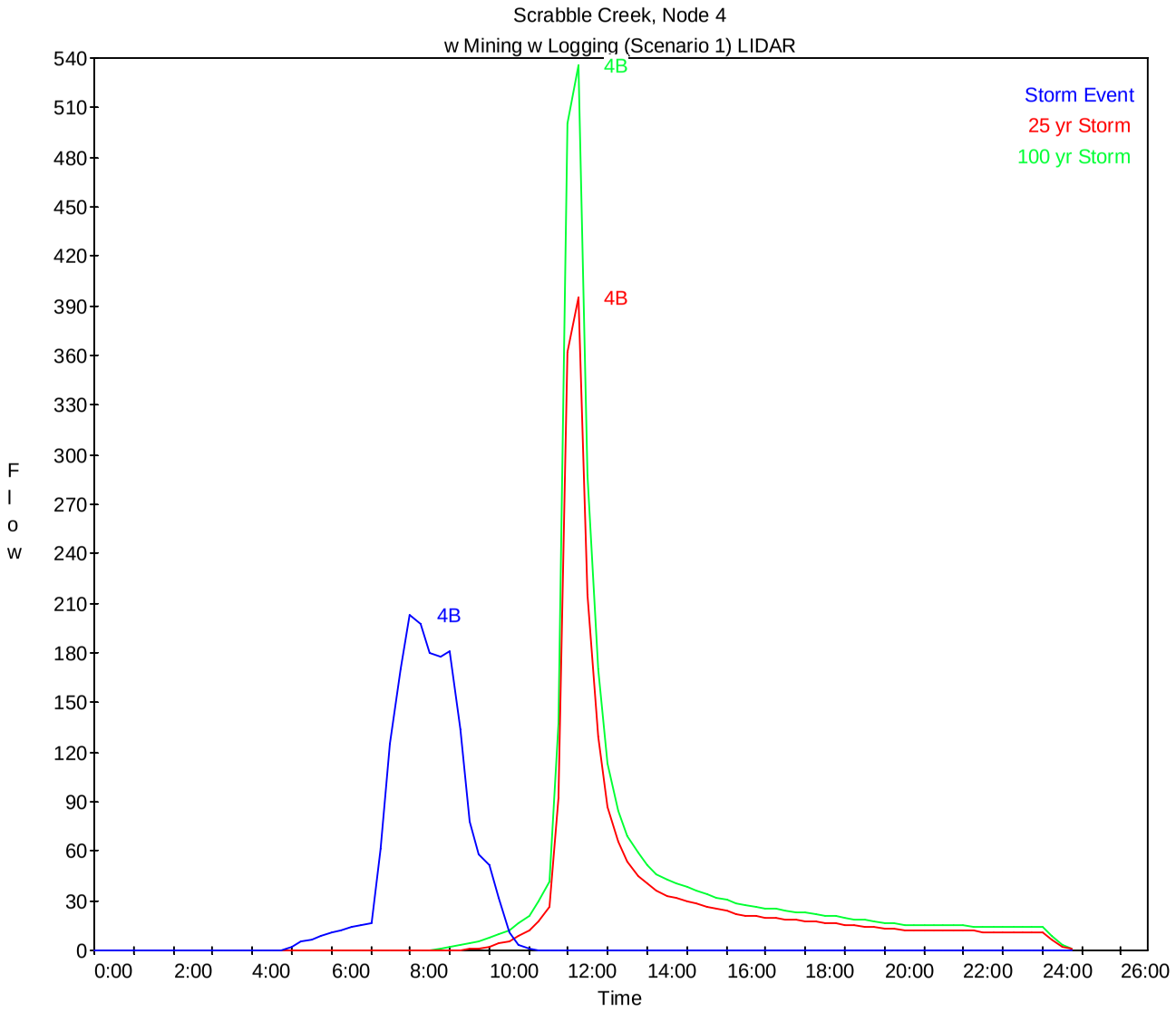
	ROUTED TO						
+		5R	800.	12.25	147.	45.	44.	0.64
	HYDROGRAPH AT						
+		4B	477.	12.25	93.	29.	28.	0.41
	ROUTED TO						
+		4R	489.	12.25	93.	29.	28.	0.41
	HYDROGRAPH AT						
+		3aB	488.	12.25	95.	29.	28.	0.41
	HYDROGRAPH AT						
+		3bB	538.	12.25	104.	32.	31.	0.44
	4 COMBINED AT						
+		3C	2316.	12.25	438.	135.	131.	1.90
	ROUTED TO						
+		3R	2318.	12.25	438.	135.	131.	1.90
	HYDROGRAPH AT						
+		2bB	225.	12.00	29.	9.	9.	0.12
	HYDROGRAPH AT						
+		2aB	952.	12.00	121.	37.	36.	0.48
	4 COMBINED AT						
+		2C	4368.	12.25	842.	259.	252.	3.57
	ROUTED TO						
+		2R	4192.	12.25	841.	259.	251.	3.57
	HYDROGRAPH AT						
+		1B	1270.	12.00	161.	50.	48.	0.65
	2 COMBINED AT						
+		1C	4755.	12.25	1002.	309.	300.	4.22
	ROUTED TO						
+		1C	4755.	12.25	1002.	309.	300.	4.22

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


Scrabble Creek, Node 1 (Downstream Outlet)
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
1C
1C
1C
Flow
Time
5400
5100
4800
4500
4200
3900
3600
3300
3000
2700
2400
2100
1800
1500
1200
900
600
300
0
-300
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 2
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
2C
2C
2C
Flow
Time
5000
4800
4600
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 3
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
3C
3C
3C
Flow
Time
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 4
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
4B
4B
4B
Flow
Time
0
30
60
90
120
150
180
210
240
270
300
330
360
390
420
450
480
510
540
0:00
2:00
4:00
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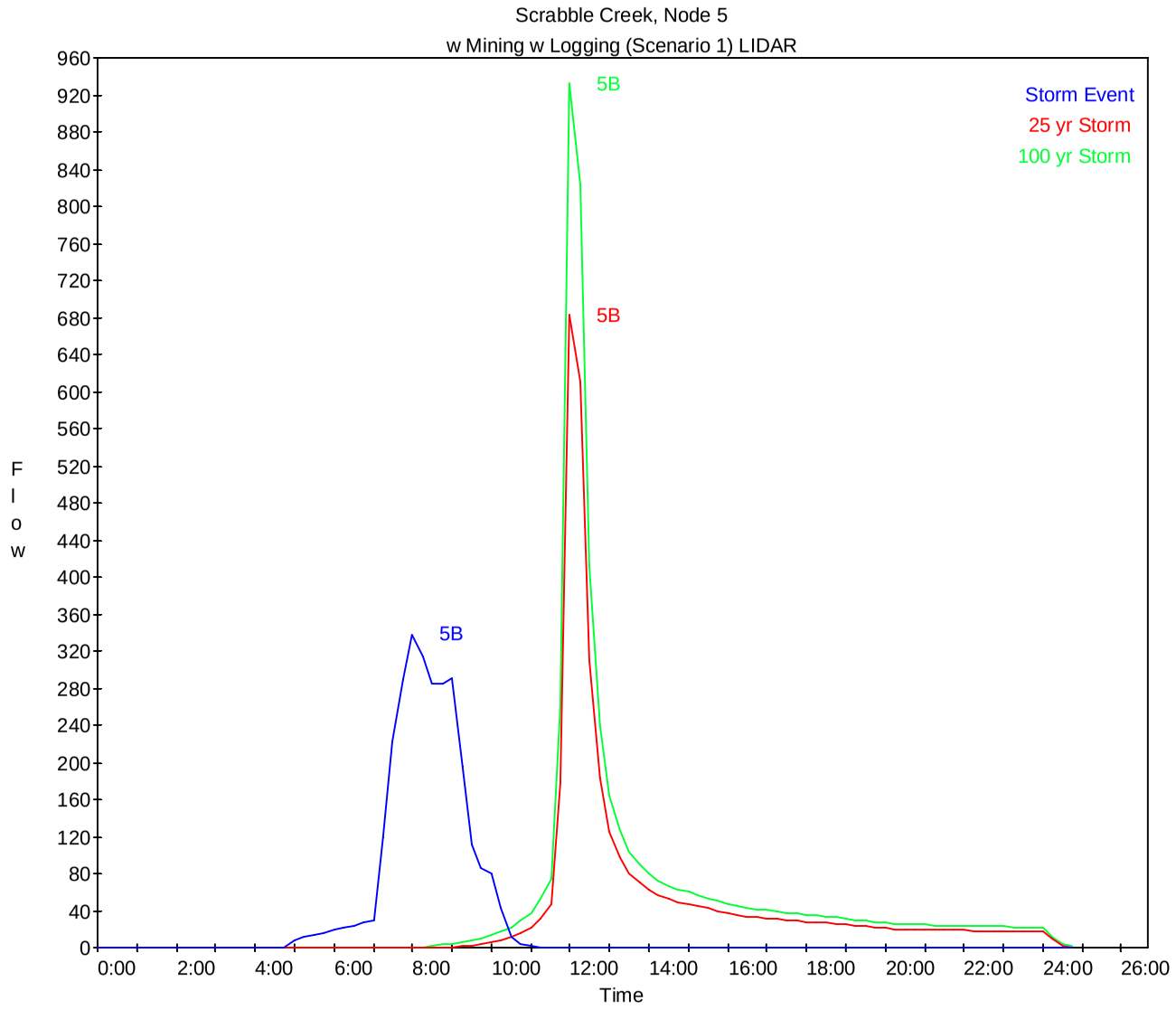
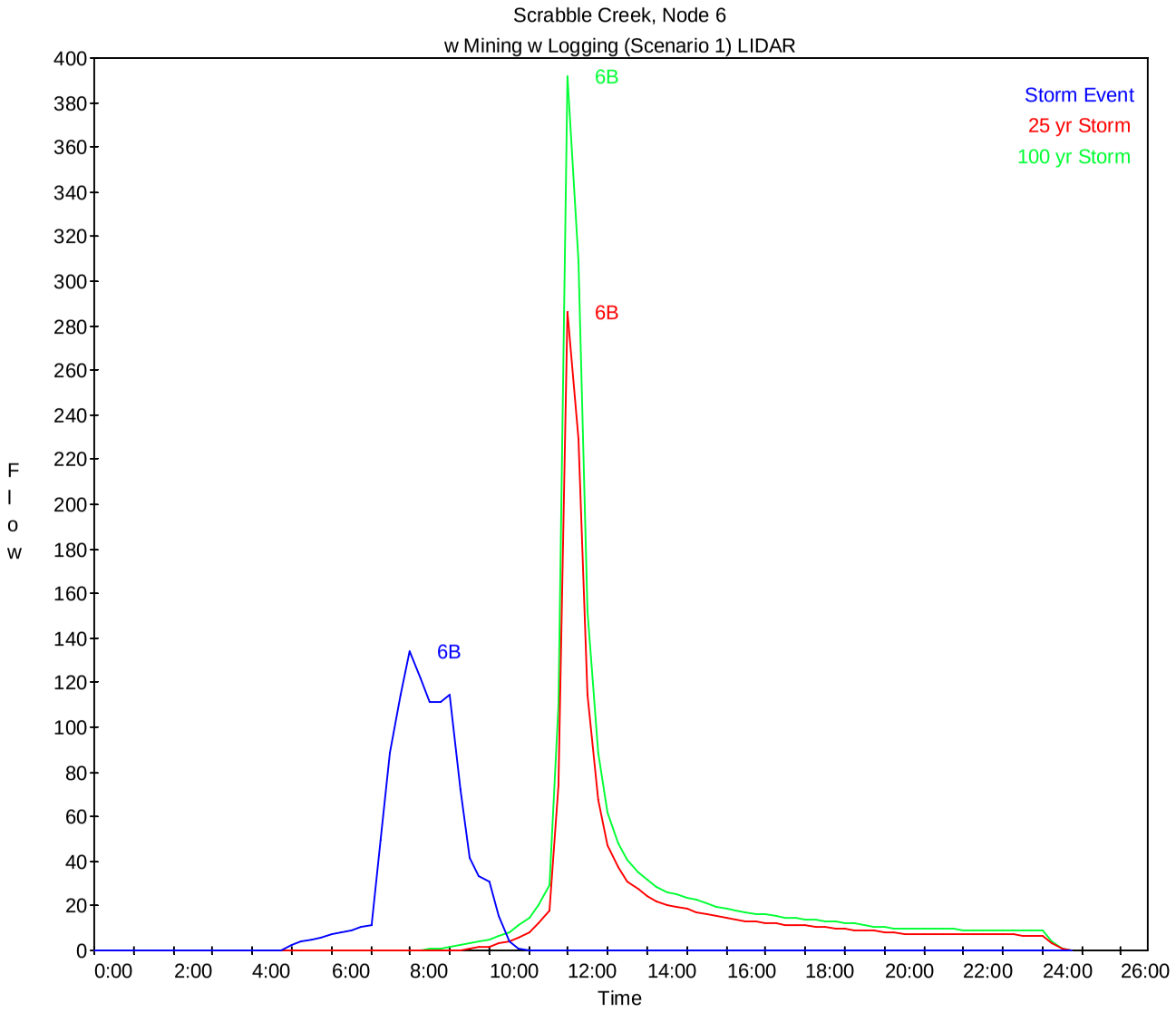
20:00
22:00
24:00
26:00


Scrabble Creek, Node 5
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
5B
5B
5B
Flow
Time
960
920
880
840
800
760
720
680
640
600
560
520
480
440
400
360
320
280
240
200
160
120
80
40
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 6
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
6B
6B
6B
Flow
Time
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
0:00
2:00
4:00
6:00
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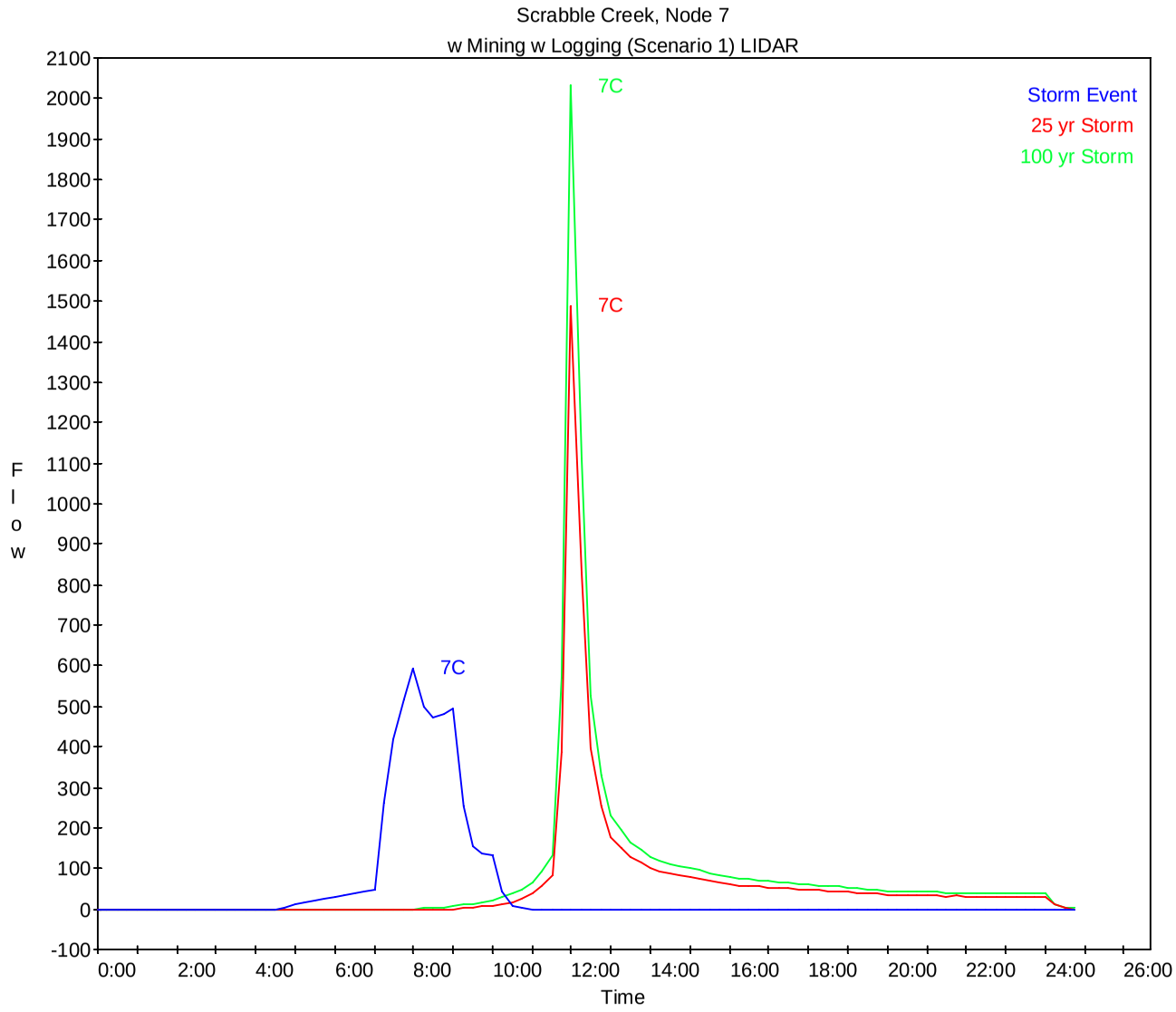
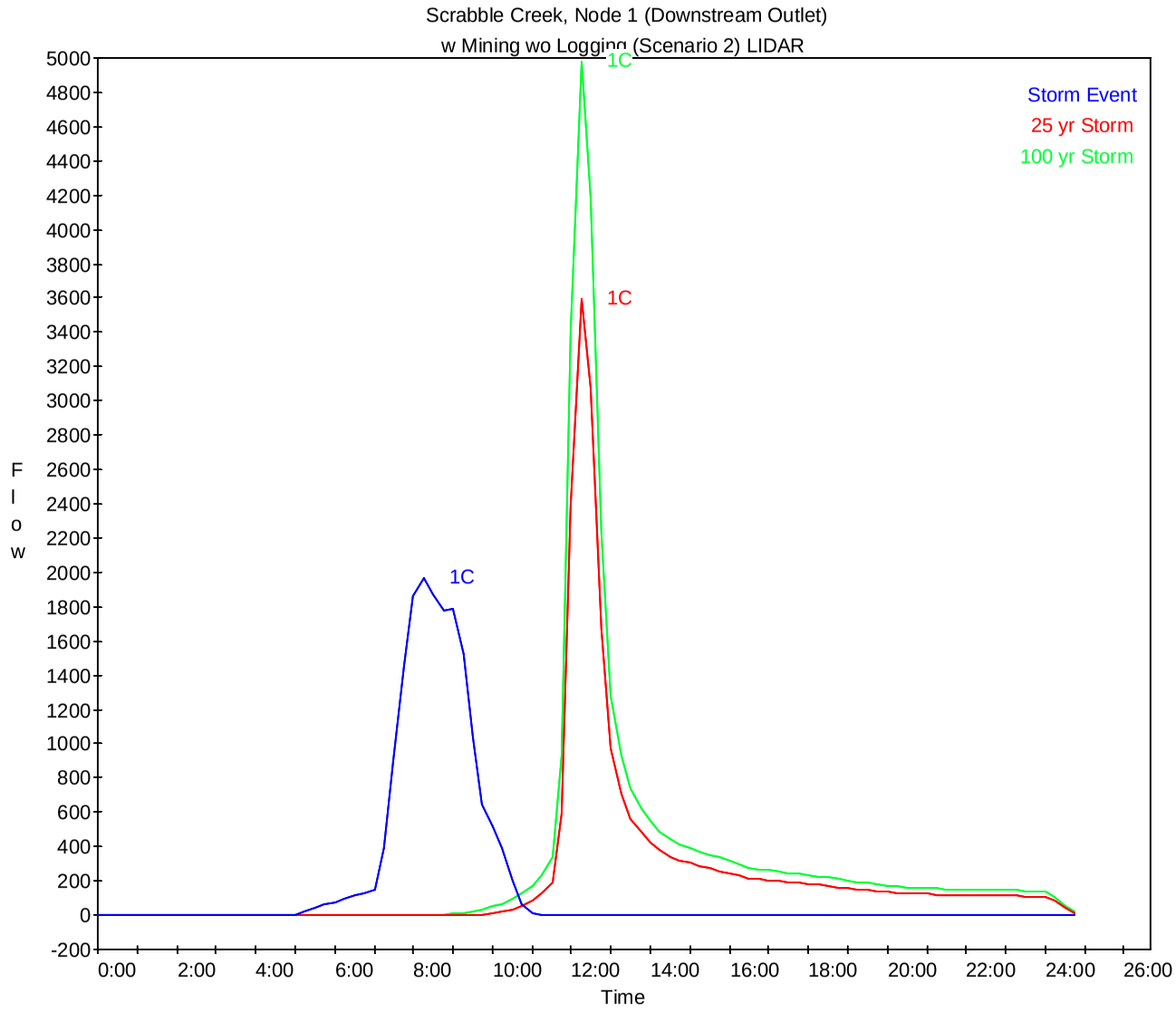
22:00
24:00
26:00


Scrabble Creek, Node 7
w Mining w Logging (Scenario 1) LIDAR
Storm Event
25 yr Storm
100 yr Storm
7C
7C
7C
Flow
Time
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 1 (Downstream Outlet)
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
1C
1C
1C
Flow
Time
5000
4800
4600
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
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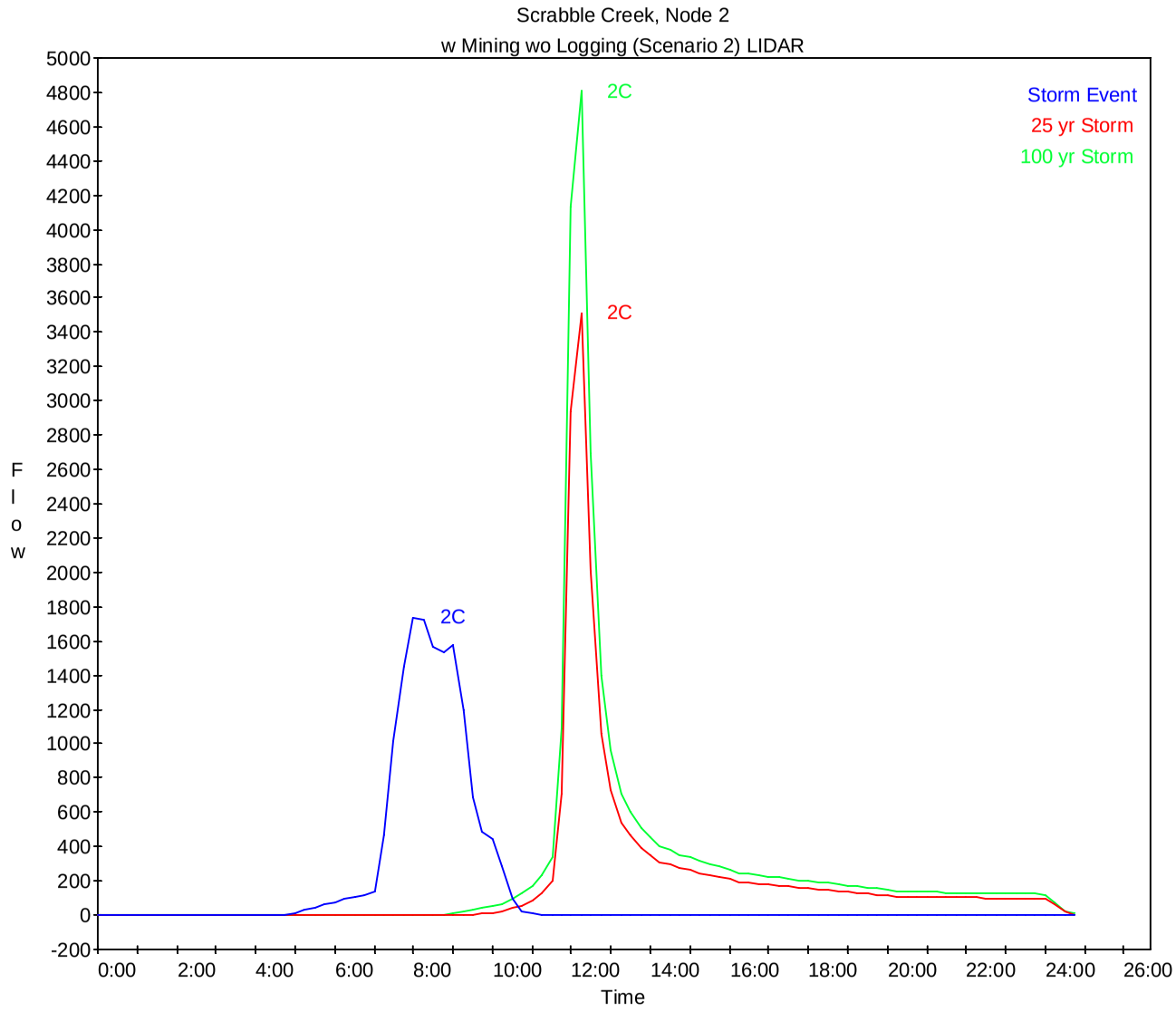
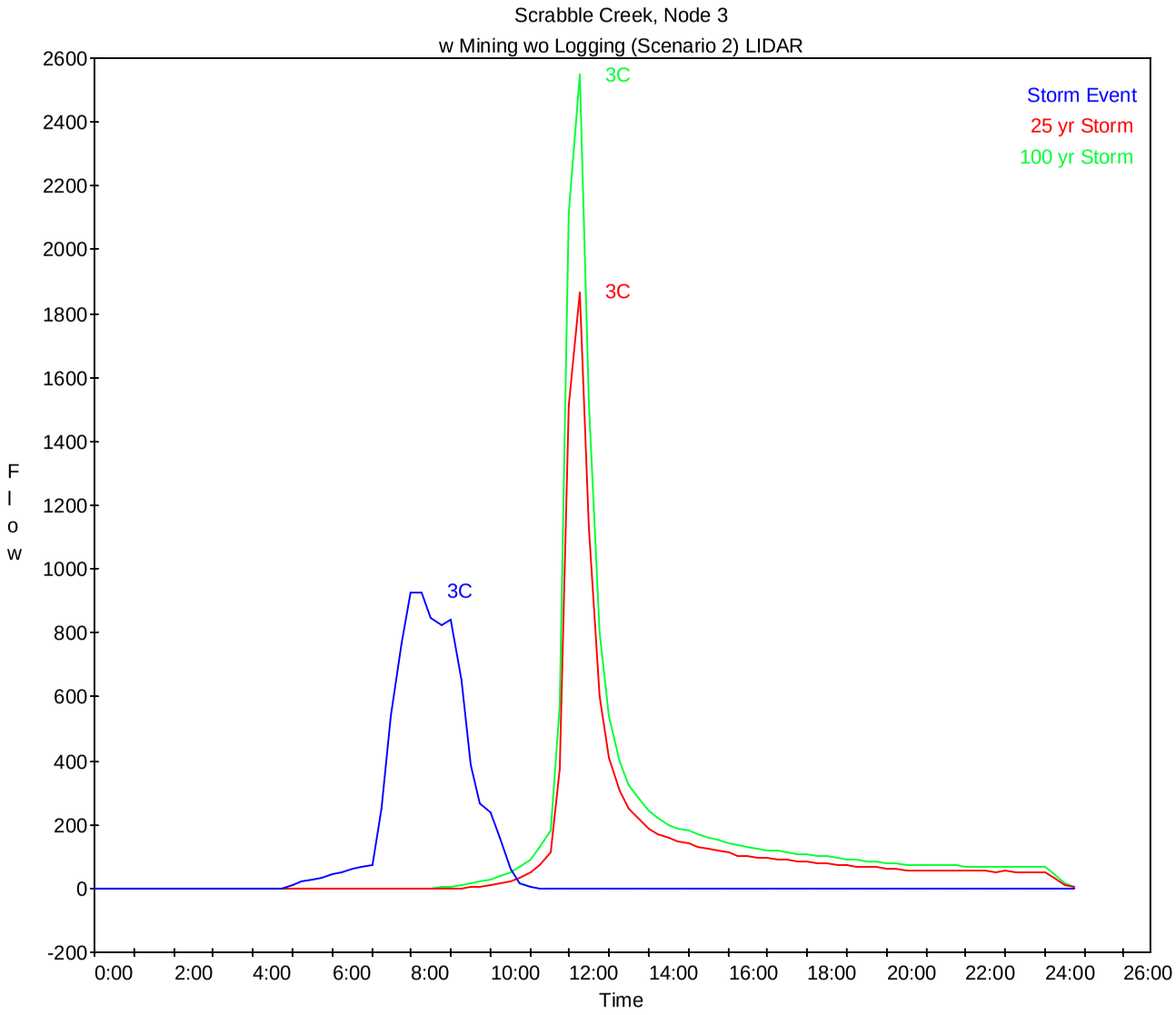
22:00
24:00
26:00


Scrabble Creek, Node 2
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
2C
2C
2C
Flow
Time
5000
4800
4600
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 3
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
3C
3C
3C
Flow
Time
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
6:00
8:00
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16:00
18:00
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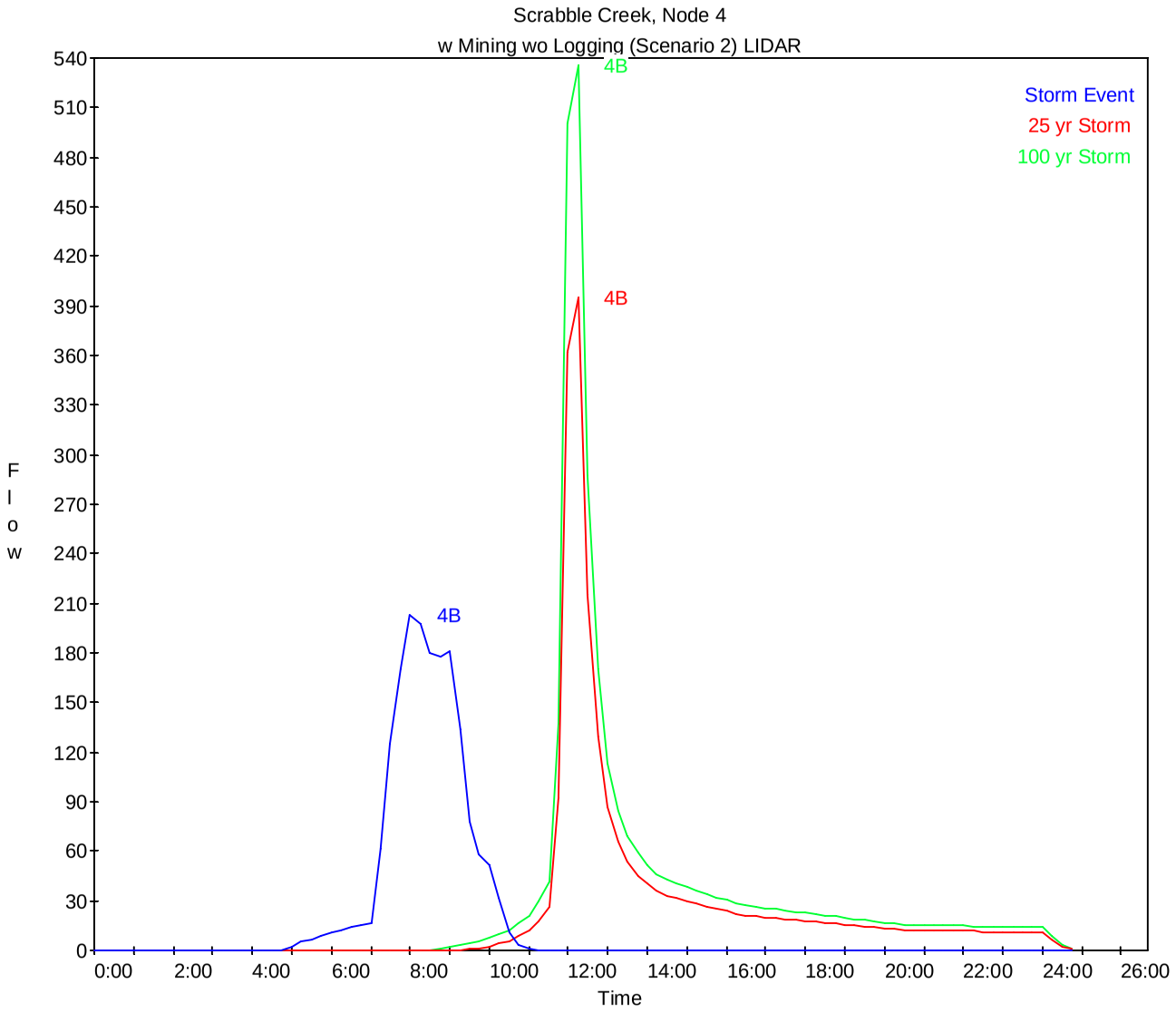
22:00
24:00
26:00


Scrabble Creek, Node 4
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
4B
4B
4B
Flow
Time
0
30
60
90
120
150
180
210
240
270
300
330
360
390
420
450
480
510
540
0:00
2:00
4:00
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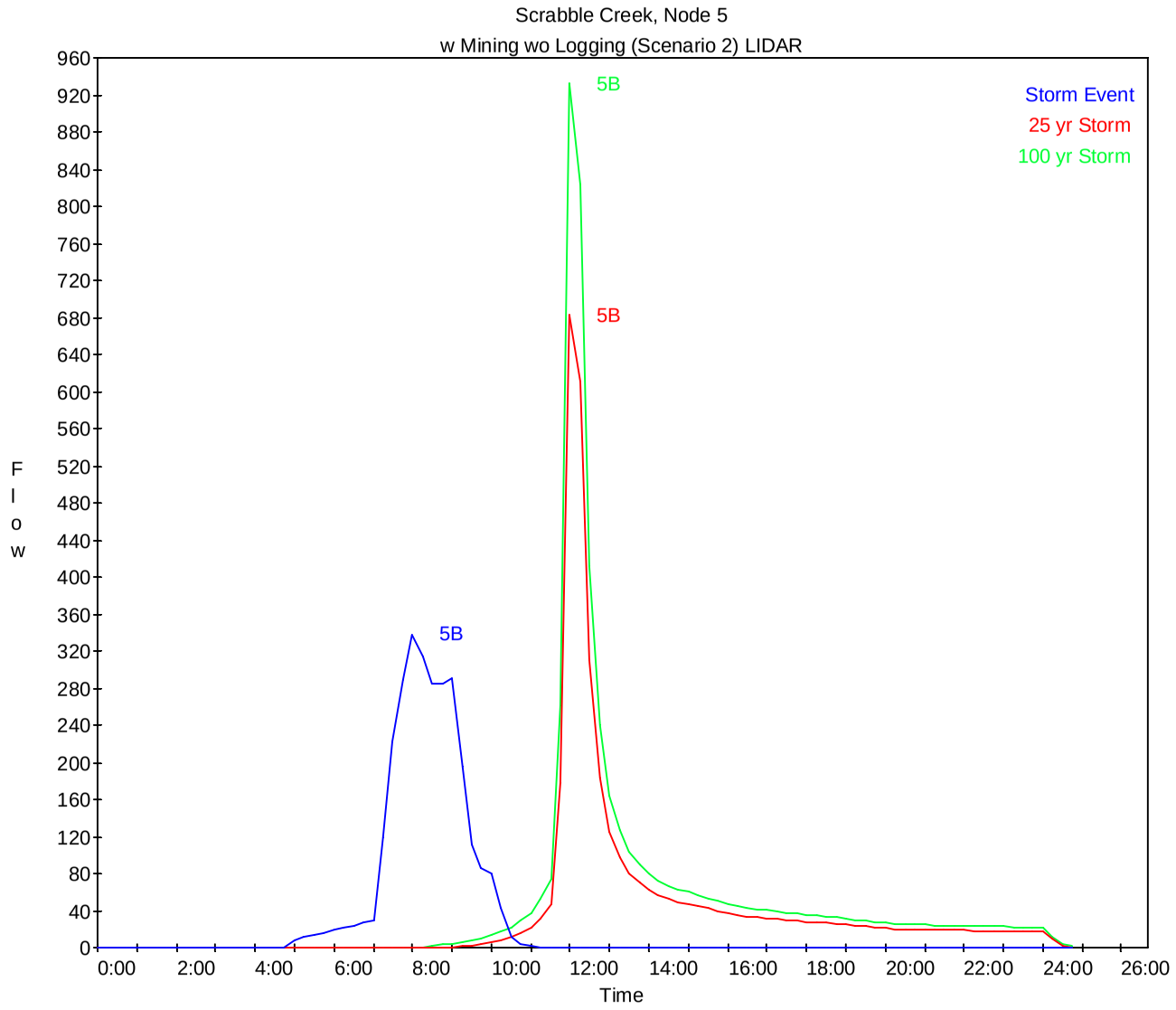
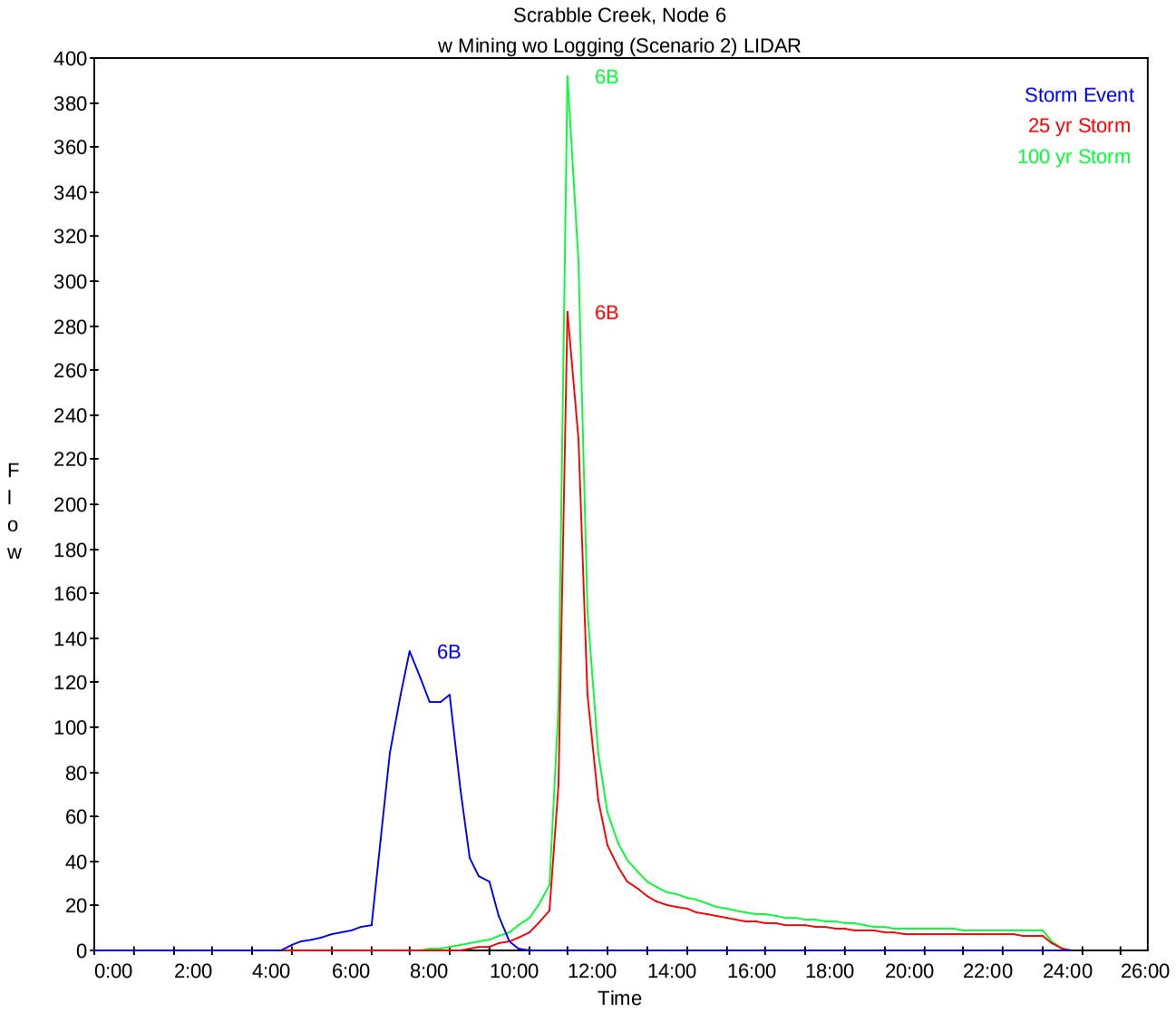
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 5
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
5B
5B
5B
Flow
Time
960
920
880
840
800
760
720
680
640
600
560
520
480
440
400
360
320
280
240
200
160
120
80
40
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 6
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
6B
6B
6B
Flow
Time
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
0:00
2:00
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22:00
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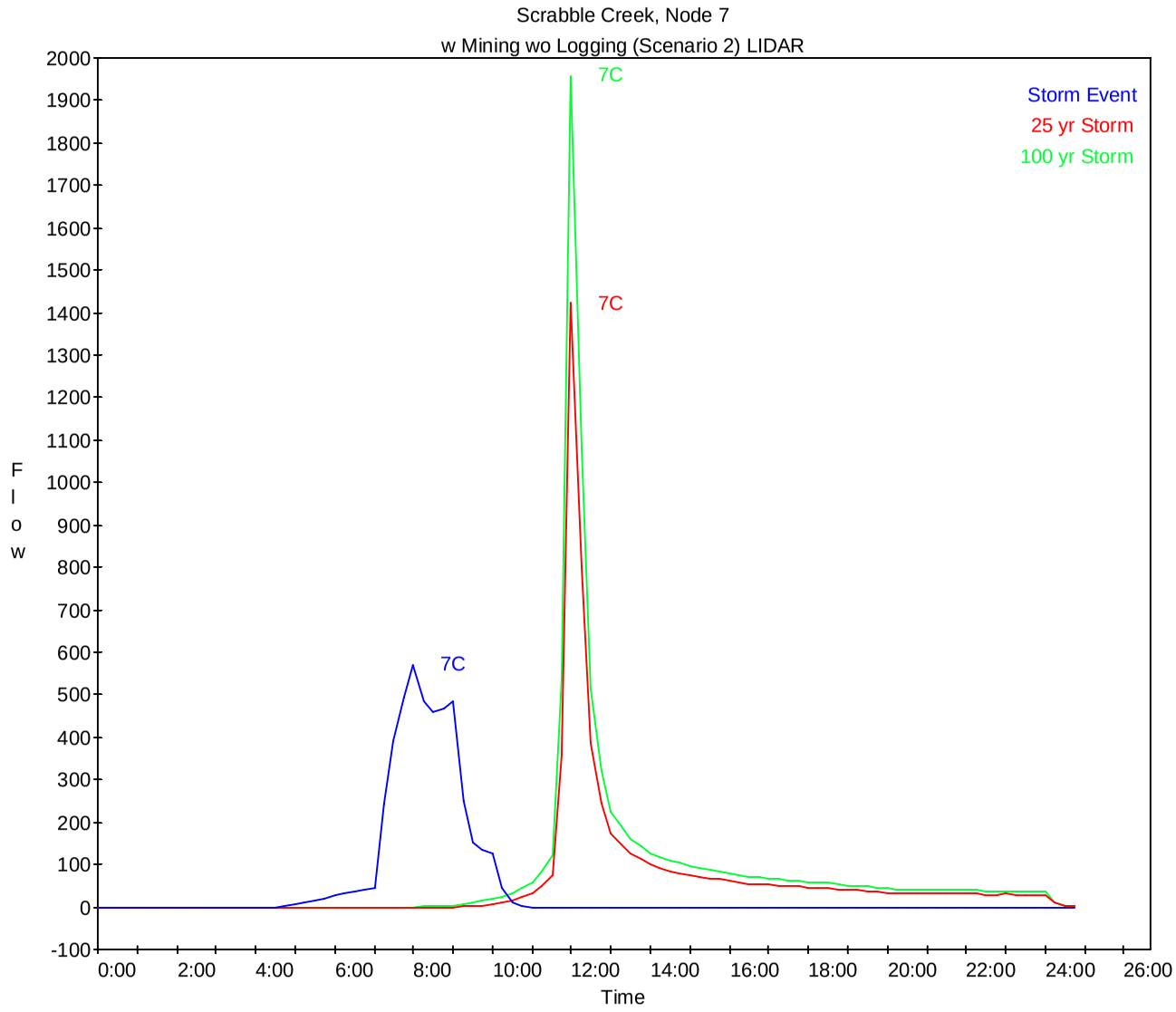
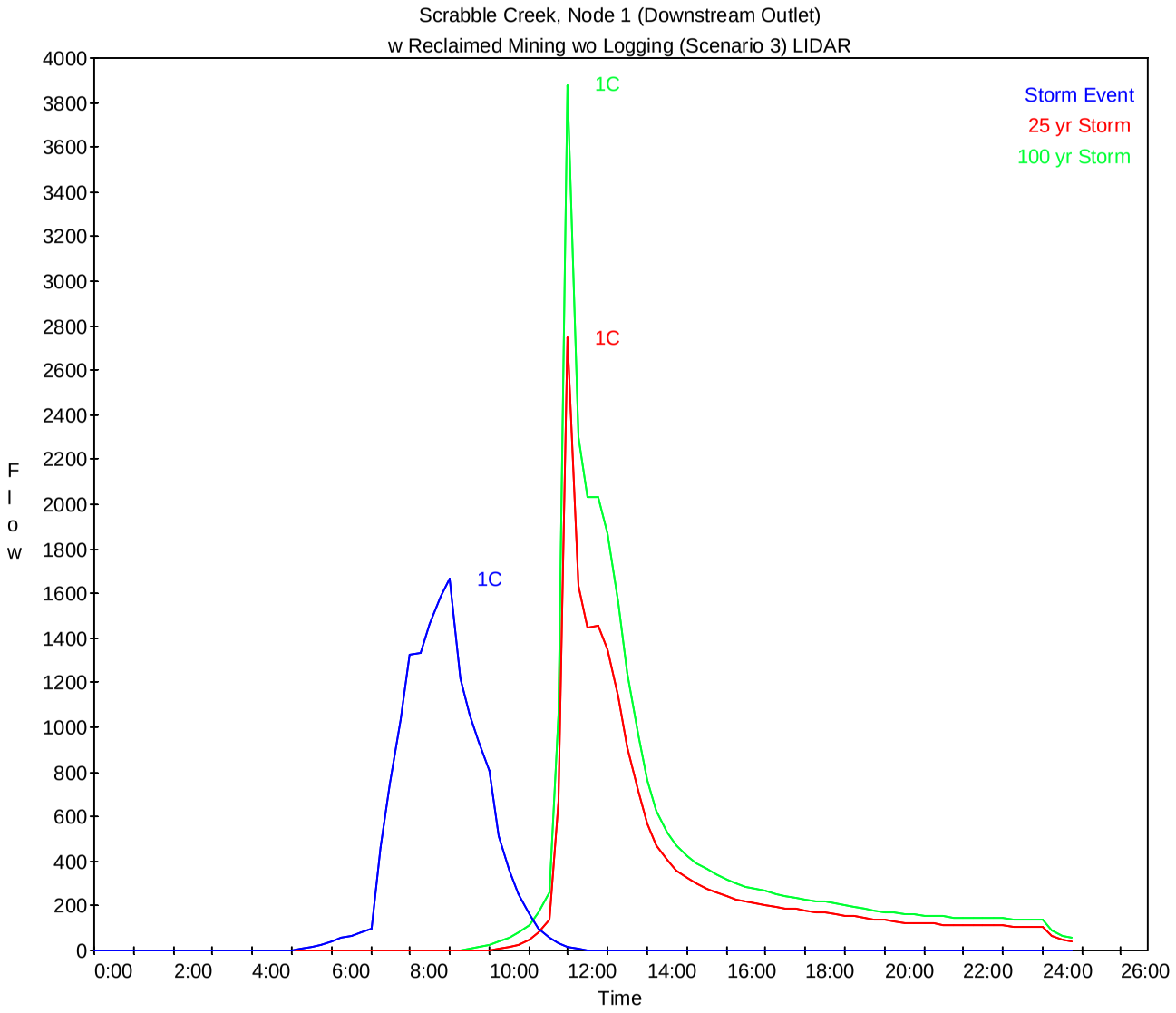
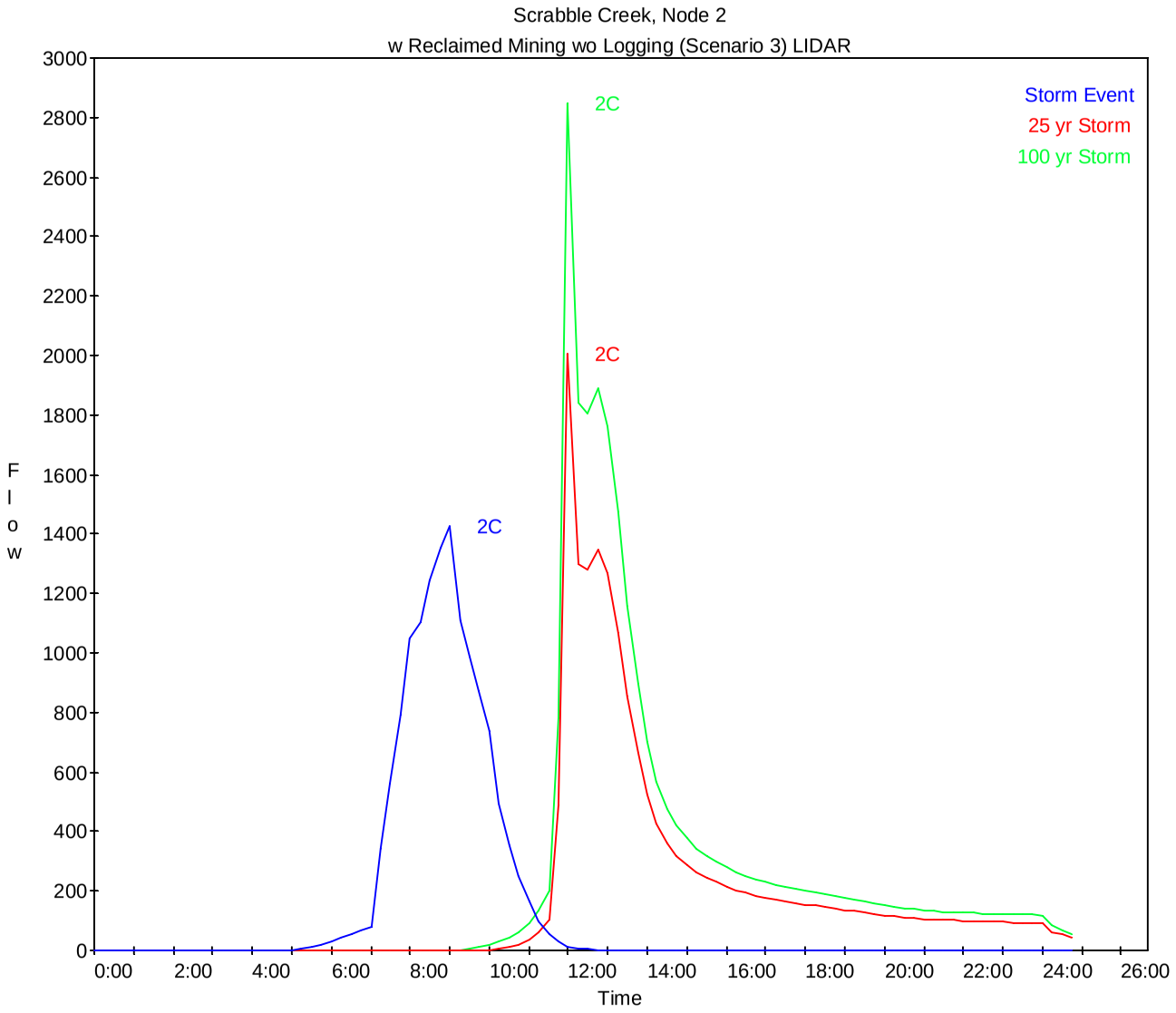
26:00


Scrabble Creek, Node 7
w Mining wo Logging (Scenario 2) LIDAR
Storm Event
25 yr Storm
100 yr Storm
7C
7C
7C
Flow
Time
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 1 (Downstream Outlet)
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
1C
1C
1C
Flow
Time
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 2
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
2C
2C
2C
Flow
Time
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
0:00
2:00
4:00
6:00
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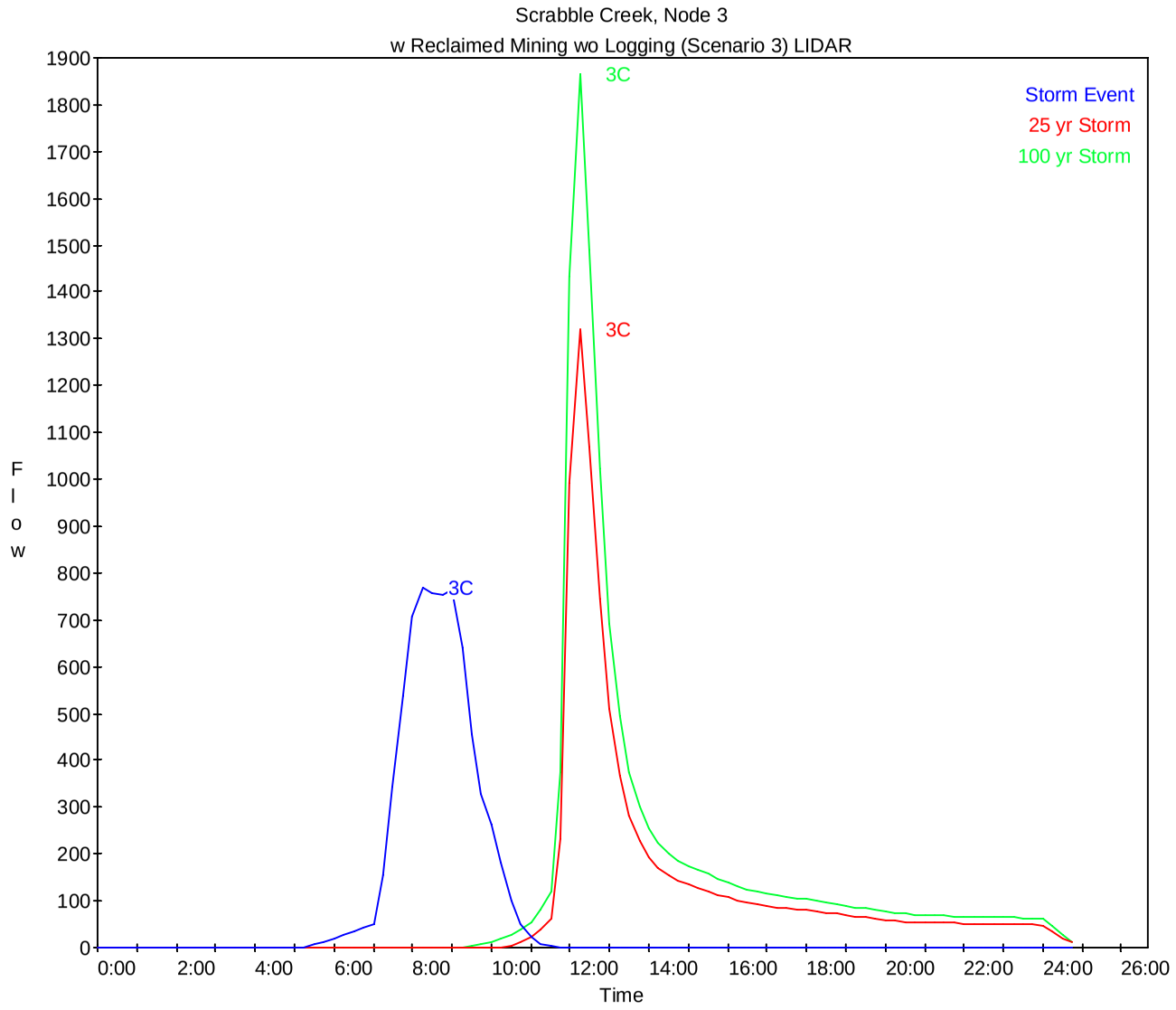
22:00
24:00
26:00


Scrabble Creek, Node 3
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
3C
3C
3C
Flow
Time
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
0:00
2:00
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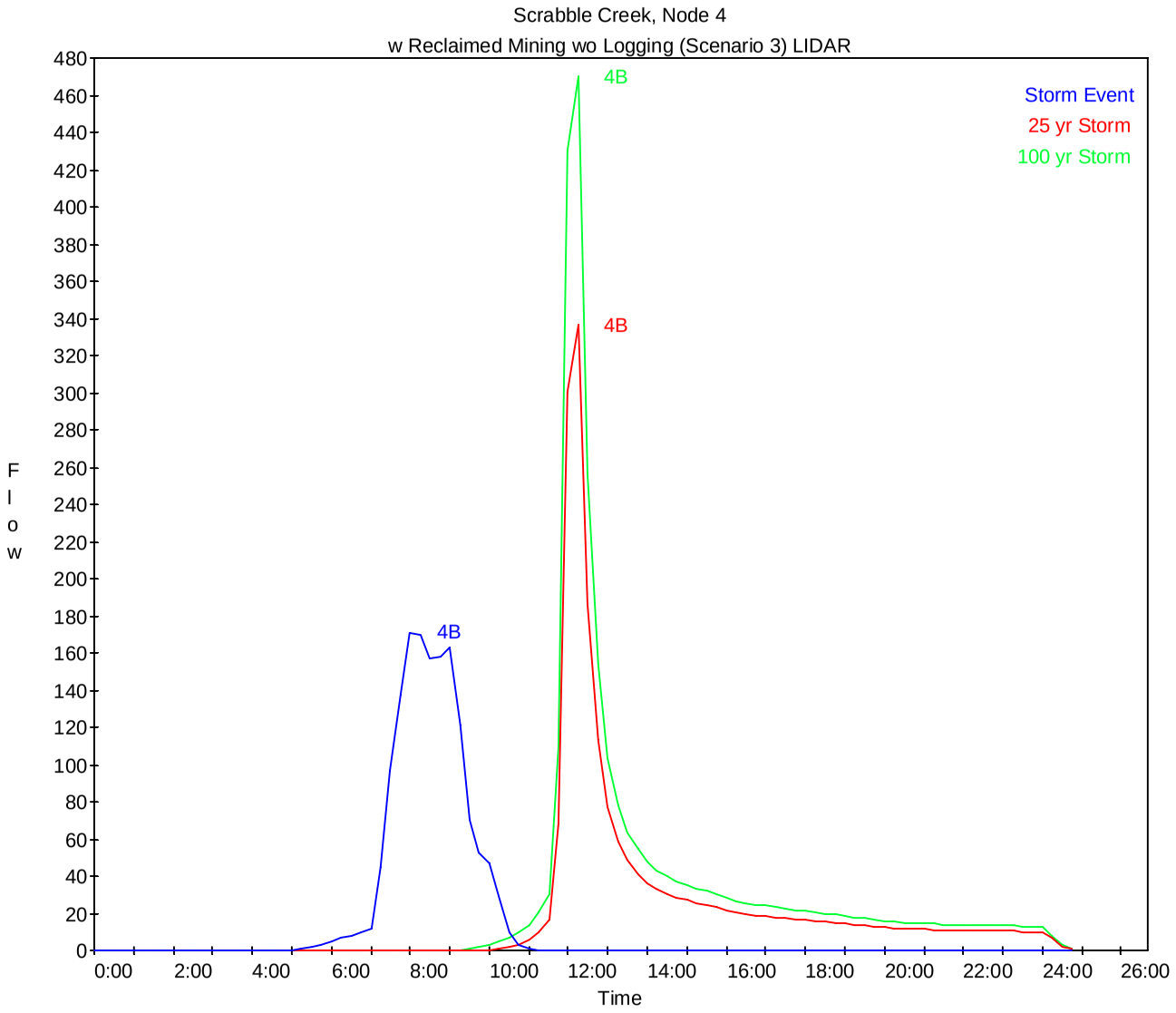
26:00


Scrabble Creek, Node 4
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
4B
4B
4B
Flow
Time
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
0:00
2:00
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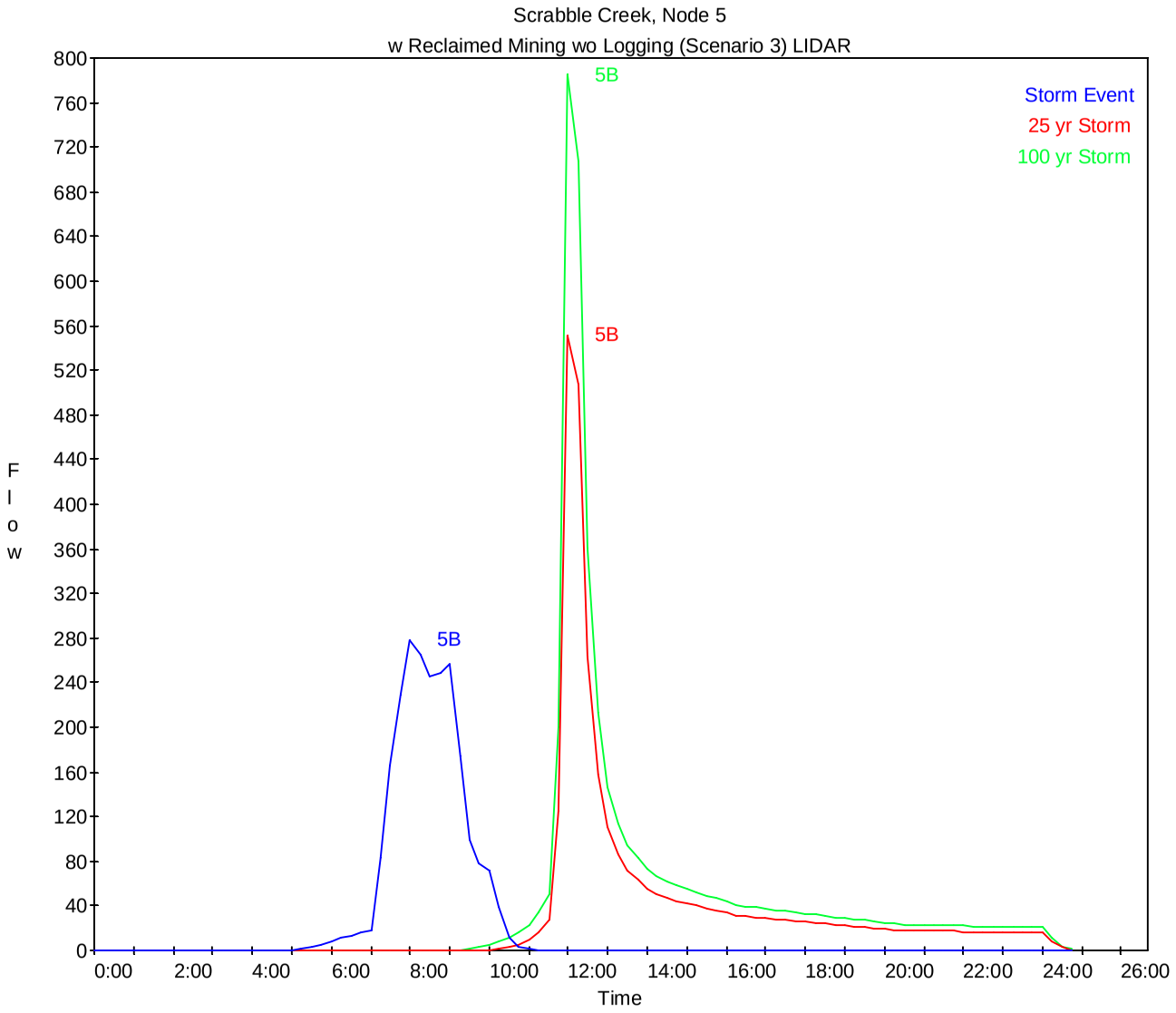
26:00


Scrabble Creek, Node 5
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
5B
5B
5B
Flow
Time
0
40
80
120
160
200
240
280
320
360
400
440
480
520
560
600
640
680
720
760
800
0:00
2:00
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10:00
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22:00
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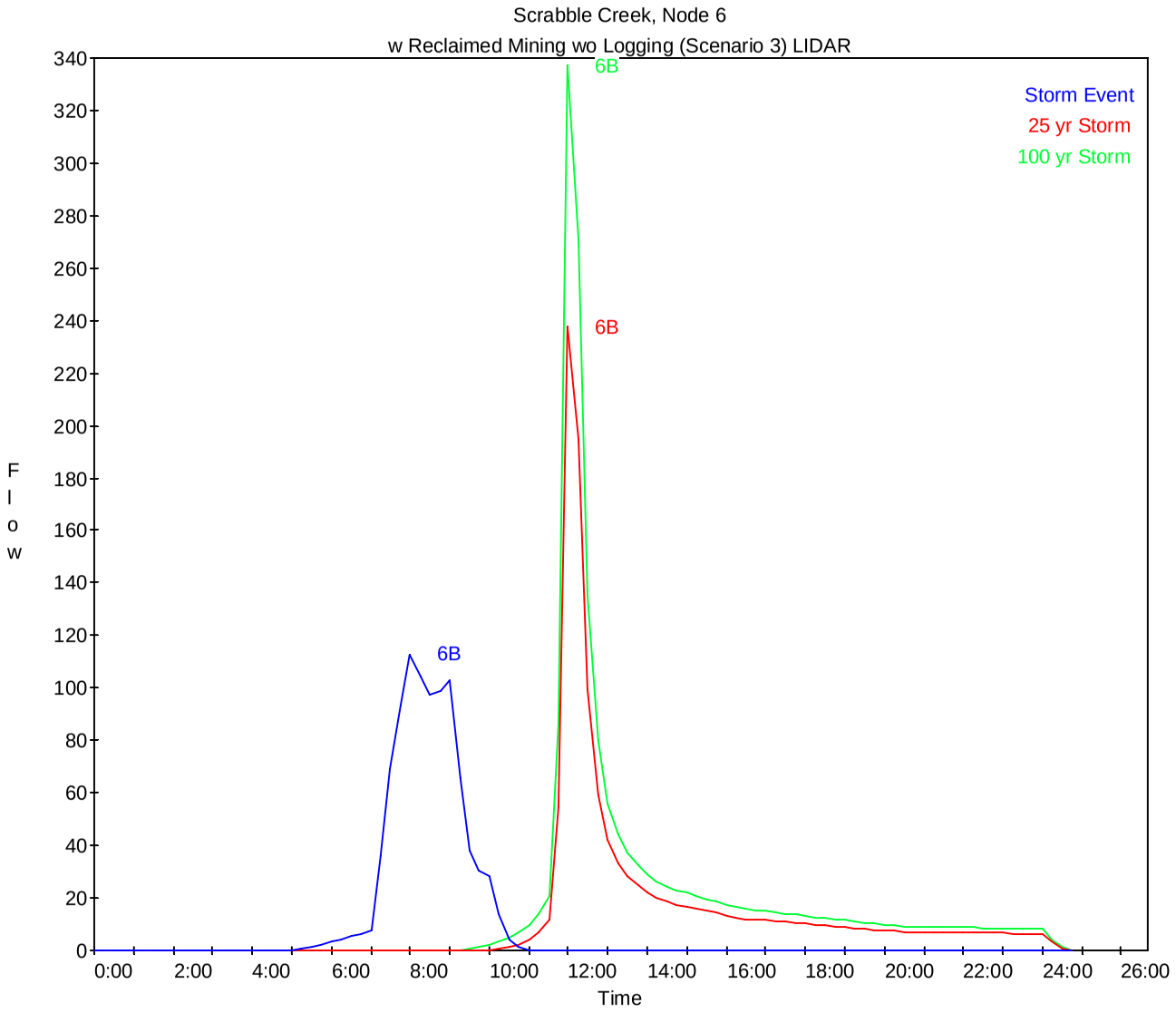
26:00


Scrabble Creek, Node 6
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
6B
6B
6B
Flow
Time
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0:00
2:00
4:00
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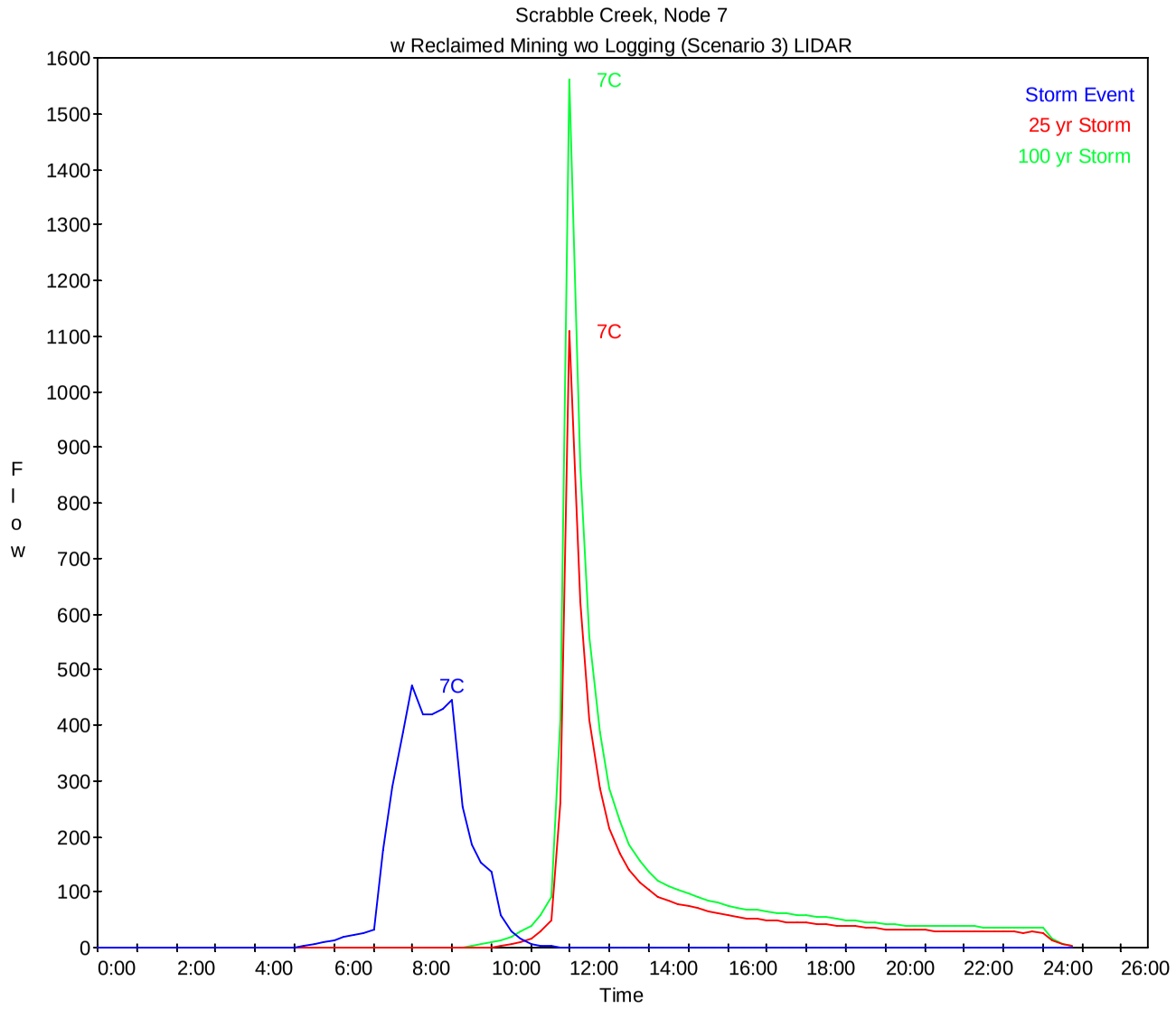
22:00
24:00
26:00


Scrabble Creek, Node 7
w Reclaimed Mining wo Logging (Scenario 3) LIDAR
Storm Event
25 yr Storm
100 yr Storm
7C
7C
7C
Flow
Time
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
0:00
2:00
4:00
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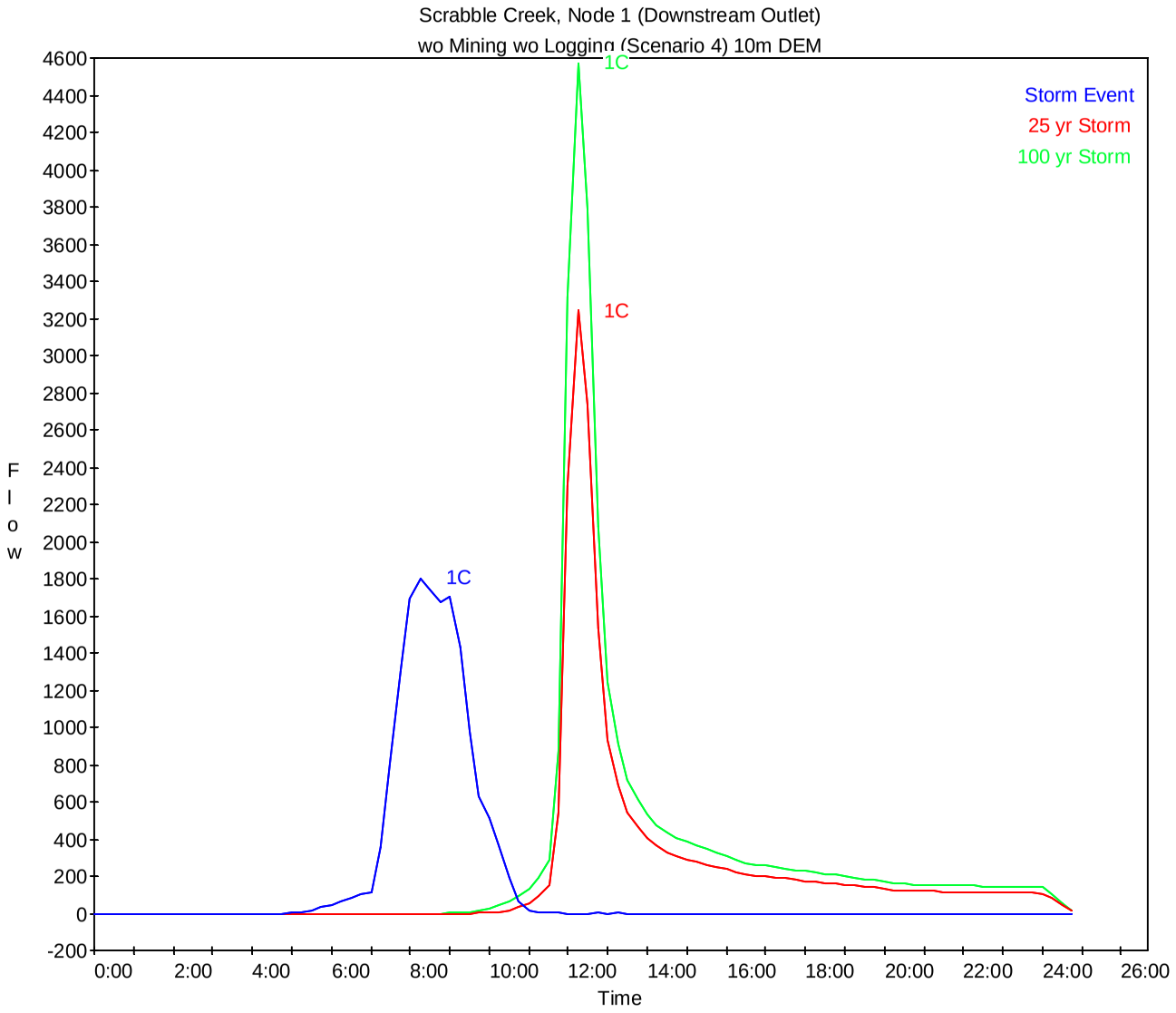
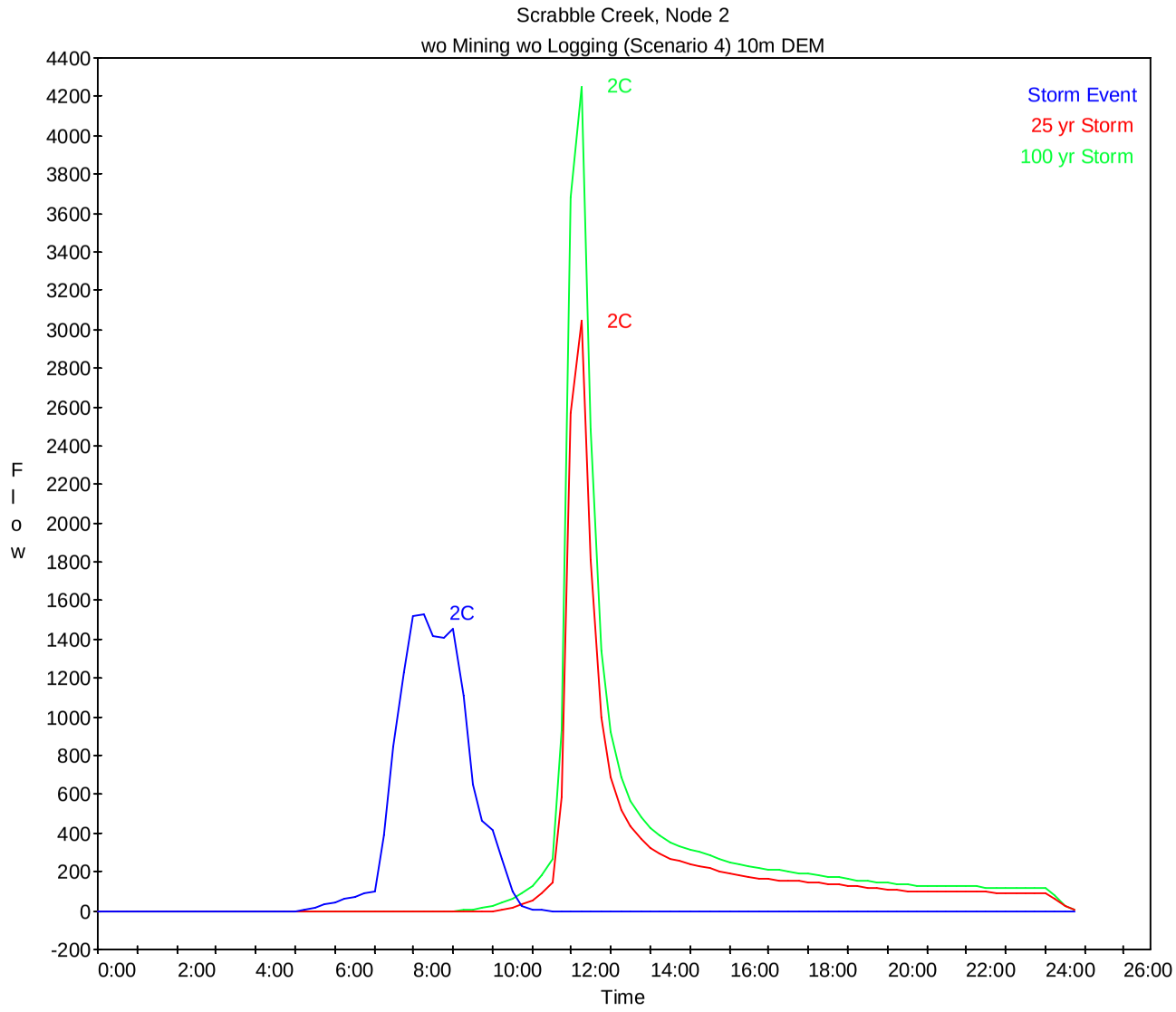
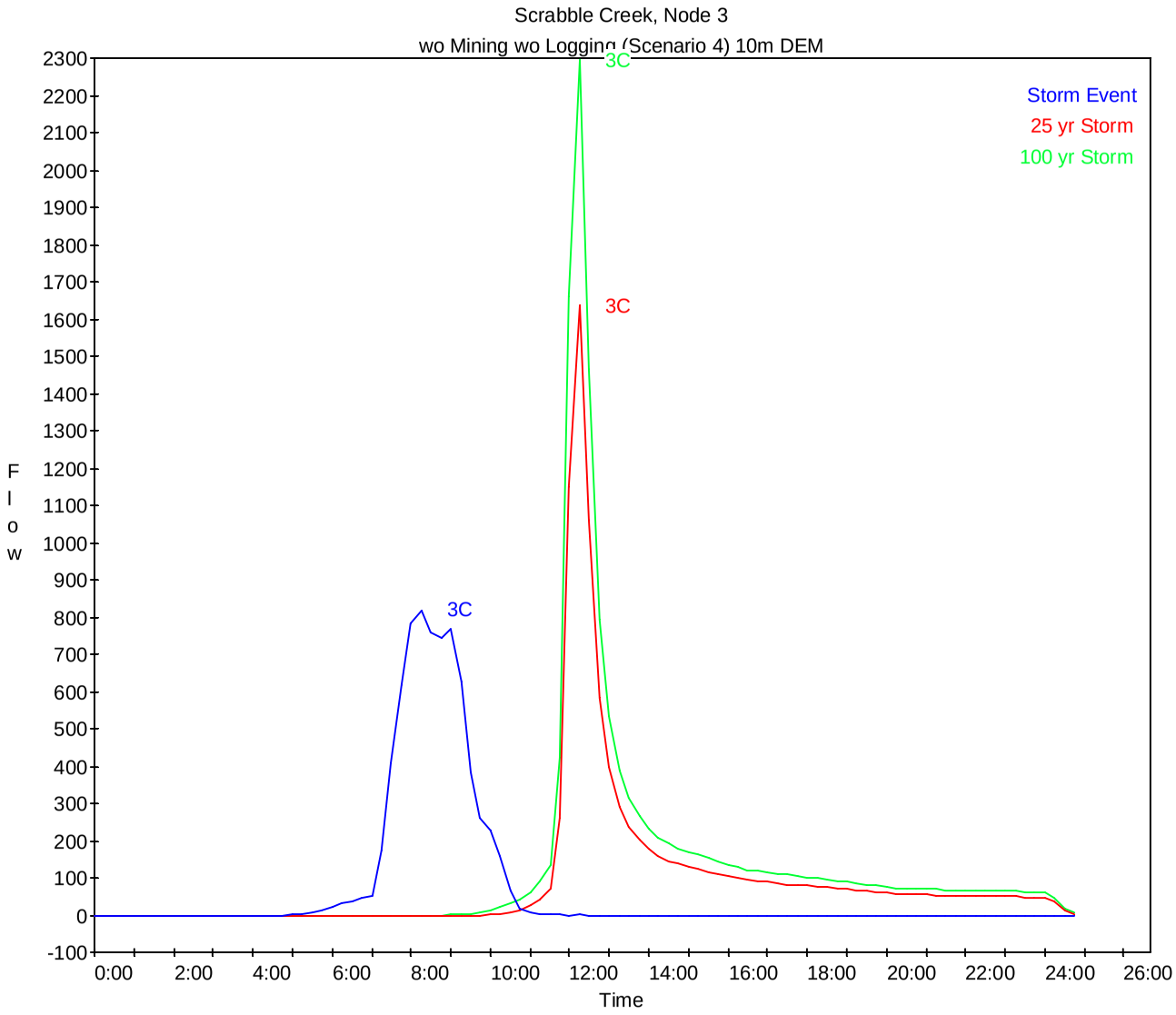
22:00
24:00
26:00


Scrabble Creek, Node 1 (Downstream Outlet)
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
1C
1C
1C
Flow
Time
4600
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 2
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
2C
2C
2C
Flow
Time
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 3
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
3C
3C
3C
Flow
Time
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
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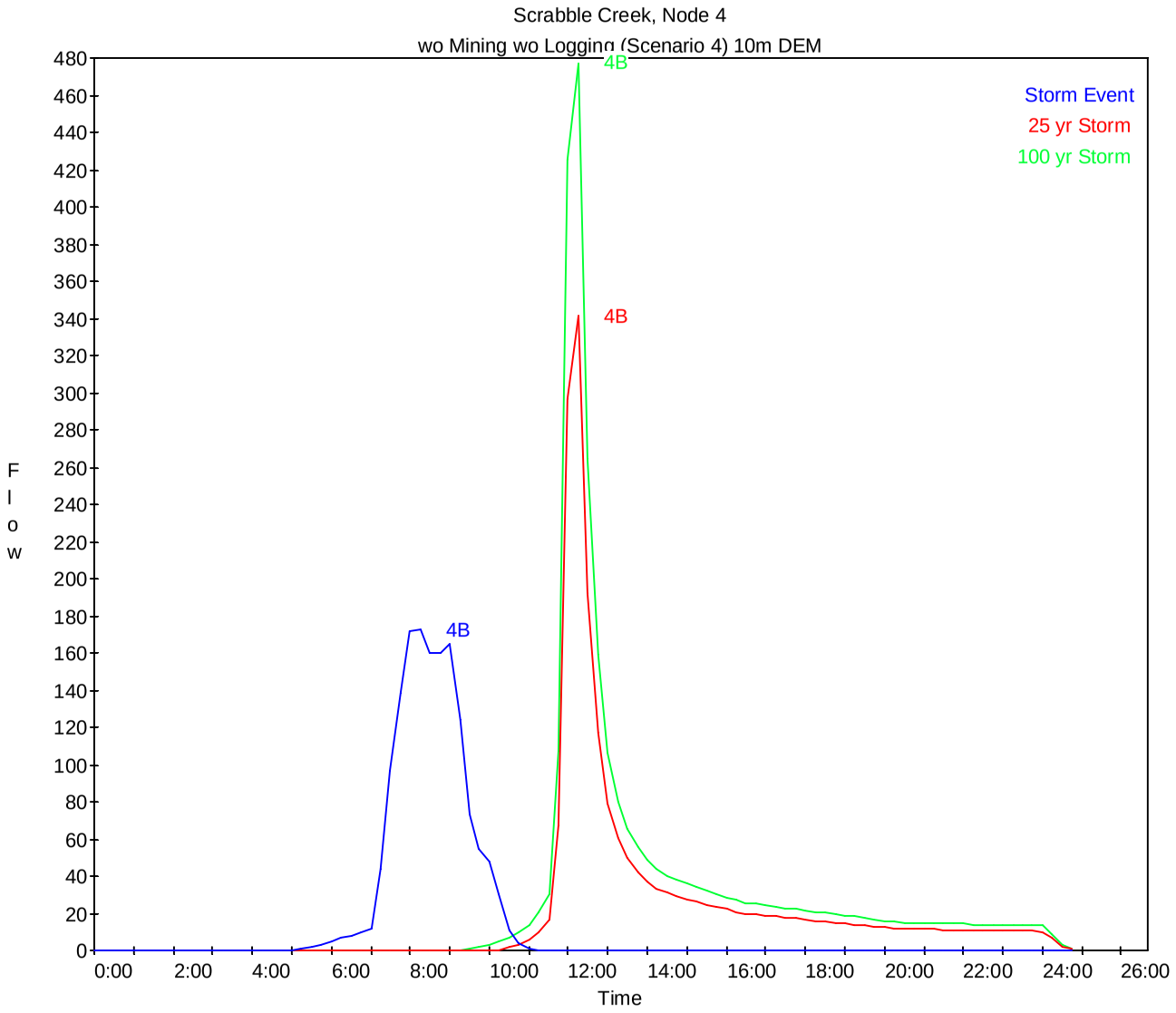
24:00
26:00


Scrabble Creek, Node 4
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
4B
4B
4B
Flow
Time
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
0:00
2:00
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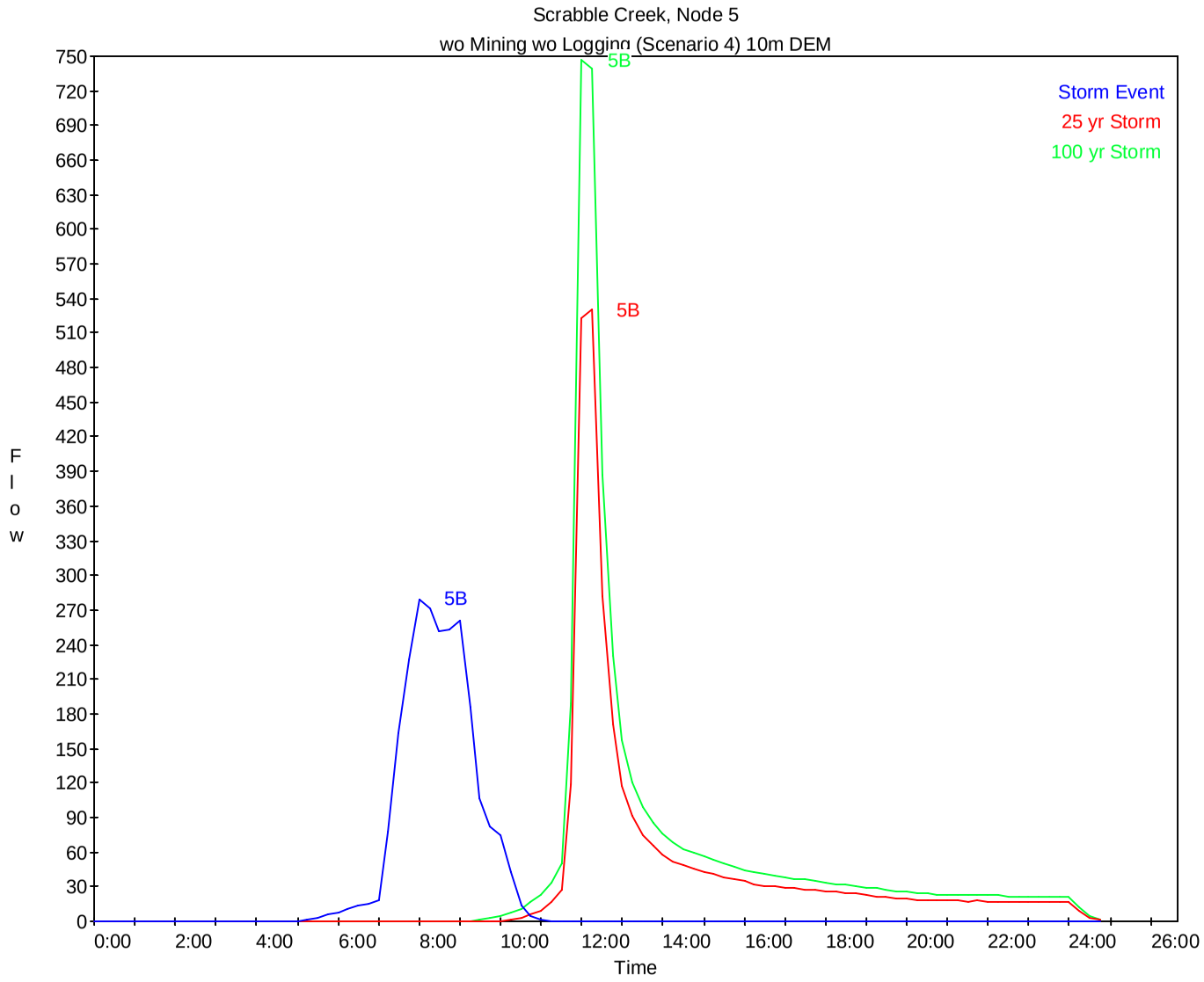
22:00
24:00
26:00


Scrabble Creek, Node 5
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
5B
5B
5B
Flow
Time
750
720
690
660
630
600
570
540
510
480
450
420
390
360
330
300
270
240
210
180
150
120
90
60
30
0
0:00
2:00
4:00
6:00
8:00
10:00
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14:00
16:00
18:00
20:00
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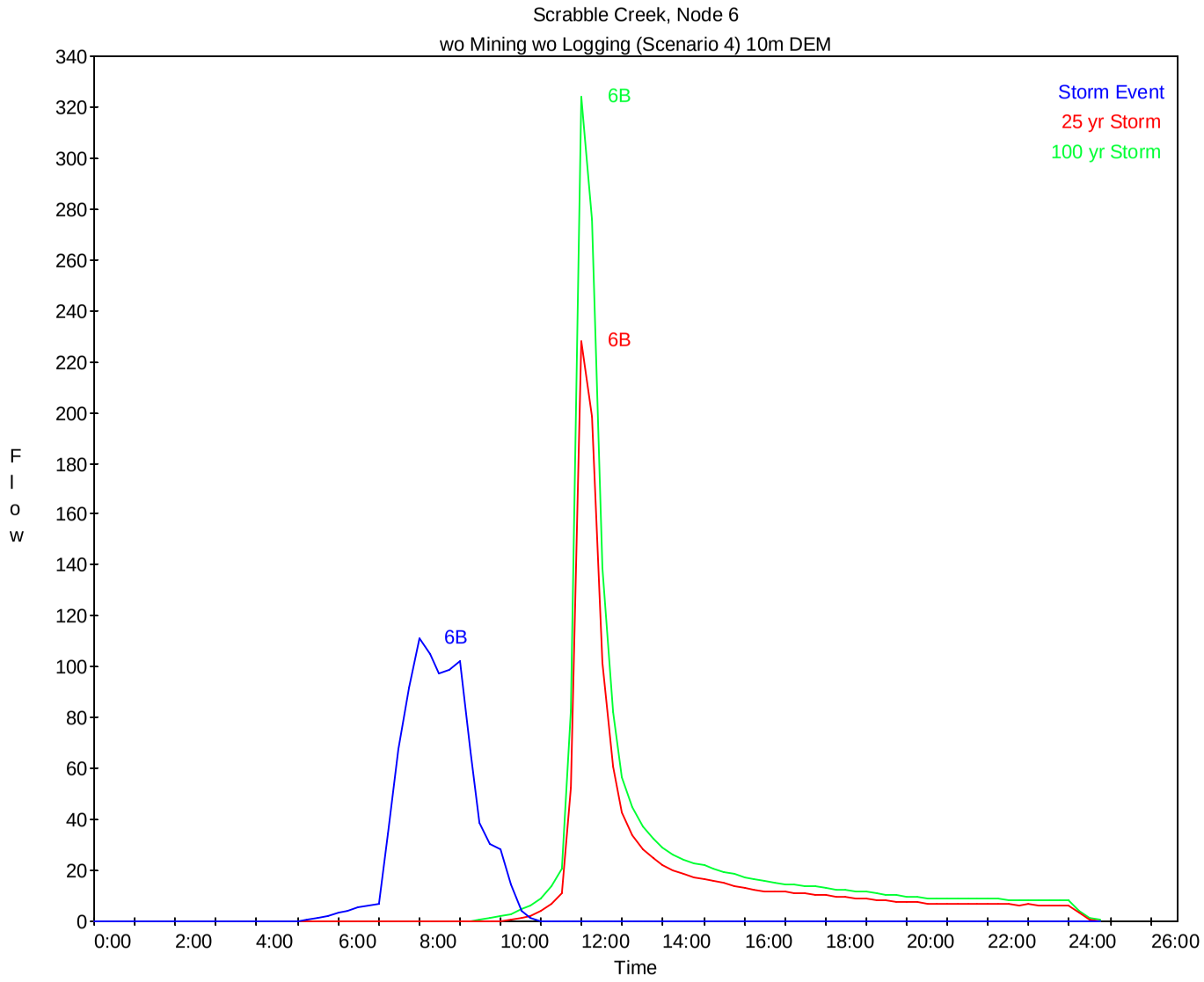
24:00
26:00


Scrabble Creek, Node 6
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
6B
6B
6B
Flow
Time
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0:00
2:00
4:00
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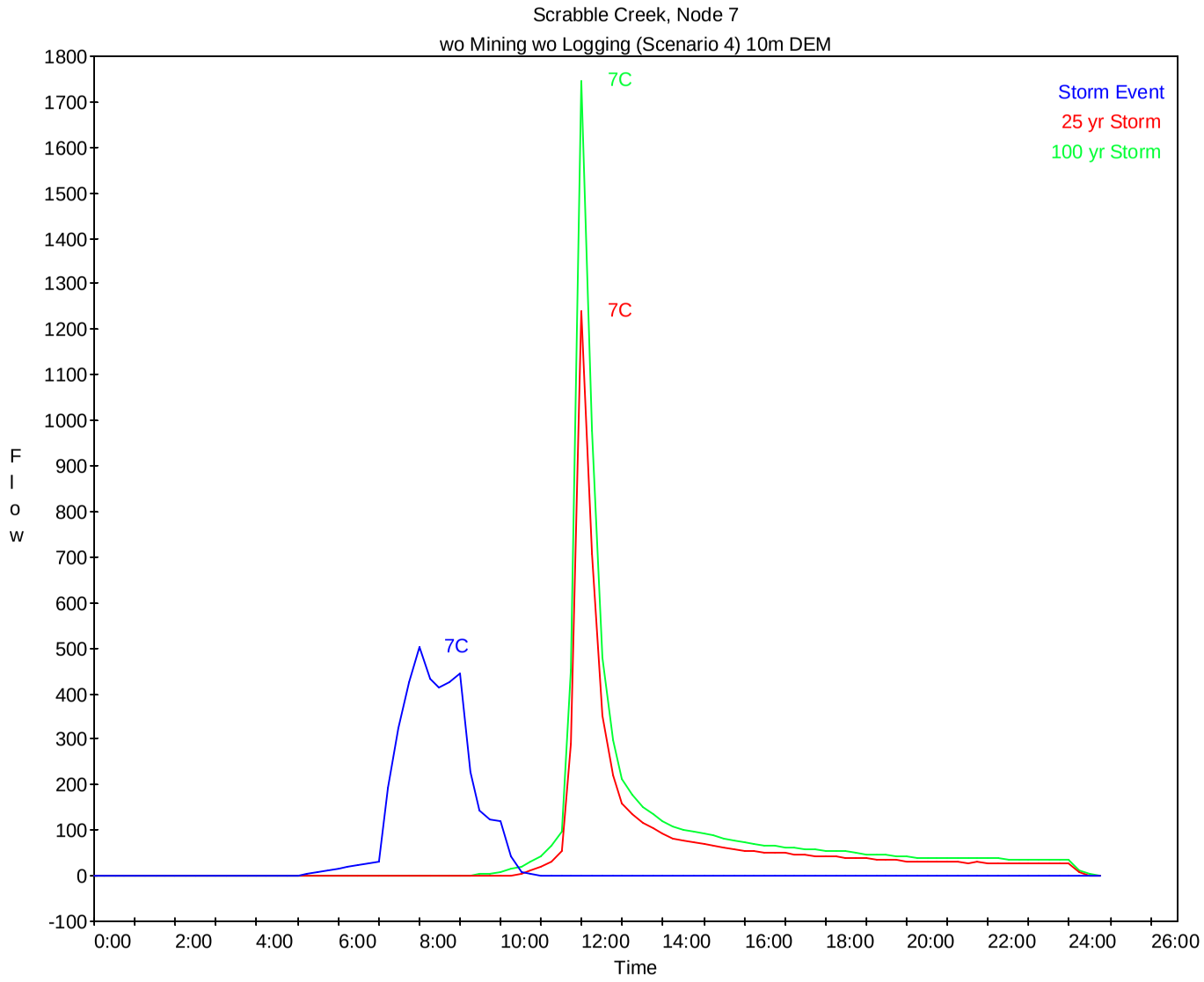
26:00


Scrabble Creek, Node 7
wo Mining wo Logging (Scenario 4) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
7C
7C
7C
Flow
Time
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
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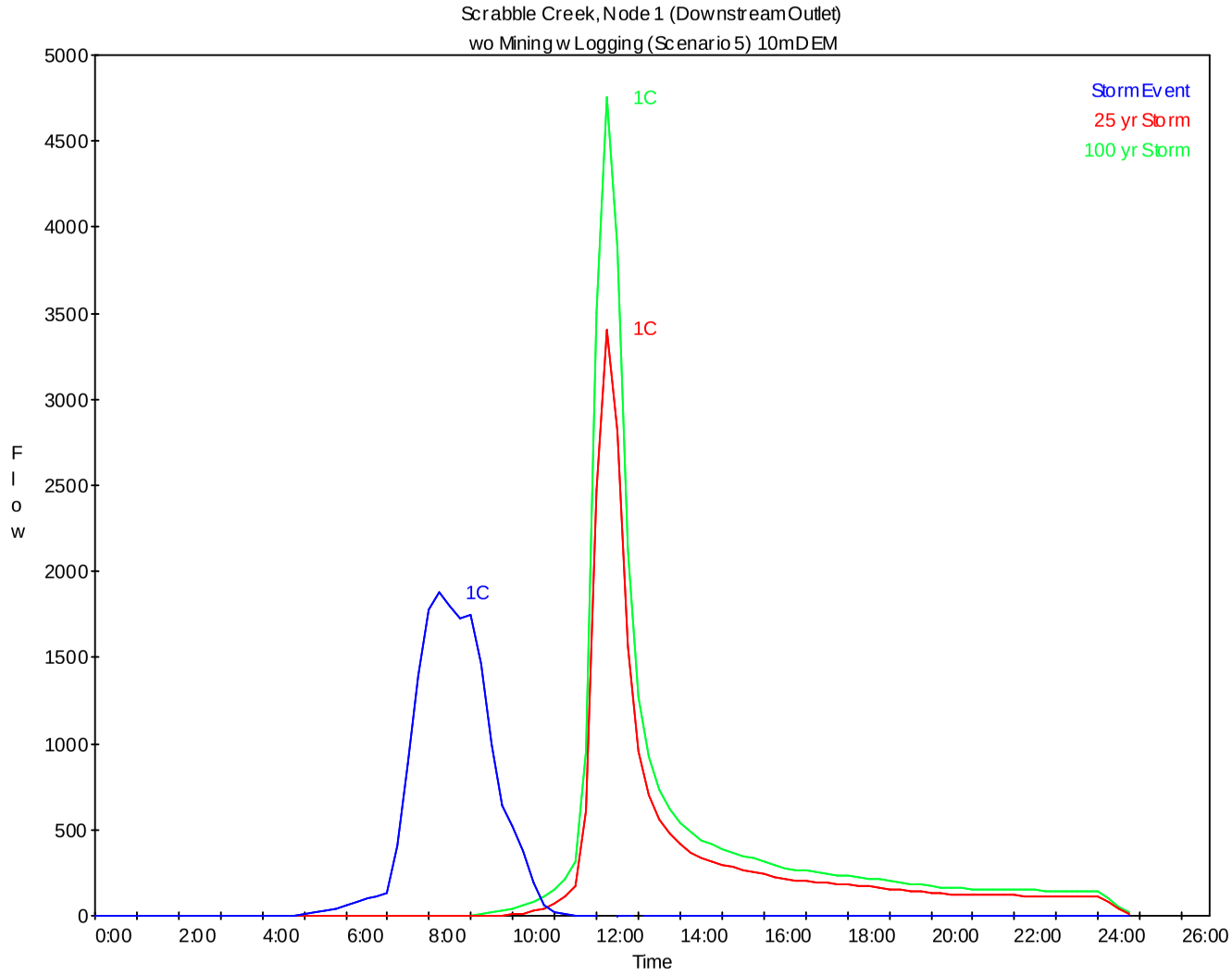
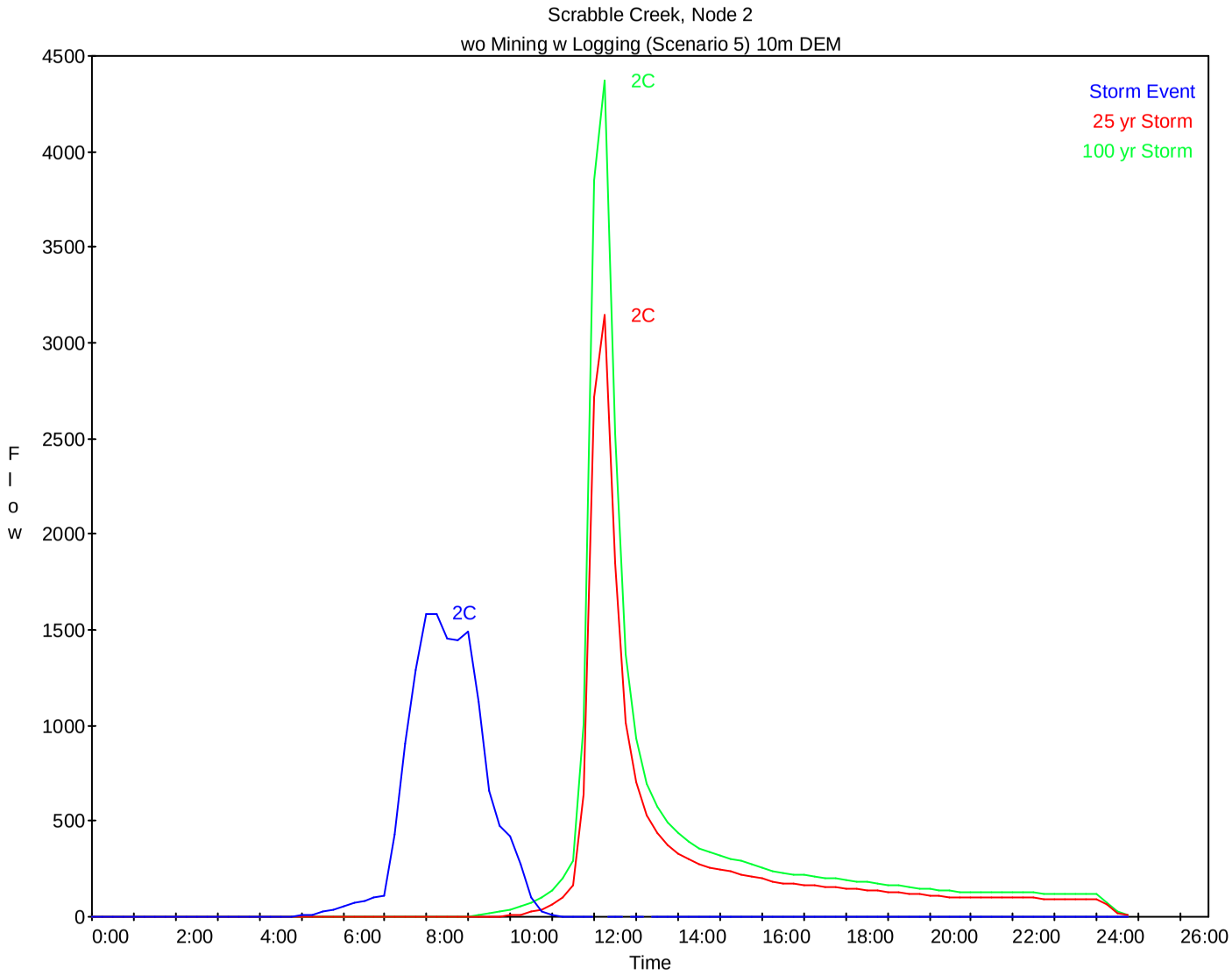
22:00
24:00
26:00


Scrabble Creek, Node 1 (Downstream Outlet)
wo Mining w Logging (Scenario 5) 10mDEM
Storm Event
25 yr Storm
100 yr Storm
1C
1C
1C
Flow
Time
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Scrabble Creek, Node 2
wo Mining w Logging (Scenario 5) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
2C
2C
2C
Flow
Time
0
500
1000
1500
2000
2500
3000
3500
4000
4500
0:00
2:00
4:00
6:00
8:00
10:00
12:00
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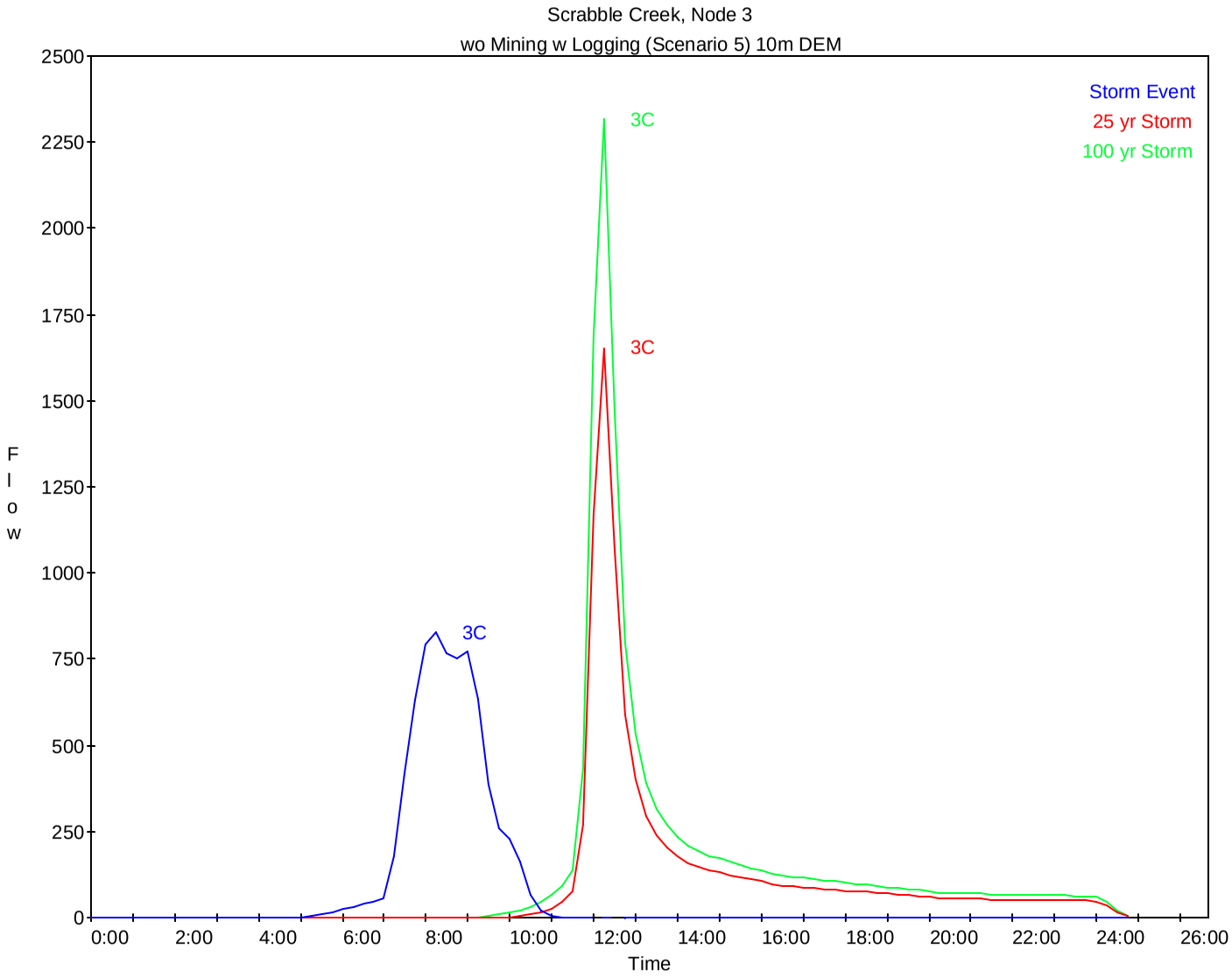
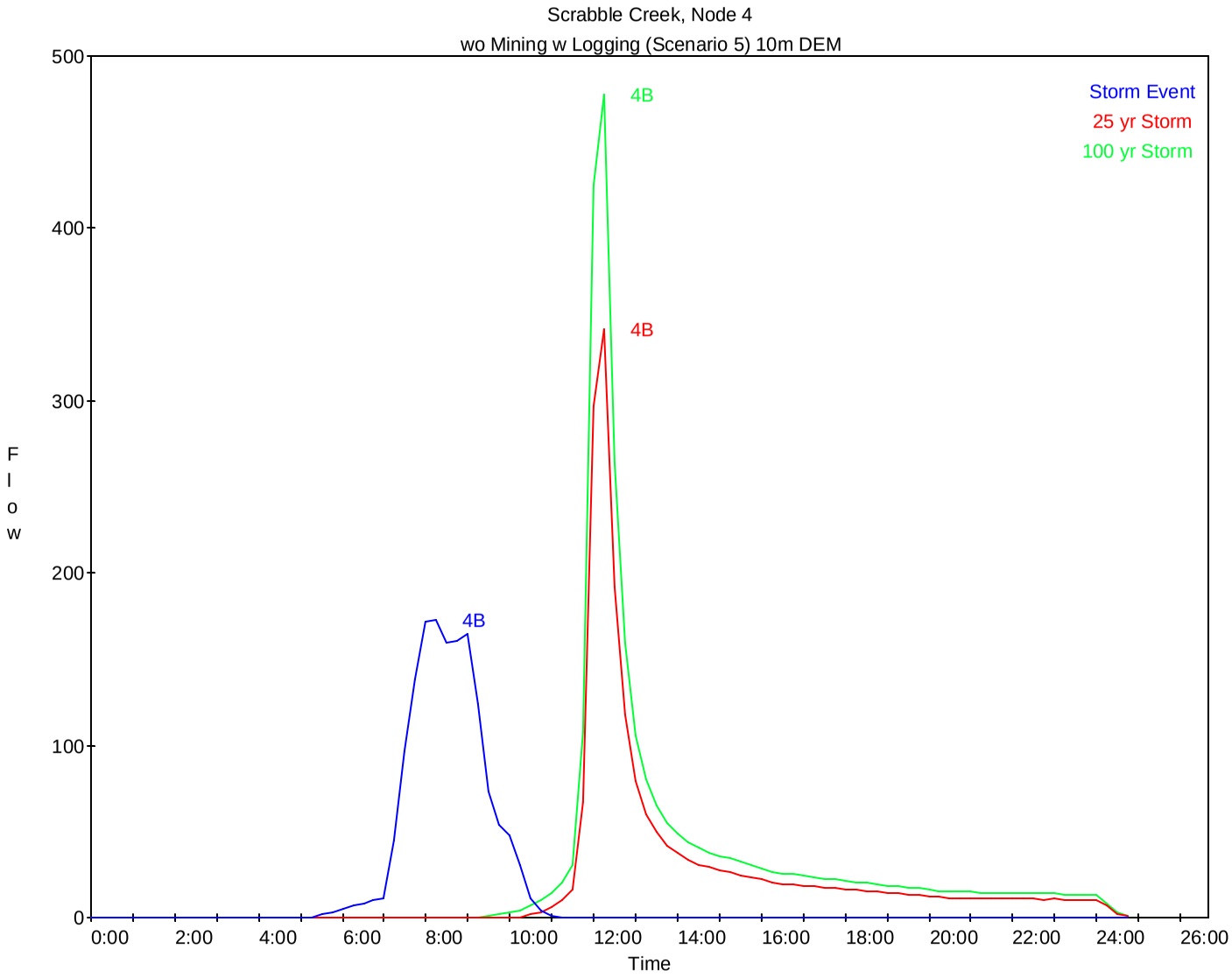
22:00
24:00
26:00


Scrabble Creek, Node 3
wo Mining w Logging (Scenario 5) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
3C
3C
3C
Flow
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00
Time


Scrabble Creek, Node 4
wo Mining w Logging (Scenario 5) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
4B
4B
4B
Flow
Time
0
100
200
300
400
500
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
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22:00
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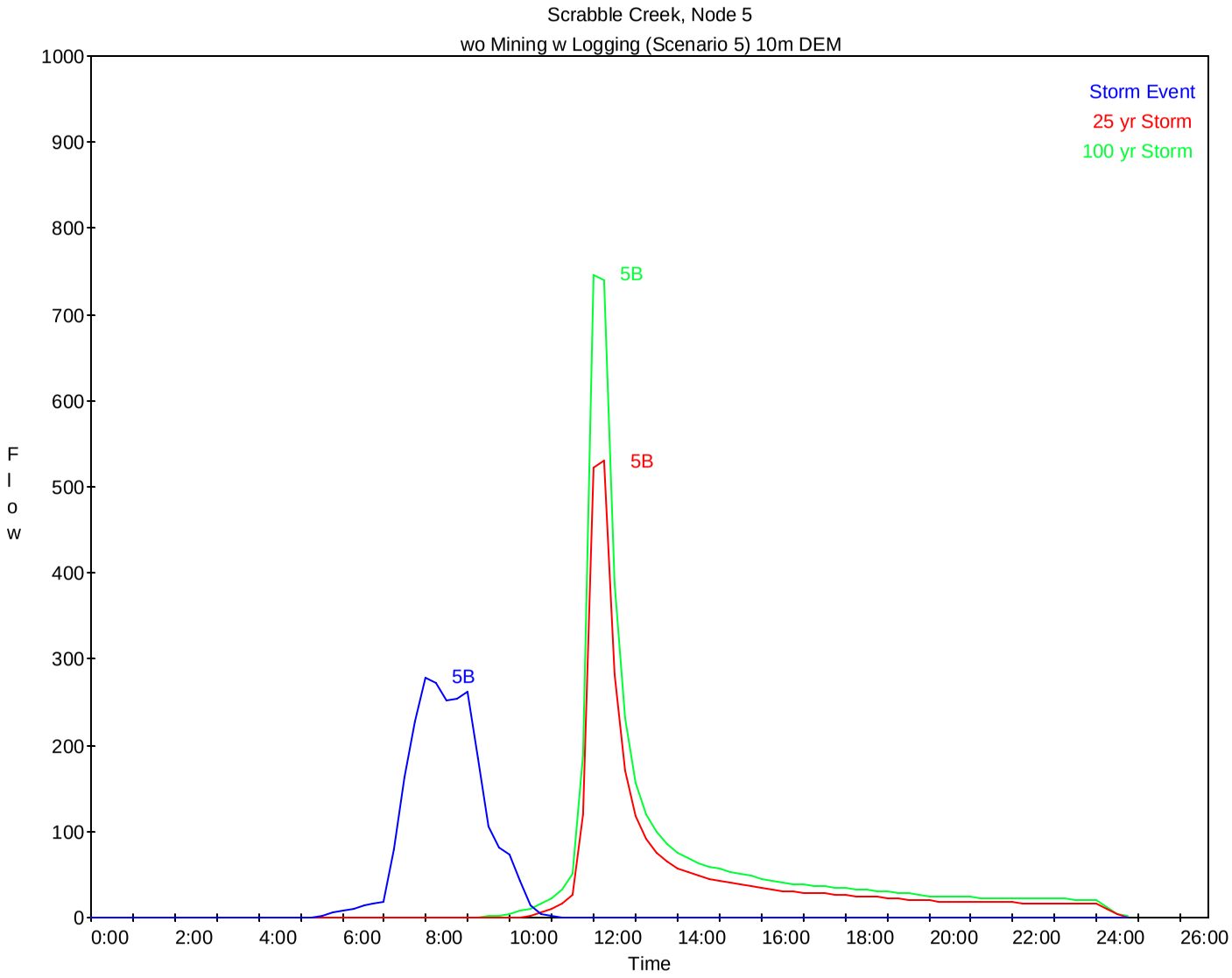
26:00


Scrabble Creek, Node 5
wo Mining w Logging (Scenario 5) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
5B
5B
5B
Flow
Time
0
100
200
300
400
500
600
700
800
900
1000
0:00
2:00
4:00
6:00
8:00
10:00
12:00
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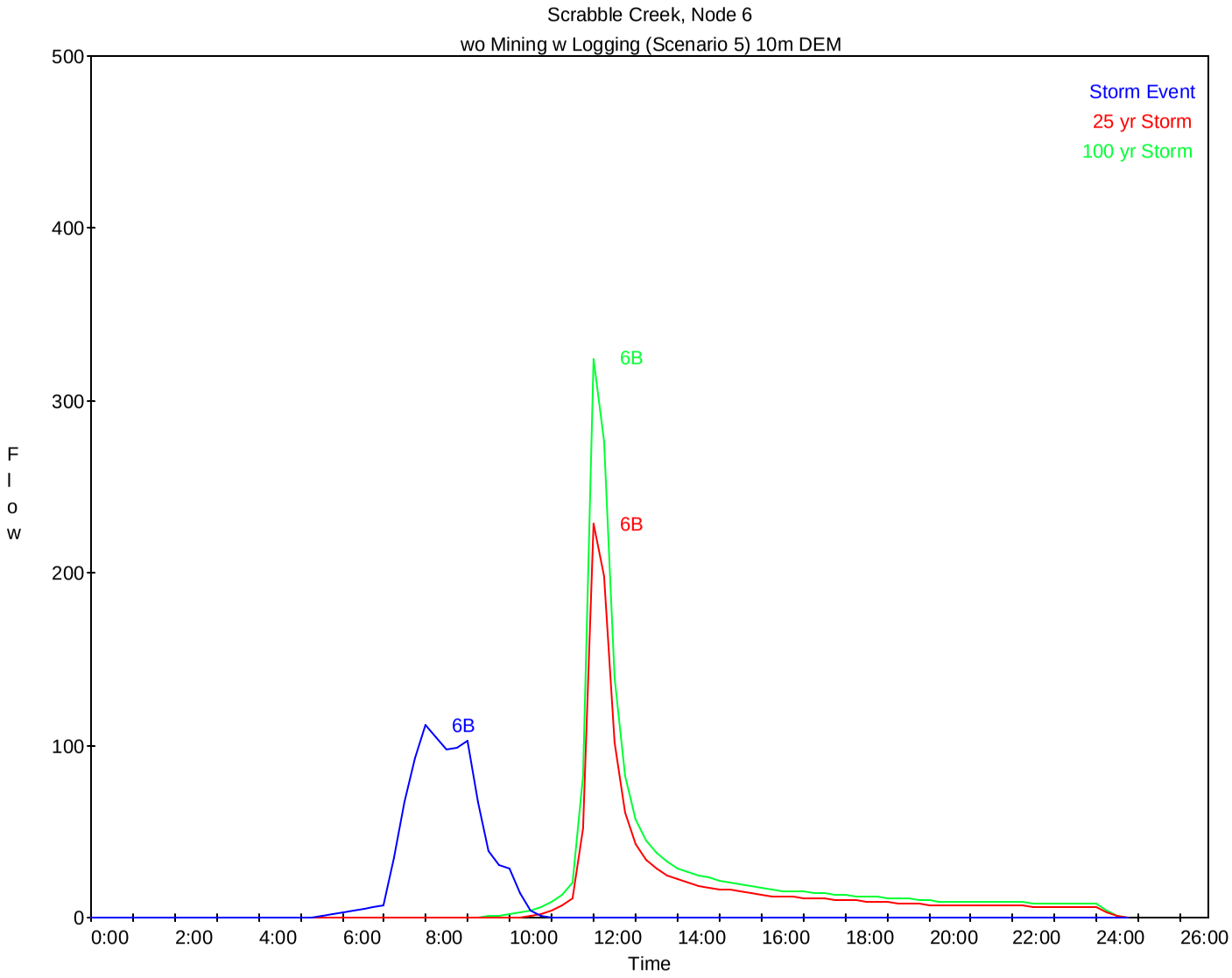
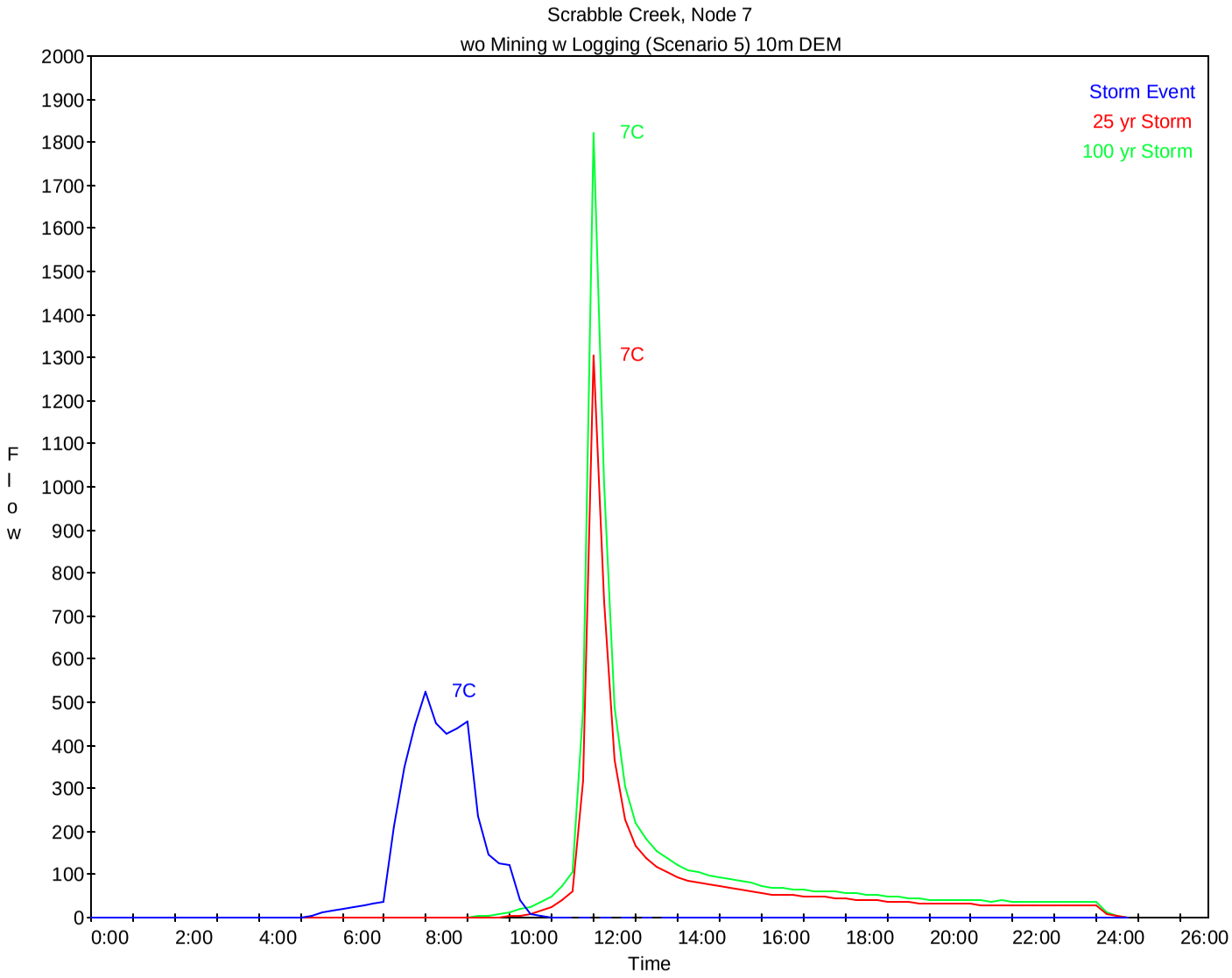
24:00
26:00


Scrabble Creek, Node 6
wo Mining w Logging (Scenario 5) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
6B
6B
6B
500
400
300
200
100
0
Flow
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00
Time


Scrabble Creek, Node 7
wo Mining w Logging (Scenario 5) 10m DEM
Storm Event
25 yr Storm
100 yr Storm
7C
7C
7C
Flow
Time
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
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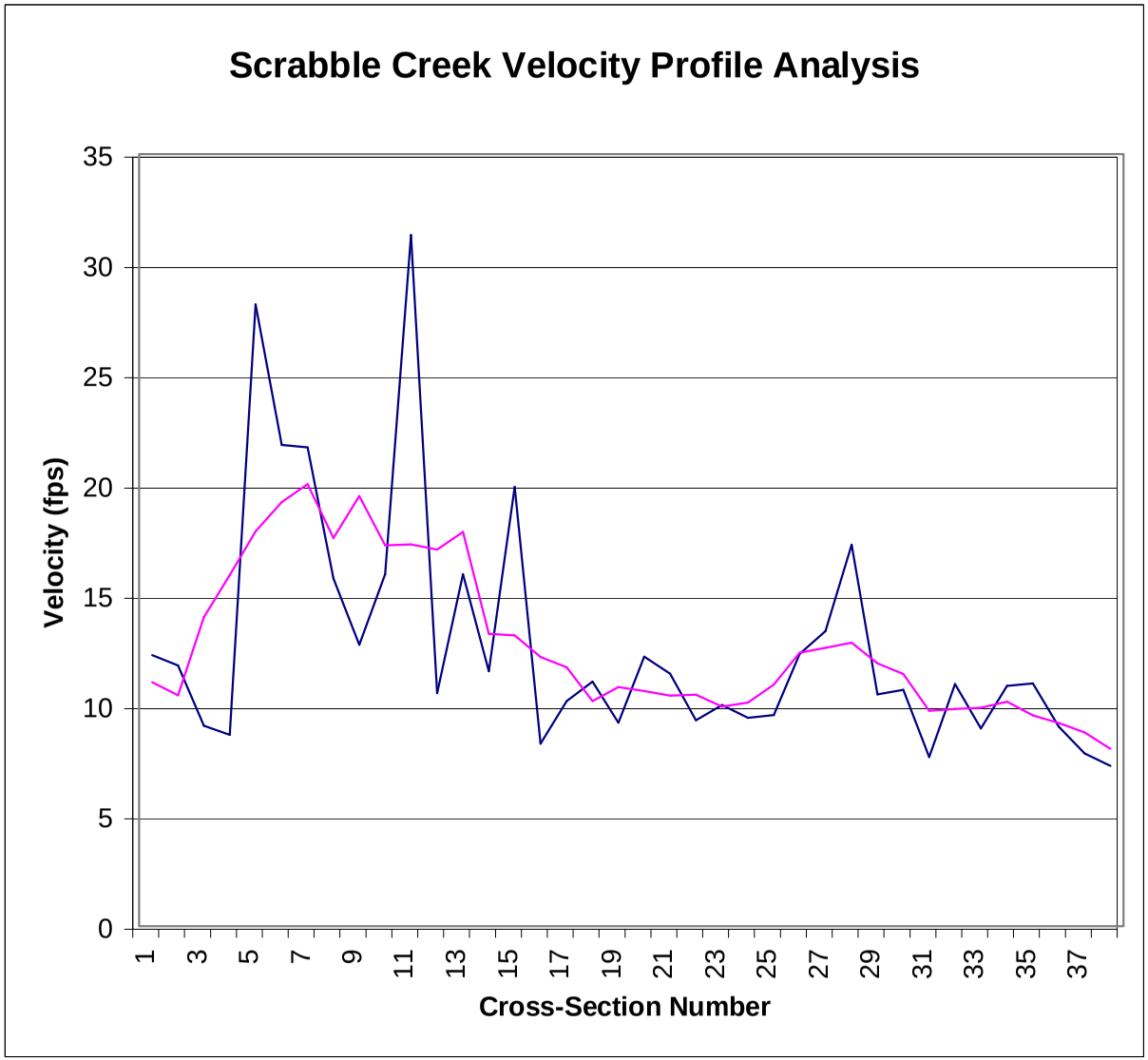
22:00
24:00
26:00

Scrabble Creek HEC-RAS Analysis using RiverCAD

Cross-Section ID	Calculated WSEL (m)	Observed WSEL (m)	Difference (m)	Difference (ft)
22	235.22	233.65	1.57	5.15
25	239.17	239.90	-0.73	-2.40
26	239.98	241.03	-1.05	-3.44
33	244.94	246.02	-1.08	-3.54
34	245.55	245.77	-0.22	-0.72
35	246.04	246.27	-0.23	-0.75

Possible influence by debris blockage during flood due to bridges & automobiles

Cross-Section ID	Storm Event	Mean
1	12.29	11.07
1.1	11.82	10.47
2	9.09	14.01
3	8.68	15.92
4	28.19	17.89
5	21.81	19.23
6	21.7	20.04
7	15.76	17.60
8	12.76	19.50
9	15.95	17.27
10	31.33	17.31
11	10.56	17.07
12	15.96	17.87
13	11.56	13.25
14	19.92	13.18
15	8.27	12.21
16	10.21	11.74
17	11.09	10.20
18	9.22	10.84
19	12.22	10.66
20	11.44	10.45
21	9.34	10.49
22	10.02	9.96
23	9.44	10.14
24	9.57	10.95
25	12.34	12.40
26	13.37	12.62
27	17.29	12.85
28	10.51	11.91
29	10.72	11.43
30	7.67	9.77
31	10.98	9.85
32	8.97	9.91
33	10.9	10.18
34	11.01	9.55
35	9.04	9.21
36	7.83	8.79
37	7.27	8.05
Mean Vel	12.79	



River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	2045.07	654.01	660.42	660.57	663.29	0.01103	14.07	166.42	34.56	1.04
1	3759.95	654.01	661.23	663.54	668.48	0.023549	22.47	195.51	37.68	1.56
1	5165.12	654.01	662.71	665.36	671.18	0.021348	24.54	255.52	43.42	1.53
1.1	2045.07	654	660.6	660.6	663.35	0.0074	13.75	172.96	35.24	1
1.1	3759.95	654	661.24	663.59	668.66	0.017434	22.63	196.55	37.74	1.56
1.1	5165.12	654	662.82	665.45	671.33	0.01527	24.48	260.9	43.86	1.52
1.55	Bridge									
2	2045.07	653.47	665.94	661.36	667.23	0.003578	9.09	224.99	19.86	0.48
2	3759.95	653.47	662.38	664.91	671.46	0.032268	24.18	155.51	19.35	1.5
2	5165.12	653.47	667.21	668.94	672.98	0.014933	19.72	357.34	292.8	0.98
3	2045.07	652.67	666.09	660.99	667.3	0.001711	8.86	235.66	20.02	0.45
3	3759.95	652.67	660.79	664.56	673.58	0.038214	28.71	132.45	19.28	1.92
3	5165.12	652.67	667.34	669.73	673.35	0.007563	19.88	321.21	128.36	0.95
4	2045.07	656.82	660.73	663.71	673.12	0.119331	28.25	72.54	26.46	2.98
4	3759.95	656.82	662.47	666.61	678.36	0.080194	31.99	117.97	27.81	2.65
4	5165.12	656.82	668.66	668.66	673.99	0.008526	18.53	283.49	35.87	1
4.5	Bridge									
5	2045.07	664.22	669.6	671.77	676.98	0.050424	21.81	93.78	25.58	2.01
5	3759.95	664.22	671.71	674.69	681.72	0.043416	25.39	148.12	25.75	1.87
5	5165.12	664.22	684.86	676.78	686.37	0.002065	10.06	587.65	85.06	0.41
6	2045.07	666.74	671.46	673.97	679.7	0.038376	23.33	94.26	23.23	1.93
6	3759.95	666.74	674.47	677.29	683.65	0.026121	24.95	170.1	27.19	1.61
6	5165.12	666.74	684.78	680.03	686.58	0.002305	11.94	664.32	90.39	0.5
7	2045.07	677.52	683.95	686.02	691.17	0.03153	24.22	129.75	60.06	1.75
7	3759.95	677.52	685.31	687.34	693.17	0.032249	28.1	244.69	100.3	1.83
7	5165.12	677.52	685.99	688.23	694.47	0.034141	30.65	314.25	105.9	1.91
8	2045.07	685.65	693.75	695.12	697.72	0.018293	17.61	160.32	61.72	1.1
8	3759.95	685.65	695.06	697.16	700.98	0.025671	23.11	248.93	73.88	1.34
8	5165.12	685.65	695.84	698.12	703.04	0.030048	26.38	309.93	85.23	1.47
9	2045.07	685.86	693.04	695.03	698.35	0.021286	19.72	128.21	43.5	1.31
9	3759.95	685.86	695	697.29	701.37	0.021688	23.44	246.01	70.3	1.38
9	5165.12	685.86	695.87	698.4	703.47	0.024626	26.56	309.81	75.75	1.49
10	2045.07	692.07	696.8	700.36	713.67	0.27889	33.37	65.28	29.03	3.62
10	3759.95	692.07	699.2	702.82	712.47	0.097048	30.33	143	36.52	2.38
10	5165.12	692.07	700.56	704.48	714.4	0.076033	31.49	200.88	45.48	2.19
11	2045.07	717.95	726.49	726.49	728.95	0.008799	13.4	193.59	44.09	0.89
11	3759.95	717.95	727.28	729.11	733.38	0.019423	21.37	229.91	47.39	1.34
11	5165.12	717.95	728.11	730.75	736.59	0.024309	25.57	270.79	50.23	1.53
12	2045.07	719.68	725.78	726.57	729.92	0.021261	16.35	128.11	23.52	1.23
12	3759.95	719.68	729.73	729.73	734.48	0.011921	17.53	221.61	23.88	1
12	5165.12	719.68	731.96	731.96	737.83	0.011093	19.48	275.25	24.09	1
12.5	Bridge									

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
13	2045.07	720.7	728.65	727.68	731.08	0.008246	12.8	176.93	25.03	0.83
13	3759.95	720.7	735.64	730.87	737.82	0.003071	12.14	390.2	92.37	0.56
13	5165.12	720.7	734.99	733.11	739.56	0.006809	17.53	337.53	44.08	0.83
14	2045.07	722.55	727.15	729.15	733.81	0.049474	21.1	102.67	28.21	1.83
14	3759.95	722.55	737.2	731.96	738.08	0.001578	8.57	632.14	93.08	0.4
14	5165.12	722.55	739.08		740.09	0.001646	9.51	811.55	98.87	0.42
15	2045.07	729.25	736.47	737.05	738.38	0.010007	14.73	247.24	130.77	0.99
15	3759.95	729.25	737.87	738.09	739.61	0.008472	15.33	438.92	140.64	0.94
15	5165.12	729.25	739.51	738.83	740.72	0.00479	13	674.9	145.62	0.73
16	2045.07	735.96	741.8	742.86	745.88	0.018103	18.66	200.25	173.58	1.49
16	3759.95	735.96	742.62	743.67	746.41	0.017907	20.59	352.62	190.2	1.52
16	5165.12	735.96	743.09	744.25	747.07	0.018542	22.09	443.08	193.6	1.57
17	2045.07	745.37	751.37	752.47	755.09	0.018558	18.13	184.47	102.12	1.36
17	3759.95	745.37	752.16	753.68	757.47	0.0257	23.32	270.41	113.63	1.63
17	5165.12	745.37	752.76	754.49	758.63	0.027029	25.39	339.74	118.48	1.7
18	2045.07	753.52	760.35	760.86	762.62	0.011529	16.14	221.86	69.69	1.1
18	3759.95	753.52	762.6	762.6	764.75	0.008446	16.75	397.08	87.09	0.99
18	5165.12	753.52	763.7	763.7	766.23	0.008798	18.47	496.08	92.9	1.03
19	2045.07	757.52	762.13	763.19	765.84	0.027482	18.34	167.38	96.38	1.56
19	3759.95	757.52	763.24	764.46	767.09	0.023935	19.98	281.06	107.41	1.52
19	5165.12	757.52	764.03	765.22	768.05	0.021729	20.84	369.08	117.28	1.48
20	2045.07	760.99	765.4	766.49	769.56	0.024943	20.37	178.83	128.64	1.75
20	3759.95	760.99	766.29	767.48	770.42	0.023297	22.38	303.96	143.58	1.75
20	5165.12	760.99	766.87	768.14	771.19	0.022342	23.56	388.57	144.88	1.74
21	2045.07	763.97	770.38	771.37	773.86	0.020002	20.46	219.04	176.82	1.44
21	3759.95	763.97	771.11	772.21	774.94	0.023773	24.01	350.11	180.96	1.59
21	5165.12	763.97	771.56	772.77	775.79	0.026256	26.28	432.22	184.76	1.69
22	2045.07	765.89	771.71	772.83	775.46	0.014728	19.08	204.18	123.03	1.41
22	3759.95	765.89	772.71	774.07	776.75	0.01573	21.99	333.85	140.35	1.5
22	5165.12	765.89	773.34	774.69	777.63	0.016198	23.69	424.5	152.87	1.55
23	2045.07	774.52	780.26	781.01	782.57	0.016226	16.74	216.54	121.6	1.26
23	3759.95	774.52	781.37	781.99	783.59	0.014409	17.84	383.19	171.6	1.22
23	5165.12	774.52	782.06	782.83	784.33	0.013586	18.52	510.89	202.75	1.21
24	2045.07	776.81	782.4	783.16	785.19	0.024317	20.12	213.64	157.27	1.53
24	3759.95	776.81	783.08	783.99	786.26	0.026849	22.9	323.88	167.37	1.64
24	5165.12	776.81	783.56	784.62	786.99	0.026822	24.07	405.34	175.25	1.66
25	2045.07	779.92	784.66	786.09	790.12	0.03674	22.51	165.7	113.75	1.84
25	3759.95	779.92	785.51	787.1	791.89	0.042085	26.94	276.97	143.12	2.03
25	5165.12	779.92	786.01	787.74	792.67	0.043099	28.89	349.75	152.53	2.08
26	2045.07	781.42	787.32	788.74	793.13	0.040452	23.97	152.95	99.12	1.76
26	3759.95	781.42	787.97	789.69	796.2	0.059767	31.28	231.47	139.39	2.18
26	5165.12	781.42	788.41	790.38	797.23	0.064635	34.01	293.97	142.65	2.29

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
27	2045.07	785.24	790.58	793.56	797.47	0.031962	22.76	118.28	31.88	1.76
27	3759.95	785.24	793.39	795.26	799.87	0.019221	23.56	262.52	79.14	1.47
27	5165.12	785.24	794.68	796.9	800.75	0.016339	24	366.99	82.86	1.39
28	2045.07	787.84	797.45	798.62	800.64	0.007721	16.54	194.55	63.11	0.95
28	3759.95	787.84	799.74	800.61	802.3	0.00627	17.23	453.42	257.86	0.89
28	5165.12	787.84	801.22	801.22	802.62	0.003853	14.63	841.29	264.87	0.71
29	2045.07	789.93	798.32	799.53	801.32	0.009287	16.75	190.83	64.85	1.02
29	3759.95	789.93	800.33	801.22	802.85	0.00776	17.69	429.64	206.69	0.97
29	5165.12	789.93	801.33		803.25	0.006431	17.13	703.09	285.31	0.9
30	2045.07	792.15	800.17	800.94	802.02	0.008801	15.68	266.61	156.21	0.99
30	3759.95	792.15	801.02	801.78	803.48	0.012692	20.17	450.78	277.58	1.2
30	5165.12	792.15	803.09	802.28	803.66	0.003047	11.39	1073.58	315.44	0.61
31	2045.07	793.96	800.4	801.51	803.72	0.015213	17.14	186.29	88.88	1.24
31	3759.95	793.96	801.61	802.92	805.56	0.016806	20.37	308.89	117.03	1.34
31	5165.12	793.96	802.47	803.83	806.39	0.015714	21.25	420.01	142.03	1.32
32	2045.07	795.77	804.06	804.1	805.66	0.011168	14.11	228.01	72.02	0.87
32	3759.95	795.77	805.95	806.02	807.42	0.008902	14.47	443.5	148.42	0.8
32	5165.12	795.77	806.19	806.71	808.53	0.013935	18.39	478.86	149.3	1.01
33	2045.07	797.08	803.6	804.76	807.15	0.017325	19.23	187.59	72.75	1.34
33	3759.95	797.08	805.19	806.41	808.88	0.015642	21.19	319.64	104.15	1.32
33	5165.12	797.08	806.13	807.39	809.98	0.015066	22.4	428.83	125.31	1.32
34	2045.07	799.14	805.59	806.78	808.86	0.014376	17.26	185.67	80.64	1.22
34	3759.95	799.14	807.02	808.17	810.5	0.013857	19.43	326.35	110.51	1.24
34	5165.12	799.14	807.83	808.92	811.55	0.013842	20.77	420.07	120.2	1.26
35	2045.07	799.25	807.21	807.97	809.7	0.008756	14.94	226.2	97.57	0.97
35	3759.95	799.25	808.65	809.44	811.35	0.009076	17.12	380.55	116.43	1.01
35	5165.12	799.25	809.52	810.23	812.43	0.009352	18.5	485.52	124.75	1.05
36	2045.07	802.34	809.25	809.46	810.69	0.007641	13.33	261.2	101.12	0.9
36	3759.95	802.34	810.69	810.69	812.33	0.007268	14.77	417.66	116.29	0.91
36	5165.12	802.34	811.53	811.53	813.44	0.007562	16.07	518.23	123.88	0.94
37	2045.07	804.7	810.27	810.27	811.35	0.008717	11.87	281.37	113.31	0.91
37	3759.95	804.7	811.61	811.35	812.94	0.007776	13.06	438.95	121.1	0.9
37	5165.12	804.7	812.5	812.1	814.06	0.007471	13.94	549.56	126.25	0.9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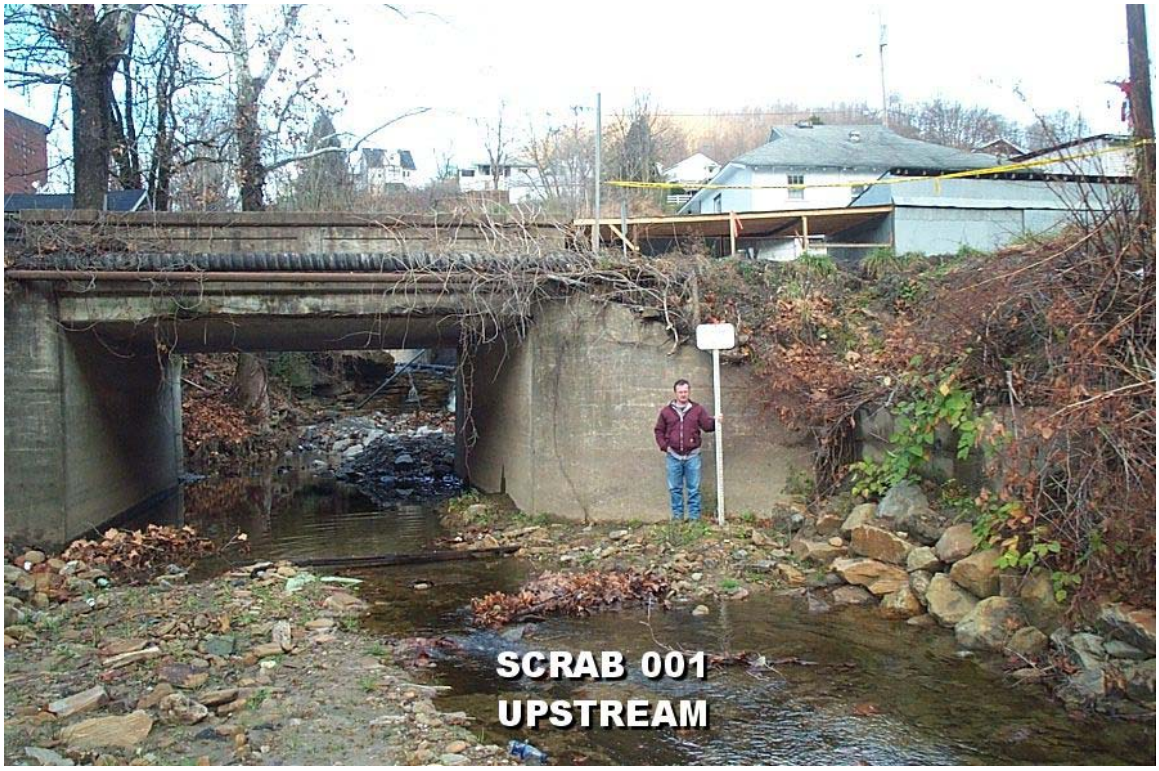
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SCRAB 002
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SCRAB 004
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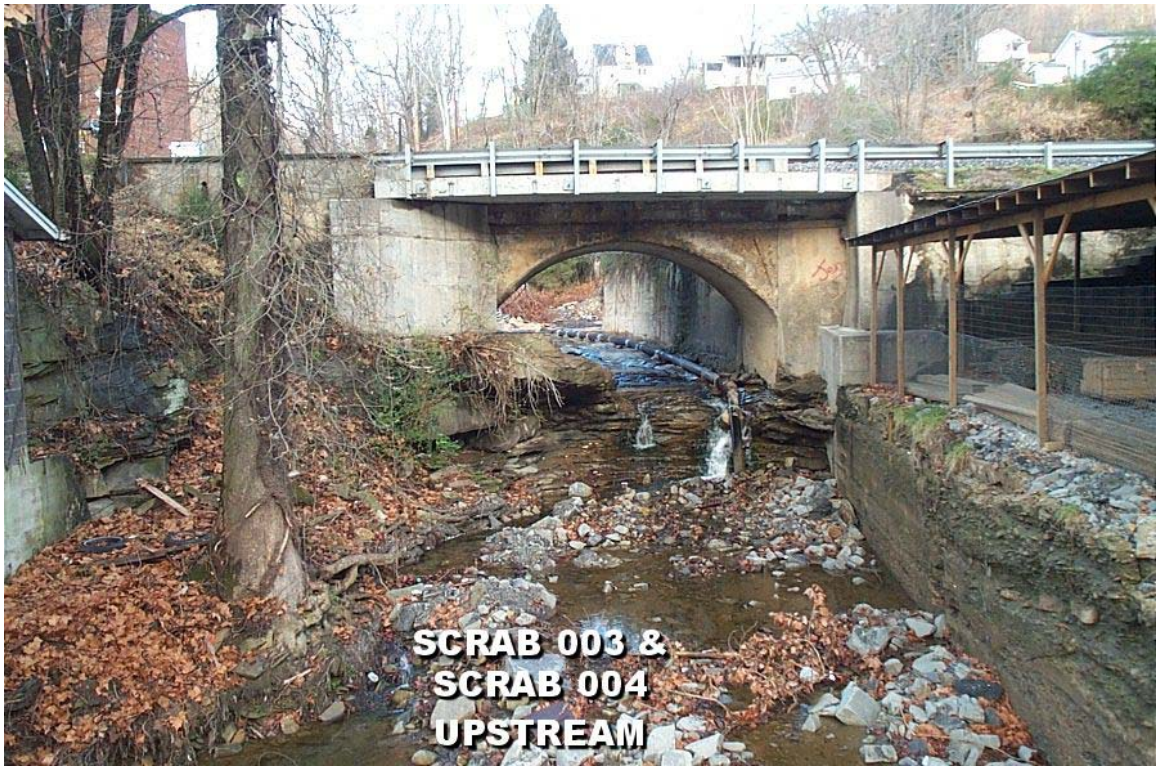
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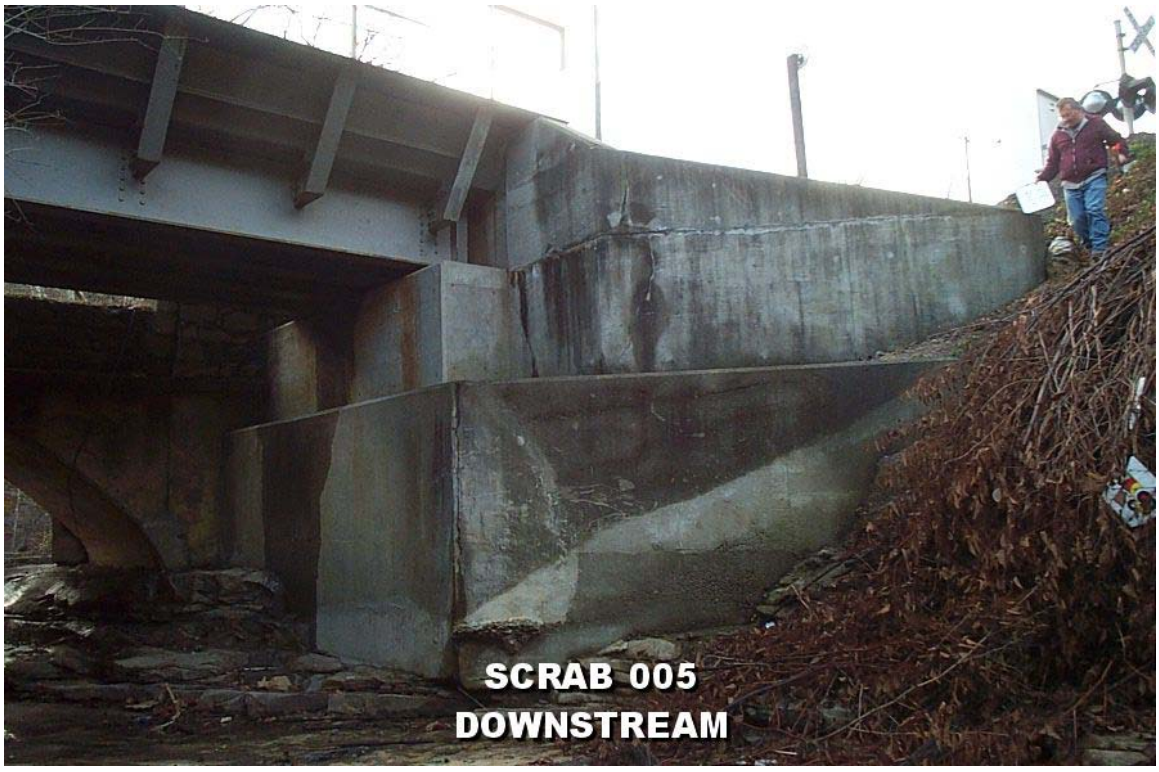
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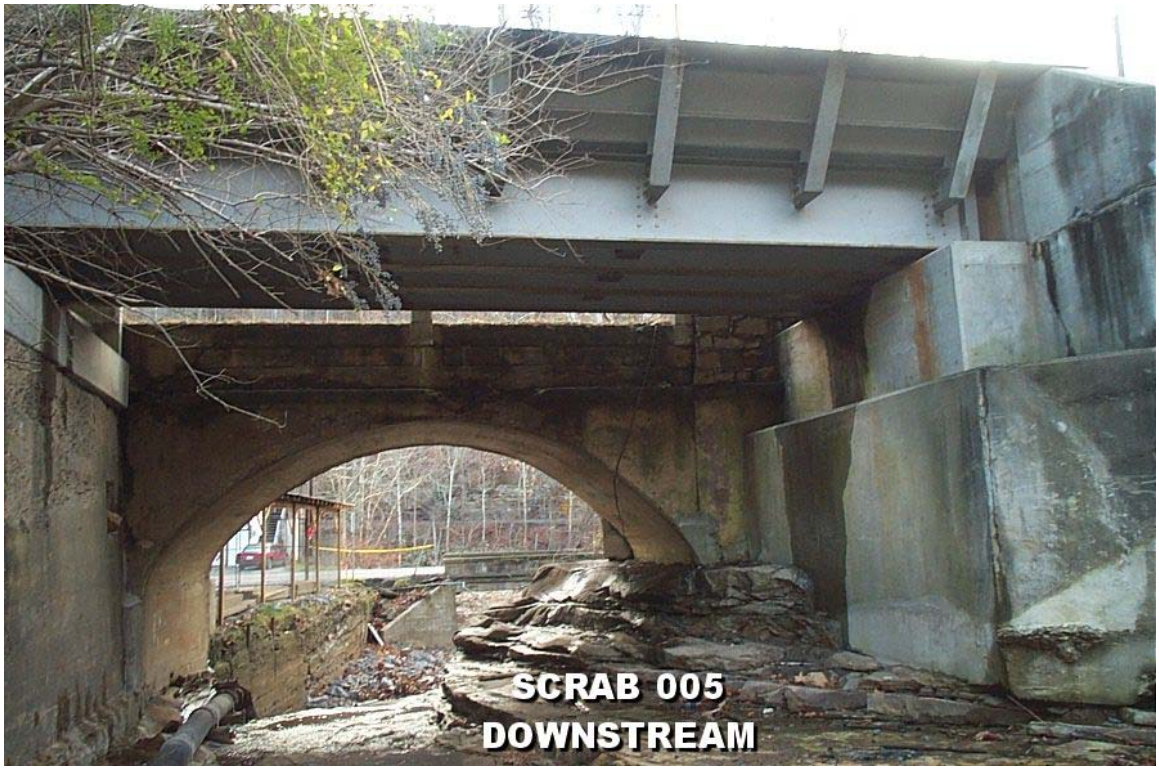
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SCRAB 005
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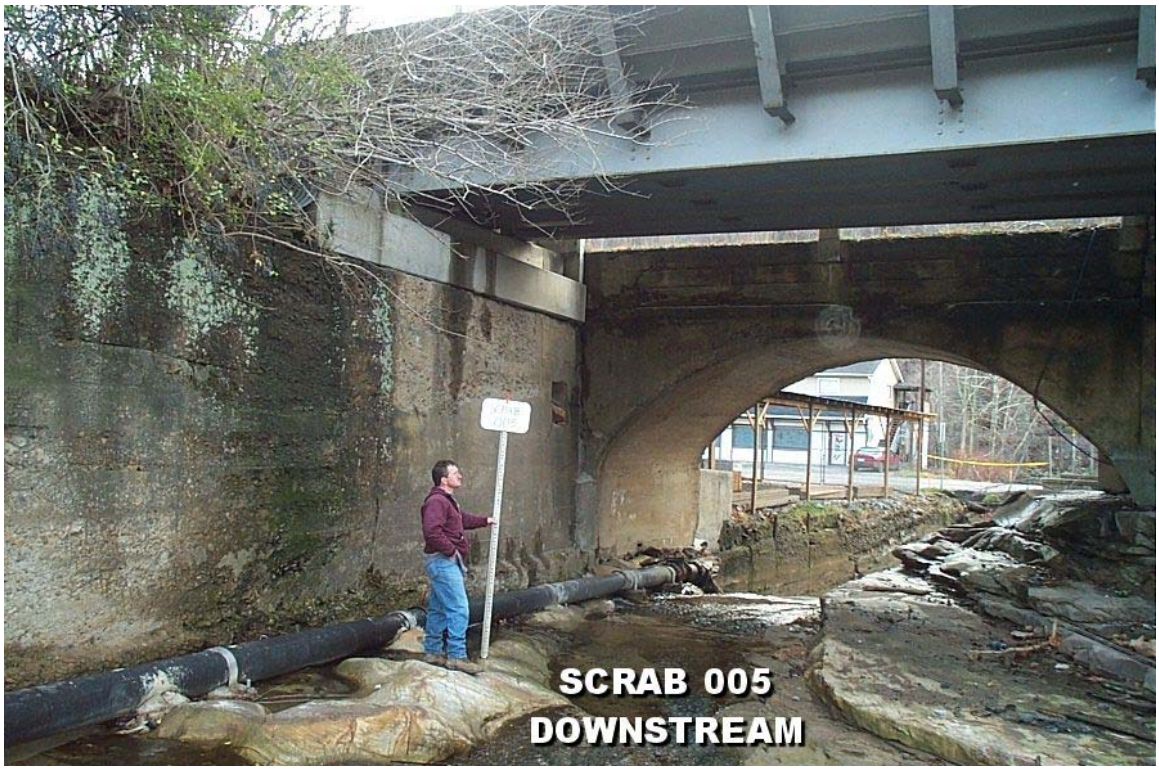
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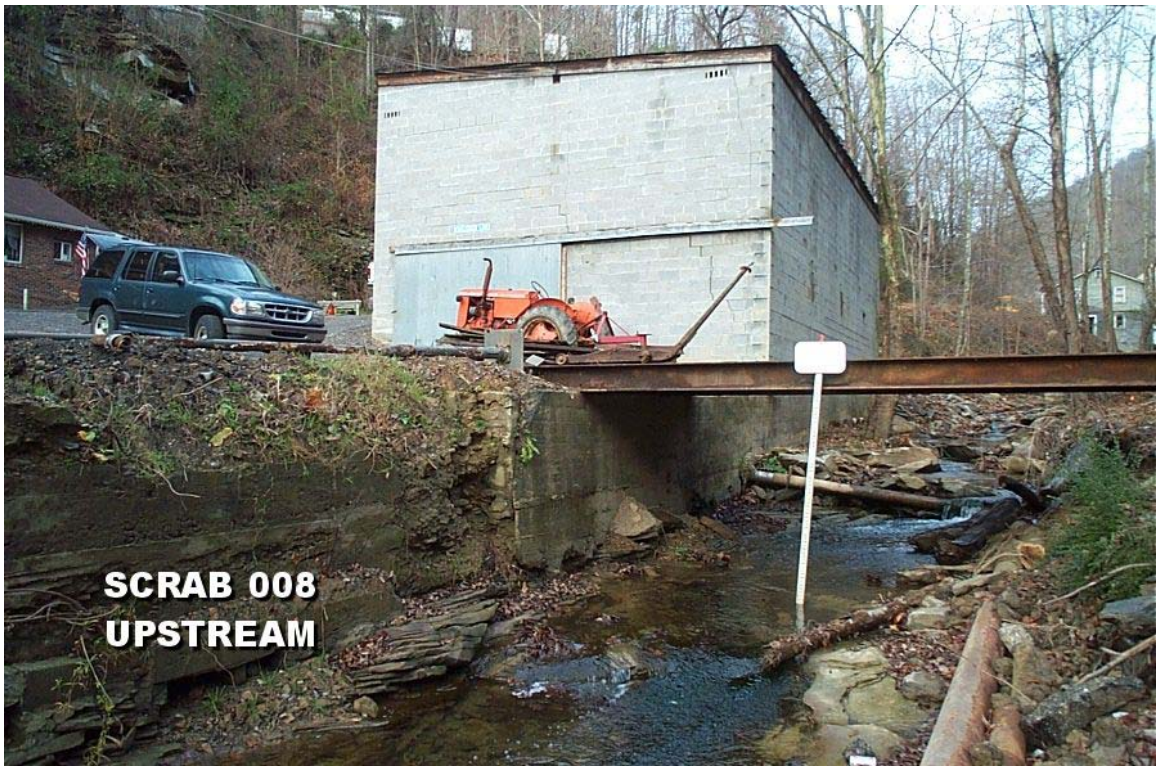
SCRAB 006
DOWNSTREAM


SCRAB 006
DOWNSTREAM


SCRAB 007
UPSTREAM


SCRAB
007
SCRAB 007
UPSTREAM


SCRAB 008
UPSTREAM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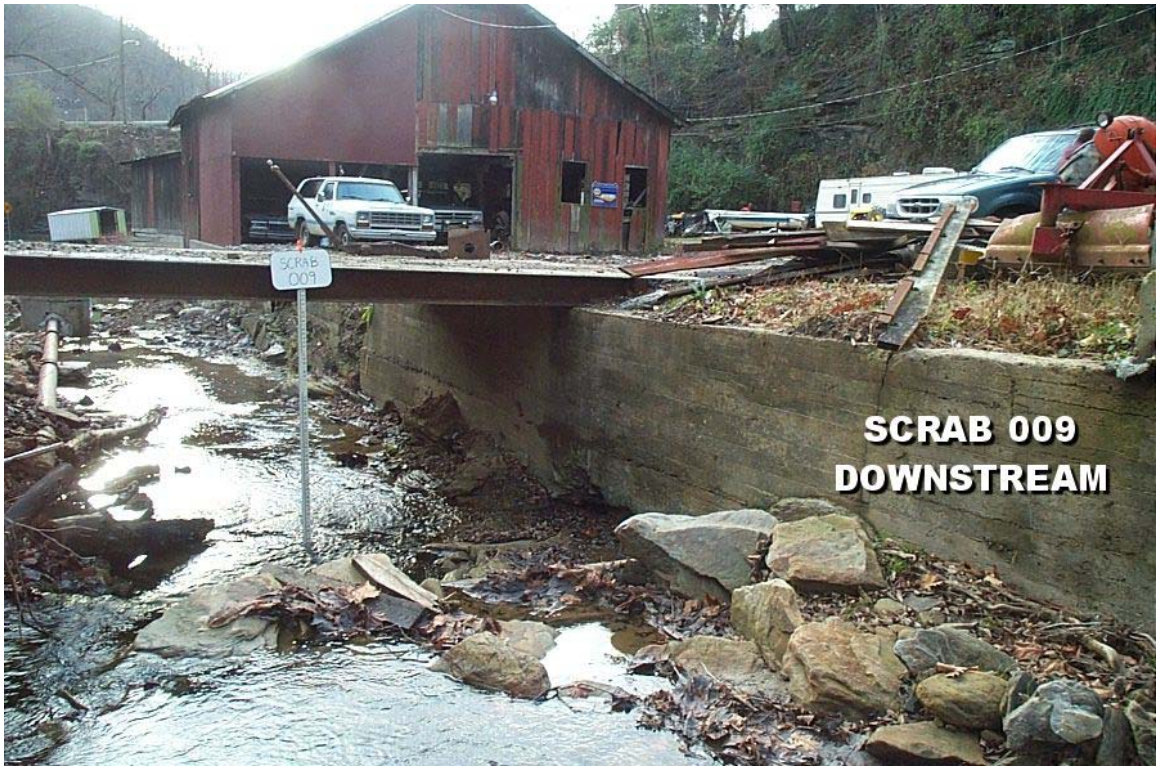
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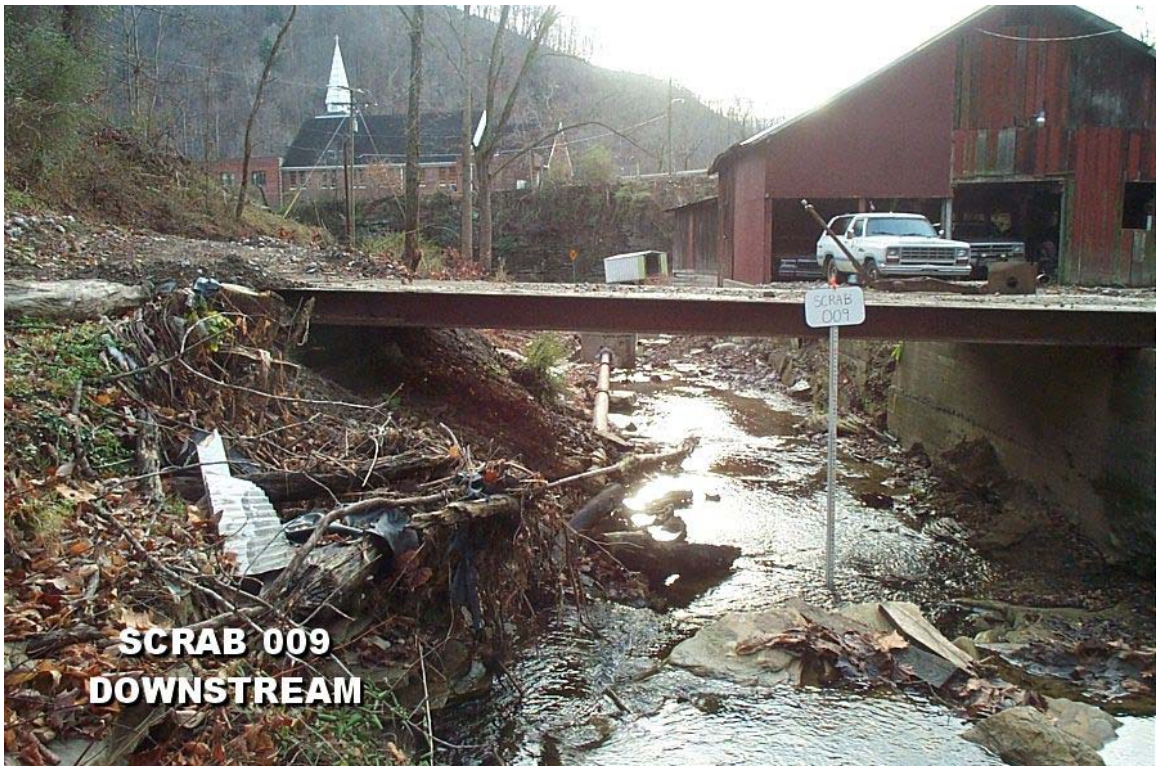
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SCRAB 010
UPSTREAM


SCRAB 010
UPSTREAM


SPEED LIMIT
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SCRAB 012
UPSTREAM


SCRAB 011
SCRAB 012
UPSTREAM


SCRAB 011
SCRAB 012
UPSTREAM


SCRAB 013
SCRAB 014
DOWNSTREAM


SCRAB 013
SCRAB 014
DOWNSTREAM


SCRAB 015
UPSTREAM


SCRAB 015
UPSTREAM


SCRAB 016
UPSTREAM


SCRAB 016
UPSTREAM


SCRAB 016A
UPSTREAM


SCRAB 017
UPSTREAM


SCRAB 017
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SCRAB 018
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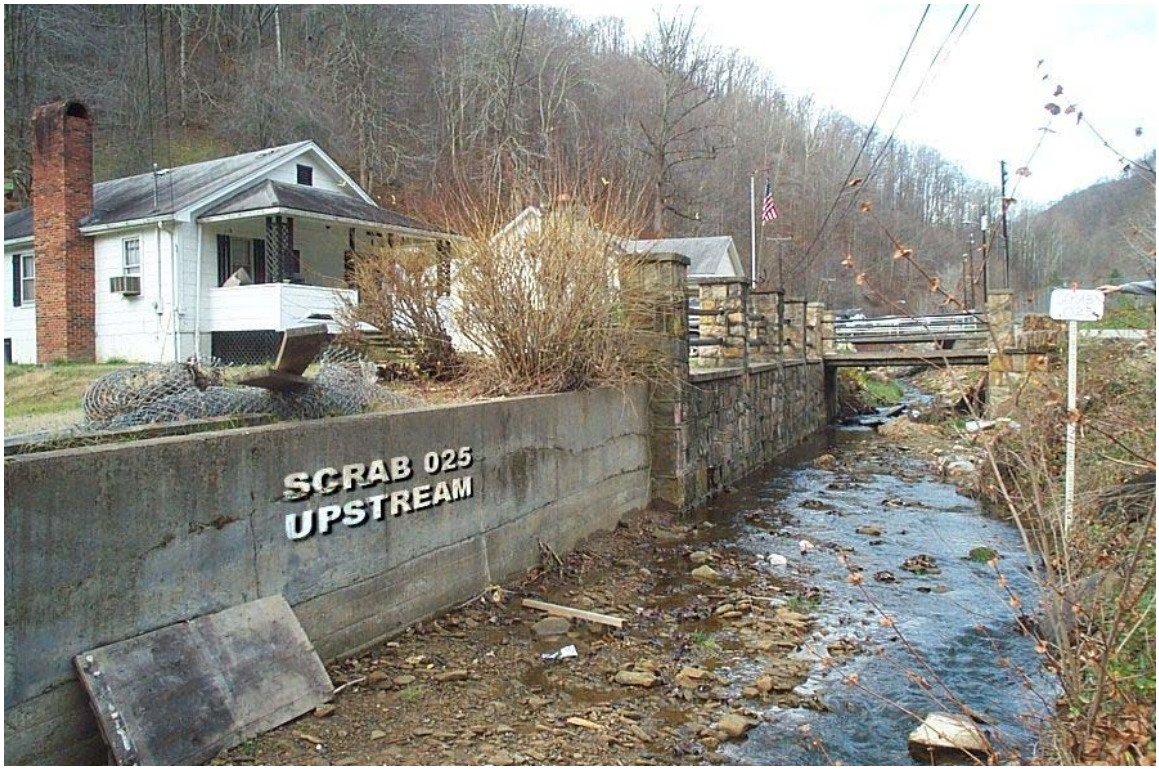
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Traveller's Field
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SCRAB
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SCRAB 026
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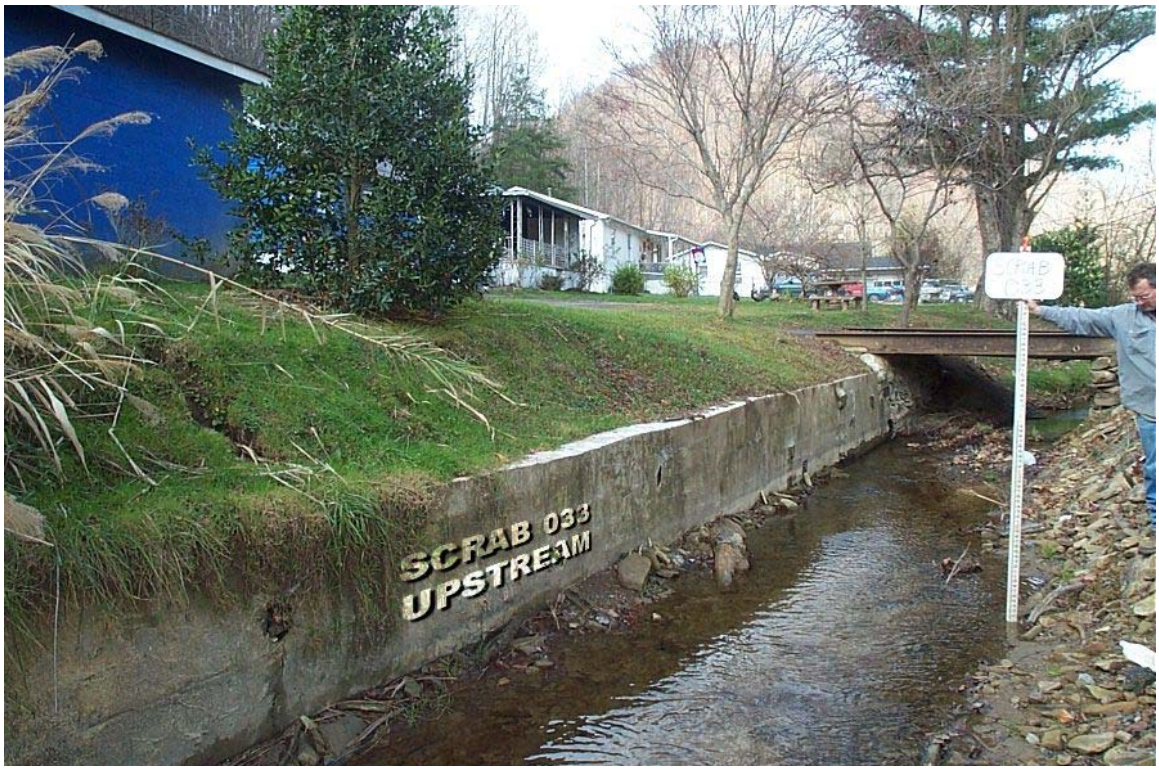
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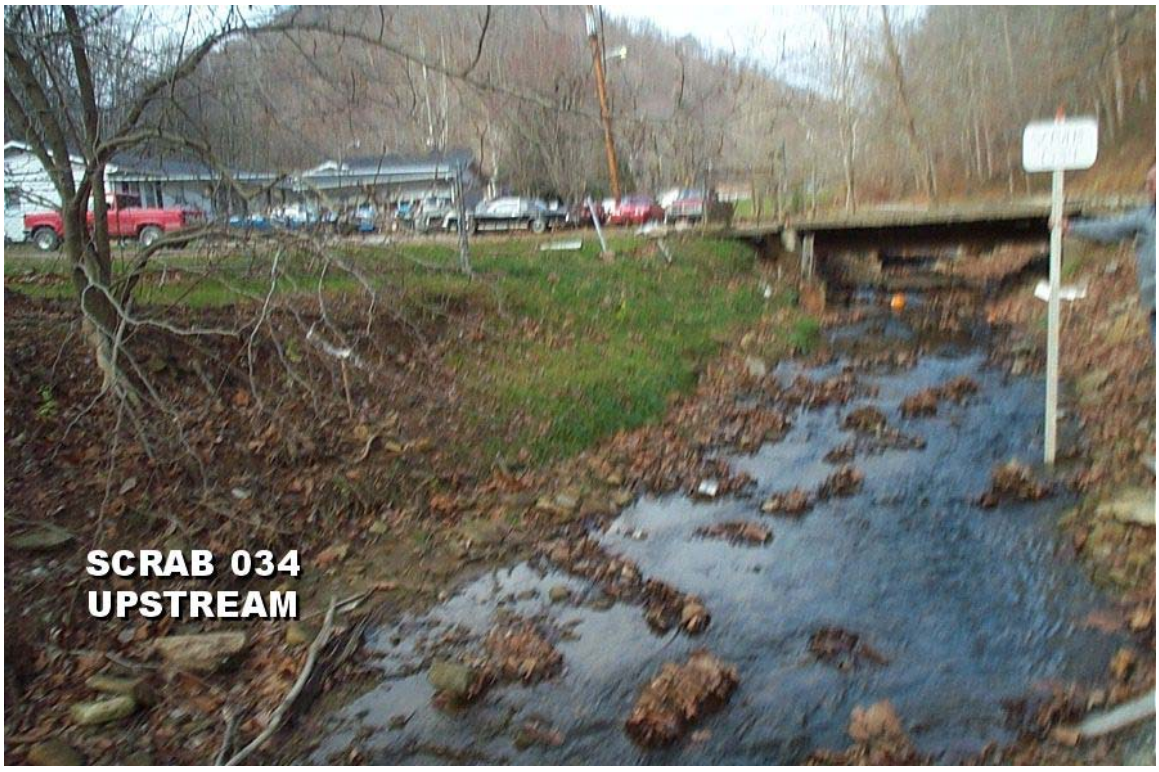
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SCRAB 039
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SCRAB 050C
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SCRAB 050B
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SCRAB 050B
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SCRAB
050B


SCRAB 050A
POND


SCRAB 051
UPSTREAM
SCRAB
051


SCRAB 051
UPSTREAM
SCRAB
051


SCRAB 051A
UPSTREAM


PIG TAKING NAP ON CAR SEAT


SCRAB 052
UPSTREAM


SCRAB 052
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SCRAB 053
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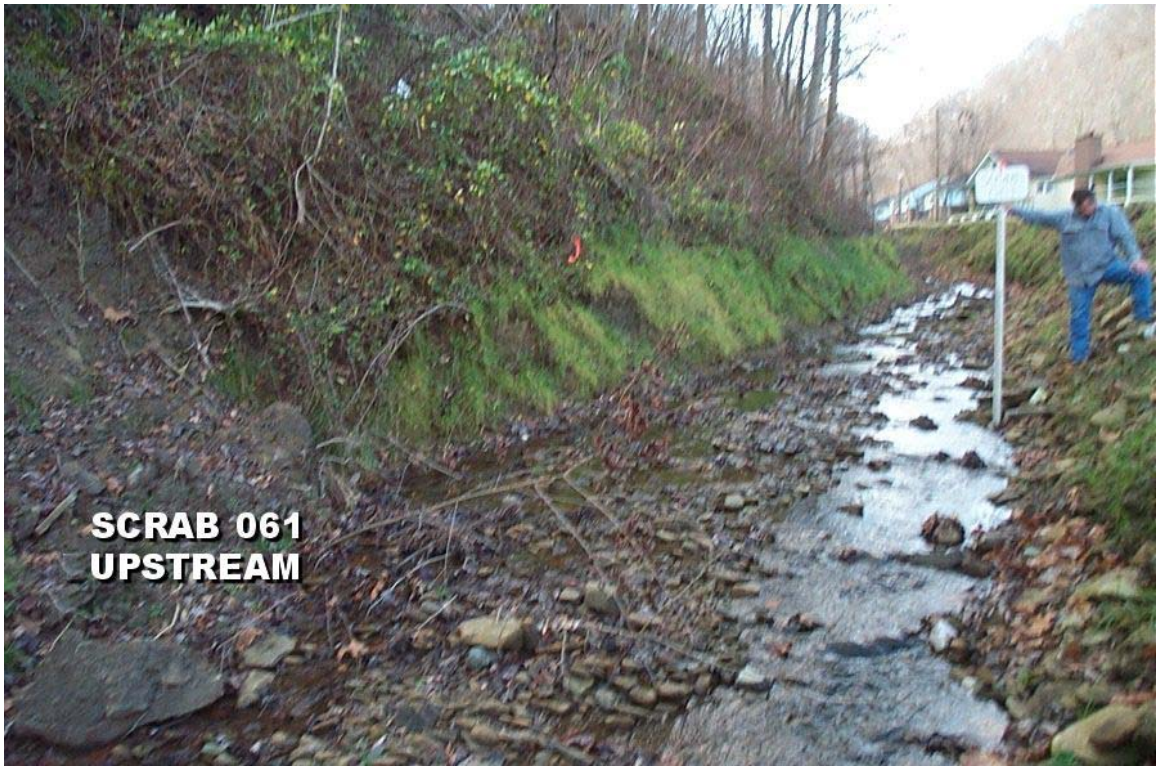
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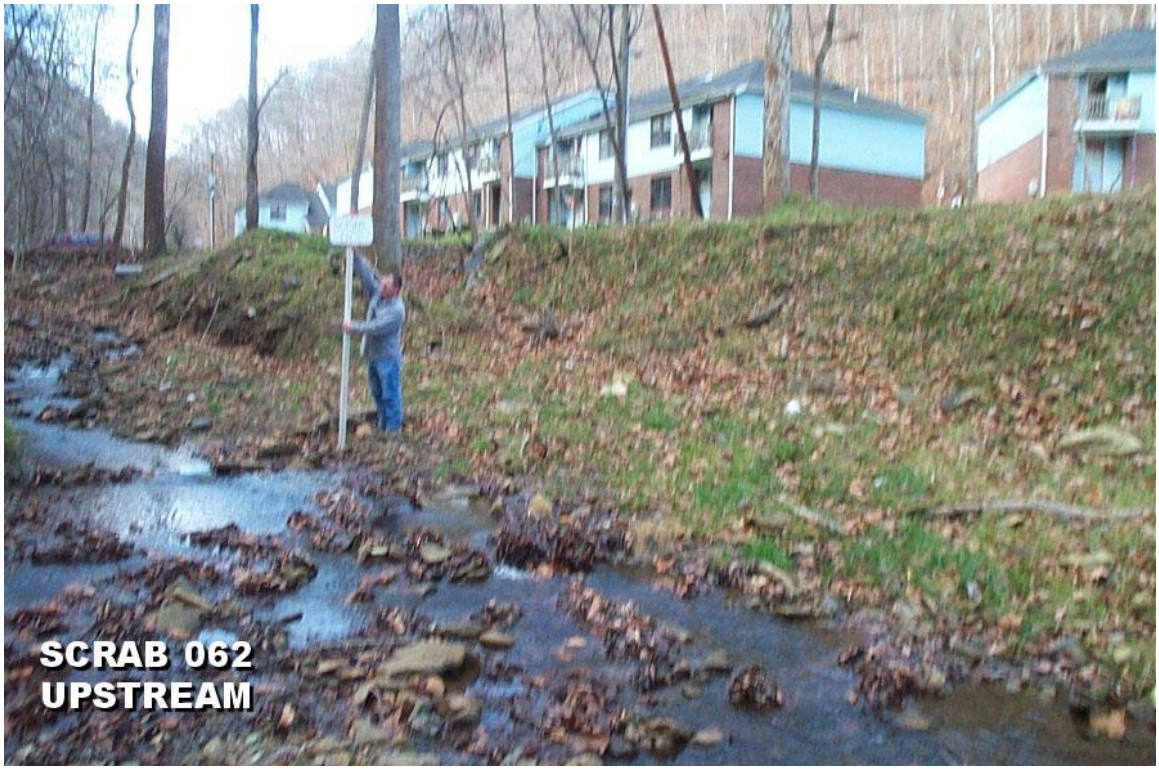
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SCRAB 063
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SCRAB 063
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SCRAB 063
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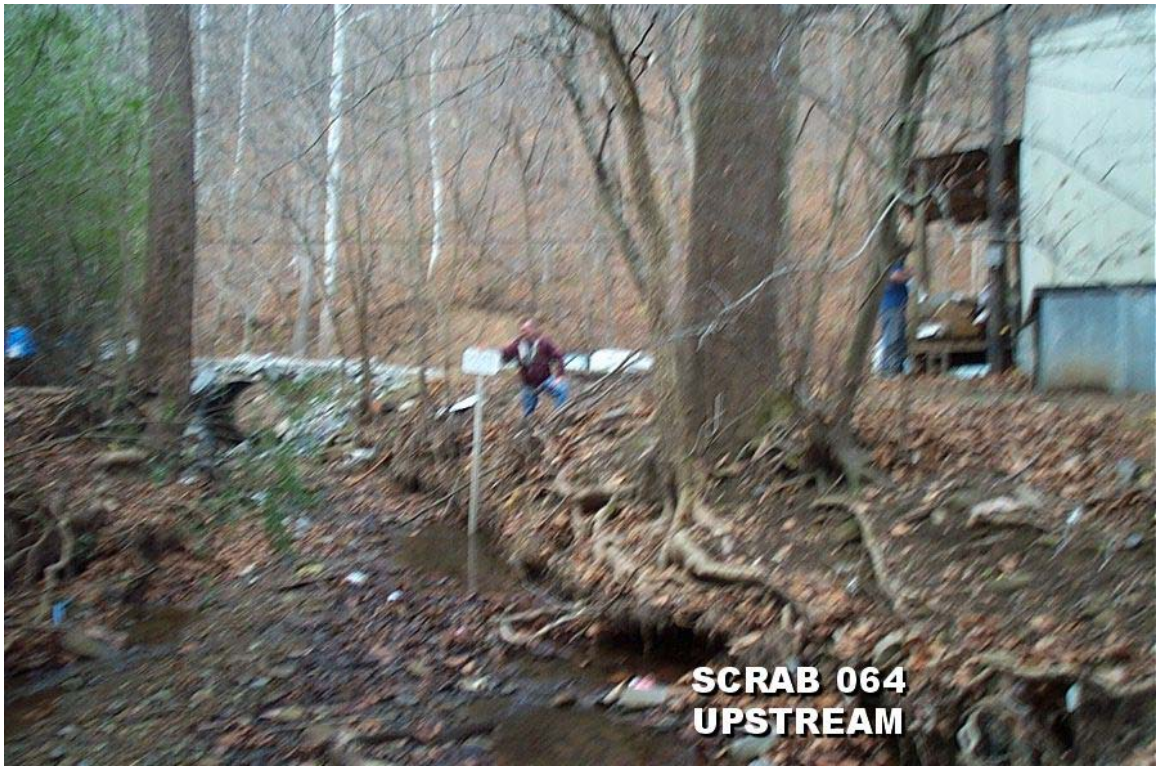
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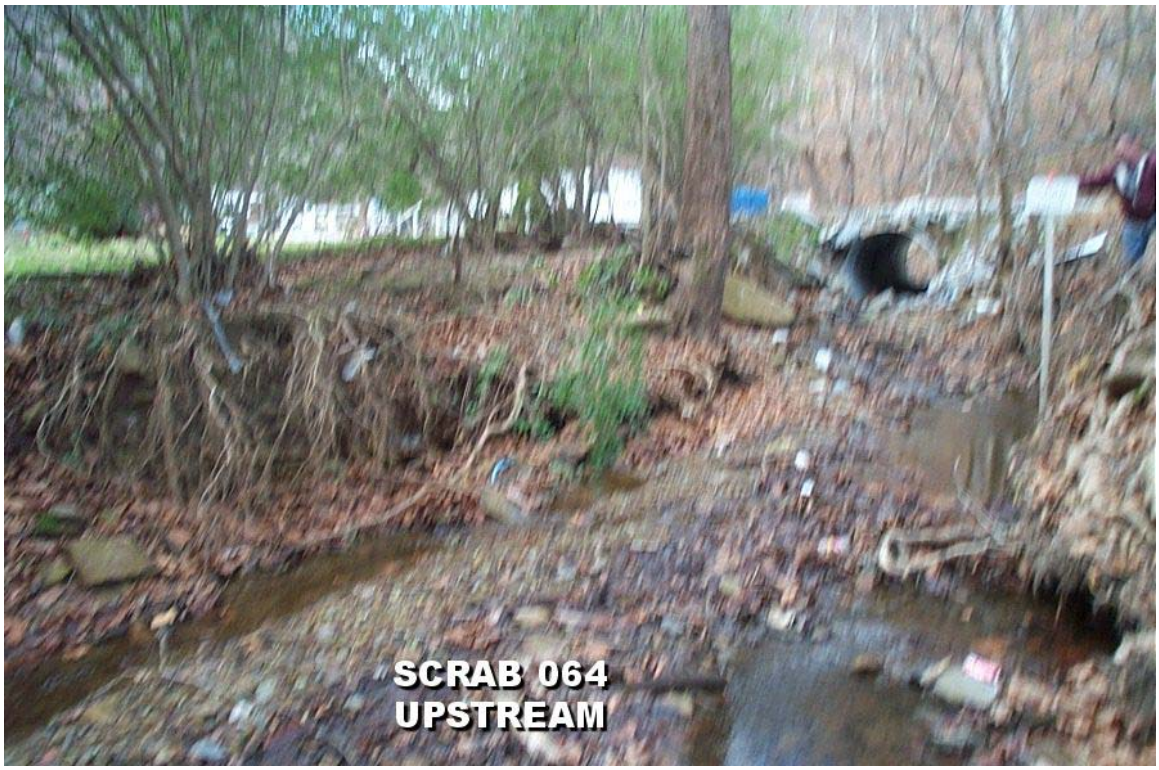
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SCRAB 065
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SCRAB 065
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SCRAB 066
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SCRAB 066
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SCRAB 066A
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SCRAB 067
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SCRAB 068
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SCRAB 068
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SCRAB 069
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SCRAB 069
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SCRAB 069
DOWNSTREAM


SCRAB 073
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SCRAB 073
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DOWNSTREAM


SCRAB
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SCRAB 076
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SCRAB
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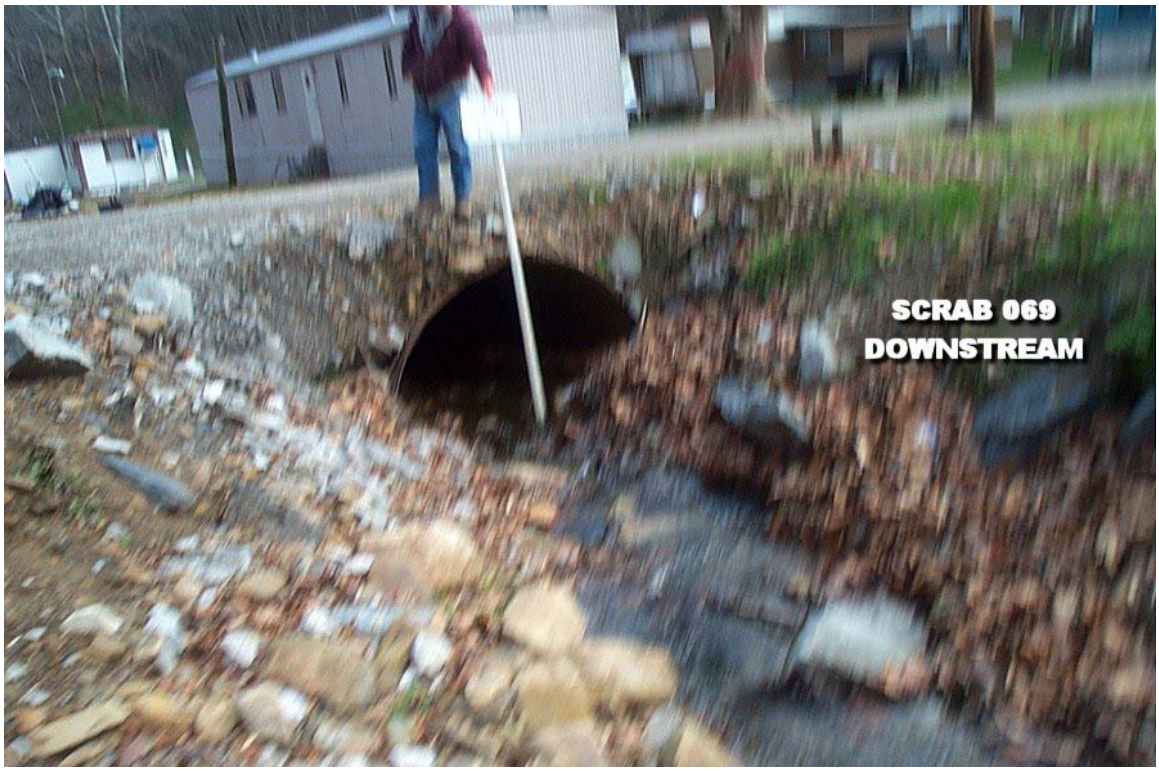
UPSTREAM


SCRAB 061
UPSTREAM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SCRAB 069
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SCRAB 070
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SCRAB 071
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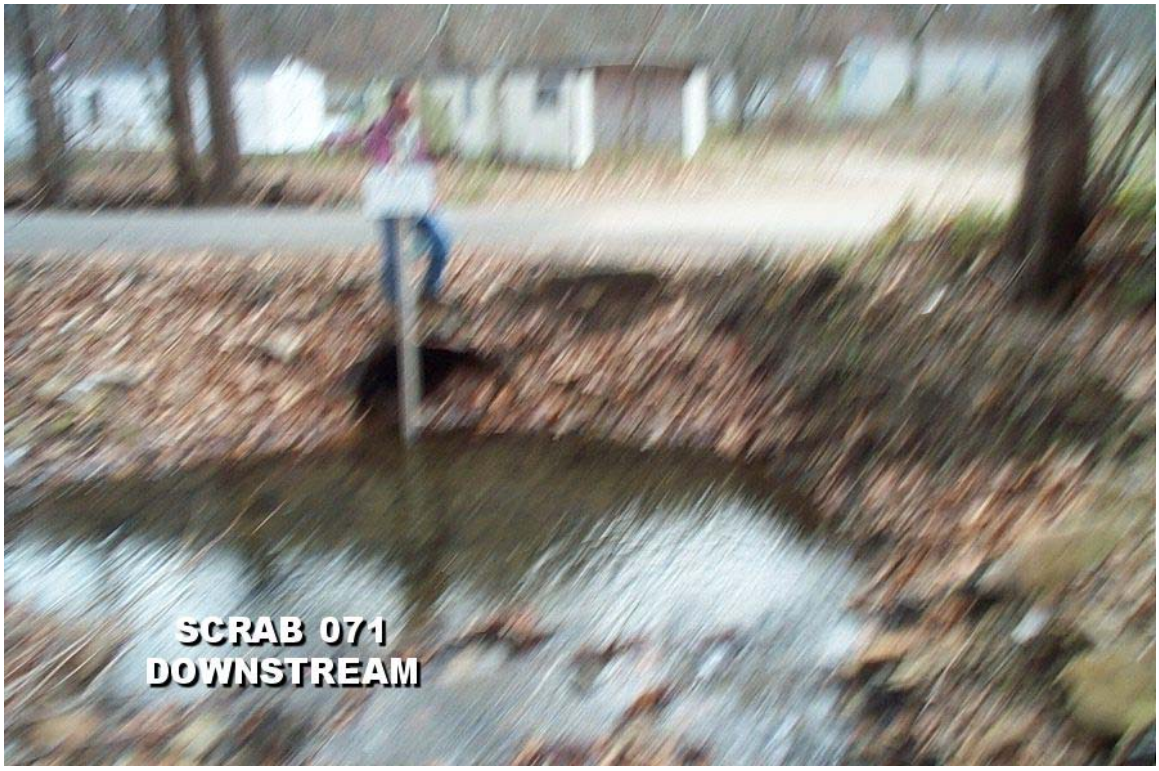
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SCRAB 072
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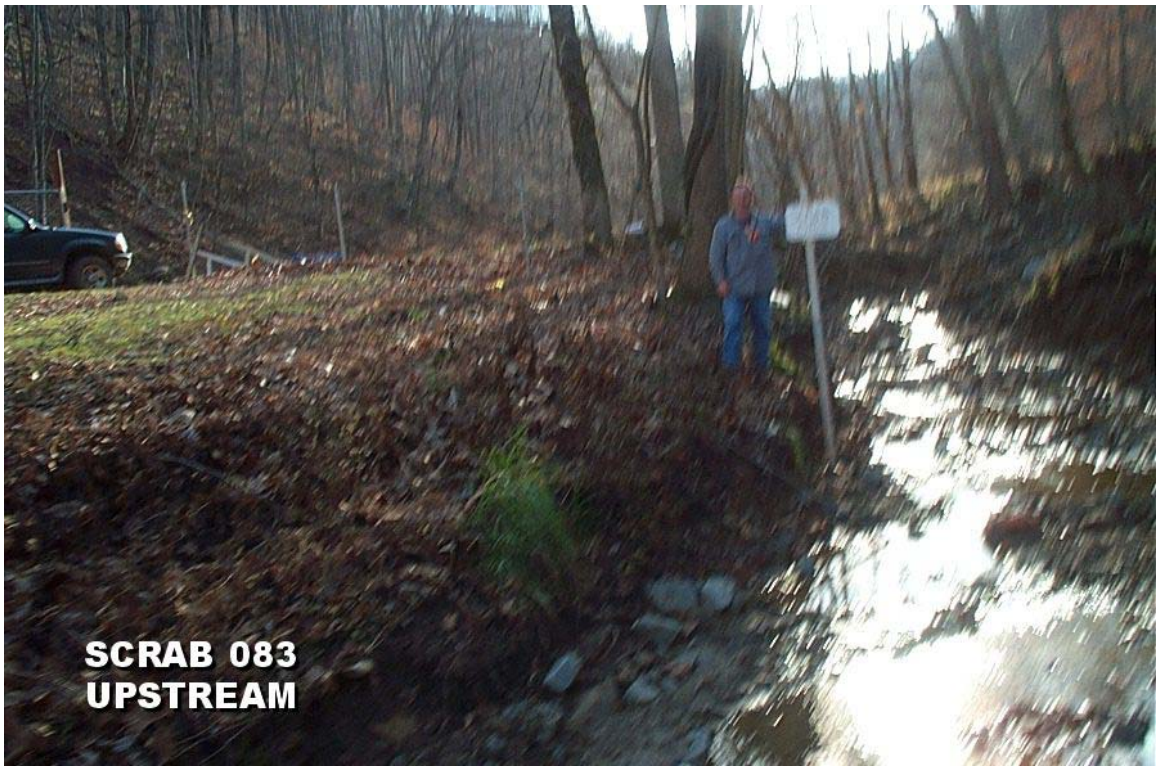
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SCRAB 088
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SCRAB 088A


SCRAB 088B
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SCRAB 088B


CAT
320B
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UPSTREAM


SCRAB
089
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SCRAB 093
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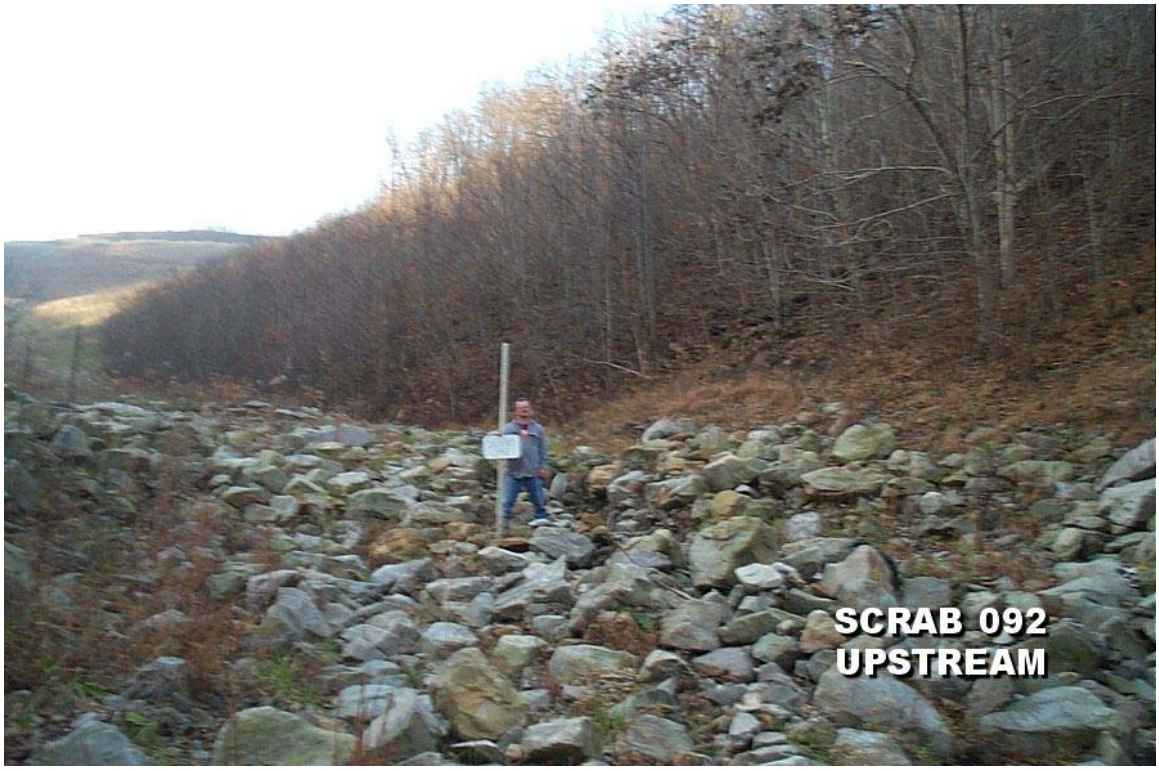
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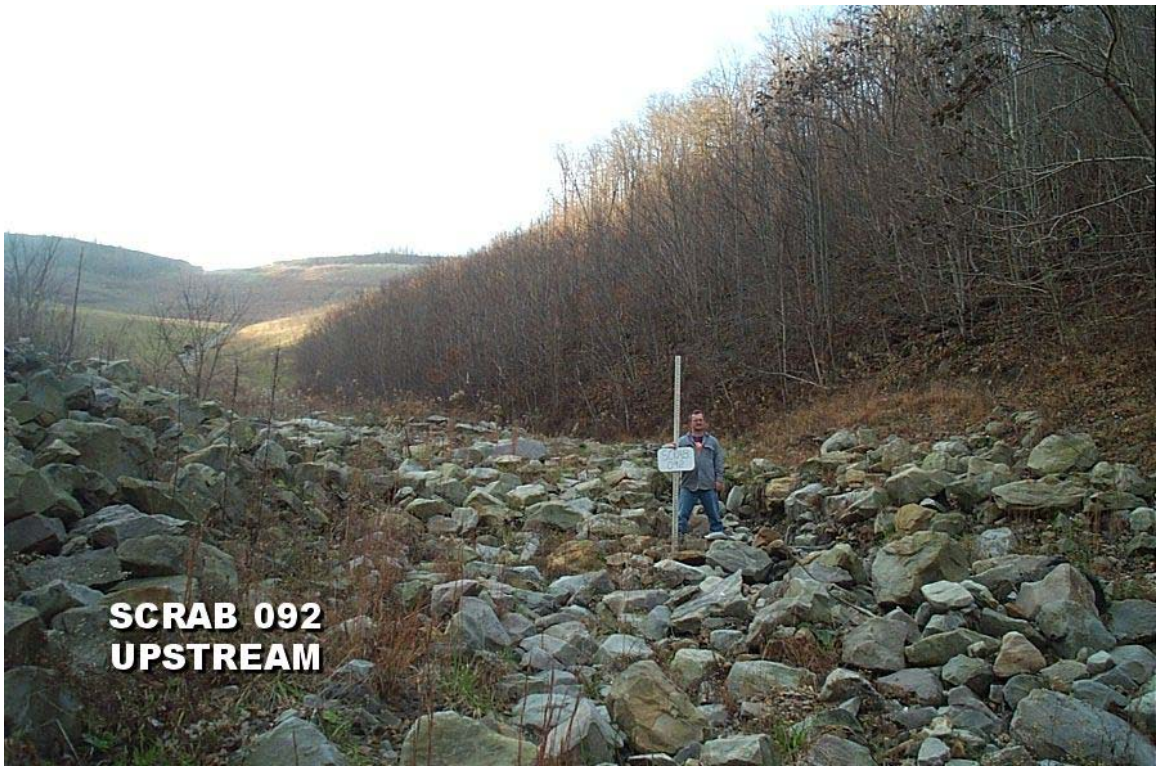
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SCRAB 090
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SCRAB 090
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SCRAB 090
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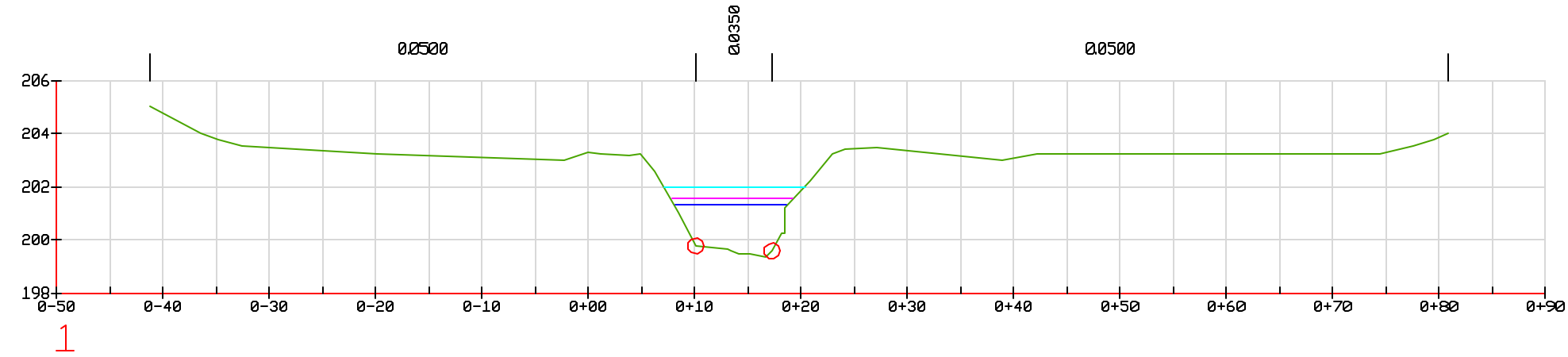
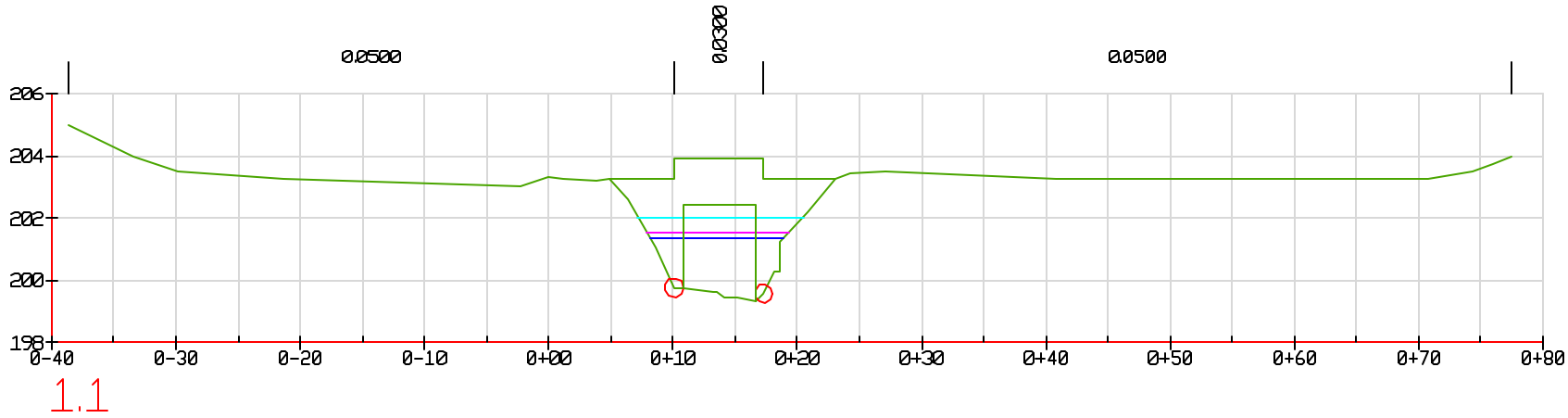


Scrakkle Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 201.30 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 201.54 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 201.99 m

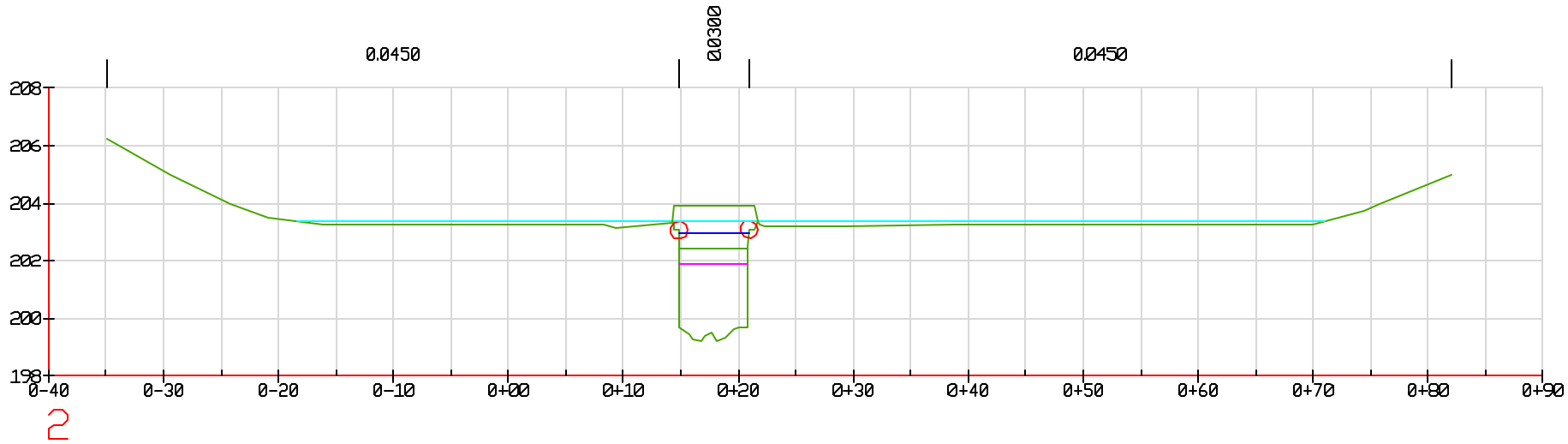


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 201.35 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 201.55 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 202.03 m

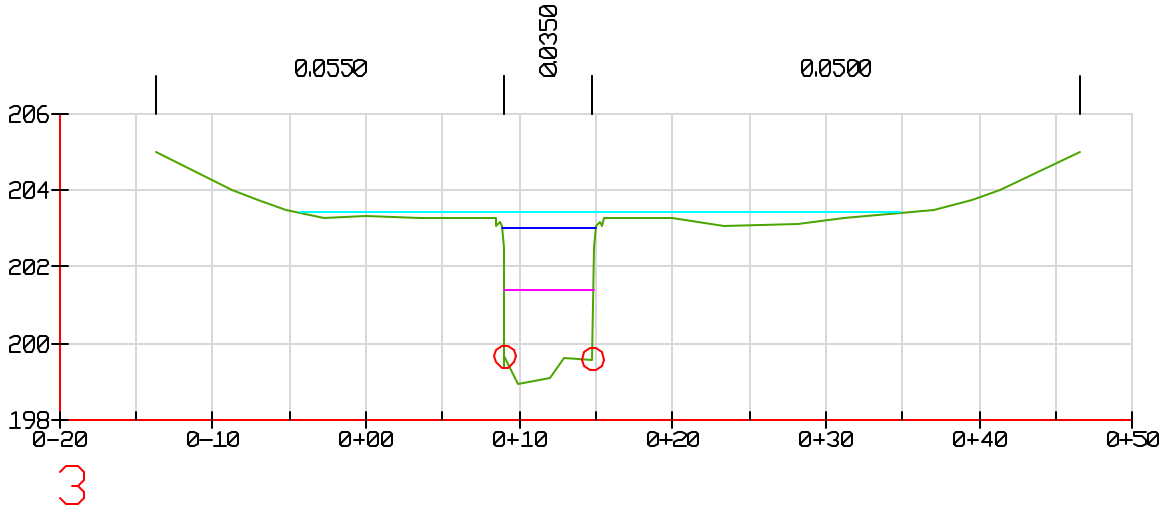


Scrakkle Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 202.98 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 201.89 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 203.37 m

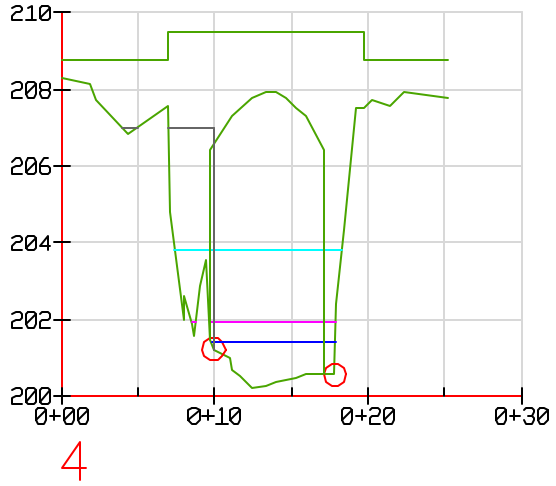


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 203.02 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 201.41 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 203.41 m

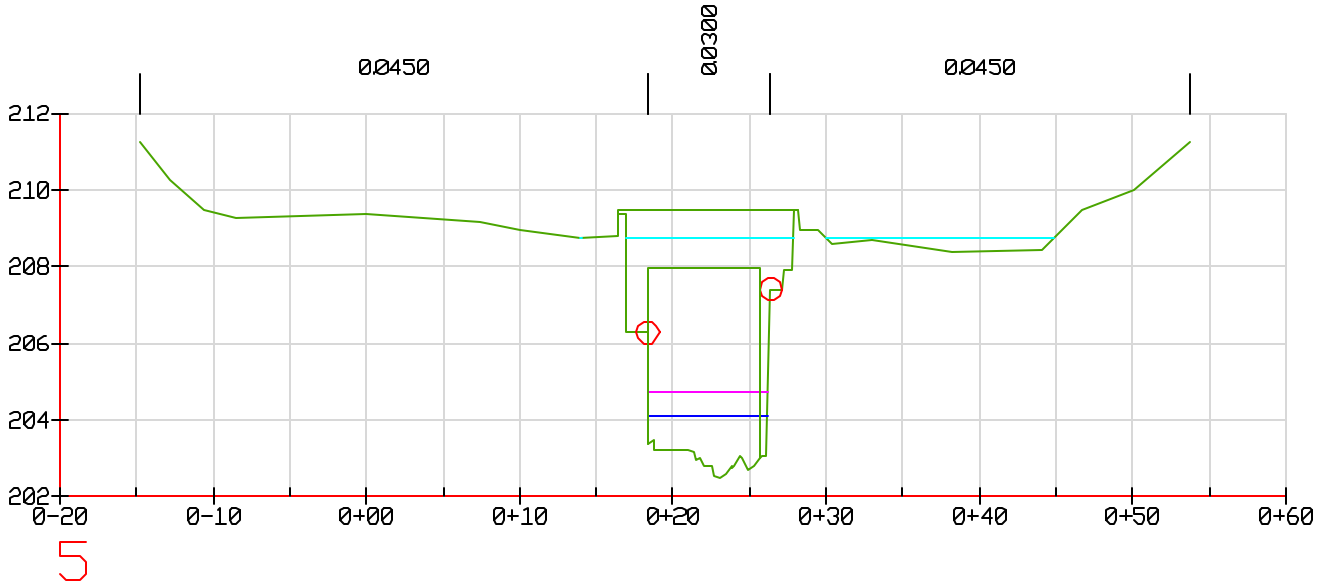


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 201.39 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 201.92 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 203.81 m

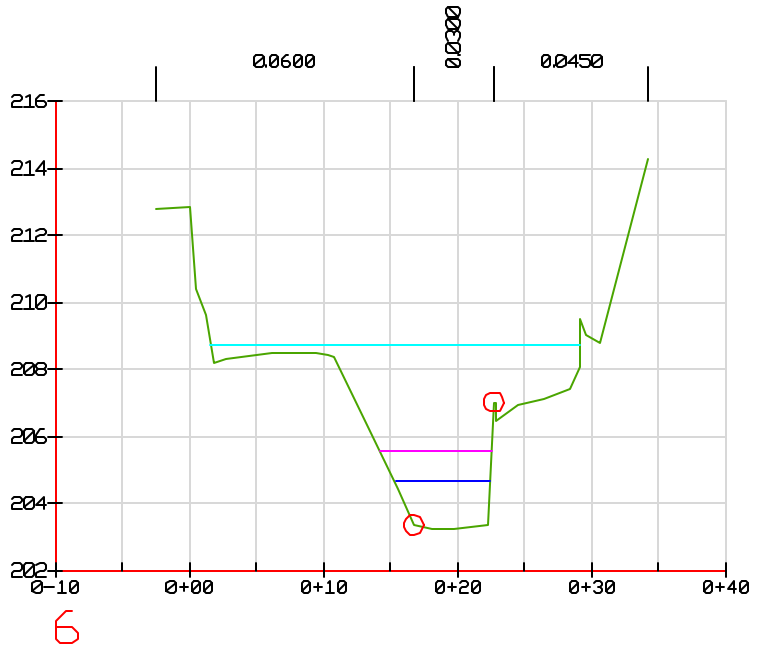


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 204.09 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 204.74 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 208.75 m

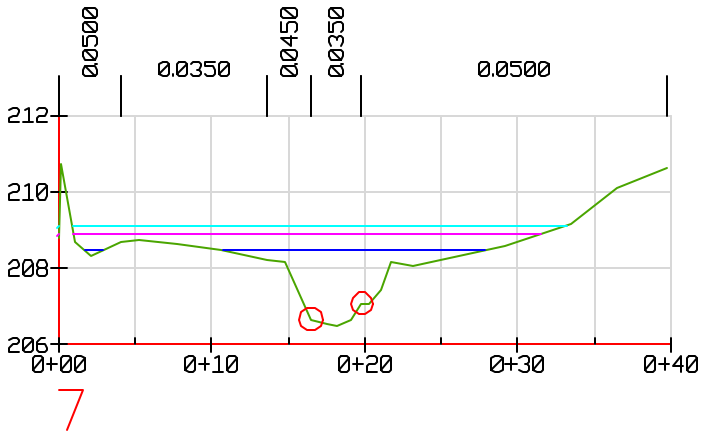


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 204.66 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 205.58 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 208.72 m



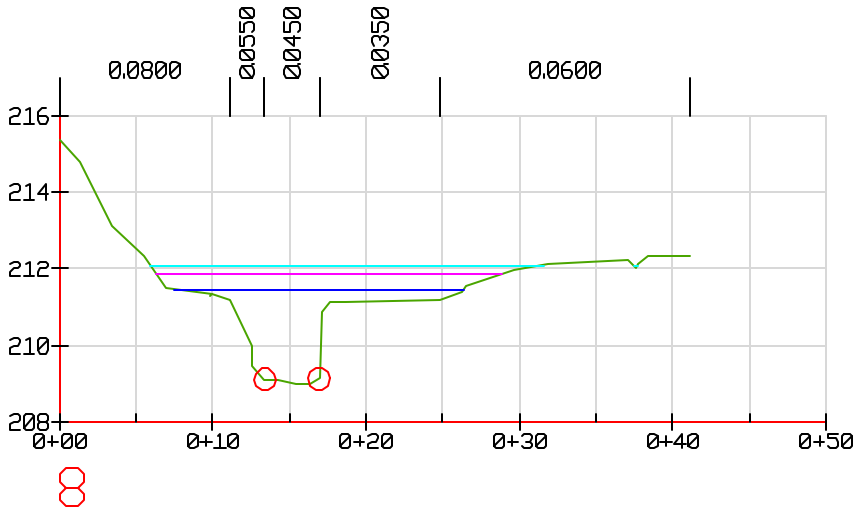
7

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 208.47 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 208.88 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 209.09 m

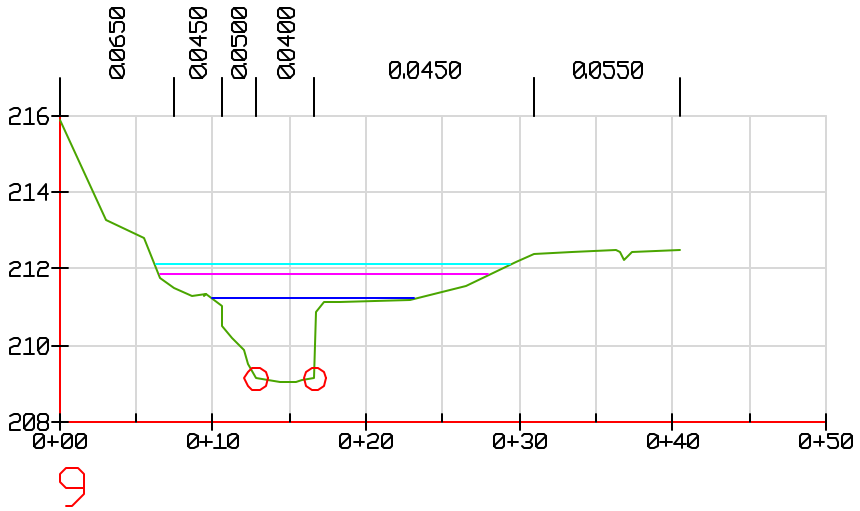


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 211.46 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 211.86 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 212.09 m

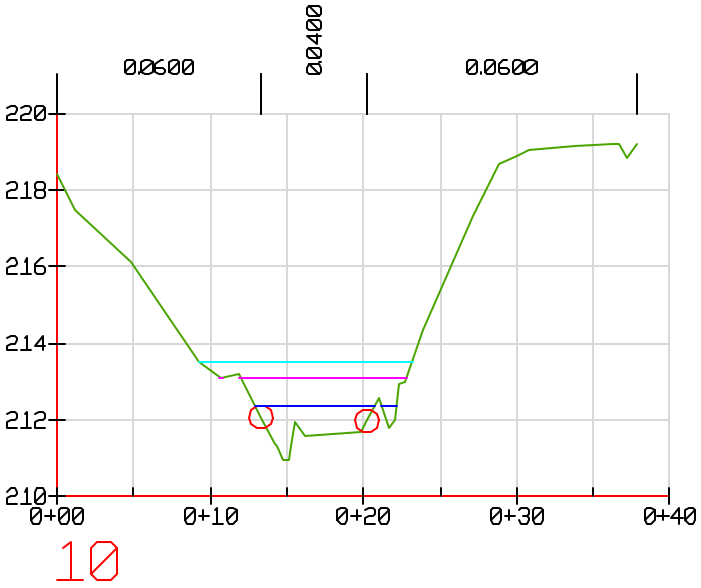


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 211.24 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 211.84 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 212.10 m

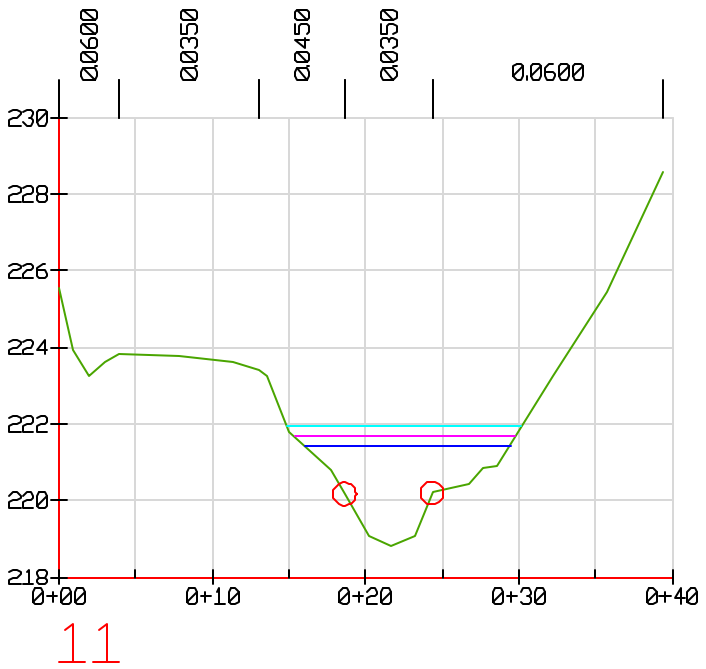


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 212.38 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 213.12 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 213.53 m



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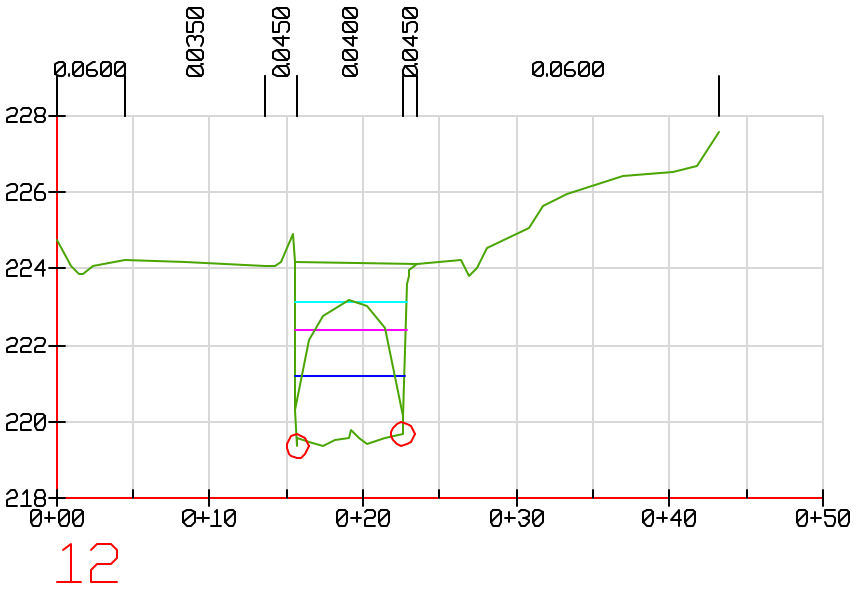
Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 221.43 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 221.68 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 221.93 m

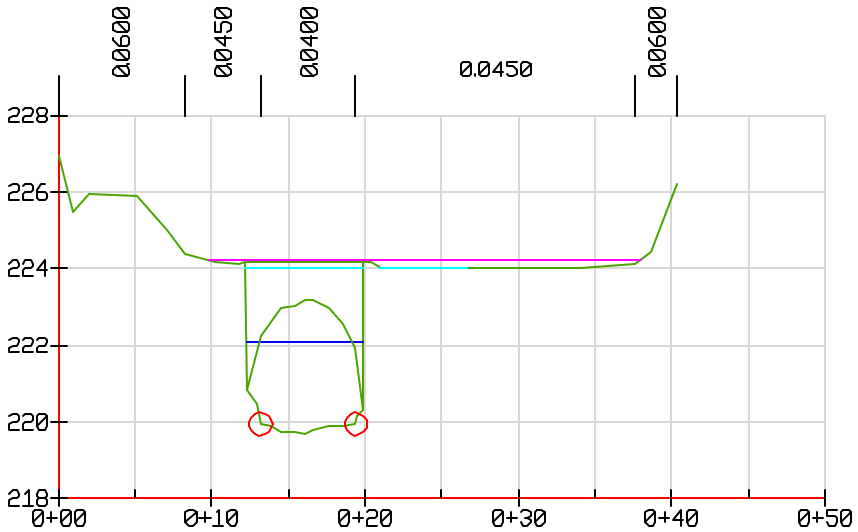


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 221.22 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 222.42 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 223.10 m



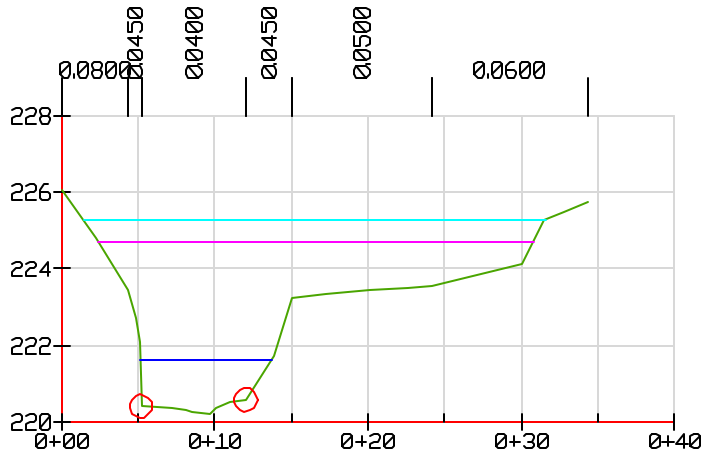
13

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 222.09 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 224.23 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 224.03 m



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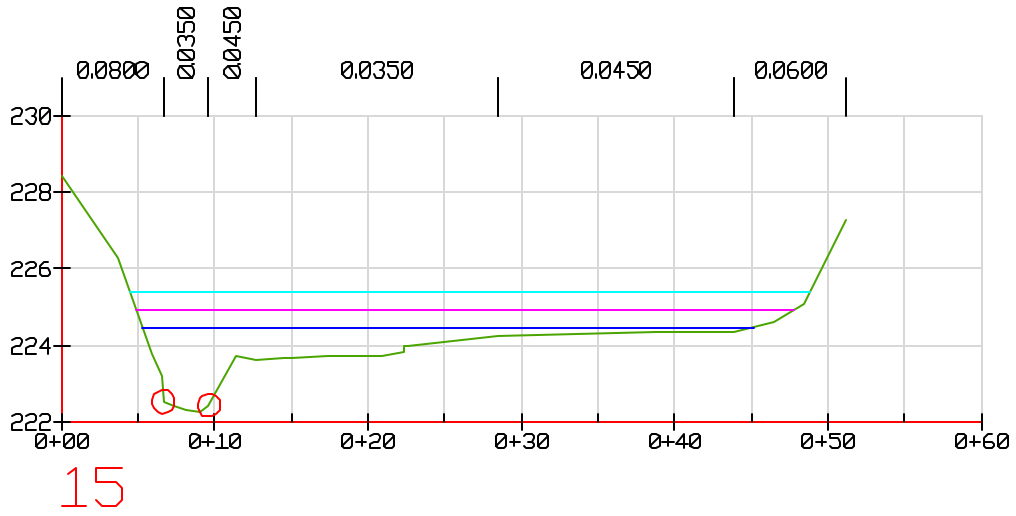
Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 221.64 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 224.70 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 225.27 m

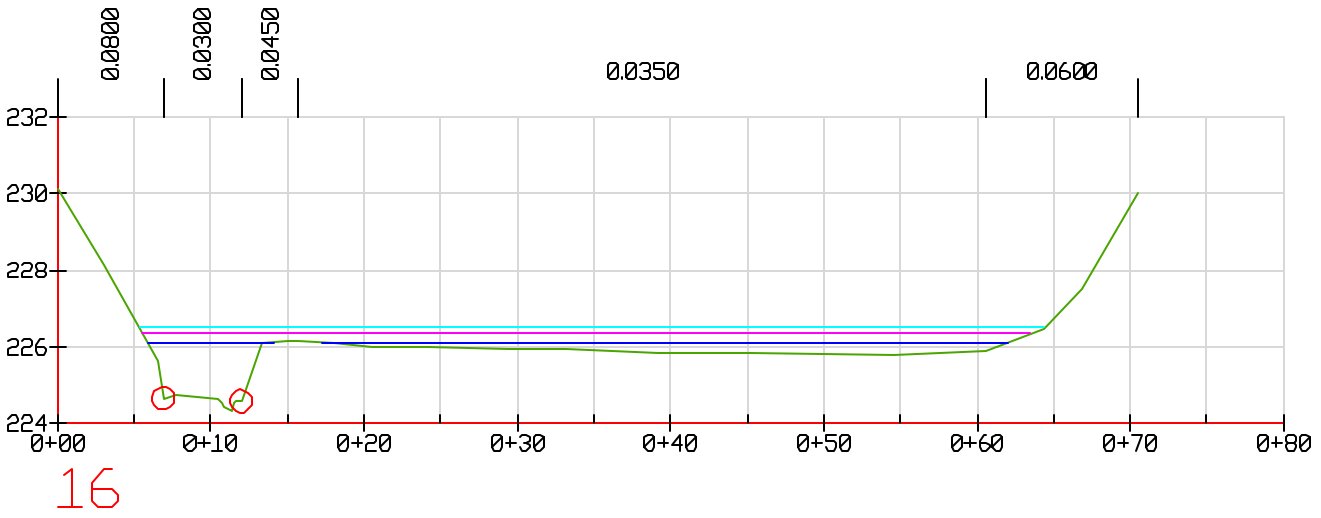


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 224.48 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 224.90 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 225.40 m



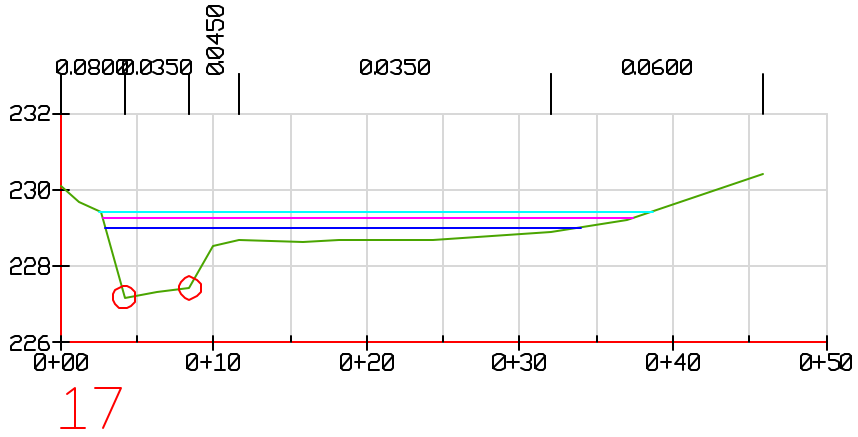
16

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 226.10 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 226.35 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 226.50 m

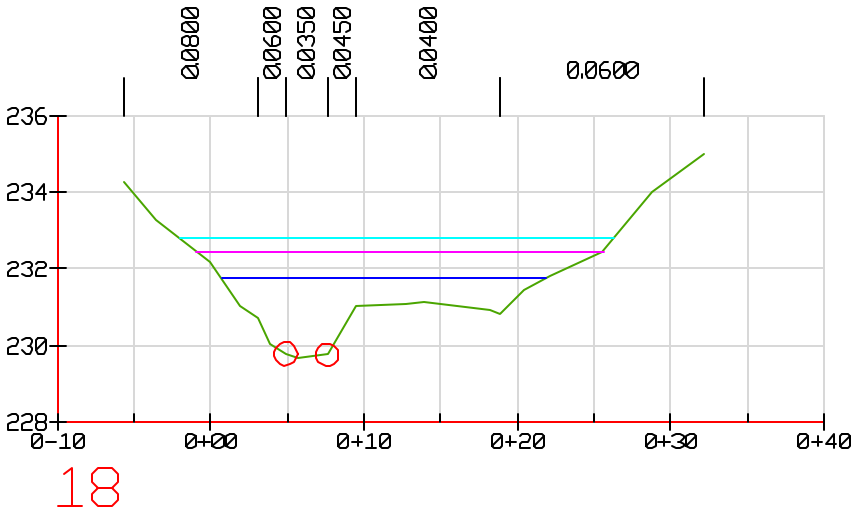


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 229.02 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 229.26 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 229.44 m

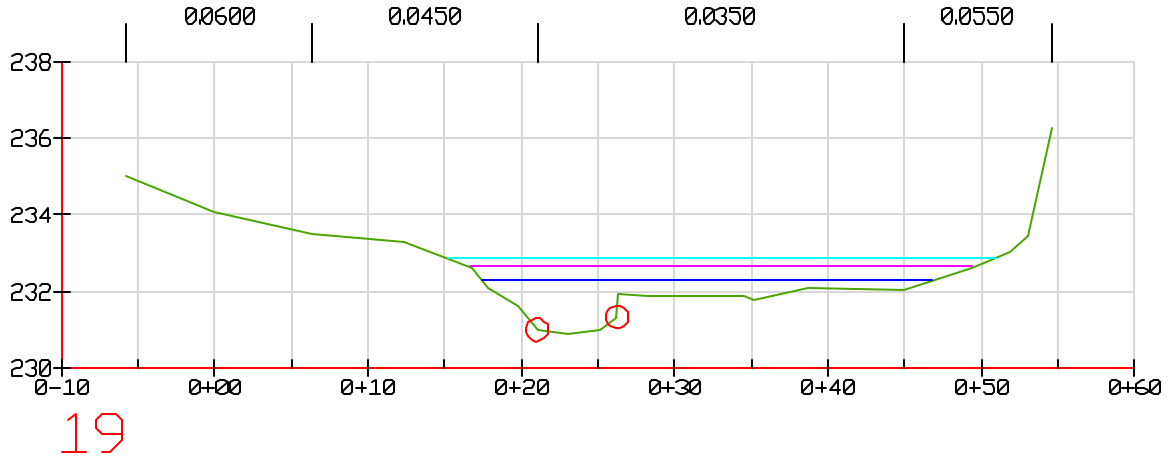


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 231.76 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 232.44 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 232.78 m

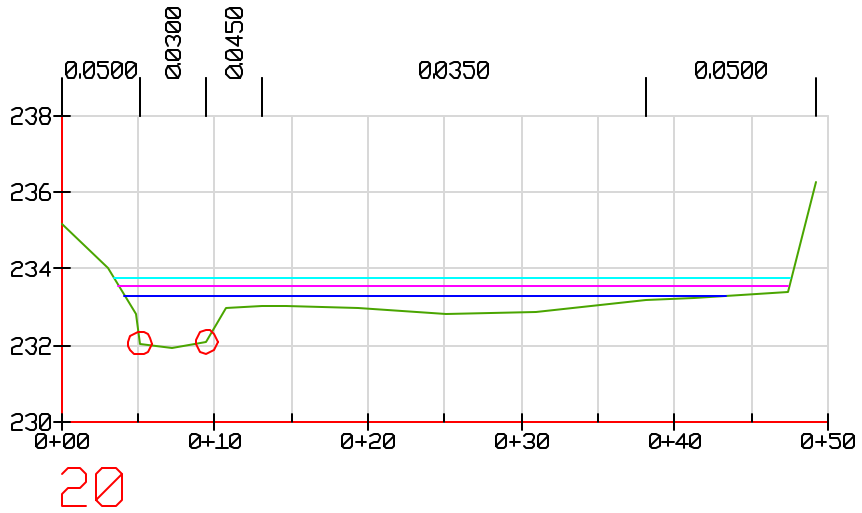


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 232.30 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 232.64 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 232.88 m

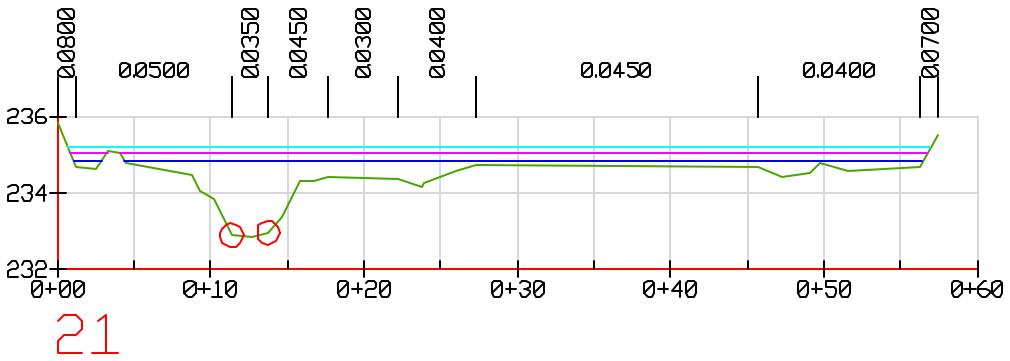


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 233.29 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 233.57 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 233.74 m



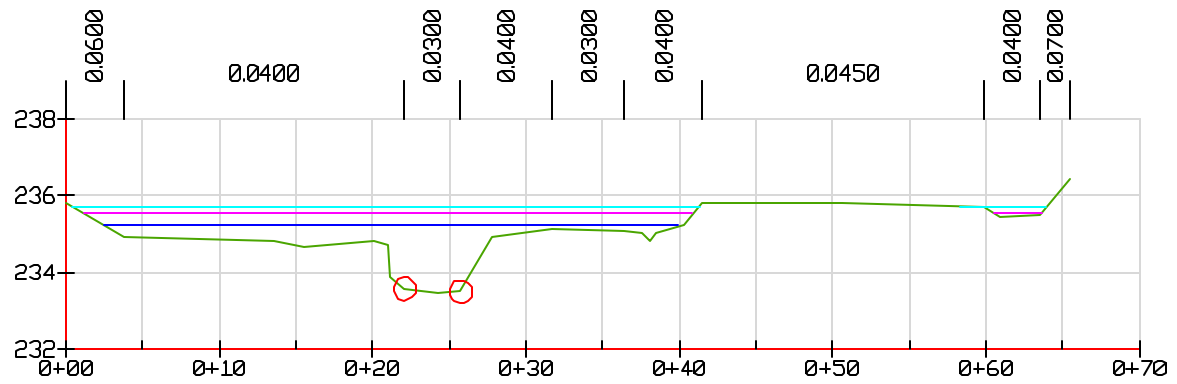
21

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 234.81 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 235.04 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 235.17 m



22

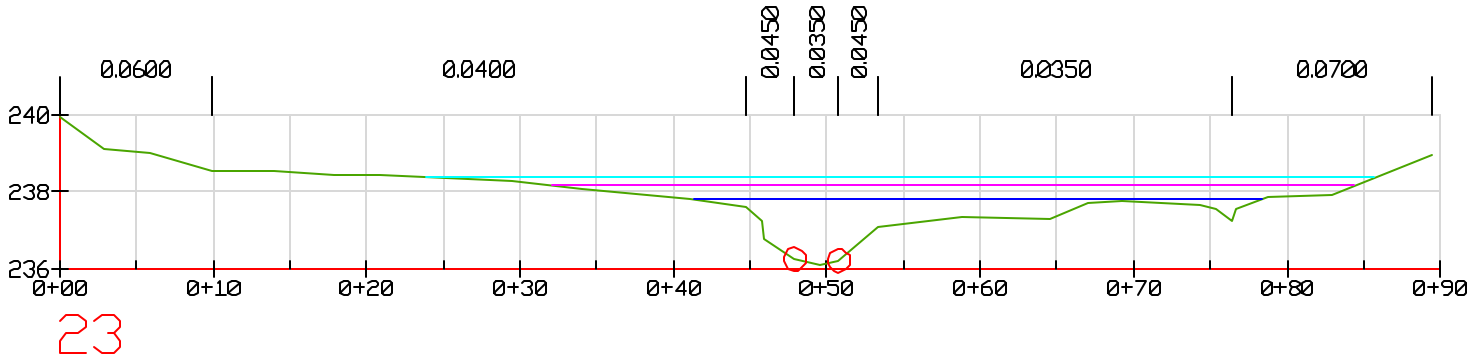
(3m downstream) Observed HWM = 233.65 m (766.57 ft)

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 235.22 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 235.52 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 235.72 m



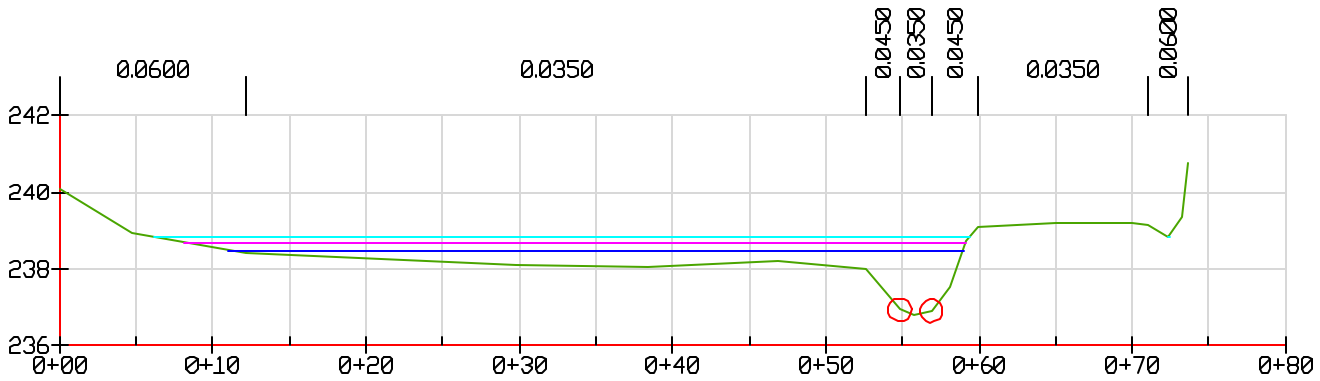
23

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 237.82 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 238.16 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 238.37 m



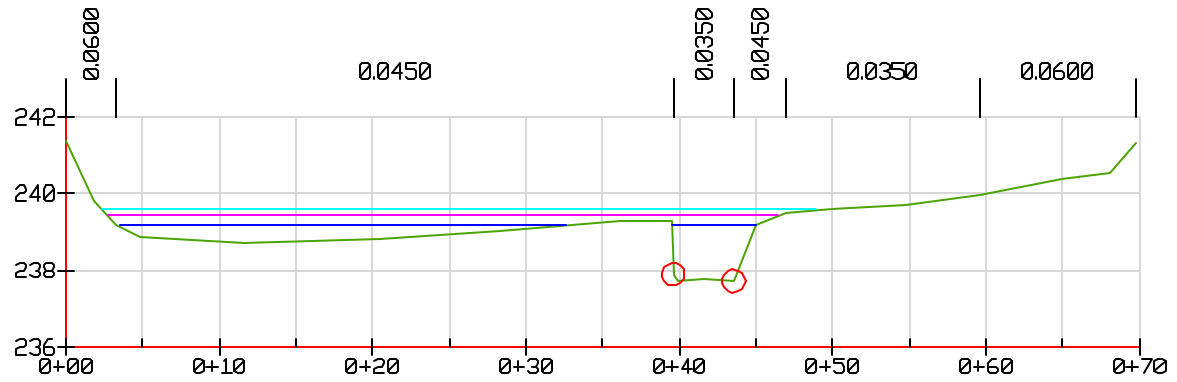
24

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 238.48 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 238.68 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 238.83 m



25

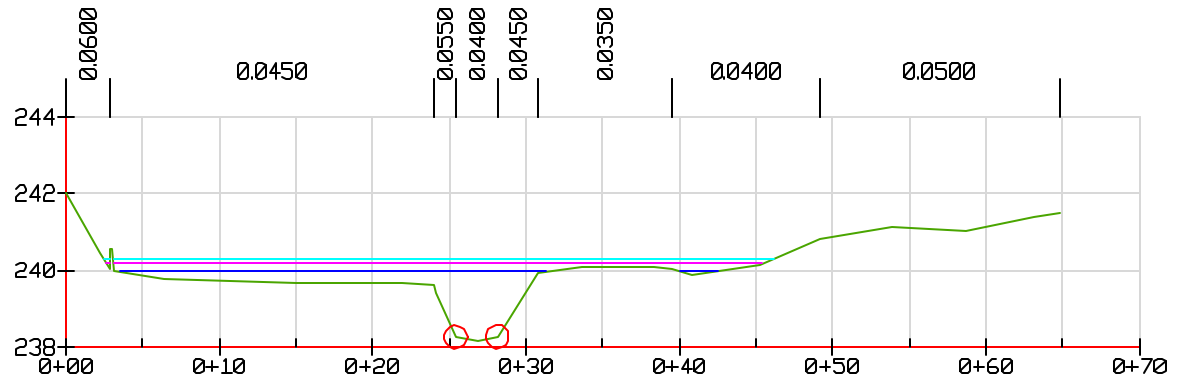
Observed HWM = 239.90 m (878.07 ft)

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 239.17 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 239.42 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 239.58 m



26

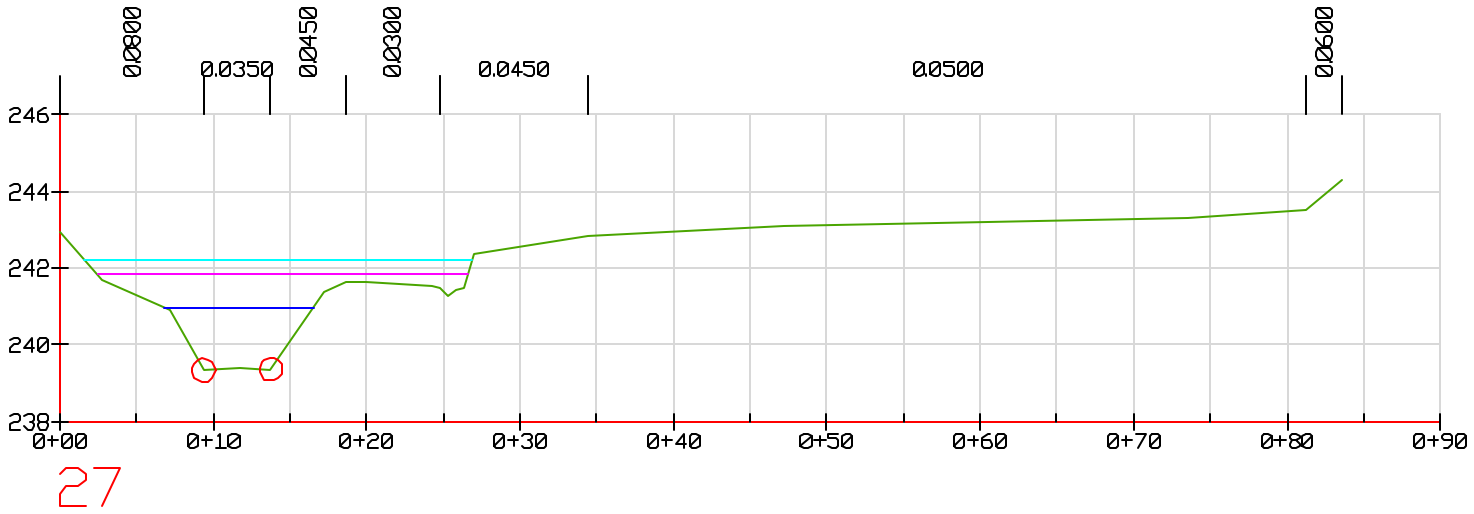
Observed HWM = 241.03 m (790.78 ft)

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 239.98 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 240.17 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 240.31 m



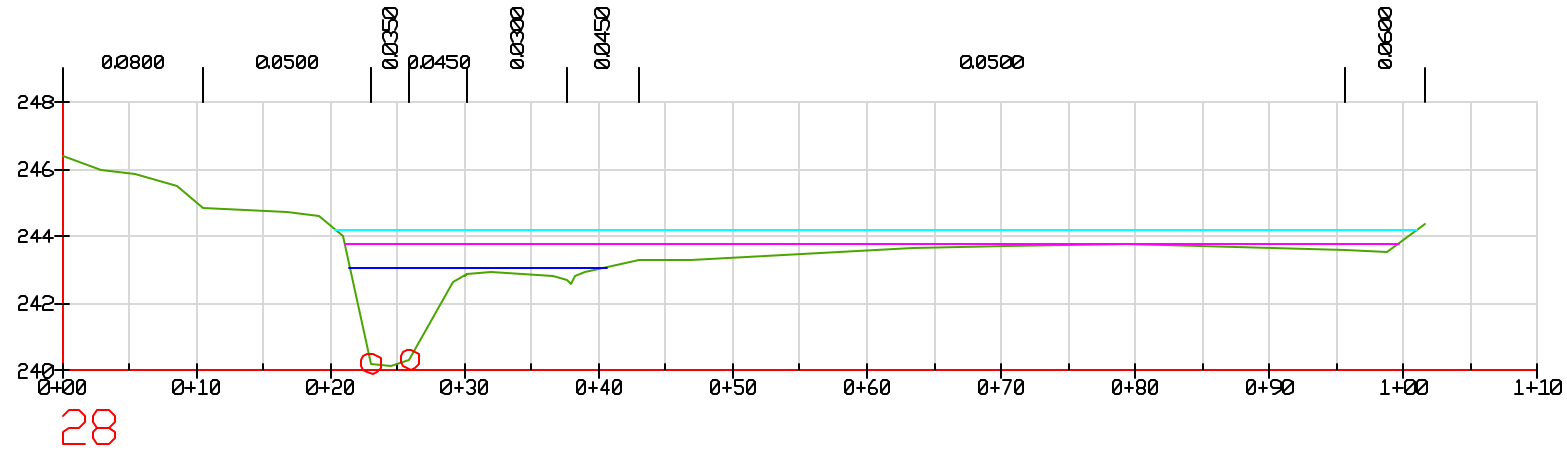
27

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 240.97 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 241.83 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 242.22 m



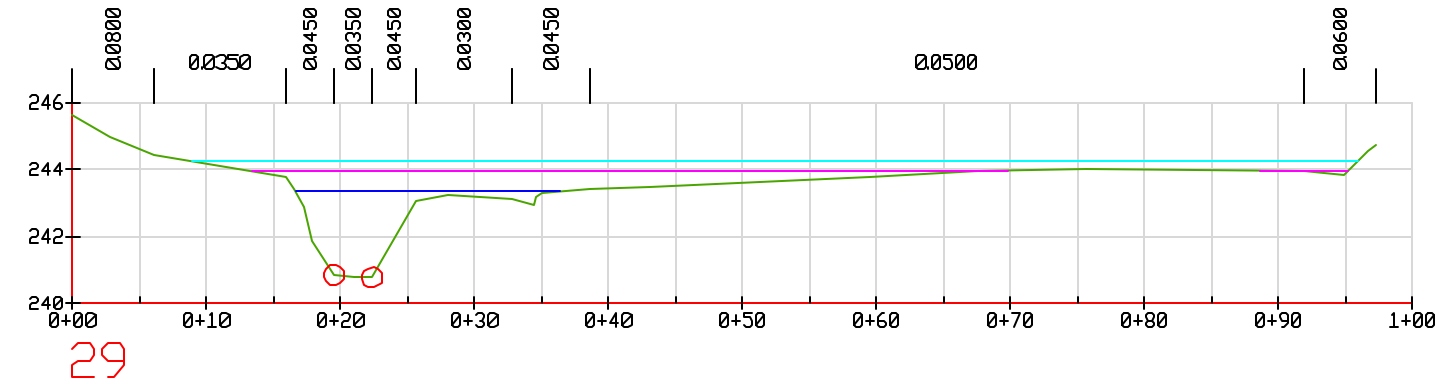
28

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 243.06 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 243.76 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 244.21 m

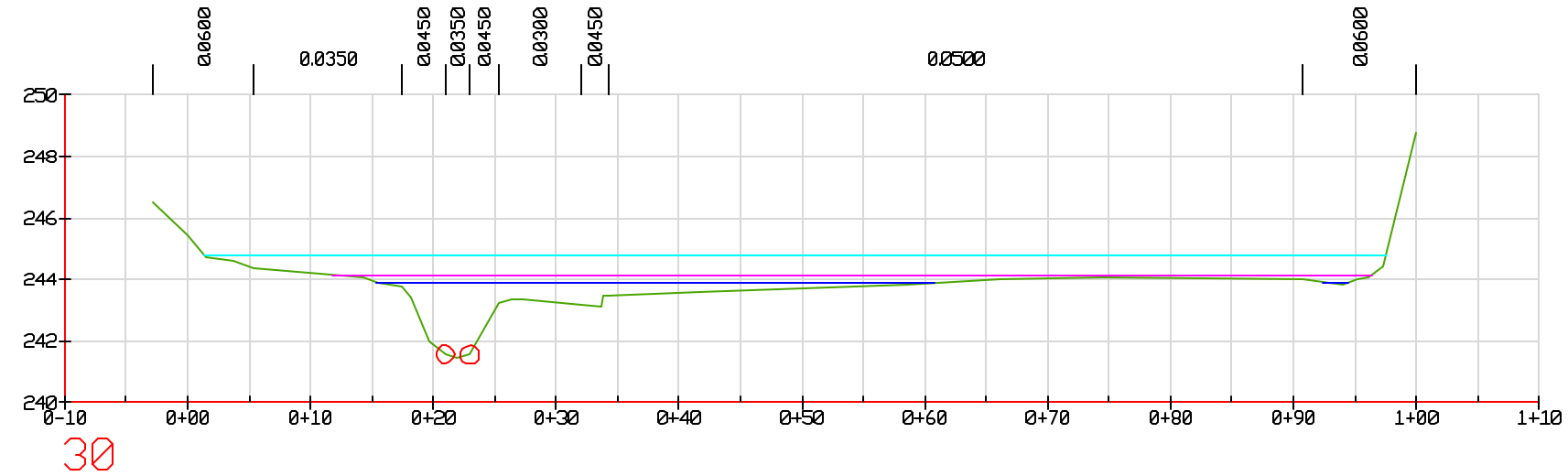


Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 243.33 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 243.94 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 244.25 m

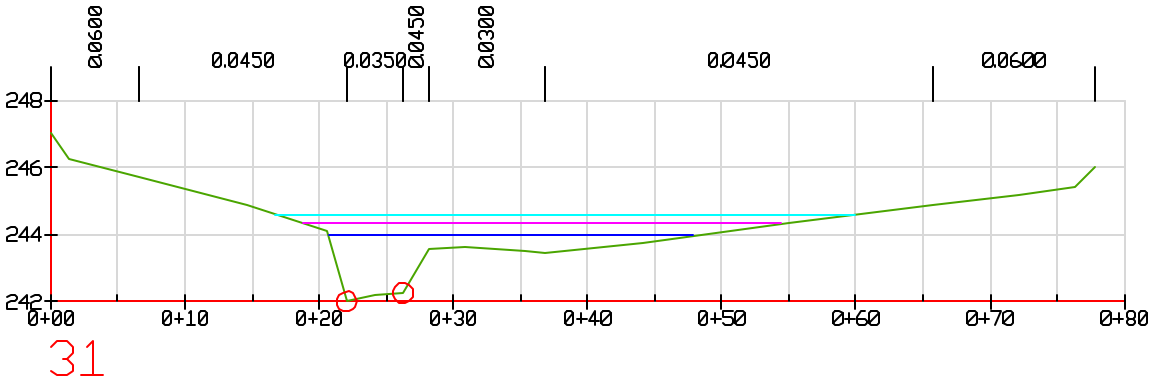


Scrakkle Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 243.89 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 244.15 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 244.78 m



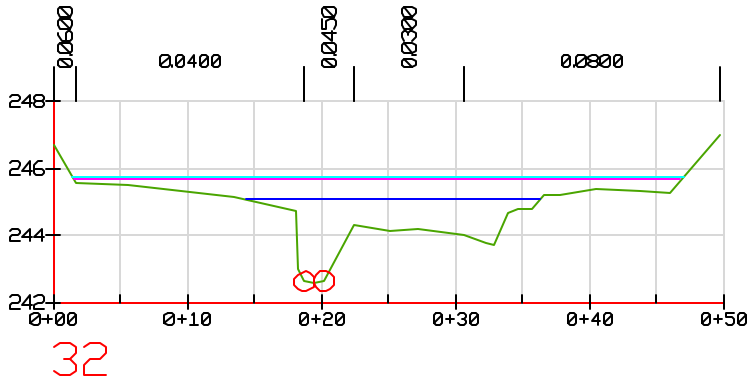
31

Scrakkle Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 243.96 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 244.33 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 244.59 m



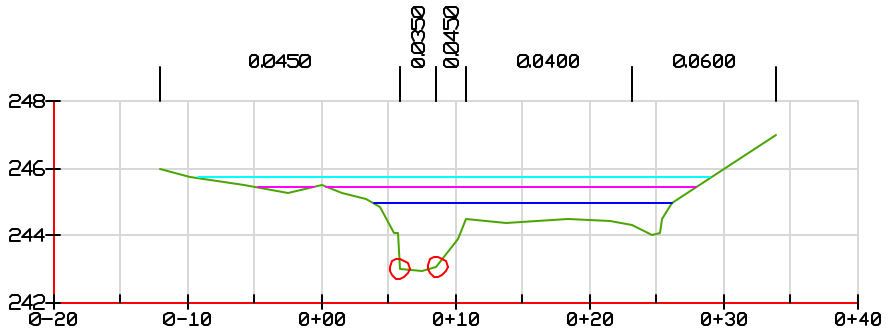
32

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 245.08 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 245.66 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 245.73 m



33

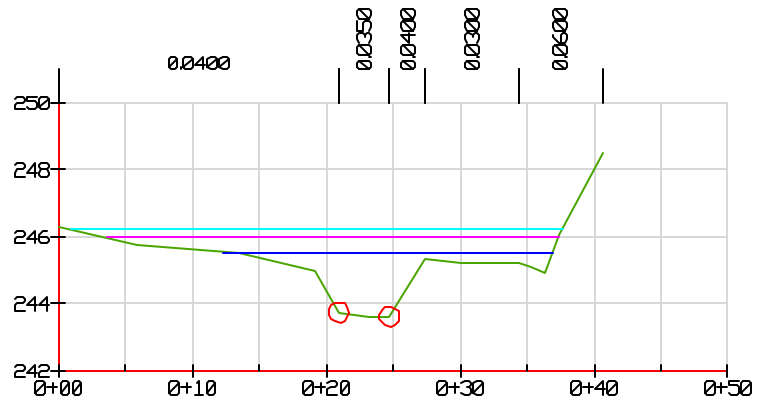
Observed HWM = 246.02 m (807.15 ft)

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 244.94 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 245.42 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 245.71 m



34

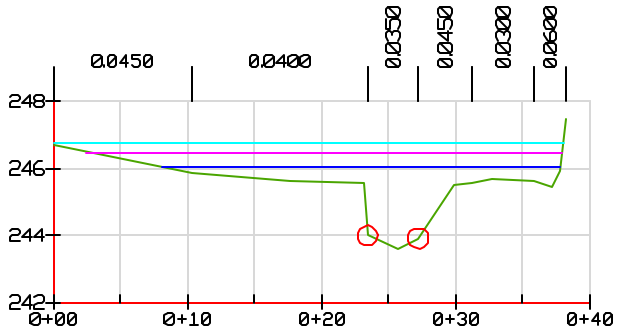
Observed HWM = 245.77 m (806.33 ft)

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 245.55 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 245.98 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 246.23 m



35

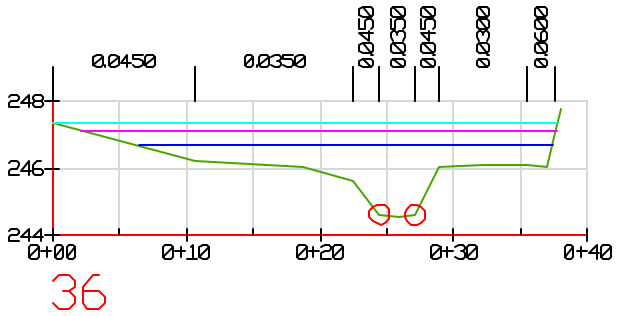
Observed HWM = 246.27 m (807.97 ft)

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 246.04 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 246.48 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 246.74 m



36

Scrabble Creek

Profile: Storm Event
Flow Discharge = 57.91 cms
Computed Water Surface = 246.66 m

Profile: 25 yr Storm
Flow Discharge = 106.47 cms
Computed Water Surface = 247.10 m

Profile: 100 yr Storm
Flow Discharge = 146.26 cms
Computed Water Surface = 247.35 m

Scrabble Creek HEC-RAS Analysis Report
PLAN DATA

Plan Summary Information:
Number of: Cross-Sections =   38   Multiple Openings =   0
            Culverts   =   0
            Bridges   =   3

Computational Information
    Water surface calculation tolerance = 0.003
    Critical depth calculation tolerance = 0.003
    Maximum number of iterations   = 20
    Maximum difference tolerance   = 0.1
    Flow tolerance factor   = 0.001

Computational Flow Regime: Mixed Flow

Encroachment Data: None

****

FLOW DATA

Flow Data (cfs)

River Sta	Storm Event	25 yr Storm	100 yr Storm
37	57.91	106.47	146.26

Boundary Conditions

Profile	Upstream	Downstream
Storm Event	Known WSEL = -90909	Critical Depth
25 yr Storm	Known WSEL = -90909	Critical Depth
100 yr Storm	Known WSEL = -90909	Critical Depth

****

CROSS SECTION INPUT   River Station: 1
Description:

Station Elevation Data, num = 33

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-41.2	205	-36.42	204	-34.83	203.75	-32.56	203.5	-19.84	203.25
-2.25	203	0	203.3	1.14203.2535		3.85203.1987		4.89203.2371	
6.3202.5885		8.56201.0337		10.09199.7715		13.16199.6581		13.47199.6026	
14.1199.4624		15.2 199.464		16.71199.3427		17.31199.5807		18.21200.2641	
18.52200.2631		18.55201.2303		20.87202.1877		22.99203.2557		24.22203.4221	
27.16203.4986		38.87	203	42.16	203.25	56.52	203.25	74.46	203.25
77.56	203.5	79.5	203.75	80.93	204				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-41.2	.05	10.09	.035	17.31	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10.09	17.31	0	0	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 1 Profile # Storm Event

E.G. Elev (m)	202.17	Element	Left OB	Channel	Right OB
Vel Head (m)	0.87	Wt. n-Val	0.050	0.035	0.050
W.S. Elev (m)	201.30	Reach Len. (m)			
Crit W.S. (m)	201.34	Flow Area (m2)	1.42	12.46	1.58
E.G. Slope (m/m)	0.011030	Area (m2)	1.42	12.46	1.58
Q Total (m3/s)	57.91	Flow (m3/s)	2.08	53.44	2.39
Top Width (m)	10.53	Top Width (m)	1.91	7.22	1.40
Vel Total (m/s)	3.75	Avg. Vel. (m/s)	1.46	4.29	1.51
Max Chl Dpth (m)	1.95	Hydr. Depth (m)	0.74	1.73	1.13
Conv. Total (m3/s)	551.4	Conv. (m3/s)	19.8	508.9	22.8
Length Wtd. (m)		Wetted Per. (m)	2.45	7.29	2.58
Min Ch El (m)	199.34	Shear (N/sq m)	62.76	184.85	66.15
Alpha	1.22	Stream Power (N/m s)	91.71	792.86	100.10
Frctn Loss (m)	0.02	Cum Volume (cu m x 10^			
C & E Loss (m)	0.00	Cum SA (1000 m2)			

CROSS SECTION OUTPUT Riv Sta: 1 Profile # 25 yr Storm

E.G. Elev (m)	203.75	Element	Left OB	Channel	Right OB
Vel Head (m)	2.21	Wt. n-Val	0.050	0.035	0.050
W.S. Elev (m)	201.54	Reach Len. (m)			
Crit W.S. (m)	202.25	Flow Area (m2)	1.93	14.23	2.00
E.G. Slope (m/m)	0.023549	Area (m2)	1.93	14.23	2.00
Q Total (m3/s)	106.47	Flow (m3/s)	4.55	97.47	4.45
Top Width (m)	11.49	Top Width (m)	2.27	7.22	2.00
Vel Total (m/s)	5.86	Avg. Vel. (m/s)	2.35	6.85	2.23
Max Chl Dpth (m)	2.20	Hydr. Depth (m)	0.85	1.97	1.00
Conv. Total (m3/s)	693.8	Conv. (m3/s)	29.7	635.1	29.0
Length Wtd. (m)		Wetted Per. (m)	2.88	7.29	3.23
Min Ch El (m)	199.34	Shear (N/sq m)	155.03	450.81	142.91
Alpha	1.26	Stream Power (N/m s)	364.79	3087.25	318.49
Frctn Loss (m)	0.04	Cum Volume (cu m x 10^			
C & E Loss (m)	0.02	Cum SA (1000 m2)			

CROSS SECTION OUTPUT Riv Sta: 1 Profile # 100 yr Storm

E.G. Elev (m)	204.58	Element	Left OB	Channel	Right OB
Vel Head (m)	2.58	Wt. n-Val	0.050	0.035	0.050
W.S. Elev (m)	201.99	Reach Len. (m)			
Crit W.S. (m)	202.80	Flow Area (m2)	3.11	17.49	3.14
E.G. Slope (m/m)	0.021348	Area (m2)	3.11	17.49	3.14
Q Total (m3/s)	146.26	Flow (m3/s)	8.11	130.82	7.33
Top Width (m)	13.23	Top Width (m)	2.93	7.22	3.09
Vel Total (m/s)	6.16	Avg. Vel. (m/s)	2.61	7.48	2.33
Max Chl Dpth (m)	2.65	Hydr. Depth (m)	1.06	2.42	1.02
Conv. Total (m3/s)	1001.0	Conv. (m3/s)	55.5	895.3	50.2
Length Wtd. (m)		Wetted Per. (m)	3.68	7.29	4.41
Min Ch El (m)	199.34	Shear (N/sq m)	176.85	502.15	149.27
Alpha	1.34	Stream Power (N/m s)	461.82	3756.18	348.12
Frctn Loss (m)	0.04	Cum Volume (cu m x 10^			
C & E Loss (m)	0.00	Cum SA (1000 m2)			

CROSS SECTION INPUT River Station: 1.1
Description:

Station Elevation Data, num = 32

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-38.61	205	-33.46	204	-29.81	203.5	-21.28	203.25	-2.2	203
0	203.3	1.14203.2535		3.85203.1987		4.89	203.24	6.3202.5885	
8.56201.0337		10.09	199.77	10.89	199.72	13.16199.6581		13.47199.6026	
14.1199.4624		15.2	199.464	16.71	199.34	17.31	199.58	18.21	200.26
18.52200.2631		18.55201.2303		20.87202.1877		22.99	203.26	24.22203.4221	
27.16	203.5	40.84	203.25	55.4	203.25	70.71	203.25	74.27	203.5
75.97	203.75	77.51	204						

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-38.61	.05	10.09	.03	17.31	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10.09	17.31	2	2	0.1	0.3

BRIDGE INPUT River Station: 1.55
Description:
Distance from Upstream XS = 0.5
Deck/Roadway Width = 5
Weir Coefficient = 1.4
Bridge Deck/Roadway Skew =

Upstream Deck/Roadway Coordinates, num = 6

Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord
14.19	203.32		14.35	203.92		14.92	203.92	202.41
20.74	203.92	202.41	21.35	203.92		21.68	203.39	

Upstream Bridge Cross Section Data
Station Elevation Data, num = 38

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-34.91	206.25	-29.36	205	-24.15	204	-20.85	203.5	-16.2	203.25
0	203.26	8.35203.2328		9.29203.1615		14.19	203.32	14.35	203.25
14.44203.0566		14.83203.0609		14.89	202.49	14.92	199.66	15.69	199.431
15.98199.2604		16.73	199.21	17.08199.4051		17.74199.4832		18.16199.1774	
18.87199.2966		19.59199.5999		20.09199.6673		20.74	199.68	20.81	202.5
20.91203.0944		21.35	203.09	21.68	203.39	21.8203.2842		22.31203.1947	
23.65203.1992		29.52	203.209	38.81203.2572		58.81	203.25	69.96	203.25
74.39	203.75	75.84	204	82.03	205				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-34.91	.045	14.83	.03	20.91	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
14.83	20.91	5.68	5.85	6.32	0.1	0.3

Downstream Deck/Roadway Coordinates, num = 8

Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord
4.89	203.24		10.09	203.92		10.89	203.92	199.72
10.89	203.92	202.41	16.71	203.92	202.41	16.71	203.92	199.34
17.31	203.26		22.99	203.26				

Downstream Bridge Cross Section Data
Station Elevation Data, num = 32

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-38.61	205	-33.46	204	-29.81	203.5	-21.28	203.25	-2.2	203
0	203.3	1.14203.2535		3.85203.1987		4.89	203.24	6.3202.5885	
8.56201.0337		10.09	199.77	10.89	199.72	13.16199.6581		13.47199.6026	
14.1199.4624		15.2	199.464	16.71	199.34	17.31	199.58	18.21	200.26
18.52200.2631		18.55201.2303		20.87202.1877		22.99	203.26	24.22203.4221	
27.16	203.5	40.84	203.25	55.4	203.25	70.71	203.25	74.27	203.5
75.97	203.75	77.51	204						

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-38.61	.05	10.09	.03	17.31	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10.09	17.31	2	2	0.1	0.3

Elevation at which weir flow begins =

Maximum allowable submergence for weir flow = 0.95
Submergence criteria : Broad Crested

Number of Bridge Coefficient Sets = 1

CROSS SECTION OUTPUT Riv Sta: 1.1 Profile # Storm Event

E.G. Elev (m)	202.19	Element	Left OB	Channel	Right OB
Vel Head (m)	0.84	Wt. n-Val	0.050	0.030	0.050
W.S. Elev (m)	201.35	Reach Len. (m)	2.00	2.00	2.00
Crit W.S. (m)	201.35	Flow Area (m2)	1.52	12.88	1.66
E.G. Slope (m/m)	0.007400	Area (m2)	1.52	12.88	1.66
Q Total (m3/s)	57.91	Flow (m3/s)	1.86	53.99	2.06
Top Width (m)	10.74	Top Width (m)	1.99	7.22	1.53
Vel Total (m/s)	3.60	Avg. Vel. (m/s)	1.22	4.19	1.24
Max Chl Dpth (m)	2.01	Hydr. Depth (m)	0.77	1.78	1.08
Conv. Total (m3/s)	673.2	Conv. (m3/s)	21.7	627.6	23.9
Length Wtd. (m)	2.00	Wetted Per. (m)	2.54	7.29	2.72
Min Ch El (m)	199.34	Shear (N/sq m)	43.49	128.20	44.30
Alpha	1.27	Stream Power (N/m s)	53.19	537.22	54.84
Frctn Loss (m)		Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)		Cum SA (1000 m2)	0.00	0.01	0.00

CROSS SECTION OUTPUT Riv Sta: 1.1 Profile # 25 yr Storm

E.G. Elev (m)	203.81	Element	Left OB	Channel	Right OB
Vel Head (m)	2.26	Wt. n-Val	0.050	0.030	0.050
W.S. Elev (m)	201.55	Reach Len. (m)	2.00	2.00	2.00
Crit W.S. (m)	202.26	Flow Area (m2)	1.94	14.31	2.01
E.G. Slope (m/m)	0.017434	Area (m2)	1.94	14.31	2.01
Q Total (m3/s)	106.47	Flow (m3/s)	3.94	98.67	3.86
Top Width (m)	11.50	Top Width (m)	2.28	7.22	2.01
Vel Total (m/s)	5.83	Avg. Vel. (m/s)	2.03	6.90	1.92
Max Chl Dpth (m)	2.21	Hydr. Depth (m)	0.85	1.98	1.00
Conv. Total (m3/s)	806.4	Conv. (m3/s)	29.8	747.3	29.2
Length Wtd. (m)	2.00	Wetted Per. (m)	2.89	7.29	3.24
Min Ch El (m)	199.34	Shear (N/sq m)	114.99	335.35	106.11
Alpha	1.30	Stream Power (N/m s)	233.11	2312.79	203.89
Frctn Loss (m)	0.00	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.20	Cum SA (1000 m2)	0.00	0.01	0.00

CROSS SECTION OUTPUT Riv Sta: 1.1 Profile # 100 yr Storm

E.G. Elev (m)	204.62	Element	Left OB	Channel	Right OB
Vel Head (m)	2.59	Wt. n-Val	0.050	0.030	0.050
W.S. Elev (m)	202.03	Reach Len. (m)	2.00	2.00	2.00
Crit W.S. (m)	202.83	Flow Area (m2)	3.21	17.78	3.25
E.G. Slope (m/m)	0.015270	Area (m2)	3.21	17.78	3.25
Q Total (m3/s)	146.26	Flow (m3/s)	7.15	132.63	6.48
Top Width (m)	13.37	Top Width (m)	2.98	7.22	3.17
Vel Total (m/s)	6.03	Avg. Vel. (m/s)	2.23	7.46	1.99
Max Chl Dpth (m)	2.69	Hydr. Depth (m)	1.08	2.46	1.03
Conv. Total (m3/s)	1183.6	Conv. (m3/s)	57.9	1073.3	52.5
Length Wtd. (m)	2.00	Wetted Per. (m)	3.74	7.29	4.50
Min Ch El (m)	199.34	Shear (N/sq m)	128.43	365.00	108.37
Alpha	1.40	Stream Power (N/m s)	286.53	2722.94	215.88
Frctn Loss (m)	0.01	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.14	Cum SA (1000 m2)	0.01	0.01	0.01

CROSS SECTION INPUT   River Station: 2
Description:

Station Elevation Data, num = 38

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-34.91	206.25	-29.36	205	-24.15	204	-20.85	203.5	-16.2	203.25
0	203.26	8.35203.2328		9.29203.1615		14.19	203.32	14.35	203.25
14.44203.0566		14.83203.0609		14.89	202.49	14.92	199.66	15.69	199.431
15.98199.2604		16.73	199.21	17.08199.4051		17.74199.4832		18.16199.1774	
18.87199.2966		19.59199.5999		20.09199.6673		20.74	199.68	20.81	202.5
20.91203.0944		21.35	203.09	21.68	203.39	21.8203.2842		22.31203.1947	
23.65203.1992		29.52	203.209	38.81203.2572		58.81	203.25	69.96	203.25
74.39	203.75	75.84	204	82.03	205				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-34.91	.045	14.83	.03	20.91	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
14.83	20.91	5.68	5.85	6.32	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 2 Profile # Storm Event

E.G. Elev (m)	203.37	Element	Left OB	Channel	Right OB
Vel Head (m)	0.39	Wt. n-Val		0.030	
W.S. Elev (m)	202.98	Reach Len. (m)	0.50	0.50	0.50
Crit W.S. (m)	201.58	Flow Area (m2)		20.90	
E.G. Slope (m/m)	0.003578	Area (m2)		20.90	
Q Total (m3/s)	57.91	Flow (m3/s)		57.91	
Top Width (m)	6.05	Top Width (m)		6.05	
Vel Total (m/s)	2.77	Avg. Vel. (m/s)		2.77	
Max Chl Dpth (m)	3.80	Hydr. Depth (m)		3.45	
Conv. Total (m3/s)	968.1	Conv. (m3/s)		968.1	
Length Wtd. (m)	0.50	Wetted Per. (m)		12.76	
Min Ch El (m)	199.18	Shear (N/sq m)		57.47	
Alpha	1.00	Stream Power (N/m s)		159.24	
Frctn Loss (m)		Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)		Cum SA (1000 m2)	0.01	0.02	0.00

CROSS SECTION OUTPUT Riv Sta: 2 Profile # 25 yr Storm

E.G. Elev (m)	204.66	Element	Left OB	Channel	Right OB
Vel Head (m)	2.77	Wt. n-Val		0.030	
W.S. Elev (m)	201.89	Reach Len. (m)	0.50	0.50	0.50
Crit W.S. (m)	202.66	Flow Area (m2)		14.45	
E.G. Slope (m/m)	0.032268	Area (m2)		14.45	
Q Total (m3/s)	106.47	Flow (m3/s)		106.47	
Top Width (m)	5.90	Top Width (m)		5.90	
Vel Total (m/s)	7.37	Avg. Vel. (m/s)		7.37	
Max Chl Dpth (m)	2.72	Hydr. Depth (m)		2.45	
Conv. Total (m3/s)	592.7	Conv. (m3/s)		592.7	
Length Wtd. (m)	0.50	Wetted Per. (m)		10.58	
Min Ch El (m)	199.18	Shear (N/sq m)		432.10	
Alpha	1.00	Stream Power (N/m s)		3184.46	
Frctn Loss (m)	0.31	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.34	Cum SA (1000 m2)	0.12	0.03	0.16

CROSS SECTION OUTPUT Riv Sta: 2 Profile # 100 yr Storm

E.G. Elev (m)	205.12	Element	Left OB	Channel	Right OB
Vel Head (m)	1.76	Wt. n-Val	0.045	0.030	0.045
W.S. Elev (m)	203.36	Reach Len. (m)	0.50	0.50	0.50
Crit W.S. (m)	203.89	Flow Area (m2)	3.79	23.24	6.16
E.G. Slope (m/m)	0.014933	Area (m2)	3.79	23.24	6.16
Q Total (m3/s)	146.26	Flow (m3/s)	2.42	139.69	4.15
Top Width (m)	89.25	Top Width (m)	33.15	6.09	50.01
Vel Total (m/s)	4.41	Avg. Vel. (m/s)	0.64	6.01	0.67
Max Chl Dpth (m)	4.19	Hydr. Depth (m)	0.11	3.82	0.12
Conv. Total (m3/s)	1196.9	Conv. (m3/s)	19.8	1143.1	34.0
Length Wtd. (m)	0.50	Wetted Per. (m)	33.30	12.97	50.16
Min Ch El (m)	199.18	Shear (N/sq m)	16.68	262.50	18.00
Alpha	1.78	Stream Power (N/m s)	10.64	1577.79	12.11
Frctn Loss (m)	0.09	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.02	Cum SA (1000 m2)	0.22	0.02	0.31

CROSS SECTION INPUT   River Station: 3
Description:

Station Elevation Data, num = 31

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-13.68	205	-8.71	204	-7.03	203.75	-5.22	203.5	-2.81	203.25
0	203.32	3.44203.2932		8.44203.2596		8.49203.0856		8.71203.1667	
8.84203.0859		8.93 202.479		9199.3747		9.02 199.666		9.89198.9348	
12.02199.0869		12.92199.5993		14.76 199.578		14.87202.4888		14.96203.0819	
15.2203.1473		15.38203.0755		15.46203.2539		20203.2462		23.33203.0856	
28.2 203.121		31.21	203.25	37.01	203.5	39.47	203.75	41.27	204
46.56	205								

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-13.68	.055	9.02	.035	14.76	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.02	14.76	8.79	8.81	8.76	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 3 Profile # Storm Event

E.G. Elev (m)	203.39	Element	Left OB	Channel	Right OB
Vel Head (m)	0.37	Wt. n-Val	0.055	0.035	0.050
W.S. Elev (m)	203.02	Reach Len. (m)	8.79	8.81	8.76
Crit W.S. (m)	201.47	Flow Area (m2)	0.24	21.42	0.23
E.G. Slope (m/m)	0.001711	Area (m2)	0.24	21.42	0.23
Q Total (m3/s)	57.91	Flow (m3/s)	0.03	57.85	0.03
Top Width (m)	6.10	Top Width (m)	0.17	5.74	0.19
Vel Total (m/s)	2.65	Avg. Vel. (m/s)	0.12	2.70	0.14
Max Chl Dpth (m)	4.09	Hydr. Depth (m)	1.39	3.73	1.24
Conv. Total (m3/s)	1400.0	Conv. (m3/s)	0.7	1398.6	0.8
Length Wtd. (m)	8.81	Wetted Per. (m)	3.94	6.20	3.41
Min Ch El (m)	198.93	Shear (N/sq m)	1.01	57.95	1.16
Alpha	1.04	Stream Power (N/m s)	0.12	156.50	0.16
Frctn Loss (m)	0.02	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.00	Cum SA (1000 m2)	0.01	0.07	0.00

CROSS SECTION OUTPUT Riv Sta: 3 Profile # 25 yr Storm

E.G. Elev (m)	205.31	Element	Left OB	Channel	Right OB
Vel Head (m)	3.90	Wt. n-Val	0.055	0.035	0.050
W.S. Elev (m)	201.41	Reach Len. (m)	8.79	8.81	8.76
Crit W.S. (m)	202.56	Flow Area (m2)	0.08	12.16	0.06
E.G. Slope (m/m)	0.038214	Area (m2)	0.08	12.16	0.06
Q Total (m3/s)	106.47	Flow (m3/s)	0.03	106.41	0.02
Top Width (m)	5.88	Top Width (m)	0.07	5.74	0.07
Vel Total (m/s)	8.65	Avg. Vel. (m/s)	0.39	8.75	0.41
Max Chl Dpth (m)	2.48	Hydr. Depth (m)	1.28	2.12	0.89
Conv. Total (m3/s)	544.6	Conv. (m3/s)	0.2	544.4	0.1
Length Wtd. (m)	8.81	Wetted Per. (m)	2.32	6.20	1.79
Min Ch El (m)	198.93	Shear (N/sq m)	13.45	734.84	12.66
Alpha	1.02	Stream Power (N/m s)	5.20	6429.77	5.17
Frctn Loss (m)	1.18	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.29	Cum SA (1000 m2)	0.12	0.08	0.16

CROSS SECTION OUTPUT Riv Sta: 3 Profile # 100 yr Storm

E.G. Elev (m)	205.24	Element	Left OB	Channel	Right OB
Vel Head (m)	1.83	Wt. n-Val	0.055	0.035	0.050

W.S. Elev (m)	203.41	Reach Len. (m)	8.79	8.81	8.76
Crit W.S. (m)	204.13	Flow Area (m2)	1.85	23.62	4.37
E.G. Slope (m/m)	0.007563	Area (m2)	1.85	23.62	4.37
Q Total (m3/s)	146.26	Flow (m3/s)	0.66	143.12	2.48
Top Width (m)	39.12	Top Width (m)	13.33	5.74	20.05
Vel Total (m/s)	4.90	Avg. Vel. (m/s)	0.36	6.06	0.57
Max Chl Dpth (m)	4.47	Hydr. Depth (m)	0.14	4.11	0.22
Conv. Total (m3/s)	1681.8	Conv. (m3/s)	7.6	1645.7	28.5
Length Wtd. (m)	8.81	Wetted Per. (m)	17.32	6.20	23.47
Min Ch El (m)	198.93	Shear (N/sq m)	7.93	282.46	13.80
Alpha	1.50	Stream Power (N/m s)	2.83	1711.59	7.83
Frctn Loss (m)	0.18	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.02	Cum SA (1000 m2)	0.42	0.07	0.62

CROSS SECTION INPUT River Station: 4
Description:

Station Elevation Data, num = 36

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	208.3	1.87	208.162.241703	207.7354.326159	206.8167	6.97	207.58		
7.037994	204.82697.997242	202.00948.002404	202.63828.513095	201.88998.635305	201.5543				
9.007905	202.88239.373868	203.5285	9.73	201.489.913542	201.2245	10.48	201.1		
10.92692	01.0066	11.09	200.6611.58811	200.5417	12.07	200.35	12.45	200.2	
13.31	200.28	14.02	200.35	14.64	200.43	15.35	200.5	15.89	200.56
16.5	200.57	17.12	200.5717.82142	200.5676	17.90554	202.4096	18.47442	204.3438	
19.16573	207.5308	19.76	207.5320.30413	207.7085	21.38034	207.5954	22.39	207.93	
25.17	207.78								

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.05	59.913542	.03517.82142	.05	

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.91354	17.8214	21.23	22.02	22.82	0.1	0.3

Ineffective Flow Areas, num = 1

Sta L	Sta R	Elev
0	9.91	207

BRIDGE INPUT River Station: 4.5
Description:
Distance from Upstream XS = 0.5
Deck/Roadway Width = 11
Weir Coefficient = 1.4
Bridge Deck/Roadway Skew =

Upstream Deck/Roadway Coordinates, num = 6

Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord
16.46	209.48		18.41	209.48	203.39	18.41	209.48	207.95
25.66	209.48	207.95	25.66	209.48	203.01	28.22	209.48	

Upstream Bridge Cross Section Data
Station Elevation Data, num = 54

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-14.76	211.25	-12.79	210.25	-10.62	209.5	-8.55	209.25	0	209.39
7.36209.1783		10208.9744		13.97208.7451		16.43208.7866		16.46	209.36
16.89209.3633		16.92206.2976		18.34206.2866		18.41	203.39	18.7	203.45
18.74	203.22	19.49	203.2	20.41	203.2	21	203.2	21.4203.1691	
21.46	202.97	21.79	202.98	22.04	202.81	22.54	202.79	22.69202.5318	
23.1202.4553		23.44	202.57	23.86	202.77	23.91202.7296		23.99202.8165	
24.43	203.05	24.56203.0021		24.7	202.9	24.96202.6961		25.34202.8037	
25.66	203.01	25.81203.0786		26.13203.0429		26.38207.4113		27.18207.4062	
27.26	207.931	27.82207.9204		27.85209.4852		28.22	209.48	28.25208.9472	
29.41208.9683		30.41208.5781		33.02	208.676	38.2208.3678		44.12208.4233	
46.74	209.5	48.34	209.75	50.06	210	53.69	211.25		

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-14.76	.045	18.34	.03	26.38	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
18.34	26.38	12.5	12.59	12.42	0.1	0.3

Downstream Deck/Roadway Coordinates, num = 15

Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord
0	208.75		6.97	209.48		9.73	209.48	201.48
9.73	209.48	206.43	11.09	209.48	207.3	12.45	209.48	207.79
13.31	209.48	207.95	14.02	209.48	207.95	14.64	209.48	207.79
15.35	209.48	207.5	15.89	209.48	207.3	17.12	209.48	206.43
17.12	209.48	200.57	19.76	208.75		25.17	208.75	

Downstream Bridge Cross Section Data
Station Elevation Data, num = 36

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	208.3	1.87	208.162.241703	207.7354.326159	206.8167	6.97	207.58		
7.037994	204.82697.997242	202.00948.002404	202.63828.513095	201.88998.635305	201.5543				
9.007905	202.88239.373868	203.5285	9.73	201.489.913542	201.2245	10.48	201.1		
10.92692	01.0066	11.09	200.6611.58811	200.5417	12.07	200.35	12.45	200.2	
13.31	200.28	14.02	200.35	14.64	200.43	15.35	200.5	15.89	200.56
16.5	200.57	17.12	200.5717.82142	200.5676	17.90554	202.4096	18.47442	204.3438	
19.16573	207.5308	19.76	207.5320.30413	207.7085	21.38034	207.5954	22.39	207.93	
25.17	207.78								

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Mannings n Values,  num = 3
    Sta.   Value    Sta.   Value    Sta.   Value
**********************************************
       0    .0559.913542    .03517.82142     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
       9.91354 17.8214            21.23   22.02   22.82             0.1     0.3

Elevation at which weir flow begins         =
Maximum allowable submergence for weir flow = 0.95
Submergence criteria : Broad Crested

Number of Bridge Coefficient Sets = 1

CROSS SECTION OUTPUT  Riv Sta: 4  Profile # Storm Event
*****************************************************************************************
* E.G. Elev (m)       *   205.17 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     3.78 * Wt. n-Val             *    0.000 *    0.035 *    0.050 *
* W.S. Elev (m)       *   201.39 * Reach Len. (m)        *    21.23 *    22.02 *    22.82 *
* Crit W.S. (m)       *   202.30 * Flow Area (m2)        *     0.00 *     6.72 *     0.02 *
* E.G. Slope (m/m)    * 0.119331 * Area (m2)             *     0.01 *     6.72 *     0.02 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)           *     0.00 *    57.90 *     0.01 *
* Top Width (m)       *     8.06 * Top Width (m)         *     0.12 *     7.91 *     0.04 *
* Vel Total (m/s)     *     8.59 * Avg. Vel. (m/s)       *     1.31 *     8.61 *     0.49 *
* Max Chl Dpth (m)    *     1.19 * Hydr. Depth (m)       *     0.16 *     0.85 *     0.41 *
* Conv. Total (m3/s)  *    167.6 * Conv. (m3/s)          *      0.0 *    167.6 *      0.0 *
* Length Wtd. (m)     *    22.02 * Wetted Per. (m)       *     0.01 *     8.25 *     0.82 *
* Min Ch El (m)       *   200.20 * Shear (N/sq m)        *   111.34 *   953.82 *    21.95 *
* Alpha               *     1.00 * Stream Power (N/m s)  *   145.74 *  8214.17 *    10.71 *
* Frctn Loss (m)      *     0.14 * Cum Volume (cu m x 10^ *     0.00 *     0.00 *     0.00 *
* C & E Loss (m)      *     0.03 * Cum SA (1000 m2)      *     0.01 *     0.22 *     0.01 *
*****************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 4  Profile # 25 yr Storm
*****************************************************************************************
* E.G. Elev (m)       *   206.76 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     4.84 * Wt. n-Val             *    0.000 *    0.035 *    0.050 *
* W.S. Elev (m)       *   201.92 * Reach Len. (m)        *    21.23 *    22.02 *    22.82 *
* Crit W.S. (m)       *   203.18 * Flow Area (m2)        *     0.00 *    10.91 *     0.04 *
* E.G. Slope (m/m)    * 0.080194 * Area (m2)             *     0.16 *    10.91 *     0.04 *
* Q Total (m3/s)      *   106.47 * Flow (m3/s)           *     0.01 *   106.44 *     0.02 *
* Top Width (m)       *     8.48 * Top Width (m)         *     0.51 *     7.91 *     0.06 *
* Vel Total (m/s)     *     9.72 * Avg. Vel. (m/s)       *     2.82 *     9.75 *     0.56 *
* Max Chl Dpth (m)    *     1.72 * Hydr. Depth (m)       *     0.69 *     1.38 *     0.68 *
* Conv. Total (m3/s)  *    376.0 * Conv. (m3/s)          *      0.0 *    375.9 *      0.1 *
* Length Wtd. (m)     *    22.02 * Wetted Per. (m)       *     0.01 *     8.25 *     1.35 *
* Min Ch El (m)       *   200.20 * Shear (N/sq m)        *   318.04 *  1040.60 *    24.26 *
* Alpha               *     1.01 * Stream Power (N/m s)  *   895.51 * 10147.62 *    13.52 *
* Frctn Loss (m)      *     0.09 * Cum Volume (cu m x 10^ *     0.00 *     0.00 *     0.00 *
* C & E Loss (m)      *     0.00 * Cum SA (1000 m2)      *     0.12 *     0.23 *     0.16 *
*****************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 4  Profile # 100 yr Storm
*****************************************************************************************
* E.G. Elev (m)       *   205.43 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.62 * Wt. n-Val             *    0.000 *    0.035 *    0.050 *
* W.S. Elev (m)       *   203.81 * Reach Len. (m)        *    21.23 *    22.02 *    22.82 *
* Crit W.S. (m)       *   203.81 * Flow Area (m2)        *     0.01 *    25.84 *     0.48 *
* E.G. Slope (m/m)    * 0.008526 * Area (m2)             *     3.33 *    25.84 *     0.48 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)           *     0.02 *   145.99 *     0.25 *
* Top Width (m)       *    10.93 * Top Width (m)         *     2.53 *     7.91 *     0.50 *
* Vel Total (m/s)     *     5.55 * Avg. Vel. (m/s)       *     2.21 *     5.65 *     0.51 *
* Max Chl Dpth (m)    *     3.61 * Hydr. Depth (m)       *     2.58 *     3.27 *     0.97 *
* Conv. Total (m3/s)  *   1584.0 * Conv. (m3/s)          *      0.2 *   1581.1 *      2.7 *
* Length Wtd. (m)     *    22.03 * Wetted Per. (m)       *     0.01 *     8.25 *     3.30 *
* Min Ch El (m)       *   200.20 * Shear (N/sq m)        *   125.92 *   261.96 *    12.23 *
* Alpha               *     1.03 * Stream Power (N/m s)  *   277.74 *  1479.72 *     6.27 *
* Frctn Loss (m)      *     0.10 * Cum Volume (cu m x 10^ *     0.00 *     0.00 *     0.00 *
* C & E Loss (m)      *     0.27 * Cum SA (1000 m2)      *     0.59 *     0.22 *     0.85 *
*****************************************************************************************

CROSS SECTION INPUT    River Station: 5
Description:

Station Elevation Data,  num = 54
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
**********************************************************************************
  -14.76  211.25  -12.79  210.25  -10.62   209.5   -8.55  209.25       0  209.39
    7.36209.1783      10208.9744   13.97208.7451   16.43208.7866   16.46  209.36
   16.89209.3633   16.92206.2976   18.34206.2866   18.41  203.39    18.7  203.45
   18.74  203.22   19.49   203.2   20.41   203.2      21   203.2    21.4203.1691
   21.46  202.97   21.79  202.98   22.04  202.81   22.54  202.79   22.69202.5318
    23.1202.4553   23.44  202.57   23.86  202.77   23.91202.7296   23.99202.8165
   24.43  203.05   24.56203.0021    24.7   202.9   24.96202.6961   25.34202.8037
   25.66  203.01   25.81203.0786   26.13203.0429   26.38207.4113   27.18207.4062
   27.26 207.931   27.82207.9204   27.85209.4852   28.22  209.48   28.25208.9472
   29.41208.9683   30.41208.5781   33.02 208.676    38.2208.3678   44.12208.4233
   46.74   209.5   48.34  209.75   50.06     210   53.69  211.25

Mannings n Values,  num = 3
    Sta.   Value    Sta.   Value    Sta.   Value
**********************************************
  -14.76    .045   18.34     .03   26.38    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         18.34   26.38             12.5   12.59   12.42             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 5  Profile # Storm Event
*****************************************************************************************
* E.G. Elev (m)       *   206.34 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     2.25 * Wt. n-Val             *          *    0.030 *          *
* W.S. Elev (m)       *   204.09 * Reach Len. (m)        *     0.50 *     0.50 *     0.50 *
* Crit W.S. (m)       *   204.75 * Flow Area (m2)        *          *     8.71 *          *
```

* E.G. Slope (m/m)	* 0.050424	* Area (m2)	*	* 8.71	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	*	* 57.91	*
* Top Width (m)	* 7.80	* Top Width (m)	*	* 7.80	*
* Vel Total (m/s)	* 6.65	* Avg. Vel. (m/s)	*	* 6.65	*
* Max Chl Dpth (m)	* 1.64	* Hydr. Depth (m)	*	* 1.12	*
* Conv. Total (m3/s)	* 257.9	* Conv. (m3/s)	*	* 257.9	*
* Length Wtd. (m)	* 0.50	* Wetted Per. (m)	*	* 10.41	*
* Min Ch El (m)	* 202.46	* Shear (N/sq m)	*	* 413.81	*
* Alpha	* 1.00	* Stream Power (N/m s)	*	* 2750.55	*
* Frctn Loss (m)	* 0.75	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00 *
* C & E Loss (m)	* 0.08	* Cum SA (1000 m2)	* 0.01	* 0.31	* 0.01 *

CROSS SECTION OUTPUT Riv Sta: 5 Profile # 25 yr Storm

* E.G. Elev (m)	* 207.79	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 3.05	* Wt. n-Val	*	* 0.030	*
* W.S. Elev (m)	* 204.74	* Reach Len. (m)	* 0.50	* 0.50	* 0.50 *
* Crit W.S. (m)	* 205.64	* Flow Area (m2)	*	* 13.76	*
* E.G. Slope (m/m)	* 0.043416	* Area (m2)	*	* 13.76	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	*	* 106.47	*
* Top Width (m)	* 7.85	* Top Width (m)	*	* 7.85	*
* Vel Total (m/s)	* 7.74	* Avg. Vel. (m/s)	*	* 7.74	*
* Max Chl Dpth (m)	* 2.28	* Hydr. Depth (m)	*	* 1.75	*
* Conv. Total (m3/s)	* 511.0	* Conv. (m3/s)	*	* 511.0	*
* Length Wtd. (m)	* 0.50	* Wetted Per. (m)	*	* 11.70	*
* Min Ch El (m)	* 202.46	* Shear (N/sq m)	*	* 500.63	*
* Alpha	* 1.00	* Stream Power (N/m s)	*	* 3873.60	*
* Frctn Loss (m)	* 0.57	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00 *
* C & E Loss (m)	* 0.02	* Cum SA (1000 m2)	* 0.12	* 0.33	* 0.16 *

CROSS SECTION OUTPUT Riv Sta: 5 Profile # 100 yr Storm

* E.G. Elev (m)	* 209.21	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 0.46	* Wt. n-Val	* 0.045	* 0.030	* 0.045 *
* W.S. Elev (m)	* 208.75	* Reach Len. (m)	* 0.50	* 0.50	* 0.50 *
* Crit W.S. (m)	* 206.28	* Flow Area (m2)	* 3.52	* 45.74	* 5.33 *
* E.G. Slope (m/m)	* 0.002065	* Area (m2)	* 3.52	* 45.74	* 5.33 *
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 3.31	* 140.32	* 2.63 *
* Top Width (m)	* 25.93	* Top Width (m)	* 1.51	* 8.04	* 16.38 *
* Vel Total (m/s)	* 2.68	* Avg. Vel. (m/s)	* 0.94	* 3.07	* 0.49 *
* Max Chl Dpth (m)	* 6.29	* Hydr. Depth (m)	* 2.33	* 5.69	* 0.33 *
* Conv. Total (m3/s)	* 3218.8	* Conv. (m3/s)	* 72.9	* 3088.0	* 57.8 *
* Length Wtd. (m)	* 0.50	* Wetted Per. (m)	* 3.96	* 15.88	* 17.78 *
* Min Ch El (m)	* 202.46	* Shear (N/sq m)	* 17.99	* 58.35	* 6.07 *
* Alpha	* 1.26	* Stream Power (N/m s)	* 16.96	* 178.98	* 2.99 *
* Frctn Loss (m)	*	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00 *
* C & E Loss (m)	*	* Cum SA (1000 m2)	* 0.62	* 0.23	* 0.94 *

CROSS SECTION INPUT River Station: 6
Description:

Station Elevation Data, num = 27

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-2.52	212.75	0	212.81	.41	210.3676	1.15	209.5873	1.79	208.1944
2.76	208.3053	6.22	208.4586	9.46	208.462	10.38	208.4193	10.79	208.3452
13.38	206.2802	15.62	204.4447	16.69	203.3499	18.11	203.2365	19.75	203.2237
22.31	203.3355	22.66	207.0191	22.84	206.9935	22.93	206.4604	24.53	206.9468
26.47	207.1138	28.44	207.3876	29.08	208.074	29.12	209.5257	29.63	209.0161
30.67	208.7573	34.27	214.25						

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
-2.52	.06	16.69	.03	22.66	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
16.69	22.66	16.45	17.16	18.76	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 6 Profile # Storm Event

* E.G. Elev (m)	* 207.17	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 2.51	* Wt. n-Val	* 0.060	* 0.030	*
* W.S. Elev (m)	* 204.66	* Reach Len. (m)	* 16.45	* 17.16	* 18.76 *
* Crit W.S. (m)	* 205.43	* Flow Area (m2)	* 0.84	* 7.91	*
* E.G. Slope (m/m)	* 0.038376	* Area (m2)	* 0.84	* 7.91	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 1.62	* 56.29	*
* Top Width (m)	* 7.08	* Top Width (m)	* 1.33	* 5.75	*
* Vel Total (m/s)	* 6.61	* Avg. Vel. (m/s)	* 1.92	* 7.11	*
* Max Chl Dpth (m)	* 1.44	* Hydr. Depth (m)	* 0.63	* 1.38	*
* Conv. Total (m3/s)	* 295.6	* Conv. (m3/s)	* 8.3	* 287.4	*
* Length Wtd. (m)	* 17.15	* Wetted Per. (m)	* 1.87	* 6.96	*
* Min Ch El (m)	* 203.22	* Shear (N/sq m)	* 169.67	* 427.80	*
* Alpha	* 1.13	* Stream Power (N/m s)	* 325.71	* 3042.65	*
* Frctn Loss (m)	* 3.47	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00 *
* C & E Loss (m)	* 0.03	* Cum SA (1000 m2)	* 0.03	* 0.43	* 0.01 *

CROSS SECTION OUTPUT Riv Sta: 6 Profile # 25 yr Storm

* E.G. Elev (m)	* 208.38	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 2.80	* Wt. n-Val	* 0.060	* 0.030	*
* W.S. Elev (m)	* 205.58	* Reach Len. (m)	* 16.45	* 17.16	* 18.76 *
* Crit W.S. (m)	* 206.44	* Flow Area (m2)	* 2.58	* 13.23	*
* E.G. Slope (m/m)	* 0.026121	* Area (m2)	* 2.58	* 13.23	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 5.87	* 100.60	*
* Top Width (m)	* 8.29	* Top Width (m)	* 2.45	* 5.84	*
* Vel Total (m/s)	* 6.74	* Avg. Vel. (m/s)	* 2.28	* 7.61	*
* Max Chl Dpth (m)	* 2.35	* Hydr. Depth (m)	* 1.05	* 2.27	*
* Conv. Total (m3/s)	* 658.8	* Conv. (m3/s)	* 36.3	* 622.5	*

* Length Wtd. (m)	*	17.14	* Wetted Per. (m)	*	3.32	*	7.88	*	*
* Min Ch El (m)	*	203.22	* Shear (N/sq m)	*	199.08	*	429.75	*	*
* Alpha	*	1.21	* Stream Power (N/m s)	*	453.28	*	3268.77	*	*
* Frctn Loss (m)	*	2.86	* Cum Volume (cu m x 10^	*	0.00	*	0.00	*	0.00 *
* C & E Loss (m)	*	0.04	* Cum SA (1000 m2)	*	0.14	*	0.44	*	0.16 *

CROSS SECTION OUTPUT Riv Sta: 6 Profile # 100 yr Storm

* E.G. Elev (m)	*	209.27	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (m)	*	0.55	* Wt. n-Val	*	0.060	*	0.030	*	0.045 *
* W.S. Elev (m)	*	208.72	* Reach Len. (m)	*	16.45	*	17.16	*	18.76 *
* Crit W.S. (m)	*	207.27	* Flow Area (m2)	*	19.27	*	31.90	*	10.55 *
* E.G. Slope (m/m)	*	0.002305	* Area (m2)	*	19.27	*	31.90	*	10.55 *
* Q Total (m3/s)	*	146.26	* Flow (m3/s)	*	16.55	*	116.13	*	13.58 *
* Top Width (m)	*	27.55	* Top Width (m)	*	15.14	*	5.97	*	6.44 *
* Vel Total (m/s)	*	2.37	* Avg. Vel. (m/s)	*	0.86	*	3.64	*	1.29 *
* Max Chl Dpth (m)	*	5.50	* Hydr. Depth (m)	*	1.27	*	5.34	*	1.64 *
* Conv. Total (m3/s)	*	3046.7	* Conv. (m3/s)	*	344.7	*	2419.1	*	282.9 *
* Length Wtd. (m)	*	17.20	* Wetted Per. (m)	*	17.33	*	9.30	*	7.95 *
* Min Ch El (m)	*	203.22	* Shear (N/sq m)	*	25.13	*	77.55	*	29.97 *
* Alpha	*	1.92	* Stream Power (N/m s)	*	21.57	*	282.33	*	38.59 *
* Frctn Loss (m)	*	0.04	* Cum Volume (cu m x 10^	*	0.00	*	0.00	*	0.00 *
* C & E Loss (m)	*	0.03	* Cum SA (1000 m2)	*	0.75	*	0.35	*	1.16 *

CROSS SECTION INPUT   River Station: 7
Description:

Station Elevation Data, num = 23

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0208.7875	.21427	210.73881	079604	208.67022	.178373	208.344	4.11	208.67	
5.260128	208.74587	.792784	208.65110	.67434	208.4699	13.62	208.24	14.86	208.14
16.49	206.6717	.50979	206.54481	8.13289	206.50731	9.04548	206.656	19.8	207.07
20.22923	207.04192	1.02973	207.4089	21.6991	208.15322	3.09247	208.05962	9.22379	208.5845
33.47797	209.13193	6.53079	210.1061	39.68	210.64				

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.05	4.11	.035	13.62	.045	16.49	.035	19.8	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
16.49	19.8	82.23	100.95	103.93	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 7 Profile # Storm Event

* E.G. Elev (m)	*	210.67	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (m)	*	2.20	* Wt. n-Val	*	0.044	*	0.035	*	0.050 *
* W.S. Elev (m)	*	208.47	* Reach Len. (m)	*	82.23	*	100.95	*	103.93 *
* Crit W.S. (m)	*	209.10	* Flow Area (m2)	*	2.48	*	6.05	*	3.53 *
* E.G. Slope (m/m)	*	0.031530	* Area (m2)	*	2.48	*	6.05	*	3.53 *
* Q Total (m3/s)	*	57.91	* Flow (m3/s)	*	6.27	*	44.65	*	6.99 *
* Top Width (m)	*	18.31	* Top Width (m)	*	6.93	*	3.32	*	8.06 *
* Vel Total (m/s)	*	4.80	* Avg. Vel. (m/s)	*	2.53	*	7.38	*	1.98 *
* Max Chl Dpth (m)	*	1.96	* Hydr. Depth (m)	*	0.36	*	1.82	*	0.44 *
* Conv. Total (m3/s)	*	326.1	* Conv. (m3/s)	*	35.3	*	251.5	*	39.4 *
* Length Wtd. (m)	*	99.85	* Wetted Per. (m)	*	7.54	*	3.44	*	8.49 *
* Min Ch El (m)	*	206.51	* Shear (N/sq m)	*	101.53	*	543.06	*	128.62 *
* Alpha	*	1.87	* Stream Power (N/m s)	*	257.23	*	4009.51	*	254.52 *
* Frctn Loss (m)	*	1.90	* Cum Volume (cu m x 10^	*	0.00	*	0.00	*	0.00 *
* C & E Loss (m)	*	0.10	* Cum SA (1000 m2)	*	0.37	*	0.88	*	0.43 *

CROSS SECTION OUTPUT Riv Sta: 7 Profile # 25 yr Storm

* E.G. Elev (m)	*	211.28	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (m)	*	2.39	* Wt. n-Val	*	0.042	*	0.035	*	0.050 *
* W.S. Elev (m)	*	208.88	* Reach Len. (m)	*	82.23	*	100.95	*	103.93 *
* Crit W.S. (m)	*	209.50	* Flow Area (m2)	*	7.58	*	7.43	*	7.72 *
* E.G. Slope (m/m)	*	0.032249	* Area (m2)	*	7.58	*	7.43	*	7.72 *
* Q Total (m3/s)	*	106.47	* Flow (m3/s)	*	22.42	*	63.61	*	20.44 *
* Top Width (m)	*	30.57	* Top Width (m)	*	15.51	*	3.32	*	11.75 *
* Vel Total (m/s)	*	4.68	* Avg. Vel. (m/s)	*	2.96	*	8.56	*	2.65 *
* Max Chl Dpth (m)	*	2.38	* Hydr. Depth (m)	*	0.49	*	2.24	*	0.66 *
* Conv. Total (m3/s)	*	592.9	* Conv. (m3/s)	*	124.8	*	354.2	*	113.8 *
* Length Wtd. (m)	*	98.75	* Wetted Per. (m)	*	16.50	*	3.44	*	12.21 *
* Min Ch El (m)	*	206.51	* Shear (N/sq m)	*	145.37	*	682.25	*	200.09 *
* Alpha	*	2.14	* Stream Power (N/m s)	*	429.87	*	5842.44	*	529.62 *
* Frctn Loss (m)	*	2.31	* Cum Volume (cu m x 10^	*	0.00	*	0.00	*	0.00 *
* C & E Loss (m)	*	0.06	* Cum SA (1000 m2)	*	0.88	*	0.91	*	0.77 *

CROSS SECTION OUTPUT Riv Sta: 7 Profile # 100 yr Storm

* E.G. Elev (m)	*	211.67	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (m)	*	2.58	* Wt. n-Val	*	0.041	*	0.035	*	0.050 *
* W.S. Elev (m)	*	209.09	* Reach Len. (m)	*	82.23	*	100.95	*	103.93 *
* Crit W.S. (m)	*	209.77	* Flow Area (m2)	*	10.78	*	8.11	*	10.30 *
* E.G. Slope (m/m)	*	0.034141	* Area (m2)	*	10.78	*	8.11	*	10.30 *
* Q Total (m3/s)	*	146.26	* Flow (m3/s)	*	39.19	*	75.77	*	31.30 *
* Top Width (m)	*	32.28	* Top Width (m)	*	15.62	*	3.32	*	13.35 *
* Vel Total (m/s)	*	5.01	* Avg. Vel. (m/s)	*	3.63	*	9.34	*	3.04 *
* Max Chl Dpth (m)	*	2.58	* Hydr. Depth (m)	*	0.69	*	2.45	*	0.77 *
* Conv. Total (m3/s)	*	791.6	* Conv. (m3/s)	*	212.1	*	410.0	*	169.4 *
* Length Wtd. (m)	*	96.96	* Wetted Per. (m)	*	17.13	*	3.44	*	13.82 *
* Min Ch El (m)	*	206.51	* Shear (N/sq m)	*	210.74	*	788.57	*	249.65 *
* Alpha	*	2.02	* Stream Power (N/m s)	*	765.97	*	7367.06	*	758.61 *
* Frctn Loss (m)	*	2.57	* Cum Volume (cu m x 10^	*	0.00	*	0.00	*	0.00 *
* C & E Loss (m)	*	0.04	* Cum SA (1000 m2)	*	2.02	*	0.81	*	2.19 *

CROSS SECTION INPUT River Station: 8
Description:

Station Elevation Data, num = 29
```
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*********************************************************************************
       0215.37151.285324214.77533.453222213.08985.454878212.35286.980749211.4865
9.939075211.3167 9.96165211.3192   11.09   211.212.50746209.971412.58304209.4395
   13.37   209.114.30034209.085615.39693209.002716.30222208.9859   16.93  209.13
17.05393210.873617.63135211.1157 18.6113 211.125   24.82   211.2 26.2139211.3859
26.45339211.548429.66253 211.95931.84203212.107734.49661212.1772  37.079212.2144
37.59117212.021737.76519212.140938.41174212.3174   41.08  212.32
```

Mannings n Values, num = 5
```
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0     .08   11.09    .055   13.37    .045   16.93    .035   24.82     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         13.37   16.93            94.04   80.33   68.45             0.1     0.3
```

CROSS SECTION OUTPUT Riv Sta: 8 Profile # Storm Event

E.G. Elev (m)	212.66	Element	Left OB	Channel	Right OB
Vel Head (m)	1.21	Wt. n-Val	0.056	0.045	0.036
W.S. Elev (m)	211.46	Reach Len. (m)	94.04	80.33	68.45
Crit W.S. (m)	211.87	Flow Area (m2)	3.48	8.59	2.83
E.G. Slope (m/m)	0.018293	Area (m2)	3.48	8.59	2.83
Q Total (m3/s)	57.91	Flow (m3/s)	7.45	46.10	4.36
Top Width (m)	18.81	Top Width (m)	5.86	3.56	9.39
Vel Total (m/s)	3.89	Avg. Vel. (m/s)	2.14	5.37	1.54
Max Chl Dpth (m)	2.47	Hydr. Depth (m)	0.59	2.41	0.30
Conv. Total (m3/s)	428.2	Conv. (m3/s)	55.1	340.8	32.3
Length Wtd. (m)	80.79	Wetted Per. (m)	6.86	3.60	11.07
Min Ch El (m)	208.99	Shear (N/sq m)	90.91	427.57	45.84
Alpha	1.57	Stream Power (N/m s)	194.63	2295.47	70.71
Frctn Loss (m)	0.07	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.12	Cum SA (1000 m2)	0.97	1.16	1.02

CROSS SECTION OUTPUT Riv Sta: 8 Profile # 25 yr Storm

E.G. Elev (m)	213.66	Element	Left OB	Channel	Right OB
Vel Head (m)	1.80	Wt. n-Val	0.059	0.045	0.037
W.S. Elev (m)	211.85	Reach Len. (m)	94.04	80.33	68.45
Crit W.S. (m)	212.49	Flow Area (m2)	6.13	10.01	6.98
E.G. Slope (m/m)	0.025671	Area (m2)	6.13	10.01	6.98
Q Total (m3/s)	106.47	Flow (m3/s)	15.77	70.47	20.23
Top Width (m)	22.52	Top Width (m)	7.04	3.56	11.92
Vel Total (m/s)	4.60	Avg. Vel. (m/s)	2.57	7.04	2.90
Max Chl Dpth (m)	2.87	Hydr. Depth (m)	0.87	2.81	0.59
Conv. Total (m3/s)	664.5	Conv. (m3/s)	98.4	439.8	126.2
Length Wtd. (m)	80.52	Wetted Per. (m)	8.13	3.60	13.65
Min Ch El (m)	208.99	Shear (N/sq m)	189.88	699.22	128.79
Alpha	1.67	Stream Power (N/m s)	488.04	4924.52	372.97
Frctn Loss (m)	0.08	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.04	Cum SA (1000 m2)	1.94	1.18	1.58

CROSS SECTION OUTPUT Riv Sta: 8 Profile # 100 yr Storm

E.G. Elev (m)	214.29	Element	Left OB	Channel	Right OB
Vel Head (m)	2.19	Wt. n-Val	0.061	0.045	0.038
W.S. Elev (m)	212.09	Reach Len. (m)	94.04	80.33	68.45
Crit W.S. (m)	212.79	Flow Area (m2)	7.85	10.85	10.09
E.G. Slope (m/m)	0.030048	Area (m2)	7.85	10.85	10.09
Q Total (m3/s)	146.26	Flow (m3/s)	22.99	87.25	36.02
Top Width (m)	25.98	Top Width (m)	7.45	3.56	14.96
Vel Total (m/s)	5.08	Avg. Vel. (m/s)	2.93	8.04	3.57
Max Chl Dpth (m)	3.11	Hydr. Depth (m)	1.05	3.04	0.67
Conv. Total (m3/s)	843.8	Conv. (m3/s)	132.6	503.4	207.8
Length Wtd. (m)	80.51	Wetted Per. (m)	8.61	3.60	16.74
Min Ch El (m)	208.99	Shear (N/sq m)	268.53	887.40	177.66
Alpha	1.67	Stream Power (N/m s)	786.31	7136.39	633.99
Frctn Loss (m)	0.10	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.04	Cum SA (1000 m2)	3.10	1.09	3.15

CROSS SECTION INPUT River Station: 9
Description:

Station Elevation Data, num = 31
```
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*********************************************************************************
       0 215.8583.084844213.27725.463642212.78136.583435211.7813    7.44  211.51
8.630728   211.39.576559211.32019.582573 211.324   10.54  211.04 10.5933210.5014
11.29503210.215812.06506209.883612.27497209.5078   12.83  209.1314.32312209.0585
15.43845209.050615.83599209.1088   16.65  209.14 16.7218210.873317.22359211.1301
18.26206211.1119 22.7997211.205826.54423  211.5629.79263212.1952   30.97  212.36
33.40057212.4317 36.3181212.4668 36.5598212.445436.82825212.228737.33619212.4518
    40.5  212.51
```

Mannings n Values, num = 6
```
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0    .065    7.44    .045   10.54     .05   12.83     .04   16.65    .045   30.97    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         12.83   16.65             3.62    3.53    3.66             0.1     0.3
```

CROSS SECTION OUTPUT Riv Sta: 9 Profile # Storm Event

E.G. Elev (m)	212.86	Element	Left OB	Channel	Right OB
Vel Head (m)	1.62	Wt. n-Val	0.050	0.040	0.045
W.S. Elev (m)	211.24	Reach Len. (m)	3.62	3.53	3.66
Crit W.S. (m)	211.84	Flow Area (m2)	3.02	8.21	0.68
E.G. Slope (m/m)	0.021286	Area (m2)	3.02	8.21	0.68
Q Total (m3/s)	57.91	Flow (m3/s)	8.15	49.33	0.43
Top Width (m)	13.26	Top Width (m)	2.96	3.82	6.48
Vel Total (m/s)	4.86	Avg. Vel. (m/s)	2.70	6.01	0.62
Max Chl Dpth (m)	2.19	Hydr. Depth (m)	1.02	2.15	0.11
Conv. Total (m3/s)	396.9	Conv. (m3/s)	55.9	338.1	2.9
Length Wtd. (m)	3.55	Wetted Per. (m)	3.94	3.87	8.16
Min Ch El (m)	209.05	Shear (N/sq m)	160.02	442.59	17.51
Alpha	1.35	Stream Power (N/m s)	432.32	2659.88	10.88
Frctn Loss (m)	3.61	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	1.06	Cum SA (1000 m2)	0.98	1.17	1.05

CROSS SECTION OUTPUT Riv Sta: 9 Profile # 25 yr Storm

E.G. Elev (m)	213.78	Element	Left OB	Channel	Right OB
Vel Head (m)	1.94	Wt. n-Val	0.049	0.040	0.045
W.S. Elev (m)	211.84	Reach Len. (m)	3.62	3.53	3.66
Crit W.S. (m)	212.53	Flow Area (m2)	6.12	10.49	6.24
E.G. Slope (m/m)	0.021688	Area (m2)	6.12	10.49	6.24
Q Total (m3/s)	106.47	Flow (m3/s)	19.02	74.95	12.51
Top Width (m)	21.43	Top Width (m)	6.31	3.82	11.30
Vel Total (m/s)	4.66	Avg. Vel. (m/s)	3.10	7.14	2.00
Max Chl Dpth (m)	2.78	Hydr. Depth (m)	0.97	2.75	0.55
Conv. Total (m3/s)	723.0	Conv. (m3/s)	129.1	508.9	84.9
Length Wtd. (m)	3.56	Wetted Per. (m)	7.38	3.87	13.02
Min Ch El (m)	209.05	Shear (N/sq m)	176.42	576.32	101.94
Alpha	1.76	Stream Power (N/m s)	547.79	4117.37	204.30
Frctn Loss (m)	2.76	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.63	Cum SA (1000 m2)	1.97	1.19	1.63

CROSS SECTION OUTPUT Riv Sta: 9 Profile # 100 yr Storm

E.G. Elev (m)	214.42	Element	Left OB	Channel	Right OB
Vel Head (m)	2.32	Wt. n-Val	0.049	0.040	0.045
W.S. Elev (m)	212.10	Reach Len. (m)	3.62	3.53	3.66
Crit W.S. (m)	212.87	Flow Area (m2)	7.84	11.51	9.43
E.G. Slope (m/m)	0.024626	Area (m2)	7.84	11.51	9.43
Q Total (m3/s)	146.26	Flow (m3/s)	28.29	93.17	24.79
Top Width (m)	23.09	Top Width (m)	6.61	3.82	12.66
Vel Total (m/s)	5.08	Avg. Vel. (m/s)	3.61	8.10	2.63
Max Chl Dpth (m)	3.05	Hydr. Depth (m)	1.19	3.01	0.74
Conv. Total (m3/s)	932.0	Conv. (m3/s)	180.3	593.7	158.0
Length Wtd. (m)	3.57	Wetted Per. (m)	7.78	3.87	14.41
Min Ch El (m)	209.05	Shear (N/sq m)	243.40	717.80	158.06
Alpha	1.76	Stream Power (N/m s)	877.96	5811.99	415.52
Frctn Loss (m)	2.76	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.57	Cum SA (1000 m2)	3.13	1.10	3.21

CROSS SECTION INPUT   River Station: 10
Description:

Station Elevation Data, num = 31

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	218.41	203922	217.47	434.890458	216.1122	9.31662	213.525	610.64234	213.0977
11.83832	213.194	13.31	212.06	14.17593	211.386	214.38012	211.320	714.75462	210.9647
15.13515	210.941	515.26982	211.32	515.50537	211.950	416.22754	211.576	419.81476	211.667
20.22	211.98	21.03422	212.56	3421.64391	211.79	522.00354	211.988	522.31583	212.9438
22.69514	213.0011	23.9176	214.36	7827.10362	217.30	1228.86843	218.678	929.97692	218.8874
30.77125	219.040	133.79697	219.14	7136.25894	219.186	436.71571	219.194	637.20233	218.81
37.80044	219.2102								

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	13.31	.04	20.22	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
13.31	20.22	71.06	68.99	67.18	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 10 Profile # Storm Event

E.G. Elev (m)	217.53	Element	Left OB	Channel	Right OB
Vel Head (m)	5.14	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	212.38	Reach Len. (m)	71.06	68.99	67.18
Crit W.S. (m)	213.47	Flow Area (m2)	0.07	5.54	0.45
E.G. Slope (m/m)	0.278890	Area (m2)	0.07	5.54	0.45
Q Total (m3/s)	57.91	Flow (m3/s)	0.15	56.38	1.38
Top Width (m)	8.85	Top Width (m)	0.42	6.91	1.52
Vel Total (m/s)	9.55	Avg. Vel. (m/s)	2.24	10.17	3.03
Max Chl Dpth (m)	1.44	Hydr. Depth (m)	0.16	0.80	0.30
Conv. Total (m3/s)	109.7	Conv. (m3/s)	0.3	106.8	2.6
Length Wtd. (m)	69.11	Wetted Per. (m)	0.53	8.20	2.27
Min Ch El (m)	210.94	Shear (N/sq m)	350.53	1849.41	546.81
Alpha	1.11	Stream Power (N/m s)	784.26	18810.64	1658.71
Frctn Loss (m)	4.21	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.44	Cum SA (1000 m2)	1.10	1.54	1.32

CROSS SECTION OUTPUT Riv Sta: 10 Profile # 25 yr Storm

E.G. Elev (m)	217.16	Element	Left OB	Channel	Right OB
Vel Head (m)	4.05	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	213.12	Reach Len. (m)	71.06	68.99	67.18
Crit W.S. (m)	214.22	Flow Area (m2)	0.72	10.60	1.96
E.G. Slope (m/m)	0.097048	Area (m2)	0.72	10.60	1.96

* Q Total (m3/s)	*	106.47	* Flow (m3/s)	*	2.10	* 97.97	* 6.40	*
* Top Width (m)	*	11.13	* Top Width (m)	*	1.64	* 6.91	* 2.58	*
* Vel Total (m/s)	*	8.01	* Avg. Vel. (m/s)	*	2.89	* 9.24	* 3.26	*
* Max Chl Dpth (m)	*	2.17	* Hydr. Depth (m)	*	0.44	* 1.53	* 0.76	*
* Conv. Total (m3/s)	*	341.8	* Conv. (m3/s)	*	6.7	* 314.5	* 20.5	*
* Length Wtd. (m)	*	69.03	* Wetted Per. (m)	*	2.01	* 8.20	* 3.93	*
* Min Ch El (m)	*	210.94	* Shear (N/sq m)	*	344.03	* 1230.55	* 474.42	*
* Alpha	*	1.24	* Stream Power (N/m s)	*	995.49	* 11374.23	* 1548.57	*
* Frctn Loss (m)	*	6.15	* Cum Volume (cu m x 10^	*	0.00	* 0.00	* 0.00	*
* C & E Loss (m)	*	0.22	* Cum SA (1000 m2)	*	2.25	* 1.57	* 2.09	*

CROSS SECTION OUTPUT Riv Sta: 10 Profile # 100 yr Storm

* E.G. Elev (m)	*	217.75	* Element	*	Left OB	* Channel	* Right OB	*
* Vel Head (m)	*	4.22	* Wt. n-Val	*	0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	*	213.53	* Reach Len. (m)	*	71.06	* 68.99	* 67.18	*
* Crit W.S. (m)	*	214.73	* Flow Area (m2)	*	2.08	* 13.47	* 3.11	*
* E.G. Slope (m/m)	*	0.076033	* Area (m2)	*	2.08	* 13.47	* 3.11	*
* Q Total (m3/s)	*	146.26	* Flow (m3/s)	*	5.76	* 129.32	* 11.18	*
* Top Width (m)	*	13.86	* Top Width (m)	*	4.00	* 6.91	* 2.95	*
* Vel Total (m/s)	*	7.84	* Avg. Vel. (m/s)	*	2.76	* 9.60	* 3.60	*
* Max Chl Dpth (m)	*	2.59	* Hydr. Depth (m)	*	0.52	* 1.95	* 1.05	*
* Conv. Total (m3/s)	*	530.4	* Conv. (m3/s)	*	20.9	* 469.0	* 40.6	*
* Length Wtd. (m)	*	69.01	* Wetted Per. (m)	*	4.46	* 8.20	* 4.49	*
* Min Ch El (m)	*	210.94	* Shear (N/sq m)	*	347.92	* 1225.33	* 516.24	*
* Alpha	*	1.35	* Stream Power (N/m s)	*	961.91	* 11762.70	* 1856.74	*
* Frctn Loss (m)	*	6.59	* Cum Volume (cu m x 10^	*	0.00	* 0.01	* 0.00	*
* C & E Loss (m)	*	0.16	* Cum SA (1000 m2)	*	3.50	* 1.47	* 3.73	*

CROSS SECTION INPUT   River Station: 11
Description:

Station Elevation Data, num = 22

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	225.57	.93791223.91781.994609223.23143.045831223.6404		3.93	223.8				
7.847894223.749911.32795223.6084		13.03	223.4213.62081223.274414.99833221.8147						
17.7	220.78	18.63	220.1720.21613219.082121.63054218.830123.22597219.0782						
24.36	220.226.77909220.423627.70081220.840228.61955220.905232.20862223.2326								
35.77722225.4616		39.46	228.6						

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.06	3.93	.035	13.03	.045	18.63	.035	24.36	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
18.63	24.36	158.51	165.96	168.44	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 11 Profile # Storm Event

* E.G. Elev (m)	*	222.18	* Element	*	Left OB	* Channel	* Right OB	*
* Vel Head (m)	*	0.75	* Wt. n-Val	*	0.045	* 0.035	* 0.060	*
* W.S. Elev (m)	*	221.43	* Reach Len. (m)	*	158.51	* 165.96	* 168.44	*
* Crit W.S. (m)	*	221.43	* Flow Area (m2)	*	1.45	* 12.36	* 4.18	*
* E.G. Slope (m/m)	*	0.008799	* Area (m2)	*	1.45	* 12.36	* 4.18	*
* Q Total (m3/s)	*	57.91	* Flow (m3/s)	*	1.88	* 50.47	* 5.56	*
* Top Width (m)	*	13.44	* Top Width (m)	*	2.63	* 5.73	* 5.07	*
* Vel Total (m/s)	*	3.22	* Avg. Vel. (m/s)	*	1.30	* 4.08	* 1.33	*
* Max Chl Dpth (m)	*	2.60	* Hydr. Depth (m)	*	0.55	* 2.16	* 0.82	*
* Conv. Total (m3/s)	*	617.3	* Conv. (m3/s)	*	20.1	* 538.0	* 59.3	*
* Length Wtd. (m)	*	165.98	* Wetted Per. (m)	*	2.94	* 6.57	* 5.33	*
* Min Ch El (m)	*	218.83	* Shear (N/sq m)	*	42.52	* 162.34	* 67.65	*
* Alpha	*	1.42	* Stream Power (N/m s)	*	55.29	* 663.04	* 89.94	*
* Frctn Loss (m)	*	1.79	* Cum Volume (cu m x 10^	*	0.00	* 0.00	* 0.00	*
* C & E Loss (m)	*	0.01	* Cum SA (1000 m2)	*	1.35	* 2.59	* 1.88	*

CROSS SECTION OUTPUT Riv Sta: 11 Profile # 25 yr Storm

* E.G. Elev (m)	*	223.53	* Element	*	Left OB	* Channel	* Right OB	*
* Vel Head (m)	*	1.86	* Wt. n-Val	*	0.045	* 0.035	* 0.060	*
* W.S. Elev (m)	*	221.67	* Reach Len. (m)	*	158.51	* 165.96	* 168.44	*
* Crit W.S. (m)	*	222.23	* Flow Area (m2)	*	2.16	* 13.74	* 5.45	*
* E.G. Slope (m/m)	*	0.019423	* Area (m2)	*	2.16	* 13.74	* 5.45	*
* Q Total (m3/s)	*	106.47	* Flow (m3/s)	*	4.75	* 89.53	* 12.19	*
* Top Width (m)	*	14.44	* Top Width (m)	*	3.27	* 5.73	* 5.45	*
* Vel Total (m/s)	*	4.98	* Avg. Vel. (m/s)	*	2.20	* 6.51	* 2.24	*
* Max Chl Dpth (m)	*	2.84	* Hydr. Depth (m)	*	0.66	* 2.40	* 1.00	*
* Conv. Total (m3/s)	*	764.0	* Conv. (m3/s)	*	34.1	* 642.4	* 87.5	*
* Length Wtd. (m)	*	165.94	* Wetted Per. (m)	*	3.61	* 6.57	* 5.78	*
* Min Ch El (m)	*	218.83	* Shear (N/sq m)	*	113.91	* 398.55	* 179.81	*
* Alpha	*	1.47	* Stream Power (N/m s)	*	250.42	* 2596.12	* 401.97	*
* Frctn Loss (m)	*	0.29	* Cum Volume (cu m x 10^	*	0.00	* 0.01	* 0.00	*
* C & E Loss (m)	*	0.04	* Cum SA (1000 m2)	*	2.64	* 2.61	* 2.77	*

CROSS SECTION OUTPUT Riv Sta: 11 Profile # 100 yr Storm

* E.G. Elev (m)	*	224.51	* Element	*	Left OB	* Channel	* Right OB	*
* Vel Head (m)	*	2.58	* Wt. n-Val	*	0.045	* 0.035	* 0.060	*
* W.S. Elev (m)	*	221.93	* Reach Len. (m)	*	158.51	* 165.96	* 168.44	*
* Crit W.S. (m)	*	222.73	* Flow Area (m2)	*	3.07	* 15.20	* 6.89	*
* E.G. Slope (m/m)	*	0.024309	* Area (m2)	*	3.07	* 15.20	* 6.89	*
* Q Total (m3/s)	*	146.26	* Flow (m3/s)	*	8.66	* 118.48	* 19.12	*
* Top Width (m)	*	15.31	* Top Width (m)	*	3.74	* 5.73	* 5.84	*
* Vel Total (m/s)	*	5.81	* Avg. Vel. (m/s)	*	2.83	* 7.79	* 2.77	*
* Max Chl Dpth (m)	*	3.10	* Hydr. Depth (m)	*	0.82	* 2.65	* 1.18	*
* Conv. Total (m3/s)	*	938.1	* Conv. (m3/s)	*	55.6	* 759.9	* 122.6	*
* Length Wtd. (m)	*	165.85	* Wetted Per. (m)	*	4.16	* 6.57	* 6.25	*
* Min Ch El (m)	*	218.83	* Shear (N/sq m)	*	175.59	* 551.71	* 263.00	*

```
* Alpha               *     1.50 * Stream Power (N/m s)   *   496.20 *  4299.96 *   729.78 *
* Frctn Loss (m)      *     0.30 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.00 *
* C & E Loss (m)      *     0.08 * Cum SA (1000 m2)       *     4.12 *     2.52 *     4.47 *
*********************************************************************************************

CROSS SECTION INPUT    River Station: 12
Description:

Station Elevation Data,  num = 40
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*********************************************************************************
       0  224.73.8869096224.04581.413134223.87511.706258223.86782.356852224.0687
    4.41  224.228.357019224.1738   13.65  224.0414.27254224.041914.66619224.1845
   15.49  224.88   15.54  224.18   15.57  220.32   15.71  219.3615.72378219.5503
   16.47  219.49   17.41  219.3918.23306219.5302   19.14  219.58   19.27  219.77
19.71636219.5848   20.21   219.4   21.42  219.59   22.58  219.68   22.64  220.14
 22.9321 223.59523.04826223.789523.05409223.9611   23.56  224.1226.36497224.2132
26.95822223.8078 27.4561 224.03328.15349224.526830.86475225.039531.73803225.6152
33.29329225.932836.90734 226.39840.27699226.526641.76029226.6686   43.21  227.54

Mannings n Values,  num = 6
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0     .06    4.41    .035   13.65    .045   15.71     .04   22.58    .045   23.56     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         15.71   22.58             19.35   19.25   19.14             0.1     0.3


BRIDGE INPUT River Station: 12.5
Description:
Distance from Upstream XS = 1
Deck/Roadway Width        = 19
Weir Coefficient          = 1.39
Bridge Deck/Roadway Skew  =

Upstream Deck/Roadway Coordinates,  num = 12
    Sta. Hi Cord Lo Cord    Sta. Hi Cord Lo Cord    Sta. Hi Cord Lo Cord
*********************************************************************************
   12.21  224.16           12.29224.1599  220.82   13.21224.1587  222.25
   14.58224.1569  222.95   15.48224.1558     223   16.05 224.155  223.16
   16.57224.1543  223.16   17.68224.1529  222.97   18.61224.1517  222.55
   19.41224.1506  221.95   19.87224.1501  220.32   19.91  224.15

Upstream Bridge Cross Section Data
Station Elevation Data,  num = 30
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*********************************************************************************
       0  226.95 .972674225.47781.925423225.91975.057775225.88967.061209225.0279
     8.2   224.4 10.2164224.185111.83765224.1357   12.21  224.16   12.29  220.82
12.92667220.4855   13.21  219.9413.85819219.9115   14.58  219.75   15.48  219.71
   16.05  219.67   16.57   219.8   17.68  219.87   18.61  219.87   19.41  219.94
19.45376220.1523   19.87  220.32   19.91  224.1520.37635224.147321.03574 223.987
28.40988224.0388 34.0414224.0303   37.65  224.1138.65546224.4354   40.39  226.19

Mannings n Values,  num = 5
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0     .06     8.2    .045   13.21     .04   19.41    .045   37.65     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         13.21   19.41             21.44   21.78   21.52             0.1     0.3


Downstream Deck/Roadway Coordinates,  num = 9
    Sta. Hi Cord Lo Cord    Sta. Hi Cord Lo Cord    Sta. Hi Cord Lo Cord
*********************************************************************************
   15.54  224.18           15.57224.1798  220.32   16.47 224.173  222.12
   17.41 224.166  222.75   19.14224.1531  223.16   20.21224.1451  223.02
   21.42 224.136  222.45   22.64224.1269  220.14   23.56  224.12


Downstream Bridge Cross Section Data
Station Elevation Data,  num = 40
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*********************************************************************************
       0  224.73.8869096224.04581.413134223.87511.706258223.86782.356852224.0687
    4.41  224.228.357019224.1738   13.65  224.0414.27254224.041914.66619224.1845
   15.49  224.88   15.54  224.18   15.57  220.32   15.71  219.3615.72378219.5503
   16.47  219.49   17.41  219.3918.23306219.5302   19.14  219.58   19.27  219.77
19.71636219.5848   20.21   219.4   21.42  219.59   22.58  219.68   22.64  220.14
 22.9321 223.59523.04826223.789523.05409223.9611   23.56  224.1226.36497224.2132
26.95822223.8078 27.4561 224.03328.15349224.526830.86475225.039531.73803225.6152
33.29329225.932836.90734 226.39840.27699226.526641.76029226.6686   43.21  227.54

Mannings n Values,  num = 6
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0     .06    4.41    .035   13.65    .045   15.71     .04   22.58    .045   23.56     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         15.71   22.58             19.35   19.25   19.14             0.1     0.3

Elevation at which weir flow begins         =
Maximum allowable submergence for weir flow = 0.95
Submergence criteria : Broad Crested

Number of Bridge Coefficient Sets = 1

CROSS SECTION OUTPUT  Riv Sta: 12  Profile # Storm Event
*********************************************************************************************
* E.G. Elev (m)       *   222.48 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.26 * Wt. n-Val             *    0.045 *    0.040 *    0.045 *
* W.S. Elev (m)       *   221.22 * Reach Len. (m)        *    19.35 *    19.25 *    19.14 *
```

* Crit W.S. (m)	* 221.46	* Flow Area (m2)	* 0.20	* 11.58	* 0.12	*
* E.G. Slope (m/m)	* 0.021261	* Area (m2)	* 0.20	* 11.58	* 0.12	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 0.15	* 57.69	* 0.08	*
* Top Width (m)	* 7.17	* Top Width (m)	* 0.15	* 6.87	* 0.15	*
* Vel Total (m/s)	* 4.87	* Avg. Vel. (m/s)	* 0.73	* 4.98	* 0.61	*
* Max Chl Dpth (m)	* 1.86	* Hydr. Depth (m)	* 1.34	* 1.69	* 0.84	*
* Conv. Total (m3/s)	* 397.2	* Conv. (m3/s)	* 1.0	* 395.6	* 0.5	*
* Length Wtd. (m)	* 19.25	* Wetted Per. (m)	* 1.90	* 7.24	* 1.53	*
* Min Ch El (m)	* 219.36	* Shear (N/sq m)	* 21.97	* 333.39	* 17.00	*
* Alpha	* 1.04	* Stream Power (N/m s)	* 15.94	* 1661.40	* 10.35	*
* Frctn Loss (m)	*	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00	*
* C & E Loss (m)	*	* Cum SA (1000 m2)	* 1.37	* 2.71	* 1.93	*

CROSS SECTION OUTPUT Riv Sta: 12 Profile # 25 yr Storm

* E.G. Elev (m)	* 223.87	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 1.45	* Wt. n-Val	* 0.045	* 0.040	* 0.045	*
* W.S. Elev (m)	* 222.42	* Reach Len. (m)	* 19.35	* 19.25	* 19.14	*
* Crit W.S. (m)	* 222.42	* Flow Area (m2)	* 0.39	* 19.84	* 0.37	*
* E.G. Slope (m/m)	* 0.011921	* Area (m2)	* 0.39	* 19.84	* 0.37	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 0.23	* 106.00	* 0.23	*
* Top Width (m)	* 7.28	* Top Width (m)	* 0.16	* 6.87	* 0.25	*
* Vel Total (m/s)	* 5.17	* Avg. Vel. (m/s)	* 0.61	* 5.34	* 0.63	*
* Max Chl Dpth (m)	* 3.06	* Hydr. Depth (m)	* 2.43	* 2.89	* 1.46	*
* Conv. Total (m3/s)	* 975.1	* Conv. (m3/s)	* 2.1	* 970.9	* 2.1	*
* Length Wtd. (m)	* 19.25	* Wetted Per. (m)	* 3.10	* 7.24	* 2.74	*
* Min Ch El (m)	* 219.36	* Shear (N/sq m)	* 14.52	* 320.34	* 15.61	*
* Alpha	* 1.06	* Stream Power (N/m s)	* 8.82	* 1711.82	* 9.89	*
* Frctn Loss (m)	* 0.19	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00	*
* C & E Loss (m)	* 0.14	* Cum SA (1000 m2)	* 2.67	* 2.74	* 2.82	*

CROSS SECTION OUTPUT Riv Sta: 12 Profile # 100 yr Storm

* E.G. Elev (m)	* 224.89	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 1.79	* Wt. n-Val	* 0.045	* 0.040	* 0.045	*
* W.S. Elev (m)	* 223.10	* Reach Len. (m)	* 19.35	* 19.25	* 19.14	*
* Crit W.S. (m)	* 223.10	* Flow Area (m2)	* 0.49	* 24.52	* 0.56	*
* E.G. Slope (m/m)	* 0.011093	* Area (m2)	* 0.49	* 24.52	* 0.56	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 0.30	* 145.57	* 0.39	*
* Top Width (m)	* 7.34	* Top Width (m)	* 0.16	* 6.87	* 0.31	*
* Vel Total (m/s)	* 5.72	* Avg. Vel. (m/s)	* 0.61	* 5.94	* 0.70	*
* Max Chl Dpth (m)	* 3.74	* Hydr. Depth (m)	* 3.02	* 3.57	* 1.80	*
* Conv. Total (m3/s)	* 1388.7	* Conv. (m3/s)	* 2.9	* 1382.1	* 3.7	*
* Length Wtd. (m)	* 19.25	* Wetted Per. (m)	* 3.78	* 7.24	* 3.42	*
* Min Ch El (m)	* 219.36	* Shear (N/sq m)	* 14.24	* 368.45	* 17.68	*
* Alpha	* 1.07	* Stream Power (N/m s)	* 8.66	* 2187.43	* 12.33	*
* Frctn Loss (m)	* 0.18	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00	*
* C & E Loss (m)	* 0.19	* Cum SA (1000 m2)	* 4.16	* 2.64	* 4.53	*

CROSS SECTION INPUT River Station: 13
Description:

Station Elevation Data, num = 30

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	226.95	.972674225.47781	.925423225.91975	.057775225.88967	.061209225.0279				
8.2	224.4	10.2164224.185111	.83765224.1357	12.21	224.16	12.29	220.82		
12.92667220.4855		13.21	219.9413	.85819219.9115		14.58	219.75	15.48	219.71
16.05	219.67	16.57	219.8	17.68	219.87	18.61	219.87	19.41	219.94
19.45376220.1523		19.87	220.32	19.91	224.1520.37635224	.147321.03574		223.987	
28.40988224.0388		34.0414224.0303		37.65	224.1138.65546224	.4354		40.39	226.19

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.06	8.2	.045	13.21	.04	19.41	.045	37.65	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
13.21	19.41	21.44	21.78	21.52	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 13 Profile # Storm Event

* E.G. Elev (m)	* 222.83	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.74	* Wt. n-Val	* 0.045	* 0.040	* 0.045	*
* W.S. Elev (m)	* 222.09	* Reach Len. (m)	* 1.00	* 1.00	* 1.00	*
* Crit W.S. (m)	* 221.80	* Flow Area (m2)	* 1.47	* 14.09	* 0.87	*
* E.G. Slope (m/m)	* 0.008246	* Area (m2)	* 1.47	* 14.09	* 0.87	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 2.04	* 54.97	* 0.89	*
* Top Width (m)	* 7.63	* Top Width (m)	* 0.95	* 6.20	* 0.48	*
* Vel Total (m/s)	* 3.52	* Avg. Vel. (m/s)	* 1.39	* 3.90	* 1.02	*
* Max Chl Dpth (m)	* 2.42	* Hydr. Depth (m)	* 1.55	* 2.27	* 1.84	*
* Conv. Total (m3/s)	* 637.7	* Conv. (m3/s)	* 22.5	* 605.4	* 9.8	*
* Length Wtd. (m)	* 1.00	* Wetted Per. (m)	* 2.61	* 6.25	* 2.43	*
* Min Ch El (m)	* 219.67	* Shear (N/sq m)	* 45.70	* 182.29	* 29.12	*
* Alpha	* 1.17	* Stream Power (N/m s)	* 63.31	* 711.34	* 29.75	*
* Frctn Loss (m)	*	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00	*
* C & E Loss (m)	*	* Cum SA (1000 m2)	* 1.38	* 2.85	* 1.93	*

CROSS SECTION OUTPUT Riv Sta: 13 Profile # 25 yr Storm

* E.G. Elev (m)	* 224.89	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.66	* Wt. n-Val	* 0.044	* 0.040	* 0.045	*
* W.S. Elev (m)	* 224.22	* Reach Len. (m)	* 1.00	* 1.00	* 1.00	*
* Crit W.S. (m)	* 222.77	* Flow Area (m2)	* 3.70	* 27.29	* 5.26	*
* E.G. Slope (m/m)	* 0.003071	* Area (m2)	* 3.70	* 27.29	* 5.26	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 2.99	* 101.02	* 2.46	*
* Top Width (m)	* 28.15	* Top Width (m)	* 3.36	* 6.20	* 18.59	*
* Vel Total (m/s)	* 2.94	* Avg. Vel. (m/s)	* 0.81	* 3.70	* 0.47	*
* Max Chl Dpth (m)	* 4.55	* Hydr. Depth (m)	* 1.10	* 4.40	* 0.28	*

* Conv. Total (m3/s)	* 1921.4	* Conv. (m3/s)	* 54.0	* 1823.0	* 44.4	*
* Length Wtd. (m)	* 1.00	* Wetted Per. (m)	* 7.04	* 6.25	* 22.62	*
* Min Ch El (m)	* 219.67	* Shear (N/sq m)	* 15.82	* 131.53	* 7.00	*
* Alpha	* 1.51	* Stream Power (N/m s)	* 12.79	* 486.77	* 3.28	*
* Frctn Loss (m)	*	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00	*
* C & E Loss (m)	*	* Cum SA (1000 m2)	* 2.85	* 2.88	* 3.07	*

CROSS SECTION OUTPUT Riv Sta: 13 Profile # 100 yr Storm

* E.G. Elev (m)	* 225.42	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 1.39	* Wt. n-Val	* 0.045	* 0.040	* 0.045	*
* W.S. Elev (m)	* 224.03	* Reach Len. (m)	* 1.00	* 1.00	* 1.00	*
* Crit W.S. (m)	* 223.45	* Flow Area (m2)	* 3.36	* 26.07	* 1.93	*
* E.G. Slope (m/m)	* 0.006809	* Area (m2)	* 3.36	* 26.07	* 1.93	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 5.07	* 139.32	* 1.87	*
* Top Width (m)	* 13.43	* Top Width (m)	* 1.00	* 6.20	* 6.24	*
* Vel Total (m/s)	* 4.66	* Avg. Vel. (m/s)	* 1.51	* 5.34	* 0.97	*
* Max Chl Dpth (m)	* 4.36	* Hydr. Depth (m)	* 3.36	* 4.20	* 0.31	*
* Conv. Total (m3/s)	* 1772.5	* Conv. (m3/s)	* 61.5	* 1688.4	* 22.7	*
* Length Wtd. (m)	* 1.00	* Wetted Per. (m)	* 4.54	* 6.25	* 10.11	*
* Min Ch El (m)	* 219.67	* Shear (N/sq m)	* 49.40	* 278.52	* 12.74	*
* Alpha	* 1.25	* Stream Power (N/m s)	* 74.54	* 1488.55	* 12.36	*
* Frctn Loss (m)	*	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00	*
* C & E Loss (m)	*	* Cum SA (1000 m2)	* 4.17	* 2.65	* 4.60	*

CROSS SECTION INPUT River Station: 14
Description:

Station Elevation Data, num = 23

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	226.07	2.25224.7959		4.36	223.42	4.83222.7382		5.09222.0674	
5.19	220.41	7.15220.3894		8.06220.3315		8.48220.2376		9.69220.2322	
10.13	220.344	10.98220.5062		12.01	220.58	13.83221.7077		15.03	223.22
17.23	223.3396	20.09223.4277		22.55223.4823		24.11	223.55	30.07	224.13
31.44	225.25	32.76	225.5	34.27	225.75				

Mannings n Values, num = 6

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.08	4.36	.045	5.19	.04	12.01	.045	15.03	.05	24.11	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5.19	12.01	18.77	18.64	18.17	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 14 Profile # Storm Event

* E.G. Elev (m)	* 223.67	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 2.03	* Wt. n-Val	* 0.045	* 0.040	* 0.045	*
* W.S. Elev (m)	* 221.64	* Reach Len. (m)	* 18.77	* 18.64	* 18.17	*
* Crit W.S. (m)	* 222.25	* Flow Area (m2)	* 0.04	* 8.59	* 0.90	*
* E.G. Slope (m/m)	* 0.049474	* Area (m2)	* 0.04	* 8.59	* 0.90	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 0.02	* 55.27	* 2.61	*
* Top Width (m)	* 8.60	* Top Width (m)	* 0.07	* 6.82	* 1.71	*
* Vel Total (m/s)	* 6.07	* Avg. Vel. (m/s)	* 0.54	* 6.43	* 2.90	*
* Max Chl Dpth (m)	* 1.40	* Hydr. Depth (m)	* 0.59	* 1.26	* 0.53	*
* Conv. Total (m3/s)	* 260.4	* Conv. (m3/s)	* 0.1	* 248.5	* 11.8	*
* Length Wtd. (m)	* 18.62	* Wetted Per. (m)	* 1.19	* 6.90	* 2.01	*
* Min Ch El (m)	* 220.23	* Shear (N/sq m)	* 17.32	* 604.09	* 217.93	*
* Alpha	* 1.08	* Stream Power (N/m s)	* 9.28	* 3884.75	* 632.39	*
* Frctn Loss (m)	* 1.25	* Cum Volume (cu m x 10^	* 0.00	* 0.00	* 0.00	*
* C & E Loss (m)	* 0.14	* Cum SA (1000 m2)	* 1.39	* 2.97	* 1.95	*

CROSS SECTION OUTPUT Riv Sta: 14 Profile # 25 yr Storm

* E.G. Elev (m)	* 224.97	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.27	* Wt. n-Val	* 0.055	* 0.040	* 0.049	*
* W.S. Elev (m)	* 224.70	* Reach Len. (m)	* 18.77	* 18.64	* 18.17	*
* Crit W.S. (m)	* 223.10	* Flow Area (m2)	* 2.95	* 29.49	* 26.28	*
* E.G. Slope (m/m)	* 0.001578	* Area (m2)	* 2.95	* 29.49	* 26.28	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 1.40	* 77.07	* 28.01	*
* Top Width (m)	* 28.37	* Top Width (m)	* 2.79	* 6.82	* 18.76	*
* Vel Total (m/s)	* 1.81	* Avg. Vel. (m/s)	* 0.47	* 2.61	* 1.07	*
* Max Chl Dpth (m)	* 4.47	* Hydr. Depth (m)	* 1.06	* 4.32	* 1.40	*
* Conv. Total (m3/s)	* 2680.3	* Conv. (m3/s)	* 35.2	* 1940.1	* 705.1	*
* Length Wtd. (m)	* 18.58	* Wetted Per. (m)	* 5.51	* 6.90	* 20.05	*
* Min Ch El (m)	* 220.23	* Shear (N/sq m)	* 8.29	* 66.11	* 20.29	*
* Alpha	* 1.60	* Stream Power (N/m s)	* 3.92	* 172.74	* 21.62	*
* Frctn Loss (m)	* 0.04	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00	*
* C & E Loss (m)	* 0.04	* Cum SA (1000 m2)	* 2.91	* 3.00	* 3.41	*

CROSS SECTION OUTPUT Riv Sta: 14 Profile # 100 yr Storm

* E.G. Elev (m)	* 225.58	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.31	* Wt. n-Val	* 0.060	* 0.040	* 0.049	*
* W.S. Elev (m)	* 225.27	* Reach Len. (m)	* 18.77	* 18.64	* 18.17	*
* Crit W.S. (m)	*	* Flow Area (m2)	* 4.82	* 33.38	* 37.18	*
* E.G. Slope (m/m)	* 0.001646	* Area (m2)	* 4.82	* 33.38	* 37.18	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 2.64	* 96.76	* 46.86	*
* Top Width (m)	* 30.14	* Top Width (m)	* 3.78	* 6.82	* 19.54	*
* Vel Total (m/s)	* 1.94	* Avg. Vel. (m/s)	* 0.55	* 2.90	* 1.26	*
* Max Chl Dpth (m)	* 5.04	* Hydr. Depth (m)	* 1.28	* 4.89	* 1.90	*
* Conv. Total (m3/s)	* 3605.6	* Conv. (m3/s)	* 65.0	* 2385.4	* 1155.1	*
* Length Wtd. (m)	* 18.57	* Wetted Per. (m)	* 6.65	* 6.90	* 21.03	*
* Min Ch El (m)	* 220.23	* Shear (N/sq m)	* 11.70	* 78.05	* 28.54	*
* Alpha	* 1.61	* Stream Power (N/m s)	* 6.40	* 226.20	* 35.96	*
* Frctn Loss (m)	* 0.05	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00	*
* C & E Loss (m)	* 0.11	* Cum SA (1000 m2)	* 4.22	* 2.77	* 4.83	*

CROSS SECTION INPUT   River Station: 15
Description:

Station Elevation Data, num = 25

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	228.44	3.69226.2727		5.83223.7749		6.59223.2119		6.64	222.53
7.27222.4173		8.15222.3338		9.05222.2768		9.59	222.43	11.4223.7258	
12.7	223.6	14.51223.6557		14.97223.6923		17.31223.7365		19.8	223.738
20.95223.7112		22.35223.8282		22.38223.9891		22.63223.9891		28.46	224.24
38.74224.3458		43.9	224.37	46.48224.5975		48.38	225.06	51.19	227.25

Mannings n Values, num = 6

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.08	6.64	.035	9.59	.045	12.7	.035	28.46	.045	43.9	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
6.64	9.59	64.74	65.22	66.69	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 15 Profile # Storm Event

* E.G. Elev (m)	* 225.06	* Element	* Left OB	* Channel	* Right OB
* Vel Head (m)	* 0.58	* Wt. n-Val	* 0.080	* 0.036	* 0.038
* W.S. Elev (m)	* 224.47	* Reach Len. (m)	* 64.74	* 65.22	* 66.69
* Crit W.S. (m)	* 224.65	* Flow Area (m2)	* 1.03	* 6.21	* 15.72
* E.G. Slope (m/m)	* 0.010007	* Area (m2)	* 1.03	* 6.21	* 15.72
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 0.71	* 27.90	* 29.29
* Top Width (m)	* 39.86	* Top Width (m)	* 1.41	* 2.95	* 35.50
* Vel Total (m/s)	* 2.52	* Avg. Vel. (m/s)	* 0.69	* 4.49	* 1.86
* Max Chl Dpth (m)	* 2.20	* Hydr. Depth (m)	* 0.73	* 2.10	* 0.44
* Conv. Total (m3/s)	* 578.9	* Conv. (m3/s)	* 7.1	* 278.9	* 292.8
* Length Wtd. (m)	* 65.62	* Wetted Per. (m)	* 2.50	* 3.04	* 36.07
* Min Ch El (m)	* 222.28	* Shear (N/sq m)	* 40.36	* 200.84	* 42.78
* Alpha	* 1.81	* Stream Power (N/m s)	* 27.91	* 901.70	* 79.70
* Frctn Loss (m)	* 2.09	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00
* C & E Loss (m)	* 0.20	* Cum SA (1000 m2)	* 1.43	* 3.29	* 3.19

CROSS SECTION OUTPUT Riv Sta: 15 Profile # 25 yr Storm

* E.G. Elev (m)	* 225.43	* Element	* Left OB	* Channel	* Right OB
* Vel Head (m)	* 0.53	* Wt. n-Val	* 0.080	* 0.036	* 0.039
* W.S. Elev (m)	* 224.90	* Reach Len. (m)	* 64.74	* 65.22	* 66.69
* Crit W.S. (m)	* 224.97	* Flow Area (m2)	* 1.71	* 7.48	* 31.59
* E.G. Slope (m/m)	* 0.008472	* Area (m2)	* 1.71	* 7.48	* 31.59
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 1.33	* 34.94	* 70.20
* Top Width (m)	* 42.87	* Top Width (m)	* 1.77	* 2.95	* 38.14
* Vel Total (m/s)	* 2.61	* Avg. Vel. (m/s)	* 0.78	* 4.67	* 2.22
* Max Chl Dpth (m)	* 2.63	* Hydr. Depth (m)	* 0.96	* 2.53	* 0.83
* Conv. Total (m3/s)	* 1156.8	* Conv. (m3/s)	* 14.5	* 379.6	* 762.7
* Length Wtd. (m)	* 65.90	* Wetted Per. (m)	* 3.07	* 3.04	* 38.76
* Min Ch El (m)	* 222.28	* Shear (N/sq m)	* 46.30	* 204.55	* 67.72
* Alpha	* 1.53	* Stream Power (N/m s)	* 36.07	* 955.81	* 150.48
* Frctn Loss (m)	* 1.89	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00
* C & E Loss (m)	* 0.19	* Cum SA (1000 m2)	* 3.06	* 3.32	* 5.31

CROSS SECTION OUTPUT Riv Sta: 15 Profile # 100 yr Storm

* E.G. Elev (m)	* 225.77	* Element	* Left OB	* Channel	* Right OB
* Vel Head (m)	* 0.37	* Wt. n-Val	* 0.080	* 0.036	* 0.040
* W.S. Elev (m)	* 225.40	* Reach Len. (m)	* 64.74	* 65.22	* 66.69
* Crit W.S. (m)	* 225.19	* Flow Area (m2)	* 2.70	* 8.96	* 51.03
* E.G. Slope (m/m)	* 0.004790	* Area (m2)	* 2.70	* 8.96	* 51.03
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 1.89	* 35.50	* 108.87
* Top Width (m)	* 44.38	* Top Width (m)	* 2.20	* 2.95	* 39.23
* Vel Total (m/s)	* 2.33	* Avg. Vel. (m/s)	* 0.70	* 3.96	* 2.13
* Max Chl Dpth (m)	* 3.13	* Hydr. Depth (m)	* 1.23	* 3.03	* 1.30
* Conv. Total (m3/s)	* 2113.2	* Conv. (m3/s)	* 27.3	* 512.9	* 1573.0
* Length Wtd. (m)	* 66.00	* Wetted Per. (m)	* 3.72	* 3.04	* 39.98
* Min Ch El (m)	* 222.28	* Shear (N/sq m)	* 34.09	* 138.56	* 59.97
* Alpha	* 1.32	* Stream Power (N/m s)	* 23.82	* 549.11	* 127.92
* Frctn Loss (m)	* 0.17	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01
* C & E Loss (m)	* 0.02	* Cum SA (1000 m2)	* 4.41	* 3.09	* 6.79

CROSS SECTION INPUT   River Station: 16
Description:

Station Elevation Data, num = 27

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	230.101	3.07175228.1588		6.49592225.6524		6.89	224.657.669085224.7432		
10.47539224.609410.76424224.537810.88037224.438711.35839224.319511.53273224.5372									
11.64573224.5686		11.99	224.581	3.34657226.072815.05264226.1371		15.75	226.13		
18.00151226.087120.48697 226.00624.21018226.000229.35868225.929533.18551225.9274									
39.18079225.833545.21937225.829854.55428225.7603		60.64	225.896	4.31574226.4787					
66.89444227.4882		70.51	230						

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.08	6.89	.03	11.99	.045	15.75	.035	60.64	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
6.89	11.99	156.7	158.58	159	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 16 Profile # Storm Event

* E.G. Elev (m)	* 227.34	* Element	* Left OB	* Channel	* Right OB

* Vel Head (m)	* 1.24	* Wt. n-Val	* 0.073	* 0.030	* 0.036 *
* W.S. Elev (m)	* 226.10	* Reach Len. (m)	* 156.70	* 158.58	* 159.00 *
* Crit W.S. (m)	* 226.42	* Flow Area (m2)	* 0.52	* 7.53	* 10.55 *
* E.G. Slope (m/m)	* 0.018103	* Area (m2)	* 0.52	* 7.53	* 10.55 *
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 0.40	* 42.84	* 14.67 *
* Top Width (m)	* 52.91	* Top Width (m)	* 1.01	* 5.10	* 46.80 *
* Vel Total (m/s)	* 3.11	* Avg. Vel. (m/s)	* 0.77	* 5.69	* 1.39 *
* Max Chl Dpth (m)	* 1.78	* Hydr. Depth (m)	* 0.51	* 1.48	* 0.23 *
* Conv. Total (m3/s)	* 430.4	* Conv. (m3/s)	* 3.0	* 318.4	* 109.0 *
* Length Wtd. (m)	* 158.72	* Wetted Per. (m)	* 1.84	* 5.28	* 47.48 *
* Min Ch El (m)	* 224.32	* Shear (N/sq m)	* 49.92	* 253.47	* 39.46 *
* Alpha	* 2.52	* Stream Power (N/m s)	* 38.58	* 1441.30	* 54.85 *
* Frctn Loss (m)	* 2.79	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.00 *
* C & E Loss (m)	* 0.01	* Cum SA (1000 m2)	* 1.62	* 3.92	* 9.73 *

CROSS SECTION OUTPUT Riv Sta: 16 Profile # 25 yr Storm

* E.G. Elev (m)	* 227.51	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.16	* Wt. n-Val	* 0.075	* 0.030	* 0.036 *
* W.S. Elev (m)	* 226.35	* Reach Len. (m)	* 156.70	* 158.58	* 159.00 *
* Crit W.S. (m)	* 226.67	* Flow Area (m2)	* 0.81	* 8.80	* 23.14 *
* E.G. Slope (m/m)	* 0.017907	* Area (m2)	* 0.81	* 8.80	* 23.14 *
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 0.72	* 55.25	* 50.50 *
* Top Width (m)	* 57.97	* Top Width (m)	* 1.35	* 5.10	* 51.52 *
* Vel Total (m/s)	* 3.25	* Avg. Vel. (m/s)	* 0.89	* 6.27	* 2.18 *
* Max Chl Dpth (m)	* 2.03	* Hydr. Depth (m)	* 0.60	* 1.73	* 0.45 *
* Conv. Total (m3/s)	* 795.6	* Conv. (m3/s)	* 5.4	* 412.9	* 377.4 *
* Length Wtd. (m)	* 158.80	* Wetted Per. (m)	* 2.26	* 5.28	* 52.22 *
* Min Ch El (m)	* 224.32	* Shear (N/sq m)	* 63.03	* 293.04	* 77.82 *
* Alpha	* 2.15	* Stream Power (N/m s)	* 55.86	* 1838.74	* 169.81 *
* Frctn Loss (m)	* 3.23	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01 *
* C & E Loss (m)	* 0.14	* Cum SA (1000 m2)	* 3.30	* 3.96	* 12.44 *

CROSS SECTION OUTPUT Riv Sta: 16 Profile # 100 yr Storm

* E.G. Elev (m)	* 227.71	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.21	* Wt. n-Val	* 0.076	* 0.030	* 0.036 *
* W.S. Elev (m)	* 226.49	* Reach Len. (m)	* 156.70	* 158.58	* 159.00 *
* Crit W.S. (m)	* 226.85	* Flow Area (m2)	* 1.02	* 9.54	* 30.60 *
* E.G. Slope (m/m)	* 0.018542	* Area (m2)	* 1.02	* 9.54	* 30.60 *
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 0.99	* 64.23	* 81.04 *
* Top Width (m)	* 59.01	* Top Width (m)	* 1.55	* 5.10	* 52.36 *
* Vel Total (m/s)	* 3.55	* Avg. Vel. (m/s)	* 0.97	* 6.73	* 2.65 *
* Max Chl Dpth (m)	* 2.17	* Hydr. Depth (m)	* 0.66	* 1.87	* 0.58 *
* Conv. Total (m3/s)	* 1074.1	* Conv. (m3/s)	* 7.3	* 471.7	* 595.1 *
* Length Wtd. (m)	* 158.86	* Wetted Per. (m)	* 2.51	* 5.28	* 53.08 *
* Min Ch El (m)	* 224.32	* Shear (N/sq m)	* 74.04	* 328.66	* 104.86 *
* Alpha	* 1.89	* Stream Power (N/m s)	* 72.06	* 2213.30	* 277.64 *
* Frctn Loss (m)	* 3.36	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01 *
* C & E Loss (m)	* 0.18	* Cum SA (1000 m2)	* 4.70	* 3.73	* 14.07 *

CROSS SECTION INPUT River Station: 17
Description:

Station Elevation Data, num = 14

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	230.1	0561.1	614812	29.68	172.6	201679	229.4	358	4.17
227.196	259146	227.3	322	8.46	227.4	39.9	765882	28.51	61
11.67	228.6	615.9	02422	28.6	097	18.2	062	9228.6	826
24.324	06	228.6	89	31.99	228.8	936.9	5034	229.2	01
45.87	230.4	3							

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.08	4.17	.035	8.46	.045	11.67	.035	31.99	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
4.17	8.46	153.6	152.88	151.04	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 17 Profile # Storm Event

* E.G. Elev (m)	* 230.15	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.13	* Wt. n-Val	* 0.077	* 0.035	* 0.038 *
* W.S. Elev (m)	* 229.02	* Reach Len. (m)	* 153.60	* 152.88	* 151.04 *
* Crit W.S. (m)	* 229.35	* Flow Area (m2)	* 1.16	* 7.27	* 8.71 *
* E.G. Slope (m/m)	* 0.018558	* Area (m2)	* 1.16	* 7.27	* 8.71 *
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 1.32	* 40.18	* 16.42 *
* Top Width (m)	* 31.13	* Top Width (m)	* 1.27	* 4.29	* 25.57 *
* Vel Total (m/s)	* 3.38	* Avg. Vel. (m/s)	* 1.13	* 5.53	* 1.89 *
* Max Chl Dpth (m)	* 1.83	* Hydr. Depth (m)	* 0.92	* 1.70	* 0.34 *
* Conv. Total (m3/s)	* 425.1	* Conv. (m3/s)	* 9.7	* 294.9	* 120.5 *
* Length Wtd. (m)	* 152.40	* Wetted Per. (m)	* 2.23	* 4.29	* 25.94 *
* Min Ch El (m)	* 227.19	* Shear (N/sq m)	* 94.96	* 308.01	* 61.10 *
* Alpha	* 1.95	* Stream Power (N/m s)	* 107.56	* 1702.42	* 115.22 *
* Frctn Loss (m)	* 2.25	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01 *
* C & E Loss (m)	* 0.04	* Cum SA (1000 m2)	* 1.80	* 4.64	* 15.19 *

CROSS SECTION OUTPUT Riv Sta: 17 Profile # 25 yr Storm

* E.G. Elev (m)	* 230.88	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.62	* Wt. n-Val	* 0.077	* 0.035	* 0.038 *
* W.S. Elev (m)	* 229.26	* Reach Len. (m)	* 153.60	* 152.88	* 151.04 *
* Crit W.S. (m)	* 229.72	* Flow Area (m2)	* 1.49	* 8.30	* 15.33 *
* E.G. Slope (m/m)	* 0.025700	* Area (m2)	* 1.49	* 8.30	* 15.33 *
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 2.15	* 59.02	* 45.30 *
* Top Width (m)	* 34.63	* Top Width (m)	* 1.43	* 4.29	* 28.91 *
* Vel Total (m/s)	* 4.24	* Avg. Vel. (m/s)	* 1.44	* 7.11	* 2.95 *
* Max Chl Dpth (m)	* 2.07	* Hydr. Depth (m)	* 1.04	* 1.94	* 0.53 *
* Conv. Total (m3/s)	* 664.1	* Conv. (m3/s)	* 13.4	* 368.2	* 282.6 *

* Length Wtd. (m)	* 152.06	* Wetted Per. (m)	* 2.52	* 4.29	* 29.29	*
* Min Ch El (m)	* 227.19	* Shear (N/sq m)	* 148.79	* 487.29	* 131.94	*
* Alpha	* 1.77	* Stream Power (N/m s)	* 214.71	* 3463.68	* 389.85	*
* Frctn Loss (m)	* 2.12	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.10	* Cum SA (1000 m2)	* 3.52	* 4.67	* 18.51	*

CROSS SECTION OUTPUT Riv Sta: 17 Profile # 100 yr Storm

* E.G. Elev (m)	* 231.23	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 1.79	* Wt. n-Val	* 0.078	* 0.035	* 0.038	*
* W.S. Elev (m)	* 229.44	* Reach Len. (m)	* 153.60	* 152.88	* 151.04	*
* Crit W.S. (m)	* 229.97	* Flow Area (m2)	* 1.76	* 9.08	* 20.72	*
* E.G. Slope (m/m)	* 0.027029	* Area (m2)	* 1.76	* 9.08	* 20.72	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 2.73	* 70.31	* 73.22	*
* Top Width (m)	* 36.11	* Top Width (m)	* 1.59	* 4.29	* 30.24	*
* Vel Total (m/s)	* 4.63	* Avg. Vel. (m/s)	* 1.55	* 7.74	* 3.53	*
* Max Chl Dpth (m)	* 2.25	* Hydr. Depth (m)	* 1.11	* 2.12	* 0.69	*
* Conv. Total (m3/s)	* 889.6	* Conv. (m3/s)	* 16.6	* 427.7	* 445.3	*
* Length Wtd. (m)	* 151.92	* Wetted Per. (m)	* 2.77	* 4.29	* 30.62	*
* Min Ch El (m)	* 227.19	* Shear (N/sq m)	* 168.44	* 560.68	* 179.35	*
* Alpha	* 1.63	* Stream Power (N/m s)	* 261.39	* 4339.56	* 633.79	*
* Frctn Loss (m)	* 2.22	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.02	*
* C & E Loss (m)	* 0.10	* Cum SA (1000 m2)	* 4.94	* 4.45	* 20.31	*

CROSS SECTION INPUT River Station: 18
Description:

Station Elevation Data, num = 19

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-5.68	234.25	-3.62	233.25	0	232.15	1.92	231.011	3.01	230.69
3.82230.0379		4.88	229.78	5.7229.6743		7.57	229.75	9.46	231.01
12.76231.1021		13.89231.1171		18.26230.9379		18.91	230.8	20.36231.4234	
22.16	231.81	25.53	232.41	28.7	234	32.17	235		

Mannings n Values, num = 6

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value		
-5.68	.08	3.01	.06	4.88	.035	7.57	.045	9.46	.04	18.91	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
4.88	7.57	157.22	156.61	154.33	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 18 Profile # Storm Event

* E.G. Elev (m)	* 232.45	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.69	* Wt. n-Val	* 0.063	* 0.035	* 0.042	*
* W.S. Elev (m)	* 231.76	* Reach Len. (m)	* 157.22	* 156.61	* 154.33	*
* Crit W.S. (m)	* 231.91	* Flow Area (m2)	* 4.54	* 5.49	* 10.58	*
* E.G. Slope (m/m)	* 0.011529	* Area (m2)	* 4.54	* 5.49	* 10.58	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 8.39	* 27.02	* 22.50	*
* Top Width (m)	* 21.24	* Top Width (m)	* 4.22	* 2.69	* 14.33	*
* Vel Total (m/s)	* 2.81	* Avg. Vel. (m/s)	* 1.85	* 4.92	* 2.13	*
* Max Chl Dpth (m)	* 2.08	* Hydr. Depth (m)	* 1.08	* 2.04	* 0.74	*
* Conv. Total (m3/s)	* 539.3	* Conv. (m3/s)	* 78.1	* 251.7	* 209.5	*
* Length Wtd. (m)	* 155.90	* Wetted Per. (m)	* 4.73	* 2.70	* 14.90	*
* Min Ch El (m)	* 229.67	* Shear (N/sq m)	* 108.57	* 229.73	* 80.29	*
* Alpha	* 1.72	* Stream Power (N/m s)	* 200.71	* 1129.91	* 170.76	*
* Frctn Loss (m)	* 0.85	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.13	* Cum SA (1000 m2)	* 2.23	* 5.19	* 18.27	*

CROSS SECTION OUTPUT Riv Sta: 18 Profile # 25 yr Storm

* E.G. Elev (m)	* 233.10	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.66	* Wt. n-Val	* 0.065	* 0.035	* 0.043	*
* W.S. Elev (m)	* 232.44	* Reach Len. (m)	* 157.22	* 156.61	* 154.33	*
* Crit W.S. (m)	* 232.44	* Flow Area (m2)	* 7.88	* 7.34	* 21.66	*
* E.G. Slope (m/m)	* 0.008446	* Area (m2)	* 7.88	* 7.34	* 21.66	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 14.29	* 37.47	* 54.72	*
* Top Width (m)	* 26.54	* Top Width (m)	* 5.83	* 2.69	* 18.02	*
* Vel Total (m/s)	* 2.89	* Avg. Vel. (m/s)	* 1.81	* 5.11	* 2.53	*
* Max Chl Dpth (m)	* 2.77	* Hydr. Depth (m)	* 1.35	* 2.72	* 1.20	*
* Conv. Total (m3/s)	* 1158.5	* Conv. (m3/s)	* 155.5	* 407.7	* 595.4	*
* Length Wtd. (m)	* 155.59	* Wetted Per. (m)	* 6.50	* 2.70	* 18.64	*
* Min Ch El (m)	* 229.67	* Shear (N/sq m)	* 100.53	* 224.79	* 96.25	*
* Alpha	* 1.55	* Stream Power (N/m s)	* 182.14	* 1147.71	* 243.08	*
* Frctn Loss (m)	* 1.16	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.05	* Cum SA (1000 m2)	* 4.09	* 5.22	* 22.13	*

CROSS SECTION OUTPUT Riv Sta: 18 Profile # 100 yr Storm

* E.G. Elev (m)	* 233.55	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.77	* Wt. n-Val	* 0.066	* 0.035	* 0.043	*
* W.S. Elev (m)	* 232.78	* Reach Len. (m)	* 157.22	* 156.61	* 154.33	*
* Crit W.S. (m)	* 232.78	* Flow Area (m2)	* 10.03	* 8.24	* 27.82	*
* E.G. Slope (m/m)	* 0.008798	* Area (m2)	* 10.03	* 8.24	* 27.82	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 19.32	* 46.40	* 80.54	*
* Top Width (m)	* 28.32	* Top Width (m)	* 6.94	* 2.69	* 18.68	*
* Vel Total (m/s)	* 3.17	* Avg. Vel. (m/s)	* 1.93	* 5.63	* 2.90	*
* Max Chl Dpth (m)	* 3.10	* Hydr. Depth (m)	* 1.45	* 3.06	* 1.49	*
* Conv. Total (m3/s)	* 1559.3	* Conv. (m3/s)	* 205.9	* 494.7	* 858.6	*
* Length Wtd. (m)	* 155.46	* Wetted Per. (m)	* 7.65	* 2.70	* 19.39	*
* Min Ch El (m)	* 229.67	* Shear (N/sq m)	* 113.09	* 263.00	* 123.78	*
* Alpha	* 1.51	* Stream Power (N/m s)	* 217.88	* 1480.85	* 358.35	*
* Frctn Loss (m)	* 1.22	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.02	*
* C & E Loss (m)	* 0.06	* Cum SA (1000 m2)	* 5.61	* 5.00	* 24.09	*

CROSS SECTION INPUT River Station: 19

Description:

Station Elevation Data, num = 22

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-5.74	235	0	234.09	6.37	233.5	12.33233.3128		16.77232.6252	
17.74232.0922		19.7231.6216		21.01	231	23.06230.8929		25.05231.0059	
26.19	231.33	26.28231.9289		28.2	231.86	29.7231.9015		34.49231.8831	
35.15231.7929		38.62232.0712		44.87	232.06	49.39232.6298		51.88233.0349	
52.98	233.45	54.53	236.25						

Mannings n Values, num = 4

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
-5.74	.06	6.37	.045	21.01	.035	44.87	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
21.01	26.19	53.01	50.5	48.51	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 19 Profile # Storm Event

E.G. Elev (m)	233.43	Element	Left OB	Channel	Right OB
Vel Head (m)	1.13	Wt. n-Val	0.045	0.035	0.035
W.S. Elev (m)	232.30	Reach Len. (m)	53.01	50.50	48.51
Crit W.S. (m)	232.62	Flow Area (m2)	2.19	6.74	6.62
E.G. Slope (m/m)	0.027482	Area (m2)	2.19	6.74	6.62
Q Total (m3/s)	57.91	Flow (m3/s)	5.49	37.69	14.73
Top Width (m)	29.38	Top Width (m)	3.64	5.19	20.55
Vel Total (m/s)	3.72	Avg. Vel. (m/s)	2.51	5.59	2.23
Max Chl Dpth (m)	1.40	Hydr. Depth (m)	0.60	1.30	0.32
Conv. Total (m3/s)	349.3	Conv. (m3/s)	33.1	227.3	88.9
Length Wtd. (m)	50.16	Wetted Per. (m)	3.89	5.26	21.08
Min Ch El (m)	230.89	Shear (N/sq m)	151.60	345.51	84.65
Alpha	1.60	Stream Power (N/m s)	380.58	1930.91	188.38
Frctn Loss (m)	1.10	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.04	Cum SA (1000 m2)	2.44	5.39	19.12

CROSS SECTION OUTPUT Riv Sta: 19 Profile # 25 yr Storm

E.G. Elev (m)	233.81	Element	Left OB	Channel	Right OB
Vel Head (m)	1.17	Wt. n-Val	0.045	0.035	0.036
W.S. Elev (m)	232.64	Reach Len. (m)	53.01	50.50	48.51
Crit W.S. (m)	233.01	Flow Area (m2)	3.53	8.51	14.07
E.G. Slope (m/m)	0.023935	Area (m2)	3.53	8.51	14.07
Q Total (m3/s)	106.47	Flow (m3/s)	10.10	51.82	44.55
Top Width (m)	32.74	Top Width (m)	4.31	5.19	23.24
Vel Total (m/s)	4.08	Avg. Vel. (m/s)	2.86	6.09	3.17
Max Chl Dpth (m)	1.74	Hydr. Depth (m)	0.82	1.64	0.61
Conv. Total (m3/s)	688.2	Conv. (m3/s)	65.3	334.9	287.9
Length Wtd. (m)	49.75	Wetted Per. (m)	4.64	5.26	23.79
Min Ch El (m)	230.89	Shear (N/sq m)	178.38	379.67	138.86
Alpha	1.38	Stream Power (N/m s)	510.72	2312.12	439.55
Frctn Loss (m)	0.99	Cum Volume (cu m x 10^	0.00	0.01	0.02
C & E Loss (m)	0.03	Cum SA (1000 m2)	4.36	5.42	23.13

CROSS SECTION OUTPUT Riv Sta: 19 Profile # 100 yr Storm

E.G. Elev (m)	234.10	Element	Left OB	Channel	Right OB
Vel Head (m)	1.23	Wt. n-Val	0.045	0.035	0.036
W.S. Elev (m)	232.88	Reach Len. (m)	53.01	50.50	48.51
Crit W.S. (m)	233.24	Flow Area (m2)	4.74	9.75	19.80
E.G. Slope (m/m)	0.021729	Area (m2)	4.74	9.75	19.80
Q Total (m3/s)	146.26	Flow (m3/s)	12.99	61.93	71.34
Top Width (m)	35.75	Top Width (m)	5.85	5.19	24.71
Vel Total (m/s)	4.27	Avg. Vel. (m/s)	2.74	6.35	3.60
Max Chl Dpth (m)	1.98	Hydr. Depth (m)	0.81	1.88	0.80
Conv. Total (m3/s)	992.2	Conv. (m3/s)	88.1	420.1	484.0
Length Wtd. (m)	49.64	Wetted Per. (m)	6.20	5.26	25.28
Min Ch El (m)	230.89	Shear (N/sq m)	162.89	394.86	166.91
Alpha	1.32	Stream Power (N/m s)	446.11	2508.49	601.48
Frctn Loss (m)	0.93	Cum Volume (cu m x 10^	0.01	0.02	0.02
C & E Loss (m)	0.03	Cum SA (1000 m2)	5.95	5.20	25.14

CROSS SECTION INPUT   River Station: 20
Description:

Station Elevation Data, num = 16

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	235.18	2.96234.0243		4.86232.7941		5.09	232.05	7.23231.9497	
9.44	232.09	10.72232.9657		13.11	233.02	14.6233.0308		19.3232.9688	
25.01232.8198		30.97232.8673		38.05	233.18	41.28233.2495		47.31	233.38
49.23	236.25								

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.05	5.09	.03	9.44	.045	13.11	.035	38.05	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5.09	9.44	39.93	42.05	42.51	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 20 Profile # Storm Event

E.G. Elev (m)	234.56	Element	Left OB	Channel	Right OB
Vel Head (m)	1.27	Wt. n-Val	0.048	0.030	0.037
W.S. Elev (m)	233.29	Reach Len. (m)	39.93	42.05	42.51
Crit W.S. (m)	233.63	Flow Area (m2)	0.40	5.58	10.64
E.G. Slope (m/m)	0.024943	Area (m2)	0.40	5.58	10.64
Q Total (m3/s)	57.91	Flow (m3/s)	0.48	34.64	22.79

Top Width (m)	39.21	Top Width (m)	1.00	4.35	33.86
Vel Total (m/s)	3.49	Avg. Vel. (m/s)	1.23	6.21	2.14
Max Chl Dpth (m)	1.34	Hydr. Depth (m)	0.39	1.28	0.31
Conv. Total (m3/s)	366.7	Conv. (m3/s)	3.1	219.3	144.3
Length Wtd. (m)	42.09	Wetted Per. (m)	1.70	4.35	34.14
Min Ch El (m)	231.95	Shear (N/sq m)	56.93	313.41	76.24
Alpha	2.05	Stream Power (N/m s)	69.75	1946.37	163.27
Frctn Loss (m)	1.29	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.02	Cum SA (1000 m2)	2.53	5.59	20.28

CROSS SECTION OUTPUT Riv Sta: 20 Profile # 25 yr Storm

E.G. Elev (m)	234.82	Element	Left OB	Channel	Right OB
Vel Head (m)	1.26	Wt. n-Val	0.049	0.030	0.037
W.S. Elev (m)	233.56	Reach Len. (m)	39.93	42.05	42.51
Crit W.S. (m)	233.93	Flow Area (m2)	0.72	6.76	20.76
E.G. Slope (m/m)	0.023297	Area (m2)	0.72	6.76	20.76
Q Total (m3/s)	106.47	Flow (m3/s)	1.07	46.09	59.31
Top Width (m)	43.76	Top Width (m)	1.42	4.35	38.00
Vel Total (m/s)	3.77	Avg. Vel. (m/s)	1.48	6.82	2.86
Max Chl Dpth (m)	1.61	Hydr. Depth (m)	0.51	1.55	0.55
Conv. Total (m3/s)	697.6	Conv. (m3/s)	7.0	301.9	388.6
Length Wtd. (m)	42.16	Wetted Per. (m)	2.20	4.35	38.38
Min Ch El (m)	231.95	Shear (N/sq m)	75.30	354.64	123.57
Alpha	1.74	Stream Power (N/m s)	111.26	2418.90	353.11
Frctn Loss (m)	1.37	Cum Volume (cu m x 10^	0.00	0.01	0.02
C & E Loss (m)	0.01	Cum SA (1000 m2)	4.47	5.62	24.43

CROSS SECTION OUTPUT Riv Sta: 20 Profile # 100 yr Storm

E.G. Elev (m)	235.06	Element	Left OB	Channel	Right OB
Vel Head (m)	1.31	Wt. n-Val	0.049	0.030	0.037
W.S. Elev (m)	233.74	Reach Len. (m)	39.93	42.05	42.51
Crit W.S. (m)	234.13	Flow Area (m2)	1.00	7.53	27.56
E.G. Slope (m/m)	0.022342	Area (m2)	1.00	7.53	27.56
Q Total (m3/s)	146.26	Flow (m3/s)	1.64	54.11	90.51
Top Width (m)	44.16	Top Width (m)	1.70	4.35	38.11
Vel Total (m/s)	4.05	Avg. Vel. (m/s)	1.63	7.18	3.28
Max Chl Dpth (m)	1.79	Hydr. Depth (m)	0.59	1.73	0.72
Conv. Total (m3/s)	978.5	Conv. (m3/s)	11.0	362.0	605.5
Length Wtd. (m)	42.20	Wetted Per. (m)	2.53	4.35	38.59
Min Ch El (m)	231.95	Shear (N/sq m)	87.00	379.23	156.49
Alpha	1.57	Stream Power (N/m s)	142.03	2723.77	513.88
Frctn Loss (m)	1.40	Cum Volume (cu m x 10^	0.01	0.02	0.02
C & E Loss (m)	0.00	Cum SA (1000 m2)	6.10	5.40	26.47

CROSS SECTION INPUT River Station: 21
Description:

Station Elevation Data, num = 28

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0235.8319	1.18	234.692.477581234.61423.348441235.07964.059574235.0525							
4.437055234.75478.806785		234.4779.341242234.054610.27332233.8336		11.38	232.89				
12.65278232.8594	13.75	232.96	14.588233.390115.88418234.314616.78183234.3112						
17.62	234.39	22.23	234.3623.79788234.149423.91583234.262126.05211234.5773						
27.25	234.71	45.7	234.6747.21091234.435949.04038234.507249.74361234.7983						
51.62023234.5611	56.28	234.69	57.5	235.51					

Mannings n Values, num = 9

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.08	1.18	.05	11.38	.035	13.75	.045	17.62	.03
22.23	.04	27.25	.045	45.7	.04	56.28	.07		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
11.38	13.75	57.76	58.22	57.79	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 21 Profile # Storm Event

E.G. Elev (m)	235.87	Element	Left OB	Channel	Right OB
Vel Head (m)	1.06	Wt. n-Val	0.050	0.035	0.040
W.S. Elev (m)	234.81	Reach Len. (m)	57.76	58.22	57.79
Crit W.S. (m)	235.11	Flow Area (m2)	3.83	4.54	11.98
E.G. Slope (m/m)	0.020002	Area (m2)	3.83	4.54	11.98
Q Total (m3/s)	57.91	Flow (m3/s)	6.36	28.31	23.24
Top Width (m)	53.89	Top Width (m)	8.82	2.36	42.72
Vel Total (m/s)	2.85	Avg. Vel. (m/s)	1.66	6.24	1.94
Max Chl Dpth (m)	1.95	Hydr. Depth (m)	0.43	1.92	0.28
Conv. Total (m3/s)	409.5	Conv. (m3/s)	45.0	200.2	164.3
Length Wtd. (m)	58.02	Wetted Per. (m)	9.47	2.37	43.34
Min Ch El (m)	232.86	Shear (N/sq m)	79.34	376.15	54.23
Alpha	2.57	Stream Power (N/m s)	131.74	2346.09	105.19
Frctn Loss (m)	0.47	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.03	Cum SA (1000 m2)	2.81	5.78	22.49

CROSS SECTION OUTPUT Riv Sta: 21 Profile # 25 yr Storm

E.G. Elev (m)	236.20	Element	Left OB	Channel	Right OB
Vel Head (m)	1.16	Wt. n-Val	0.050	0.035	0.040
W.S. Elev (m)	235.04	Reach Len. (m)	57.76	58.22	57.79
Crit W.S. (m)	235.37	Flow Area (m2)	5.90	5.07	21.56
E.G. Slope (m/m)	0.023773	Area (m2)	5.90	5.07	21.56
Q Total (m3/s)	106.47	Flow (m3/s)	13.00	37.07	56.40
Top Width (m)	55.16	Top Width (m)	9.75	2.36	43.05
Vel Total (m/s)	3.27	Avg. Vel. (m/s)	2.20	7.32	2.62
Max Chl Dpth (m)	2.18	Hydr. Depth (m)	0.61	2.14	0.50
Conv. Total (m3/s)	690.5	Conv. (m3/s)	84.3	240.4	365.8
Length Wtd. (m)	57.96	Wetted Per. (m)	10.62	2.37	43.74
Min Ch El (m)	232.86	Shear (N/sq m)	129.54	499.04	114.91
Alpha	2.13	Stream Power (N/m s)	285.32	3651.39	300.62

* Frctn Loss (m)	* 0.53	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.02 *
* C & E Loss (m)	* 0.02	* Cum SA (1000 m2)	* 4.80	* 5.82	* 26.78 *

CROSS SECTION OUTPUT Riv Sta: 21 Profile # 100 yr Storm

* E.G. Elev (m)	* 236.46	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.29	* Wt. n-Val	* 0.050	* 0.035	* 0.040 *
* W.S. Elev (m)	* 235.17	* Reach Len. (m)	* 57.76	* 58.22	* 57.79 *
* Crit W.S. (m)	* 235.54	* Flow Area (m2)	* 7.33	* 5.39	* 27.44 *
* E.G. Slope (m/m)	* 0.026256	* Area (m2)	* 7.33	* 5.39	* 27.44 *
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 17.79	* 43.17	* 85.30 *
* Top Width (m)	* 56.32	* Top Width (m)	* 10.70	* 2.36	* 43.25 *
* Vel Total (m/s)	* 3.64	* Avg. Vel. (m/s)	* 2.43	* 8.01	* 3.11 *
* Max Chl Dpth (m)	* 2.31	* Hydr. Depth (m)	* 0.68	* 2.28	* 0.63 *
* Conv. Total (m3/s)	* 902.6	* Conv. (m3/s)	* 109.8	* 266.4	* 526.5 *
* Length Wtd. (m)	* 57.93	* Wetted Per. (m)	* 11.65	* 2.37	* 43.99 *
* Min Ch El (m)	* 232.86	* Shear (N/sq m)	* 161.96	* 586.16	* 160.62 *
* Alpha	* 1.91	* Stream Power (N/m s)	* 393.11	* 4696.12	* 499.37 *
* Frctn Loss (m)	* 0.56	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.02 *
* C & E Loss (m)	* 0.01	* Cum SA (1000 m2)	* 6.46	* 5.59	* 28.82 *

CROSS SECTION INPUT River Station: 22
Description: (3m downstream) Observed HWM = 233.65 m (766.57 ft)

Station Elevation Data, num = 24

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	235.8075	3.77	234.91	13.63	152	34.82	111	5.57	63
234.799	20.03	156	234.69	832	1.12	966	233.85	42	22.1
233.57	24.43	1	233.44	37	25.76	233.49	27.79	257	234.89
73	31.75	235.15	36.47	235.08	37.59	671	235.01	293	8.14
091	234.81	66	38.45	805	235.00	739.4	0506	235.14	740.26
037	235.24	97	41.52	235.85	0.56	389	235.79	13	59.83
235.76	0.899	682	35.42	71	63.58	235.51	65.44	236.45	

Mannings n Values, num = 9

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.06	3.77	.04	22.1	.03	25.76	.04	31.75	.03
36.47	.04	41.52	.045	59.83	.04	63.58	.07		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
22.1	25.76	28.69	27.76	27.42	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 22 Profile # Storm Event

* E.G. Elev (m)	* 236.36	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.14	* Wt. n-Val	* 0.040	* 0.030	* 0.039 *
* W.S. Elev (m)	* 235.22	* Reach Len. (m)	* 28.69	* 27.76	* 27.42 *
* Crit W.S. (m)	* 235.56	* Flow Area (m2)	* 8.72	* 6.31	* 3.93 *
* E.G. Slope (m/m)	* 0.014728	* Area (m2)	* 8.72	* 6.31	* 3.93 *
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 15.21	* 36.72	* 5.98 *
* Top Width (m)	* 37.50	* Top Width (m)	* 19.62	* 3.66	* 14.22 *
* Vel Total (m/s)	* 3.05	* Avg. Vel. (m/s)	* 1.74	* 5.81	* 1.52 *
* Max Chl Dpth (m)	* 1.77	* Hydr. Depth (m)	* 0.44	* 1.73	* 0.28 *
* Conv. Total (m3/s)	* 477.2	* Conv. (m3/s)	* 125.3	* 302.6	* 49.3 *
* Length Wtd. (m)	* 27.85	* Wetted Per. (m)	* 20.46	* 3.66	* 14.77 *
* Min Ch El (m)	* 233.44	* Shear (N/sq m)	* 61.60	* 248.90	* 38.41 *
* Alpha	* 2.41	* Stream Power (N/m s)	* 107.38	* 1447.29	* 58.49 *
* Frctn Loss (m)	* 2.12	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01 *
* C & E Loss (m)	* 0.04	* Cum SA (1000 m2)	* 3.22	* 5.87	* 23.27 *

CROSS SECTION OUTPUT Riv Sta: 22 Profile # 25 yr Storm

* E.G. Elev (m)	* 236.75	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.23	* Wt. n-Val	* 0.040	* 0.030	* 0.038 *
* W.S. Elev (m)	* 235.52	* Reach Len. (m)	* 28.69	* 27.76	* 27.42 *
* Crit W.S. (m)	* 235.94	* Flow Area (m2)	* 14.95	* 7.44	* 8.63 *
* E.G. Slope (m/m)	* 0.015730	* Area (m2)	* 14.95	* 7.44	* 8.63 *
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 37.05	* 49.86	* 19.56 *
* Top Width (m)	* 42.78	* Top Width (m)	* 20.91	* 3.66	* 18.21 *
* Vel Total (m/s)	* 3.43	* Avg. Vel. (m/s)	* 2.48	* 6.70	* 2.27 *
* Max Chl Dpth (m)	* 2.08	* Hydr. Depth (m)	* 0.71	* 2.03	* 0.47 *
* Conv. Total (m3/s)	* 848.9	* Conv. (m3/s)	* 295.4	* 397.5	* 156.0 *
* Length Wtd. (m)	* 27.86	* Wetted Per. (m)	* 21.78	* 3.66	* 18.84 *
* Min Ch El (m)	* 233.44	* Shear (N/sq m)	* 105.85	* 313.15	* 70.66 *
* Alpha	* 2.05	* Stream Power (N/m s)	* 262.36	* 2098.92	* 160.19 *
* Frctn Loss (m)	* 2.03	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.02 *
* C & E Loss (m)	* 0.06	* Cum SA (1000 m2)	* 5.24	* 5.90	* 27.62 *

CROSS SECTION OUTPUT Riv Sta: 22 Profile # 100 yr Storm

* E.G. Elev (m)	* 237.02	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (m)	* 1.31	* Wt. n-Val	* 0.041	* 0.030	* 0.037 *
* W.S. Elev (m)	* 235.71	* Reach Len. (m)	* 28.69	* 27.76	* 27.42 *
* Crit W.S. (m)	* 236.12	* Flow Area (m2)	* 19.02	* 8.14	* 12.27 *
* E.G. Slope (m/m)	* 0.016198	* Area (m2)	* 19.02	* 8.14	* 12.27 *
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 54.83	* 58.78	* 32.65 *
* Top Width (m)	* 46.60	* Top Width (m)	* 21.71	* 3.66	* 21.23 *
* Vel Total (m/s)	* 3.71	* Avg. Vel. (m/s)	* 2.88	* 7.22	* 2.66 *
* Max Chl Dpth (m)	* 2.27	* Hydr. Depth (m)	* 0.88	* 2.22	* 0.58 *
* Conv. Total (m3/s)	* 1149.2	* Conv. (m3/s)	* 430.8	* 461.8	* 256.5 *
* Length Wtd. (m)	* 27.85	* Wetted Per. (m)	* 22.61	* 3.66	* 21.96 *
* Min Ch El (m)	* 233.44	* Shear (N/sq m)	* 133.66	* 352.83	* 88.79 *
* Alpha	* 1.87	* Stream Power (N/m s)	* 385.22	* 2548.17	* 236.20 *
* Frctn Loss (m)	* 1.98	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.03 *
* C & E Loss (m)	* 0.06	* Cum SA (1000 m2)	* 6.93	* 5.67	* 29.71 *

CROSS SECTION INPUT River Station: 23
Description:

Station Elevation Data, num = 28

```
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*****************************************************************************
       0239.96072.849216239.13865.845048238.9993    9.97  238.5314.02146238.5248
17.89001238.432120.85136238.423929.49058238.281234.07093238.069441.09519237.8344
   44.73  237.6345.81011 237.26245.93449236.7941    47.9  236.2549.52603236.0739
   50.79  236.21    53.4   237.158.79785237.345264.55273237.288567.05346237.6911
69.17969237.768674.38151237.635475.37911237.5573   76.47  237.2476.64665237.5436
78.70835237.8838 82.9431237.9335   89.43  238.96

Mannings n Values,  num = 7
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*****************************************************************************
       0     .06    9.97     .04   44.73    .045    47.9    .035   50.79    .045    53.4    .035   76.47     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
          47.9   50.79           142.75   144.5  119.37             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 23  Profile # Storm Event
*************************************************************************************************
* E.G. Elev (m)       *   238.53 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.70 * Wt. n-Val             *    0.045 *    0.035 *    0.039 *
* W.S. Elev (m)       *   237.82 * Reach Len. (m)        *   142.75 *   144.50 *   119.37 *
* Crit W.S. (m)       *   238.05 * Flow Area (m2)        *     3.41 *     4.82 *    11.88 *
* E.G. Slope (m/m)    * 0.016226 * Area (m2)             *     3.41 *     4.82 *    11.88 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)           *     7.97 *    24.63 *    25.32 *
* Top Width (m)       *    37.06 * Top Width (m)         *     6.62 *     2.89 *    27.55 *
* Vel Total (m/s)     *     2.88 * Avg. Vel. (m/s)       *     2.34 *     5.10 *     2.13 *
* Max Chl Dpth (m)    *     1.75 * Hydr. Depth (m)       *     0.51 *     1.67 *     0.43 *
* Conv. Total (m3/s)  *    454.6 * Conv. (m3/s)          *     62.6 *    193.3 *    198.7 *
* Length Wtd. (m)     *   137.36 * Wetted Per. (m)       *     7.12 *     2.90 *    27.99 *
* Min Ch El (m)       *   236.07 * Shear (N/sq m)        *    76.14 *   264.32 *    67.57 *
* Alpha               *     1.67 * Stream Power (N/m s)  *   178.02 *  1348.96 *   143.94 *
* Frctn Loss (m)      *     0.76 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.01 *
* C & E Loss (m)      *     0.04 * Cum SA (1000 m2)      *     5.09 *     6.34 *    25.76 *
*************************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 23  Profile # 25 yr Storm
*************************************************************************************************
* E.G. Elev (m)       *   238.84 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.68 * Wt. n-Val             *    0.044 *    0.035 *    0.038 *
* W.S. Elev (m)       *   238.16 * Reach Len. (m)        *   142.75 *   144.50 *   119.37 *
* Crit W.S. (m)       *   238.35 * Flow Area (m2)        *     7.27 *     5.80 *    22.53 *
* E.G. Slope (m/m)    * 0.014409 * Area (m2)             *     7.27 *     5.80 *    22.53 *
* Q Total (m3/s)      *   106.47 * Flow (m3/s)           *    15.70 *    31.53 *    59.24 *
* Top Width (m)       *    52.30 * Top Width (m)         *    15.82 *     2.89 *    33.59 *
* Vel Total (m/s)     *     2.99 * Avg. Vel. (m/s)       *     2.16 *     5.44 *     2.63 *
* Max Chl Dpth (m)    *     2.09 * Hydr. Depth (m)       *     0.46 *     2.01 *     0.67 *
* Conv. Total (m3/s)  *    887.0 * Conv. (m3/s)          *    130.8 *    262.7 *    493.5 *
* Length Wtd. (m)     *   134.77 * Wetted Per. (m)       *    16.33 *     2.90 *    34.05 *
* Min Ch El (m)       *   236.07 * Shear (N/sq m)        *    62.90 *   282.15 *    93.51 *
* Alpha               *     1.49 * Stream Power (N/m s)  *   135.83 *  1534.04 *   245.86 *
* Frctn Loss (m)      *     0.73 * Cum Volume (cu m x 10^ *     0.01 *     0.01 *     0.02 *
* C & E Loss (m)      *     0.09 * Cum SA (1000 m2)      *     7.86 *     6.37 *    30.71 *
*************************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 23  Profile # 100 yr Storm
*************************************************************************************************
* E.G. Elev (m)       *   239.06 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.69 * Wt. n-Val             *    0.043 *    0.035 *    0.038 *
* W.S. Elev (m)       *   238.37 * Reach Len. (m)        *   142.75 *   144.50 *   119.37 *
* Crit W.S. (m)       *   238.61 * Flow Area (m2)        *    11.27 *     6.41 *    29.78 *
* E.G. Slope (m/m)    * 0.013586 * Area (m2)             *    11.27 *     6.41 *    29.78 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)           *    23.58 *    36.19 *    86.49 *
* Top Width (m)       *    61.80 * Top Width (m)         *    23.98 *     2.89 *    34.93 *
* Vel Total (m/s)     *     3.08 * Avg. Vel. (m/s)       *     2.09 *     5.64 *     2.90 *
* Max Chl Dpth (m)    *     2.30 * Hydr. Depth (m)       *     0.47 *     2.22 *     0.85 *
* Conv. Total (m3/s)  *   1254.8 * Conv. (m3/s)          *    202.3 *    310.5 *    742.0 *
* Length Wtd. (m)     *   133.80 * Wetted Per. (m)       *    24.49 *     2.90 *    35.40 *
* Min Ch El (m)       *   236.07 * Shear (N/sq m)        *    61.30 *   294.06 *   112.09 *
* Alpha               *     1.43 * Stream Power (N/m s)  *   128.30 *  1659.70 *   325.49 *
* Frctn Loss (m)      *     0.70 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.03 *
* C & E Loss (m)      *     0.11 * Cum SA (1000 m2)      *    10.19 *     6.15 *    33.06 *
*************************************************************************************************

CROSS SECTION INPUT    River Station: 24
Description:

Station Elevation Data,  num = 19
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*****************************************************************************
       0240.10524.725687238.9283   12.23  238.3929.72587238.115738.38001238.0563
46.83099238.2081   52.65  238.01   54.85  236.9355.79291236.7731   56.89   236.9
58.07964237.523859.20979238.7409   59.97   239.164.96927239.172269.95761239.1804
   71.01  239.1372.36868238.804373.22709239.3255   73.67  240.75

Mannings n Values,  num = 7
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*****************************************************************************
       0     .06   12.23    .035   52.65    .045   54.85    .035   56.89    .045   59.97    .035   71.01     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         54.85   56.89            32.48   39.57   44.49             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 24  Profile # Storm Event
*************************************************************************************************
* E.G. Elev (m)       *   239.33 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.85 * Wt. n-Val             *    0.037 *    0.035 *    0.045 *
* W.S. Elev (m)       *   238.48 * Reach Len. (m)        *    32.48 *    39.57 *    44.49 *
* Crit W.S. (m)       *   238.71 * Flow Area (m2)        *    14.60 *     3.33 *     1.92 *
* E.G. Slope (m/m)    * 0.024317 * Area (m2)             *    14.60 *     3.33 *     1.92 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)           *    32.10 *    20.44 *     5.37 *
* Top Width (m)       *    47.94 * Top Width (m)         *    43.82 *     2.04 *     2.07 *
```

* Vel Total (m/s)	*	2.92	* Avg. Vel. (m/s)	*	2.20	*	6.13	*	2.80	*
* Max Chl Dpth (m)	*	1.70	* Hydr. Depth (m)	*	0.33	*	1.63	*	0.93	*
* Conv. Total (m3/s)	*	371.4	* Conv. (m3/s)	*	205.8	*	131.1	*	34.5	*
* Length Wtd. (m)	*	38.42	* Wetted Per. (m)	*	44.09	*	2.06	*	2.64	*
* Min Ch El (m)	*	236.77	* Shear (N/sq m)	*	78.96	*	385.43	*	173.39	*
* Alpha	*	1.96	* Stream Power (N/m s)	*	173.62	*	2364.01	*	485.85	*
* Frctn Loss (m)	*	1.27	* Cum Volume (cu m x 10^	*	0.00	*	0.01	*	0.01	*
* C & E Loss (m)	*	0.25	* Cum SA (1000 m2)	*	5.91	*	6.44	*	26.42	*

CROSS SECTION OUTPUT Riv Sta: 24 Profile # 25 yr Storm

* E.G. Elev (m)	*	239.65	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (m)	*	0.97	* Wt. n-Val	*	0.037	*	0.035	*	0.045	*
* W.S. Elev (m)	*	238.68	* Reach Len. (m)	*	32.48	*	39.57	*	44.49	*
* Crit W.S. (m)	*	238.96	* Flow Area (m2)	*	23.97	*	3.75	*	2.37	*
* E.G. Slope (m/m)	*	0.026849	* Area (m2)	*	23.97	*	3.75	*	2.37	*
* Q Total (m3/s)	*	106.47	* Flow (m3/s)	*	72.78	*	26.21	*	7.49	*
* Top Width (m)	*	51.01	* Top Width (m)	*	46.71	*	2.04	*	2.26	*
* Vel Total (m/s)	*	3.54	* Avg. Vel. (m/s)	*	3.04	*	6.98	*	3.16	*
* Max Chl Dpth (m)	*	1.91	* Hydr. Depth (m)	*	0.51	*	1.84	*	1.05	*
* Conv. Total (m3/s)	*	649.8	* Conv. (m3/s)	*	444.1	*	159.9	*	45.7	*
* Length Wtd. (m)	*	38.17	* Wetted Per. (m)	*	46.98	*	2.06	*	2.92	*
* Min Ch El (m)	*	236.77	* Shear (N/sq m)	*	134.34	*	479.51	*	213.35	*
* Alpha	*	1.52	* Stream Power (N/m s)	*	407.90	*	3346.40	*	675.19	*
* Frctn Loss (m)	*	1.43	* Cum Volume (cu m x 10^	*	0.01	*	0.01	*	0.02	*
* C & E Loss (m)	*	0.29	* Cum SA (1000 m2)	*	8.87	*	6.47	*	31.51	*

CROSS SECTION OUTPUT Riv Sta: 24 Profile # 100 yr Storm

* E.G. Elev (m)	*	239.87	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (m)	*	1.05	* Wt. n-Val	*	0.036	*	0.035	*	0.045	*
* W.S. Elev (m)	*	238.83	* Reach Len. (m)	*	32.48	*	39.57	*	44.49	*
* Crit W.S. (m)	*	239.15	* Flow Area (m2)	*	30.89	*	4.05	*	2.71	*
* E.G. Slope (m/m)	*	0.026822	* Area (m2)	*	30.89	*	4.05	*	2.71	*
* Q Total (m3/s)	*	146.26	* Flow (m3/s)	*	107.72	*	29.73	*	8.81	*
* Top Width (m)	*	53.42	* Top Width (m)	*	48.73	*	2.04	*	2.64	*
* Vel Total (m/s)	*	3.88	* Avg. Vel. (m/s)	*	3.49	*	7.34	*	3.25	*
* Max Chl Dpth (m)	*	2.06	* Hydr. Depth (m)	*	0.63	*	1.98	*	1.03	*
* Conv. Total (m3/s)	*	893.1	* Conv. (m3/s)	*	657.7	*	181.5	*	53.8	*
* Length Wtd. (m)	*	37.99	* Wetted Per. (m)	*	49.01	*	2.06	*	3.35	*
* Min Ch El (m)	*	236.77	* Shear (N/sq m)	*	165.83	*	516.83	*	212.63	*
* Alpha	*	1.36	* Stream Power (N/m s)	*	578.17	*	3792.20	*	691.54	*
* Frctn Loss (m)	*	1.44	* Cum Volume (cu m x 10^	*	0.01	*	0.02	*	0.03	*
* C & E Loss (m)	*	0.30	* Cum SA (1000 m2)	*	11.37	*	6.25	*	33.90	*

CROSS SECTION INPUT   River Station: 25
Description: Observed HWM = 239.90 m (878.07 ft)

Station Elevation Data, num = 21

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0241.37	981.85	3848	239.8147	3.33	239.24	844136	238.8713	11.58	297238.6948
20.43641	238.8268	28.30746	238.9993	36.15626	239.2971	39.56376	239.3026	39.61	237.89
39.955	237.7361	41.60593	237.7631	43.58	237.7245	04.663	239.1627	46.92	239.52
50.0282	239.6062	54.8008	239.6781	59.59	239.9865	.03173	240.3743	68.13	087240.5188
69.75	241.33								

Mannings n Values, num = 6

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.06	3.33	.045	39.61	.035	43.58	.045	46.92	.035	59.59	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39.61	43.58	42.02	44.16	44.9	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 25 Profile # Storm Event

* E.G. Elev (m)	*	240.83	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (m)	*	1.67	* Wt. n-Val	*	0.045	*	0.035	*	0.045	*
* W.S. Elev (m)	*	239.16	* Reach Len. (m)	*	42.02	*	44.16	*	44.90	*
* Crit W.S. (m)	*	239.60	* Flow Area (m2)	*	8.72	*	5.61	*	1.06	*
* E.G. Slope (m/m)	*	0.036740	* Area (m2)	*	8.72	*	5.61	*	1.06	*
* Q Total (m3/s)	*	57.91	* Flow (m3/s)	*	16.51	*	38.50	*	2.90	*
* Top Width (m)	*	34.67	* Top Width (m)	*	29.22	*	3.97	*	1.48	*
* Vel Total (m/s)	*	3.76	* Avg. Vel. (m/s)	*	1.89	*	6.86	*	2.73	*
* Max Chl Dpth (m)	*	1.44	* Hydr. Depth (m)	*	0.30	*	1.41	*	0.72	*
* Conv. Total (m3/s)	*	302.1	* Conv. (m3/s)	*	86.1	*	200.9	*	15.1	*
* Length Wtd. (m)	*	43.31	* Wetted Per. (m)	*	30.50	*	4.00	*	2.07	*
* Min Ch El (m)	*	237.72	* Shear (N/sq m)	*	103.02	*	505.13	*	184.79	*
* Alpha	*	2.31	* Stream Power (N/m s)	*	195.07	*	3465.23	*	504.34	*
* Frctn Loss (m)	*	0.89	* Cum Volume (cu m x 10^	*	0.00	*	0.01	*	0.01	*
* C & E Loss (m)	*	0.03	* Cum SA (1000 m2)	*	7.45	*	6.57	*	26.50	*

CROSS SECTION OUTPUT Riv Sta: 25 Profile # 25 yr Storm

* E.G. Elev (m)	*	241.37	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (m)	*	1.94	* Wt. n-Val	*	0.045	*	0.035	*	0.045	*
* W.S. Elev (m)	*	239.42	* Reach Len. (m)	*	42.02	*	44.16	*	44.90	*
* Crit W.S. (m)	*	239.91	* Flow Area (m2)	*	17.47	*	6.64	*	1.62	*
* E.G. Slope (m/m)	*	0.042085	* Area (m2)	*	17.47	*	6.64	*	1.62	*
* Q Total (m3/s)	*	106.47	* Flow (m3/s)	*	47.48	*	54.53	*	4.46	*
* Top Width (m)	*	43.62	* Top Width (m)	*	36.82	*	3.97	*	2.83	*
* Vel Total (m/s)	*	4.14	* Avg. Vel. (m/s)	*	2.72	*	8.21	*	2.75	*
* Max Chl Dpth (m)	*	1.70	* Hydr. Depth (m)	*	0.47	*	1.67	*	0.57	*
* Conv. Total (m3/s)	*	519.0	* Conv. (m3/s)	*	231.5	*	265.8	*	21.7	*
* Length Wtd. (m)	*	42.99	* Wetted Per. (m)	*	38.27	*	4.00	*	3.45	*
* Min Ch El (m)	*	237.72	* Shear (N/sq m)	*	188.41	*	684.51	*	193.70	*
* Alpha	*	2.23	* Stream Power (N/m s)	*	512.02	*	5621.58	*	533.28	*
* Frctn Loss (m)	*	1.14	* Cum Volume (cu m x 10^	*	0.01	*	0.01	*	0.02	*

* C & E Loss (m)	* 0.17	* Cum SA (1000 m2)	* 10.63	* 6.60	* 31.62	*

CROSS SECTION OUTPUT Riv Sta: 25 Profile # 100 yr Storm

* E.G. Elev (m)	* 241.61	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 2.03	* Wt. n-Val	* 0.045	* 0.035	* 0.045	*
* W.S. Elev (m)	* 239.58	* Reach Len. (m)	* 42.02	* 44.16	* 44.90	*
* Crit W.S. (m)	* 240.10	* Flow Area (m2)	* 23.09	* 7.24	* 2.16	*
* E.G. Slope (m/m)	* 0.043099	* Area (m2)	* 23.09	* 7.24	* 2.16	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 76.09	* 63.78	* 6.38	*
* Top Width (m)	* 46.49	* Top Width (m)	* 37.18	* 3.97	* 5.34	*
* Vel Total (m/s)	* 4.50	* Avg. Vel. (m/s)	* 3.30	* 8.81	* 2.96	*
* Max Chl Dpth (m)	* 1.86	* Hydr. Depth (m)	* 0.62	* 1.82	* 0.40	*
* Conv. Total (m3/s)	* 704.5	* Conv. (m3/s)	* 366.5	* 307.2	* 30.7	*
* Length Wtd. (m)	* 42.85	* Wetted Per. (m)	* 38.67	* 4.00	* 5.97	*
* Min Ch El (m)	* 237.72	* Shear (N/sq m)	* 252.40	* 764.67	* 152.86	*
* Alpha	* 1.97	* Stream Power (N/m s)	* 831.71	* 6734.22	* 452.22	*
* Frctn Loss (m)	* 1.20	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.03	*
* C & E Loss (m)	* 0.20	* Cum SA (1000 m2)	* 13.17	* 6.38	* 34.07	*

CROSS SECTION INPUT River Station: 26
Description: Observed HWM = 241.03 m (790.78 ft)

Station Elevation Data, num = 25

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	242.01	22.28	242.56	24.04	240.44	752.84	240.05	769.2	240.57
3.07	815524	0.00736	403.32	723	9.748215	0.00175	239.66	472	1.98583
24.2086	2239.43	28	25.46	238.26	26.9150	3238.17	61	28.16	238.27
33.6117	5240.07	7138.3	8102	240.09	54	39.54	240.05	40.9026	6239.8
49.14	240.82	53.8294	4241.1	19558.6	6565	241.05	63.1164	6241.4	009

Mannings n Values, num = 8

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.06	2.9	.045	24.04	.055	25.46	.04	28.16	.045	30.78	.035	39.54	.04	49.14	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
25.46	28.16	22.94	23.13	22.07	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 26 Profile # Storm Event

* E.G. Elev (m)	* 241.75	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 1.77	* Wt. n-Val	* 0.048	* 0.040	* 0.045	*
* W.S. Elev (m)	* 239.98	* Reach Len. (m)	* 22.94	* 23.13	* 22.07	*
* Crit W.S. (m)	* 240.41	* Flow Area (m2)	* 7.07	* 4.74	* 2.40	*
* E.G. Slope (m/m)	* 0.040452	* Area (m2)	* 7.07	* 4.74	* 2.40	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 15.01	* 34.61	* 8.29	*
* Top Width (m)	* 30.21	* Top Width (m)	* 21.93	* 2.70	* 5.58	*
* Vel Total (m/s)	* 4.08	* Avg. Vel. (m/s)	* 2.12	* 7.30	* 3.45	*
* Max Chl Dpth (m)	* 1.80	* Hydr. Depth (m)	* 0.32	* 1.75	* 0.43	*
* Conv. Total (m3/s)	* 287.9	* Conv. (m3/s)	* 74.6	* 172.1	* 41.2	*
* Length Wtd. (m)	* 22.98	* Wetted Per. (m)	* 22.48	* 2.71	* 6.09	*
* Min Ch El (m)	* 238.18	* Shear (N/sq m)	* 124.78	* 694.64	* 156.51	*
* Alpha	* 2.09	* Stream Power (N/m s)	* 264.85	* 5074.13	* 540.59	*
* Frctn Loss (m)	* 1.22	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.10	* Cum SA (1000 m2)	* 8.03	* 6.65	* 26.58	*

CROSS SECTION OUTPUT Riv Sta: 26 Profile # 25 yr Storm

* E.G. Elev (m)	* 242.68	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 2.51	* Wt. n-Val	* 0.047	* 0.040	* 0.044	*
* W.S. Elev (m)	* 240.17	* Reach Len. (m)	* 22.94	* 23.13	* 22.07	*
* Crit W.S. (m)	* 240.70	* Flow Area (m2)	* 11.48	* 5.27	* 4.75	*
* E.G. Slope (m/m)	* 0.059767	* Area (m2)	* 11.48	* 5.27	* 4.75	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 38.77	* 50.25	* 17.45	*
* Top Width (m)	* 42.49	* Top Width (m)	* 22.55	* 2.70	* 17.24	*
* Vel Total (m/s)	* 4.95	* Avg. Vel. (m/s)	* 3.38	* 9.53	* 3.68	*
* Max Chl Dpth (m)	* 2.00	* Hydr. Depth (m)	* 0.51	* 1.95	* 0.28	*
* Conv. Total (m3/s)	* 435.5	* Conv. (m3/s)	* 158.6	* 205.5	* 71.4	*
* Length Wtd. (m)	* 22.94	* Wetted Per. (m)	* 23.42	* 2.71	* 17.75	*
* Min Ch El (m)	* 238.18	* Shear (N/sq m)	* 287.52	* 1141.73	* 156.71	*
* Alpha	* 2.01	* Stream Power (N/m s)	* 970.46	* 10883.90	* 576.22	*
* Frctn Loss (m)	* 1.07	* Cum Volume (cu m x 10^	* 0.01	* 0.01	* 0.02	*
* C & E Loss (m)	* 0.05	* Cum SA (1000 m2)	* 11.31	* 6.68	* 31.84	*

CROSS SECTION OUTPUT Riv Sta: 26 Profile # 100 yr Storm

* E.G. Elev (m)	* 243.00	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 2.69	* Wt. n-Val	* 0.047	* 0.040	* 0.042	*
* W.S. Elev (m)	* 240.31	* Reach Len. (m)	* 22.94	* 23.13	* 22.07	*
* Crit W.S. (m)	* 240.91	* Flow Area (m2)	* 14.55	* 5.64	* 7.13	*
* E.G. Slope (m/m)	* 0.064635	* Area (m2)	* 14.55	* 5.64	* 7.13	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 58.94	* 58.42	* 28.91	*
* Top Width (m)	* 43.48	* Top Width (m)	* 22.76	* 2.70	* 18.02	*
* Vel Total (m/s)	* 5.36	* Avg. Vel. (m/s)	* 4.05	* 10.37	* 4.06	*
* Max Chl Dpth (m)	* 2.13	* Hydr. Depth (m)	* 0.64	* 2.09	* 0.40	*
* Conv. Total (m3/s)	* 575.3	* Conv. (m3/s)	* 231.8	* 229.8	* 113.7	*
* Length Wtd. (m)	* 22.91	* Wetted Per. (m)	* 23.91	* 2.71	* 18.55	*
* Min Ch El (m)	* 238.18	* Shear (N/sq m)	* 385.57	* 1320.19	* 243.62	*
* Alpha	* 1.84	* Stream Power (N/m s)	* 1562.14	* 13684.68	* 987.89	*
* Frctn Loss (m)	* 0.99	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.03	*
* C & E Loss (m)	* 0.08	* Cum SA (1000 m2)	* 13.86	* 6.46	* 34.33	*

CROSS SECTION INPUT River Station: 27
Description:

Station Elevation Data, num = 21

```
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*******************************************************************************
       0242.9563 2.74078241.68167.249772240.8909    9.37  239.3411.77454239.4188
   13.74  239.3617.27508241.3981   18.63  241.6419.91314241.656624.21771241.5475
   24.76  241.4625.26162241.261625.80764241.430726.30222 241.48526.96824 242.397
   34.49  242.8347.21785 243.07760.51508243.204473.49724 243.304   81.27  243.53
   83.56  244.32

Mannings n Values,  num = 7
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*******************************************************************************
       0     .08    9.37    .035   13.74    .045   18.63     .03   24.76    .045   34.49     .05   81.27     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
          9.37   13.74            31.81   34.28    36.1             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 27  Profile # Storm Event
*******************************************************************************************
* E.G. Elev (m)       *   243.07 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     2.10 * Wt. n-Val              *    0.080 *    0.035 *    0.045 *
* W.S. Elev (m)       *   240.97 * Reach Len. (m)         *    31.81 *    34.28 *    36.10 *
* Crit W.S. (m)       *   241.88 * Flow Area (m2)         *     1.82 *     6.92 *     2.25 *
* E.G. Slope (m/m)    * 0.031962 * Area (m2)              *     1.82 *     6.92 *     2.25 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)            *     2.88 *    48.00 *     7.03 *
* Top Width (m)       *     9.72 * Top Width (m)          *     2.56 *     4.37 *     2.79 *
* Vel Total (m/s)     *     5.27 * Avg. Vel. (m/s)        *     1.58 *     6.94 *     3.13 *
* Max Chl Dpth (m)    *     1.63 * Hydr. Depth (m)        *     0.71 *     1.58 *     0.80 *
* Conv. Total (m3/s)  *    323.9 * Conv. (m3/s)           *     16.1 *    268.5 *     39.3 *
* Length Wtd. (m)     *    34.14 * Wetted Per. (m)        *     3.07 *     4.37 *     3.22 *
* Min Ch El (m)       *   239.34 * Shear (N/sq m)         *   186.12 *   496.26 *   218.57 *
* Alpha               *     1.48 * Stream Power (N/m s)   *   293.94 *  3443.41 *   684.05 *
* Frctn Loss (m)      *     0.85 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.01 *
* C & E Loss (m)      *     0.11 * Cum SA (1000 m2)       *     8.42 *     6.77 *    26.73 *
*******************************************************************************************


CROSS SECTION OUTPUT  Riv Sta: 27  Profile # 25 yr Storm
*******************************************************************************************
* E.G. Elev (m)       *   243.80 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.97 * Wt. n-Val              *    0.080 *    0.035 *    0.043 *
* W.S. Elev (m)       *   241.83 * Reach Len. (m)         *    31.81 *    34.28 *    36.10 *
* Crit W.S. (m)       *   242.40 * Flow Area (m2)         *     6.09 *    10.67 *     7.63 *
* E.G. Slope (m/m)    * 0.019221 * Area (m2)              *     6.09 *    10.67 *     7.63 *
* Q Total (m3/s)      *   106.47 * Flow (m3/s)            *     9.14 *    76.62 *    20.71 *
* Top Width (m)       *    24.12 * Top Width (m)          *     6.94 *     4.37 *    12.81 *
* Vel Total (m/s)     *     4.37 * Avg. Vel. (m/s)        *     1.50 *     7.18 *     2.71 *
* Max Chl Dpth (m)    *     2.49 * Hydr. Depth (m)        *     0.88 *     2.44 *     0.60 *
* Conv. Total (m3/s)  *    768.0 * Conv. (m3/s)           *     65.9 *    552.6 *    149.4 *
* Length Wtd. (m)     *    34.05 * Wetted Per. (m)        *     7.55 *     4.37 *    13.63 *
* Min Ch El (m)       *   239.34 * Shear (N/sq m)         *   152.02 *   460.23 *   105.57 *
* Alpha               *     2.03 * Stream Power (N/m s)   *   228.31 *  3305.58 *   286.40 *
* Frctn Loss (m)      *     0.62 * Cum Volume (cu m x 10^ *     0.01 *     0.01 *     0.02 *
* C & E Loss (m)      *     0.12 * Cum SA (1000 m2)       *    11.78 *     6.80 *    32.38 *
*******************************************************************************************


CROSS SECTION OUTPUT  Riv Sta: 27  Profile # 100 yr Storm
*******************************************************************************************
* E.G. Elev (m)       *   244.07 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.85 * Wt. n-Val              *    0.080 *    0.035 *    0.041 *
* W.S. Elev (m)       *   242.22 * Reach Len. (m)         *    31.81 *    34.28 *    36.10 *
* Crit W.S. (m)       *   242.90 * Flow Area (m2)         *     8.98 *    12.38 *    12.73 *
* E.G. Slope (m/m)    * 0.016339 * Area (m2)              *     8.98 *    12.38 *    12.73 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)            *    14.92 *    90.59 *    40.76 *
* Top Width (m)       *    25.26 * Top Width (m)          *     7.79 *     4.37 *    13.10 *
* Vel Total (m/s)     *     4.29 * Avg. Vel. (m/s)        *     1.66 *     7.31 *     3.20 *
* Max Chl Dpth (m)    *     2.88 * Hydr. Depth (m)        *     1.15 *     2.84 *     0.97 *
* Conv. Total (m3/s)  *   1144.2 * Conv. (m3/s)           *    116.7 *    708.7 *    318.9 *
* Length Wtd. (m)     *    34.09 * Wetted Per. (m)        *     8.48 *     4.37 *    14.12 *
* Min Ch El (m)       *   239.34 * Shear (N/sq m)         *   169.71 *   454.17 *   144.46 *
* Alpha               *     1.97 * Stream Power (N/m s)   *   281.80 *  3322.08 *   462.64 *
* Frctn Loss (m)      *     0.43 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.03 *
* C & E Loss (m)      *     0.14 * Cum SA (1000 m2)       *    14.35 *     6.58 *    34.89 *
*******************************************************************************************


CROSS SECTION INPUT    River Station: 28
Description:

Station Elevation Data,  num = 28
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*******************************************************************************
       0246.39842.878857245.99425.396853245.85258.494763245.4843   10.54  244.85
16.82991244.738419.15727244.606220.86539244.0301   23.03  240.2124.49898240.1335
   25.92  240.3329.17803 242.63930.21947242.8776   30.22  242.85 31.9429242.9096
36.62864242.8203   37.57  242.7137.94338242.602438.21307242.806939.04066242.9191
   42.99  243.2746.88276 243.31263.39674243.670470.44758243.726879.38816243.7558
   95.63  243.5898.80351243.5049  101.59  244.38

Mannings n Values,  num = 8
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*******************************************************************************
       0     .08   10.54     .05   23.03    .035   25.92    .045   30.22     .03   37.57    .045   42.99     .05   95.63     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         23.03   25.92            63.06   61.29   60.41             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 28  Profile # Storm Event
*******************************************************************************************
* E.G. Elev (m)       *   244.03 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.97 * Wt. n-Val              *    0.050 *    0.035 *    0.043 *
* W.S. Elev (m)       *   243.06 * Reach Len. (m)         *    63.06 *    61.29 *    60.41 *
* Crit W.S. (m)       *   243.42 * Flow Area (m2)         *     2.30 *     8.27 *     7.50 *
* E.G. Slope (m/m)    * 0.007721 * Area (m2)              *     2.30 *     8.27 *     7.50 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)            *     3.20 *    41.69 *    13.02 *
```

Top Width (m)	19.24	Top Width (m)	1.62	2.89	14.73
Vel Total (m/s)	3.20	Avg. Vel. (m/s)	1.39	5.04	1.74
Max Chl Dpth (m)	2.93	Hydr. Depth (m)	1.43	2.86	0.51
Conv. Total (m3/s)	659.0	Conv. (m3/s)	36.4	474.5	148.2
Length Wtd. (m)	61.23	Wetted Per. (m)	3.28	2.91	15.62
Min Ch El (m)	240.13	Shear (N/sq m)	53.22	215.42	36.35
Alpha	1.86	Stream Power (N/m s)	73.93	1085.81	63.09
Frctn Loss (m)	0.20	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.01	Cum SA (1000 m2)	8.56	6.99	27.26

CROSS SECTION OUTPUT Riv Sta: 28 Profile # 25 yr Storm

E.G. Elev (m)	244.54	Element	Left OB	Channel	Right OB
Vel Head (m)	0.78	Wt. n-Val	0.050	0.035	0.040
W.S. Elev (m)	243.76	Reach Len. (m)	63.06	61.29	60.41
Crit W.S. (m)	244.02	Flow Area (m2)	3.57	10.29	28.27
E.G. Slope (m/m)	0.006270	Area (m2)	3.57	10.29	28.27
Q Total (m3/s)	106.47	Flow (m3/s)	5.17	54.04	47.26
Top Width (m)	78.59	Top Width (m)	2.01	2.89	73.69
Vel Total (m/s)	2.53	Avg. Vel. (m/s)	1.45	5.25	1.67
Max Chl Dpth (m)	3.63	Hydr. Depth (m)	1.77	3.56	0.38
Conv. Total (m3/s)	1344.6	Conv. (m3/s)	65.2	682.4	596.9
Length Wtd. (m)	61.13	Wetted Per. (m)	4.08	2.91	74.64
Min Ch El (m)	240.13	Shear (N/sq m)	53.78	217.57	23.29
Alpha	2.40	Stream Power (N/m s)	77.90	1142.95	38.94
Frctn Loss (m)	0.17	Cum Volume (cu m x 10^	0.01	0.02	0.02
C & E Loss (m)	0.00	Cum SA (1000 m2)	12.06	7.02	35.00

CROSS SECTION OUTPUT Riv Sta: 28 Profile # 100 yr Storm

E.G. Elev (m)	244.64	Element	Left OB	Channel	Right OB
Vel Head (m)	0.43	Wt. n-Val	0.050	0.035	0.043
W.S. Elev (m)	244.21	Reach Len. (m)	63.06	61.29	60.41
Crit W.S. (m)	244.21	Flow Area (m2)	4.58	11.60	61.98
E.G. Slope (m/m)	0.003853	Area (m2)	4.58	11.60	61.98
Q Total (m3/s)	146.26	Flow (m3/s)	5.38	51.73	89.15
Top Width (m)	80.73	Top Width (m)	2.70	2.89	75.14
Vel Total (m/s)	1.87	Avg. Vel. (m/s)	1.18	4.46	1.44
Max Chl Dpth (m)	4.08	Hydr. Depth (m)	1.69	4.01	0.82
Conv. Total (m3/s)	2356.2	Conv. (m3/s)	86.7	833.3	1436.1
Length Wtd. (m)	61.02	Wetted Per. (m)	4.96	2.91	76.15
Min Ch El (m)	240.13	Shear (N/sq m)	34.86	150.72	30.76
Alpha	2.38	Stream Power (N/m s)	41.02	672.31	44.24
Frctn Loss (m)	0.27	Cum Volume (cu m x 10^	0.01	0.02	0.03
C & E Loss (m)	0.03	Cum SA (1000 m2)	14.68	6.80	37.56

CROSS SECTION INPUT River Station: 29
Description:

Station Elevation Data, num = 25

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	245.59	432.786	444.953	6.05	244.45	15.92	243.76	16.50417	243.4168
17.23819	242.9026	17.9134	241.8471	19.55	240.8421	05.49124	0.7952	22.37	240.77
25.66	243.06	28.0914	243.2199	32.77	243.134	.40452	242.9179	34.57583	243.1593
35.05324	243.2681	38.6	243.4343	.15102	243.4741	59.54591	243.7771	67.61739	243.9249
75.64603	243.9841	91.89	243.9394	.89901	243.832	96.7187	244.5699	97.32	244.71

Mannings n Values, num = 9

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value						
0	.08	6.05	.035	15.92	.045	19.55	.035	22.37	.045	25.66	.03	32.77	.045	38.6	.05	91.89	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.55	22.37	24.05	23.96	23.58	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 29 Profile # Storm Event

E.G. Elev (m)	244.24	Element	Left OB	Channel	Right OB
Vel Head (m)	0.91	Wt. n-Val	0.045	0.035	0.044
W.S. Elev (m)	243.33	Reach Len. (m)	24.05	23.96	23.58
Crit W.S. (m)	243.70	Flow Area (m2)	4.03	7.13	6.56
E.G. Slope (m/m)	0.009287	Area (m2)	4.03	7.13	6.56
Q Total (m3/s)	57.91	Flow (m3/s)	8.80	36.42	12.69
Top Width (m)	19.76	Top Width (m)	2.92	2.82	14.02
Vel Total (m/s)	3.27	Avg. Vel. (m/s)	2.18	5.10	1.93
Max Chl Dpth (m)	2.56	Hydr. Depth (m)	1.38	2.53	0.47
Conv. Total (m3/s)	600.9	Conv. (m3/s)	91.4	377.9	131.7
Length Wtd. (m)	23.89	Wetted Per. (m)	3.92	2.82	14.89
Min Ch El (m)	240.77	Shear (N/sq m)	93.63	230.10	40.14
Alpha	1.68	Stream Power (N/m s)	204.51	1174.54	77.59
Frctn Loss (m)	0.18	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.03	Cum SA (1000 m2)	8.61	7.06	27.60

CROSS SECTION OUTPUT Riv Sta: 29 Profile # 25 yr Storm

E.G. Elev (m)	244.71	Element	Left OB	Channel	Right OB
Vel Head (m)	0.77	Wt. n-Val	0.045	0.035	0.041
W.S. Elev (m)	243.94	Reach Len. (m)	24.05	23.96	23.58
Crit W.S. (m)	244.21	Flow Area (m2)	6.33	8.86	24.72
E.G. Slope (m/m)	0.007760	Area (m2)	6.33	8.86	24.72
Q Total (m3/s)	106.47	Flow (m3/s)	14.22	47.77	44.48
Top Width (m)	63.00	Top Width (m)	6.22	2.82	53.96
Vel Total (m/s)	2.67	Avg. Vel. (m/s)	2.25	5.39	1.80
Max Chl Dpth (m)	3.17	Hydr. Depth (m)	1.02	3.14	0.46
Conv. Total (m3/s)	1208.6	Conv. (m3/s)	161.5	542.3	504.9
Length Wtd. (m)	23.80	Wetted Per. (m)	7.34	2.82	54.86
Min Ch El (m)	240.77	Shear (N/sq m)	65.58	238.77	34.30
Alpha	2.12	Stream Power (N/m s)	147.36	1287.18	61.70
Frctn Loss (m)	0.19	Cum Volume (cu m x 10^	0.01	0.02	0.02

* C & E Loss (m)	* 0.00	* Cum SA (1000 m2)	* 12.16	* 7.09	* 36.50	*

CROSS SECTION OUTPUT Riv Sta: 29 Profile # 100 yr Storm

* E.G. Elev (m)	* 244.83	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.58	* Wt. n-Val	* 0.044	* 0.035	* 0.042	*
* W.S. Elev (m)	* 244.25	* Reach Len. (m)	* 24.05	* 23.96	* 23.58	*
* Crit W.S. (m)	*	* Flow Area (m2)	* 8.90	* 9.72	* 46.69	*
* E.G. Slope (m/m)	* 0.006431	* Area (m2)	* 8.90	* 9.72	* 46.69	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 18.48	* 50.77	* 77.01	*
* Top Width (m)	* 86.96	* Top Width (m)	* 10.59	* 2.82	* 73.55	*
* Vel Total (m/s)	* 2.24	* Avg. Vel. (m/s)	* 2.08	* 5.22	* 1.65	*
* Max Chl Dpth (m)	* 3.48	* Hydr. Depth (m)	* 0.84	* 3.45	* 0.63	*
* Conv. Total (m3/s)	* 1823.9	* Conv. (m3/s)	* 230.4	* 633.1	* 960.3	*
* Length Wtd. (m)	* 23.75	* Wetted Per. (m)	* 11.73	* 2.82	* 74.51	*
* Min Ch El (m)	* 240.77	* Shear (N/sq m)	* 47.85	* 217.14	* 39.52	*
* Alpha	* 2.28	* Stream Power (N/m s)	* 99.35	* 1133.76	* 65.18	*
* Frctn Loss (m)	* 0.11	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.03	*
* C & E Loss (m)	* 0.03	* Cum SA (1000 m2)	* 14.84	* 6.87	* 39.31	*

CROSS SECTION INPUT River Station: 30
Description:

Station Elevation Data, num = 30

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-2.77	246.5	0	245.41	1.54244.7232		3.77244.6058		5.43	244.38
14.29244.0645		15.46243.8698		17.5	243.77	18.16243.4375		19.63241.9587	
20.94	241.56	21.95241.4466		22.96	241.54	25.35	243.22	26.4243.3376	
27.24243.3778		32.1	243.17	33.6243.0846		33.82243.4607		34.24	243.45
41.74243.5933		58.54243.8402		66.16244.0136		74.51244.0871		90.8	243.98
93.97243.8061		95.2243.9938		96.13244.0554		97.33	244.42	100.02	248.75

Mannings n Values, num = 9

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
-2.77	.06	5.43	.035	17.5	.045	20.94	.035	22.96	.045	25.35	.03	32.1	.045	34.24	.05	90.8	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.94	22.96	20.96	19.77	19.11	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 30 Profile # Storm Event

* E.G. Elev (m)	* 244.46	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.56	* Wt. n-Val	* 0.045	* 0.035	* 0.040	*
* W.S. Elev (m)	* 243.89	* Reach Len. (m)	* 20.96	* 19.77	* 19.11	*
* Crit W.S. (m)	* 244.13	* Flow Area (m2)	* 4.90	* 4.81	* 15.06	*
* E.G. Slope (m/m)	* 0.008801	* Area (m2)	* 4.90	* 4.81	* 15.06	*
* Q Total (m3/s)	* 57.91	* Flow (m3/s)	* 10.83	* 23.01	* 24.07	*
* Top Width (m)	* 47.61	* Top Width (m)	* 5.62	* 2.01	* 39.99	*
* Vel Total (m/s)	* 2.34	* Avg. Vel. (m/s)	* 2.21	* 4.78	* 1.60	*
* Max Chl Dpth (m)	* 2.45	* Hydr. Depth (m)	* 0.87	* 2.39	* 0.38	*
* Conv. Total (m3/s)	* 617.3	* Conv. (m3/s)	* 115.5	* 245.3	* 256.5	*
* Length Wtd. (m)	* 19.76	* Wetted Per. (m)	* 6.38	* 2.02	* 40.76	*
* Min Ch El (m)	* 241.45	* Shear (N/sq m)	* 66.30	* 205.52	* 31.88	*
* Alpha	* 2.02	* Stream Power (N/m s)	* 146.64	* 982.33	* 50.96	*
* Frctn Loss (m)	* 0.39	* Cum Volume (cu m x 10^	* 0.00	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.14	* Cum SA (1000 m2)	* 8.70	* 7.11	* 28.11	*

CROSS SECTION OUTPUT Riv Sta: 30 Profile # 25 yr Storm

* E.G. Elev (m)	* 244.90	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.75	* Wt. n-Val	* 0.044	* 0.035	* 0.041	*
* W.S. Elev (m)	* 244.15	* Reach Len. (m)	* 20.96	* 19.77	* 19.11	*
* Crit W.S. (m)	* 244.38	* Flow Area (m2)	* 6.64	* 5.34	* 29.90	*
* E.G. Slope (m/m)	* 0.012692	* Area (m2)	* 6.64	* 5.34	* 29.90	*
* Q Total (m3/s)	* 106.47	* Flow (m3/s)	* 18.24	* 32.81	* 55.42	*
* Top Width (m)	* 84.61	* Top Width (m)	* 9.10	* 2.01	* 73.49	*
* Vel Total (m/s)	* 2.54	* Avg. Vel. (m/s)	* 2.75	* 6.15	* 1.85	*
* Max Chl Dpth (m)	* 2.71	* Hydr. Depth (m)	* 0.73	* 2.65	* 0.41	*
* Conv. Total (m3/s)	* 945.1	* Conv. (m3/s)	* 161.9	* 291.2	* 491.9	*
* Length Wtd. (m)	* 19.64	* Wetted Per. (m)	* 9.88	* 2.02	* 74.29	*
* Min Ch El (m)	* 241.45	* Shear (N/sq m)	* 83.72	* 328.56	* 50.09	*
* Alpha	* 2.28	* Stream Power (N/m s)	* 229.90	* 2019.98	* 92.84	*
* Frctn Loss (m)	* 0.50	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.02	*
* C & E Loss (m)	* 0.14	* Cum SA (1000 m2)	* 12.32	* 7.14	* 37.72	*

CROSS SECTION OUTPUT Riv Sta: 30 Profile # 100 yr Storm

* E.G. Elev (m)	* 244.95	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.17	* Wt. n-Val	* 0.041	* 0.035	* 0.045	*
* W.S. Elev (m)	* 244.78	* Reach Len. (m)	* 20.96	* 19.77	* 19.11	*
* Crit W.S. (m)	* 244.54	* Flow Area (m2)	* 16.43	* 6.60	* 76.69	*
* E.G. Slope (m/m)	* 0.003047	* Area (m2)	* 16.43	* 6.60	* 76.69	*
* Q Total (m3/s)	* 146.26	* Flow (m3/s)	* 24.07	* 22.93	* 99.25	*
* Top Width (m)	* 96.15	* Top Width (m)	* 19.54	* 2.01	* 74.60	*
* Vel Total (m/s)	* 1.47	* Avg. Vel. (m/s)	* 1.46	* 3.47	* 1.29	*
* Max Chl Dpth (m)	* 3.34	* Hydr. Depth (m)	* 0.84	* 3.28	* 1.03	*
* Conv. Total (m3/s)	* 2649.6	* Conv. (m3/s)	* 436.1	* 415.4	* 1798.1	*
* Length Wtd. (m)	* 19.55	* Wetted Per. (m)	* 20.34	* 2.02	* 75.64	*
* Min Ch El (m)	* 241.45	* Shear (N/sq m)	* 24.14	* 97.62	* 30.30	*
* Alpha	* 1.57	* Stream Power (N/m s)	* 35.36	* 338.96	* 39.21	*
* Frctn Loss (m)	* 0.08	* Cum Volume (cu m x 10^	* 0.01	* 0.02	* 0.03	*
* C & E Loss (m)	* 0.04	* Cum SA (1000 m2)	* 15.15	* 6.91	* 40.73	*

CROSS SECTION INPUT River Station: 31
Description:

Station Elevation Data, num = 18

```
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*******************************************************************************
       0247.04641.359843246.2426    6.61  245.7314.60251244.854920.60668244.0916
   22.08     24224.16537242.1827   26.29  242.25   28.17  243.5830.80937243.6457
35.41643243.5363   36.77  243.4344.20257243.764655.01376244.3632   65.79  244.86
72.20316245.187476.32284245.4181   77.78  246.04

Mannings n Values,  num = 7
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*******************************************************************************
       0     .06    6.61    .045   22.08    .035   26.29    .045   28.17     .03   36.77    .045   65.79     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         22.08   26.29            35.19   34.55   33.34             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 31  Profile # Storm Event
*************************************************************************************************
* E.G. Elev (m)       *   244.97 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.01 * Wt. n-Val             *    0.045 *    0.035 *    0.038 *
* W.S. Elev (m)       *   243.96 * Reach Len. (m)        *    35.19 *    34.55 *    33.34 *
* Crit W.S. (m)       *   244.30 * Flow Area (m2)        *     1.36 *     7.61 *     8.34 *
* E.G. Slope (m/m)    * 0.015213 * Area (m2)             *     1.36 *     7.61 *     8.34 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)           *     2.54 *    39.78 *    15.59 *
* Top Width (m)       *    27.09 * Top Width (m)         *     1.38 *     4.21 *    21.50 *
* Vel Total (m/s)     *     3.35 * Avg. Vel. (m/s)       *     1.87 *     5.22 *     1.87 *
* Max Chl Dpth (m)    *     1.96 * Hydr. Depth (m)       *     0.98 *     1.81 *     0.39 *
* Conv. Total (m3/s)  *    469.5 * Conv. (m3/s)          *     20.6 *    322.5 *    126.4 *
* Length Wtd. (m)     *    34.21 * Wetted Per. (m)       *     2.40 *     4.22 *    21.94 *
* Min Ch El (m)       *   242.00 * Shear (N/sq m)        *    84.30 *   269.25 *    56.68 *
* Alpha               *     1.77 * Stream Power (N/m s)  *   157.91 *  1406.45 *   106.02 *
* Frctn Loss (m)      *     0.53 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.01 *
* C & E Loss (m)      *     0.05 * Cum SA (1000 m2)      *     8.82 *     7.21 *    29.14 *
*************************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 31  Profile # 25 yr Storm
*************************************************************************************************
* E.G. Elev (m)       *   245.54 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.21 * Wt. n-Val             *    0.045 *    0.035 *    0.037 *
* W.S. Elev (m)       *   244.33 * Reach Len. (m)        *    35.19 *    34.55 *    33.34 *
* Crit W.S. (m)       *   244.73 * Flow Area (m2)        *     2.11 *     9.16 *    17.42 *
* E.G. Slope (m/m)    * 0.016806 * Area (m2)             *     2.11 *     9.16 *    17.42 *
* Q Total (m3/s)      *   106.47 * Flow (m3/s)           *     3.71 *    56.86 *    45.91 *
* Top Width (m)       *    35.67 * Top Width (m)         *     3.34 *     4.21 *    28.12 *
* Vel Total (m/s)     *     3.71 * Avg. Vel. (m/s)       *     1.75 *     6.21 *     2.63 *
* Max Chl Dpth (m)    *     2.33 * Hydr. Depth (m)       *     0.63 *     2.18 *     0.62 *
* Conv. Total (m3/s)  *    821.3 * Conv. (m3/s)          *     28.6 *    438.6 *    354.1 *
* Length Wtd. (m)     *    34.04 * Wetted Per. (m)       *     4.44 *     4.22 *    28.57 *
* Min Ch El (m)       *   242.00 * Shear (N/sq m)        *    78.34 *   357.68 *   100.53 *
* Alpha               *     1.72 * Stream Power (N/m s)  *   137.47 *  2220.76 *   264.82 *
* Frctn Loss (m)      *     0.49 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.02 *
* C & E Loss (m)      *     0.08 * Cum SA (1000 m2)      *    12.54 *     7.25 *    39.41 *
*************************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 31  Profile # 100 yr Storm
*************************************************************************************************
* E.G. Elev (m)       *   245.79 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.19 * Wt. n-Val             *    0.045 *    0.035 *    0.038 *
* W.S. Elev (m)       *   244.59 * Reach Len. (m)        *    35.19 *    34.55 *    33.34 *
* Crit W.S. (m)       *   245.01 * Flow Area (m2)        *     3.26 *    10.26 *    25.50 *
* E.G. Slope (m/m)    * 0.015714 * Area (m2)             *     3.26 *    10.26 *    25.50 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)           *     5.72 *    66.45 *    74.10 *
* Top Width (m)       *    43.29 * Top Width (m)         *     5.40 *     4.21 *    33.68 *
* Vel Total (m/s)     *     3.75 * Avg. Vel. (m/s)       *     1.75 *     6.48 *     2.91 *
* Max Chl Dpth (m)    *     2.59 * Hydr. Depth (m)       *     0.60 *     2.44 *     0.76 *
* Conv. Total (m3/s)  *   1166.7 * Conv. (m3/s)          *     45.6 *    530.1 *    591.1 *
* Length Wtd. (m)     *    33.85 * Wetted Per. (m)       *     6.52 *     4.22 *    34.13 *
* Min Ch El (m)       *   242.00 * Shear (N/sq m)        *    77.00 *   374.72 *   115.14 *
* Alpha               *     1.67 * Stream Power (N/m s)  *   135.07 *  2426.87 *   334.55 *
* Frctn Loss (m)      *     0.61 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.04 *
* C & E Loss (m)      *     0.05 * Cum SA (1000 m2)      *    15.59 *     7.02 *    42.53 *
*************************************************************************************************

CROSS SECTION INPUT    River Station: 32
Description:

Station Elevation Data,  num = 24
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*******************************************************************************
       0  246.66    1.72  245.55    5.49245.4907   13.47245.1572   18.03  244.74
   18.19242.9611   18.73  242.61    19.5242.5509    20.2242.6341   22.38  244.33
   25.05244.1328   27.21244.1739   30.56  243.99   32.22243.7823   32.89243.7311
   33.84244.6784   34.71244.7525   35.71244.7826   36.58245.2197   37.83245.2225
   40.47245.3581   43.76245.2895   45.94  245.26   49.72     247

Mannings n Values,  num = 5
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*******************************************************************************
       0     .06    1.72     .04   18.73    .045   22.38     .03   30.56     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         18.73    20.2            45.31   41.99   39.86             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 32  Profile # Storm Event
*************************************************************************************************
* E.G. Elev (m)       *   245.56 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.49 * Wt. n-Val             *    0.040 *    0.045 *    0.039 *
* W.S. Elev (m)       *   245.08 * Reach Len. (m)        *    45.31 *    41.99 *    39.86 *
* Crit W.S. (m)       *   245.09 * Flow Area (m2)        *     2.05 *     3.67 *    15.46 *
* E.G. Slope (m/m)    * 0.011168 * Area (m2)             *     2.05 *     3.67 *    15.46 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)           *     2.62 *    15.77 *    39.52 *
* Top Width (m)       *    21.95 * Top Width (m)         *     4.38 *     1.47 *    16.09 *
* Vel Total (m/s)     *     2.73 * Avg. Vel. (m/s)       *     1.27 *     4.30 *     2.56 *
```

Max Chl Dpth (m)	2.53	Hydr. Depth (m)	0.47	2.49	0.96
Conv. Total (m3/s)	548.0	Conv. (m3/s)	24.8	149.2	374.0
Length Wtd. (m)	41.12	Wetted Per. (m)	6.13	1.48	17.17
Min Ch El (m)	242.55	Shear (N/sq m)	36.69	271.40	98.64
Alpha	1.28	Stream Power (N/m s)	46.75	1167.18	252.13
Frctn Loss (m)	0.29	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.18	Cum SA (1000 m2)	8.95	7.33	29.89

CROSS SECTION OUTPUT Riv Sta: 32 Profile # 25 yr Storm

			Left OB	Channel	Right OB
E.G. Elev (m)	246.10	Element	Left OB	Channel	Right OB
Vel Head (m)	0.45	Wt. n-Val	0.040	0.045	0.040
W.S. Elev (m)	245.65	Reach Len. (m)	45.31	41.99	39.86
Crit W.S. (m)	245.67	Flow Area (m2)	8.20	4.52	28.48
E.G. Slope (m/m)	0.008902	Area (m2)	8.20	4.52	28.48
Q Total (m3/s)	106.47	Flow (m3/s)	11.13	19.92	75.42
Top Width (m)	45.24	Top Width (m)	17.17	1.47	26.60
Vel Total (m/s)	2.58	Avg. Vel. (m/s)	1.36	4.41	2.65
Max Chl Dpth (m)	3.10	Hydr. Depth (m)	0.48	3.07	1.07
Conv. Total (m3/s)	1128.5	Conv. (m3/s)	118.0	211.2	799.3
Length Wtd. (m)	41.01	Wetted Per. (m)	18.96	1.48	27.79
Min Ch El (m)	242.55	Shear (N/sq m)	37.78	266.45	89.46
Alpha	1.32	Stream Power (N/m s)	51.25	1175.52	236.87
Frctn Loss (m)	0.24	Cum Volume (cu m x 10^	0.01	0.02	0.02
C & E Loss (m)	0.20	Cum SA (1000 m2)	13.00	7.37	40.50

CROSS SECTION OUTPUT Riv Sta: 32 Profile # 100 yr Storm

			Left OB	Channel	Right OB
E.G. Elev (m)	246.44	Element	Left OB	Channel	Right OB
Vel Head (m)	0.71	Wt. n-Val	0.040	0.045	0.040
W.S. Elev (m)	245.73	Reach Len. (m)	45.31	41.99	39.86
Crit W.S. (m)	245.89	Flow Area (m2)	9.45	4.62	30.41
E.G. Slope (m/m)	0.013935	Area (m2)	9.45	4.62	30.41
Q Total (m3/s)	146.26	Flow (m3/s)	17.59	25.92	102.75
Top Width (m)	45.51	Top Width (m)	17.28	1.47	26.75
Vel Total (m/s)	3.29	Avg. Vel. (m/s)	1.86	5.61	3.38
Max Chl Dpth (m)	3.18	Hydr. Depth (m)	0.55	3.14	1.14
Conv. Total (m3/s)	1239.0	Conv. (m3/s)	149.0	219.6	870.4
Length Wtd. (m)	40.97	Wetted Per. (m)	19.09	1.48	27.97
Min Ch El (m)	242.55	Shear (N/sq m)	67.65	426.96	148.62
Alpha	1.30	Stream Power (N/m s)	125.91	2393.77	502.11
Frctn Loss (m)	0.31	Cum Volume (cu m x 10^	0.01	0.02	0.04
C & E Loss (m)	0.14	Cum SA (1000 m2)	16.11	7.14	43.74

CROSS SECTION INPUT River Station: 33
Description: Observed HWM = 246.02 m (807.15 ft)

Station Elevation Data, num = 24

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-12.12	246	-9.87	245.75	-5.85	245.5	-2.49	245.25	0	245.47
1.55245.2688		3.36245.0902		4.38244.8241		5.44244.0813		5.73244.0767	
5.78	243	7.51242.9493		8.6	243.06	10.16	243.881	10.7	244.51
13.77244.3879		18.41244.4708		21.5244.3943		23.13	244.28	24.71244.0179	
25.18244.0441		25.44244.5028		26.19	244.98	33.95	247		

Mannings n Values, num = 5

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
-12.12	.045	5.78	.035	8.6	.045	10.7	.04	23.13	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5.78	8.6	24.82	22.24	20.07	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 33 Profile # Storm Event

			Left OB	Channel	Right OB
E.G. Elev (m)	246.02	Element	Left OB	Channel	Right OB
Vel Head (m)	1.08	Wt. n-Val	0.045	0.035	0.044
W.S. Elev (m)	244.94	Reach Len. (m)	24.82	22.24	20.07
Crit W.S. (m)	245.29	Flow Area (m2)	0.86	5.50	11.07
E.G. Slope (m/m)	0.017325	Area (m2)	0.86	5.50	11.07
Q Total (m3/s)	57.91	Flow (m3/s)	1.06	32.25	24.60
Top Width (m)	22.18	Top Width (m)	1.83	2.82	17.52
Vel Total (m/s)	3.32	Avg. Vel. (m/s)	1.24	5.86	2.22
Max Chl Dpth (m)	1.99	Hydr. Depth (m)	0.47	1.95	0.63
Conv. Total (m3/s)	440.0	Conv. (m3/s)	8.1	245.0	186.9
Length Wtd. (m)	21.12	Wetted Per. (m)	3.11	2.83	18.44
Min Ch El (m)	242.95	Shear (N/sq m)	46.80	330.69	102.01
Alpha	1.93	Stream Power (N/m s)	57.95	1938.68	226.67
Frctn Loss (m)	0.52	Cum Volume (cu m x 10^	0.00	0.01	0.01
C & E Loss (m)	0.01	Cum SA (1000 m2)	9.03	7.38	30.23

CROSS SECTION OUTPUT Riv Sta: 33 Profile # 25 yr Storm

			Left OB	Channel	Right OB
E.G. Elev (m)	246.55	Element	Left OB	Channel	Right OB
Vel Head (m)	1.13	Wt. n-Val	0.045	0.035	0.043
W.S. Elev (m)	245.42	Reach Len. (m)	24.82	22.24	20.07
Crit W.S. (m)	245.80	Flow Area (m2)	2.87	6.87	19.96
E.G. Slope (m/m)	0.015642	Area (m2)	2.87	6.87	19.96
Q Total (m3/s)	106.47	Flow (m3/s)	3.81	44.34	58.32
Top Width (m)	31.74	Top Width (m)	9.64	2.82	19.28
Vel Total (m/s)	3.59	Avg. Vel. (m/s)	1.33	6.46	2.92
Max Chl Dpth (m)	2.47	Hydr. Depth (m)	0.30	2.43	1.03
Conv. Total (m3/s)	851.3	Conv. (m3/s)	30.5	354.5	466.3
Length Wtd. (m)	21.06	Wetted Per. (m)	10.97	2.83	20.27
Min Ch El (m)	242.95	Shear (N/sq m)	40.17	372.66	151.04
Alpha	1.72	Stream Power (N/m s)	53.33	2406.53	441.35
Frctn Loss (m)	0.49	Cum Volume (cu m x 10^	0.01	0.02	0.02
C & E Loss (m)	0.01	Cum SA (1000 m2)	13.34	7.41	40.96

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

CROSS SECTION OUTPUT  Riv Sta: 33  Profile # 100 yr Storm
*******************************************************************************************
* E.G. Elev (m)       *   246.88 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.17 * Wt. n-Val             *    0.045 *    0.035 *    0.043 *
* W.S. Elev (m)       *   245.71 * Reach Len. (m)        *    24.82 *    22.24 *    20.07 *
* Crit W.S. (m)       *   246.09 * Flow Area (m2)        *     6.50 *     7.68 *    25.66 *
* E.G. Slope (m/m)    * 0.015066 * Area (m2)             *     6.50 *     7.68 *    25.66 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)           *     9.60 *    52.41 *    84.25 *
* Top Width (m)       *    38.19 * Top Width (m)         *    14.98 *     2.82 *    20.39 *
* Vel Total (m/s)     *     3.67 * Avg. Vel. (m/s)       *     1.48 *     6.83 *     3.28 *
* Max Chl Dpth (m)    *     2.76 * Hydr. Depth (m)       *     0.43 *     2.72 *     1.26 *
* Conv. Total (m3/s)  *   1191.6 * Conv. (m3/s)          *     78.2 *    427.0 *    686.4 *
* Length Wtd. (m)     *    21.09 * Wetted Per. (m)       *    16.33 *     2.83 *    21.41 *
* Min Ch El (m)       *   242.95 * Shear (N/sq m)        *    58.83 *   401.33 *   177.08 *
* Alpha               *     1.71 * Stream Power (N/m s)  *    86.85 *  2740.02 *   581.38 *
* Frctn Loss (m)      *     0.48 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.04 *
* C & E Loss (m)      *     0.00 * Cum SA (1000 m2)      *    16.51 *     7.19 *    44.21 *
*******************************************************************************************

CROSS SECTION INPUT    River Station: 34
Description: Observed HWM = 245.77 m (806.33 ft)

Station Elevation Data,  num = 15
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*******************************************************************************
       0  246.32    5.89245.7687   13.56245.5032   19.09244.9817   20.95  243.75
   23.19243.5793   24.73  243.62   27.45  245.31   30.07245.2063   31.22245.2429
   34.33  245.21   35.36245.1264   36.33244.9006   37.37  246.03   40.66   248.5

Mannings n Values,  num = 5
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*******************************************************************************
       0     .04   20.95    .035   24.73     .04   27.45     .03   34.33     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         20.95   24.73             31.7    32.8   33.93             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 34  Profile # Storm Event
*******************************************************************************************
* E.G. Elev (m)       *   246.54 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.00 * Wt. n-Val             *    0.040 *    0.035 *    0.039 *
* W.S. Elev (m)       *   245.55 * Reach Len. (m)        *    31.70 *    32.80 *    33.93 *
* Crit W.S. (m)       *   245.91 * Flow Area (m2)        *     3.89 *     7.21 *     6.15 *
* E.G. Slope (m/m)    * 0.014376 * Area (m2)             *     3.89 *     7.21 *     6.15 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)           *     6.68 *    37.93 *    13.30 *
* Top Width (m)       *    24.58 * Top Width (m)         *     8.61 *     3.78 *    12.19 *
* Vel Total (m/s)     *     3.36 * Avg. Vel. (m/s)       *     1.71 *     5.26 *     2.16 *
* Max Chl Dpth (m)    *     1.97 * Hydr. Depth (m)       *     0.45 *     1.91 *     0.50 *
* Conv. Total (m3/s)  *    483.0 * Conv. (m3/s)          *     55.7 *    316.4 *    110.9 *
* Length Wtd. (m)     *    33.10 * Wetted Per. (m)       *     9.00 *     3.79 *    12.99 *
* Min Ch El (m)       *   243.58 * Shear (N/sq m)        *    60.99 *   268.38 *    66.71 *
* Alpha               *     1.73 * Stream Power (N/m s)  *   104.57 *  1412.14 *   144.36 *
* Frctn Loss (m)      *     0.23 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.01 *
* C & E Loss (m)      *     0.02 * Cum SA (1000 m2)      *     9.20 *     7.49 *    30.73 *
*******************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 34  Profile # 25 yr Storm
*******************************************************************************************
* E.G. Elev (m)       *   247.04 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.06 * Wt. n-Val             *    0.040 *    0.035 *    0.037 *
* W.S. Elev (m)       *   245.98 * Reach Len. (m)        *    31.70 *    32.80 *    33.93 *
* Crit W.S. (m)       *   246.33 * Flow Area (m2)        *     9.94 *     8.85 *    11.52 *
* E.G. Slope (m/m)    * 0.013857 * Area (m2)             *     9.94 *     8.85 *    11.52 *
* Q Total (m3/s)      *   106.47 * Flow (m3/s)           *    19.91 *    52.41 *    34.15 *
* Top Width (m)       *    33.68 * Top Width (m)         *    17.31 *     3.78 *    12.59 *
* Vel Total (m/s)     *     3.51 * Avg. Vel. (m/s)       *     2.00 *     5.92 *     2.96 *
* Max Chl Dpth (m)    *     2.40 * Hydr. Depth (m)       *     0.57 *     2.34 *     0.92 *
* Conv. Total (m3/s)  *    904.5 * Conv. (m3/s)          *    169.2 *    445.2 *    290.1 *
* Length Wtd. (m)     *    33.17 * Wetted Per. (m)       *    17.72 *     3.79 *    13.58 *
* Min Ch El (m)       *   243.58 * Shear (N/sq m)        *    76.27 *   317.56 *   115.32 *
* Alpha               *     1.69 * Stream Power (N/m s)  *   152.73 *  1880.76 *   341.69 *
* Frctn Loss (m)      *     0.23 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.03 *
* C & E Loss (m)      *     0.02 * Cum SA (1000 m2)      *    13.76 *     7.52 *    41.51 *
*******************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 34  Profile # 100 yr Storm
*******************************************************************************************
* E.G. Elev (m)       *   247.36 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.13 * Wt. n-Val             *    0.040 *    0.035 *    0.037 *
* W.S. Elev (m)       *   246.23 * Reach Len. (m)        *    31.70 *    32.80 *    33.93 *
* Crit W.S. (m)       *   246.56 * Flow Area (m2)        *    14.56 *     9.78 *    14.68 *
* E.G. Slope (m/m)    * 0.013842 * Area (m2)             *    14.56 *     9.78 *    14.68 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)           *    34.23 *    61.94 *    50.09 *
* Top Width (m)       *    36.64 * Top Width (m)         *    19.96 *     3.78 *    12.90 *
* Vel Total (m/s)     *     3.75 * Avg. Vel. (m/s)       *     2.35 *     6.33 *     3.41 *
* Max Chl Dpth (m)    *     2.65 * Hydr. Depth (m)       *     0.73 *     2.59 *     1.14 *
* Conv. Total (m3/s)  *   1243.2 * Conv. (m3/s)          *    290.9 *    526.5 *    425.8 *
* Length Wtd. (m)     *    33.15 * Wetted Per. (m)       *    20.38 *     3.79 *    13.98 *
* Min Ch El (m)       *   243.58 * Shear (N/sq m)        *    96.99 *   350.76 *   142.57 *
* Alpha               *     1.58 * Stream Power (N/m s)  *   228.02 *  2220.23 *   486.48 *
* Frctn Loss (m)      *     0.24 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.04 *
* C & E Loss (m)      *     0.03 * Cum SA (1000 m2)      *    17.06 *     7.30 *    44.78 *
*******************************************************************************************

CROSS SECTION INPUT    River Station: 35
Description: Observed HWM = 246.27 m (807.97 ft)

Station Elevation Data,  num = 14
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*******************************************************************************
       0246.6697   10.33  245.8617.69612 245.594 23.1787245.5346   23.39  243.98
```

```
 25.6501243.6122   27.21  243.9129.82578245.5138   31.23  245.5432.63668245.6498
   35.83   245.637.23035245.445637.76879245.9336   38.25  247.46

Mannings n Values,  num = 6
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0    .045   10.33     .04   23.39    .035   27.21    .045   31.23     .03   35.83     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         23.39   27.21            22.13   21.68   19.23             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 35  Profile # Storm Event
*********************************************************************************************
* E.G. Elev (m)       *   246.80 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.76 * Wt. n-Val              *    0.040 *    0.035 *    0.042 *
* W.S. Elev (m)       *   246.04 * Reach Len. (m)         *    22.13 *    21.68 *    19.23 *
* Crit W.S. (m)       *   246.27 * Flow Area (m2)         *     5.36 *     8.62 *     7.04 *
* E.G. Slope (m/m)    * 0.008756 * Area (m2)              *     5.36 *     8.62 *     7.04 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)            *     6.16 *    39.24 *    12.51 *
* Top Width (m)       *    29.74 * Top Width (m)          *    15.33 *     3.82 *    10.59 *
* Vel Total (m/s)     *     2.76 * Avg. Vel. (m/s)        *     1.15 *     4.55 *     1.78 *
* Max Chl Dpth (m)    *     2.43 * Hydr. Depth (m)        *     0.35 *     2.26 *     0.66 *
* Conv. Total (m3/s)  *    618.9 * Conv. (m3/s)           *     65.8 *    419.3 *    133.7 *
* Length Wtd. (m)     *    21.18 * Wetted Per. (m)        *    16.70 *     3.88 *    11.32 *
* Min Ch El (m)       *   243.61 * Shear (N/sq m)         *    27.56 *   190.84 *    53.38 *
* Alpha               *     1.96 * Stream Power (N/m s)   *    31.68 *   868.91 *    94.89 *
* Frctn Loss (m)      *     0.27 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.01 *
* C & E Loss (m)      *     0.03 * Cum SA (1000 m2)       *     9.46 *     7.57 *    30.95 *
*********************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 35  Profile # 25 yr Storm
*********************************************************************************************
* E.G. Elev (m)       *   247.30 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.82 * Wt. n-Val              *    0.040 *    0.035 *    0.040 *
* W.S. Elev (m)       *   246.48 * Reach Len. (m)         *    22.13 *    21.68 *    19.23 *
* Crit W.S. (m)       *   246.72 * Flow Area (m2)         *    13.33 *    10.30 *    11.72 *
* E.G. Slope (m/m)    * 0.009076 * Area (m2)              *    13.33 *    10.30 *    11.72 *
* Q Total (m3/s)      *   106.47 * Flow (m3/s)            *    23.88 *    53.75 *    28.84 *
* Top Width (m)       *    35.49 * Top Width (m)          *    20.94 *     3.82 *    10.73 *
* Vel Total (m/s)     *     3.01 * Avg. Vel. (m/s)        *     1.79 *     5.22 *     2.46 *
* Max Chl Dpth (m)    *     2.87 * Hydr. Depth (m)        *     0.64 *     2.70 *     1.09 *
* Conv. Total (m3/s)  *   1117.6 * Conv. (m3/s)           *    250.7 *    564.2 *    302.7 *
* Length Wtd. (m)     *    21.05 * Wetted Per. (m)        *    22.33 *     3.88 *    11.78 *
* Min Ch El (m)       *   243.61 * Shear (N/sq m)         *    53.15 *   236.35 *    88.57 *
* Alpha               *     1.78 * Stream Power (N/m s)   *    95.22 *  1233.67 *   217.82 *
* Frctn Loss (m)      *     0.27 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.03 *
* C & E Loss (m)      *     0.03 * Cum SA (1000 m2)       *    14.19 *     7.60 *    41.73 *
*********************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 35  Profile # 100 yr Storm
*********************************************************************************************
* E.G. Elev (m)       *   247.63 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.89 * Wt. n-Val              *    0.041 *    0.035 *    0.040 *
* W.S. Elev (m)       *   246.74 * Reach Len. (m)         *    22.13 *    21.68 *    19.23 *
* Crit W.S. (m)       *   246.96 * Flow Area (m2)         *    19.24 *    11.30 *    14.56 *
* E.G. Slope (m/m)    * 0.009352 * Area (m2)              *    19.24 *    11.30 *    14.56 *
* Q Total (m3/s)      *   146.26 * Flow (m3/s)            *    40.90 *    63.72 *    41.64 *
* Top Width (m)       *    38.02 * Top Width (m)          *    23.39 *     3.82 *    10.81 *
* Vel Total (m/s)     *     3.24 * Avg. Vel. (m/s)        *     2.13 *     5.64 *     2.86 *
* Max Chl Dpth (m)    *     3.13 * Hydr. Depth (m)        *     0.82 *     2.96 *     1.35 *
* Conv. Total (m3/s)  *   1512.4 * Conv. (m3/s)           *    422.9 *    658.9 *    430.6 *
* Length Wtd. (m)     *    21.03 * Wetted Per. (m)        *    24.86 *     3.88 *    12.06 *
* Min Ch El (m)       *   243.61 * Shear (N/sq m)         *    71.02 *   267.31 *   110.72 *
* Alpha               *     1.66 * Stream Power (N/m s)   *   150.93 *  1507.01 *   316.71 *
* Frctn Loss (m)      *     0.28 * Cum Volume (cu m x 10^ *     0.01 *     0.02 *     0.04 *
* C & E Loss (m)      *     0.03 * Cum SA (1000 m2)       *    17.54 *     7.38 *    45.00 *
*********************************************************************************************

CROSS SECTION INPUT    River Station: 36
Description:

Station Elevation Data,  num = 13
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*********************************************************************************
       0  247.32   10.72  246.2418.78919 246.007    22.5  245.64   24.46  244.62
25.87289244.5546   27.12   244.6   28.94  246.0232.20069246.0646    35.4  246.08
36.97503246.0503   37.61  247.05   37.95  247.74

Mannings n Values,  num = 7
    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************************************************
       0    .045   10.72    .035    22.5    .045   24.46    .035   27.12    .045   28.94     .03    35.4     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         24.46   27.12            31.29   33.54   35.08             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 36  Profile # Storm Event
*********************************************************************************************
* E.G. Elev (m)       *   247.10 * Element                *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.44 * Wt. n-Val              *    0.039 *    0.035 *    0.037 *
* W.S. Elev (m)       *   246.66 * Reach Len. (m)         *    31.29 *    33.54 *    35.08 *
* Crit W.S. (m)       *   246.72 * Flow Area (m2)         *    11.31 *     5.52 *     7.42 *
* E.G. Slope (m/m)    * 0.007641 * Area (m2)              *    11.31 *     5.52 *     7.42 *
* Q Total (m3/s)      *    57.91 * Flow (m3/s)            *    21.40 *    22.45 *    14.05 *
* Top Width (m)       *    30.82 * Top Width (m)          *    17.91 *     2.66 *    10.25 *
* Vel Total (m/s)     *     2.39 * Avg. Vel. (m/s)        *     1.89 *     4.06 *     1.89 *
* Max Chl Dpth (m)    *     2.11 * Hydr. Depth (m)        *     0.63 *     2.08 *     0.72 *
* Conv. Total (m3/s)  *    662.5 * Conv. (m3/s)           *    244.8 *    256.8 *    160.8 *
* Length Wtd. (m)     *    33.36 * Wetted Per. (m)        *    18.21 *     2.66 *    11.07 *
* Min Ch El (m)       *   244.55 * Shear (N/sq m)         *    46.58 *   155.58 *    50.25 *
* Alpha               *     1.51 * Stream Power (N/m s)   *    88.10 *   632.21 *    95.13 *
* Frctn Loss (m)      *     0.19 * Cum Volume (cu m x 10^ *     0.00 *     0.01 *     0.01 *
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C & E Loss (m)	0.01	Cum SA (1000 m2)	9.98	7.68	31.32

CROSS SECTION OUTPUT Riv Sta: 36 Profile # 25 yr Storm

E.G. Elev (m)	247.60	Element	Left OB	Channel	Right OB
Vel Head (m)	0.50	Wt. n-Val	0.038	0.035	0.036
W.S. Elev (m)	247.10	Reach Len. (m)	31.29	33.54	35.08
Crit W.S. (m)	247.10	Flow Area (m2)	20.13	6.69	11.98
E.G. Slope (m/m)	0.007268	Area (m2)	20.13	6.69	11.98
Q Total (m3/s)	106.47	Flow (m3/s)	46.63	30.13	29.71
Top Width (m)	35.45	Top Width (m)	22.27	2.66	10.52
Vel Total (m/s)	2.74	Avg. Vel. (m/s)	2.32	4.50	2.48
Max Chl Dpth (m)	2.54	Hydr. Depth (m)	0.90	2.52	1.14
Conv. Total (m3/s)	1248.9	Conv. (m3/s)	547.0	353.4	348.5
Length Wtd. (m)	33.22	Wetted Per. (m)	22.58	2.66	11.59
Min Ch El (m)	244.55	Shear (N/sq m)	63.53	179.20	73.69
Alpha	1.30	Stream Power (N/m s)	147.18	806.90	182.73
Frctn Loss (m)	0.20	Cum Volume (cu m x 10^	0.01	0.02	0.03
C & E Loss (m)	0.00	Cum SA (1000 m2)	14.86	7.71	42.10

CROSS SECTION OUTPUT Riv Sta: 36 Profile # 100 yr Storm

E.G. Elev (m)	247.94	Element	Left OB	Channel	Right OB
Vel Head (m)	0.58	Wt. n-Val	0.038	0.035	0.036
W.S. Elev (m)	247.35	Reach Len. (m)	31.29	33.54	35.08
Crit W.S. (m)	247.35	Flow Area (m2)	26.10	7.37	14.67
E.G. Slope (m/m)	0.007562	Area (m2)	26.10	7.37	14.67
Q Total (m3/s)	146.26	Flow (m3/s)	68.09	36.08	42.09
Top Width (m)	37.76	Top Width (m)	24.46	2.66	10.64
Vel Total (m/s)	3.04	Avg. Vel. (m/s)	2.61	4.90	2.87
Max Chl Dpth (m)	2.80	Hydr. Depth (m)	1.07	2.77	1.38
Conv. Total (m3/s)	1681.9	Conv. (m3/s)	783.0	414.9	484.0
Length Wtd. (m)	33.14	Wetted Per. (m)	24.82	2.66	11.87
Min Ch El (m)	244.55	Shear (N/sq m)	78.02	205.30	91.65
Alpha	1.24	Stream Power (N/m s)	203.50	1005.43	262.91
Frctn Loss (m)	0.22	Cum Volume (cu m x 10^	0.01	0.02	0.04
C & E Loss (m)	0.00	Cum SA (1000 m2)	18.29	7.49	45.38

CROSS SECTION INPUT   River Station: 37
Description:

Station Elevation Data, num = 18

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	248.08	31.5	274	95.8002	8.05	246.37	14.5	84	1246.1088
17.5043	246.2036	20.8596	5246.22	4323.5836	9246.0198	23.96	245.52	5.67734	245.2728
27.01	245.45	27.69	246.44	31.4550	6 246.35	334.59	349246.3478	37.03	246.28
37.8605	5245.9762	38.3440	5246.28	1939.8	8464246.9824	40.78	247.73		

Mannings n Values, num = 6

Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value	Sta.	Value
0	.06	8.05	.04	23.96	.035	27.01	.045	27.69	.03	37.03	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.96	27.01	24.66	23.49	21.63	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 37 Profile # Storm Event

E.G. Elev (m)	247.30	Element	Left OB	Channel	Right OB
Vel Head (m)	0.33	Wt. n-Val	0.040	0.035	0.034
W.S. Elev (m)	246.97	Reach Len. (m)	24.66	23.49	21.63
Crit W.S. (m)	246.97	Flow Area (m2)	13.26	4.86	8.01
E.G. Slope (m/m)	0.008717	Area (m2)	13.26	4.86	8.01
Q Total (m3/s)	57.91	Flow (m3/s)	24.95	17.59	15.38
Top Width (m)	34.54	Top Width (m)	18.64	3.05	12.85
Vel Total (m/s)	2.22	Avg. Vel. (m/s)	1.88	3.62	1.92
Max Chl Dpth (m)	1.70	Hydr. Depth (m)	0.71	1.59	0.62
Conv. Total (m3/s)	620.3	Conv. (m3/s)	267.2	188.4	164.7
Length Wtd. (m)	23.49	Wetted Per. (m)	18.99	3.08	13.66
Min Ch El (m)	245.27	Shear (N/sq m)	59.73	135.05	50.15
Alpha	1.32	Stream Power (N/m s)	112.32	488.65	96.24
Frctn Loss (m)	0.17	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	0.00	Cum SA (1000 m2)	10.43	7.75	31.56

CROSS SECTION OUTPUT Riv Sta: 37 Profile # 25 yr Storm

E.G. Elev (m)	247.79	Element	Left OB	Channel	Right OB
Vel Head (m)	0.41	Wt. n-Val	0.041	0.035	0.034
W.S. Elev (m)	247.38	Reach Len. (m)	24.66	23.49	21.63
Crit W.S. (m)	247.30	Flow Area (m2)	21.28	6.11	13.38
E.G. Slope (m/m)	0.007776	Area (m2)	21.28	6.11	13.38
Q Total (m3/s)	106.47	Flow (m3/s)	48.59	24.32	33.56
Top Width (m)	36.91	Top Width (m)	20.51	3.05	13.35
Vel Total (m/s)	2.61	Avg. Vel. (m/s)	2.28	3.98	2.51
Max Chl Dpth (m)	2.11	Hydr. Depth (m)	1.04	2.00	1.00
Conv. Total (m3/s)	1207.4	Conv. (m3/s)	551.1	275.8	380.5
Length Wtd. (m)	23.46	Wetted Per. (m)	20.90	3.08	14.31
Min Ch El (m)	245.27	Shear (N/sq m)	77.67	151.44	71.32
Alpha	1.17	Stream Power (N/m s)	177.30	602.83	178.82
Frctn Loss (m)	0.18	Cum Volume (cu m x 10^	0.01	0.02	0.03
C & E Loss (m)	0.01	Cum SA (1000 m2)	15.39	7.78	42.36

CROSS SECTION OUTPUT Riv Sta: 37 Profile # 100 yr Storm

E.G. Elev (m)	248.12	Element	Left OB	Channel	Right OB
Vel Head (m)	0.47	Wt. n-Val	0.041	0.035	0.034
W.S. Elev (m)	247.65	Reach Len. (m)	24.66	23.49	21.63

Crit W.S. (m)	247.53	Flow Area (m2)	27.05	6.94	17.06
E.G. Slope (m/m)	0.007471	Area (m2)	27.05	6.94	17.06
Q Total (m3/s)	146.26	Flow (m3/s)	68.14	29.49	48.63
Top Width (m)	38.48	Top Width (m)	21.75	3.05	13.68
Vel Total (m/s)	2.86	Avg. Vel. (m/s)	2.52	4.25	2.85
Max Chl Dpth (m)	2.38	Hydr. Depth (m)	1.24	2.28	1.25
Conv. Total (m3/s)	1692.1	Conv. (m3/s)	788.4	341.2	562.6
Length Wtd. (m)	23.46	Wetted Per. (m)	22.17	3.08	14.74
Min Ch El (m)	245.27	Shear (N/sq m)	89.38	165.31	84.86
Alpha	1.13	Stream Power (N/m s)	225.18	702.25	241.79
Frctn Loss (m)	0.18	Cum Volume (cu m x 10^	0.01	0.02	0.04
C & E Loss (m)	0.01	Cum SA (1000 m2)	18.86	7.56	45.64

SUMMARY OF MANNING'S N VALUES

River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
37	0.06	0.04	0.035	0.045	0.03	0.06			
36	0.045	0.035	0.045	0.035	0.045	0.03	0.06		
35	0.045	0.04	0.035	0.045	0.03	0.06			
34	0.04	0.035	0.04	0.03	0.06				
33	0.045	0.035	0.045	0.04	0.06				
32	0.06	0.04	0.045	0.03	0.08				
31	0.06	0.045	0.035	0.045	0.03	0.045	0.06		
30	0.06	0.035	0.045	0.035	0.045	0.03	0.045	0.05	0.06
29	0.08	0.035	0.045	0.035	0.045	0.03	0.045	0.05	0.06
28	0.08	0.05	0.035	0.045	0.03	0.045	0.05	0.06	
27	0.08	0.035	0.045	0.03	0.045	0.05	0.06		
26	0.06	0.045	0.055	0.04	0.045	0.035	0.04	0.05	
25	0.06	0.045	0.035	0.045	0.035	0.06			
24	0.06	0.035	0.045	0.035	0.045	0.035	0.06		
23	0.06	0.04	0.045	0.035	0.045	0.035	0.07		
22	0.06	0.04	0.03	0.04	0.03	0.04	0.045	0.04	0.07
21	0.08	0.05	0.035	0.045	0.03	0.04	0.045	0.04	0.07
20	0.05	0.03	0.045	0.035	0.05				
19	0.06	0.045	0.035	0.055					
18	0.08	0.06	0.035	0.045	0.04	0.06			
17	0.08	0.035	0.045	0.035	0.06				
16	0.08	0.03	0.045	0.035	0.06				
15	0.08	0.035	0.045	0.035	0.045	0.06			
14	0.08	0.045	0.04	0.045	0.05	0.06			
13	0.06	0.045	0.04	0.045	0.06				
12.5	Bridge								
12	0.06	0.035	0.045	0.04	0.045	0.06			
11	0.06	0.035	0.045	0.035	0.06				
10	0.06	0.04	0.06						
9	0.065	0.045	0.05	0.04	0.045	0.055			
8	0.08	0.055	0.045	0.035	0.06				
7	0.05	0.035	0.045	0.035	0.05				
6	0.06	0.03	0.045						
5	0.045	0.03	0.045						
4.5	Bridge								
4	0.055	0.035	0.05						
3	0.055	0.035	0.05						
2	0.045	0.03	0.045						
1.55	Bridge								
1.1	0.05	0.03	0.05						
1	0.05	0.035	0.05						

SUMMARY OF REACH LENGTHS

River Sta.	Left	Channel	Right
37	24.66	23.49	21.63
36	31.29	33.54	35.08
35	22.13	21.68	19.23
34	31.7	32.8	33.93
33	24.82	22.24	20.07
32	45.31	41.99	39.86
31	35.19	34.55	33.34
30	20.96	19.77	19.11
29	24.05	23.96	23.58
28	63.06	61.29	60.41
27	31.81	34.28	36.1
26	22.94	23.13	22.07
25	42.02	44.16	44.9
24	32.48	39.57	44.49
23	142.75	144.5	119.37
22	28.69	27.76	27.42
21	57.76	58.22	57.79
20	39.93	42.05	42.51
19	53.01	50.5	48.51
18	157.22	156.61	154.33
17	153.6	152.88	151.04
16	156.7	158.58	159
15	64.74	65.22	66.69
14	18.77	18.64	18.17
13	21.44	21.78	21.52
12.5	Bridge		
12	19.35	19.25	19.14
11	158.51	165.96	168.44
10	71.06	68.99	67.18
9	3.62	3.53	3.66
8	94.04	80.33	68.45
7	82.23	100.95	103.93
6	16.45	17.16	18.76
5	12.5	12.59	12.42
4.5	Bridge		

4	21.23	22.02	22.82
3	8.79	8.81	8.76
2	5.68	5.85	6.32
1.55	Bridge		
1.1	2	2	2
1			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River Sta.	Contr.	Expan.
37	0.1	0.3
36	0.1	0.3
35	0.1	0.3
34	0.1	0.3
33	0.1	0.3
32	0.1	0.3
31	0.1	0.3
30	0.1	0.3
29	0.1	0.3
28	0.1	0.3
27	0.1	0.3
26	0.1	0.3
25	0.1	0.3
24	0.1	0.3
23	0.1	0.3
22	0.1	0.3
21	0.1	0.3
20	0.1	0.3
19	0.1	0.3
18	0.1	0.3
17	0.1	0.3
16	0.1	0.3
15	0.1	0.3
14	0.1	0.3
13	0.1	0.3
12.5	Bridge	
12	0.1	0.3
11	0.1	0.3
10	0.1	0.3
9	0.1	0.3
8	0.1	0.3
7	0.1	0.3
6	0.1	0.3
5	0.1	0.3
4.5	Bridge	
4	0.1	0.3
3	0.1	0.3
2	0.1	0.3
1.55	Bridge	
1.1	0.1	0.3
1	0.1	0.3

Profile Output - Standard Table 1

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	57.91	199.34	201.30	201.34	202.17	0.011030	4.29	15.46	10.53	1.04
1	106.47	199.34	201.54	202.25	203.75	0.023549	6.85	18.16	11.49	1.56
1	146.26	199.34	201.99	202.80	204.58	0.021348	7.48	23.74	13.23	1.53
1.1	57.91	199.34	201.35	201.35	202.19	0.007400	4.19	16.07	10.74	1.00
1.1	106.47	199.34	201.55	202.26	203.81	0.017434	6.90	18.26	11.50	1.56
1.1	146.26	199.34	202.03	202.83	204.62	0.015270	7.46	24.24	13.37	1.52
1.55	Bridge									
2	57.91	199.18	202.98	201.58	203.37	0.003578	2.77	20.90	6.05	0.48
2	106.47	199.18	201.89	202.66	204.66	0.032268	7.37	14.45	5.90	1.50
2	146.26	199.18	203.36	203.89	205.12	0.014933	6.01	33.19	89.25	0.98
3	57.91	198.93	203.02	201.47	203.39	0.001711	2.70	21.89	6.10	0.45
3	106.47	198.93	201.41	202.56	205.31	0.038214	8.75	12.30	5.88	1.92
3	146.26	198.93	203.41	204.13	205.24	0.007563	6.06	29.84	39.12	0.95
4	57.91	200.20	201.39	202.30	205.17	0.119331	8.61	6.74	8.06	2.98
4	106.47	200.20	201.92	203.18	206.76	0.080194	9.75	10.96	8.48	2.65
4	146.26	200.20	203.81	203.81	205.43	0.008526	5.65	26.33	10.93	1.00
4.5	Bridge									
5	57.91	202.46	204.09	204.75	206.34	0.050424	6.65	8.71	7.80	2.01
5	106.47	202.46	204.74	205.64	207.79	0.043416	7.74	13.76	7.85	1.87
5	146.26	202.46	208.75	206.28	209.21	0.002065	3.07	54.59	25.93	0.41
6	57.91	203.22	204.66	205.43	207.17	0.038376	7.11	8.76	7.08	1.93
6	106.47	203.22	205.58	206.44	208.38	0.026121	7.61	15.80	8.29	1.61
6	146.26	203.22	208.72	207.27	209.27	0.002305	3.64	61.71	27.55	0.50
7	57.91	206.51	208.47	209.10	210.67	0.031530	7.38	12.05	18.31	1.75
7	106.47	206.51	208.88	209.50	211.28	0.032249	8.56	22.73	30.57	1.83
7	146.26	206.51	209.09	209.77	211.67	0.034141	9.34	29.19	32.28	1.91
8	57.91	208.99	211.46	211.87	212.66	0.018293	5.37	14.89	18.81	1.10
8	106.47	208.99	211.85	212.49	213.66	0.025671	7.04	23.12	22.52	1.34
8	146.26	208.99	212.09	212.79	214.29	0.030048	8.04	28.79	25.98	1.47
9	57.91	209.05	211.24	211.84	212.86	0.021286	6.01	11.91	13.26	1.31
9	106.47	209.05	211.84	212.53	213.78	0.021688	7.14	22.85	21.43	1.38

9	146.26	209.05	212.10	212.87	214.42	0.024626	8.10	28.78	23.09	1.49
10	57.91	210.94	212.38	213.47	217.53	0.278890	10.17	6.06	8.85	3.62
10	106.47	210.94	213.12	214.22	217.16	0.097048	9.24	13.28	11.13	2.38
10	146.26	210.94	213.53	214.73	217.75	0.076033	9.60	18.66	13.86	2.19
11	57.91	218.83	221.43	221.43	222.18	0.008799	4.08	17.98	13.44	0.89
11	106.47	218.83	221.67	222.23	223.53	0.019423	6.51	21.36	14.44	1.34
11	146.26	218.83	221.93	222.73	224.51	0.024309	7.79	25.15	15.31	1.53
12	57.91	219.36	221.22	221.46	222.48	0.021261	4.98	11.90	7.17	1.23
12	106.47	219.36	222.42	222.42	223.87	0.011921	5.34	20.59	7.28	1.00
12	146.26	219.36	223.10	223.10	224.89	0.011093	5.94	25.57	7.34	1.00
12.5	Bridge									
13	57.91	219.67	222.09	221.80	222.83	0.008246	3.90	16.44	7.63	0.83
13	106.47	219.67	224.22	222.77	224.89	0.003071	3.70	36.25	28.15	0.56
13	146.26	219.67	224.03	223.45	225.42	0.006809	5.34	31.35	13.43	0.83
14	57.91	220.23	221.64	222.25	223.67	0.049474	6.43	9.54	8.60	1.83
14	106.47	220.23	224.70	223.10	224.97	0.001578	2.61	58.72	28.37	0.40
14	146.26	220.23	225.27		225.58	0.001646	2.90	75.39	30.14	0.42
15	57.91	222.28	224.47	224.65	225.06	0.010007	4.49	22.97	39.86	0.99
15	106.47	222.28	224.90	224.97	225.43	0.008472	4.67	40.77	42.87	0.94
15	146.26	222.28	225.40	225.19	225.77	0.004790	3.96	62.69	44.38	0.73
16	57.91	224.32	226.10	226.42	227.34	0.018103	5.69	18.60	52.91	1.49
16	106.47	224.32	226.35	226.67	227.51	0.017907	6.27	32.76	57.97	1.52
16	146.26	224.32	226.49	226.85	227.71	0.018542	6.73	41.16	59.01	1.57
17	57.91	227.19	229.02	229.35	230.15	0.018558	5.53	17.14	31.13	1.36
17	106.47	227.19	229.26	229.72	230.88	0.025700	7.11	25.12	34.63	1.63
17	146.26	227.19	229.44	229.97	231.23	0.027029	7.74	31.56	36.11	1.70
18	57.91	229.67	231.76	231.91	232.45	0.011529	4.92	20.61	21.24	1.10
18	106.47	229.67	232.44	232.44	233.10	0.008446	5.11	36.89	26.54	0.99
18	146.26	229.67	232.78	232.78	233.55	0.008798	5.63	46.08	28.32	1.03
19	57.91	230.89	232.30	232.62	233.43	0.027482	5.59	15.55	29.38	1.56
19	106.47	230.89	232.64	233.01	233.81	0.023935	6.09	26.11	32.74	1.52
19	146.26	230.89	232.88	233.24	234.10	0.021729	6.35	34.29	35.75	1.48
20	57.91	231.95	233.29	233.63	234.56	0.024943	6.21	16.61	39.21	1.75
20	106.47	231.95	233.56	233.93	234.82	0.023297	6.82	28.24	43.76	1.75
20	146.26	231.95	233.74	234.13	235.06	0.022342	7.18	36.10	44.16	1.74
21	57.91	232.86	234.81	235.11	235.87	0.020002	6.24	20.35	53.89	1.44
21	106.47	232.86	235.04	235.37	236.20	0.023773	7.32	32.52	55.16	1.59
21	146.26	232.86	235.17	235.54	236.46	0.026256	8.01	40.15	56.32	1.69
22	57.91	233.44	235.22	235.56	236.36	0.014728	5.81	18.97	37.50	1.41
22	106.47	233.44	235.52	235.94	236.75	0.015730	6.70	31.01	42.78	1.50
22	146.26	233.44	235.71	236.12	237.02	0.016198	7.22	39.43	46.60	1.55
23	57.91	236.07	237.82	238.05	238.53	0.016226	5.10	20.12	37.06	1.26
23	106.47	236.07	238.16	238.35	238.84	0.014409	5.44	35.60	52.30	1.22
23	146.26	236.07	238.37	238.61	239.06	0.013586	5.64	47.46	61.80	1.21
24	57.91	236.77	238.48	238.71	239.33	0.024317	6.13	19.85	47.94	1.53
24	106.47	236.77	238.68	238.96	239.65	0.026849	6.98	30.09	51.01	1.64
24	146.26	236.77	238.83	239.15	239.87	0.026822	7.34	37.65	53.42	1.66
25	57.91	237.72	239.16	239.60	240.83	0.036740	6.86	15.39	34.67	1.84
25	106.47	237.72	239.42	239.91	241.37	0.042085	8.21	25.73	43.62	2.03
25	146.26	237.72	239.58	240.10	241.61	0.043099	8.81	32.49	46.49	2.08
26	57.91	238.18	239.98	240.41	241.75	0.040452	7.30	14.21	30.21	1.76
26	106.47	238.18	240.17	240.70	242.68	0.059767	9.53	21.50	42.49	2.18
26	146.26	238.18	240.31	240.91	243.00	0.064635	10.37	27.31	43.48	2.29
27	57.91	239.34	240.97	241.88	243.07	0.031962	6.94	10.99	9.72	1.76
27	106.47	239.34	241.83	242.40	243.80	0.019221	7.18	24.39	24.12	1.47
27	146.26	239.34	242.22	242.90	244.07	0.016339	7.31	34.09	25.26	1.39
28	57.91	240.13	243.06	243.42	244.03	0.007721	5.04	18.07	19.24	0.95
28	106.47	240.13	243.76	244.02	244.54	0.006270	5.25	42.12	78.59	0.89
28	146.26	240.13	244.21	244.21	244.64	0.003853	4.46	78.15	80.73	0.71
29	57.91	240.77	243.33	243.70	244.24	0.009287	5.10	17.73	19.76	1.02
29	106.47	240.77	243.94	244.21	244.71	0.007760	5.39	39.91	63.00	0.97
29	146.26	240.77	244.25		244.83	0.006431	5.22	65.31	86.96	0.90
30	57.91	241.45	243.89	244.13	244.46	0.008801	4.78	24.77	47.61	0.99
30	106.47	241.45	244.15	244.38	244.90	0.012692	6.15	41.88	84.61	1.20
30	146.26	241.45	244.78	244.54	244.95	0.003047	3.47	99.73	96.15	0.61
31	57.91	242.00	243.96	244.30	244.97	0.015213	5.22	17.31	27.09	1.24
31	106.47	242.00	244.33	244.73	245.54	0.016806	6.21	28.69	35.67	1.34
31	146.26	242.00	244.59	245.01	245.79	0.015714	6.48	39.02	43.29	1.32
32	57.91	242.55	245.08	245.09	245.56	0.011168	4.30	21.18	21.95	0.87
32	106.47	242.55	245.65	245.67	246.10	0.008902	4.41	41.20	45.24	0.80
32	146.26	242.55	245.73	245.89	246.44	0.013935	5.61	44.48	45.51	1.01
33	57.91	242.95	244.94	245.29	246.02	0.017325	5.86	17.43	22.18	1.34
33	106.47	242.95	245.42	245.80	246.55	0.015642	6.46	29.69	31.74	1.32
33	146.26	242.95	245.71	246.09	246.88	0.015066	6.83	39.84	38.19	1.32
34	57.91	243.58	245.55	245.91	246.54	0.014376	5.26	17.25	24.58	1.22
34	106.47	243.58	245.98	246.33	247.04	0.013857	5.92	30.32	33.68	1.24
34	146.26	243.58	246.23	246.56	247.36	0.013842	6.33	39.02	36.64	1.26

35	57.91	243.61	246.04	246.27	246.80	0.008756	4.55	21.01	29.74	0.97
35	106.47	243.61	246.48	246.72	247.30	0.009076	5.22	35.35	35.49	1.01
35	146.26	243.61	246.74	246.96	247.63	0.009352	5.64	45.10	38.02	1.05
36	57.91	244.55	246.66	246.72	247.10	0.007641	4.06	24.26	30.82	0.90
36	106.47	244.55	247.10	247.10	247.60	0.007268	4.50	38.80	35.45	0.91
36	146.26	244.55	247.35	247.35	247.94	0.007562	4.90	48.14	37.76	0.94
37	57.91	245.27	246.97	246.97	247.30	0.008717	3.62	26.14	34.54	0.91
37	106.47	245.27	247.38	247.30	247.79	0.007776	3.98	40.78	36.91	0.90
37	146.26	245.27	247.65	247.53	248.12	0.007471	4.25	51.05	38.48	0.90

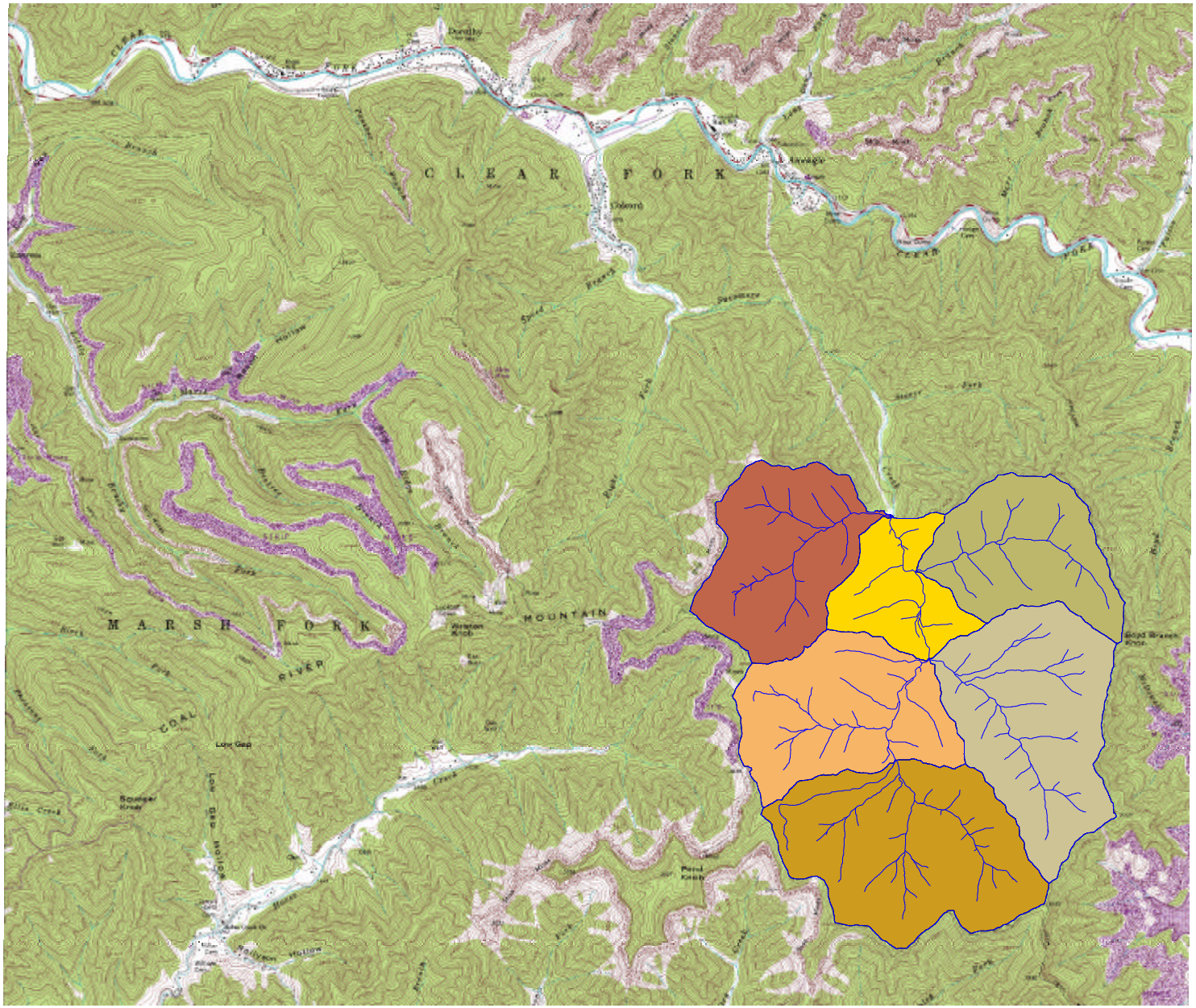
Profile Output - Standard Table 2

River Sta.	E.G. Elev (m)	W.S. Elev (m)	Vel Head (m)	Frctn Loss (m)	C & E Loss (m)	Q Left (m3/s)	Q Channel (m3/s)	Q Right (m3/s)	Top Width (m)
1	202.17	201.30	0.87	0.02	0.00	2.08	53.44	2.39	10.53
1	203.75	201.54	2.21	0.04	0.02	4.55	97.47	4.45	11.49
1	204.58	201.99	2.58	0.04	0.00	8.11	130.82	7.33	13.23
1.1	202.19	201.35	0.84			1.86	53.99	2.06	10.74
1.1	203.81	201.55	2.26	0.00	0.20	3.94	98.67	3.86	11.50
1.1	204.62	202.03	2.59	0.01	0.14	7.15	132.63	6.48	13.37
1.55	Bridge								
2	203.37	202.98	0.39				57.91		6.05
2	204.66	201.89	2.77	0.31	0.34		106.47		5.90
2	205.12	203.36	1.76	0.09	0.02	2.42	139.69	4.15	89.25
3	203.39	203.02	0.37	0.02	0.00	0.03	57.85	0.03	6.10
3	205.31	201.41	3.90	1.18	0.29	0.03	106.41	0.02	5.88
3	205.24	203.41	1.83	0.18	0.02	0.66	143.12	2.48	39.12
4	205.17	201.39	3.78	0.14	0.03	0.00	57.90	0.01	8.06
4	206.76	201.92	4.84	0.09	0.00	0.01	106.44	0.02	8.48
4	205.43	203.81	1.62	0.10	0.27	0.02	145.99	0.25	10.93
4.5	Bridge								
5	206.34	204.09	2.25	0.75	0.08		57.91		7.80
5	207.79	204.74	3.05	0.57	0.02		106.47		7.85
5	209.21	208.75	0.46			3.31	140.32	2.63	25.93
6	207.17	204.66	2.51	3.47	0.03	1.62	56.29		7.08
6	208.38	205.58	2.80	2.86	0.04	5.87	100.60		8.29
6	209.27	208.72	0.55	0.04	0.03	16.55	116.13	13.58	27.55
7	210.67	208.47	2.20	1.90	0.10	6.27	44.65	6.99	18.31
7	211.28	208.88	2.39	2.31	0.06	22.42	63.61	20.44	30.57
7	211.67	209.09	2.58	2.57	0.04	39.19	75.77	31.30	32.28
8	212.66	211.46	1.21	0.07	0.12	7.45	46.10	4.36	18.81
8	213.66	211.85	1.80	0.08	0.04	15.77	70.47	20.23	22.52
8	214.29	212.09	2.19	0.10	0.04	22.99	87.25	36.02	25.98
9	212.86	211.24	1.62	3.61	1.06	8.15	49.33	0.43	13.26
9	213.78	211.84	1.94	2.76	0.63	19.02	74.95	12.51	21.43
9	214.42	212.10	2.32	2.76	0.57	28.29	93.17	24.79	23.09
10	217.53	212.38	5.14	4.21	0.44	0.15	56.38	1.38	8.85
10	217.16	213.12	4.05	6.15	0.22	2.10	97.97	6.40	11.13
10	217.75	213.53	4.22	6.59	0.16	5.76	129.32	11.18	13.86
11	222.18	221.43	0.75	1.79	0.01	1.88	50.47	5.56	13.44
11	223.53	221.67	1.86	0.29	0.04	4.75	89.53	12.19	14.44
11	224.51	221.93	2.58	0.30	0.08	8.66	118.48	19.12	15.31
12	222.48	221.22	1.26			0.15	57.69	0.08	7.17
12	223.87	222.42	1.45	0.19	0.14	0.23	106.00	0.23	7.28
12	224.89	223.10	1.79	0.18	0.19	0.30	145.57	0.39	7.34
12.5	Bridge								
13	222.83	222.09	0.74			2.04	54.97	0.89	7.63
13	224.89	224.22	0.66			2.99	101.02	2.46	28.15
13	225.42	224.03	1.39			5.07	139.32	1.87	13.43
14	223.67	221.64	2.03	1.25	0.14	0.02	55.27	2.61	8.60
14	224.97	224.70	0.27	0.04	0.04	1.40	77.07	28.01	28.37
14	225.58	225.27	0.31	0.05	0.11	2.64	96.76	46.86	30.14
15	225.06	224.47	0.58	2.09	0.20	0.71	27.90	29.29	39.86
15	225.43	224.90	0.53	1.89	0.19	1.33	34.94	70.20	42.87
15	225.77	225.40	0.37	0.17	0.02	1.89	35.50	108.87	44.38
16	227.34	226.10	1.24	2.79	0.01	0.40	42.84	14.67	52.91
16	227.51	226.35	1.16	3.23	0.14	0.72	55.25	50.50	57.97
16	227.71	226.49	1.21	3.36	0.18	0.99	64.23	81.04	59.01
17	230.15	229.02	1.13	2.25	0.04	1.32	40.18	16.42	31.13
17	230.88	229.26	1.62	2.12	0.10	2.15	59.02	45.30	34.63
17	231.23	229.44	1.79	2.22	0.10	2.73	70.31	73.22	36.11
18	232.45	231.76	0.69	0.85	0.13	8.39	27.02	22.50	21.24
18	233.10	232.44	0.66	1.16	0.05	14.29	37.47	54.72	26.54
18	233.55	232.78	0.77	1.22	0.06	19.32	46.40	80.54	28.32
19	233.43	232.30	1.13	1.10	0.04	5.49	37.69	14.73	29.38
19	233.81	232.64	1.17	0.99	0.03	10.10	51.82	44.55	32.74
19	234.10	232.88	1.23	0.93	0.03	12.99	61.93	71.34	35.75

20	234.56	233.29	1.27	1.29	0.02	0.48	34.64	22.79	39.21
20	234.82	233.56	1.26	1.37	0.01	1.07	46.09	59.31	43.76
20	235.06	233.74	1.31	1.40	0.00	1.64	54.11	90.51	44.16
21	235.87	234.81	1.06	0.47	0.03	6.36	28.31	23.24	53.89
21	236.20	235.04	1.16	0.53	0.02	13.00	37.07	56.40	55.16
21	236.46	235.17	1.29	0.56	0.01	17.79	43.17	85.30	56.32
22	236.36	235.22	1.14	2.12	0.04	15.21	36.72	5.98	37.50
22	236.75	235.52	1.23	2.03	0.06	37.05	49.86	19.56	42.78
22	237.02	235.71	1.31	1.98	0.06	54.83	58.78	32.65	46.60
23	238.53	237.82	0.70	0.76	0.04	7.97	24.63	25.32	37.06
23	238.84	238.16	0.68	0.73	0.09	15.70	31.53	59.24	52.30
23	239.06	238.37	0.69	0.70	0.11	23.58	36.19	86.49	61.80
24	239.33	238.48	0.85	1.27	0.25	32.10	20.44	5.37	47.94
24	239.65	238.68	0.97	1.43	0.29	72.78	26.21	7.49	51.01
24	239.87	238.83	1.05	1.44	0.30	107.72	29.73	8.81	53.42
25	240.83	239.16	1.67	0.89	0.03	16.51	38.50	2.90	34.67
25	241.37	239.42	1.94	1.14	0.17	47.48	54.53	4.46	43.62
25	241.61	239.58	2.03	1.20	0.20	76.09	63.78	6.38	46.49
26	241.75	239.98	1.77	1.22	0.10	15.01	34.61	8.29	30.21
26	242.68	240.17	2.51	1.07	0.05	38.77	50.25	17.45	42.49
26	243.00	240.31	2.69	0.99	0.08	58.94	58.42	28.91	43.48
27	243.07	240.97	2.10	0.85	0.11	2.88	48.00	7.03	9.72
27	243.80	241.83	1.97	0.62	0.12	9.14	76.62	20.71	24.12
27	244.07	242.22	1.85	0.43	0.14	14.92	90.59	40.76	25.26
28	244.03	243.06	0.97	0.20	0.01	3.20	41.69	13.02	19.24
28	244.54	243.76	0.78	0.17	0.00	5.17	54.04	47.26	78.59
28	244.64	244.21	0.43	0.27	0.03	5.38	51.73	89.15	80.73
29	244.24	243.33	0.91	0.18	0.03	8.80	36.42	12.69	19.76
29	244.71	243.94	0.77	0.19	0.00	14.22	47.77	44.48	63.00
29	244.83	244.25	0.58	0.11	0.03	18.48	50.77	77.01	86.96
30	244.46	243.89	0.56	0.39	0.14	10.83	23.01	24.07	47.61
30	244.90	244.15	0.75	0.50	0.14	18.24	32.81	55.42	84.61
30	244.95	244.78	0.17	0.08	0.04	24.07	22.93	99.25	96.15
31	244.97	243.96	1.01	0.53	0.05	2.54	39.78	15.59	27.09
31	245.54	244.33	1.21	0.49	0.08	3.71	56.86	45.91	35.67
31	245.79	244.59	1.19	0.61	0.05	5.72	66.45	74.10	43.29
32	245.56	245.08	0.49	0.29	0.18	2.62	15.77	39.52	21.95
32	246.10	245.65	0.45	0.24	0.20	11.13	19.92	75.42	45.24
32	246.44	245.73	0.71	0.31	0.14	17.59	25.92	102.75	45.51
33	246.02	244.94	1.08	0.52	0.01	1.06	32.25	24.60	22.18
33	246.55	245.42	1.13	0.49	0.01	3.81	44.34	58.32	31.74
33	246.88	245.71	1.17	0.48	0.00	9.60	52.41	84.25	38.19
34	246.54	245.55	1.00	0.23	0.02	6.68	37.93	13.30	24.58
34	247.04	245.98	1.06	0.23	0.02	19.91	52.41	34.15	33.68
34	247.36	246.23	1.13	0.24	0.03	34.23	61.94	50.09	36.64
35	246.80	246.04	0.76	0.27	0.03	6.16	39.24	12.51	29.74
35	247.30	246.48	0.82	0.27	0.03	23.88	53.75	28.84	35.49
35	247.63	246.74	0.89	0.28	0.03	40.90	63.72	41.64	38.02
36	247.10	246.66	0.44	0.19	0.01	21.40	22.45	14.05	30.82
36	247.60	247.10	0.50	0.20	0.00	46.63	30.13	29.71	35.45
36	247.94	247.35	0.58	0.22	0.00	68.09	36.08	42.09	37.76
37	247.30	246.97	0.33	0.17	0.00	24.95	17.59	15.38	34.54
37	247.79	247.38	0.41	0.18	0.01	48.59	24.32	33.56	36.91
37	248.12	247.65	0.47	0.18	0.01	68.14	29.49	48.63	38.48

Report Completed - 04/02/02 03:38:41 PM

Sycamore Creek Watershed



Streams

Drainage Areas

- 1aB
- 1bB
- 2B
- 3aB
- 3bB
- 4B

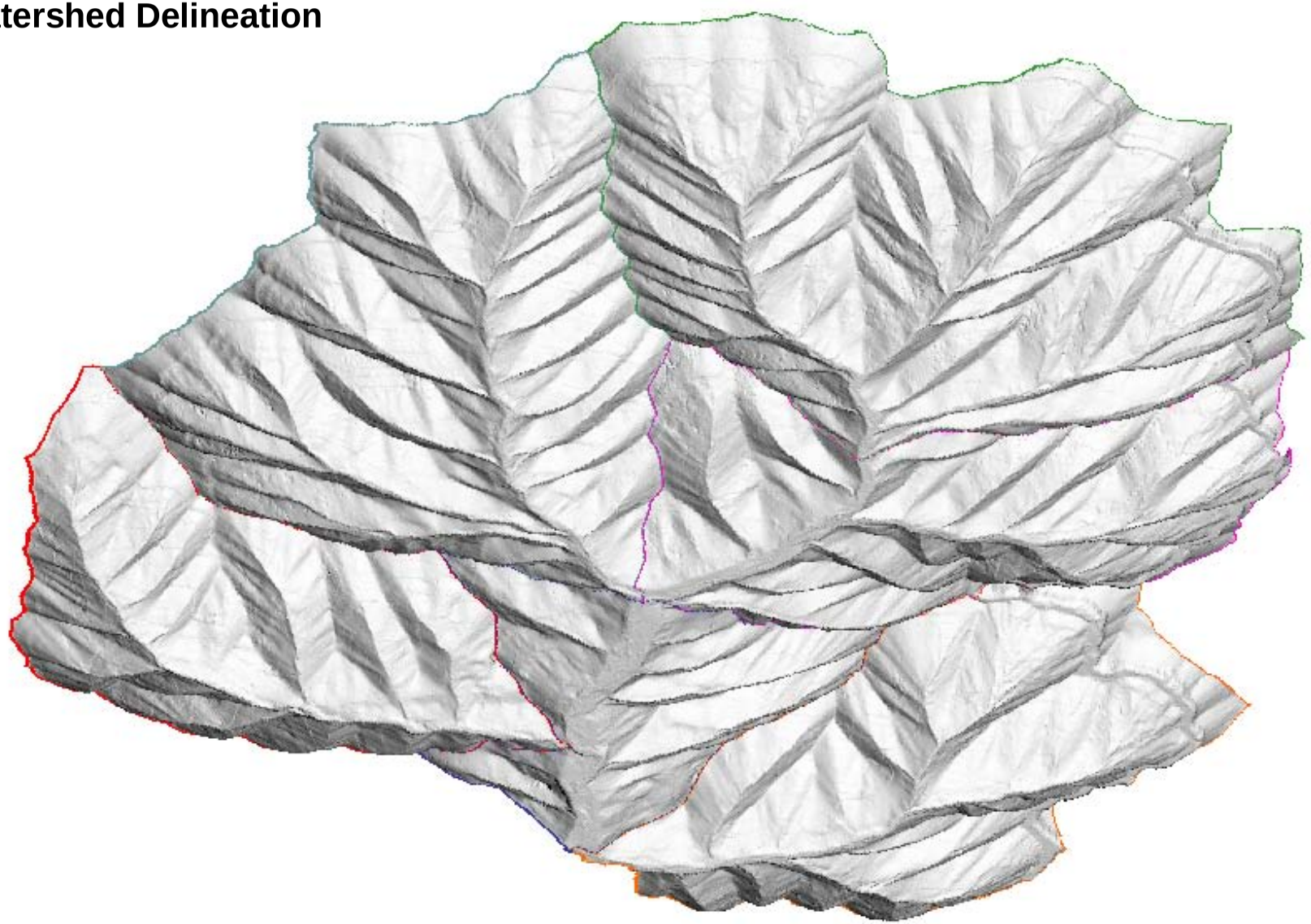
N

W E

S

Printed March 27, 2002

Sycamore Creek LIDAR
3D View
Watershed Delineation



Sycamore Creek LIDAR
Plan View
Watershed Delineation



Sycamore Creek Study Area



Legend

Sycamore Creek Watershed Boundaries

N

W E

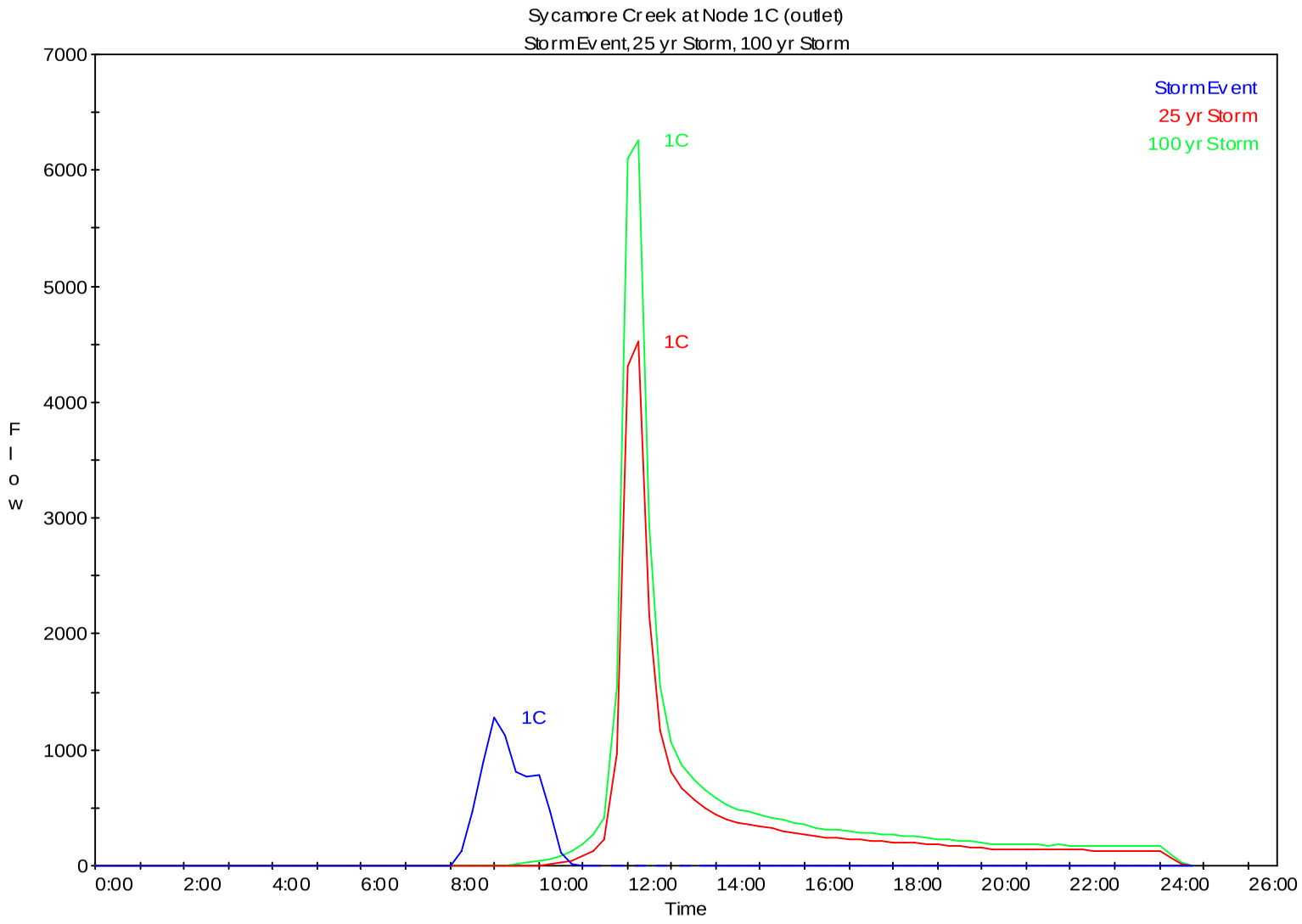
S

3000 0 3000 6000 Feet

TAGIS

Sycamore Creek Hydrology Analysis

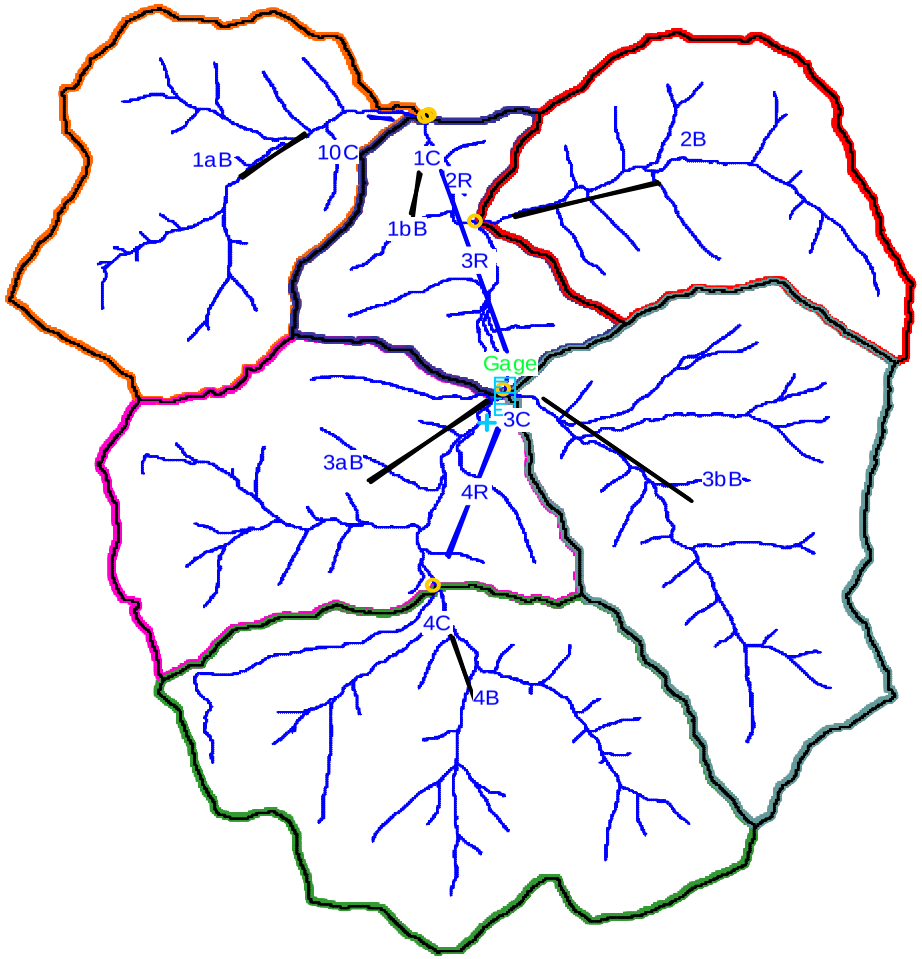
Bottom of Sycamore Creek	Storm Event	25 Yr Storm	100 yr Storm
Max Flow	*1211*	*4378*	*6078*

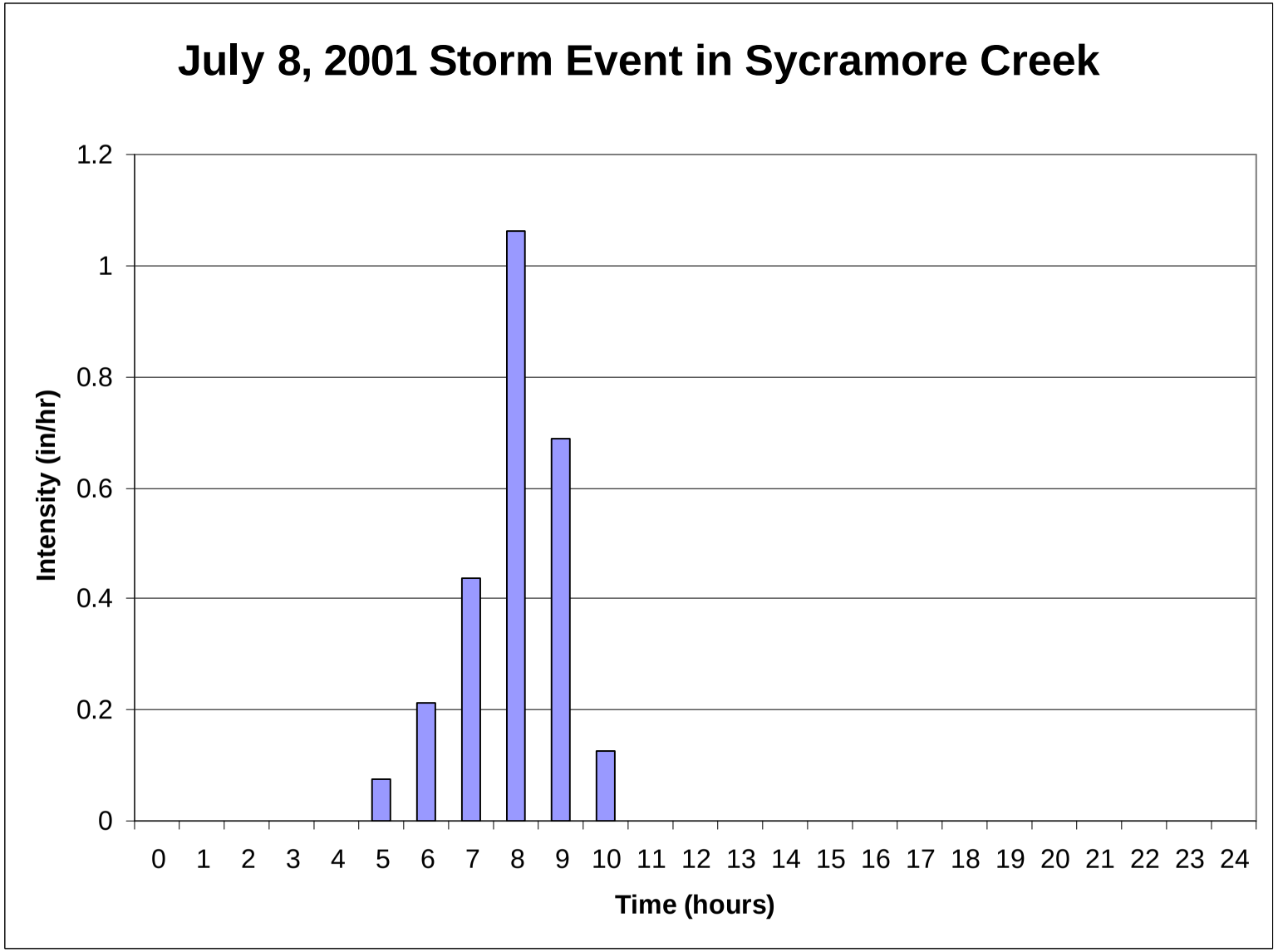


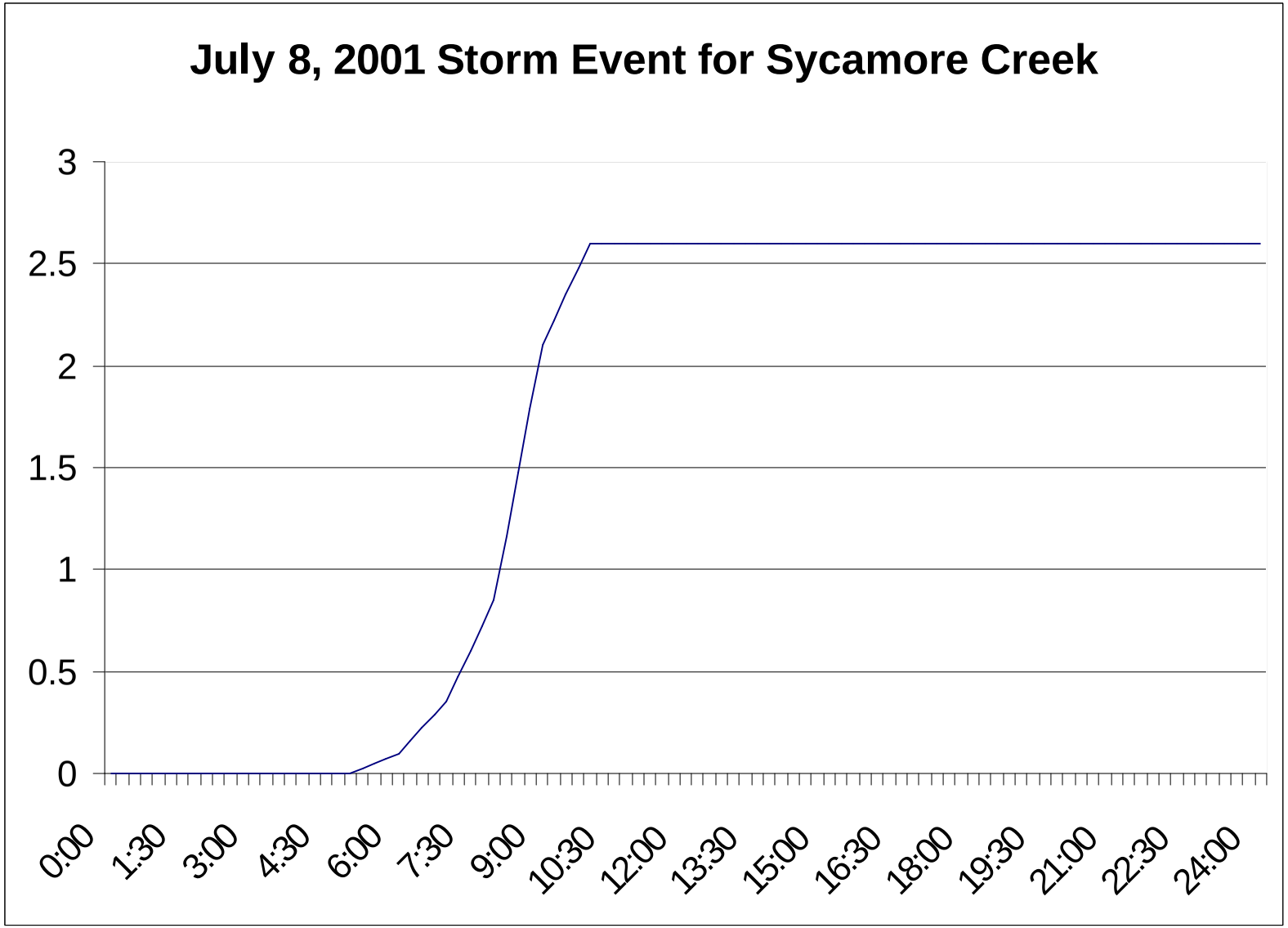
Sycamore Creek Outlet Node	LIDAR (wo Mining & wo Logging)		
	Event	25 yr	100 yr
1C	1211	4378	6078
2C	198	901	1255
3C	840	3374	4737
4C	333	1513	2109

9 fps

Watershed Delineation and Basin / Outlet / Routing Naming




July 8, 2001 Storm Event in Sycramore Creek
Intensity (in/hr)
1.2
1
0.8
0.6
0.4
0.2
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)


July 8, 2001 Storm Event for Sycamore Creek
3
2.5
2
1.5
1
0.5
0
0:00
1:30
3:00
4:30
6:00
7:30
9:00
10:30
12:00
13:30
15:00
16:30
18:00
19:30
21:00
22:30
24:00

```
ID  Sycamore Creek
ID  wo Mining & wo Logging (Pristine Conditions), LIDAR Data
ID  Storm Event
*DIAGRAM
IT    15  1JAN94       0     100
IO     1
* Gage XY Position 464530.00000 4195279.00000 1
PG  Gage     2.6
IN    15  1JAN94       0
* Sycamore Rainfall Distribution
PC   0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
PC   0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
PC   0.0   0.025    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475
PC   0.6   0.725    0.85  1.1625   1.475  1.7875     2.1   2.225    2.35   2.475
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6
KK   1aB
KO     0       0     0.0       1      22
BA0.8108
PR  Gage
PW   1.0
PT  Gage
PW 0.816
LS   0.0    70.5     0.0
UD0.0889
KK   10R   CNAME     10C
KO     0       0     0.0       0      22
RN   10R
KK    2B
KO     0       0     0.0       1      22
BA0.7081
PR  Gage
PW   1.0
PT  Gage
PW 0.816
LS   0.0    70.5     0.0
UD0.0987
KK    2R   CNAME      2C
KO     0       0     0.0       0      22
RM     1   0.072     0.2
KK    4B
KO     0       0     0.0       1      22
BA1.1898
PR  Gage
PW   1.0
PT  Gage
PW 0.816
LS   0.0    70.5     0.0
UD0.0828
KK    4R   CNAME      4C
KO     0       0     0.0       0      22
RM     1   0.123     0.2
KK   3bB
KO     0       0     0.0       1      22
BA1.0754
PR  Gage
PW   1.0
PT  Gage
PW 0.816
LS   0.0    70.5     0.0
UD0.1006
KK   3aB
KO     0       0     0.0       1      22
BA0.8748
PR  Gage
PW   1.0
PT  Gage
PW 0.816
LS   0.0    70.5     0.0
UD0.1062
```

```
KK    3C   CNAME      3R
KO     0       0     0.0       0      22
HC     3
KK    3R   CNAME      3C
KO     0       0     0.0       0      22
RM     1   0.165     0.2
KK   1bB
KO     0       0     0.0       1      22
BA 0.423
PR  Gage
PW   1.0
PT  Gage
PW 0.816
LS   0.0    70.5     0.0
UD0.0852
KK    1C   CNAME      1C
KO     0       0     0.0       0      22
HC     4
KK    1C   CNAME      1C
KO     0       0     0.0       0      22
RN    1C
ZZ
```

```
ID  Sycamore Creek
ID  wo Mining & wo Logging (Pristine Conditions), LIDAR Data
ID  25 yr Storm
*DIAGRAM
IT    15  1JAN94       0     100
IO     1
* Gage XY Position 464530.00000 4195279.00000 1
PG  Gage     2.6
IN    15  1JAN94       0
* Sycamore Rainfall Distribution
PC   0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
PC   0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
PC   0.0   0.025    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475
PC   0.6   0.725    0.85  1.1625   1.475  1.7875     2.1   2.225    2.35   2.475
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6
KK   1aB
KO     0       0     0.0       1      22
BA0.8108
PB  4.75
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0889
KK   10R   CNAME     10C
KO     0       0     0.0       0      22
RN   10R
KK    2B
KO     0       0     0.0       1      22
BA0.7081
PB  4.75
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
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PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0987
KK    2R   CNAME      2C
KO     0       0     0.0       0      22
RM     1   0.072     0.2
KK    4B
KO     0       0     0.0       1      22
BA1.1898
PB  4.75
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0828
KK    4R   CNAME      4C
KO     0       0     0.0       0      22
RM     1   0.123     0.2
KK   3bB
KO     0       0     0.0       1      22
BA1.0754
PB  4.75
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
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```
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.1006
KK   3aB
KO     0       0     0.0       1      22
BA0.8748
PB  4.75
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.1062
KK    3C   CNAME      3R
KO     0       0     0.0       0      22
HC     3
KK    3R   CNAME      3C
KO     0       0     0.0       0      22
RM     1   0.165     0.2
KK   1bB
KO     0       0     0.0       1      22
BA 0.423
PB  4.75
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
```

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PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0852
KK    1C   CNAME      1C
KO     0       0     0.0       0      22
HC     4
KK    1C   CNAME      1C
KO     0       0     0.0       0      22
RN    1C
ZZ
```

```
ID  Sycamore Creek
ID  wo Mining & wo Logging (Pristine Conditions), LIDAR Data
ID  100 yr Storm
*DIAGRAM
IT    15  1JAN94       0     100
IO     1
* Gage XY Position 464530.00000 4195279.00000 1
PG  Gage     2.6
IN    15  1JAN94       0
* Sycamore Rainfall Distribution
PC   0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
PC   0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
PC   0.0   0.025    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475
PC   0.6   0.725    0.85  1.1625   1.475  1.7875     2.1   2.225    2.35   2.475
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
PC   2.6     2.6     2.6     2.6     2.6     2.6     2.6
KK   1aB
KO     0       0     0.0       1      22
BA0.8108
PB  5.68
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0889
KK   10R   CNAME     10C
KO     0       0     0.0       0      22
RN   10R
KK    2B
KO     0       0     0.0       1      22
BA0.7081
PB  5.68
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
```

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PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0987
KK    2R   CNAME      2C
KO     0       0     0.0       0      22
RM     1   0.072     0.2
KK    4B
KO     0       0     0.0       1      22
BA1.1898
PB  5.68
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0828
KK    4R   CNAME      4C
KO     0       0     0.0       0      22
RM     1   0.123     0.2
KK   3bB
KO     0       0     0.0       1      22
BA1.0754
PB  5.68
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
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PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.1006
KK   3aB
KO     0       0     0.0       1      22
BA0.8748
PB  5.68
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.1062
KK    3C   CNAME      3R
KO     0       0     0.0       0      22
HC     3
KK    3R   CNAME      3C
KO     0       0     0.0       0      22
RM     1   0.165     0.2
KK   1bB
KO     0       0     0.0       1      22
BA 0.423
PB  5.68
IN     6  1JAN94       0
* typeII-24hour
PC   0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
PC0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
PC 0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
PC0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
PC 0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
PC 0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
PC  0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
PC 0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
PC  0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
PC 0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
PC 0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
PC 0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
PC 0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
PC 0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
PC  0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
PC0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
```

```
PC  0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
PC0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
PC 0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
PC0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
PC 0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
PC0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
PC 0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
PC0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
PC   1.0
LS   0.0    70.5     0.0
UD0.0852
KK    1C   CNAME      1C
KO     0       0     0.0       0      22
HC     4
KK    1C   CNAME      1C
KO     0       0     0.0       0      22
RN    1C
ZZ
```

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Sycamore Creek
   2          ID    wo Mining & wo Logging (Pristine Conditions), LIDAR Data
   3          ID    Storm Event
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 464530.00000 4195279.00000 1
   6          PG    Gage     2.6
   7          IN      15  1JAN94       0
              * Sycamore Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   9          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
  10          PC     0.0   0.025    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475
  11          PC     0.6   0.725    0.85  1.1625   1.475  1.7875     2.1   2.225    2.35   2.475
  12          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  13          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  14          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  15          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  16          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  17          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6

  18          KK     1aB
  19          KO       0       0     0.0       1      22
  20          BA  0.8108
  21          PR    Gage
  22          PW     1.0
  23          PT    Gage
  24          PW   0.816
  25          LS     0.0    70.5     0.0
  26          UD  0.0889

  27          KK     10R   CNAME     10C
  28          KO       0       0     0.0       0      22
  29          RN     10R

  30          KK      2B
  31          KO       0       0     0.0       1      22
  32          BA  0.7081
  33          PR    Gage
  34          PW     1.0
  35          PT    Gage
  36          PW   0.816
  37          LS     0.0    70.5     0.0
  38          UD  0.0987

  39          KK      2R   CNAME      2C
  40          KO       0       0     0.0       0      22
  41          RM       1   0.072     0.2

  42          KK      4B
  43          KO       0       0     0.0       1      22
  44          BA  1.1898
  45          PR    Gage
  46          PW     1.0
  47          PT    Gage
```

HEC-1 INPUT PAGE 2

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

  48          PW   0.816
```

```
 49          LS     0.0    70.5     0.0
 50          UD  0.0828

 51          KK      4R   CNAME      4C
 52          KO       0       0     0.0       0      22
 53          RM       1   0.123     0.2

 54          KK     3bB
 55          KO       0       0     0.0       1      22
 56          BA  1.0754
 57          PR    Gage
 58          PW     1.0
 59          PT    Gage
 60          PW   0.816
 61          LS     0.0    70.5     0.0
 62          UD  0.1006

 63          KK     3aB
 64          KO       0       0     0.0       1      22
 65          BA  0.8748
 66          PR    Gage
 67          PW     1.0
 68          PT    Gage
 69          PW   0.816
 70          LS     0.0    70.5     0.0
 71          UD  0.1062

 72          KK      3C   CNAME      3R
 73          KO       0       0     0.0       0      22
 74          HC       3

 75          KK      3R   CNAME      3C
 76          KO       0       0     0.0       0      22
 77          RM       1   0.165     0.2

 78          KK     1bB
 79          KO       0       0     0.0       1      22
 80          BA   0.423
 81          PR    Gage
 82          PW     1.0
 83          PT    Gage
 84          PW   0.816
 85          LS     0.0    70.5     0.0
 86          UD  0.0852

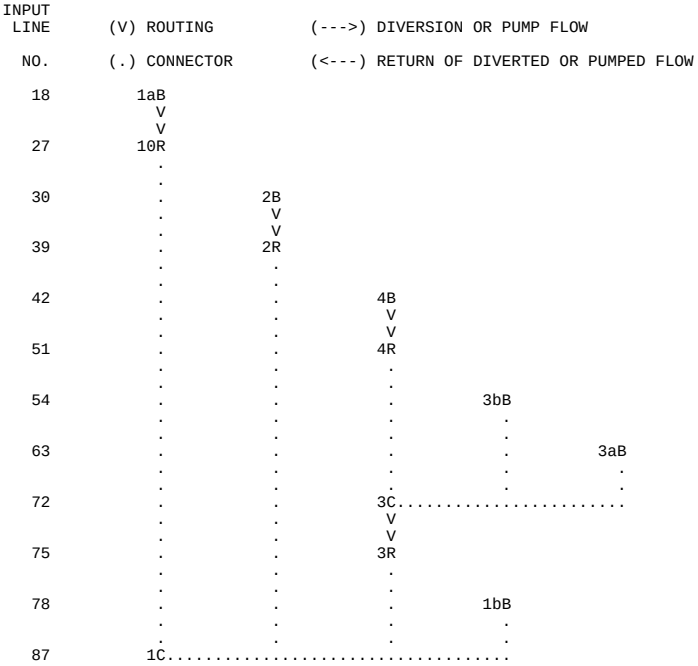
 87          KK      1C   CNAME      1C
 88          KO       0       0     0.0       0      22
 89          HC       4
```



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

 90          KK      1C   CNAME      1C
 91          KO       0       0     0.0       0      22
 92          RN      1C
 93          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



```
              V
              V
   90         1C

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1**************************************                  **************************************
 *                                    *                  *                                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                  *    U.S. ARMY CORPS OF ENGINEERS    *
 *              MAY   1991            *                  *    HYDROLOGIC ENGINEERING CENTER   *
 *           VERSION 4.0.1E           *                  *          609 SECOND STREET         *
 *                                    *                  *       DAVIS, CALIFORNIA 95616      *
 *  RUN DATE           TIME           *                  *           (916) 551-1748           *
 *                                    *                  *                                    *
 **************************************                  **************************************
```

Sycamore Creek
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
Storm Event

```
   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

   7 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN         15  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

     IT          HYDROGRAPH TIME DATA
                      NMIN          15  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1JAN94  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ,         100  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2JAN94  ENDING DATE
                    NDTIME        0045  ENDING TIME
                    ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.25 HOURS
                       TOTAL TIME BASE   24.75 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


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


           **************
           *            *
  18 KK    *       1aB  *
           *            *
           **************

  19 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

  20 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.81  SUBBASIN AREA

                 PRECIPITATION DATA

  23 PT           TOTAL STORM STATIONS      Gage
  24 PW                       WEIGHTS      0.82

  21 PR             RECORDING STATIONS      Gage
  22 PW                       WEIGHTS      1.00

  25 LS          SCS LOSS RATE
                       STRTL        0.84  INITIAL ABSTRACTION
                      CRVNBR       70.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  26 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.09  LAG
```

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	2.60	0.00	0.82

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.03	0.03	0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13
0.12	0.12	0.31	0.31	0.31	0.31	0.12	0.12	0.12	0.12

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1555.	435.	86.	17.	0.

HYDROGRAPH AT STATION 1aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.00	0.00	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.00	0.00	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.00	0.00	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.00	0.00	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.00	0.00	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.00	0.00	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.00	0.00	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.00	0.00	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.00	0.00	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.00	0.00	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.00	0.00	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.00	0.00	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.03	0.03	0.00	0.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.03	0.03	0.00	0.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.03	0.03	0.00	0.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.06	0.00	0.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.06	0.00	0.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.06	0.00	0.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.06	0.00	0.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.12	0.12	0.00	0.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.13	0.13	0.00	0.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.12	0.12	0.00	0.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.12	0.12	0.00	0.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.31	0.29	0.02	37.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.31	0.25	0.06	105.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.31	0.22	0.09	171.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.31	0.20	0.12	227.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.12	0.07	0.05	142.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.12	0.07	0.06	122.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.12	0.07	0.06	123.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.12	0.06	0.06	127.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	33.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	6.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.08, TOTAL EXCESS = 0.52

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
	(CFS)				
+ 227.	9.00	46.	11.	11.	11.
	(INCHES)	0.523	0.523	0.523	0.523
	(AC-FT)	23.	23.	23.	23.

CUMULATIVE AREA = 0.81 SQ MI

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          *           *
  27 KK   *       10R *        CNAME     10C
          *           *
          *************

  28 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

  29 RN          NO ROUTING
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HYDROGRAPH AT STATION 10R

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	37.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	105.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	171.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	227.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	142.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	122.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	123.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	127.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	33.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	6.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	1.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	0.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	0.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	0.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	0.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
227.	9.00	46.	11.	11.	11.
		(INCHES) 0.523	0.523	0.523	0.523
		(AC-FT) 23.	23.	23.	23.

CUMULATIVE AREA = 0.81 SQ MI

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          *************
          *           *
  30 KK   *        2B *
          *           *
          *************

  31 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

  32 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       0.71  SUBBASIN AREA

             PRECIPITATION DATA

  35 PT           TOTAL STORM STATIONS      Gage
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 36 PW                      WEIGHTS      0.82

 33 PR            RECORDING STATIONS     Gage
 34 PW                      WEIGHTS      1.00

 37 LS          SCS LOSS RATE
                     STRTL       0.84  INITIAL ABSTRACTION
                    CRVNBR      70.50  CURVE NUMBER
                     RTIMP       0.00  PERCENT IMPERVIOUS AREA

 38 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG       0.10  LAG
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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
Gage	2.60	0.00	0.82

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.03	0.03	0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13
0.12	0.12	0.31	0.31	0.31	0.31	0.12	0.12	0.12	0.12

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1358.	380.	75.	15.	0.

HYDROGRAPH AT STATION 2B

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.00	0.00	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.00	0.00	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.00	0.00	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.00	0.00	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.00	0.00	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.00	0.00	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.00	0.00	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.00	0.00	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.00	0.00	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.00	0.00	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.00	0.00	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.00	0.00	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.03	0.03	0.00	0.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.03	0.03	0.00	0.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.03	0.03	0.00	0.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.06	0.00	0.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.06	0.00	0.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.06	0.00	0.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.06	0.00	0.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.12	0.12	0.00	0.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.13	0.13	0.00	0.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.12	0.12	0.00	0.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.12	0.12	0.00	0.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.31	0.29	0.02	32.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.31	0.25	0.06	92.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.31	0.22	0.09	149.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.31	0.20	0.12	198.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.12	0.07	0.05	124.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.12	0.07	0.06	106.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.12	0.07	0.06	107.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.12	0.06	0.06	111.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	29.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	5.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.08, TOTAL EXCESS = 0.52

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR

```
+   (CFS)       (HR)
                  (CFS)
+     198.      9.00                40.         10.         10.          10.
                (INCHES)     0.523       0.523       0.523        0.523
                 (AC-FT)       20.         20.         20.          20.

                 CUMULATIVE AREA =    0.71 SQ MI
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*** ***

```
          **************
          *            *
  39 KK   *        2R  *        CNAME      2C
          *            *
          **************

  40 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

  41 RM          MUSKINGUM ROUTING
                       NSTPS         1 NUMBER OF SUBREACHES
                       AMSKK      0.07 MUSKINGUM K
                           X      0.20 MUSKINGUM X

                                                          ***
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH      2R.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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HYDROGRAPH AT STATION 2R

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	19.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	73.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	134.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	185.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	158.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	101.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	109.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	109.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	62.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	2.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	4.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	-1.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	0.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	0.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	0.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

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  PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                                6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                  (CFS)
+     185.      9.00                40.         10.         10.          10.
                (INCHES)     0.523       0.523       0.523        0.523
                 (AC-FT)       20.         20.         20.          20.

                 CUMULATIVE AREA =    0.71 SQ MI
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*** ***

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          **************
          *            *
  42 KK   *        4B  *
          *            *
          **************
```

```
 43 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 44 BA          SUBBASIN CHARACTERISTICS
                     TAREA,       1.19  SUBBASIN AREA

                PRECIPITATION DATA

 47 PT           TOTAL STORM STATIONS      Gage
 48 PW                       WEIGHTS      0.82

 45 PR             RECORDING STATIONS      Gage
 46 PW                       WEIGHTS      1.00

 49 LS          SCS LOSS RATE
                      STRTL       0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

 50 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.08  LAG

                                                    ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     2.60        0.00         0.82

                TEMPORAL DISTRIBUTIONS

                STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.03      0.03      0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13
                     0.12      0.12      0.31      0.31      0.31      0.31      0.12      0.12      0.12      0.12

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
             2282.      639.      125.       25.        0.

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

                                              HYDROGRAPH AT STATION       4B

*****************************************************************************************************************************************
                                                                                *
      DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q        *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                                *
       1 JAN 0000    1    0.00    0.00    0.00         0.        *        1 JAN 1230   51    0.00    0.00    0.00         0.
       1 JAN 0015    2    0.00    0.00    0.00         0.        *        1 JAN 1245   52    0.00    0.00    0.00         0.
       1 JAN 0030    3    0.00    0.00    0.00         0.        *        1 JAN 1300   53    0.00    0.00    0.00         0.
       1 JAN 0045    4    0.00    0.00    0.00         0.        *        1 JAN 1315   54    0.00    0.00    0.00         0.
       1 JAN 0100    5    0.00    0.00    0.00         0.        *        1 JAN 1330   55    0.00    0.00    0.00         0.
       1 JAN 0115    6    0.00    0.00    0.00         0.        *        1 JAN 1345   56    0.00    0.00    0.00         0.
       1 JAN 0130    7    0.00    0.00    0.00         0.        *        1 JAN 1400   57    0.00    0.00    0.00         0.
       1 JAN 0145    8    0.00    0.00    0.00         0.        *        1 JAN 1415   58    0.00    0.00    0.00         0.
       1 JAN 0200    9    0.00    0.00    0.00         0.        *        1 JAN 1430   59    0.00    0.00    0.00         0.
       1 JAN 0215   10    0.00    0.00    0.00         0.        *        1 JAN 1445   60    0.00    0.00    0.00         0.
       1 JAN 0230   11    0.00    0.00    0.00         0.        *        1 JAN 1500   61    0.00    0.00    0.00         0.
       1 JAN 0245   12    0.00    0.00    0.00         0.        *        1 JAN 1515   62    0.00    0.00    0.00         0.
       1 JAN 0300   13    0.00    0.00    0.00         0.        *        1 JAN 1530   63    0.00    0.00    0.00         0.
       1 JAN 0315   14    0.00    0.00    0.00         0.        *        1 JAN 1545   64    0.00    0.00    0.00         0.
       1 JAN 0330   15    0.00    0.00    0.00         0.        *        1 JAN 1600   65    0.00    0.00    0.00         0.
       1 JAN 0345   16    0.00    0.00    0.00         0.        *        1 JAN 1615   66    0.00    0.00    0.00         0.
       1 JAN 0400   17    0.00    0.00    0.00         0.        *        1 JAN 1630   67    0.00    0.00    0.00         0.
       1 JAN 0415   18    0.00    0.00    0.00         0.        *        1 JAN 1645   68    0.00    0.00    0.00         0.
       1 JAN 0430   19    0.00    0.00    0.00         0.        *        1 JAN 1700   69    0.00    0.00    0.00         0.
       1 JAN 0445   20    0.00    0.00    0.00         0.        *        1 JAN 1715   70    0.00    0.00    0.00         0.
       1 JAN 0500   21    0.00    0.00    0.00         0.        *        1 JAN 1730   71    0.00    0.00    0.00         0.
       1 JAN 0515   22    0.03    0.03    0.00         0.        *        1 JAN 1745   72    0.00    0.00    0.00         0.
       1 JAN 0530   23    0.03    0.03    0.00         0.        *        1 JAN 1800   73    0.00    0.00    0.00         0.
       1 JAN 0545   24    0.03    0.03    0.00         0.        *        1 JAN 1815   74    0.00    0.00    0.00         0.
       1 JAN 0600   25    0.02    0.02    0.00         0.        *        1 JAN 1830   75    0.00    0.00    0.00         0.
       1 JAN 0615   26    0.06    0.06    0.00         0.        *        1 JAN 1845   76    0.00    0.00    0.00         0.
       1 JAN 0630   27    0.06    0.06    0.00         0.        *        1 JAN 1900   77    0.00    0.00    0.00         0.
       1 JAN 0645   28    0.06    0.06    0.00         0.        *        1 JAN 1915   78    0.00    0.00    0.00         0.
       1 JAN 0700   29    0.06    0.06    0.00         0.        *        1 JAN 1930   79    0.00    0.00    0.00         0.
       1 JAN 0715   30    0.12    0.12    0.00         0.        *        1 JAN 1945   80    0.00    0.00    0.00         0.
       1 JAN 0730   31    0.13    0.13    0.00         0.        *        1 JAN 2000   81    0.00    0.00    0.00         0.
       1 JAN 0745   32    0.12    0.12    0.00         0.        *        1 JAN 2015   82    0.00    0.00    0.00         0.
       1 JAN 0800   33    0.12    0.12    0.00         0.        *        1 JAN 2030   83    0.00    0.00    0.00         0.
       1 JAN 0815   34    0.31    0.29    0.02        54.        *        1 JAN 2045   84    0.00    0.00    0.00         0.
       1 JAN 0830   35    0.31    0.25    0.06       154.        *        1 JAN 2100   85    0.00    0.00    0.00         0.
       1 JAN 0845   36    0.31    0.22    0.09       251.        *        1 JAN 2115   86    0.00    0.00    0.00         0.
       1 JAN 0900   37    0.31    0.20    0.12       333.        *        1 JAN 2130   87    0.00    0.00    0.00         0.
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1	JAN	0915	38	0.12	0.07	0.05	208.	*	1	JAN	2145	88	0.00	0.00	0.00	0.
1	JAN	0930	39	0.12	0.07	0.06	179.	*	1	JAN	2200	89	0.00	0.00	0.00	0.
1	JAN	0945	40	0.12	0.07	0.06	180.	*	1	JAN	2215	90	0.00	0.00	0.00	0.
1	JAN	1000	41	0.12	0.06	0.06	187.	*	1	JAN	2230	91	0.00	0.00	0.00	0.
1	JAN	1015	42	0.00	0.00	0.00	48.	*	1	JAN	2245	92	0.00	0.00	0.00	0.
1	JAN	1030	43	0.00	0.00	0.00	9.	*	1	JAN	2300	93	0.00	0.00	0.00	0.
1	JAN	1045	44	0.00	0.00	0.00	2.	*	1	JAN	2315	94	0.00	0.00	0.00	0.
1	JAN	1100	45	0.00	0.00	0.00	0.	*	1	JAN	2330	95	0.00	0.00	0.00	0.
1	JAN	1115	46	0.00	0.00	0.00	0.	*	1	JAN	2345	96	0.00	0.00	0.00	0.
1	JAN	1130	47	0.00	0.00	0.00	0.	*	2	JAN	0000	97	0.00	0.00	0.00	0.
1	JAN	1145	48	0.00	0.00	0.00	0.	*	2	JAN	0015	98	0.00	0.00	0.00	0.
1	JAN	1200	49	0.00	0.00	0.00	0.	*	2	JAN	0030	99	0.00	0.00	0.00	0.
1	JAN	1215	50	0.00	0.00	0.00	0.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.08, TOTAL EXCESS = 0.52

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
333.	9.00	67.	17.	16.	16.
		(INCHES) 0.523	0.523	0.523	0.523
		(AC-FT) 33.	33.	33.	33.

CUMULATIVE AREA = 1.19 SQ MI

*** ***

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            **************
            *            *
  51 KK     *        4R  *        CNAME      4C
            *            *
            **************
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52 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

53 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.12	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 4R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	0.	1	JAN	1845	76	0.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	0.	1	JAN	1900	77	0.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	0.	1	JAN	1915	78	0.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	0.	1	JAN	1930	79	0.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	0.	1	JAN	1945	80	0.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	0.	1	JAN	2000	81	0.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	0.	1	JAN	2015	82	0.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	0.	1	JAN	2030	83	0.
1	JAN	0200	9	0.	1	JAN	0815	34	24.	1	JAN	1430	59	0.	1	JAN	2045	84	0.
1	JAN	0215	10	0.	1	JAN	0830	35	102.	1	JAN	1445	60	0.	1	JAN	2100	85	0.
1	JAN	0230	11	0.	1	JAN	0845	36	204.	1	JAN	1500	61	0.	1	JAN	2115	86	**********
1	JAN	0245	12	0.	1	JAN	0900	37	294.	1	JAN	1515	62	0.	1	JAN	2130	87	**********
1	JAN	0300	13	0.	1	JAN	0915	38	282.	1	JAN	1530	63	0.	1	JAN	2145	88	**********
1	JAN	0315	14	0.	1	JAN	0930	39	186.	1	JAN	1545	64	0.	1	JAN	2200	89	**********
1	JAN	0330	15	0.	1	JAN	0945	40	178.	1	JAN	1600	65	0.	1	JAN	2215	90	**********
1	JAN	0345	16	0.	1	JAN	1000	41	183.	1	JAN	1615	66	0.	1	JAN	2230	91	**********
1	JAN	0400	17	0.	1	JAN	1015	42	125.	1	JAN	1630	67	0.	1	JAN	2245	92	**********
1	JAN	0415	18	0.	1	JAN	1030	43	22.	1	JAN	1645	68	0.	1	JAN	2300	93	**********
1	JAN	0430	19	0.	1	JAN	1045	44	4.	1	JAN	1700	69	0.	1	JAN	2315	94	0.
1	JAN	0445	20	0.	1	JAN	1100	45	1.	1	JAN	1715	70	0.	1	JAN	2330	95	0.
1	JAN	0500	21	0.	1	JAN	1115	46	0.	1	JAN	1730	71	0.	1	JAN	2345	96	0.
1	JAN	0515	22	0.	1	JAN	1130	47	0.	1	JAN	1745	72	0.	2	JAN	0000	97	0.
1	JAN	0530	23	0.	1	JAN	1145	48	0.	1	JAN	1800	73	0.	2	JAN	0015	98	0.
1	JAN	0545	24	0.	1	JAN	1200	49	0.	1	JAN	1815	74	0.	2	JAN	0030	99	0.
1	JAN	0600	25	0.	1	JAN	1215	50	0.	1	JAN	1830	75	0.	2	JAN	0045	100	0.

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PEAK FLOW TIME MAXIMUM AVERAGE FLOW

```
                                    6-HR       24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                     (CFS)
+     294.      9.00          67.         17.         16.          16.
                     (INCHES)     0.523       0.523       0.523        0.523
                      (AC-FT)       33.         33.         33.          33.

                      CUMULATIVE AREA =    1.19 SQ MI
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*** ***

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          **************
          *            *
  54 KK   *       3bB  *
          *            *
          **************

  55 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

  56 BA          SUBBASIN CHARACTERISTICS
                      TAREA,       1.08  SUBBASIN AREA

                 PRECIPITATION DATA

  59 PT           TOTAL STORM STATIONS      Gage
  60 PW                       WEIGHTS      0.82

  57 PR             RECORDING STATIONS      Gage
  58 PW                       WEIGHTS      1.00

  61 LS          SCS LOSS RATE
                       STRTL        0.84  INITIAL ABSTRACTION
                      CRVNBR       70.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  62 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.10  LAG

                                                        ***

             PRECIPITATION STATION DATA

                     STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        Gage     2.60        0.00         0.82

                 TEMPORAL DISTRIBUTIONS

                 STATION     Gage,  WEIGHT =   1.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.03      0.03      0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13
                     0.12      0.12      0.31      0.31      0.31      0.31      0.12      0.12      0.12      0.12

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
            2062.      577.      113.       23.        0.
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HYDROGRAPH AT STATION 3bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.00	0.00	0.00	0.
1	JAN	0015	2	0.00	0.00	0.00	0.	1	JAN	1245	52	0.00	0.00	0.00	0.
1	JAN	0030	3	0.00	0.00	0.00	0.	1	JAN	1300	53	0.00	0.00	0.00	0.
1	JAN	0045	4	0.00	0.00	0.00	0.	1	JAN	1315	54	0.00	0.00	0.00	0.
1	JAN	0100	5	0.00	0.00	0.00	0.	1	JAN	1330	55	0.00	0.00	0.00	0.
1	JAN	0115	6	0.00	0.00	0.00	0.	1	JAN	1345	56	0.00	0.00	0.00	0.
1	JAN	0130	7	0.00	0.00	0.00	0.	1	JAN	1400	57	0.00	0.00	0.00	0.
1	JAN	0145	8	0.00	0.00	0.00	0.	1	JAN	1415	58	0.00	0.00	0.00	0.
1	JAN	0200	9	0.00	0.00	0.00	0.	1	JAN	1430	59	0.00	0.00	0.00	0.
1	JAN	0215	10	0.00	0.00	0.00	0.	1	JAN	1445	60	0.00	0.00	0.00	0.
1	JAN	0230	11	0.00	0.00	0.00	0.	1	JAN	1500	61	0.00	0.00	0.00	0.
1	JAN	0245	12	0.00	0.00	0.00	0.	1	JAN	1515	62	0.00	0.00	0.00	0.
1	JAN	0300	13	0.00	0.00	0.00	0.	1	JAN	1530	63	0.00	0.00	0.00	0.
1	JAN	0315	14	0.00	0.00	0.00	0.	1	JAN	1545	64	0.00	0.00	0.00	0.
1	JAN	0330	15	0.00	0.00	0.00	0.	1	JAN	1600	65	0.00	0.00	0.00	0.
1	JAN	0345	16	0.00	0.00	0.00	0.	1	JAN	1615	66	0.00	0.00	0.00	0.
1	JAN	0400	17	0.00	0.00	0.00	0.	1	JAN	1630	67	0.00	0.00	0.00	0.

1	JAN 0415	18	0.00	0.00	0.00	0.	*	1	JAN 1645	68	0.00	0.00	0.00	0.
1	JAN 0430	19	0.00	0.00	0.00	0.	*	1	JAN 1700	69	0.00	0.00	0.00	0.
1	JAN 0445	20	0.00	0.00	0.00	0.	*	1	JAN 1715	70	0.00	0.00	0.00	0.
1	JAN 0500	21	0.00	0.00	0.00	0.	*	1	JAN 1730	71	0.00	0.00	0.00	0.
1	JAN 0515	22	0.03	0.03	0.00	0.	*	1	JAN 1745	72	0.00	0.00	0.00	0.
1	JAN 0530	23	0.03	0.03	0.00	0.	*	1	JAN 1800	73	0.00	0.00	0.00	0.
1	JAN 0545	24	0.03	0.03	0.00	0.	*	1	JAN 1815	74	0.00	0.00	0.00	0.
1	JAN 0600	25	0.02	0.02	0.00	0.	*	1	JAN 1830	75	0.00	0.00	0.00	0.
1	JAN 0615	26	0.06	0.06	0.00	0.	*	1	JAN 1845	76	0.00	0.00	0.00	0.
1	JAN 0630	27	0.06	0.06	0.00	0.	*	1	JAN 1900	77	0.00	0.00	0.00	0.
1	JAN 0645	28	0.06	0.06	0.00	0.	*	1	JAN 1915	78	0.00	0.00	0.00	0.
1	JAN 0700	29	0.06	0.06	0.00	0.	*	1	JAN 1930	79	0.00	0.00	0.00	0.
1	JAN 0715	30	0.12	0.12	0.00	0.	*	1	JAN 1945	80	0.00	0.00	0.00	0.
1	JAN 0730	31	0.13	0.13	0.00	0.	*	1	JAN 2000	81	0.00	0.00	0.00	0.
1	JAN 0745	32	0.12	0.12	0.00	0.	*	1	JAN 2015	82	0.00	0.00	0.00	0.
1	JAN 0800	33	0.12	0.12	0.00	0.	*	1	JAN 2030	83	0.00	0.00	0.00	0.
1	JAN 0815	34	0.31	0.29	0.02	48.	*	1	JAN 2045	84	0.00	0.00	0.00	0.
1	JAN 0830	35	0.31	0.25	0.06	139.	*	1	JAN 2100	85	0.00	0.00	0.00	0.
1	JAN 0845	36	0.31	0.22	0.09	227.	*	1	JAN 2115	86	0.00	0.00	0.00	0.
1	JAN 0900	37	0.31	0.20	0.12	301.	*	1	JAN 2130	87	0.00	0.00	0.00	0.
1	JAN 0915	38	0.12	0.07	0.05	188.	*	1	JAN 2145	88	0.00	0.00	0.00	0.
1	JAN 0930	39	0.12	0.07	0.06	162.	*	1	JAN 2200	89	0.00	0.00	0.00	0.
1	JAN 0945	40	0.12	0.07	0.06	163.	*	1	JAN 2215	90	0.00	0.00	0.00	0.
1	JAN 1000	41	0.12	0.06	0.06	169.	*	1	JAN 2230	91	0.00	0.00	0.00	0.
1	JAN 1015	42	0.00	0.00	0.00	44.	*	1	JAN 2245	92	0.00	0.00	0.00	0.
1	JAN 1030	43	0.00	0.00	0.00	8.	*	1	JAN 2300	93	0.00	0.00	0.00	0.
1	JAN 1045	44	0.00	0.00	0.00	1.	*	1	JAN 2315	94	0.00	0.00	0.00	0.
1	JAN 1100	45	0.00	0.00	0.00	0.	*	1	JAN 2330	95	0.00	0.00	0.00	0.
1	JAN 1115	46	0.00	0.00	0.00	0.	*	1	JAN 2345	96	0.00	0.00	0.00	0.
1	JAN 1130	47	0.00	0.00	0.00	0.	*	2	JAN 0000	97	0.00	0.00	0.00	0.
1	JAN 1145	48	0.00	0.00	0.00	0.	*	2	JAN 0015	98	0.00	0.00	0.00	0.
1	JAN 1200	49	0.00	0.00	0.00	0.	*	2	JAN 0030	99	0.00	0.00	0.00	0.
1	JAN 1215	50	0.00	0.00	0.00	0.	*	2	JAN 0045	100	0.00	0.00	0.00	0.
							*							

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.08, TOTAL EXCESS = 0.52

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 301.	9.00		60.	15.	15.	15.
		(INCHES)	0.523	0.523	0.523	0.523
		(AC-FT)	30.	30.	30.	30.

CUMULATIVE AREA = 1.08 SQ MI

*** ***

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            **************
            *            *
   63 KK    *       3aB  *
            *            *
            **************

   64 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT           22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


               SUBBASIN RUNOFF DATA

   65 BA         SUBBASIN CHARACTERISTICS
                       TAREA,       0.87  SUBBASIN AREA

               PRECIPITATION DATA

   68 PT          TOTAL STORM STATIONS      Gage
   69 PW                      WEIGHTS      0.82

   66 PR            RECORDING STATIONS      Gage
   67 PW                      WEIGHTS      1.00

   70 LS         SCS LOSS RATE
                       STRTL        0.84  INITIAL ABSTRACTION
                      CRVNBR       70.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

   71 UD         SCS DIMENSIONLESS UNITGRAPH
                        TLAG        0.11  LAG

                                                          ***

               PRECIPITATION STATION DATA

                       STATION    TOTAL    AVG. ANNUAL    WEIGHT
                          Gage     2.60        0.00         0.82
```

TEMPORAL DISTRIBUTIONS

STATION Gage, WEIGHT = 1.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.03	0.03	0.03	0.02	0.06	0.06	0.06	0.06	0.12	0.13
0.12	0.12	0.31	0.31	0.31	0.31	0.12	0.12	0.12	0.12

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1678. 470. 92. 18. 0.

HYDROGRAPH AT STATION 3aB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.00	0.00	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.00	0.00	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.00	0.00	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.00	0.00	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.00	0.00	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.00	0.00	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.00	0.00	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.00	0.00	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.00	0.00	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.00	0.00	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.00	0.00	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.00	0.00	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.03	0.03	0.00	0.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.03	0.03	0.00	0.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.03	0.03	0.00	0.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.06	0.00	0.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.06	0.00	0.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.06	0.00	0.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.06	0.00	0.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.12	0.12	0.00	0.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.13	0.13	0.00	0.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.12	0.12	0.00	0.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.12	0.12	0.00	0.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.31	0.29	0.02	39.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.31	0.25	0.06	113.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.31	0.22	0.09	184.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.31	0.20	0.12	245.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.12	0.07	0.05	153.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.12	0.07	0.06	131.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.12	0.07	0.06	132.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.12	0.06	0.06	138.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	36.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	7.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.08, TOTAL EXCESS = 0.52

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
	(CFS)				
+ 245.	9.00	49.	12.	12.	12.
	(INCHES)	0.523	0.523	0.523	0.523
	(AC-FT)	24.	24.	24.	24.

CUMULATIVE AREA = 0.87 SQ MI

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72 KK 3C CNAME 3R

```
  73 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


  74 HC          HYDROGRAPH COMBINATION
                       ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 3C
SUM OF 3 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	112.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	355.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	615.	1 JAN 1500	61	0.	1 JAN 2115	86**********
1 JAN 0245	12	0.	1 JAN 0900	37	840.	1 JAN 1515	62	0.	1 JAN 2130	87**********
1 JAN 0300	13	0.	1 JAN 0915	38	624.	1 JAN 1530	63	0.	1 JAN 2145	88**********
1 JAN 0315	14	0.	1 JAN 0930	39	479.	1 JAN 1545	64	0.	1 JAN 2200	89**********
1 JAN 0330	15	0.	1 JAN 0945	40	474.	1 JAN 1600	65	0.	1 JAN 2215	90**********
1 JAN 0345	16	0.	1 JAN 1000	41	490.	1 JAN 1615	66	0.	1 JAN 2230	91**********
1 JAN 0400	17	0.	1 JAN 1015	42	204.	1 JAN 1630	67	0.	1 JAN 2245	92**********
1 JAN 0415	18	0.	1 JAN 1030	43	37.	1 JAN 1645	68	0.	1 JAN 2300	93**********
1 JAN 0430	19	0.	1 JAN 1045	44	7.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	1.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	0.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	0.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	0.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
840.	9.00	177.	44.	43.	43.
		(INCHES) 0.523	0.523	0.523	0.523
		(AC-FT) 88.	88.	88.	88.

CUMULATIVE AREA = 3.14 SQ MI

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            **************
            *            *
  75 KK     *        3R  *        CNAME      3C
            *            *
            **************


  76 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

  77 RM          MUSKINGUM ROUTING
                       NSTPS           1 NUMBER OF SUBREACHES
                       AMSKK        0.17 MUSKINGUM K
                           X        0.20 MUSKINGUM X
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HYDROGRAPH AT STATION 3R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	40.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	197.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	443.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	691.	1 JAN 1515	62	0.	1 JAN 2130	87	**********
1 JAN 0300	13	0.	1 JAN 0915	38	759.	1 JAN 1530	63	0.	1 JAN 2145	88	**********
1 JAN 0315	14	0.	1 JAN 0930	39	576.	1 JAN 1545	64	0.	1 JAN 2200	89	**********
1 JAN 0330	15	0.	1 JAN 0945	40	480.	1 JAN 1600	65	0.	1 JAN 2215	90	**********
1 JAN 0345	16	0.	1 JAN 1000	41	480.	1 JAN 1615	66	0.	1 JAN 2230	91	**********
1 JAN 0400	17	0.	1 JAN 1015	42	387.	1 JAN 1630	67	0.	1 JAN 2245	92	**********
1 JAN 0415	18	0.	1 JAN 1030	43	149.	1 JAN 1645	68	0.	1 JAN 2300	93	**********
1 JAN 0430	19	0.	1 JAN 1045	44	29.	1 JAN 1700	69	0.	1 JAN 2315	94	**********
1 JAN 0445	20	0.	1 JAN 1100	45	5.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	0.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	0.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	0.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 759.	9.25	177.	44.	43.	43.
		(INCHES) 0.523	0.523	0.523	0.523
		(AC-FT) 88.	88.	88.	88.

CUMULATIVE AREA = 3.14 SQ MI

*** ***

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            **************
            *            *
   78 KK    *       1bB  *
            *            *
            **************

   79 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       0.250  TIME INTERVAL IN HOURS


                SUBBASIN RUNOFF DATA

   80 BA          SUBBASIN CHARACTERISTICS
                       TAREA,       0.42  SUBBASIN AREA

                  PRECIPITATION DATA

   83 PT           TOTAL STORM STATIONS      Gage
   84 PW                       WEIGHTS      0.82

   81 PR             RECORDING STATIONS      Gage
   82 PW                       WEIGHTS      1.00

   85 LS          SCS LOSS RATE
                        STRTL        0.84  INITIAL ABSTRACTION
                       CRVNBR       70.50  CURVE NUMBER
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

   86 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.09  LAG

                                                          ***

                PRECIPITATION STATION DATA

                        STATION    TOTAL    AVG. ANNUAL    WEIGHT
                           Gage     2.60        0.00         0.82

                  TEMPORAL DISTRIBUTIONS

                  STATION     Gage,  WEIGHT =   1.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                       0.03      0.03      0.03      0.02      0.06      0.06      0.06      0.06      0.12      0.13
```

0.12 0.12 0.31 0.31 0.31 0.31 0.12 0.12 0.12 0.12

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
811. 227. 45. 9. 0.

HYDROGRAPH AT STATION 1bB

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.00	0.00	0.00	0.
1 JAN 0015	2	0.00	0.00	0.00	0.	1 JAN 1245	52	0.00	0.00	0.00	0.
1 JAN 0030	3	0.00	0.00	0.00	0.	1 JAN 1300	53	0.00	0.00	0.00	0.
1 JAN 0045	4	0.00	0.00	0.00	0.	1 JAN 1315	54	0.00	0.00	0.00	0.
1 JAN 0100	5	0.00	0.00	0.00	0.	1 JAN 1330	55	0.00	0.00	0.00	0.
1 JAN 0115	6	0.00	0.00	0.00	0.	1 JAN 1345	56	0.00	0.00	0.00	0.
1 JAN 0130	7	0.00	0.00	0.00	0.	1 JAN 1400	57	0.00	0.00	0.00	0.
1 JAN 0145	8	0.00	0.00	0.00	0.	1 JAN 1415	58	0.00	0.00	0.00	0.
1 JAN 0200	9	0.00	0.00	0.00	0.	1 JAN 1430	59	0.00	0.00	0.00	0.
1 JAN 0215	10	0.00	0.00	0.00	0.	1 JAN 1445	60	0.00	0.00	0.00	0.
1 JAN 0230	11	0.00	0.00	0.00	0.	1 JAN 1500	61	0.00	0.00	0.00	0.
1 JAN 0245	12	0.00	0.00	0.00	0.	1 JAN 1515	62	0.00	0.00	0.00	0.
1 JAN 0300	13	0.00	0.00	0.00	0.	1 JAN 1530	63	0.00	0.00	0.00	0.
1 JAN 0315	14	0.00	0.00	0.00	0.	1 JAN 1545	64	0.00	0.00	0.00	0.
1 JAN 0330	15	0.00	0.00	0.00	0.	1 JAN 1600	65	0.00	0.00	0.00	0.
1 JAN 0345	16	0.00	0.00	0.00	0.	1 JAN 1615	66	0.00	0.00	0.00	0.
1 JAN 0400	17	0.00	0.00	0.00	0.	1 JAN 1630	67	0.00	0.00	0.00	0.
1 JAN 0415	18	0.00	0.00	0.00	0.	1 JAN 1645	68	0.00	0.00	0.00	0.
1 JAN 0430	19	0.00	0.00	0.00	0.	1 JAN 1700	69	0.00	0.00	0.00	0.
1 JAN 0445	20	0.00	0.00	0.00	0.	1 JAN 1715	70	0.00	0.00	0.00	0.
1 JAN 0500	21	0.00	0.00	0.00	0.	1 JAN 1730	71	0.00	0.00	0.00	0.
1 JAN 0515	22	0.03	0.03	0.00	0.	1 JAN 1745	72	0.00	0.00	0.00	0.
1 JAN 0530	23	0.03	0.03	0.00	0.	1 JAN 1800	73	0.00	0.00	0.00	0.
1 JAN 0545	24	0.03	0.03	0.00	0.	1 JAN 1815	74	0.00	0.00	0.00	0.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.00	0.00	0.00	0.
1 JAN 0615	26	0.06	0.06	0.00	0.	1 JAN 1845	76	0.00	0.00	0.00	0.
1 JAN 0630	27	0.06	0.06	0.00	0.	1 JAN 1900	77	0.00	0.00	0.00	0.
1 JAN 0645	28	0.06	0.06	0.00	0.	1 JAN 1915	78	0.00	0.00	0.00	0.
1 JAN 0700	29	0.06	0.06	0.00	0.	1 JAN 1930	79	0.00	0.00	0.00	0.
1 JAN 0715	30	0.12	0.12	0.00	0.	1 JAN 1945	80	0.00	0.00	0.00	0.
1 JAN 0730	31	0.13	0.13	0.00	0.	1 JAN 2000	81	0.00	0.00	0.00	0.
1 JAN 0745	32	0.12	0.12	0.00	0.	1 JAN 2015	82	0.00	0.00	0.00	0.
1 JAN 0800	33	0.12	0.12	0.00	0.	1 JAN 2030	83	0.00	0.00	0.00	0.
1 JAN 0815	34	0.31	0.29	0.02	19.	1 JAN 2045	84	0.00	0.00	0.00	0.
1 JAN 0830	35	0.31	0.25	0.06	55.	1 JAN 2100	85	0.00	0.00	0.00	0.
1 JAN 0845	36	0.31	0.22	0.09	89.	1 JAN 2115	86	0.00	0.00	0.00	0.
1 JAN 0900	37	0.31	0.20	0.12	119.	1 JAN 2130	87	0.00	0.00	0.00	0.
1 JAN 0915	38	0.12	0.07	0.05	74.	1 JAN 2145	88	0.00	0.00	0.00	0.
1 JAN 0930	39	0.12	0.07	0.06	64.	1 JAN 2200	89	0.00	0.00	0.00	0.
1 JAN 0945	40	0.12	0.07	0.06	64.	1 JAN 2215	90	0.00	0.00	0.00	0.
1 JAN 1000	41	0.12	0.06	0.06	67.	1 JAN 2230	91	0.00	0.00	0.00	0.
1 JAN 1015	42	0.00	0.00	0.00	17.	1 JAN 2245	92	0.00	0.00	0.00	0.
1 JAN 1030	43	0.00	0.00	0.00	3.	1 JAN 2300	93	0.00	0.00	0.00	0.
1 JAN 1045	44	0.00	0.00	0.00	1.	1 JAN 2315	94	0.00	0.00	0.00	0.
1 JAN 1100	45	0.00	0.00	0.00	0.	1 JAN 2330	95	0.00	0.00	0.00	0.
1 JAN 1115	46	0.00	0.00	0.00	0.	1 JAN 2345	96	0.00	0.00	0.00	0.
1 JAN 1130	47	0.00	0.00	0.00	0.	2 JAN 0000	97	0.00	0.00	0.00	0.
1 JAN 1145	48	0.00	0.00	0.00	0.	2 JAN 0015	98	0.00	0.00	0.00	0.
1 JAN 1200	49	0.00	0.00	0.00	0.	2 JAN 0030	99	0.00	0.00	0.00	0.
1 JAN 1215	50	0.00	0.00	0.00	0.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.08, TOTAL EXCESS = 0.52

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
119.	9.00	24.	6.	6.	6.
		(INCHES) 0.523	0.523	0.523	0.523
		(AC-FT) 12.	12.	12.	12.

CUMULATIVE AREA = 0.42 SQ MI

*** ***

87 KK
```
**************
*            *
*        1C  *        CNAME      1C
*            *
**************
```

88 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT

```
                    ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


  89 HC          HYDROGRAPH COMBINATION
                    ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***
```

HYDROGRAPH AT STATION 1C
SUM OF 4 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	0.	1 JAN 1945	80	0.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	0.	1 JAN 2000	81	0.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	0.	1 JAN 2015	82	0.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	0.	1 JAN 2030	83	0.
1 JAN 0200	9	0.	1 JAN 0815	34	115.	1 JAN 1430	59	0.	1 JAN 2045	84	0.
1 JAN 0215	10	0.	1 JAN 0830	35	429.	1 JAN 1445	60	0.	1 JAN 2100	85	0.
1 JAN 0230	11	0.	1 JAN 0845	36	837.	1 JAN 1500	61	0.	1 JAN 2115	86	0.
1 JAN 0245	12	0.	1 JAN 0900	37	1221.	1 JAN 1515	62	0.	1 JAN 2130	87	0.
1 JAN 0300	13	0.	1 JAN 0915	38	1133.	1 JAN 1530	63	0.	1 JAN 2145	88	0.
1 JAN 0315	14	0.	1 JAN 0930	39	862.	1 JAN 1545	64	0.	1 JAN 2200	89	0.
1 JAN 0330	15	0.	1 JAN 0945	40	775.	1 JAN 1600	65	0.	1 JAN 2215	90	0.
1 JAN 0345	16	0.	1 JAN 1000	41	783.	1 JAN 1615	66	0.	1 JAN 2230	91	0.
1 JAN 0400	17	0.	1 JAN 1015	42	500.	1 JAN 1630	67	0.	1 JAN 2245	92	0.
1 JAN 0415	18	0.	1 JAN 1030	43	161.	1 JAN 1645	68	0.	1 JAN 2300	93	0.
1 JAN 0430	19	0.	1 JAN 1045	44	35.	1 JAN 1700	69	0.	1 JAN 2315	94	0.
1 JAN 0445	20	0.	1 JAN 1100	45	4.	1 JAN 1715	70	0.	1 JAN 2330	95	0.
1 JAN 0500	21	0.	1 JAN 1115	46	1.	1 JAN 1730	71	0.	1 JAN 2345	96	0.
1 JAN 0515	22	0.	1 JAN 1130	47	0.	1 JAN 1745	72	0.	2 JAN 0000	97	0.
1 JAN 0530	23	0.	1 JAN 1145	48	0.	1 JAN 1800	73	0.	2 JAN 0015	98	0.
1 JAN 0545	24	0.	1 JAN 1200	49	0.	1 JAN 1815	74	0.	2 JAN 0030	99	0.
1 JAN 0600	25	0.	1 JAN 1215	50	0.	1 JAN 1830	75	0.	2 JAN 0045	100	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1221.	9.00	286.	71.	69.	69.
		(INCHES) 0.523	0.523	0.523	0.523
		(AC-FT) 142.	142.	142.	142.

CUMULATIVE AREA = 5.08 SQ MI

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


            **************
            *            *
  90 KK     *        1C  *        CNAME      1C
            *            *
            **************

  91 KO          OUTPUT CONTROL VARIABLES
                    IPRNT           1  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                     IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       0.250  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

  92 RN          NO ROUTING

                                                      ***
```

HYDROGRAPH AT STATION 1C

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	0.	1 JAN 1845	76	0.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	0.	1 JAN 1900	77	0.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	0.	1 JAN 1915	78	0.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	0.	1 JAN 1930	79	0.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	0.	1 JAN 1945	80	0.

1	JAN	0115	6	0.	*	1	JAN	0730	31	0.	*	1	JAN	1345	56	0.	*	1	JAN	2000	81	0.
1	JAN	0130	7	0.	*	1	JAN	0745	32	0.	*	1	JAN	1400	57	0.	*	1	JAN	2015	82	0.
1	JAN	0145	8	0.	*	1	JAN	0800	33	0.	*	1	JAN	1415	58	0.	*	1	JAN	2030	83	0.
1	JAN	0200	9	0.	*	1	JAN	0815	34	115.	*	1	JAN	1430	59	0.	*	1	JAN	2045	84	0.
1	JAN	0215	10	0.	*	1	JAN	0830	35	429.	*	1	JAN	1445	60	0.	*	1	JAN	2100	85	0.
1	JAN	0230	11	0.	*	1	JAN	0845	36	837.	*	1	JAN	1500	61	0.	*	1	JAN	2115	86	0.
1	JAN	0245	12	0.	*	1	JAN	0900	37	1221.	*	1	JAN	1515	62	0.	*	1	JAN	2130	87	0.
1	JAN	0300	13	0.	*	1	JAN	0915	38	1133.	*	1	JAN	1530	63	0.	*	1	JAN	2145	88	0.
1	JAN	0315	14	0.	*	1	JAN	0930	39	862.	*	1	JAN	1545	64	0.	*	1	JAN	2200	89	0.
1	JAN	0330	15	0.	*	1	JAN	0945	40	775.	*	1	JAN	1600	65	0.	*	1	JAN	2215	90	0.
1	JAN	0345	16	0.	*	1	JAN	1000	41	783.	*	1	JAN	1615	66	0.	*	1	JAN	2230	91	0.
1	JAN	0400	17	0.	*	1	JAN	1015	42	500.	*	1	JAN	1630	67	0.	*	1	JAN	2245	92	0.
1	JAN	0415	18	0.	*	1	JAN	1030	43	161.	*	1	JAN	1645	68	0.	*	1	JAN	2300	93	0.
1	JAN	0430	19	0.	*	1	JAN	1045	44	35.	*	1	JAN	1700	69	0.	*	1	JAN	2315	94	0.
1	JAN	0445	20	0.	*	1	JAN	1100	45	4.	*	1	JAN	1715	70	0.	*	1	JAN	2330	95	0.
1	JAN	0500	21	0.	*	1	JAN	1115	46	1.	*	1	JAN	1730	71	0.	*	1	JAN	2345	96	0.
1	JAN	0515	22	0.	*	1	JAN	1130	47	0.	*	1	JAN	1745	72	0.	*	2	JAN	0000	97	0.
1	JAN	0530	23	0.	*	1	JAN	1145	48	0.	*	1	JAN	1800	73	0.	*	2	JAN	0015	98	0.
1	JAN	0545	24	0.	*	1	JAN	1200	49	0.	*	1	JAN	1815	74	0.	*	2	JAN	0030	99	0.
1	JAN	0600	25	0.	*	1	JAN	1215	50	0.	*	1	JAN	1830	75	0.	*	2	JAN	0045	100	0.
					*						*						*					

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1221.	9.00		286.	71.	69.	69.
		(INCHES)	0.523	0.523	0.523	0.523
		(AC-FT)	142.	142.	142.	142.

CUMULATIVE AREA = 5.08 SQ MI

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									
+		1aB	227.	9.00	46.	11.	11.	0.81		
	ROUTED TO									
+		10R	227.	9.00	46.	11.	11.	0.81		
	HYDROGRAPH AT									
+		2B	198.	9.00	40.	10.	10.	0.71		
	ROUTED TO									
+		2R	185.	9.00	40.	10.	10.	0.71		
	HYDROGRAPH AT									
+		4B	333.	9.00	67.	17.	16.	1.19		
	ROUTED TO									
+		4R	294.	9.00	67.	17.	16.	1.19		
	HYDROGRAPH AT									
+		3bB	301.	9.00	60.	15.	15.	1.08		
	HYDROGRAPH AT									
+		3aB	245.	9.00	49.	12.	12.	0.87		
	3 COMBINED AT									
+		3C	840.	9.00	177.	44.	43.	3.14		
	ROUTED TO									
+		3R	759.	9.25	177.	44.	43.	3.14		
	HYDROGRAPH AT									
+		1bB	119.	9.00	24.	6.	6.	0.42		
	4 COMBINED AT									
+		1C	1221.	9.00	286.	71.	69.	5.08		
	ROUTED TO									
+		1C	1221.	9.00	286.	71.	69.	5.08		

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
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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. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT PAGE 1

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

   1          ID    Sycamore Creek
   2          ID    wo Mining & wo Logging (Pristine Conditions), LIDAR Data
   3          ID    25 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 464530.00000 4195279.00000 1
   6          PG    Gage     2.6
   7          IN      15  1JAN94       0
              * Sycamore Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   9          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
  10          PC     0.0   0.025    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475
  11          PC     0.6   0.725    0.85  1.1625   1.475  1.7875     2.1   2.225    2.35   2.475
  12          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  13          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  14          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  15          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  16          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  17          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6

  18          KK     1aB
  19          KO       0       0     0.0       1      22
  20          BA  0.8108
  21          PB    4.75
  22          IN       6  1JAN94       0
              * typeII-24hour
  23          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  24          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  25          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  26          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  27          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  28          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  29          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  30          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  31          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  32          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  33          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  34          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  35          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  36          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  37          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  38          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  39          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  40          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  41          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  42          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  43          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  44          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  45          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  46          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  47          PC     1.0
  48          LS     0.0    70.5     0.0
  49          UD  0.0889
```

HEC-1 INPUT PAGE 2

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

  50          KK     10R   CNAME     10C
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```
 51          KO       0       0     0.0       0      22
 52          RN     10R

 53          KK      2B
 54          KO       0       0     0.0       1      22
 55          BA  0.7081
 56          PB    4.75
 57          IN       6  1JAN94       0
             * typeII-24hour
 58          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 59          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 60          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 61          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 62          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 63          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 64          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 65          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 66          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 67          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 68          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 69          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 70          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 71          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 72          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 73          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 74          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 75          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 76          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 77          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 78          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 79          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 80          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 81          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 82          PC     1.0
 83          LS     0.0    70.5     0.0
 84          UD  0.0987

 85          KK      2R   CNAME      2C
 86          KO       0       0     0.0       0      22
 87          RM       1   0.072     0.2

 88          KK      4B
 89          KO       0       0     0.0       1      22
 90          BA  1.1898
 91          PB    4.75
 92          IN       6  1JAN94       0
             * typeII-24hour
 93          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 94          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 95          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 96          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 97          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 98          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
```



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

 99          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
100          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
101          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
102          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
103          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
104          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
105          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
106          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
107          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
108          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
109          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
110          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
111          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
112          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
113          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
114          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
115          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
116          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
117          PC     1.0
118          LS     0.0    70.5     0.0
119          UD  0.0828

120          KK      4R   CNAME      4C
121          KO       0       0     0.0       0      22
122          RM       1   0.123     0.2

123          KK     3bB
124          KO       0       0     0.0       1      22
125          BA  1.0754
126          PB    4.75
127          IN       6  1JAN94       0
             * typeII-24hour
128          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
129          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
130          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
131          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
132          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
133          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
134          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
135          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
136          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
```

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 137          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 138          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 139          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 140          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 141          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 142          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 143          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 144          PC   0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 145          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 146          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 147          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 148          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 149          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 150          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```



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

 151          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 152          PC     1.0
 153          LS     0.0    70.5     0.0
 154          UD  0.1006

 155          KK     3aB
 156          KO       0       0     0.0       1      22
 157          BA  0.8748
 158          PB    4.75
 159          IN       6  1JAN94       0
              * typeII-24hour
 160          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 161          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 162          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 163          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 164          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 165          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 166          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 167          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 168          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 169          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 170          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 171          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 172          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 173          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 174          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 175          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 176          PC   0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 177          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 178          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 179          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 180          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 181          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 182          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 183          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 184          PC     1.0
 185          LS     0.0    70.5     0.0
 186          UD  0.1062

 187          KK      3C   CNAME      3R
 188          KO       0       0     0.0       0      22
 189          HC       3

 190          KK      3R   CNAME      3C
 191          KO       0       0     0.0       0      22
 192          RM       1   0.165     0.2

 193          KK     1bB
 194          KO       0       0     0.0       1      22
 195          BA   0.423
 196          PB    4.75
 197          IN       6  1JAN94       0
              * typeII-24hour
 198          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 199          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
```



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

 200          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 201          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 202          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 203          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 204          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 205          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 206          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 207          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 208          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 209          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 210          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 211          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 212          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 213          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 214          PC   0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 215          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 216          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 217          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 218          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 219          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
```

```
          220          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
          221          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
          222          PC     1.0
          223          LS     0.0    70.5     0.0
          224          UD  0.0852

          225          KK      1C   CNAME      1C
          226          KO       0       0     0.0       0      22
          227          HC       4

          228          KK      1C   CNAME      1C
          229          KO       0       0     0.0       0      22
          230          RN      1C
          231          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   18         1aB
               V
               V
   50         10R
               .
               .
   53          .          2B
               .           V
               .           V
   85          .          2R
               .           .
               .           .
   88          .           .          4B
               .           .           V
               .           .           V
  120          .           .          4R
               .           .           .
               .           .           .
  123          .           .           .         3bB
               .           .           .           .
               .           .           .           .
  155          .           .           .           .         3aB
               .           .           .           .           .
               .           .           .           .           .
  187          .           .          3C.......................
               .           .           V
               .           .           V
  190          .           .          3R
               .           .           .
               .           .           .
  193          .           .           .         1bB
               .           .           .           .
               .           .           .           .
  225         1C.................................
               V
               V
  228         1C
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

Sycamore Creek
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
25 yr Storm

```
   5 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

   7 IN          TIME DATA FOR INPUT TIME SERIES
                        JXMIN          15  TIME INTERVAL IN MINUTES
                       JXDATE      1JAN94  STARTING DATE
                       JXTIME           0  STARTING TIME

     IT          HYDROGRAPH TIME DATA
                         NMIN          15  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1JAN94  STARTING DATE
                        ITIME        0000  STARTING TIME
                          NQ,         100  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2JAN94  ENDING DATE
                       NDTIME        0045  ENDING TIME
                       ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL    0.25 HOURS
                         TOTAL TIME BASE   24.75 HOURS
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         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


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


            **************
            *            *
  18 KK     *       1aB  *
            *            *
            **************

  19 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


  22 IN          TIME DATA FOR INPUT TIME SERIES
                       JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

  20 BA          SUBBASIN CHARACTERISTICS
                      TAREA,        0.81  SUBBASIN AREA

               PRECIPITATION DATA

  21 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

  23 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

  48 LS          SCS LOSS RATE
                       STRTL        0.84  INITIAL ABSTRACTION
                      CRVNBR       70.50  CURVE NUMBER
                       RTIMP        0.00  PERCENT IMPERVIOUS AREA

  49 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG        0.09  LAG

                                                        ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                  UNIT HYDROGRAPH
                                               5 END-OF-PERIOD ORDINATES
              1555.      435.       86.       17.        0.

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

                                              HYDROGRAPH AT STATION      1aB

*****************************************************************************************************************************************
                                                                  *                                                                     *
       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q       *       DA MON HRMN  ORD    RAIN    LOSS  EXCESS     COMP Q
                                                                  *                                                                     *
        1 JAN 0000    1    0.00    0.00    0.00         0.       *        1 JAN 1230   51    0.14    0.05    0.09       242.
        1 JAN 0015    2    0.01    0.01    0.00         0.       *        1 JAN 1245   52    0.10    0.04    0.06       152.
        1 JAN 0030    3    0.01    0.01    0.00         0.       *        1 JAN 1300   53    0.08    0.03    0.05       116.
        1 JAN 0045    4    0.01    0.01    0.00         0.       *        1 JAN 1315   54    0.07    0.02    0.04        97.
        1 JAN 0100    5    0.01    0.01    0.00         0.       *        1 JAN 1330   55    0.06    0.02    0.04        86.
        1 JAN 0115    6    0.01    0.01    0.00         0.       *        1 JAN 1345   56    0.05    0.02    0.03        76.
        1 JAN 0130    7    0.01    0.01    0.00         0.       *        1 JAN 1400   57    0.05    0.02    0.03        68.
        1 JAN 0145    8    0.01    0.01    0.00         0.       *        1 JAN 1415   58    0.04    0.01    0.03        62.
        1 JAN 0200    9    0.01    0.01    0.00         0.       *        1 JAN 1430   59    0.04    0.01    0.03        58.
        1 JAN 0215   10    0.01    0.01    0.00         0.       *        1 JAN 1445   60    0.04    0.01    0.03        56.
        1 JAN 0230   11    0.01    0.01    0.00         0.       *        1 JAN 1500   61    0.04    0.01    0.02        53.
        1 JAN 0245   12    0.02    0.02    0.00         0.       *        1 JAN 1515   62    0.03    0.01    0.02        50.
        1 JAN 0300   13    0.02    0.02    0.00         0.       *        1 JAN 1530   63    0.03    0.01    0.02        47.
        1 JAN 0315   14    0.02    0.02    0.00         0.       *        1 JAN 1545   64    0.03    0.01    0.02        45.
        1 JAN 0330   15    0.02    0.02    0.00         0.       *        1 JAN 1600   65    0.03    0.01    0.02        42.
        1 JAN 0345   16    0.02    0.02    0.00         0.       *        1 JAN 1615   66    0.03    0.01    0.02        40.
        1 JAN 0400   17    0.02    0.02    0.00         0.       *        1 JAN 1630   67    0.03    0.01    0.02        39.
```

1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	37.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.02	0.01	0.02	37.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.02	0.01	0.02	35.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.02	0.01	0.02	34.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.02	0.01	0.02	34.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	32.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	31.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	31.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	29.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	28.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	27.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	26.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	25.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	24.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	23.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	23.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	23.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	23.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	22.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	22.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	22.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	22.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	22.
1	JAN	1000	41	0.05	0.05	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	21.
1	JAN	1015	42	0.05	0.05	0.00	2.	*	1	JAN	2245	92	0.01	0.00	0.01	21.
1	JAN	1030	43	0.06	0.06	0.00	5.	*	1	JAN	2300	93	0.01	0.00	0.01	21.
1	JAN	1045	44	0.07	0.06	0.01	9.	*	1	JAN	2315	94	0.01	0.00	0.01	21.
1	JAN	1100	45	0.08	0.07	0.01	15.	*	1	JAN	2330	95	0.01	0.00	0.01	20.
1	JAN	1115	46	0.10	0.09	0.01	26.	*	1	JAN	2345	96	0.01	0.00	0.01	21.
1	JAN	1130	47	0.13	0.10	0.02	43.	*	2	JAN	0000	97	0.01	0.00	0.01	20.
1	JAN	1145	48	0.52	0.37	0.15	241.	*	2	JAN	0015	98	0.00	0.00	0.00	5.
1	JAN	1200	49	1.28	0.66	0.62	1031.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	472.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1031.	12.00	134.	41.	40.	40.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 67.	82.	82.	82.

CUMULATIVE AREA = 0.81 SQ MI

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          **************
          *            *
50 KK     *       10R  *        CNAME     10C
          *            *
          **************
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51 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

52 RN NO ROUTING

***

HYDROGRAPH AT STATION 10R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	242.	1	JAN	1845	76	29.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	152.	1	JAN	1900	77	28.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	116.	1	JAN	1915	78	27.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	97.	1	JAN	1930	79	26.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	86.	1	JAN	1945	80	25.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	76.	1	JAN	2000	81	24.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	68.	1	JAN	2015	82	23.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	62.	1	JAN	2030	83	23.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	58.	1	JAN	2045	84	23.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	56.	1	JAN	2100	85	23.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	53.	1	JAN	2115	86	22.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	50.	1	JAN	2130	87	22.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	47.	1	JAN	2145	88	22.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	45.	1	JAN	2200	89	22.

1	JAN	0330	15	0.	*	1	JAN	0945	40	0.	*	1	JAN	1600	65	42.	*	1	JAN	2215	90	22.
1	JAN	0345	16	0.	*	1	JAN	1000	41	0.	*	1	JAN	1615	66	40.	*	1	JAN	2230	91	21.
1	JAN	0400	17	0.	*	1	JAN	1015	42	2.	*	1	JAN	1630	67	39.	*	1	JAN	2245	92	21.
1	JAN	0415	18	0.	*	1	JAN	1030	43	5.	*	1	JAN	1645	68	37.	*	1	JAN	2300	93	21.
1	JAN	0430	19	0.	*	1	JAN	1045	44	9.	*	1	JAN	1700	69	37.	*	1	JAN	2315	94	21.
1	JAN	0445	20	0.	*	1	JAN	1100	45	15.	*	1	JAN	1715	70	35.	*	1	JAN	2330	95	20.
1	JAN	0500	21	0.	*	1	JAN	1115	46	26.	*	1	JAN	1730	71	34.	*	1	JAN	2345	96	21.
1	JAN	0515	22	0.	*	1	JAN	1130	47	43.	*	1	JAN	1745	72	34.	*	2	JAN	0000	97	20.
1	JAN	0530	23	0.	*	1	JAN	1145	48	241.	*	1	JAN	1800	73	32.	*	2	JAN	0015	98	5.
1	JAN	0545	24	0.	*	1	JAN	1200	49	1031.	*	1	JAN	1815	74	31.	*	2	JAN	0030	99	1.
1	JAN	0600	25	0.	*	1	JAN	1215	50	472.	*	1	JAN	1830	75	31.	*	2	JAN	0045	100	0.
					*						*						*						

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	24.75-HR	
+ (CFS)	(HR)					
		(CFS)				
+ 1031.	12.00	134.	41.	40.	40.	
		(INCHES) 1.539	1.891	1.891	1.891	
		(AC-FT) 67.	82.	82.	82.	

CUMULATIVE AREA = 0.81 SQ MI

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          **************
          *            *
53 KK     *        2B  *
          *            *
          **************
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54 KO — OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

57 IN — TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

55 BA — SUBBASIN CHARACTERISTICS

TAREA,	0.71	SUBBASIN AREA

PRECIPITATION DATA

56 PB — STORM 4.75 BASIN TOTAL PRECIPITATION

58 PI — INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

83 LS — SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

84 UD — SCS DIMENSIONLESS UNITGRAPH

TLAG	0.10	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1358.	380.	75.	15.	0.

****

HYDROGRAPH AT STATION 2B

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	211.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	133.

1	JAN	0030	3	0.01	0.01	0.00	0.	*	1	JAN	1300	53	0.08	0.03	0.05	101.
1	JAN	0045	4	0.01	0.01	0.00	0.	*	1	JAN	1315	54	0.07	0.02	0.04	85.
1	JAN	0100	5	0.01	0.01	0.00	0.	*	1	JAN	1330	55	0.06	0.02	0.04	75.
1	JAN	0115	6	0.01	0.01	0.00	0.	*	1	JAN	1345	56	0.05	0.02	0.03	66.
1	JAN	0130	7	0.01	0.01	0.00	0.	*	1	JAN	1400	57	0.05	0.02	0.03	59.
1	JAN	0145	8	0.01	0.01	0.00	0.	*	1	JAN	1415	58	0.04	0.01	0.03	54.
1	JAN	0200	9	0.01	0.01	0.00	0.	*	1	JAN	1430	59	0.04	0.01	0.03	51.
1	JAN	0215	10	0.01	0.01	0.00	0.	*	1	JAN	1445	60	0.04	0.01	0.03	49.
1	JAN	0230	11	0.01	0.01	0.00	0.	*	1	JAN	1500	61	0.04	0.01	0.02	46.
1	JAN	0245	12	0.02	0.02	0.00	0.	*	1	JAN	1515	62	0.03	0.01	0.02	44.
1	JAN	0300	13	0.02	0.02	0.00	0.	*	1	JAN	1530	63	0.03	0.01	0.02	41.
1	JAN	0315	14	0.02	0.02	0.00	0.	*	1	JAN	1545	64	0.03	0.01	0.02	39.
1	JAN	0330	15	0.02	0.02	0.00	0.	*	1	JAN	1600	65	0.03	0.01	0.02	36.
1	JAN	0345	16	0.02	0.02	0.00	0.	*	1	JAN	1615	66	0.03	0.01	0.02	35.
1	JAN	0400	17	0.02	0.02	0.00	0.	*	1	JAN	1630	67	0.03	0.01	0.02	34.
1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	33.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.02	0.01	0.02	32.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.02	0.01	0.02	31.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.02	0.01	0.02	30.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.02	0.01	0.02	29.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	28.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	27.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	27.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	26.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	24.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	24.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	23.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	22.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	21.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	20.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	20.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	20.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	20.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	19.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	19.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	19.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	19.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	19.
1	JAN	1000	41	0.05	0.05	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	18.
1	JAN	1015	42	0.05	0.05	0.00	2.	*	1	JAN	2245	92	0.01	0.00	0.01	19.
1	JAN	1030	43	0.06	0.06	0.00	4.	*	1	JAN	2300	93	0.01	0.00	0.01	19.
1	JAN	1045	44	0.07	0.06	0.01	8.	*	1	JAN	2315	94	0.01	0.00	0.01	18.
1	JAN	1100	45	0.08	0.07	0.01	14.	*	1	JAN	2330	95	0.01	0.00	0.01	18.
1	JAN	1115	46	0.10	0.09	0.01	23.	*	1	JAN	2345	96	0.01	0.00	0.01	18.
1	JAN	1130	47	0.13	0.10	0.02	38.	*	2	JAN	0000	97	0.01	0.00	0.01	18.
1	JAN	1145	48	0.52	0.37	0.15	211.	*	2	JAN	0015	98	0.00	0.00	0.00	5.
1	JAN	1200	49	1.28	0.66	0.62	901.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	412.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 901.	12.00		117.	36.	35.	35.
		(INCHES)	1.539	1.891	1.891	1.891
		(AC-FT)	58.	71.	71.	71.

CUMULATIVE AREA = 0.71 SQ MI

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          **************
          *            *
 85 KK    *        2R  *        CNAME      2C
          *            *
          **************
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86 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

87 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.07	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 2R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 2R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	186.	1 JAN 1845	76	26.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	173.	1 JAN 1900	77	25.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	99.	1 JAN 1915	78	24.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	92.	1 JAN 1930	79	23.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	76.	1 JAN 1945	80	22.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	69.	1 JAN 2000	81	21.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	61.	1 JAN 2015	82	20.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	55.	1 JAN 2030	83	20.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	52.	1 JAN 2045	84	20.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	49.	1 JAN 2100	85	20.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	47.	1 JAN 2115	86	20.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	45.	1 JAN 2130	87	19.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	42.	1 JAN 2145	88	19.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	40.	1 JAN 2200	89	19.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	37.	1 JAN 2215	90	19.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	35.	1 JAN 2230	91	19.
1 JAN 0400	17	0.	1 JAN 1015	42	1.	1 JAN 1630	67	34.	1 JAN 2245	92	18.
1 JAN 0415	18	0.	1 JAN 1030	43	3.	1 JAN 1645	68	33.	1 JAN 2300	93	19.
1 JAN 0430	19	0.	1 JAN 1045	44	7.	1 JAN 1700	69	32.	1 JAN 2315	94	18.
1 JAN 0445	20	0.	1 JAN 1100	45	12.	1 JAN 1715	70	31.	1 JAN 2330	95	18.
1 JAN 0500	21	0.	1 JAN 1115	46	20.	1 JAN 1730	71	30.	1 JAN 2345	96	18.
1 JAN 0515	22	0.	1 JAN 1130	47	33.	1 JAN 1745	72	30.	2 JAN 0000	97	18.
1 JAN 0530	23	0.	1 JAN 1145	48	144.	1 JAN 1800	73	29.	2 JAN 0015	98	10.
1 JAN 0545	24	0.	1 JAN 1200	49	653.	1 JAN 1815	74	28.	2 JAN 0030	99	0.
1 JAN 0600	25	0.	1 JAN 1215	50	696.	1 JAN 1830	75	27.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
696.	12.25	117.	36.	35.	35.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 58.	71.	71.	71.

CUMULATIVE AREA = 0.71 SQ MI

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          **************
          *            *
 88 KK    *        4B  *
          *            *
          **************

 89 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


 92 IN          TIME DATA FOR INPUT TIME SERIES
                       JXMIN           6  TIME INTERVAL IN MINUTES
                      JXDATE      1JAN94  STARTING DATE
                      JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 90 BA          SUBBASIN CHARACTERISTICS
                      TAREA,        1.19  SUBBASIN AREA

                PRECIPITATION DATA

 91 PB               STORM        4.75  BASIN TOTAL PRECIPITATION

 93 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

118 LS          SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

119 UD          SCS DIMENSIONLESS UNITGRAPH
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TLAG 0.08 LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
2282. 639. 125. 25. 0.

HYDROGRAPH AT STATION 4B

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	355.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	223.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	170.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	143.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	126.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	111.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	100.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	91.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	85.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	82.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	78.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	74.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	69.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	66.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	61.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	58.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	57.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	55.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	54.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	52.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	51.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	49.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	47.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	46.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	45.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	43.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	41.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	40.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	39.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	37.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	35.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	34.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	33.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	34.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	34.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	33.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	32.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	33.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	32.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	32.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	31.
1	JAN	1015	42	0.05	0.05	0.00	3.	1	JAN	2245	92	0.01	0.00	0.01	31.
1	JAN	1030	43	0.06	0.06	0.00	7.	1	JAN	2300	93	0.01	0.00	0.01	31.
1	JAN	1045	44	0.07	0.06	0.01	14.	1	JAN	2315	94	0.01	0.00	0.01	30.
1	JAN	1100	45	0.08	0.07	0.01	23.	1	JAN	2330	95	0.01	0.00	0.01	30.
1	JAN	1115	46	0.10	0.09	0.01	38.	1	JAN	2345	96	0.01	0.00	0.01	30.
1	JAN	1130	47	0.13	0.10	0.02	63.	2	JAN	0000	97	0.01	0.00	0.01	30.
1	JAN	1145	48	0.52	0.37	0.15	354.	2	JAN	0015	98	0.00	0.00	0.00	8.
1	JAN	1200	49	1.28	0.66	0.62	1513.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	693.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
1513.	12.00	197.	60.	59.	59.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 98.	120.	120.	120.

CUMULATIVE AREA = 1.19 SQ MI

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          **************
          *            *
120 KK    *        4R  *        CNAME      4C
          *            *
          **************
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121 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
```

IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

122 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.12	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 4R

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	478.	1 JAN 1845	76	44.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	281.	1 JAN 1900	77	42.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	192.	1 JAN 1915	78	41.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	155.	1 JAN 1930	79	39.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	134.	1 JAN 1945	80	38.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	119.	1 JAN 2000	81	36.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	105.	1 JAN 2015	82	35.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	95.	1 JAN 2030	83	34.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	88.	1 JAN 2045	84	33.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	84.	1 JAN 2100	85	34.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	80.	1 JAN 2115	86	33.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	76.	1 JAN 2130	87	32.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	72.	1 JAN 2145	88	32.
1 JAN 0315	14	0.	1 JAN 0930	39	0.	1 JAN 1545	64	67.	1 JAN 2200	89	32.
1 JAN 0330	15	0.	1 JAN 0945	40	0.	1 JAN 1600	65	64.	1 JAN 2215	90	32.
1 JAN 0345	16	0.	1 JAN 1000	41	0.	1 JAN 1615	66	60.	1 JAN 2230	91	31.
1 JAN 0400	17	0.	1 JAN 1015	42	1.	1 JAN 1630	67	57.	1 JAN 2245	92	31.
1 JAN 0415	18	0.	1 JAN 1030	43	5.	1 JAN 1645	68	56.	1 JAN 2300	93	31.
1 JAN 0430	19	0.	1 JAN 1045	44	10.	1 JAN 1700	69	54.	1 JAN 2315	94	31.
1 JAN 0445	20	0.	1 JAN 1100	45	18.	1 JAN 1715	70	53.	1 JAN 2330	95	30.
1 JAN 0500	21	0.	1 JAN 1115	46	30.	1 JAN 1730	71	51.	1 JAN 2345	96	30.
1 JAN 0515	22	0.	1 JAN 1130	47	50.	1 JAN 1745	72	50.	2 JAN 0000	97	30.
1 JAN 0530	23	0.	1 JAN 1145	48	196.	1 JAN 1800	73	48.	2 JAN 0015	98	20.
1 JAN 0545	24	0.	1 JAN 1200	49	894.	1 JAN 1815	74	47.	2 JAN 0030	99	3.
1 JAN 0600	25	0.	1 JAN 1215	50	1218.	1 JAN 1830	75	45.	2 JAN 0045	100	1.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1218.	12.25	197.	60.	59.	59.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 98.	120.	120.	120.

CUMULATIVE AREA = 1.19 SQ MI

*** ***

123 KK 3bB

124 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

127 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

125 BA SUBBASIN CHARACTERISTICS

TAREA,	1.08	SUBBASIN AREA

PRECIPITATION DATA

```
126 PB                STORM        4.75  BASIN TOTAL PRECIPITATION

128 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

153 LS           SCS LOSS RATE
                      STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR       70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

154 UD           SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.10  LAG

                                                                  ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                    UNIT HYDROGRAPH
                                                5 END-OF-PERIOD ORDINATES
                2062.      577.      113.       23.        0.
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HYDROGRAPH AT STATION 3bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	321.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	202.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	153.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	129.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	114.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	101.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	90.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	82.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	77.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	74.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	70.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	67.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	63.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	59.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	55.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	52.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	51.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	50.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	49.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	47.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	46.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	44.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.02	0.01	0.02	43.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.01	41.
1	JAN	0600	25	0.02	0.02	0.00	0.	1	JAN	1830	75	0.02	0.01	0.01	40.
1	JAN	0615	26	0.02	0.02	0.00	0.	1	JAN	1845	76	0.02	0.01	0.01	39.
1	JAN	0630	27	0.02	0.02	0.00	0.	1	JAN	1900	77	0.02	0.01	0.01	37.
1	JAN	0645	28	0.02	0.02	0.00	0.	1	JAN	1915	78	0.02	0.01	0.01	36.
1	JAN	0700	29	0.02	0.02	0.00	0.	1	JAN	1930	79	0.02	0.00	0.01	35.
1	JAN	0715	30	0.02	0.02	0.00	0.	1	JAN	1945	80	0.02	0.00	0.01	33.
1	JAN	0730	31	0.02	0.02	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	32.
1	JAN	0745	32	0.02	0.02	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	31.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.01	0.00	0.01	30.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	30.
1	JAN	0830	35	0.03	0.03	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	30.
1	JAN	0845	36	0.03	0.03	0.00	0.	1	JAN	2115	86	0.01	0.00	0.01	29.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.01	0.00	0.01	29.
1	JAN	0915	38	0.04	0.04	0.00	0.	1	JAN	2145	88	0.01	0.00	0.01	29.
1	JAN	0930	39	0.04	0.04	0.00	0.	1	JAN	2200	89	0.01	0.00	0.01	29.
1	JAN	0945	40	0.04	0.04	0.00	0.	1	JAN	2215	90	0.01	0.00	0.01	29.
1	JAN	1000	41	0.05	0.05	0.00	0.	1	JAN	2230	91	0.01	0.00	0.01	28.
1	JAN	1015	42	0.05	0.05	0.00	2.	1	JAN	2245	92	0.01	0.00	0.01	28.
1	JAN	1030	43	0.06	0.06	0.00	6.	1	JAN	2300	93	0.01	0.00	0.01	28.
1	JAN	1045	44	0.07	0.06	0.01	12.	1	JAN	2315	94	0.01	0.00	0.01	27.
1	JAN	1100	45	0.08	0.07	0.01	21.	1	JAN	2330	95	0.01	0.00	0.01	27.
1	JAN	1115	46	0.10	0.09	0.01	35.	1	JAN	2345	96	0.01	0.00	0.01	27.
1	JAN	1130	47	0.13	0.10	0.02	57.	2	JAN	0000	97	0.01	0.00	0.01	27.
1	JAN	1145	48	0.52	0.37	0.15	320.	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.28	0.66	0.62	1368.	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	626.	2	JAN	0045	100	0.00	0.00	0.00	0.

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1368.	12.00	178.	55.	53.	53.
		(INCHES) 1.539	1.891	1.891	1.891

(AC-FT) 88. 108. 108. 108.

CUMULATIVE AREA = 1.08 SQ MI

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          **************
          *            *
155 KK    *       3aB  *
          *            *
          **************
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156 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


159 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

157 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.87  SUBBASIN AREA

                PRECIPITATION DATA

158 PB               STORM         4.75  BASIN TOTAL PRECIPITATION

160 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

185 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

186 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG       0.11  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1678. 470. 92. 18. 0.

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HYDROGRAPH AT STATION 3aB

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.14	0.05	0.09	261.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.10	0.04	0.06	164.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.08	0.03	0.05	125.
1	JAN	0045	4	0.01	0.01	0.00	0.	1	JAN	1315	54	0.07	0.02	0.04	105.
1	JAN	0100	5	0.01	0.01	0.00	0.	1	JAN	1330	55	0.06	0.02	0.04	93.
1	JAN	0115	6	0.01	0.01	0.00	0.	1	JAN	1345	56	0.05	0.02	0.03	82.
1	JAN	0130	7	0.01	0.01	0.00	0.	1	JAN	1400	57	0.05	0.02	0.03	73.
1	JAN	0145	8	0.01	0.01	0.00	0.	1	JAN	1415	58	0.04	0.01	0.03	67.
1	JAN	0200	9	0.01	0.01	0.00	0.	1	JAN	1430	59	0.04	0.01	0.03	63.
1	JAN	0215	10	0.01	0.01	0.00	0.	1	JAN	1445	60	0.04	0.01	0.03	60.
1	JAN	0230	11	0.01	0.01	0.00	0.	1	JAN	1500	61	0.04	0.01	0.02	57.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.03	0.01	0.02	54.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.03	0.01	0.02	51.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.03	0.01	0.02	48.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.02	45.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	43.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	42.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	40.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.02	0.01	0.02	40.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.02	0.01	0.02	38.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.02	0.01	0.02	37.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.02	0.01	0.02	36.

1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.02	0.01	0.02	35.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.01	34.
1	JAN	0600	25	0.02	0.02	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.01	33.
1	JAN	0615	26	0.02	0.02	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.01	32.
1	JAN	0630	27	0.02	0.02	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.01	30.
1	JAN	0645	28	0.02	0.02	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.01	30.
1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	28.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	27.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	26.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	25.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	25.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	25.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	25.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	24.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	24.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	24.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	24.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	23.
1	JAN	1000	41	0.05	0.05	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	23.
1	JAN	1015	42	0.05	0.05	0.00	2.	*	1	JAN	2245	92	0.01	0.00	0.01	23.
1	JAN	1030	43	0.06	0.06	0.00	5.	*	1	JAN	2300	93	0.01	0.00	0.01	23.
1	JAN	1045	44	0.07	0.06	0.01	10.	*	1	JAN	2315	94	0.01	0.00	0.01	22.
1	JAN	1100	45	0.08	0.07	0.01	17.	*	1	JAN	2330	95	0.01	0.00	0.01	22.
1	JAN	1115	46	0.10	0.09	0.01	28.	*	1	JAN	2345	96	0.01	0.00	0.01	22.
1	JAN	1130	47	0.13	0.10	0.02	47.	*	2	JAN	0000	97	0.01	0.00	0.01	22.
1	JAN	1145	48	0.52	0.37	0.15	260.	*	2	JAN	0015	98	0.00	0.00	0.00	6.
1	JAN	1200	49	1.28	0.66	0.62	1113.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	509.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

****

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1113.	12.00	145.	44.	43.	43.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 72.	88.	88.	88.

CUMULATIVE AREA = 0.87 SQ MI

*** ***

187 KK 3C CNAME 3R

188 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

189 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 3C
SUM OF 3 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	1060.	1	JAN	1845	76	115.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	646.	1	JAN	1900	77	109.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	470.	1	JAN	1915	78	107.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	389.	1	JAN	1930	79	103.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	341.	1	JAN	1945	80	98.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	301.	1	JAN	2000	81	94.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	268.	1	JAN	2015	82	91.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	244.	1	JAN	2030	83	88.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	228.	1	JAN	2045	84	88.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	218.	1	JAN	2100	85	89.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	207.	1	JAN	2115	86	86.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	197.	1	JAN	2130	87	85.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	185.	1	JAN	2145	88	86.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	175.	1	JAN	2200	89	85.
1	JAN	0330	15	0.	1	JAN	0945	40	0.	1	JAN	1600	65	164.	1	JAN	2215	90	84.
1	JAN	0345	16	0.	1	JAN	1000	41	1.	1	JAN	1615	66	155.	1	JAN	2230	91	82.
1	JAN	0400	17	0.	1	JAN	1015	42	6.	1	JAN	1630	67	150.	1	JAN	2245	92	82.
1	JAN	0415	18	0.	1	JAN	1030	43	16.	1	JAN	1645	68	146.	1	JAN	2300	93	83.
1	JAN	0430	19	0.	1	JAN	1045	44	32.	1	JAN	1700	69	142.	1	JAN	2315	94	80.

1	JAN	0445	20	0.	*	1	JAN	1100	45	55.	*	1	JAN	1715	70	138.	*	1	JAN	2330	95	79.
1	JAN	0500	21	0.	*	1	JAN	1115	46	93.	*	1	JAN	1730	71	134.	*	1	JAN	2345	96	80.
1	JAN	0515	22	0.	*	1	JAN	1130	47	154.	*	1	JAN	1745	72	131.	*	2	JAN	0000	97	79.
1	JAN	0530	23	0.	*	1	JAN	1145	48	776.	*	1	JAN	1800	73	126.	*	2	JAN	0015	98	32.
1	JAN	0545	24	0.	*	1	JAN	1200	49	3374.	*	1	JAN	1815	74	122.	*	2	JAN	0030	99	6.
1	JAN	0600	25	0.	*	1	JAN	1215	50	2354.	*	1	JAN	1830	75	119.	*	2	JAN	0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3374.	12.00	520.	160.	155.	155.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 258.	317.	317.	317.

CUMULATIVE AREA = 3.14 SQ MI

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          **************
          *            *
190 KK    *        3R  *        CNAME      3C
          *            *
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191 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

192 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.17	MUSKINGUM K
X	0.20	MUSKINGUM X

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HYDROGRAPH AT STATION 3R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	1907.	1	JAN	1845	76	117.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	935.	1	JAN	1900	77	113.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	591.	1	JAN	1915	78	109.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	444.	1	JAN	1930	79	105.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	373.	1	JAN	1945	80	101.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	327.	1	JAN	2000	81	97.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	290.	1	JAN	2015	82	93.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	260.	1	JAN	2030	83	90.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	239.	1	JAN	2045	84	88.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	225.	1	JAN	2100	85	88.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	214.	1	JAN	2115	86	88.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	203.	1	JAN	2130	87	86.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	193.	1	JAN	2145	88	85.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	182.	1	JAN	2200	89	85.
1	JAN	0330	15	0.	1	JAN	0945	40	0.	1	JAN	1600	65	171.	1	JAN	2215	90	84.
1	JAN	0345	16	0.	1	JAN	1000	41	0.	1	JAN	1615	66	161.	1	JAN	2230	91	83.
1	JAN	0400	17	0.	1	JAN	1015	42	2.	1	JAN	1630	67	153.	1	JAN	2245	92	82.
1	JAN	0415	18	0.	1	JAN	1030	43	10.	1	JAN	1645	68	149.	1	JAN	2300	93	82.
1	JAN	0430	19	0.	1	JAN	1045	44	22.	1	JAN	1700	69	145.	1	JAN	2315	94	82.
1	JAN	0445	20	0.	1	JAN	1100	45	40.	1	JAN	1715	70	141.	1	JAN	2330	95	80.
1	JAN	0500	21	0.	1	JAN	1115	46	68.	1	JAN	1730	71	136.	1	JAN	2345	96	79.
1	JAN	0515	22	0.	1	JAN	1130	47	114.	1	JAN	1745	72	133.	2	JAN	0000	97	79.
1	JAN	0530	23	0.	1	JAN	1145	48	376.	1	JAN	1800	73	129.	2	JAN	0015	98	62.
1	JAN	0545	24	0.	1	JAN	1200	49	1695.	1	JAN	1815	74	125.	2	JAN	0030	99	24.
1	JAN	0600	25	0.	1	JAN	1215	50	2963.	1	JAN	1830	75	121.	2	JAN	0045	100	5.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2963.	12.25	519.	160.	155.	155.
		(INCHES) 1.538	1.891	1.891	1.891
		(AC-FT) 257.	317.	317.	317.

CUMULATIVE AREA = 3.14 SQ MI

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          **************
          *            *
193 KK    *       1bB  *
          *            *
          **************

194 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


197 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

195 BA          SUBBASIN CHARACTERISTICS
                     TAREA,      0.42  SUBBASIN AREA

                PRECIPITATION DATA

196 PB               STORM       4.75  BASIN TOTAL PRECIPITATION

198 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

223 LS          SCS LOSS RATE
                     STRTL       0.84  INITIAL ABSTRACTION
                    CRVNBR      70.50  CURVE NUMBER
                     RTIMP       0.00  PERCENT IMPERVIOUS AREA

224 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG       0.09  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
               811.      227.       45.        9.        0.
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HYDROGRAPH AT STATION 1bB

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.14	0.05	0.09	126.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.10	0.04	0.06	79.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.08	0.03	0.05	60.
1 JAN 0045	4	0.01	0.01	0.00	0.	1 JAN 1315	54	0.07	0.02	0.04	51.
1 JAN 0100	5	0.01	0.01	0.00	0.	1 JAN 1330	55	0.06	0.02	0.04	45.
1 JAN 0115	6	0.01	0.01	0.00	0.	1 JAN 1345	56	0.05	0.02	0.03	40.
1 JAN 0130	7	0.01	0.01	0.00	0.	1 JAN 1400	57	0.05	0.02	0.03	35.
1 JAN 0145	8	0.01	0.01	0.00	0.	1 JAN 1415	58	0.04	0.01	0.03	32.
1 JAN 0200	9	0.01	0.01	0.00	0.	1 JAN 1430	59	0.04	0.01	0.03	30.
1 JAN 0215	10	0.01	0.01	0.00	0.	1 JAN 1445	60	0.04	0.01	0.03	29.
1 JAN 0230	11	0.01	0.01	0.00	0.	1 JAN 1500	61	0.04	0.01	0.02	28.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.03	0.01	0.02	26.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.03	0.01	0.02	25.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.03	0.01	0.02	23.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.02	22.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	21.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	20.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	20.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.02	0.01	0.02	19.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.02	0.01	0.02	18.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.02	0.01	0.02	18.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.02	0.01	0.02	17.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.02	0.01	0.02	17.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.01	16.
1 JAN 0600	25	0.02	0.02	0.00	0.	1 JAN 1830	75	0.02	0.01	0.01	16.
1 JAN 0615	26	0.02	0.02	0.00	0.	1 JAN 1845	76	0.02	0.01	0.01	15.
1 JAN 0630	27	0.02	0.02	0.00	0.	1 JAN 1900	77	0.02	0.01	0.01	15.
1 JAN 0645	28	0.02	0.02	0.00	0.	1 JAN 1915	78	0.02	0.01	0.01	14.

1	JAN	0700	29	0.02	0.02	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.01	14.
1	JAN	0715	30	0.02	0.02	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.01	13.
1	JAN	0730	31	0.02	0.02	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	12.
1	JAN	0745	32	0.02	0.02	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	12.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.01	0.00	0.01	12.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	12.
1	JAN	0830	35	0.03	0.03	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	12.
1	JAN	0845	36	0.03	0.03	0.00	0.	*	1	JAN	2115	86	0.01	0.00	0.01	12.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.01	0.00	0.01	11.
1	JAN	0915	38	0.04	0.04	0.00	0.	*	1	JAN	2145	88	0.01	0.00	0.01	12.
1	JAN	0930	39	0.04	0.04	0.00	0.	*	1	JAN	2200	89	0.01	0.00	0.01	11.
1	JAN	0945	40	0.04	0.04	0.00	0.	*	1	JAN	2215	90	0.01	0.00	0.01	11.
1	JAN	1000	41	0.05	0.05	0.00	0.	*	1	JAN	2230	91	0.01	0.00	0.01	11.
1	JAN	1015	42	0.05	0.05	0.00	1.	*	1	JAN	2245	92	0.01	0.00	0.01	11.
1	JAN	1030	43	0.06	0.06	0.00	3.	*	1	JAN	2300	93	0.01	0.00	0.01	11.
1	JAN	1045	44	0.07	0.06	0.01	5.	*	1	JAN	2315	94	0.01	0.00	0.01	11.
1	JAN	1100	45	0.08	0.07	0.01	8.	*	1	JAN	2330	95	0.01	0.00	0.01	11.
1	JAN	1115	46	0.10	0.09	0.01	14.	*	1	JAN	2345	96	0.01	0.00	0.01	11.
1	JAN	1130	47	0.13	0.10	0.02	23.	*	2	JAN	0000	97	0.01	0.00	0.01	11.
1	JAN	1145	48	0.52	0.37	0.15	126.	*	2	JAN	0015	98	0.00	0.00	0.00	3.
1	JAN	1200	49	1.28	0.66	0.62	538.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.20	0.08	0.12	246.	*	2	JAN	0045	100	0.00	0.00	0.00	0.

*

TOTAL RAINFALL = 4.75, TOTAL LOSS = 2.86, TOTAL EXCESS = 1.89

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
538.	12.00	70.	22.	21.	21.
		(INCHES) 1.539	1.891	1.891	1.891
		(AC-FT) 35.	43.	43.	43.

CUMULATIVE AREA = 0.42 SQ MI

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          **************
          *            *
225 KK    *        1C  *        CNAME      1C
          *            *
          **************
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226 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

227 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 1C
SUM OF 4 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	2461.	1	JAN	1845	76	188.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	1339.	1	JAN	1900	77	180.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	865.	1	JAN	1915	78	174.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	685.	1	JAN	1930	79	169.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	580.	1	JAN	1945	80	162.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	512.	1	JAN	2000	81	154.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	454.	1	JAN	2015	82	149.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	410.	1	JAN	2030	83	145.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	379.	1	JAN	2045	84	143.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	359.	1	JAN	2100	85	143.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	341.	1	JAN	2115	86	141.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	324.	1	JAN	2130	87	139.
1	JAN	0300	13	0.	1	JAN	0915	38	0.	1	JAN	1530	63	307.	1	JAN	2145	88	139.
1	JAN	0315	14	0.	1	JAN	0930	39	0.	1	JAN	1545	64	290.	1	JAN	2200	89	138.
1	JAN	0330	15	0.	1	JAN	0945	40	0.	1	JAN	1600	65	272.	1	JAN	2215	90	136.
1	JAN	0345	16	0.	1	JAN	1000	41	1.	1	JAN	1615	66	256.	1	JAN	2230	91	134.
1	JAN	0400	17	0.	1	JAN	1015	42	6.	1	JAN	1630	67	246.	1	JAN	2245	92	133.
1	JAN	0415	18	0.	1	JAN	1030	43	20.	1	JAN	1645	68	238.	1	JAN	2300	93	134.
1	JAN	0430	19	0.	1	JAN	1045	44	43.	1	JAN	1700	69	233.	1	JAN	2315	94	131.
1	JAN	0445	20	0.	1	JAN	1100	45	76.	1	JAN	1715	70	226.	1	JAN	2330	95	129.
1	JAN	0500	21	0.	1	JAN	1115	46	128.	1	JAN	1730	71	219.	1	JAN	2345	96	129.
1	JAN	0515	22	0.	1	JAN	1130	47	213.	1	JAN	1745	72	213.	2	JAN	0000	97	128.
1	JAN	0530	23	0.	1	JAN	1145	48	888.	1	JAN	1800	73	207.	2	JAN	0015	98	79.
1	JAN	0545	24	0.	1	JAN	1200	49	3918.	1	JAN	1815	74	200.	2	JAN	0030	99	25.
1	JAN	0600	25	0.	1	JAN	1215	50	4378.	1	JAN	1830	75	194.	2	JAN	0045	100	5.

```
 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                  (CFS)
+    4378.     12.25                841.         258.        251.         251.
                (INCHES)            1.538        1.891       1.891        1.891
                 (AC-FT)            417.         512.        512.         512.

                 CUMULATIVE AREA =    5.08 SQ MI


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


          **************
          *            *
 228 KK   *        1C  *        CNAME      1C
          *            *
          **************

 229 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.250  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

 230 RN          NO ROUTING

                                                    ***

                                        HYDROGRAPH AT STATION       1C

    DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW
                                  *                                *                                *
     1 JAN 0000    1        0.    *    1 JAN 0615   26        0.    *    1 JAN 1230   51     2461.    *    1 JAN 1845   76       188.
     1 JAN 0015    2        0.    *    1 JAN 0630   27        0.    *    1 JAN 1245   52     1339.    *    1 JAN 1900   77       180.
     1 JAN 0030    3        0.    *    1 JAN 0645   28        0.    *    1 JAN 1300   53      865.    *    1 JAN 1915   78       174.
     1 JAN 0045    4        0.    *    1 JAN 0700   29        0.    *    1 JAN 1315   54      685.    *    1 JAN 1930   79       169.
     1 JAN 0100    5        0.    *    1 JAN 0715   30        0.    *    1 JAN 1330   55      580.    *    1 JAN 1945   80       162.
     1 JAN 0115    6        0.    *    1 JAN 0730   31        0.    *    1 JAN 1345   56      512.    *    1 JAN 2000   81       154.
     1 JAN 0130    7        0.    *    1 JAN 0745   32        0.    *    1 JAN 1400   57      454.    *    1 JAN 2015   82       149.
     1 JAN 0145    8        0.    *    1 JAN 0800   33        0.    *    1 JAN 1415   58      410.    *    1 JAN 2030   83       145.
     1 JAN 0200    9        0.    *    1 JAN 0815   34        0.    *    1 JAN 1430   59      379.    *    1 JAN 2045   84       143.
     1 JAN 0215   10        0.    *    1 JAN 0830   35        0.    *    1 JAN 1445   60      359.    *    1 JAN 2100   85       143.
     1 JAN 0230   11        0.    *    1 JAN 0845   36        0.    *    1 JAN 1500   61      341.    *    1 JAN 2115   86       141.
     1 JAN 0245   12        0.    *    1 JAN 0900   37        0.    *    1 JAN 1515   62      324.    *    1 JAN 2130   87       139.
     1 JAN 0300   13        0.    *    1 JAN 0915   38        0.    *    1 JAN 1530   63      307.    *    1 JAN 2145   88       139.
     1 JAN 0315   14        0.    *    1 JAN 0930   39        0.    *    1 JAN 1545   64      290.    *    1 JAN 2200   89       138.
     1 JAN 0330   15        0.    *    1 JAN 0945   40        0.    *    1 JAN 1600   65      272.    *    1 JAN 2215   90       136.
     1 JAN 0345   16        0.    *    1 JAN 1000   41        1.    *    1 JAN 1615   66      256.    *    1 JAN 2230   91       134.
     1 JAN 0400   17        0.    *    1 JAN 1015   42        6.    *    1 JAN 1630   67      246.    *    1 JAN 2245   92       133.
     1 JAN 0415   18        0.    *    1 JAN 1030   43       20.    *    1 JAN 1645   68      238.    *    1 JAN 2300   93       134.
     1 JAN 0430   19        0.    *    1 JAN 1045   44       43.    *    1 JAN 1700   69      233.    *    1 JAN 2315   94       131.
     1 JAN 0445   20        0.    *    1 JAN 1100   45       76.    *    1 JAN 1715   70      226.    *    1 JAN 2330   95       129.
     1 JAN 0500   21        0.    *    1 JAN 1115   46      128.    *    1 JAN 1730   71      219.    *    1 JAN 2345   96       129.
     1 JAN 0515   22        0.    *    1 JAN 1130   47      213.    *    1 JAN 1745   72      213.    *    2 JAN 0000   97       128.
     1 JAN 0530   23        0.    *    1 JAN 1145   48      888.    *    1 JAN 1800   73      207.    *    2 JAN 0015   98        79.
     1 JAN 0545   24        0.    *    1 JAN 1200   49     3918.    *    1 JAN 1815   74      200.    *    2 JAN 0030   99        25.
     1 JAN 0600   25        0.    *    1 JAN 1215   50     4378.    *    1 JAN 1830   75      194.    *    2 JAN 0045  100         5.
                                  *                                *                                *

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR       72-HR     24.75-HR
+   (CFS)       (HR)
                  (CFS)
+    4378.     12.25                841.         258.        251.         251.
                (INCHES)            1.538        1.891       1.891        1.891
                 (AC-FT)            417.         512.        512.         512.

                 CUMULATIVE AREA =    5.08 SQ MI


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

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

          HYDROGRAPH AT
+                           1aB     1031.   12.00         134.         41.         40.       0.81
```

	ROUTED TO							
+		10R	1031.	12.00	134.	41.	40.	0.81
	HYDROGRAPH AT							
+		2B	901.	12.00	117.	36.	35.	0.71
	ROUTED TO							
+		2R	696.	12.25	117.	36.	35.	0.71
	HYDROGRAPH AT							
+		4B	1513.	12.00	197.	60.	59.	1.19
	ROUTED TO							
+		4R	1218.	12.25	197.	60.	59.	1.19
	HYDROGRAPH AT							
+		3bB	1368.	12.00	178.	55.	53.	1.08
	HYDROGRAPH AT							
+		3aB	1113.	12.00	145.	44.	43.	0.87
	3 COMBINED AT							
+		3C	3374.	12.00	520.	160.	155.	3.14
	ROUTED TO							
+		3R	2963.	12.25	519.	160.	155.	3.14
	HYDROGRAPH AT							
+		1bB	538.	12.00	70.	22.	21.	0.42
	4 COMBINED AT							
+		1C	4378.	12.25	841.	258.	251.	5.08
	ROUTED TO							
+		1C	4378.	12.25	841.	258.	251.	5.08

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

```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             MAY   1991            *
 *           VERSION 4.0.1E          *
 *                                   *
 *  RUN DATE           TIME          *
 *                                   *
 *************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
*************************************
```

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

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

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

HEC-1 INPUT PAGE 1

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

   1          ID    Sycamore Creek
   2          ID    wo Mining & wo Logging (Pristine Conditions), LIDAR Data
   3          ID    100 yr Storm
              *DIAGRAM
   4          IT      15  1JAN94       0     100
   5          IO       1
              * Gage XY Position 464530.00000 4195279.00000 1
   6          PG    Gage     2.6
   7          IN      15  1JAN94       0
              * Sycamore Rainfall Distribution
   8          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   9          PC     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
  10          PC     0.0   0.025    0.05   0.075     0.1  0.1625   0.225  0.2875    0.35   0.475
  11          PC     0.6   0.725    0.85  1.1625   1.475  1.7875     2.1   2.225    2.35   2.475
  12          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  13          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  14          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  15          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  16          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6     2.6
  17          PC     2.6     2.6     2.6     2.6     2.6     2.6     2.6

  18          KK     1aB
  19          KO       0       0     0.0       1      22
  20          BA  0.8108
  21          PB    5.68
  22          IN       6  1JAN94       0
              * typeII-24hour
  23          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
  24          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
  25          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
  26          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
  27          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
  28          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
  29          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
  30          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
  31          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
  32          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
  33          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
  34          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
  35          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
  36          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
  37          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
  38          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
  39          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
  40          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
  41          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
  42          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
  43          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
  44          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
  45          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
  46          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
  47          PC     1.0
  48          LS     0.0    70.5     0.0
  49          UD  0.0889
```

HEC-1 INPUT PAGE 2

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

  50          KK     10R   CNAME     10C
```

```
 51          KO       0       0     0.0       0      22
 52          RN     10R

 53          KK      2B
 54          KO       0       0     0.0       1      22
 55          BA  0.7081
 56          PB    5.68
 57          IN       6  1JAN94       0
             * typeII-24hour
 58          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 59          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 60          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 61          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 62          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 63          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 64          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 65          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 66          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 67          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 68          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 69          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 70          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 71          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 72          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 73          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 74          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 75          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 76          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 77          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 78          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 79          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 80          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 81          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 82          PC     1.0
 83          LS     0.0    70.5     0.0
 84          UD  0.0987

 85          KK      2R   CNAME      2C
 86          KO       0       0     0.0       0      22
 87          RM       1   0.072     0.2

 88          KK      4B
 89          KO       0       0     0.0       1      22
 90          BA  1.1898
 91          PB    5.68
 92          IN       6  1JAN94       0
             * typeII-24hour
 93          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 94          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 95          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 96          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 97          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 98          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
```



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

 99          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
100          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
101          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
102          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
103          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
104          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
105          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
106          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
107          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
108          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
109          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
110          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
111          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
112          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
113          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
114          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
115          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
116          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
117          PC     1.0
118          LS     0.0    70.5     0.0
119          UD  0.0828

120          KK      4R   CNAME      4C
121          KO       0       0     0.0       0      22
122          RM       1   0.123     0.2

123          KK     3bB
124          KO       0       0     0.0       1      22
125          BA  1.0754
126          PB    5.68
127          IN       6  1JAN94       0
             * typeII-24hour
128          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
129          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
130          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
131          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
132          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
133          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
134          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
135          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
136          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
```

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 137          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 138          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 139          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 140          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 141          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 142          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 143          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 144          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 145          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 146          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 147          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 148          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 149          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 150          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
```



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

 151          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 152          PC     1.0
 153          LS     0.0    70.5     0.0
 154          UD  0.1006

 155          KK     3aB
 156          KO       0       0     0.0       1      22
 157          BA  0.8748
 158          PB    5.68
 159          IN       6  1JAN94       0
              * typeII-24hour
 160          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 161          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
 162          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 163          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 164          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 165          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 166          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 167          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 168          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 169          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 170          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 171          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 172          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 173          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 174          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 175          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 176          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 177          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 178          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 179          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 180          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 181          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
 182          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
 183          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
 184          PC     1.0
 185          LS     0.0    70.5     0.0
 186          UD  0.1062

 187          KK      3C   CNAME      3R
 188          KO       0       0     0.0       0      22
 189          HC       3

 190          KK      3R   CNAME      3C
 191          KO       0       0     0.0       0      22
 192          RM       1   0.165     0.2

 193          KK     1bB
 194          KO       0       0     0.0       1      22
 195          BA   0.423
 196          PB    5.68
 197          IN       6  1JAN94       0
              * typeII-24hour
 198          PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
 199          PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
```


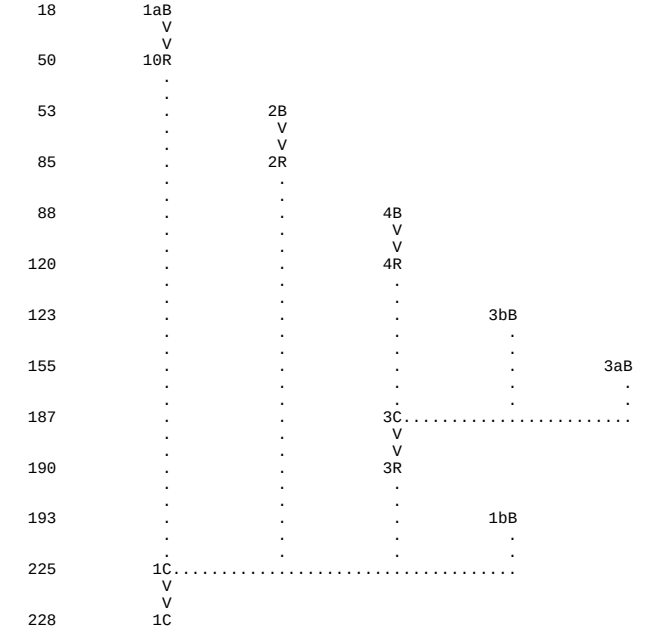

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 200          PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
 201          PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
 202          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
 203          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
 204          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
 205          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
 206          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
 207          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
 208          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
 209          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
 210          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
 211          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
 212          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
 213          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
 214          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
 215          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
 216          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
 217          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
 218          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
 219          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
```

```
          220           PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
          221           PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
          222           PC     1.0
          223           LS     0.0    70.5     0.0
          224           UD  0.0852

          225           KK      1C   CNAME      1C
          226           KO       0       0     0.0       0      22
          227           HC       4

          228           KK      1C   CNAME      1C
          229           KO       0       0     0.0       0      22
          230           RN      1C
          231           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY   1991              *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

Sycamore Creek
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
100 yr Storm

```
   5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

   7 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN         15  TIME INTERVAL IN MINUTES
                     JXDATE     1JAN94  STARTING DATE
                     JXTIME          0  STARTING TIME

     IT          HYDROGRAPH TIME DATA
                       NMIN         15  MINUTES IN COMPUTATION INTERVAL
                      IDATE     1JAN94  STARTING DATE
                      ITIME       0000  STARTING TIME
                        NQ,        100  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     2JAN94  ENDING DATE
                     NDTIME       0045  ENDING TIME
                     ICENT          19  CENTURY MARK

                   COMPUTATION INTERVAL    0.25 HOURS
                        TOTAL TIME BASE   24.75 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

*** ***

```
          **************
          *            *
 18 KK    *       1aB  *
          *            *
          **************
```

 19 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

 22 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

 20 BA SUBBASIN CHARACTERISTICS

TAREA,	0.81	SUBBASIN AREA

PRECIPITATION DATA

 21 PB

STORM	5.68	BASIN TOTAL PRECIPITATION

 23 PI INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

 48 LS SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

 49 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	0.09	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1555.	435.	86.	17.	0.

****

HYDROGRAPH AT STATION 1aB

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	324.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	201.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	152.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	128.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	113.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	99.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	89.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	81.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	76.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	73.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	69.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	65.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	61.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	58.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	54.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	51.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	50.

1	JAN	0415	18	0.02	0.02	0.00	0.	*	1	JAN	1645	68	0.03	0.01	0.02	48.
1	JAN	0430	19	0.02	0.02	0.00	0.	*	1	JAN	1700	69	0.03	0.01	0.02	47.
1	JAN	0445	20	0.02	0.02	0.00	0.	*	1	JAN	1715	70	0.03	0.01	0.02	46.
1	JAN	0500	21	0.02	0.02	0.00	0.	*	1	JAN	1730	71	0.03	0.01	0.02	44.
1	JAN	0515	22	0.02	0.02	0.00	0.	*	1	JAN	1745	72	0.03	0.01	0.02	43.
1	JAN	0530	23	0.02	0.02	0.00	0.	*	1	JAN	1800	73	0.03	0.01	0.02	42.
1	JAN	0545	24	0.02	0.02	0.00	0.	*	1	JAN	1815	74	0.02	0.01	0.02	40.
1	JAN	0600	25	0.03	0.03	0.00	0.	*	1	JAN	1830	75	0.02	0.01	0.02	39.
1	JAN	0615	26	0.03	0.03	0.00	0.	*	1	JAN	1845	76	0.02	0.01	0.02	38.
1	JAN	0630	27	0.03	0.03	0.00	0.	*	1	JAN	1900	77	0.02	0.01	0.02	36.
1	JAN	0645	28	0.03	0.03	0.00	0.	*	1	JAN	1915	78	0.02	0.01	0.02	35.
1	JAN	0700	29	0.03	0.03	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.02	34.
1	JAN	0715	30	0.03	0.03	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.02	32.
1	JAN	0730	31	0.03	0.03	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	31.
1	JAN	0745	32	0.03	0.03	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	30.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.02	0.00	0.01	29.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	29.
1	JAN	0830	35	0.04	0.04	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	29.
1	JAN	0845	36	0.04	0.04	0.00	0.	*	1	JAN	2115	86	0.02	0.00	0.01	28.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	28.
1	JAN	0915	38	0.05	0.04	0.00	1.	*	1	JAN	2145	88	0.02	0.00	0.01	29.
1	JAN	0930	39	0.05	0.04	0.00	2.	*	1	JAN	2200	89	0.02	0.00	0.01	28.
1	JAN	0945	40	0.05	0.05	0.00	5.	*	1	JAN	2215	90	0.02	0.00	0.01	28.
1	JAN	1000	41	0.05	0.05	0.00	7.	*	1	JAN	2230	91	0.02	0.00	0.01	27.
1	JAN	1015	42	0.06	0.06	0.01	11.	*	1	JAN	2245	92	0.02	0.00	0.01	27.
1	JAN	1030	43	0.07	0.06	0.01	16.	*	1	JAN	2300	93	0.02	0.00	0.01	27.
1	JAN	1045	44	0.08	0.07	0.01	24.	*	1	JAN	2315	94	0.02	0.00	0.01	26.
1	JAN	1100	45	0.09	0.08	0.02	34.	*	1	JAN	2330	95	0.02	0.00	0.01	26.
1	JAN	1115	46	0.12	0.09	0.03	50.	*	1	JAN	2345	96	0.02	0.00	0.01	26.
1	JAN	1130	47	0.15	0.11	0.04	76.	*	2	JAN	0000	97	0.02	0.00	0.01	26.
1	JAN	1145	48	0.62	0.39	0.23	375.	*	2	JAN	0015	98	0.00	0.00	0.00	7.
1	JAN	1200	49	1.54	0.68	0.86	1437.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.24	0.08	0.16	645.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

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TOTAL RAINFALL = 5.68, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.60

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1437.	12.00	184.	57.	55.	55.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 91.	112.	112.	112.

CUMULATIVE AREA = 0.81 SQ MI

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          **************
          *            *
50 KK     *       10R  *        CNAME     10C
          *            *
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51 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

52 RN NO ROUTING

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HYDROGRAPH AT STATION 10R

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	324.	1	JAN	1845	76	38.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	201.	1	JAN	1900	77	36.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	152.	1	JAN	1915	78	35.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	128.	1	JAN	1930	79	34.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	113.	1	JAN	1945	80	32.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	99.	1	JAN	2000	81	31.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	89.	1	JAN	2015	82	30.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	81.	1	JAN	2030	83	29.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	76.	1	JAN	2045	84	29.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	73.	1	JAN	2100	85	29.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	69.	1	JAN	2115	86	28.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	65.	1	JAN	2130	87	28.
1	JAN	0300	13	0.	1	JAN	0915	38	1.	1	JAN	1530	63	61.	1	JAN	2145	88	29.
1	JAN	0315	14	0.	1	JAN	0930	39	2.	1	JAN	1545	64	58.	1	JAN	2200	89	28.

1 JAN 0330	15	0.	*	1 JAN 0945	40	5.	*	1 JAN 1600	65	54.	*	1 JAN 2215	90	28.
1 JAN 0345	16	0.	*	1 JAN 1000	41	7.	*	1 JAN 1615	66	51.	*	1 JAN 2230	91	27.
1 JAN 0400	17	0.	*	1 JAN 1015	42	11.	*	1 JAN 1630	67	50.	*	1 JAN 2245	92	27.
1 JAN 0415	18	0.	*	1 JAN 1030	43	16.	*	1 JAN 1645	68	48.	*	1 JAN 2300	93	27.
1 JAN 0430	19	0.	*	1 JAN 1045	44	24.	*	1 JAN 1700	69	47.	*	1 JAN 2315	94	26.
1 JAN 0445	20	0.	*	1 JAN 1100	45	34.	*	1 JAN 1715	70	46.	*	1 JAN 2330	95	26.
1 JAN 0500	21	0.	*	1 JAN 1115	46	50.	*	1 JAN 1730	71	44.	*	1 JAN 2345	96	26.
1 JAN 0515	22	0.	*	1 JAN 1130	47	76.	*	1 JAN 1745	72	43.	*	2 JAN 0000	97	26.
1 JAN 0530	23	0.	*	1 JAN 1145	48	375.	*	1 JAN 1800	73	42.	*	2 JAN 0015	98	7.
1 JAN 0545	24	0.	*	1 JAN 1200	49	1437.	*	1 JAN 1815	74	40.	*	2 JAN 0030	99	1.
1 JAN 0600	25	0.	*	1 JAN 1215	50	645.	*	1 JAN 1830	75	39.	*	2 JAN 0045	100	0.
			*				*				*			

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	24.75-HR	
+ (CFS)	(HR)					
		(CFS)				
+ 1437.	12.00	184.	57.	55.	55.	
		(INCHES) 2.112	2.598	2.598	2.598	
		(AC-FT) 91.	112.	112.	112.	

CUMULATIVE AREA = 0.81 SQ MI

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          **************
          *            *
53 KK     *        2B  *
          *            *
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54 KO — OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

57 IN — TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

55 BA — SUBBASIN CHARACTERISTICS

TAREA,	0.71	SUBBASIN AREA

PRECIPITATION DATA

56 PB — STORM 5.68 BASIN TOTAL PRECIPITATION

58 PI — INCREMENTAL 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	0.01	0.01
0.01	0.01	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	0.03	0.11	0.27	0.04	0.03
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	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00				

83 LS — SCS LOSS RATE

STRTL	0.84	INITIAL ABSTRACTION
CRVNBR	70.50	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

84 UD — SCS DIMENSIONLESS UNITGRAPH

TLAG	0.10	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1358.	380.	75.	15.	0.

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HYDROGRAPH AT STATION 2B

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	283.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	176.

1	JAN 0030	3	0.01	0.01	0.00	0.	*	1	JAN 1300	53	0.10	0.03	0.07	133.
1	JAN 0045	4	0.02	0.02	0.00	0.	*	1	JAN 1315	54	0.08	0.02	0.06	112.
1	JAN 0100	5	0.02	0.02	0.00	0.	*	1	JAN 1330	55	0.07	0.02	0.05	98.
1	JAN 0115	6	0.02	0.02	0.00	0.	*	1	JAN 1345	56	0.06	0.02	0.05	87.
1	JAN 0130	7	0.02	0.02	0.00	0.	*	1	JAN 1400	57	0.06	0.02	0.04	77.
1	JAN 0145	8	0.02	0.02	0.00	0.	*	1	JAN 1415	58	0.05	0.01	0.04	71.
1	JAN 0200	9	0.02	0.02	0.00	0.	*	1	JAN 1430	59	0.05	0.01	0.04	66.
1	JAN 0215	10	0.02	0.02	0.00	0.	*	1	JAN 1445	60	0.05	0.01	0.03	63.
1	JAN 0230	11	0.02	0.02	0.00	0.	*	1	JAN 1500	61	0.04	0.01	0.03	60.
1	JAN 0245	12	0.02	0.02	0.00	0.	*	1	JAN 1515	62	0.04	0.01	0.03	57.
1	JAN 0300	13	0.02	0.02	0.00	0.	*	1	JAN 1530	63	0.04	0.01	0.03	54.
1	JAN 0315	14	0.02	0.02	0.00	0.	*	1	JAN 1545	64	0.04	0.01	0.03	51.
1	JAN 0330	15	0.02	0.02	0.00	0.	*	1	JAN 1600	65	0.03	0.01	0.03	47.
1	JAN 0345	16	0.02	0.02	0.00	0.	*	1	JAN 1615	66	0.03	0.01	0.02	45.
1	JAN 0400	17	0.02	0.02	0.00	0.	*	1	JAN 1630	67	0.03	0.01	0.02	44.
1	JAN 0415	18	0.02	0.02	0.00	0.	*	1	JAN 1645	68	0.03	0.01	0.02	42.
1	JAN 0430	19	0.02	0.02	0.00	0.	*	1	JAN 1700	69	0.03	0.01	0.02	41.
1	JAN 0445	20	0.02	0.02	0.00	0.	*	1	JAN 1715	70	0.03	0.01	0.02	40.
1	JAN 0500	21	0.02	0.02	0.00	0.	*	1	JAN 1730	71	0.03	0.01	0.02	39.
1	JAN 0515	22	0.02	0.02	0.00	0.	*	1	JAN 1745	72	0.03	0.01	0.02	38.
1	JAN 0530	23	0.02	0.02	0.00	0.	*	1	JAN 1800	73	0.03	0.01	0.02	36.
1	JAN 0545	24	0.02	0.02	0.00	0.	*	1	JAN 1815	74	0.02	0.01	0.02	35.
1	JAN 0600	25	0.03	0.03	0.00	0.	*	1	JAN 1830	75	0.02	0.01	0.02	34.
1	JAN 0615	26	0.03	0.03	0.00	0.	*	1	JAN 1845	76	0.02	0.01	0.02	33.
1	JAN 0630	27	0.03	0.03	0.00	0.	*	1	JAN 1900	77	0.02	0.01	0.02	32.
1	JAN 0645	28	0.03	0.03	0.00	0.	*	1	JAN 1915	78	0.02	0.01	0.02	31.
1	JAN 0700	29	0.03	0.03	0.00	0.	*	1	JAN 1930	79	0.02	0.00	0.02	30.
1	JAN 0715	30	0.03	0.03	0.00	0.	*	1	JAN 1945	80	0.02	0.00	0.02	28.
1	JAN 0730	31	0.03	0.03	0.00	0.	*	1	JAN 2000	81	0.02	0.00	0.01	27.
1	JAN 0745	32	0.03	0.03	0.00	0.	*	1	JAN 2015	82	0.02	0.00	0.01	26.
1	JAN 0800	33	0.03	0.03	0.00	0.	*	1	JAN 2030	83	0.02	0.00	0.01	26.
1	JAN 0815	34	0.03	0.03	0.00	0.	*	1	JAN 2045	84	0.02	0.00	0.01	26.
1	JAN 0830	35	0.04	0.04	0.00	0.	*	1	JAN 2100	85	0.02	0.00	0.01	26.
1	JAN 0845	36	0.04	0.04	0.00	0.	*	1	JAN 2115	86	0.02	0.00	0.01	25.
1	JAN 0900	37	0.04	0.04	0.00	0.	*	1	JAN 2130	87	0.02	0.00	0.01	25.
1	JAN 0915	38	0.05	0.04	0.00	1.	*	1	JAN 2145	88	0.02	0.00	0.01	25.
1	JAN 0930	39	0.05	0.04	0.00	2.	*	1	JAN 2200	89	0.02	0.00	0.01	24.
1	JAN 0945	40	0.05	0.05	0.00	4.	*	1	JAN 2215	90	0.02	0.00	0.01	24.
1	JAN 1000	41	0.05	0.05	0.00	6.	*	1	JAN 2230	91	0.02	0.00	0.01	24.
1	JAN 1015	42	0.06	0.06	0.01	10.	*	1	JAN 2245	92	0.02	0.00	0.01	24.
1	JAN 1030	43	0.07	0.06	0.01	14.	*	1	JAN 2300	93	0.02	0.00	0.01	24.
1	JAN 1045	44	0.08	0.07	0.01	21.	*	1	JAN 2315	94	0.02	0.00	0.01	23.
1	JAN 1100	45	0.09	0.08	0.02	29.	*	1	JAN 2330	95	0.02	0.00	0.01	23.
1	JAN 1115	46	0.12	0.09	0.03	44.	*	1	JAN 2345	96	0.02	0.00	0.01	23.
1	JAN 1130	47	0.15	0.11	0.04	66.	*	2	JAN 0000	97	0.02	0.00	0.01	23.
1	JAN 1145	48	0.62	0.39	0.23	327.	*	2	JAN 0015	98	0.00	0.00	0.00	6.
1	JAN 1200	49	1.54	0.68	0.86	1255.	*	2	JAN 0030	99	0.00	0.00	0.00	1.
1	JAN 1215	50	0.24	0.08	0.16	564.	*	2	JAN 0045	100	0.00	0.00	0.00	0.
							*							

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TOTAL RAINFALL = 5.68, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.60

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1255.	12.00	161.	49.	48.	48.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 80.	98.	98.	98.

CUMULATIVE AREA = 0.71 SQ MI

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          **************
          *            *
 85 KK    *        2R  *        CNAME      2C
          *            *
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86 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

87 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.07	MUSKINGUM K
X	0.20	MUSKINGUM X

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***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 2R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 2R

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	248.	1 JAN 1845	76	33.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	231.	1 JAN 1900	77	32.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	129.	1 JAN 1915	78	31.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	121.	1 JAN 1930	79	30.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	100.	1 JAN 1945	80	29.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	91.	1 JAN 2000	81	27.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	80.	1 JAN 2015	82	26.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	72.	1 JAN 2030	83	26.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	67.	1 JAN 2045	84	25.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	64.	1 JAN 2100	85	26.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	61.	1 JAN 2115	86	25.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	58.	1 JAN 2130	87	25.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	55.	1 JAN 2145	88	25.
1 JAN 0315	14	0.	1 JAN 0930	39	2.	1 JAN 1545	64	51.	1 JAN 2200	89	25.
1 JAN 0330	15	0.	1 JAN 0945	40	3.	1 JAN 1600	65	48.	1 JAN 2215	90	24.
1 JAN 0345	16	0.	1 JAN 1000	41	6.	1 JAN 1615	66	45.	1 JAN 2230	91	24.
1 JAN 0400	17	0.	1 JAN 1015	42	9.	1 JAN 1630	67	44.	1 JAN 2245	92	24.
1 JAN 0415	18	0.	1 JAN 1030	43	13.	1 JAN 1645	68	43.	1 JAN 2300	93	24.
1 JAN 0430	19	0.	1 JAN 1045	44	19.	1 JAN 1700	69	42.	1 JAN 2315	94	23.
1 JAN 0445	20	0.	1 JAN 1100	45	27.	1 JAN 1715	70	40.	1 JAN 2330	95	23.
1 JAN 0500	21	0.	1 JAN 1115	46	39.	1 JAN 1730	71	39.	1 JAN 2345	96	23.
1 JAN 0515	22	0.	1 JAN 1130	47	59.	1 JAN 1745	72	38.	2 JAN 0000	97	23.
1 JAN 0530	23	0.	1 JAN 1145	48	227.	1 JAN 1800	73	37.	2 JAN 0015	98	12.
1 JAN 0545	24	0.	1 JAN 1200	49	926.	1 JAN 1815	74	36.	2 JAN 0030	99	1.
1 JAN 0600	25	0.	1 JAN 1215	50	958.	1 JAN 1830	75	35.	2 JAN 0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
958.	12.25	161.	49.	48.	48.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 80.	98.	98.	98.

CUMULATIVE AREA = 0.71 SQ MI

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          **************
          *            *
 88 KK    *        4B  *
          *            *
          **************

 89 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


 92 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 90 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        1.19  SUBBASIN AREA

                PRECIPITATION DATA

 91 PB               STORM        5.68  BASIN TOTAL PRECIPITATION

 93 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

118 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

119 UD          SCS DIMENSIONLESS UNITGRAPH
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TLAG 0.08 LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
2282. 639. 125. 25. 0.

HYDROGRAPH AT STATION 4B

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1 JAN 0000	1	0.00	0.00	0.00	0.	1 JAN 1230	51	0.17	0.05	0.11	475.
1 JAN 0015	2	0.01	0.01	0.00	0.	1 JAN 1245	52	0.11	0.03	0.08	295.
1 JAN 0030	3	0.01	0.01	0.00	0.	1 JAN 1300	53	0.10	0.03	0.07	223.
1 JAN 0045	4	0.02	0.02	0.00	0.	1 JAN 1315	54	0.08	0.02	0.06	188.
1 JAN 0100	5	0.02	0.02	0.00	0.	1 JAN 1330	55	0.07	0.02	0.05	165.
1 JAN 0115	6	0.02	0.02	0.00	0.	1 JAN 1345	56	0.06	0.02	0.05	146.
1 JAN 0130	7	0.02	0.02	0.00	0.	1 JAN 1400	57	0.06	0.02	0.04	130.
1 JAN 0145	8	0.02	0.02	0.00	0.	1 JAN 1415	58	0.05	0.01	0.04	118.
1 JAN 0200	9	0.02	0.02	0.00	0.	1 JAN 1430	59	0.05	0.01	0.04	111.
1 JAN 0215	10	0.02	0.02	0.00	0.	1 JAN 1445	60	0.05	0.01	0.03	107.
1 JAN 0230	11	0.02	0.02	0.00	0.	1 JAN 1500	61	0.04	0.01	0.03	101.
1 JAN 0245	12	0.02	0.02	0.00	0.	1 JAN 1515	62	0.04	0.01	0.03	96.
1 JAN 0300	13	0.02	0.02	0.00	0.	1 JAN 1530	63	0.04	0.01	0.03	90.
1 JAN 0315	14	0.02	0.02	0.00	0.	1 JAN 1545	64	0.04	0.01	0.03	85.
1 JAN 0330	15	0.02	0.02	0.00	0.	1 JAN 1600	65	0.03	0.01	0.03	79.
1 JAN 0345	16	0.02	0.02	0.00	0.	1 JAN 1615	66	0.03	0.01	0.02	75.
1 JAN 0400	17	0.02	0.02	0.00	0.	1 JAN 1630	67	0.03	0.01	0.02	73.
1 JAN 0415	18	0.02	0.02	0.00	0.	1 JAN 1645	68	0.03	0.01	0.02	71.
1 JAN 0430	19	0.02	0.02	0.00	0.	1 JAN 1700	69	0.03	0.01	0.02	70.
1 JAN 0445	20	0.02	0.02	0.00	0.	1 JAN 1715	70	0.03	0.01	0.02	67.
1 JAN 0500	21	0.02	0.02	0.00	0.	1 JAN 1730	71	0.03	0.01	0.02	65.
1 JAN 0515	22	0.02	0.02	0.00	0.	1 JAN 1745	72	0.03	0.01	0.02	64.
1 JAN 0530	23	0.02	0.02	0.00	0.	1 JAN 1800	73	0.03	0.01	0.02	61.
1 JAN 0545	24	0.02	0.02	0.00	0.	1 JAN 1815	74	0.02	0.01	0.02	59.
1 JAN 0600	25	0.03	0.03	0.00	0.	1 JAN 1830	75	0.02	0.01	0.02	58.
1 JAN 0615	26	0.03	0.03	0.00	0.	1 JAN 1845	76	0.02	0.01	0.02	55.
1 JAN 0630	27	0.03	0.03	0.00	0.	1 JAN 1900	77	0.02	0.01	0.02	53.
1 JAN 0645	28	0.03	0.03	0.00	0.	1 JAN 1915	78	0.02	0.01	0.02	52.
1 JAN 0700	29	0.03	0.03	0.00	0.	1 JAN 1930	79	0.02	0.00	0.02	50.
1 JAN 0715	30	0.03	0.03	0.00	0.	1 JAN 1945	80	0.02	0.00	0.02	48.
1 JAN 0730	31	0.03	0.03	0.00	0.	1 JAN 2000	81	0.02	0.00	0.01	45.
1 JAN 0745	32	0.03	0.03	0.00	0.	1 JAN 2015	82	0.02	0.00	0.01	44.
1 JAN 0800	33	0.03	0.03	0.00	0.	1 JAN 2030	83	0.02	0.00	0.01	43.
1 JAN 0815	34	0.03	0.03	0.00	0.	1 JAN 2045	84	0.02	0.00	0.01	43.
1 JAN 0830	35	0.04	0.04	0.00	0.	1 JAN 2100	85	0.02	0.00	0.01	43.
1 JAN 0845	36	0.04	0.04	0.00	0.	1 JAN 2115	86	0.02	0.00	0.01	42.
1 JAN 0900	37	0.04	0.04	0.00	0.	1 JAN 2130	87	0.02	0.00	0.01	41.
1 JAN 0915	38	0.05	0.04	0.00	1.	1 JAN 2145	88	0.02	0.00	0.01	42.
1 JAN 0930	39	0.05	0.04	0.00	3.	1 JAN 2200	89	0.02	0.00	0.01	41.
1 JAN 0945	40	0.05	0.05	0.00	7.	1 JAN 2215	90	0.02	0.00	0.01	41.
1 JAN 1000	41	0.05	0.05	0.00	11.	1 JAN 2230	91	0.02	0.00	0.01	40.
1 JAN 1015	42	0.06	0.06	0.01	17.	1 JAN 2245	92	0.02	0.00	0.01	40.
1 JAN 1030	43	0.07	0.06	0.01	24.	1 JAN 2300	93	0.02	0.00	0.01	40.
1 JAN 1045	44	0.08	0.07	0.01	35.	1 JAN 2315	94	0.02	0.00	0.01	39.
1 JAN 1100	45	0.09	0.08	0.02	49.	1 JAN 2330	95	0.02	0.00	0.01	38.
1 JAN 1115	46	0.12	0.09	0.03	73.	1 JAN 2345	96	0.02	0.00	0.01	39.
1 JAN 1130	47	0.15	0.11	0.04	112.	2 JAN 0000	97	0.02	0.00	0.01	38.
1 JAN 1145	48	0.62	0.39	0.23	550.	2 JAN 0015	98	0.00	0.00	0.00	10.
1 JAN 1200	49	1.54	0.68	0.86	2109.	2 JAN 0030	99	0.00	0.00	0.00	2.
1 JAN 1215	50	0.24	0.08	0.16	947.	2 JAN 0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.68, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.60

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)	(CFS)			
2109.	12.00	270.	83.	81.	81.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 134.	165.	165.	165.

CUMULATIVE AREA = 1.19 SQ MI

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          **************
          *            *
120 KK    *        4R  *        CNAME      4C
          *            *
          **************
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121 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
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IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

122 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.12	MUSKINGUM K
X	0.20	MUSKINGUM X

***

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 4R.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

****

HYDROGRAPH AT STATION 4R

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	647.	1 JAN 1845	76	57.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	374.	1 JAN 1900	77	54.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	254.	1 JAN 1915	78	52.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	204.	1 JAN 1930	79	51.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	176.	1 JAN 1945	80	49.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	155.	1 JAN 2000	81	46.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	137.	1 JAN 2015	82	45.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	124.	1 JAN 2030	83	43.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	115.	1 JAN 2045	84	43.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	109.	1 JAN 2100	85	43.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	104.	1 JAN 2115	86	43.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	98.	1 JAN 2130	87	42.
1 JAN 0300	13	0.	1 JAN 0915	38	0.	1 JAN 1530	63	93.	1 JAN 2145	88	42.
1 JAN 0315	14	0.	1 JAN 0930	39	2.	1 JAN 1545	64	88.	1 JAN 2200	89	42.
1 JAN 0330	15	0.	1 JAN 0945	40	5.	1 JAN 1600	65	82.	1 JAN 2215	90	41.
1 JAN 0345	16	0.	1 JAN 1000	41	9.	1 JAN 1615	66	77.	1 JAN 2230	91	40.
1 JAN 0400	17	0.	1 JAN 1015	42	14.	1 JAN 1630	67	74.	1 JAN 2245	92	40.
1 JAN 0415	18	0.	1 JAN 1030	43	20.	1 JAN 1645	68	72.	1 JAN 2300	93	40.
1 JAN 0430	19	0.	1 JAN 1045	44	29.	1 JAN 1700	69	70.	1 JAN 2315	94	40.
1 JAN 0445	20	0.	1 JAN 1100	45	42.	1 JAN 1715	70	68.	1 JAN 2330	95	38.
1 JAN 0500	21	0.	1 JAN 1115	46	61.	1 JAN 1730	71	66.	1 JAN 2345	96	39.
1 JAN 0515	22	0.	1 JAN 1130	47	92.	1 JAN 1745	72	64.	2 JAN 0000	97	38.
1 JAN 0530	23	0.	1 JAN 1145	48	311.	1 JAN 1800	73	62.	2 JAN 0015	98	25.
1 JAN 0545	24	0.	1 JAN 1200	49	1279.	1 JAN 1815	74	60.	2 JAN 0030	99	4.
1 JAN 0600	25	0.	1 JAN 1215	50	1686.	1 JAN 1830	75	58.	2 JAN 0045	100	1.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 1686.	12.25	270.	83.	81.	81.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 134.	165.	165.	165.

CUMULATIVE AREA = 1.19 SQ MI

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**************
*            *
*       3bB  *
*            *
**************
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124 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

127 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	6	TIME INTERVAL IN MINUTES
JXDATE	1JAN94	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

125 BA SUBBASIN CHARACTERISTICS

TAREA,	1.08	SUBBASIN AREA

PRECIPITATION DATA

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126 PB                STORM        5.68  BASIN TOTAL PRECIPITATION

128 PI            INCREMENTAL 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      0.01      0.01
                     0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                     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      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00

153 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                    CRVNBR       70.50  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

154 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.10  LAG

                                                      ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                            5 END-OF-PERIOD ORDINATES
              2062.      577.      113.       23.        0.
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HYDROGRAPH AT STATION 3bB

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	430.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	267.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	202.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	170.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	149.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	132.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	117.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	107.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	101.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	96.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	91.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	87.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	81.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	77.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	72.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	68.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	66.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	64.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	63.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	60.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	59.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	57.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	55.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	53.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	52.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	50.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.01	0.02	48.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.01	0.02	47.
1	JAN	0700	29	0.03	0.03	0.00	0.	1	JAN	1930	79	0.02	0.00	0.02	45.
1	JAN	0715	30	0.03	0.03	0.00	0.	1	JAN	1945	80	0.02	0.00	0.02	43.
1	JAN	0730	31	0.03	0.03	0.00	0.	1	JAN	2000	81	0.02	0.00	0.01	41.
1	JAN	0745	32	0.03	0.03	0.00	0.	1	JAN	2015	82	0.02	0.00	0.01	40.
1	JAN	0800	33	0.03	0.03	0.00	0.	1	JAN	2030	83	0.02	0.00	0.01	39.
1	JAN	0815	34	0.03	0.03	0.00	0.	1	JAN	2045	84	0.02	0.00	0.01	39.
1	JAN	0830	35	0.04	0.04	0.00	0.	1	JAN	2100	85	0.02	0.00	0.01	39.
1	JAN	0845	36	0.04	0.04	0.00	0.	1	JAN	2115	86	0.02	0.00	0.01	38.
1	JAN	0900	37	0.04	0.04	0.00	0.	1	JAN	2130	87	0.02	0.00	0.01	37.
1	JAN	0915	38	0.05	0.04	0.00	1.	1	JAN	2145	88	0.02	0.00	0.01	38.
1	JAN	0930	39	0.05	0.04	0.00	3.	1	JAN	2200	89	0.02	0.00	0.01	37.
1	JAN	0945	40	0.05	0.05	0.00	6.	1	JAN	2215	90	0.02	0.00	0.01	37.
1	JAN	1000	41	0.05	0.05	0.00	10.	1	JAN	2230	91	0.02	0.00	0.01	36.
1	JAN	1015	42	0.06	0.06	0.01	15.	1	JAN	2245	92	0.02	0.00	0.01	36.
1	JAN	1030	43	0.07	0.06	0.01	22.	1	JAN	2300	93	0.02	0.00	0.01	36.
1	JAN	1045	44	0.08	0.07	0.01	31.	1	JAN	2315	94	0.02	0.00	0.01	35.
1	JAN	1100	45	0.09	0.08	0.02	44.	1	JAN	2330	95	0.02	0.00	0.01	35.
1	JAN	1115	46	0.12	0.09	0.03	66.	1	JAN	2345	96	0.02	0.00	0.01	35.
1	JAN	1130	47	0.15	0.11	0.04	101.	2	JAN	0000	97	0.02	0.00	0.01	34.
1	JAN	1145	48	0.62	0.39	0.23	497.	2	JAN	0015	98	0.00	0.00	0.00	9.
1	JAN	1200	49	1.54	0.68	0.86	1907.	2	JAN	0030	99	0.00	0.00	0.00	2.
1	JAN	1215	50	0.24	0.08	0.16	856.	2	JAN	0045	100	0.00	0.00	0.00	0.

TOTAL RAINFALL = 5.68, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.60

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
		(CFS)			
1907.	12.00	244.	75.	73.	73.
		(INCHES) 2.112	2.598	2.598	2.598

(AC-FT) 121. 149. 149. 149.

CUMULATIVE AREA = 1.08 SQ MI

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          **************
          *            *
155 KK    *       3aB  *
          *            *
          **************
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156 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.250  TIME INTERVAL IN HOURS


159 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN           6  TIME INTERVAL IN MINUTES
                     JXDATE      1JAN94  STARTING DATE
                     JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

157 BA          SUBBASIN CHARACTERISTICS
                     TAREA,        0.87  SUBBASIN AREA

                PRECIPITATION DATA

158 PB               STORM        5.68  BASIN TOTAL PRECIPITATION

160 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

185 LS          SCS LOSS RATE
                     STRTL        0.84  INITIAL ABSTRACTION
                     CRVNBR      70.50  CURVE NUMBER
                      RTIMP        0.00  PERCENT IMPERVIOUS AREA

186 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG        0.11  LAG
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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

1678. 470. 92. 18. 0.

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HYDROGRAPH AT STATION 3aB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	350.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	217.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	164.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	138.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	121.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	107.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	96.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	87.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	82.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	78.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	74.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	70.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	66.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	63.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	58.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	55.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	54.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	52.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	51.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	49.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	48.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	47.

| | | |

1	JAN	0445	20	0.	*	1	JAN	1100	45	122.	*	1	JAN	1715	70	178.	*	1	JAN	2330	95	101.
1	JAN	0500	21	0.	*	1	JAN	1115	46	181.	*	1	JAN	1730	71	173.	*	1	JAN	2345	96	102.
1	JAN	0515	22	0.	*	1	JAN	1130	47	275.	*	1	JAN	1745	72	169.	*	2	JAN	0000	97	101.
1	JAN	0530	23	0.	*	1	JAN	1145	48	1213.	*	1	JAN	1800	73	163.	*	2	JAN	0015	98	41.
1	JAN	0545	24	0.	*	1	JAN	1200	49	4737.	*	1	JAN	1815	74	157.	*	2	JAN	0030	99	7.
1	JAN	0600	25	0.	*	1	JAN	1215	50	3238.	*	1	JAN	1830	75	153.	*	2	JAN	0045	100	1.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 4737.	12.00	713.	219.	213.	213.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 354.	435.	435.	435.

CUMULATIVE AREA = 3.14 SQ MI

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          **************
          *            *
190 KK    *        3R  *        CNAME      3C
          *            *
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191 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

192 RM MUSKINGUM ROUTING

NSTPS	1	NUMBER OF SUBREACHES
AMSKK	0.17	MUSKINGUM K
X	0.20	MUSKINGUM X

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HYDROGRAPH AT STATION 3R

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	2614.	1	JAN	1845	76	151.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	1255.	1	JAN	1900	77	145.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	783.	1	JAN	1915	78	140.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	585.	1	JAN	1930	79	136.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	490.	1	JAN	1945	80	130.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	429.	1	JAN	2000	81	125.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	379.	1	JAN	2015	82	119.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	340.	1	JAN	2030	83	116.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	311.	1	JAN	2045	84	114.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	293.	1	JAN	2100	85	114.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	279.	1	JAN	2115	86	113.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	265.	1	JAN	2130	87	111.
1	JAN	0300	13	0.	1	JAN	0915	38	1.	1	JAN	1530	63	250.	1	JAN	2145	88	110.
1	JAN	0315	14	0.	1	JAN	0930	39	4.	1	JAN	1545	64	236.	1	JAN	2200	89	110.
1	JAN	0330	15	0.	1	JAN	0945	40	11.	1	JAN	1600	65	222.	1	JAN	2215	90	108.
1	JAN	0345	16	0.	1	JAN	1000	41	20.	1	JAN	1615	66	209.	1	JAN	2230	91	107.
1	JAN	0400	17	0.	1	JAN	1015	42	32.	1	JAN	1630	67	198.	1	JAN	2245	92	106.
1	JAN	0415	18	0.	1	JAN	1030	43	47.	1	JAN	1645	68	192.	1	JAN	2300	93	106.
1	JAN	0430	19	0.	1	JAN	1045	44	69.	1	JAN	1700	69	187.	1	JAN	2315	94	105.
1	JAN	0445	20	0.	1	JAN	1100	45	99.	1	JAN	1715	70	182.	1	JAN	2330	95	102.
1	JAN	0500	21	0.	1	JAN	1115	46	143.	1	JAN	1730	71	176.	1	JAN	2345	96	102.
1	JAN	0515	22	0.	1	JAN	1130	47	214.	1	JAN	1745	72	172.	2	JAN	0000	97	102.
1	JAN	0530	23	0.	1	JAN	1145	48	609.	1	JAN	1800	73	167.	2	JAN	0015	98	79.
1	JAN	0545	24	0.	1	JAN	1200	49	2458.	1	JAN	1815	74	161.	2	JAN	0030	99	30.
1	JAN	0600	25	0.	1	JAN	1215	50	4138.	1	JAN	1830	75	156.	2	JAN	0045	100	6.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 4138.	12.25	712.	219.	213.	213.
		(INCHES) 2.110	2.598	2.598	2.598
		(AC-FT) 353.	435.	435.	435.

CUMULATIVE AREA = 3.14 SQ MI

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          **************
          *            *
193 KK    *       1bB  *
          *            *
          **************

194 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        100  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.250  TIME INTERVAL IN HOURS


197 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          6  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

               SUBBASIN RUNOFF DATA

195 BA          SUBBASIN CHARACTERISTICS
                     TAREA,      0.42  SUBBASIN AREA

                PRECIPITATION DATA

196 PB               STORM       5.68  BASIN TOTAL PRECIPITATION

198 PI            INCREMENTAL 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      0.01      0.01
                    0.01      0.01      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      0.03      0.11      0.27      0.04      0.03
                    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      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00

223 LS          SCS LOSS RATE
                     STRTL       0.84  INITIAL ABSTRACTION
                    CRVNBR      70.50  CURVE NUMBER
                     RTIMP       0.00  PERCENT IMPERVIOUS AREA

224 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG       0.09  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
               811.      227.       45.        9.        0.
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HYDROGRAPH AT STATION 1bB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	0000	1	0.00	0.00	0.00	0.	1	JAN	1230	51	0.17	0.05	0.11	169.
1	JAN	0015	2	0.01	0.01	0.00	0.	1	JAN	1245	52	0.11	0.03	0.08	105.
1	JAN	0030	3	0.01	0.01	0.00	0.	1	JAN	1300	53	0.10	0.03	0.07	79.
1	JAN	0045	4	0.02	0.02	0.00	0.	1	JAN	1315	54	0.08	0.02	0.06	67.
1	JAN	0100	5	0.02	0.02	0.00	0.	1	JAN	1330	55	0.07	0.02	0.05	59.
1	JAN	0115	6	0.02	0.02	0.00	0.	1	JAN	1345	56	0.06	0.02	0.05	52.
1	JAN	0130	7	0.02	0.02	0.00	0.	1	JAN	1400	57	0.06	0.02	0.04	46.
1	JAN	0145	8	0.02	0.02	0.00	0.	1	JAN	1415	58	0.05	0.01	0.04	42.
1	JAN	0200	9	0.02	0.02	0.00	0.	1	JAN	1430	59	0.05	0.01	0.04	40.
1	JAN	0215	10	0.02	0.02	0.00	0.	1	JAN	1445	60	0.05	0.01	0.03	38.
1	JAN	0230	11	0.02	0.02	0.00	0.	1	JAN	1500	61	0.04	0.01	0.03	36.
1	JAN	0245	12	0.02	0.02	0.00	0.	1	JAN	1515	62	0.04	0.01	0.03	34.
1	JAN	0300	13	0.02	0.02	0.00	0.	1	JAN	1530	63	0.04	0.01	0.03	32.
1	JAN	0315	14	0.02	0.02	0.00	0.	1	JAN	1545	64	0.04	0.01	0.03	30.
1	JAN	0330	15	0.02	0.02	0.00	0.	1	JAN	1600	65	0.03	0.01	0.03	28.
1	JAN	0345	16	0.02	0.02	0.00	0.	1	JAN	1615	66	0.03	0.01	0.02	27.
1	JAN	0400	17	0.02	0.02	0.00	0.	1	JAN	1630	67	0.03	0.01	0.02	26.
1	JAN	0415	18	0.02	0.02	0.00	0.	1	JAN	1645	68	0.03	0.01	0.02	25.
1	JAN	0430	19	0.02	0.02	0.00	0.	1	JAN	1700	69	0.03	0.01	0.02	25.
1	JAN	0445	20	0.02	0.02	0.00	0.	1	JAN	1715	70	0.03	0.01	0.02	24.
1	JAN	0500	21	0.02	0.02	0.00	0.	1	JAN	1730	71	0.03	0.01	0.02	23.
1	JAN	0515	22	0.02	0.02	0.00	0.	1	JAN	1745	72	0.03	0.01	0.02	23.
1	JAN	0530	23	0.02	0.02	0.00	0.	1	JAN	1800	73	0.03	0.01	0.02	22.
1	JAN	0545	24	0.02	0.02	0.00	0.	1	JAN	1815	74	0.02	0.01	0.02	21.
1	JAN	0600	25	0.03	0.03	0.00	0.	1	JAN	1830	75	0.02	0.01	0.02	21.
1	JAN	0615	26	0.03	0.03	0.00	0.	1	JAN	1845	76	0.02	0.01	0.02	20.
1	JAN	0630	27	0.03	0.03	0.00	0.	1	JAN	1900	77	0.02	0.01	0.02	19.
1	JAN	0645	28	0.03	0.03	0.00	0.	1	JAN	1915	78	0.02	0.01	0.02	18.

1	JAN	0700	29	0.03	0.03	0.00	0.	*	1	JAN	1930	79	0.02	0.00	0.02	18.
1	JAN	0715	30	0.03	0.03	0.00	0.	*	1	JAN	1945	80	0.02	0.00	0.02	17.
1	JAN	0730	31	0.03	0.03	0.00	0.	*	1	JAN	2000	81	0.02	0.00	0.01	16.
1	JAN	0745	32	0.03	0.03	0.00	0.	*	1	JAN	2015	82	0.02	0.00	0.01	16.
1	JAN	0800	33	0.03	0.03	0.00	0.	*	1	JAN	2030	83	0.02	0.00	0.01	15.
1	JAN	0815	34	0.03	0.03	0.00	0.	*	1	JAN	2045	84	0.02	0.00	0.01	15.
1	JAN	0830	35	0.04	0.04	0.00	0.	*	1	JAN	2100	85	0.02	0.00	0.01	15.
1	JAN	0845	36	0.04	0.04	0.00	0.	*	1	JAN	2115	86	0.02	0.00	0.01	15.
1	JAN	0900	37	0.04	0.04	0.00	0.	*	1	JAN	2130	87	0.02	0.00	0.01	15.
1	JAN	0915	38	0.05	0.04	0.00	0.	*	1	JAN	2145	88	0.02	0.00	0.01	15.
1	JAN	0930	39	0.05	0.04	0.00	1.	*	1	JAN	2200	89	0.02	0.00	0.01	15.
1	JAN	0945	40	0.05	0.05	0.00	2.	*	1	JAN	2215	90	0.02	0.00	0.01	15.
1	JAN	1000	41	0.05	0.05	0.00	4.	*	1	JAN	2230	91	0.02	0.00	0.01	14.
1	JAN	1015	42	0.06	0.06	0.01	6.	*	1	JAN	2245	92	0.02	0.00	0.01	14.
1	JAN	1030	43	0.07	0.06	0.01	9.	*	1	JAN	2300	93	0.02	0.00	0.01	14.
1	JAN	1045	44	0.08	0.07	0.01	12.	*	1	JAN	2315	94	0.02	0.00	0.01	14.
1	JAN	1100	45	0.09	0.08	0.02	17.	*	1	JAN	2330	95	0.02	0.00	0.01	14.
1	JAN	1115	46	0.12	0.09	0.03	26.	*	1	JAN	2345	96	0.02	0.00	0.01	14.
1	JAN	1130	47	0.15	0.11	0.04	40.	*	2	JAN	0000	97	0.02	0.00	0.01	13.
1	JAN	1145	48	0.62	0.39	0.23	196.	*	2	JAN	0015	98	0.00	0.00	0.00	3.
1	JAN	1200	49	1.54	0.68	0.86	750.	*	2	JAN	0030	99	0.00	0.00	0.00	1.
1	JAN	1215	50	0.24	0.08	0.16	337.	*	2	JAN	0045	100	0.00	0.00	0.00	0.
								*								

TOTAL RAINFALL = 5.68, TOTAL LOSS = 3.08, TOTAL EXCESS = 2.60

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 750.	12.00	96.	30.	29.	29.
		(INCHES) 2.112	2.598	2.598	2.598
		(AC-FT) 48.	59.	59.	59.

CUMULATIVE AREA = 0.42 SQ MI

*** ***

```
            **************
            *            *
225 KK      *        1C  *        CNAME      1C
            *            *
            **************
```

226 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

227 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION 1C
SUM OF 4 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	JAN	0000	1	0.	1	JAN	0615	26	0.	1	JAN	1230	51	3355.	1	JAN	1845	76	242.
1	JAN	0015	2	0.	1	JAN	0630	27	0.	1	JAN	1245	52	1793.	1	JAN	1900	77	232.
1	JAN	0030	3	0.	1	JAN	0645	28	0.	1	JAN	1300	53	1144.	1	JAN	1915	78	225.
1	JAN	0045	4	0.	1	JAN	0700	29	0.	1	JAN	1315	54	901.	1	JAN	1930	79	217.
1	JAN	0100	5	0.	1	JAN	0715	30	0.	1	JAN	1330	55	761.	1	JAN	1945	80	208.
1	JAN	0115	6	0.	1	JAN	0730	31	0.	1	JAN	1345	56	670.	1	JAN	2000	81	199.
1	JAN	0130	7	0.	1	JAN	0745	32	0.	1	JAN	1400	57	594.	1	JAN	2015	82	191.
1	JAN	0145	8	0.	1	JAN	0800	33	0.	1	JAN	1415	58	535.	1	JAN	2030	83	186.
1	JAN	0200	9	0.	1	JAN	0815	34	0.	1	JAN	1430	59	494.	1	JAN	2045	84	184.
1	JAN	0215	10	0.	1	JAN	0830	35	0.	1	JAN	1445	60	467.	1	JAN	2100	85	184.
1	JAN	0230	11	0.	1	JAN	0845	36	0.	1	JAN	1500	61	444.	1	JAN	2115	86	181.
1	JAN	0245	12	0.	1	JAN	0900	37	0.	1	JAN	1515	62	422.	1	JAN	2130	87	178.
1	JAN	0300	13	0.	1	JAN	0915	38	2.	1	JAN	1530	63	398.	1	JAN	2145	88	178.
1	JAN	0315	14	0.	1	JAN	0930	39	9.	1	JAN	1545	64	376.	1	JAN	2200	89	177.
1	JAN	0330	15	0.	1	JAN	0945	40	21.	1	JAN	1600	65	353.	1	JAN	2215	90	175.
1	JAN	0345	16	0.	1	JAN	1000	41	37.	1	JAN	1615	66	332.	1	JAN	2230	91	172.
1	JAN	0400	17	0.	1	JAN	1015	42	58.	1	JAN	1630	67	318.	1	JAN	2245	92	171.
1	JAN	0415	18	0.	1	JAN	1030	43	85.	1	JAN	1645	68	309.	1	JAN	2300	93	171.
1	JAN	0430	19	0.	1	JAN	1045	44	124.	1	JAN	1700	69	301.	1	JAN	2315	94	168.
1	JAN	0445	20	0.	1	JAN	1100	45	176.	1	JAN	1715	70	292.	1	JAN	2330	95	165.
1	JAN	0500	21	0.	1	JAN	1115	46	258.	1	JAN	1730	71	283.	1	JAN	2345	96	165.
1	JAN	0515	22	0.	1	JAN	1130	47	389.	1	JAN	1745	72	276.	2	JAN	0000	97	164.
1	JAN	0530	23	0.	1	JAN	1145	48	1406.	1	JAN	1800	73	267.	2	JAN	0015	98	102.
1	JAN	0545	24	0.	1	JAN	1200	49	5572.	1	JAN	1815	74	258.	2	JAN	0030	99	33.
1	JAN	0600	25	0.	1	JAN	1215	50	6078.	1	JAN	1830	75	250.	2	JAN	0045	100	7.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
	(CFS)				
6078.	12.25	1154.	355.	344.	344.
	(INCHES)	2.111	2.598	2.598	2.598
	(AC-FT)	572.	704.	704.	704.

CUMULATIVE AREA = 5.08 SQ MI

*** ***

228 KK 1C CNAME 1C

229 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	100	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.250	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

230 RN NO ROUTING

***

HYDROGRAPH AT STATION 1C

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
1 JAN 0000	1	0.	1 JAN 0615	26	0.	1 JAN 1230	51	3355.	1 JAN 1845	76	242.
1 JAN 0015	2	0.	1 JAN 0630	27	0.	1 JAN 1245	52	1793.	1 JAN 1900	77	232.
1 JAN 0030	3	0.	1 JAN 0645	28	0.	1 JAN 1300	53	1144.	1 JAN 1915	78	225.
1 JAN 0045	4	0.	1 JAN 0700	29	0.	1 JAN 1315	54	901.	1 JAN 1930	79	217.
1 JAN 0100	5	0.	1 JAN 0715	30	0.	1 JAN 1330	55	761.	1 JAN 1945	80	208.
1 JAN 0115	6	0.	1 JAN 0730	31	0.	1 JAN 1345	56	670.	1 JAN 2000	81	199.
1 JAN 0130	7	0.	1 JAN 0745	32	0.	1 JAN 1400	57	594.	1 JAN 2015	82	191.
1 JAN 0145	8	0.	1 JAN 0800	33	0.	1 JAN 1415	58	535.	1 JAN 2030	83	186.
1 JAN 0200	9	0.	1 JAN 0815	34	0.	1 JAN 1430	59	494.	1 JAN 2045	84	184.
1 JAN 0215	10	0.	1 JAN 0830	35	0.	1 JAN 1445	60	467.	1 JAN 2100	85	184.
1 JAN 0230	11	0.	1 JAN 0845	36	0.	1 JAN 1500	61	444.	1 JAN 2115	86	181.
1 JAN 0245	12	0.	1 JAN 0900	37	0.	1 JAN 1515	62	422.	1 JAN 2130	87	178.
1 JAN 0300	13	0.	1 JAN 0915	38	2.	1 JAN 1530	63	398.	1 JAN 2145	88	178.
1 JAN 0315	14	0.	1 JAN 0930	39	9.	1 JAN 1545	64	376.	1 JAN 2200	89	177.
1 JAN 0330	15	0.	1 JAN 0945	40	21.	1 JAN 1600	65	353.	1 JAN 2215	90	175.
1 JAN 0345	16	0.	1 JAN 1000	41	37.	1 JAN 1615	66	332.	1 JAN 2230	91	172.
1 JAN 0400	17	0.	1 JAN 1015	42	58.	1 JAN 1630	67	318.	1 JAN 2245	92	171.
1 JAN 0415	18	0.	1 JAN 1030	43	85.	1 JAN 1645	68	309.	1 JAN 2300	93	171.
1 JAN 0430	19	0.	1 JAN 1045	44	124.	1 JAN 1700	69	301.	1 JAN 2315	94	168.
1 JAN 0445	20	0.	1 JAN 1100	45	176.	1 JAN 1715	70	292.	1 JAN 2330	95	165.
1 JAN 0500	21	0.	1 JAN 1115	46	258.	1 JAN 1730	71	283.	1 JAN 2345	96	165.
1 JAN 0515	22	0.	1 JAN 1130	47	389.	1 JAN 1745	72	276.	2 JAN 0000	97	164.
1 JAN 0530	23	0.	1 JAN 1145	48	1406.	1 JAN 1800	73	267.	2 JAN 0015	98	102.
1 JAN 0545	24	0.	1 JAN 1200	49	5572.	1 JAN 1815	74	258.	2 JAN 0030	99	33.
1 JAN 0600	25	0.	1 JAN 1215	50	6078.	1 JAN 1830	75	250.	2 JAN 0045	100	7.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.75-HR
(CFS)	(HR)				
	(CFS)				
6078.	12.25	1154.	355.	344.	344.
	(INCHES)	2.111	2.598	2.598	2.598
	(AC-FT)	572.	704.	704.	704.

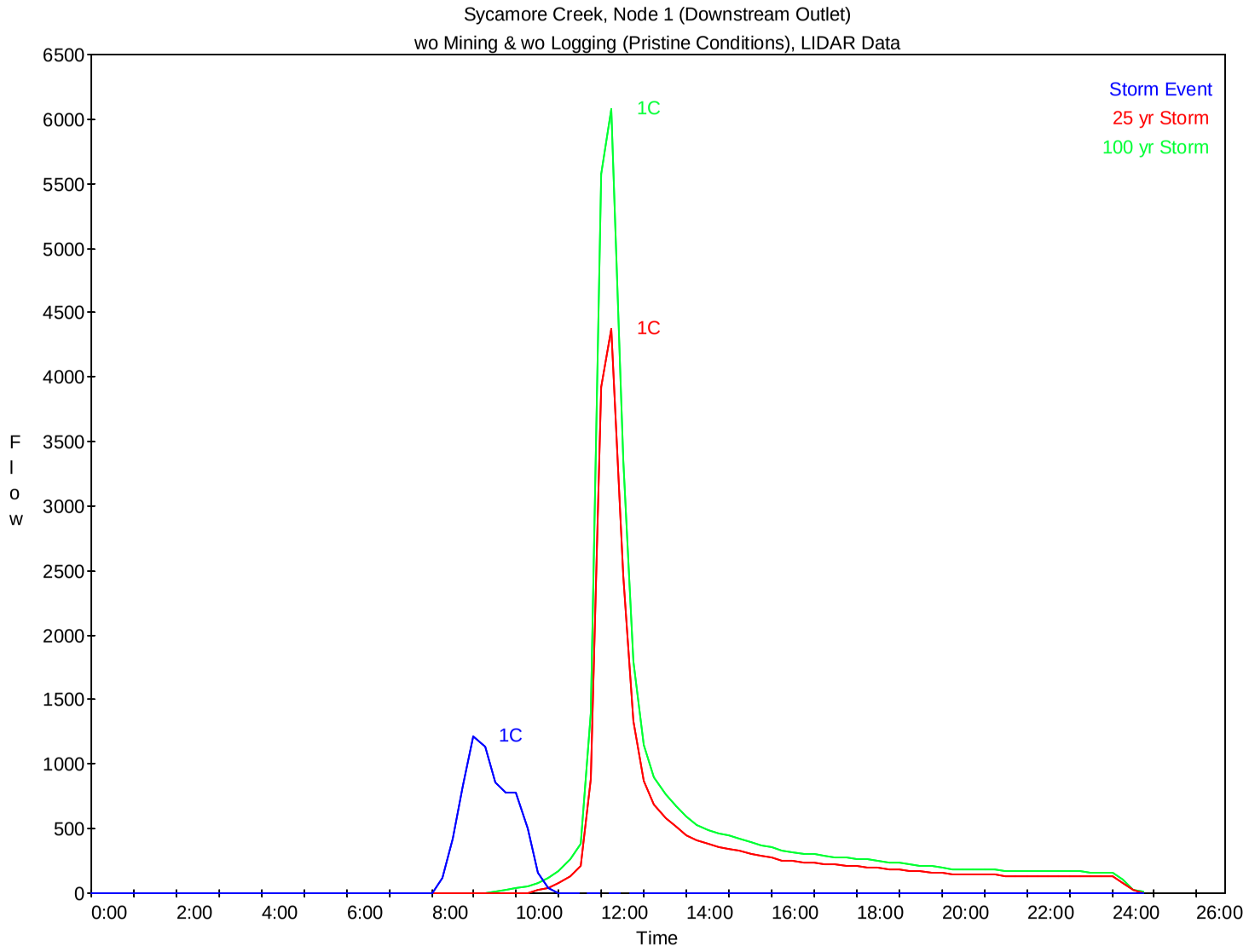
CUMULATIVE AREA = 5.08 SQ MI

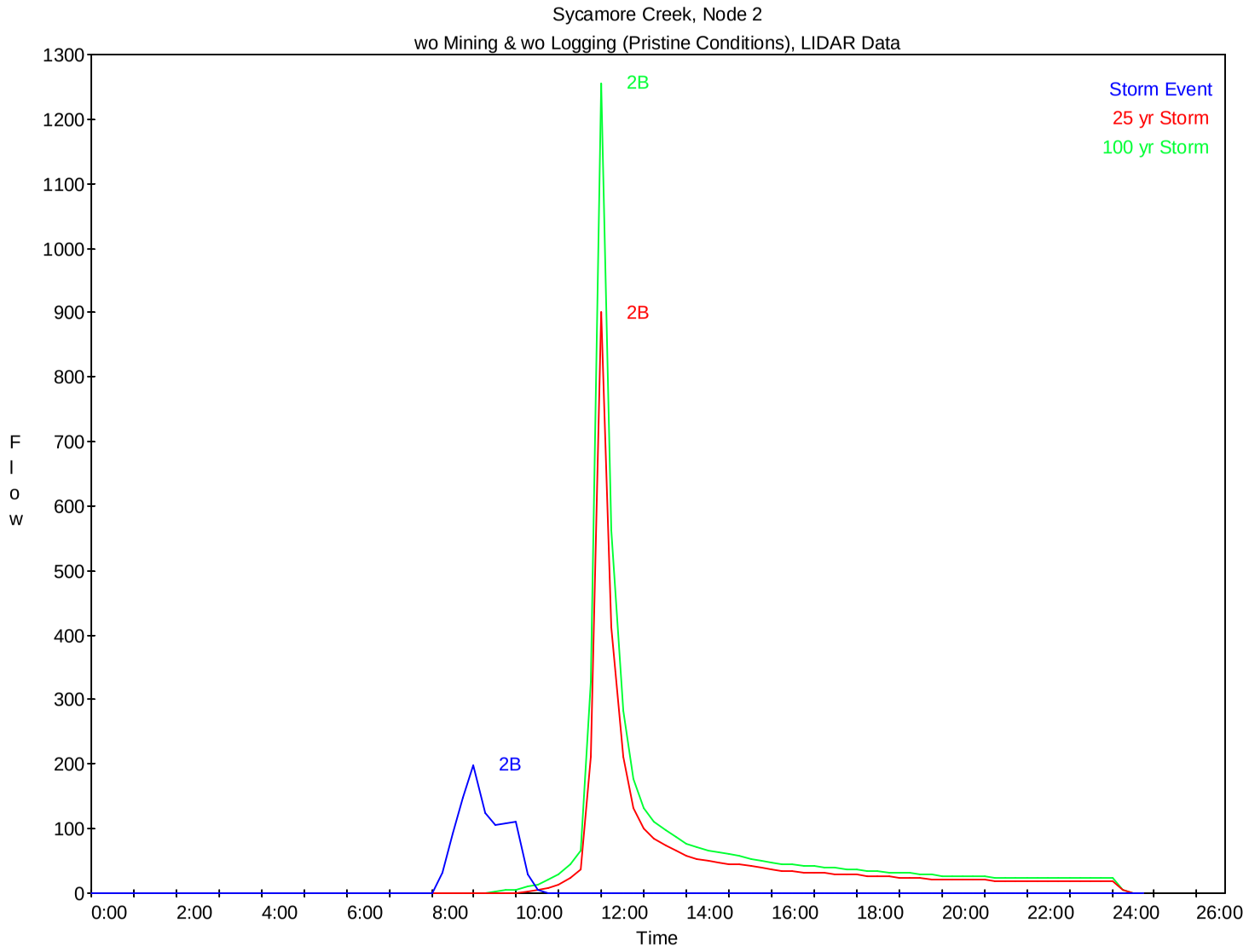
RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

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	1aB	1437.	12.00	184.	57.	55.	0.81		

	ROUTED TO						
+		10R	1437.	12.00	184.	57.	55.	0.81
	HYDROGRAPH AT						
+		2B	1255.	12.00	161.	49.	48.	0.71
	ROUTED TO						
+		2R	958.	12.25	161.	49.	48.	0.71
	HYDROGRAPH AT						
+		4B	2109.	12.00	270.	83.	81.	1.19
	ROUTED TO						
+		4R	1686.	12.25	270.	83.	81.	1.19
	HYDROGRAPH AT						
+		3bB	1907.	12.00	244.	75.	73.	1.08
	HYDROGRAPH AT						
+		3aB	1551.	12.00	199.	61.	59.	0.87
	3 COMBINED AT						
+		3C	4737.	12.00	713.	219.	213.	3.14
	ROUTED TO						
+		3R	4138.	12.25	712.	219.	213.	3.14
	HYDROGRAPH AT						
+		1bB	750.	12.00	96.	30.	29.	0.42
	4 COMBINED AT						
+		1C	6078.	12.25	1154.	355.	344.	5.08
	ROUTED TO						
+		1C	6078.	12.25	1154.	355.	344.	5.08

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


Sycamore Creek, Node 1 (Downstream Outlet)
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
Storm Event
25 yr Storm
100 yr Storm
1C
1C
1C
Flow
Time
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00


Sycamore Creek, Node 2
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
Storm Event
25 yr Storm
100 yr Storm
2B
2B
2B
Flow
Time
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0:00
2:00
4:00
6:00
8:00
10:00
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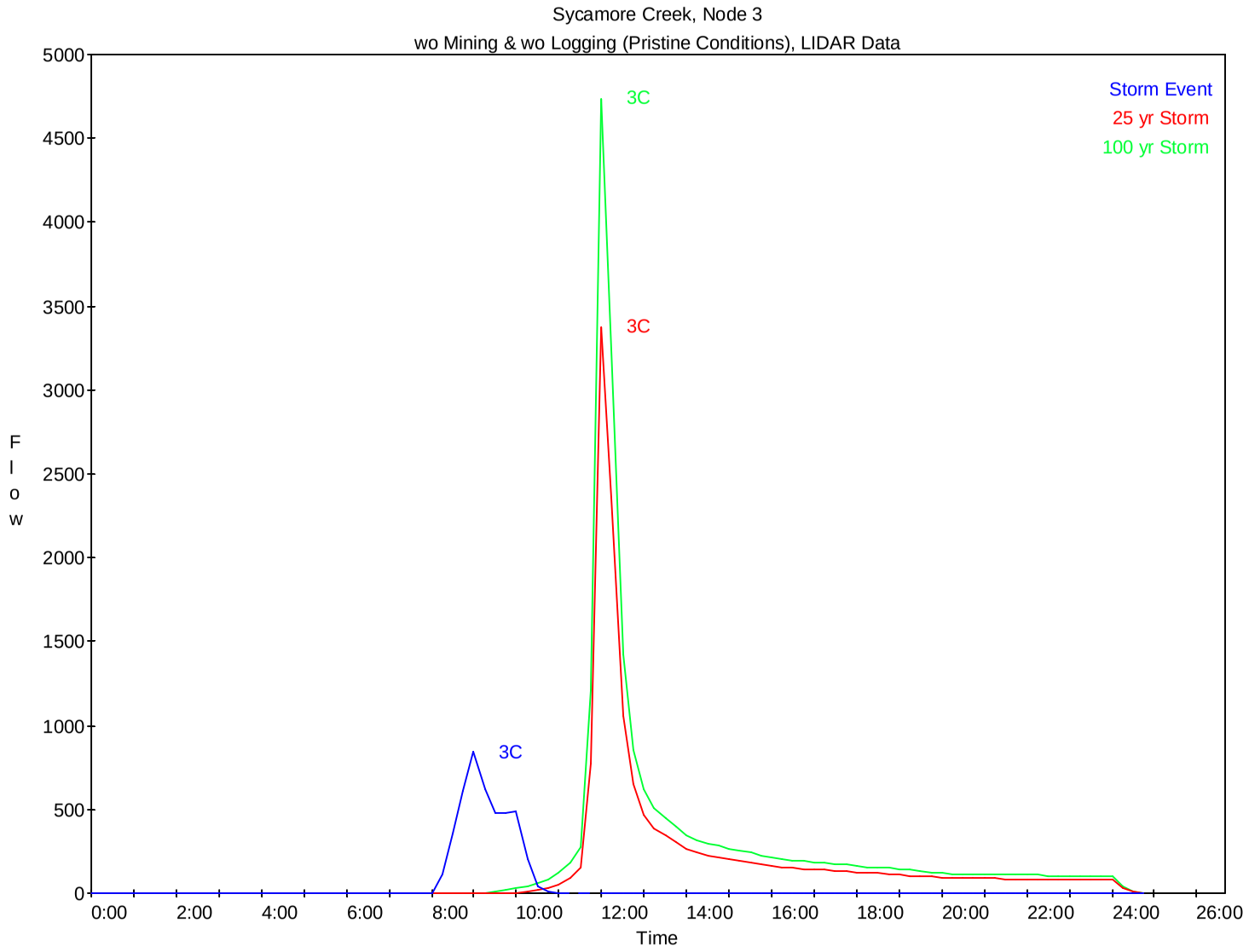
20:00
22:00
24:00
26:00


Sycamore Creek, Node 3
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
Storm Event
25 yr Storm
100 yr Storm
3C
3C
3C
Flow
Time
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
0:00
2:00
4:00
6:00
8:00
10:00
12:00
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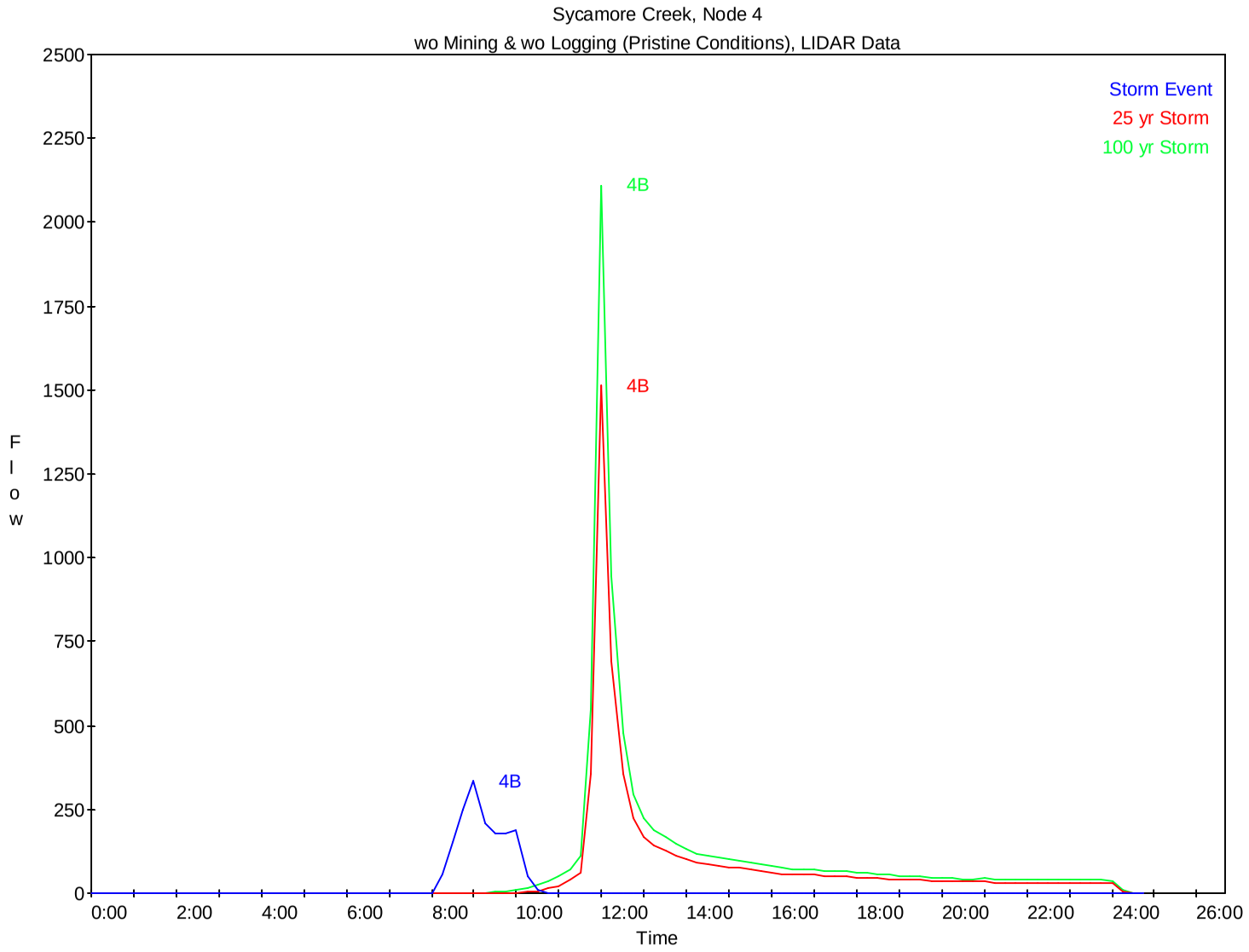
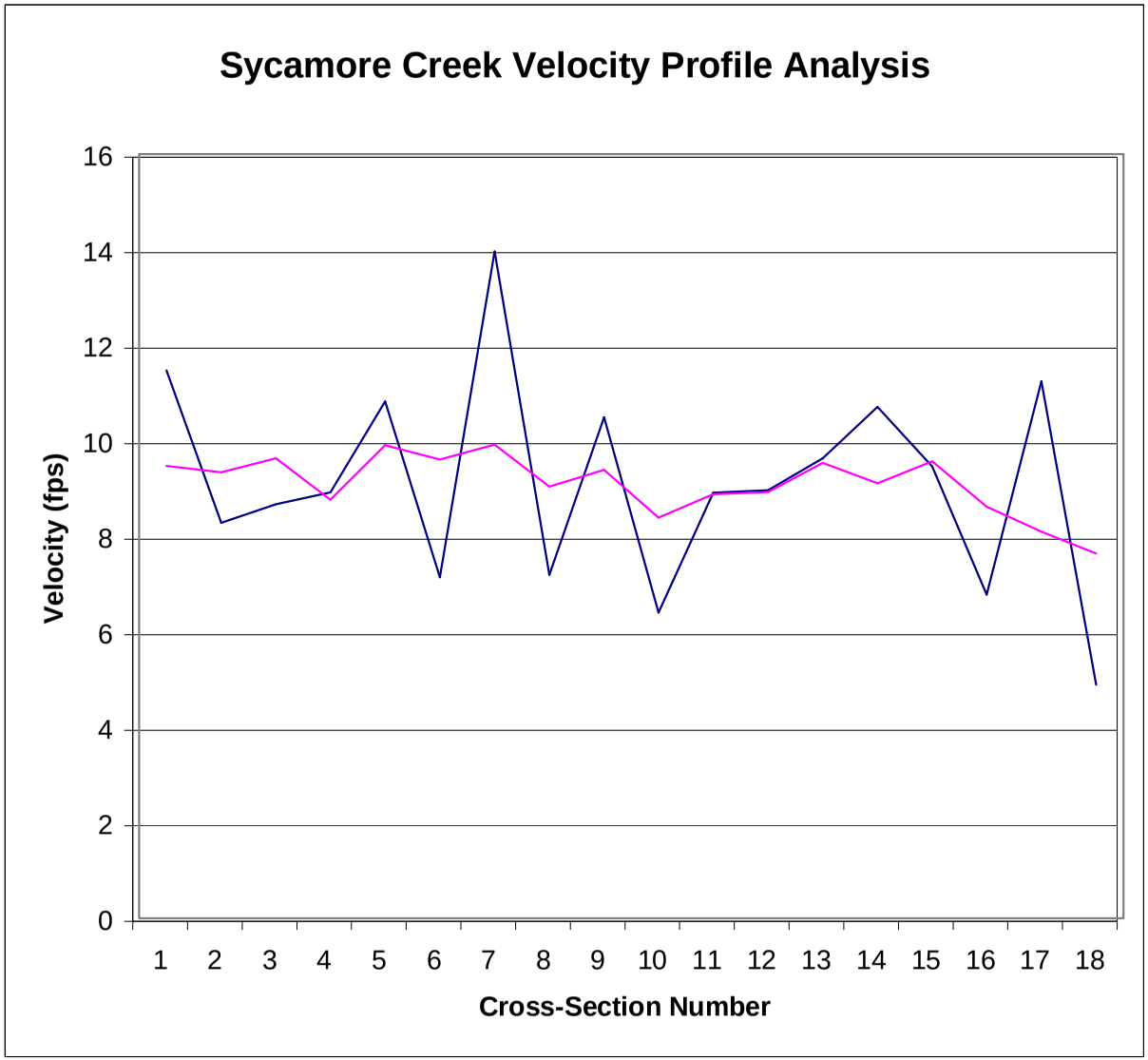
22:00
24:00
26:00


Sycamore Creek, Node 4
wo Mining & wo Logging (Pristine Conditions), LIDAR Data
Storm Event
25 yr Storm
100 yr Storm
4B
4B
4B
Flow
Time
0
250
500
750
1000
1250
1500
1750
2000
2250
2500
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
26:00

Sycamore Creek HEC-RAS Analysis using RiverCAD

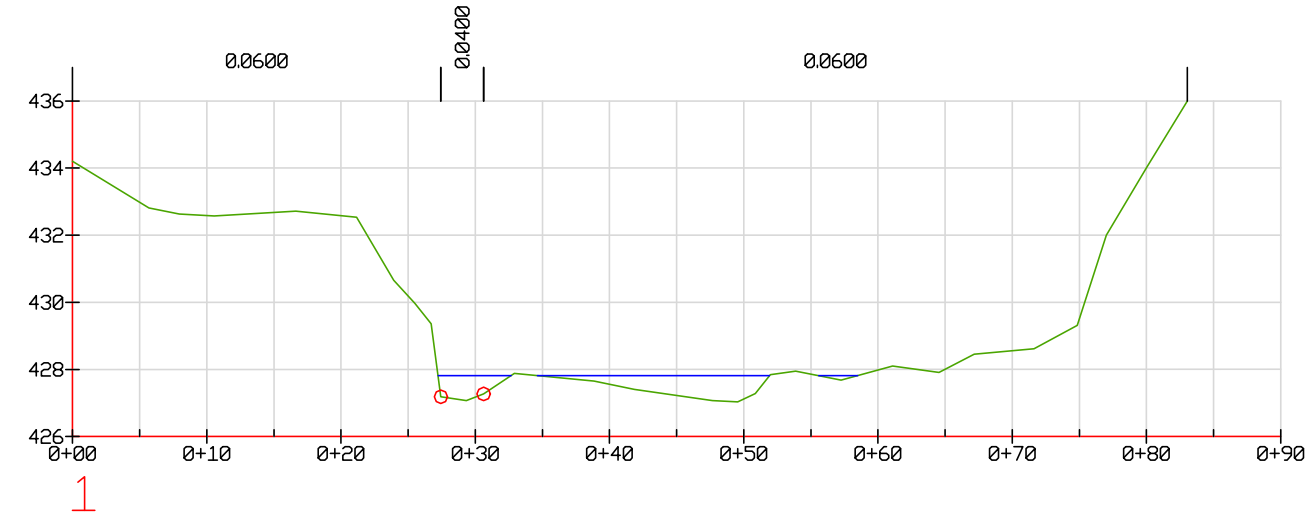
Cross-Section ID	Calculated WSEL (m)	Observed WSEL (m)	Difference (m)	Difference (ft)
5	477.45	477.30	0.15	0.49

Cross-Section ID	Storm Event	Mean
1	11.47	9.47
1.5	8.28	9.34
2	8.67	9.63
2.25	8.92	8.77
2.5	10.82	9.90
2.75	7.14	9.61
3	13.96	9.92
4	7.19	9.04
4.2	10.49	9.39
4.4	6.4	8.39
4.6	8.91	8.88
4.8	8.96	8.92
5	9.63	9.53
6	10.71	9.11
7	9.46	9.56
8	6.78	8.62
9	11.24	8.09
10	4.89	7.64
Mean Vel	9.11	



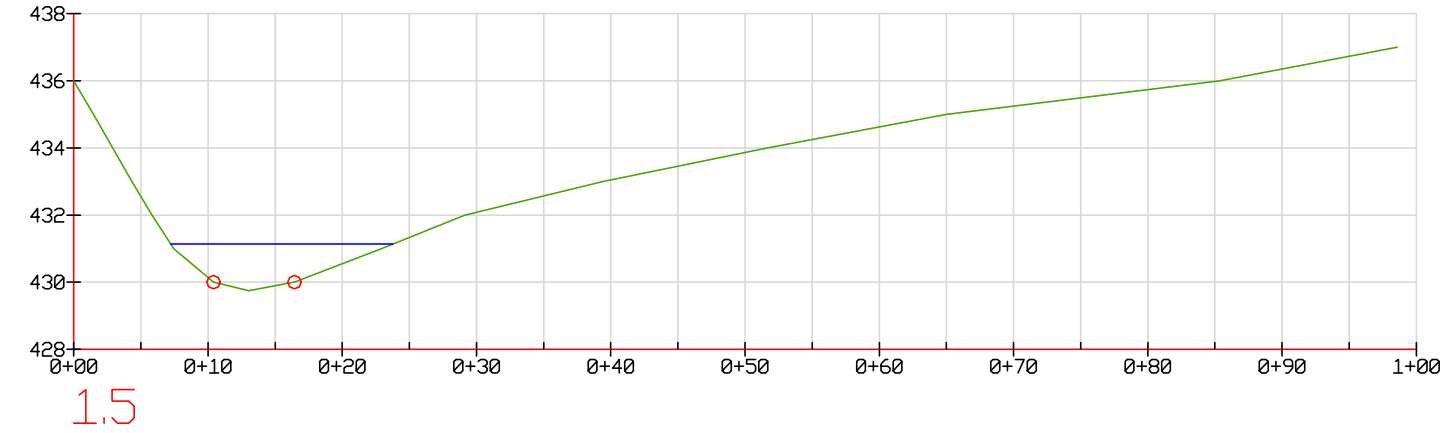
River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	1220.83	1401.03	1403.59	1404.44	1406.59	0.098284	19.59	108.28	84.08	2.33
1	4377.96	1401.03	1404.88	1406.75	1412.01	0.152597	33.25	254.82	127.58	3.14
1	6078.01	1401.03	1405.3	1407.52	1414.06	0.164125	37.19	308.67	129.71	3.32
1.5	1220.83	1409.94	1414.5	1414.61	1416.09	0.013961	11.31	148.06	54.34	0.98
1.5	4377.96	1409.94	1418.6	1418.6	1421.26	0.011296	16.08	439.59	91.44	0.99
1.5	6078.01	1409.94	1420.18	1420.18	1423.07	0.01034	17.3	598.83	110.06	0.97
2	1220.83	1417.71	1420.81	1421.22	1422.88	0.040246	15.31	142.64	96.51	1.57
2	4377.96	1417.71	1422.82	1423.76	1426.07	0.039293	21.36	373.35	122.72	1.69
2	6078.01	1417.71	1423.34	1424.64	1427.72	0.04718	25.01	437.99	125.79	1.88
2.25	1220.83	1426.44	1430.68	1431.1	1432.59	0.01946	12.75	138.24	57.33	1.14
2.25	4377.96	1426.44	1433.42	1434.8	1437.92	0.026604	21.3	336.4	87.4	1.46
2.25	6078.01	1426.44	1434.69	1436.08	1439.41	0.023535	22.52	455.53	99.46	1.41
2.5	1220.83	1439.24	1442.26	1443.12	1444.98	0.051478	16.01	113.93	64.94	1.74
2.5	4377.96	1439.24	1445.43	1446.24	1448.53	0.025107	18.95	389.19	106.96	1.39
2.5	6078.01	1439.24	1446.04	1446.86	1450.38	0.03167	22.75	456.6	114.5	1.58
2.75	1220.83	1448.82	1452.45	1452.47	1453.59	0.019369	11.35	172.9	77.84	1.11
2.75	4377.96	1448.82	1454.09	1455.46	1458.45	0.04697	23.19	316.46	96.3	1.84
2.75	6078.01	1448.82	1455.52	1456.53	1459.39	0.031582	22.53	464.01	110.8	1.58
3	1220.83	1459.94	1464.23	1465.37	1468.14	0.052389	20.71	89.46	29.37	1.84
3	4377.96	1459.94	1469.35	1470.75	1474.02	0.025703	25.29	317.51	61.38	1.48
3	6078.01	1459.94	1466.11	1466.11	1501.44	0.292766	63.54	148.15	36.72	4.64
4	1022.71	1481.72	1485.69	1486.36	1487.53	0.019824	12.9	139.87	91.49	1.15
4	3477.08	1481.72	1487.34	1488.46	1490.99	0.032516	20.93	322.33	120.53	1.57
4	4822.92	1481.72	1505.1		1505.13	0.000054	2.23	3882.21	207.02	0.08
4.2	1022.71	1491.86	1494.89	1495.62	1497.26	0.052168	16.37	99.74	53.14	1.75
4.2	3477.08	1491.86	1497.89	1498.7	1500.92	0.029681	20.31	309.07	89.36	1.5
4.2	4822.92	1491.86	1504.97	1499.68	1505.25	0.001286	7.24	1403.38	212.28	0.36
4.4	1022.71	1511.42	1515.34	1515.49	1516.42	0.02219	12.63	160.23	88.28	1.19
4.4	3477.08	1511.42	1516.98	1517.63	1519.53	0.035286	20.54	323.65	105.51	1.59
4.4	4822.92	1511.42	1517.99	1518.46	1520.56	0.028379	20.77	434.04	111.54	1.47
4.6	1022.71	1525.16	1528.69	1528.71	1530.67	0.046103	17.58	118.52	70.49	1.7
4.6	3477.08	1525.16	1531.04	1531.21	1532.51	0.023389	17.9	434.73	158.82	1.32
4.6	4822.92	1525.16	1531.52	1531.88	1533.47	0.028552	20.86	511.94	167.23	1.48
4.8	1022.71	1544.06	1548.16	1548.33	1550.11	0.031942	15.5	116.46	54.45	1.43
4.8	3477.08	1544.06	1548.51	1548.51	1564.98	0.246761	45.76	136.06	58.51	4.03
4.8	4822.92	1544.06	1548.52	1548.52	1579.83	0.4674	63.12	136.88	58.68	5.54
5	1022.71	1562.35	1566.45	1567.47	1569.48	0.034602	16.83	103.44	86.67	1.52
5	3477.08	1562.35	1571.96	1569.58	1572.53	0.003256	9.36	685.79	107.29	0.54
5	4822.92	1562.35	1583.4	1570.39	1583.53	0.00027	4.59	1912.79	107.29	0.18
6	840.14	1571.16	1575.63	1576.62	1578.78	0.031772	16.94	78.7	33.78	1.46
6	3373.96	1571.16	1579.73	1580.01	1584.13	0.023665	23.1	287.11	76.15	1.42
6	4737.11	1571.16	1581.37	1582.72	1585.74	0.021198	24.66	453.15	126.25	1.38
7	840.14	1594.91	1598.76	1599.4	1601.8	0.048298	17.6	88.67	75	1.71

River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
7	3373.96	1594.91	1600.48	1601.64	1604.24	0.055884	25.08	335.18	199.47	1.98
7	4737.11	1594.91	1600.92	1602.12	1605	0.059514	27.36	424.1	210.12	2.07
8	840.14	1612.96	1616.4	1616.75	1617.69	0.02944	13.1	124.38	82.17	1.33
8	3373.96	1612.96	1618.61	1619.06	1620.63	0.028267	18.51	362.29	125.89	1.43
8	4737.11	1612.96	1619.38	1619.84	1621.71	0.028059	20.21	462.88	135.99	1.46
9	333.02	1636.09	1637.7	1638.52	1641.83	0.217097	20.38	29.02	48.47	3.16
9	1512.88	1636.09	1638.7	1640.09	1645.45	0.237344	31.22	99.94	93.16	3.63
9	2108.99	1636.09	1639.04	1640.65	1645.99	0.22017	33.01	134.75	108.56	3.58
10	333.02	1672.15	1674.73	1674.73	1675.36	0.018456	8.42	68.09	54.58	1
10	1512.88	1672.15	1676.83	1676.83	1677.94	0.017173	12.72	225.86	93.59	1.08
10	2108.99	1672.15	1677.43	1677.43	1678.74	0.017783	14.12	284.16	100.95	1.12



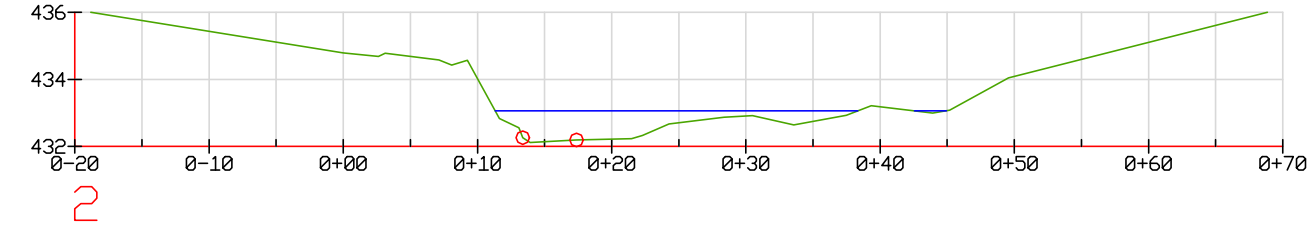
Sycamore Creek

Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 427.81 m



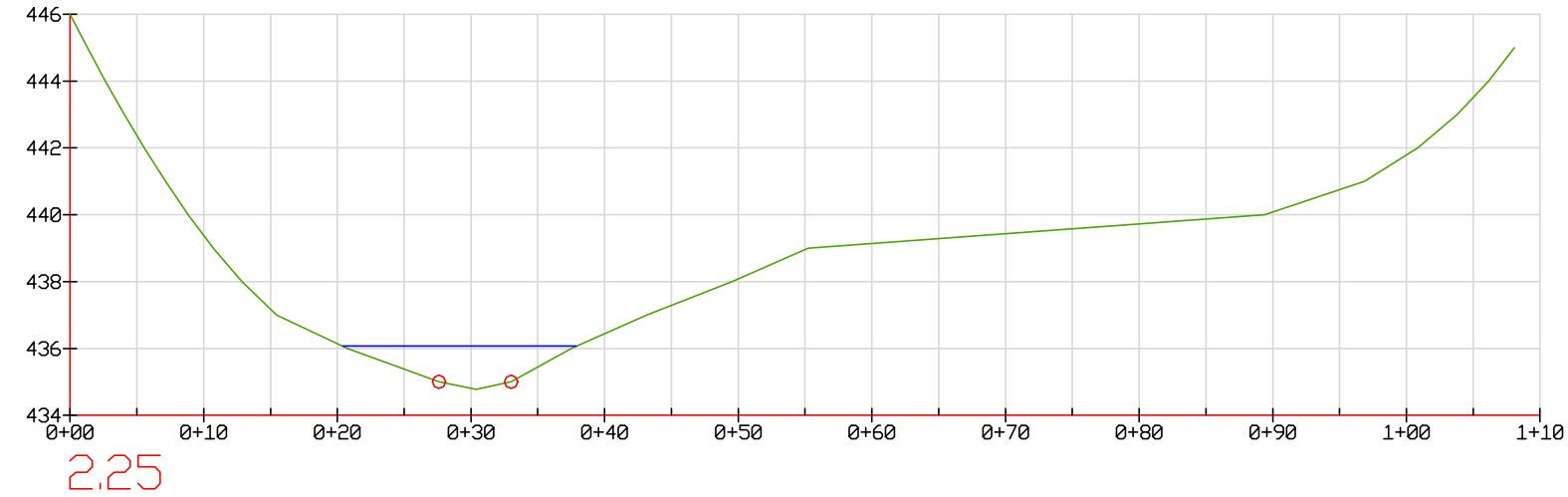
Sycamore Creek

Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 431.14 m



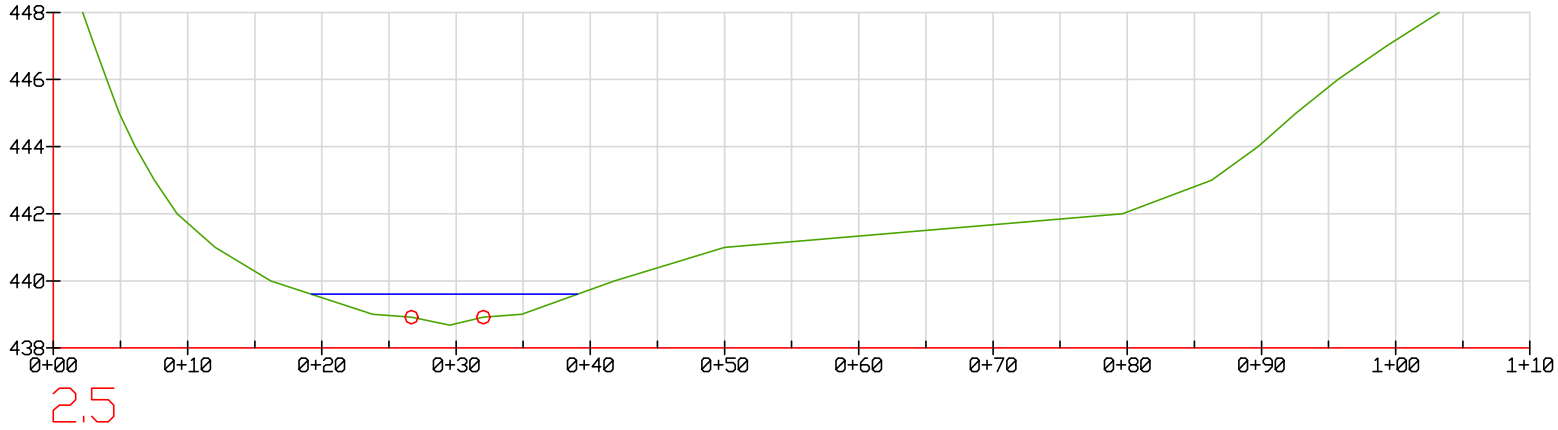
Sycamore Creek

Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 433.07 m



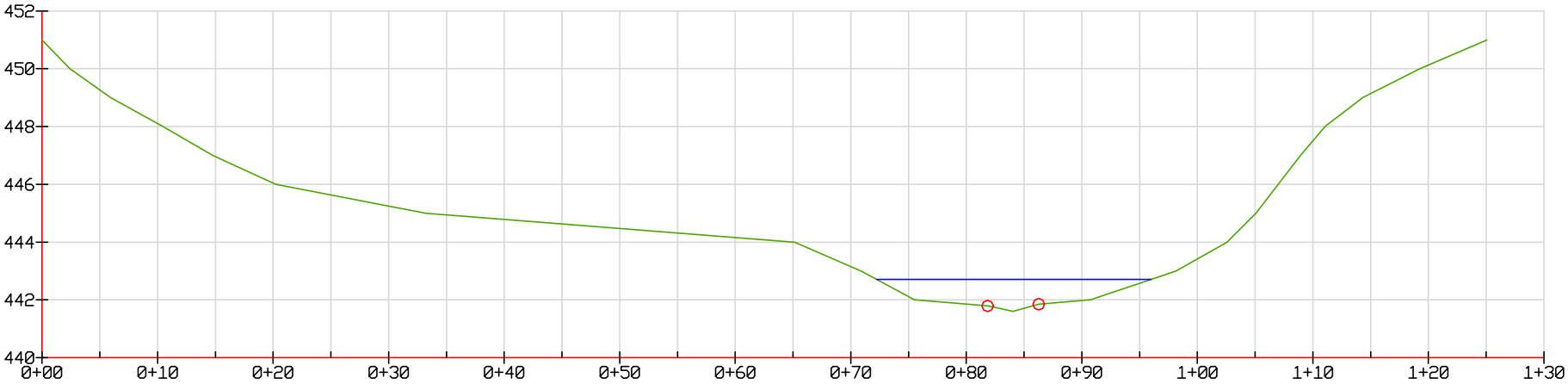
Sycamore Creek

Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 436.07 m



Sycamore Creek

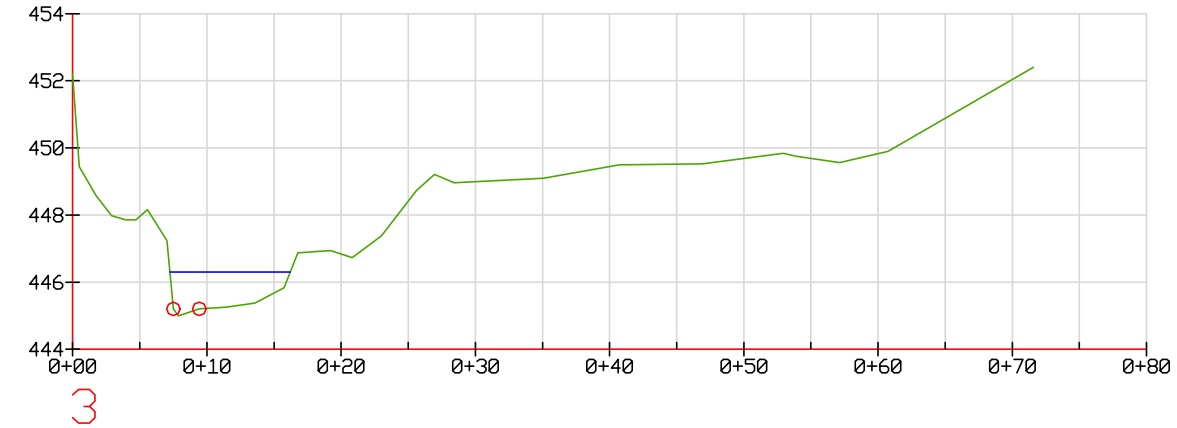
Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 439.60 m



2.75

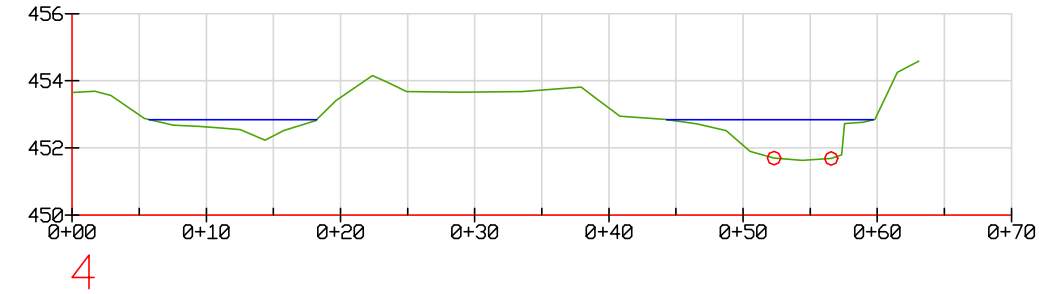
Sycamore Creek

Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 442.71 m



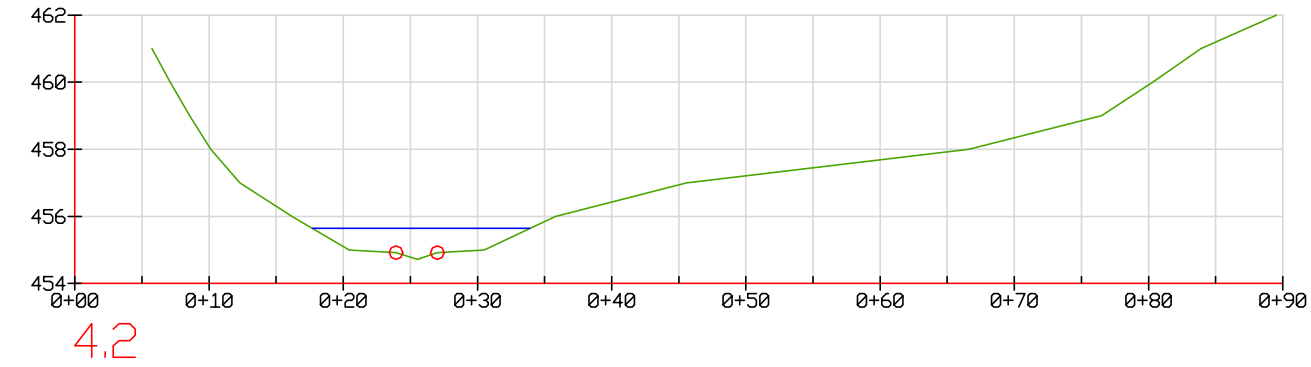
Sycamore Creek

Profile: Storm Event
Flow Discharge = 34.57 cms
Computed Water Surface = 446.30 m



Sycamore Creek

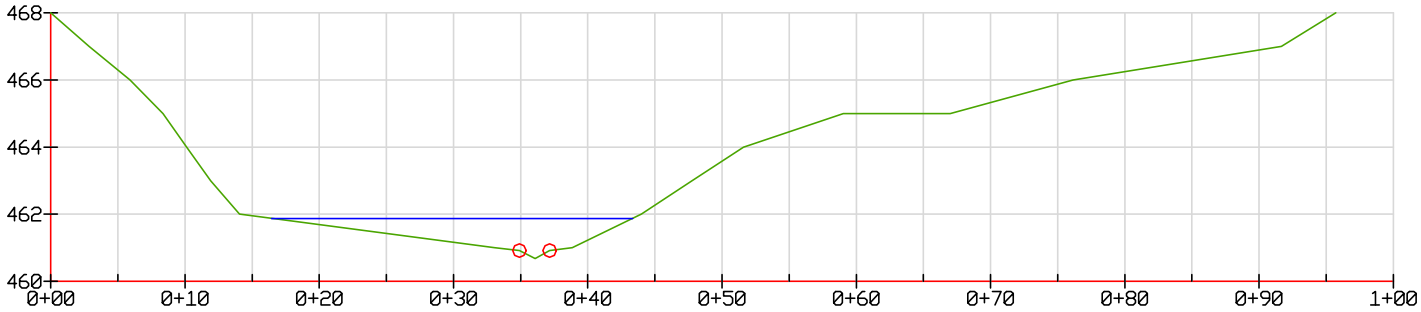
Profile: Storm Event
Flow Discharge = 28.96 cms
Computed Water Surface = 452.84 m



4.2

Sycamore Creek

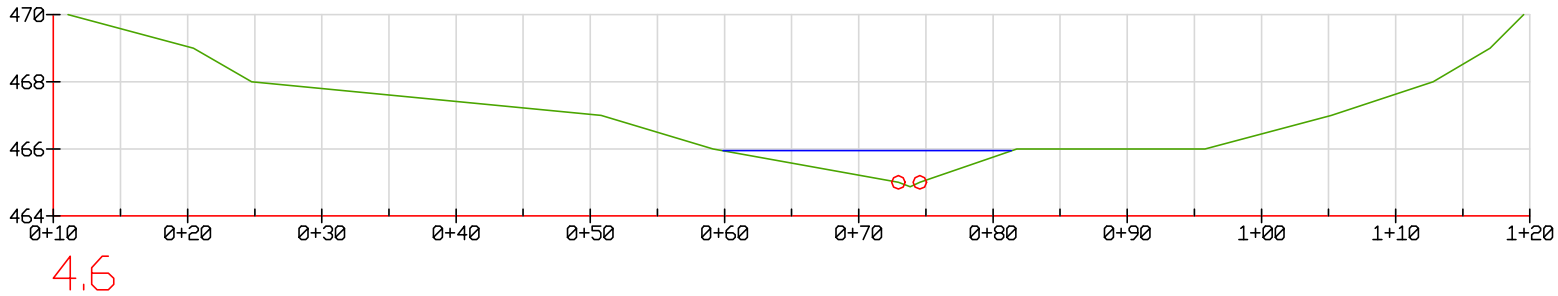
Profile: Storm Event
Flow Discharge = 28.96 cms
Computed Water Surface = 455.64 m



4.4

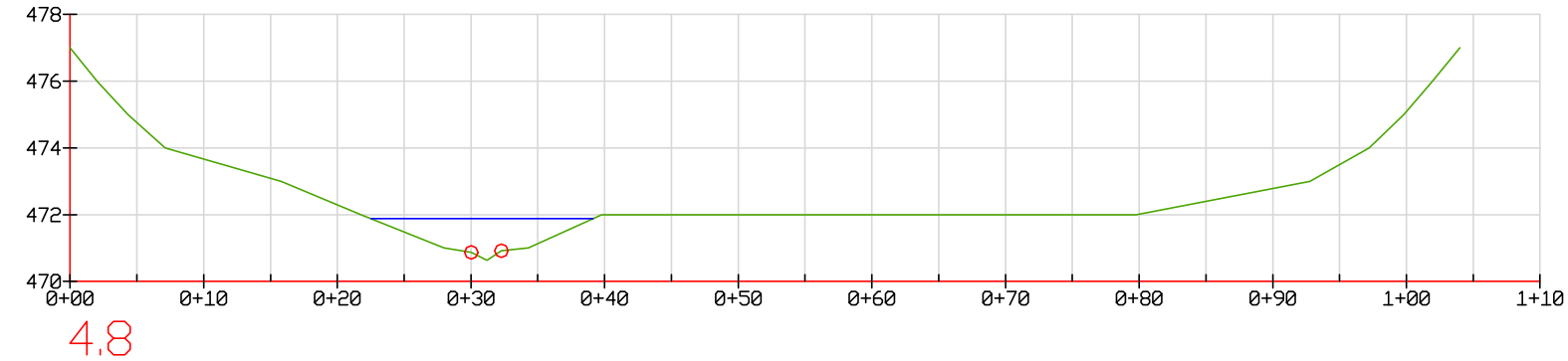
Sycamore Creek

Profile: Storm Event
Flow Discharge = 28.96 cms
Computed Water Surface = 461.88 m



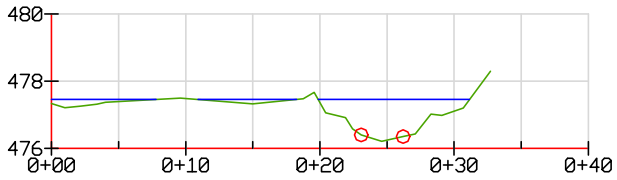
Sycamore Creek

Profile: Storm Event
Flow Discharge = 28.96 cms
Computed Water Surface = 465.95 m



Sycamore Creek

Profile: Storm Event
Flow Discharge = 28.96 cms
Computed Water Surface = 471.88 m

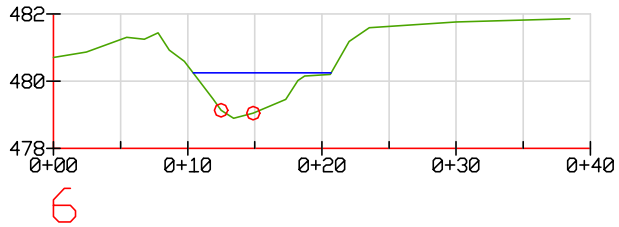


5

Observed HWM = 477.30 m (1565.94 ft)

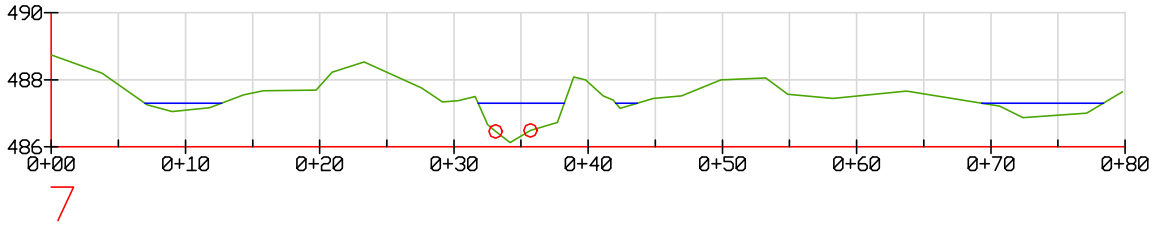
Sycamore Creek

Profile: Storm Event
Flow Discharge = 28.96 cms
Computed Water Surface = 477.45 m



Sycamore Creek

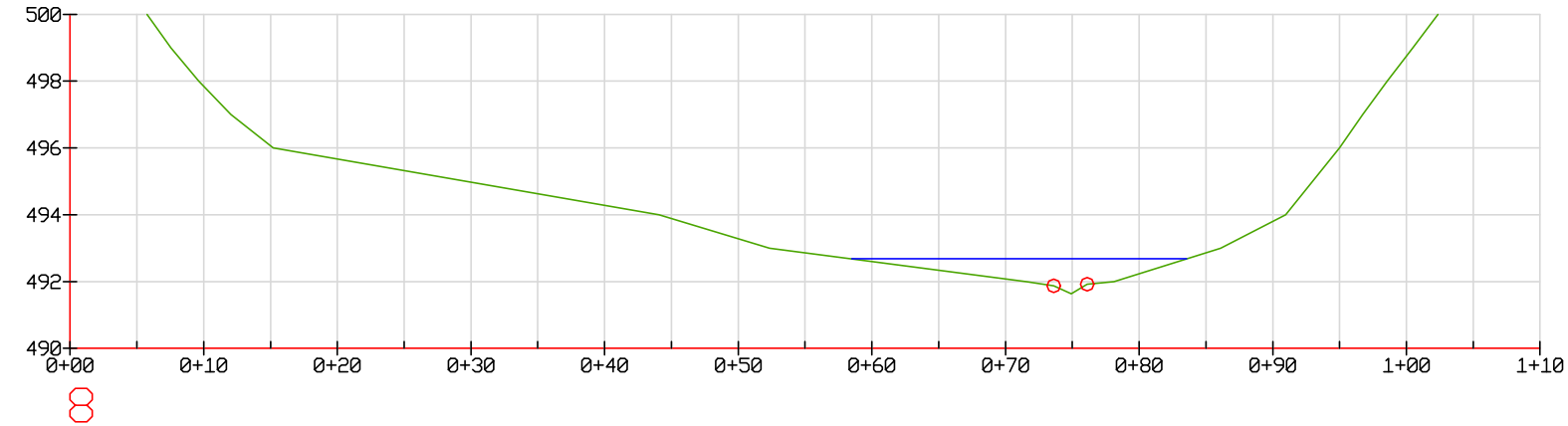
Profile: Storm Event
Flow Discharge = 23.79 cms
Computed Water Surface = 480.25 m



7

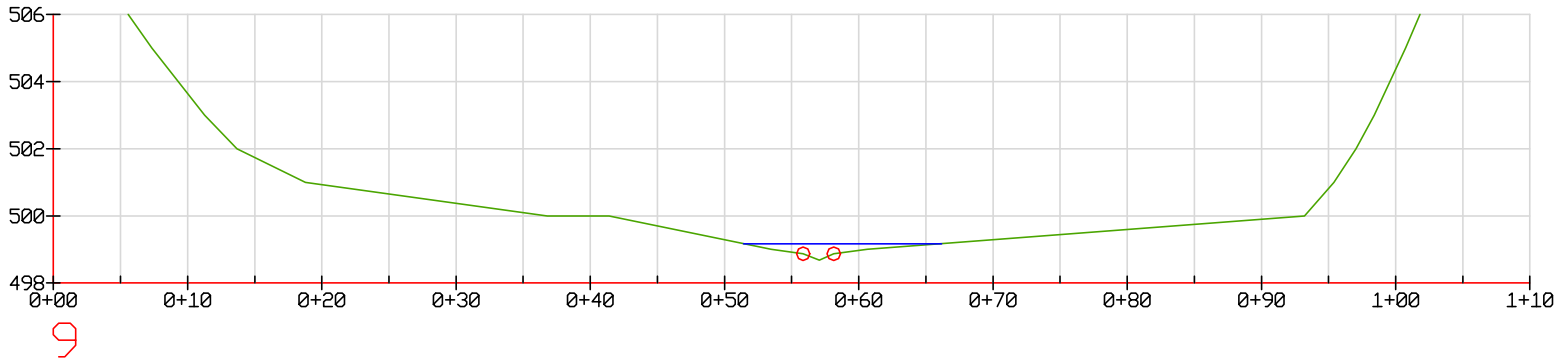
Sycamore Creek

Profile: Storm Event
Flow Discharge = 23.79 cms
Computed Water Surface = 487.30 m



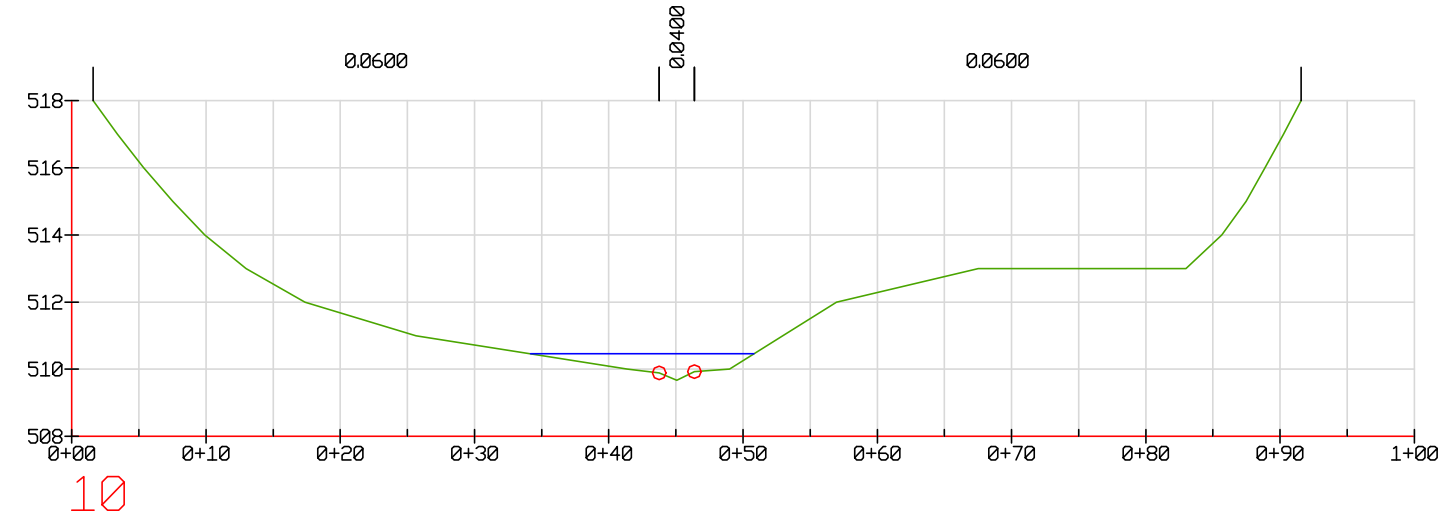
Sycamore Creek

Profile: Storm Event
Flow Discharge = 23.79 cms
Computed Water Surface = 492.68 m



Sycamore Creek

Profile: Storm Event
Flow Discharge = 9.4 cms
Computed Water Surface = 499.17 m



Sycamore Creek

Profile: Storm Event
Flow Discharge = 9.4 cms
Computed Water Surface = 510.46 m

Sycamore Creek HEC-RAS Analysis Report
PLAN DATA

Plan Summary Information:
Number of: Cross-Sections =   18   Multiple Openings =   0
            Culverts   =   0
            Bridges   =   0

Computational Information
    Water surface calculation tolerance = 0.003
    Critical depth calculation tolerance = 0.003
    Maximum number of iterations   = 20
    Maximum difference tolerance   = 0.1
    Flow tolerance factor   = 0.001

Computational Flow Regime: Mixed Flow

Encroachment Data: None

****

FLOW DATA

Flow Data (cfs)

Riv Sta	Storm Event	25 yr Storm	100 yr Storm
10	9.43	42.84	59.72
8	23.79	95.54	134.14
5	28.96	98.46	136.57
3	34.57	123.97	172.11

Boundary Conditions

Profile	Upstream	Downstream
Storm Event	Known WSEL = -90909	Critical Depth
25 yr Storm	Known WSEL = -90909	Critical Depth
100 yr Storm	Known WSEL = -90909	Critical Depth

****

CROSS SECTION INPUT   River Station: 1
Description:

Station Elevation Data, num = 29

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	434.2	5.69432.8077		7.95432.6279		10.56432.5761		16.64432.7132	
21.17432.5334		23.93430.6528		25.49429.9731		26.72429.3635		27.44427.1872	
29.33427.0714		30.62427.2665		32.91427.8791		38.84427.6535		41.84427.4067	
47.66427.0714		49.55427.0348		50.85427.2756		51.97427.8425		53.86427.9492	
57.26 427.681		61.09428.0986		64.55427.9065		67.16428.4552		71.62428.6137	
74.84429.3147		77.02	432	79.99	434	83.04	436		

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	27.44	.04	30.62	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
27.44	30.62	0	0	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 1 Profile # Storm Event

E.G. Elev (m)	428.73	Element	Left OB	Channel	Right OB
Vel Head (m)	0.91	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	427.81	Reach Len. (m)			
Crit W.S. (m)	428.07	Flow Area (m2)	0.06	2.13	7.87
E.G. Slope (m/m)	0.098284	Area (m2)	0.06	2.13	7.87
Q Total (m3/s)	34.57	Flow (m3/s)	0.07	12.69	21.81
Top Width (m)	25.63	Top Width (m)	0.21	3.18	22.24
Vel Total (m/s)	3.44	Avg. Vel. (m/s)	1.11	5.97	2.77
Max Chl Dpth (m)	0.78	Hydr. Depth (m)	0.31	0.67	0.35
Conv. Total (m3/s)	110.3	Conv. (m3/s)	0.2	40.5	69.6
Length Wtd. (m)		Wetted Per. (m)	0.66	3.20	22.50
Min Ch El (m)	427.03	Shear (N/sq m)	94.87	640.73	337.12
Alpha	1.52	Stream Power (N/m s)	105.67	3824.97	934.20
Frctn Loss (m)	2.85	Cum Volume (cu m x 10^			
C & E Loss (m)	0.04	Cum SA (1000 m2)			

CROSS SECTION OUTPUT Riv Sta: 1 Profile # 25 yr Storm

E.G. Elev (m)	430.38	Element	Left OB	Channel	Right OB
Vel Head (m)	2.17	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	428.21	Reach Len. (m)			
Crit W.S. (m)	428.78	Flow Area (m2)	0.17	3.38	20.12
E.G. Slope (m/m)	0.152597	Area (m2)	0.17	3.38	20.12
Q Total (m3/s)	123.97	Flow (m3/s)	0.33	34.27	89.37
Top Width (m)	38.89	Top Width (m)	0.34	3.18	35.37
Vel Total (m/s)	5.24	Avg. Vel. (m/s)	1.92	10.14	4.44
Max Chl Dpth (m)	1.17	Hydr. Depth (m)	0.51	1.06	0.57
Conv. Total (m3/s)	317.4	Conv. (m3/s)	0.8	87.7	228.8
Length Wtd. (m)		Wetted Per. (m)	1.08	3.20	35.70
Min Ch El (m)	427.03	Shear (N/sq m)	240.06	1582.15	843.33
Alpha	1.55	Stream Power (N/m s)	461.44	16035.19	3746.01
Frctn Loss (m)	2.68	Cum Volume (cu m x 10^			
C & E Loss (m)	0.14	Cum SA (1000 m2)			

CROSS SECTION OUTPUT Riv Sta: 1 Profile # 100 yr Storm

E.G. Elev (m)	431.01	Element	Left OB	Channel	Right OB
Vel Head (m)	2.67	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	428.34	Reach Len. (m)			
Crit W.S. (m)	429.01	Flow Area (m2)	0.22	3.79	24.67
E.G. Slope (m/m)	0.164125	Area (m2)	0.22	3.79	24.67
Q Total (m3/s)	172.11	Flow (m3/s)	0.47	42.93	128.71
Top Width (m)	39.53	Top Width (m)	0.38	3.18	35.97
Vel Total (m/s)	6.00	Avg. Vel. (m/s)	2.16	11.34	5.22
Max Chl Dpth (m)	1.30	Hydr. Depth (m)	0.57	1.19	0.69
Conv. Total (m3/s)	424.8	Conv. (m3/s)	1.2	106.0	317.7
Length Wtd. (m)		Wetted Per. (m)	1.21	3.20	36.32
Min Ch El (m)	427.03	Shear (N/sq m)	290.45	1905.86	1093.22
Alpha	1.46	Stream Power (N/m s)	626.26	21604.40	5703.58
Frctn Loss (m)	2.54	Cum Volume (cu m x 10^			
C & E Loss (m)	0.18	Cum SA (1000 m2)			

CROSS SECTION INPUT   River Station: 1.5
Description:

Station Elevation Data, num = 16

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	436	1.48	435	2.91	434	4.33	433	5.83	432
7.44	431	10.4	430	13.04	429.75	16.43	430	22.9	431
29.11	432	39.39	433	51.65	434	65	435	85.38	436
98.59	437								

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	10.4	.04	16.43	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10.4	16.43	104.02	100.38	91.36	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 1.5 Profile # Storm Event

E.G. Elev (m)	431.62	Element	Left OB	Channel	Right OB
Vel Head (m)	0.48	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	431.14	Reach Len. (m)	104.02	100.38	91.36
Crit W.S. (m)	431.17	Flow Area (m2)	1.91	7.63	4.21
E.G. Slope (m/m)	0.013961	Area (m2)	1.91	7.63	4.21
Q Total (m3/s)	34.57	Flow (m3/s)	2.57	26.33	5.67
Top Width (m)	16.56	Top Width (m)	3.19	6.03	7.34
Vel Total (m/s)	2.51	Avg. Vel. (m/s)	1.34	3.45	1.35
Max Chl Dpth (m)	1.39	Hydr. Depth (m)	0.60	1.27	0.57
Conv. Total (m3/s)	292.6	Conv. (m3/s)	21.8	222.8	48.0
Length Wtd. (m)	96.93	Wetted Per. (m)	3.39	6.05	7.43
Min Ch El (m)	429.75	Shear (N/sq m)	77.24	172.72	77.52
Alpha	1.50	Stream Power (N/m s)	103.84	595.67	104.48
Frctn Loss (m)	2.03	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.04	Cum SA (1000 m2)	0.18	0.46	1.35

CROSS SECTION OUTPUT Riv Sta: 1.5 Profile # 25 yr Storm

E.G. Elev (m)	433.20	Element	Left OB	Channel	Right OB
Vel Head (m)	0.81	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	432.39	Reach Len. (m)	104.02	100.38	91.36
Crit W.S. (m)	432.39	Flow Area (m2)	7.14	15.16	18.53
E.G. Slope (m/m)	0.011296	Area (m2)	7.14	15.16	18.53
Q Total (m3/s)	123.97	Flow (m3/s)	14.66	74.34	34.97
Top Width (m)	27.87	Top Width (m)	5.15	6.03	16.69
Vel Total (m/s)	3.04	Avg. Vel. (m/s)	2.05	4.90	1.89
Max Chl Dpth (m)	2.64	Hydr. Depth (m)	1.39	2.51	1.11
Conv. Total (m3/s)	1166.4	Conv. (m3/s)	137.9	699.5	329.0
Length Wtd. (m)	96.08	Wetted Per. (m)	5.72	6.05	16.86
Min Ch El (m)	429.75	Shear (N/sq m)	138.24	277.64	121.76
Alpha	1.73	Stream Power (N/m s)	283.83	1361.10	229.72
Frctn Loss (m)	1.41	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.10	Cum SA (1000 m2)	0.29	0.46	2.38

CROSS SECTION OUTPUT Riv Sta: 1.5 Profile # 100 yr Storm

E.G. Elev (m)	433.75	Element	Left OB	Channel	Right OB
Vel Head (m)	0.88	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	432.87	Reach Len. (m)	104.02	100.38	91.36
Crit W.S. (m)	432.87	Flow Area (m2)	9.80	18.07	27.76
E.G. Slope (m/m)	0.010340	Area (m2)	9.80	18.07	27.76
Q Total (m3/s)	172.11	Flow (m3/s)	21.63	95.26	55.23
Top Width (m)	33.55	Top Width (m)	5.88	6.03	21.64
Vel Total (m/s)	3.09	Avg. Vel. (m/s)	2.21	5.27	1.99
Max Chl Dpth (m)	3.12	Hydr. Depth (m)	1.67	3.00	1.28
Conv. Total (m3/s)	1692.6	Conv. (m3/s)	212.7	936.8	543.1
Length Wtd. (m)	95.80	Wetted Per. (m)	6.59	6.05	21.84
Min Ch El (m)	429.75	Shear (N/sq m)	150.74	302.81	128.93
Alpha	1.80	Stream Power (N/m s)	332.77	1596.28	256.44
Frctn Loss (m)	1.35	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.09	Cum SA (1000 m2)	0.33	0.46	2.63

CROSS SECTION INPUT   River Station: 2
Description:

Station Elevation Data, num = 24

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
-18.82	436	0	434.79	2.62434.6823		3.11434.7828		7.13434.5756	
8.09434.4232		9.26434.5695		11.64432.8352		13.08432.5547		13.38432.2652	

```
   13.93432.1189   17.38432.1951   21.48432.2377    22.3432.3261   24.28432.6675
   28.38432.8717   30.49432.9236   33.58432.6431   37.49432.9327   39.33433.2162
   43.91432.9998   45.19 433.079   49.57434.0452   68.86     436

Mannings n Values,  num = 3
    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************
  -18.82     .06   13.38     .04   17.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         13.38   17.38            90.46   94.97   85.25             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 2  Profile # Storm Event
*****************************************************************************************
* E.G. Elev (m)       *   433.69 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.63 * Wt. n-Val             *    0.060 *    0.040 *    0.060 *
* W.S. Elev (m)       *   433.06 * Reach Len. (m)        *    90.46 *    94.97 *    85.25 *
* Crit W.S. (m)       *   433.19 * Flow Area (m2)        *     0.76 *     3.61 *     8.88 *
* E.G. Slope (m/m)    * 0.040246 * Area (m2)             *     0.76 *     3.61 *     8.88 *
* Q Total (m3/s)      *    34.57 * Flow (m3/s)           *     1.23 *    16.85 *    16.49 *
* Top Width (m)       *    29.42 * Top Width (m)         *     2.05 *     4.00 *    23.36 *
* Vel Total (m/s)     *     2.61 * Avg. Vel. (m/s)       *     1.62 *     4.67 *     1.86 *
* Max Chl Dpth (m)    *     0.95 * Hydr. Depth (m)       *     0.37 *     0.90 *     0.38 *
* Conv. Total (m3/s)  *    172.3 * Conv. (m3/s)          *      6.2 *     84.0 *     82.2 *
* Length Wtd. (m)     *    91.61 * Wetted Per. (m)       *     2.27 *     4.02 *    23.44 *
* Min Ch El (m)       *   432.12 * Shear (N/sq m)        *   132.64 *   354.35 *   149.51 *
* Alpha               *     1.82 * Stream Power (N/m s)  *   214.37 *  1653.97 *   277.65 *
* Frctn Loss (m)      *     2.96 * Cum Volume (cu m x 10^ *     0.00 *     0.00 *     0.00 *
* C & E Loss (m)      *     0.00 * Cum SA (1000 m2)      *     0.41 *     0.94 *     2.66 *
*****************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 2  Profile # 25 yr Storm
*****************************************************************************************
* E.G. Elev (m)       *   434.67 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.99 * Wt. n-Val             *    0.060 *    0.040 *    0.060 *
* W.S. Elev (m)       *   433.68 * Reach Len. (m)        *    90.46 *    94.97 *    85.25 *
* Crit W.S. (m)       *   433.96 * Flow Area (m2)        *     2.27 *     6.05 *    26.35 *
* E.G. Slope (m/m)    * 0.039293 * Area (m2)             *     2.27 *     6.05 *    26.35 *
* Q Total (m3/s)      *   123.97 * Flow (m3/s)           *     5.85 *    39.41 *    78.71 *
* Top Width (m)       *    37.41 * Top Width (m)         *     2.89 *     4.00 *    30.51 *
* Vel Total (m/s)     *     3.57 * Avg. Vel. (m/s)       *     2.57 *     6.51 *     2.99 *
* Max Chl Dpth (m)    *     1.56 * Hydr. Depth (m)       *     0.79 *     1.51 *     0.86 *
* Conv. Total (m3/s)  *    625.4 * Conv. (m3/s)          *     29.5 *    198.8 *    397.1 *
* Length Wtd. (m)     *          * Wetted Per. (m)       *     3.31 *     4.02 *    30.67 *
* Min Ch El (m)       *   432.12 * Shear (N/sq m)        *   264.85 *   580.26 *   331.15 *
* Alpha               *     1.52 * Stream Power (N/m s)  *   681.45 *  3777.76 *   988.87 *
* Frctn Loss (m)      *     3.50 * Cum Volume (cu m x 10^ *     0.00 *     0.00 *     0.00 *
* C & E Loss (m)      *     0.11 * Cum SA (1000 m2)      *     0.65 *     0.94 *     4.39 *
*****************************************************************************************

CROSS SECTION OUTPUT  Riv Sta: 2  Profile # 100 yr Storm
*****************************************************************************************
* E.G. Elev (m)       *   435.17 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     1.33 * Wt. n-Val             *    0.060 *    0.040 *    0.060 *
* W.S. Elev (m)       *   433.83 * Reach Len. (m)        *    90.46 *    94.97 *    85.25 *
* Crit W.S. (m)       *   434.23 * Flow Area (m2)        *     2.75 *     6.69 *    31.25 *
* E.G. Slope (m/m)    * 0.047180 * Area (m2)             *     2.75 *     6.69 *    31.25 *
* Q Total (m3/s)      *   172.11 * Flow (m3/s)           *     8.36 *    50.99 *   112.77 *
* Top Width (m)       *    38.34 * Top Width (m)         *     3.11 *     4.00 *    31.23 *
* Vel Total (m/s)     *     4.23 * Avg. Vel. (m/s)       *     3.04 *     7.62 *     3.61 *
* Max Chl Dpth (m)    *     1.71 * Hydr. Depth (m)       *     0.88 *     1.67 *     1.00 *
* Conv. Total (m3/s)  *    792.4 * Conv. (m3/s)          *     38.5 *    234.7 *    519.2 *
* Length Wtd. (m)     *    89.66 * Wetted Per. (m)       *     3.58 *     4.02 *    31.41 *
* Min Ch El (m)       *   432.12 * Shear (N/sq m)        *   355.61 *   769.73 *   460.42 *
* Alpha               *     1.46 * Stream Power (N/m s)  *  1080.17 *  5868.52 *  1661.33 *
* Frctn Loss (m)      *     3.53 * Cum Volume (cu m x 10^ *     0.00 *     0.00 *     0.00 *
* C & E Loss (m)      *     0.03 * Cum SA (1000 m2)      *     0.73 *     0.94 *     4.89 *
*****************************************************************************************

CROSS SECTION INPUT    River Station: 2.25
Description:

Station Elevation Data,  num = 24
    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.    Sta.   Elev.
*************************************************************************
       0    446     1.3     445    2.64     444    4.08     443    5.54     442
    7.15    441    8.83     440   10.72     439   12.86     438   15.46     437
   20.78    436   27.61     435   30.38  434.78      33     435   37.48     436
   43.14    437   49.54     438   55.22     439    89.4     440   96.87     441
  100.86    442   103.8     443  106.14     444  108.08     445

Mannings n Values,  num = 3
    Sta.   Value    Sta.   Value    Sta.   Value
*********************************************
       0     .06   27.61     .04      33     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.  Expan.
         27.61      33            116.8  108.92  106.61             0.1     0.3


CROSS SECTION OUTPUT  Riv Sta: 2.25  Profile # Storm Event
*****************************************************************************************
* E.G. Elev (m)       *   436.65 * Element               *  Left OB *  Channel * Right OB *
* Vel Head (m)        *     0.58 * Wt. n-Val             *    0.060 *    0.040 *    0.060 *
* W.S. Elev (m)       *   436.07 * Reach Len. (m)        *   116.80 *   108.92 *   106.61 *
* Crit W.S. (m)       *   436.20 * Flow Area (m2)        *     3.91 *     6.36 *     2.57 *
* E.G. Slope (m/m)    * 0.019460 * Area (m2)             *     3.91 *     6.36 *     2.57 *
* Q Total (m3/s)      *    34.57 * Flow (m3/s)           *     6.00 *    24.73 *     3.84 *
* Top Width (m)       *    17.47 * Top Width (m)         *     7.21 *     5.39 *     4.88 *
* Vel Total (m/s)     *     2.69 * Avg. Vel. (m/s)       *     1.54 *     3.89 *     1.49 *
* Max Chl Dpth (m)    *     1.29 * Hydr. Depth (m)       *     0.54 *     1.18 *     0.53 *
* Conv. Total (m3/s)  *    247.8 * Conv. (m3/s)          *     43.0 *    177.3 *     27.5 *
* Length Wtd. (m)     *   109.07 * Wetted Per. (m)       *     7.28 *     5.41 *     5.00 *
```

Min Ch El (m)	434.78	Shear (N/sq m)	102.43	224.53	98.18
Alpha	1.58	Stream Power (N/m s)	157.29	872.69	146.56
Frctn Loss (m)	3.70	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.07	Cum SA (1000 m2)	0.95	1.45	4.17

CROSS SECTION OUTPUT Riv Sta: 2.25 Profile # 25 yr Storm

E.G. Elev (m)	438.28	Element	Left OB	Channel	Right OB
Vel Head (m)	1.37	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	436.91	Reach Len. (m)	116.80	108.92	106.61
Crit W.S. (m)	437.33	Flow Area (m2)	11.78	10.86	8.61
E.G. Slope (m/m)	0.026604	Area (m2)	11.78	10.86	8.61
Q Total (m3/s)	123.97	Flow (m3/s)	31.97	70.50	21.50
Top Width (m)	26.64	Top Width (m)	11.65	5.39	9.60
Vel Total (m/s)	3.97	Avg. Vel. (m/s)	2.71	6.49	2.50
Max Chl Dpth (m)	2.13	Hydr. Depth (m)	1.01	2.02	0.90
Conv. Total (m3/s)	760.0	Conv. (m3/s)	196.0	432.2	131.8
Length Wtd. (m)	109.19	Wetted Per. (m)	11.80	5.41	9.79
Min Ch El (m)	434.78	Shear (N/sq m)	260.34	524.02	229.50
Alpha	1.71	Stream Power (N/m s)	706.71	3401.50	572.77
Frctn Loss (m)	3.19	Cum Volume (cu m x 10^	0.00	0.00	0.01
C & E Loss (m)	0.04	Cum SA (1000 m2)	1.50	1.45	6.53

CROSS SECTION OUTPUT Riv Sta: 2.25 Profile # 100 yr Storm

E.G. Elev (m)	438.73	Element	Left OB	Channel	Right OB
Vel Head (m)	1.44	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	437.29	Reach Len. (m)	116.80	108.92	106.61
Crit W.S. (m)	437.72	Flow Area (m2)	16.57	12.95	12.79
E.G. Slope (m/m)	0.023535	Area (m2)	16.57	12.95	12.79
Q Total (m3/s)	172.11	Flow (m3/s)	49.50	88.91	33.70
Top Width (m)	30.32	Top Width (m)	12.91	5.39	12.01
Vel Total (m/s)	4.07	Avg. Vel. (m/s)	2.99	6.87	2.63
Max Chl Dpth (m)	2.51	Hydr. Depth (m)	1.28	2.40	1.06
Conv. Total (m3/s)	1121.9	Conv. (m3/s)	322.6	579.6	219.7
Length Wtd. (m)	109.26	Wetted Per. (m)	13.13	5.41	12.23
Min Ch El (m)	434.78	Shear (N/sq m)	291.32	552.74	241.36
Alpha	1.71	Stream Power (N/m s)	869.97	3794.68	635.79
Frctn Loss (m)	3.34	Cum Volume (cu m x 10^	0.00	0.00	0.01
C & E Loss (m)	0.01	Cum SA (1000 m2)	1.67	1.45	7.19

CROSS SECTION INPUT   River Station: 2.5
Description:

Station Elevation Data, num = 23

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
2.18	448	3.06	447	3.97	446	4.91	445	6.09	444
7.53	443	9.21	442	12.05	441	16.21	440	23.79	439
26.68	438.92	29.54	438.68	32.04	438.92	34.89	439	41.78	440
50	441	79.63	442	86.28	443	89.76	444	92.59	445
95.71	446	99.32	447	103.25	448				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
2.18	.06	26.68	.04	32.04	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
26.68	32.04	120.7	127.05	118.85	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 2.5 Profile # Storm Event

E.G. Elev (m)	440.43	Element	Left OB	Channel	Right OB
Vel Head (m)	0.83	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	439.60	Reach Len. (m)	120.70	127.05	118.85
Crit W.S. (m)	439.86	Flow Area (m2)	3.22	4.29	3.07
E.G. Slope (m/m)	0.051478	Area (m2)	3.22	4.29	3.07
Q Total (m3/s)	34.57	Flow (m3/s)	6.94	20.95	6.68
Top Width (m)	19.79	Top Width (m)	7.44	5.36	6.99
Vel Total (m/s)	3.27	Avg. Vel. (m/s)	2.16	4.88	2.18
Max Chl Dpth (m)	0.92	Hydr. Depth (m)	0.43	0.80	0.44
Conv. Total (m3/s)	152.4	Conv. (m3/s)	30.6	92.3	29.4
Length Wtd. (m)	124.61	Wetted Per. (m)	7.49	5.38	7.03
Min Ch El (m)	438.68	Shear (N/sq m)	217.23	402.75	220.37
Alpha	1.53	Stream Power (N/m s)	468.19	1965.02	479.51
Frctn Loss (m)	2.59	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.05	Cum SA (1000 m2)	1.84	2.13	4.87

CROSS SECTION OUTPUT Riv Sta: 2.5 Profile # 25 yr Storm

E.G. Elev (m)	441.51	Element	Left OB	Channel	Right OB
Vel Head (m)	0.94	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	440.57	Reach Len. (m)	120.70	127.05	118.85
Crit W.S. (m)	440.82	Flow Area (m2)	13.41	9.48	13.27
E.G. Slope (m/m)	0.025107	Area (m2)	13.41	9.48	13.27
Q Total (m3/s)	123.97	Flow (m3/s)	36.23	54.74	33.00
Top Width (m)	32.60	Top Width (m)	12.83	5.36	14.41
Vel Total (m/s)	3.43	Avg. Vel. (m/s)	2.70	5.78	2.49
Max Chl Dpth (m)	1.89	Hydr. Depth (m)	1.05	1.77	0.92
Conv. Total (m3/s)	782.4	Conv. (m3/s)	228.7	345.5	208.2
Length Wtd. (m)	123.50	Wetted Per. (m)	12.97	5.38	14.52
Min Ch El (m)	438.68	Shear (N/sq m)	254.69	433.59	225.02
Alpha	1.57	Stream Power (N/m s)	687.95	2504.72	559.62
Frctn Loss (m)	2.91	Cum Volume (cu m x 10^	0.00	0.00	0.01
C & E Loss (m)	0.12	Cum SA (1000 m2)	2.98	2.13	7.95

CROSS SECTION OUTPUT Riv Sta: 2.5 Profile # 100 yr Storm

E.G. Elev (m)	442.07	Element	Left OB	Channel	Right OB
Vel Head (m)	1.32	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	440.75	Reach Len. (m)	120.70	127.05	118.85
Crit W.S. (m)	441.00	Flow Area (m2)	15.86	10.47	16.08
E.G. Slope (m/m)	0.031670	Area (m2)	15.86	10.47	16.08
Q Total (m3/s)	172.11	Flow (m3/s)	51.74	72.61	47.76
Top Width (m)	34.90	Top Width (m)	13.61	5.36	15.94
Vel Total (m/s)	4.06	Avg. Vel. (m/s)	3.26	6.93	2.97
Max Chl Dpth (m)	2.07	Hydr. Depth (m)	1.17	1.95	1.01
Conv. Total (m3/s)	967.1	Conv. (m3/s)	290.8	408.0	268.4
Length Wtd. (m)	123.24	Wetted Per. (m)	13.76	5.38	16.05
Min Ch El (m)	438.68	Shear (N/sq m)	358.09	604.33	311.13
Alpha	1.58	Stream Power (N/m s)	1167.82	4190.57	923.90
Frctn Loss (m)	2.74	Cum Volume (cu m x 10^	0.00	0.00	0.01
C & E Loss (m)	0.01	Cum SA (1000 m2)	3.27	2.13	8.85

CROSS SECTION INPUT River Station: 2.75
Description:

Station Elevation Data, num = 23

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	451	2.39	450	5.92	449	10.45	448	14.76	447
20.23	446	33.22	445	65.15	444	70.9	443	75.5	442
81.84	441.79	84.05	441.6	86.27	441.85	90.75	442	98.14	443
102.57	444	105.07	445	107.01	446	108.93	447	111.06	448
114.31	449	119.28	450	125.07	451				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	81.84	.04	86.27	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
81.84	86.27	72.52	90.36	97.87	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 2.75 Profile # Storm Event

E.G. Elev (m)	443.06	Element	Left OB	Channel	Right OB
Vel Head (m)	0.35	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	442.71	Reach Len. (m)	72.52	90.36	97.87
Crit W.S. (m)	442.71	Flow Area (m2)	6.30	4.42	5.35
E.G. Slope (m/m)	0.019369	Area (m2)	6.30	4.42	5.35
Q Total (m3/s)	34.57	Flow (m3/s)	10.97	15.28	8.31
Top Width (m)	23.73	Top Width (m)	9.59	4.43	9.70
Vel Total (m/s)	2.15	Avg. Vel. (m/s)	1.74	3.46	1.55
Max Chl Dpth (m)	1.11	Hydr. Depth (m)	0.66	1.00	0.55
Conv. Total (m3/s)	248.4	Conv. (m3/s)	78.8	109.8	59.7
Length Wtd. (m)	87.36	Wetted Per. (m)	9.67	4.45	9.75
Min Ch El (m)	441.60	Shear (N/sq m)	123.68	188.41	104.18
Alpha	1.48	Stream Power (N/m s)	215.52	652.00	161.91
Frctn Loss (m)	4.18	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.25	Cum SA (1000 m2)	2.46	2.58	5.69

CROSS SECTION OUTPUT Riv Sta: 2.75 Profile # 25 yr Storm

E.G. Elev (m)	444.53	Element	Left OB	Channel	Right OB
Vel Head (m)	1.33	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	443.21	Reach Len. (m)	72.52	90.36	97.87
Crit W.S. (m)	443.62	Flow Area (m2)	11.70	6.63	11.07
E.G. Slope (m/m)	0.046970	Area (m2)	11.70	6.63	11.07
Q Total (m3/s)	123.97	Flow (m3/s)	40.95	46.88	36.13
Top Width (m)	29.35	Top Width (m)	12.13	4.43	12.79
Vel Total (m/s)	4.22	Avg. Vel. (m/s)	3.50	7.07	3.26
Max Chl Dpth (m)	1.61	Hydr. Depth (m)	0.96	1.50	0.87
Conv. Total (m3/s)	572.0	Conv. (m3/s)	189.0	216.3	166.7
Length Wtd. (m)	86.90	Wetted Per. (m)	12.26	4.45	12.88
Min Ch El (m)	441.60	Shear (N/sq m)	439.49	686.29	395.79
Alpha	1.46	Stream Power (N/m s)	1538.55	4850.57	1292.09
Frctn Loss (m)	4.72	Cum Volume (cu m x 10^	0.00	0.00	0.01
C & E Loss (m)	0.03	Cum SA (1000 m2)	3.88	2.58	9.29

CROSS SECTION OUTPUT Riv Sta: 2.75 Profile # 100 yr Storm

E.G. Elev (m)	444.82	Element	Left OB	Channel	Right OB
Vel Head (m)	1.18	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	443.64	Reach Len. (m)	72.52	90.36	97.87
Crit W.S. (m)	443.95	Flow Area (m2)	17.51	8.56	17.04
E.G. Slope (m/m)	0.031582	Area (m2)	17.51	8.56	17.04
Q Total (m3/s)	172.11	Flow (m3/s)	58.03	58.77	55.31
Top Width (m)	33.77	Top Width (m)	14.63	4.43	14.71
Vel Total (m/s)	3.99	Avg. Vel. (m/s)	3.31	6.87	3.25
Max Chl Dpth (m)	2.04	Hydr. Depth (m)	1.20	1.93	1.16
Conv. Total (m3/s)	968.5	Conv. (m3/s)	326.5	330.7	311.2
Length Wtd. (m)	86.92	Wetted Per. (m)	14.80	4.45	14.85
Min Ch El (m)	441.60	Shear (N/sq m)	366.54	595.30	355.31
Alpha	1.46	Stream Power (N/m s)	1214.69	4088.63	1153.30
Frctn Loss (m)	9.94	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	2.88	Cum SA (1000 m2)	4.29	2.58	10.35

CROSS SECTION INPUT River Station: 3
Description:

Station Elevation Data, num = 29

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	452.19.4927645449.4346	1.7671448.57512.907235447.9837	3.94146447.8527						
4.710685447.85575.564446448.15757.034832	447.2377.497906445.20097.879583444.9906								

9.430774 445.20411.39562445.252713.58084445.371615.73829445.831916.77567446.8773
 19.2037446.944420.83136 446.73122.99551447.374125.61616448.730526.95499449.2121
28.40269448.965235.07031449.090240.74189449.495646.90199 449.52352.94754449.8369
 53.8634449.754657.12788449.5626 60.7371449.894871.59155452.4003

Mannings n Values, num = 3
    Sta.   Value   Sta.   Value   Sta.   Value
****
       0   .067.497906   .049.430774   .06

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr. Expan.
       7.49791 9.43077   139.83 141.64 137.17   0.1   0.3

CROSS SECTION OUTPUT Riv Sta: 3 Profile # Storm Event
****
* E.G. Elev (m)   *   447.49 * Element   * Left OB * Channel * Right OB *
* Vel Head (m)   *   1.19 * Wt. n-Val   *   0.060 *   0.040 *   0.060 *
* W.S. Elev (m)   *   446.30 * Reach Len. (m)   *   139.83 *   141.64 *   137.17 *
* Crit W.S. (m)   *   446.65 * Flow Area (m2)   *   0.14 *   2.32 *   5.86 *
* E.G. Slope (m/m)   * 0.052389 * Area (m2)   *   0.14 *   2.32 *   5.86 *
* Q Total (m3/s)   *   34.57 * Flow (m3/s)   *   0.13 *   14.63 *   19.81 *
* Top Width (m)   *   8.95 * Top Width (m)   *   0.25 *   1.93 *   6.77 *
* Vel Total (m/s)   *   4.16 * Avg. Vel. (m/s)   *   0.94 *   6.31 *   3.38 *
* Max Chl Dpth (m)   *   1.31 * Hydr. Depth (m)   *   0.55 *   1.20 *   0.87 *
* Conv. Total (m3/s) *   151.0 * Conv. (m3/s)   *   0.6 *   63.9 *   86.5 *
* Length Wtd. (m)   *   139.53 * Wetted Per. (m)   *   1.12 *   2.00 *   7.01 *
* Min Ch El (m)   *   444.99 * Shear (N/sq m)   *   62.42 *   595.16 *   428.94 *
* Alpha   *   1.35 * Stream Power (N/m s) *   58.41 * 3756.43 * 1450.83 *
* Frctn Loss (m)   *   5.85 * Cum Volume (cu m x 10^ *   0.00 *   0.00 *   0.00 *
* C & E Loss (m)   *   0.06 * Cum SA (1000 m2)   *   3.14 *   3.03 *   6.82 *
****

CROSS SECTION OUTPUT Riv Sta: 3 Profile # 25 yr Storm
****
* E.G. Elev (m)   *   449.28 * Element   * Left OB * Channel * Right OB *
* Vel Head (m)   *   1.42 * Wt. n-Val   *   0.060 *   0.040 *   0.060 *
* W.S. Elev (m)   *   447.86 * Reach Len. (m)   *   139.83 *   141.64 *   137.17 *
* Crit W.S. (m)   *   448.28 * Flow Area (m2)   *   1.07 *   5.34 *   23.09 *
* E.G. Slope (m/m)   * 0.025703 * Area (m2)   *   1.07 *   5.34 *   23.09 *
* Q Total (m3/s)   *   123.97 * Flow (m3/s)   *   1.36 *   41.13 *   81.48 *
* Top Width (m)   *   18.71 * Top Width (m)   *   2.28 *   1.93 *   14.50 *
* Vel Total (m/s)   *   4.20 * Avg. Vel. (m/s)   *   1.27 *   7.71 *   3.53 *
* Max Chl Dpth (m)   *   2.87 * Hydr. Depth (m)   *   0.47 *   2.76 *   1.59 *
* Conv. Total (m3/s) *   773.3 * Conv. (m3/s)   *   8.5 *   256.6 *   508.2 *
* Length Wtd. (m)   *   139.21 * Wetted Per. (m)   *   4.08 *   2.00 *   15.21 *
* Min Ch El (m)   *   444.99 * Shear (N/sq m)   *   66.15 *   672.11 *   382.56 *
* Alpha   *   1.58 * Stream Power (N/m s) *   83.74 * 5180.00 * 1349.97 *
* Frctn Loss (m)   *   5.14 * Cum Volume (cu m x 10^ *   0.00 *   0.01 *   0.01 *
* C & E Loss (m)   *   0.03 * Cum SA (1000 m2)   *   4.89 *   3.03 *   11.16 *
****

CROSS SECTION OUTPUT Riv Sta: 3 Profile # 100 yr Storm
****
* E.G. Elev (m)   *   457.64 * Element   * Left OB * Channel * Right OB *
* Vel Head (m)   *   10.77 * Wt. n-Val   *   0.060 *   0.040 *   0.060 *
* W.S. Elev (m)   *   446.87 * Reach Len. (m)   *   139.83 *   141.64 *   137.17 *
* Crit W.S. (m)   *   446.87 * Flow Area (m2)   *   0.32 *   3.43 *   10.02 *
* E.G. Slope (m/m)   * 0.292766 * Area (m2)   *   0.32 *   3.43 *   10.02 *
* Q Total (m3/s)   *   172.11 * Flow (m3/s)   *   0.93 *   66.42 *   104.77 *
* Top Width (m)   *   11.19 * Top Width (m)   *   0.38 *   1.93 *   8.88 *
* Vel Total (m/s)   *   12.50 * Avg. Vel. (m/s)   *   2.93 *   19.37 *   10.46 *
* Max Chl Dpth (m)   *   1.88 * Hydr. Depth (m)   *   0.84 *   1.77 *   1.13 *
* Conv. Total (m3/s) *   318.1 * Conv. (m3/s)   *   1.7 *   122.7 *   193.6 *
* Length Wtd. (m)   *   139.25 * Wetted Per. (m)   *   1.71 *   2.00 *   9.39 *
* Min Ch El (m)   *   444.99 * Shear (N/sq m)   *   531.74 * 4918.91 * 3061.56 *
* Alpha   *   1.35 * Stream Power (N/m s) * 1558.02 * 95268.31 * 32020.56 *
* Frctn Loss (m)   *   3.88 * Cum Volume (cu m x 10^ *   0.01 *   0.01 *   0.01 *
* C & E Loss (m)   *   0.65 * Cum SA (1000 m2)   *   5.34 *   3.03 *   11.97 *
****

CROSS SECTION INPUT   River Station: 4
Description:

Station Elevation Data, num = 33
    Sta.   Elev.   Sta.   Elev.   Sta.   Elev.   Sta.   Elev.   Sta.   Elev.
****
       0 453.651.698037453.68352.882241453.56465.381784452.87287.524813452.6716
 9.50714452.638111.10025452.589312.53987452.543614.37099452.223515.75198452.5131
18.14865452.808719.65767453.406222.37541 454.15923.61095453.939624.90515453.6774
28.97593453.6591 33.5643453.680537.93897453.808539.31658453.390940.82915452.9398
44.18561452.845346.56226452.7173 48.7287 452.5150.52226451.894352.30231451.6932
54.39868451.629256.56811 451.68157.35415451.787757.55975452.723458.94948452.7661
59.82742452.851461.49459454.253563.09927454.5827

Mannings n Values, num = 3
    Sta.   Value   Sta.   Value   Sta.   Value
****
       0   .0652.30231   .0456.56811   .06

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr. Expan.
       52.3023 56.5681   173.53 195.31   170.8   0.1   0.3

CROSS SECTION OUTPUT Riv Sta: 4 Profile # Storm Event
****
* E.G. Elev (m)   *   453.40 * Element   * Left OB * Channel * Right OB *
* Vel Head (m)   *   0.56 * Wt. n-Val   *   0.060 *   0.040 *   0.060 *
* W.S. Elev (m)   *   452.84 * Reach Len. (m)   *   173.53 *   195.31 *   170.80 *
* Crit W.S. (m)   *   453.04 * Flow Area (m2)   *   6.81 *   5.04 *   1.15 *
* E.G. Slope (m/m)   * 0.019824 * Area (m2)   *   6.81 *   5.04 *   1.15 *
* Q Total (m3/s)   *   28.96 * Flow (m3/s)   *   7.96 *   19.81 *   1.19 *
* Top Width (m)   *   27.89 * Top Width (m)   *   20.49 *   4.27 *   3.13 *
* Vel Total (m/s)   *   2.23 * Avg. Vel. (m/s)   *   1.17 *   3.93 *   1.04 *

Max Chl Dpth (m)	1.21	Hydr. Depth (m)	0.33	1.18	0.37
Conv. Total (m3/s)	205.7	Conv. (m3/s)	56.5	140.7	8.5
Length Wtd. (m)	184.44	Wetted Per. (m)	20.71	4.27	3.90
Min Ch El (m)	451.63	Shear (N/sq m)	63.93	229.53	57.23
Alpha	2.21	Stream Power (N/m s)	74.72	902.51	59.43
Frctn Loss (m)	2.92	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.05	Cum SA (1000 m2)	4.94	3.63	7.66

CROSS SECTION OUTPUT Riv Sta: 4 Profile # 25 yr Storm

E.G. Elev (m)	454.45	Element	Left OB	Channel	Right OB
Vel Head (m)	1.11	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	453.34	Reach Len. (m)	173.53	195.31	170.80
Crit W.S. (m)	453.68	Flow Area (m2)	19.83	7.18	2.93
E.G. Slope (m/m)	0.032516	Area (m2)	19.83	7.18	2.93
Q Total (m3/s)	98.46	Flow (m3/s)	46.30	45.82	6.34
Top Width (m)	36.74	Top Width (m)	28.63	4.27	3.84
Vel Total (m/s)	3.29	Avg. Vel. (m/s)	2.33	6.38	2.17
Max Chl Dpth (m)	1.71	Hydr. Depth (m)	0.69	1.68	0.76
Conv. Total (m3/s)	546.0	Conv. (m3/s)	256.8	254.1	35.2
Length Wtd. (m)	180.97	Wetted Per. (m)	29.07	4.27	4.79
Min Ch El (m)	451.63	Shear (N/sq m)	217.59	536.73	195.08
Alpha	2.02	Stream Power (N/m s)	507.92	3423.70	422.53
Frctn Loss (m)	3.01	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	0.02	Cum SA (1000 m2)	7.57	3.63	12.72

CROSS SECTION OUTPUT Riv Sta: 4 Profile # 100 yr Storm

E.G. Elev (m)	458.76	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	458.75	Reach Len. (m)	173.53	195.31	170.80
Crit W.S. (m)		Flow Area (m2)	294.31	30.27	36.06
E.G. Slope (m/m)	0.000054	Area (m2)	294.31	30.27	36.06
Q Total (m3/s)	136.57	Flow (m3/s)	106.73	20.61	9.23
Top Width (m)	63.10	Top Width (m)	52.30	4.27	6.53
Vel Total (m/s)	0.38	Avg. Vel. (m/s)	0.36	0.68	0.26
Max Chl Dpth (m)	7.13	Hydr. Depth (m)	5.63	7.10	5.52
Conv. Total (m3/s)	18512.5	Conv. (m3/s)	14467.6	2794.3	1250.6
Length Wtd. (m)	178.66	Wetted Per. (m)	58.11	4.27	12.01
Min Ch El (m)	451.63	Shear (N/sq m)	2.70	3.79	1.60
Alpha	1.24	Stream Power (N/m s)	0.98	2.58	0.41
Frctn Loss (m)	0.05	Cum Volume (cu m x 10^	0.03	0.01	0.02
C & E Loss (m)	1.08	Cum SA (1000 m2)	9.91	3.63	13.29

CROSS SECTION INPUT   River Station: 4.2
Description:

Station Elevation Data, num = 18

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
5.73	461	7.09	460	8.55	459	10.13	458	12.29	457
16.19	456	20.46	455	23.93	454.92	25.52	454.72	27.01	454.92
30.48	455	35.81	456	45.57	457	66.62	458	76.51	459
80.32	460	83.92	461	89.53	462				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
5.73	.06	23.93	.04	27.01	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.93	27.01	96.26	96.2	99.7	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 4.2 Profile # Storm Event

E.G. Elev (m)	456.37	Element	Left OB	Channel	Right OB
Vel Head (m)	0.72	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	455.64	Reach Len. (m)	96.26	96.20	99.70
Crit W.S. (m)	455.86	Flow Area (m2)	3.26	2.54	3.47
E.G. Slope (m/m)	0.052168	Area (m2)	3.26	2.54	3.47
Q Total (m3/s)	28.96	Flow (m3/s)	7.99	12.65	8.32
Top Width (m)	16.20	Top Width (m)	6.22	3.08	6.90
Vel Total (m/s)	3.13	Avg. Vel. (m/s)	2.45	4.99	2.40
Max Chl Dpth (m)	0.92	Hydr. Depth (m)	0.52	0.82	0.50
Conv. Total (m3/s)	126.8	Conv. (m3/s)	35.0	55.4	36.4
Length Wtd. (m)	96.79	Wetted Per. (m)	6.29	3.11	6.96
Min Ch El (m)	454.72	Shear (N/sq m)	264.67	417.71	255.42
Alpha	1.45	Stream Power (N/m s)	649.29	2083.56	611.90
Frctn Loss (m)	5.80	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.04	Cum SA (1000 m2)	6.23	3.98	8.16

CROSS SECTION OUTPUT Riv Sta: 4.2 Profile # 25 yr Storm

E.G. Elev (m)	457.48	Element	Left OB	Channel	Right OB
Vel Head (m)	0.92	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	456.56	Reach Len. (m)	96.26	96.20	99.70
Crit W.S. (m)	456.80	Flow Area (m2)	10.66	5.35	12.70
E.G. Slope (m/m)	0.029681	Area (m2)	10.66	5.35	12.70
Q Total (m3/s)	98.46	Flow (m3/s)	31.75	33.12	33.58
Top Width (m)	27.24	Top Width (m)	9.91	3.08	14.24
Vel Total (m/s)	3.43	Avg. Vel. (m/s)	2.98	6.19	2.64
Max Chl Dpth (m)	1.84	Hydr. Depth (m)	1.08	1.74	0.89
Conv. Total (m3/s)	571.5	Conv. (m3/s)	184.3	192.3	194.9
Length Wtd. (m)	96.93	Wetted Per. (m)	10.10	3.11	14.36
Min Ch El (m)	454.72	Shear (N/sq m)	307.34	501.52	257.31
Alpha	1.54	Stream Power (N/m s)	915.07	3104.47	680.52
Frctn Loss (m)	5.66	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	0.01	Cum SA (1000 m2)	9.43	3.98	13.63

CROSS SECTION OUTPUT Riv Sta: 4.2 Profile # 100 yr Storm

E.G. Elev (m)	458.80	Element	Left OB	Channel	Right OB
Vel Head (m)	0.09	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	458.72	Reach Len. (m)	96.26	96.20	99.70
Crit W.S. (m)	457.10	Flow Area (m2)	38.44	12.00	79.93
E.G. Slope (m/m)	0.001286	Area (m2)	38.44	12.00	79.93
Q Total (m3/s)	136.57	Flow (m3/s)	41.91	26.49	68.17
Top Width (m)	64.70	Top Width (m)	14.93	3.08	46.69
Vel Total (m/s)	1.05	Avg. Vel. (m/s)	1.09	2.21	0.85
Max Chl Dpth (m)	4.00	Hydr. Depth (m)	2.57	3.90	1.71
Conv. Total (m3/s)	3808.5	Conv. (m3/s)	1168.8	738.6	1901.1
Length Wtd. (m)	97.22	Wetted Per. (m)	15.60	3.11	46.90
Min Ch El (m)	454.72	Shear (N/sq m)	31.07	48.72	21.50
Alpha	1.52	Stream Power (N/m s)	33.88	107.54	18.33
Frctn Loss (m)	0.01	Cum Volume (cu m x 10^	0.05	0.01	0.02
C & E Loss (m)	0.02	Cum SA (1000 m2)	13.15	3.98	15.94

CROSS SECTION INPUT   River Station: 4.4
Description:

Station Elevation Data, num = 21

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	468	2.84	467	5.9	466	8.36	465	10.13	464
11.9	463	14.06	462	33.06	461	34.9	460.92	36.09	460.68
37.16	460.92	38.84	461	44	462	47.77	463	51.59	464
59.03	465	66.73	465	66.99	465	76.14	466	91.67	467
95.71	468								

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	34.9	.04	37.16	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
34.9	37.16	154.92	192.59	191.85	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 4.4 Profile # Storm Event

E.G. Elev (m)	462.20	Element	Left OB	Channel	Right OB
Vel Head (m)	0.33	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	461.87	Reach Len. (m)	154.92	192.59	191.85
Crit W.S. (m)	461.92	Flow Area (m2)	8.95	2.43	3.51
E.G. Slope (m/m)	0.022190	Area (m2)	8.95	2.43	3.51
Q Total (m3/s)	28.96	Flow (m3/s)	13.70	9.35	5.91
Top Width (m)	26.91	Top Width (m)	18.46	2.26	6.19
Vel Total (m/s)	1.95	Avg. Vel. (m/s)	1.53	3.85	1.68
Max Chl Dpth (m)	1.19	Hydr. Depth (m)	0.48	1.07	0.57
Conv. Total (m3/s)	194.4	Conv. (m3/s)	92.0	62.8	39.7
Length Wtd. (m)	178.30	Wetted Per. (m)	18.48	2.31	6.28
Min Ch El (m)	460.68	Shear (N/sq m)	105.37	228.71	121.65
Alpha	1.71	Stream Power (N/m s)	161.31	880.45	204.94
Frctn Loss (m)	4.26	Cum Volume (cu m x 10^	0.00	0.00	0.00
C & E Loss (m)	0.08	Cum SA (1000 m2)	8.14	4.50	9.42

CROSS SECTION OUTPUT Riv Sta: 4.4 Profile # 25 yr Storm

E.G. Elev (m)	463.15	Element	Left OB	Channel	Right OB
Vel Head (m)	0.78	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	462.37	Reach Len. (m)	154.92	192.59	191.85
Crit W.S. (m)	462.57	Flow Area (m2)	19.36	3.56	7.15
E.G. Slope (m/m)	0.035286	Area (m2)	19.36	3.56	7.15
Q Total (m3/s)	98.46	Flow (m3/s)	56.08	22.28	20.11
Top Width (m)	32.16	Top Width (m)	21.65	2.26	8.25
Vel Total (m/s)	3.27	Avg. Vel. (m/s)	2.90	6.26	2.81
Max Chl Dpth (m)	1.69	Hydr. Depth (m)	0.89	1.57	0.87
Conv. Total (m3/s)	524.2	Conv. (m3/s)	298.5	118.6	107.1
Length Wtd. (m)	175.59	Wetted Per. (m)	21.76	2.31	8.40
Min Ch El (m)	460.68	Shear (N/sq m)	307.91	532.77	294.65
Alpha	1.42	Stream Power (N/m s)	891.83	3335.99	828.71
Frctn Loss (m)	3.92	Cum Volume (cu m x 10^	0.01	0.01	0.02
C & E Loss (m)	0.03	Cum SA (1000 m2)	11.87	4.50	15.78

CROSS SECTION OUTPUT Riv Sta: 4.4 Profile # 100 yr Storm

E.G. Elev (m)	463.47	Element	Left OB	Channel	Right OB
Vel Head (m)	0.78	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	462.68	Reach Len. (m)	154.92	192.59	191.85
Crit W.S. (m)	462.83	Flow Area (m2)	26.17	4.26	9.89
E.G. Slope (m/m)	0.028379	Area (m2)	26.17	4.26	9.89
Q Total (m3/s)	136.57	Flow (m3/s)	81.31	26.96	28.31
Top Width (m)	34.00	Top Width (m)	22.32	2.26	9.42
Vel Total (m/s)	3.39	Avg. Vel. (m/s)	3.11	6.33	2.86
Max Chl Dpth (m)	2.00	Hydr. Depth (m)	1.17	1.88	1.05
Conv. Total (m3/s)	810.7	Conv. (m3/s)	482.6	160.0	168.0
Length Wtd. (m)	175.20	Wetted Per. (m)	22.50	2.31	9.61
Min Ch El (m)	460.68	Shear (N/sq m)	323.84	512.88	286.50
Alpha	1.34	Stream Power (N/m s)	1005.87	3246.79	820.11
Frctn Loss (m)	3.92	Cum Volume (cu m x 10^	0.05	0.01	0.03
C & E Loss (m)	0.02	Cum SA (1000 m2)	16.03	4.50	21.32

CROSS SECTION INPUT   River Station: 4.6
Description:

Station Elevation Data, num = 15

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.

11.09	470	20.44	469	24.77	468	50.8	467	59.14	466
72.96	465	73.84	464.87	74.55	465	81.77	466	88.69	466
95.78	466	105.2	467	112.78	468	117.04	469	119.54	470

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
11.09	.06	72.96	.04	74.55	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
72.96	74.55	135.23	139.59	140.8	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 4.6 Profile # Storm Event

E.G. Elev (m)	466.55	Element	Left OB	Channel	Right OB
Vel Head (m)	0.60	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	465.95	Reach Len. (m)	135.23	139.59	140.80
Crit W.S. (m)	465.95	Flow Area (m2)	6.18	1.61	3.23
E.G. Slope (m/m)	0.046103	Area (m2)	6.18	1.61	3.23
Q Total (m3/s)	28.96	Flow (m3/s)	13.39	8.61	6.96
Top Width (m)	21.49	Top Width (m)	13.07	1.59	6.83
Vel Total (m/s)	2.63	Avg. Vel. (m/s)	2.17	5.36	2.16
Max Chl Dpth (m)	1.08	Hydr. Depth (m)	0.47	1.01	0.47
Conv. Total (m3/s)	134.9	Conv. (m3/s)	62.4	40.1	32.4
Length Wtd. (m)	137.82	Wetted Per. (m)	13.10	1.61	6.89
Min Ch El (m)	464.87	Shear (N/sq m)	213.16	450.78	211.69
Alpha	1.71	Stream Power (N/m s)	462.06	2414.93	456.79
Frctn Loss (m)	13.62	Cum Volume (cu m x 10^	0.00	0.00	0.01
C & E Loss (m)	0.50	Cum SA (1000 m2)	10.27	4.77	10.34

CROSS SECTION OUTPUT Riv Sta: 4.6 Profile # 25 yr Storm

E.G. Elev (m)	467.11	Element	Left OB	Channel	Right OB
Vel Head (m)	0.45	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	466.66	Reach Len. (m)	135.23	139.59	140.80
Crit W.S. (m)	466.71	Flow Area (m2)	17.89	2.75	19.74
E.G. Slope (m/m)	0.023389	Area (m2)	17.89	2.75	19.74
Q Total (m3/s)	98.46	Flow (m3/s)	43.20	14.98	40.28
Top Width (m)	48.41	Top Width (m)	19.35	1.59	27.47
Vel Total (m/s)	2.44	Avg. Vel. (m/s)	2.41	5.46	2.04
Max Chl Dpth (m)	1.79	Hydr. Depth (m)	0.93	1.73	0.72
Conv. Total (m3/s)	643.8	Conv. (m3/s)	282.4	98.0	263.4
Length Wtd. (m)	137.76	Wetted Per. (m)	19.42	1.61	27.58
Min Ch El (m)	464.87	Shear (N/sq m)	211.36	390.97	164.24
Alpha	1.48	Stream Power (N/m s)	510.16	2133.01	335.05
Frctn Loss (m)	8.52	Cum Volume (cu m x 10^	0.01	0.01	0.02
C & E Loss (m)	1.37	Cum SA (1000 m2)	14.64	4.77	18.30

CROSS SECTION OUTPUT Riv Sta: 4.6 Profile # 100 yr Storm

E.G. Elev (m)	467.40	Element	Left OB	Channel	Right OB
Vel Head (m)	0.60	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	466.81	Reach Len. (m)	135.23	139.59	140.80
Crit W.S. (m)	466.92	Flow Area (m2)	20.77	2.98	23.81
E.G. Slope (m/m)	0.028552	Area (m2)	20.77	2.98	23.81
Q Total (m3/s)	136.57	Flow (m3/s)	58.78	18.93	58.87
Top Width (m)	50.97	Top Width (m)	20.55	1.59	28.83
Vel Total (m/s)	2.87	Avg. Vel. (m/s)	2.83	6.36	2.47
Max Chl Dpth (m)	1.94	Hydr. Depth (m)	1.01	1.87	0.83
Conv. Total (m3/s)	808.2	Conv. (m3/s)	347.9	112.0	348.4
Length Wtd. (m)	137.74	Wetted Per. (m)	20.63	1.61	28.94
Min Ch El (m)	464.87	Shear (N/sq m)	281.94	517.16	230.34
Alpha	1.42	Stream Power (N/m s)	797.64	3288.72	569.50
Frctn Loss (m)	11.44	Cum Volume (cu m x 10^	0.06	0.01	0.03
C & E Loss (m)	2.68	Cum SA (1000 m2)	18.93	4.77	24.01

CROSS SECTION INPUT River Station: 4.8
Description:

Station Elevation Data, num = 19

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	477	2.02	476	4.32	475	7.11	474	15.8	473
21.78	472	27.99	471	30.02	470.87	31.21	470.63	32.28	470.92
34.3	471	39.79	472	56.56	472	79.75	472	92.77	473
97.2	474	99.8	475	101.95	476	104.01	477		

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	30.02	.04	32.28	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
30.02	32.28	169.58	158.82	139.13	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 4.8 Profile # Storm Event

E.G. Elev (m)	472.47	Element	Left OB	Channel	Right OB
Vel Head (m)	0.59	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	471.88	Reach Len. (m)	169.58	158.82	139.13
Crit W.S. (m)	471.93	Flow Area (m2)	4.32	2.52	3.98
E.G. Slope (m/m)	0.031942	Area (m2)	4.32	2.52	3.98
Q Total (m3/s)	28.96	Flow (m3/s)	8.84	11.93	8.19
Top Width (m)	16.60	Top Width (m)	7.49	2.26	6.85
Vel Total (m/s)	2.68	Avg. Vel. (m/s)	2.05	4.72	2.06
Max Chl Dpth (m)	1.25	Hydr. Depth (m)	0.58	1.12	0.58
Conv. Total (m3/s)	162.0	Conv. (m3/s)	49.5	66.7	45.8
Length Wtd. (m)	157.77	Wetted Per. (m)	7.56	2.32	6.93
Min Ch El (m)	470.63	Shear (N/sq m)	178.74	340.58	179.87

* Alpha	* 1.63	* Stream Power (N/m s)	* 366.28	* 1608.97	* 370.16	*
* Frctn Loss (m)	* 5.80	* Cum Volume (cu m x 10^	* 0.01	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.10	* Cum SA (1000 m2)	* 12.01	* 5.07	* 11.29	*

CROSS SECTION OUTPUT Riv Sta: 4.8 Profile # 25 yr Storm

* E.G. Elev (m)	* 477.01	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 5.02	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 471.98	* Reach Len. (m)	* 169.58	* 158.82	* 139.13	*
* Crit W.S. (m)	* 471.98	* Flow Area (m2)	* 5.14	* 2.76	* 4.73	*
* E.G. Slope (m/m)	* 0.246761	* Area (m2)	* 5.14	* 2.76	* 4.73	*
* Q Total (m3/s)	* 98.46	* Flow (m3/s)	* 31.13	* 38.55	* 28.78	*
* Top Width (m)	* 17.83	* Top Width (m)	* 8.15	* 2.26	* 7.43	*
* Vel Total (m/s)	* 7.79	* Avg. Vel. (m/s)	* 6.05	* 13.95	* 6.08	*
* Max Chl Dpth (m)	* 1.35	* Hydr. Depth (m)	* 0.63	* 1.22	* 0.64	*
* Conv. Total (m3/s)	* 198.2	* Conv. (m3/s)	* 62.7	* 77.6	* 57.9	*
* Length Wtd. (m)	* 155.97	* Wetted Per. (m)	* 8.23	* 2.32	* 7.52	*
* Min Ch El (m)	* 470.63	* Shear (N/sq m)	* 1512.34	* 2880.10	* 1523.45	*
* Alpha	* 1.62	* Stream Power (N/m s)	* 9152.30	* 40168.71	* 9264.71	*
* Frctn Loss (m)	* 7.48	* Cum Volume (cu m x 10^	* 0.02	* 0.01	* 0.02	*
* C & E Loss (m)	* 1.39	* Cum SA (1000 m2)	* 16.97	* 5.07	* 20.73	*

CROSS SECTION OUTPUT Riv Sta: 4.8 Profile # 100 yr Storm

* E.G. Elev (m)	* 481.53	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 9.54	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 471.99	* Reach Len. (m)	* 169.58	* 158.82	* 139.13	*
* Crit W.S. (m)	* 471.99	* Flow Area (m2)	* 5.18	* 2.77	* 4.76	*
* E.G. Slope (m/m)	* 0.467400	* Area (m2)	* 5.18	* 2.77	* 4.76	*
* Q Total (m3/s)	* 136.57	* Flow (m3/s)	* 43.23	* 53.37	* 39.97	*
* Top Width (m)	* 17.89	* Top Width (m)	* 8.17	* 2.26	* 7.45	*
* Vel Total (m/s)	* 10.74	* Avg. Vel. (m/s)	* 8.35	* 19.24	* 8.39	*
* Max Chl Dpth (m)	* 1.36	* Hydr. Depth (m)	* 0.63	* 1.23	* 0.64	*
* Conv. Total (m3/s)	* 199.8	* Conv. (m3/s)	* 63.2	* 78.1	* 58.5	*
* Length Wtd. (m)	* 155.71	* Wetted Per. (m)	* 8.26	* 2.32	* 7.54	*
* Min Ch El (m)	* 470.63	* Shear (N/sq m)	* 2874.62	* 5474.40	* 2895.84	*
* Alpha	* 1.62	* Stream Power (N/m s)	* 23998.36	* 105325.5	* 24294.38	*
* Frctn Loss (m)	*	* Cum Volume (cu m x 10^	* 0.06	* 0.01	* 0.04	*
* C & E Loss (m)	*	* Cum SA (1000 m2)	* 21.37	* 5.07	* 26.54	*

CROSS SECTION INPUT River Station: 5
Description: Observed HWM = 477.30 m (1565.94 ft)

Station Elevation Data, num = 20

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	477.3	361.008446	477.2	082.193662	477.2	5983.387841	477.3	1174.021057	477.3
665	9.61376	477.494514	99643	477.323918	76784	477.473219	56949	477.665220	43097
477.0587	21.90981	476.915422	42578	476.577123	08414	476.397324	59462	476.205226	20433
476.3454	27.09716	476.421628	27363	477.019129	09603	476.982530	67571	477.198932	70157
478.2992									

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	23.08414	.04	26.20433	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.0841	26.2043	169	176.96	175.79	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 5 Profile # Storm Event

* E.G. Elev (m)	* 478.38	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.92	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 477.45	* Reach Len. (m)	* 169.00	* 176.96	* 175.79	*
* Crit W.S. (m)	* 477.77	* Flow Area (m2)	* 3.15	* 3.64	* 2.82	*
* E.G. Slope (m/m)	* 0.034602	* Area (m2)	* 3.15	* 3.64	* 2.82	*
* Q Total (m3/s)	* 28.96	* Flow (m3/s)	* 4.47	* 18.65	* 5.84	*
* Top Width (m)	* 26.42	* Top Width (m)	* 18.36	* 3.12	* 4.94	*
* Vel Total (m/s)	* 3.01	* Avg. Vel. (m/s)	* 1.42	* 5.13	* 2.07	*
* Max Chl Dpth (m)	* 1.25	* Hydr. Depth (m)	* 0.17	* 1.17	* 0.57	*
* Conv. Total (m3/s)	* 155.7	* Conv. (m3/s)	* 24.0	* 100.3	* 31.4	*
* Length Wtd. (m)	* 174.85	* Wetted Per. (m)	* 18.75	* 3.14	* 5.17	*
* Min Ch El (m)	* 476.21	* Shear (N/sq m)	* 57.06	* 393.10	* 185.31	*
* Alpha	* 1.99	* Stream Power (N/m s)	* 80.87	* 2016.41	* 383.84	*
* Frctn Loss (m)	* 2.83	* Cum Volume (cu m x 10^	* 0.01	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.01	* Cum SA (1000 m2)	* 14.20	* 5.55	* 12.32	*

CROSS SECTION OUTPUT Riv Sta: 5 Profile # 25 yr Storm

* E.G. Elev (m)	* 479.31	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.17	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 479.13	* Reach Len. (m)	* 169.00	* 176.96	* 175.79	*
* Crit W.S. (m)	* 478.41	* Flow Area (m2)	* 41.75	* 8.88	* 13.08	*
* E.G. Slope (m/m)	* 0.003256	* Area (m2)	* 41.75	* 8.88	* 13.08	*
* Q Total (m3/s)	* 98.46	* Flow (m3/s)	* 55.52	* 25.34	* 17.60	*
* Top Width (m)	* 32.70	* Top Width (m)	* 23.08	* 3.12	* 6.50	*
* Vel Total (m/s)	* 1.55	* Avg. Vel. (m/s)	* 1.33	* 2.85	* 1.35	*
* Max Chl Dpth (m)	* 2.93	* Hydr. Depth (m)	* 1.81	* 2.85	* 2.01	*
* Conv. Total (m3/s)	* 1725.6	* Conv. (m3/s)	* 973.1	* 444.0	* 308.4	*
* Length Wtd. (m)	* 173.18	* Wetted Per. (m)	* 25.25	* 3.14	* 7.77	*
* Min Ch El (m)	* 476.21	* Shear (N/sq m)	* 52.80	* 90.33	* 53.73	*
* Alpha	* 1.43	* Stream Power (N/m s)	* 70.22	* 257.77	* 72.30	*
* Frctn Loss (m)	* 1.82	* Cum Volume (cu m x 10^	* 0.02	* 0.01	* 0.02	*
* C & E Loss (m)	* 0.48	* Cum SA (1000 m2)	* 19.61	* 5.55	* 21.95	*

CROSS SECTION OUTPUT Riv Sta: 5 Profile # 100 yr Storm

* E.G. Elev (m)	* 482.66	* Element	* Left OB	* Channel	* Right OB	*

Vel Head (m)	0.04	Wt. n-Val	0.060	0.040	0.060	
W.S. Elev (m)	482.62	Reach Len. (m)	169.00	176.96	175.79	
Crit W.S. (m)	478.66	Flow Area (m2)	122.21	19.75	35.73	
E.G. Slope (m/m)	0.000270	Area (m2)	122.21	19.75	35.73	
Q Total (m3/s)	136.57	Flow (m3/s)	87.81	27.65	21.12	
Top Width (m)	32.70	Top Width (m)	23.08	3.12	6.50	
Vel Total (m/s)	0.77	Avg. Vel. (m/s)	0.72	1.40	0.59	
Max Chl Dpth (m)	6.41	Hydr. Depth (m)	5.29	6.33	5.50	
Conv. Total (m3/s)	8317.2	Conv. (m3/s)	5347.5	1683.8	1285.9	
Length Wtd. (m)	172.88	Wetted Per. (m)	28.73	3.14	11.26	
Min Ch El (m)	476.21	Shear (N/sq m)	11.25	16.64	8.39	
Alpha	1.32	Stream Power (N/m s)	8.08	23.29	4.96	
Frctn Loss (m)	0.18	Cum Volume (cu m x 10^	0.07	0.02	0.04	
C & E Loss (m)	0.95	Cum SA (1000 m2)	24.01	5.55	27.76	

CROSS SECTION INPUT River Station: 6
Description:

Station Elevation Data, num = 19

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	480.7	0712.4	41053	480.87	175.4	58863	481.3	0156.7	57121
481.2	4667.7	85967	481.4417						
8.638265	480.9	2669.7	55933	480.5944	11.8965	479.469	712.4	8089479	.1313
13.4255	478.8905								
14.88657	479.0	4617.3	1354	479.454	418.2	1641	480.0	18318.7	2098
480.1555	20.6232	1480.1951							
22.03362	481.1	82623.5	2767	481.58	830.0	1596	481.7	64838.4	8035
481.8562									

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.0612	48089	.0414	88657	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
12.4809	14.8866	75.47	84.47	93.41	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 6 Profile # Storm Event

E.G. Elev (m)	481.21	Element	Left OB	Channel	Right OB
Vel Head (m)	0.96	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	480.25	Reach Len. (m)	75.47	84.47	93.41
Crit W.S. (m)	480.55	Flow Area (m2)	1.14	3.05	3.13
E.G. Slope (m/m)	0.031772	Area (m2)	1.14	3.05	3.13
Q Total (m3/s)	23.79	Flow (m3/s)	2.08	15.73	5.98
Top Width (m)	10.30	Top Width (m)	2.07	2.41	5.82
Vel Total (m/s)	3.25	Avg. Vel. (m/s)	1.83	5.16	1.91
Max Chl Dpth (m)	1.36	Hydr. Depth (m)	0.55	1.27	0.54
Conv. Total (m3/s)	133.5	Conv. (m3/s)	11.7	88.2	33.6
Length Wtd. (m)	85.35	Wetted Per. (m)	2.36	2.44	6.05
Min Ch El (m)	478.89	Shear (N/sq m)	150.44	388.46	161.02
Alpha	1.78	Stream Power (N/m s)	275.06	2005.15	308.06
Frctn Loss (m)	7.01	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	0.00	Cum SA (1000 m2)	14.97	5.78	12.83

CROSS SECTION OUTPUT Riv Sta: 6 Profile # 25 yr Storm

E.G. Elev (m)	482.84	Element	Left OB	Channel	Right OB
Vel Head (m)	1.34	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	481.50	Reach Len. (m)	75.47	84.47	93.41
Crit W.S. (m)	481.59	Flow Area (m2)	8.98	6.05	11.63
E.G. Slope (m/m)	0.023665	Area (m2)	8.98	6.05	11.63
Q Total (m3/s)	95.54	Flow (m3/s)	17.23	42.64	35.67
Top Width (m)	23.21	Top Width (m)	12.48	2.41	8.32
Vel Total (m/s)	3.58	Avg. Vel. (m/s)	1.92	7.04	3.07
Max Chl Dpth (m)	2.61	Hydr. Depth (m)	0.72	2.52	1.40
Conv. Total (m3/s)	621.1	Conv. (m3/s)	112.0	277.2	231.9
Length Wtd. (m)	83.45	Wetted Per. (m)	13.89	2.44	8.89
Min Ch El (m)	478.89	Shear (N/sq m)	150.11	574.97	303.58
Alpha	2.05	Stream Power (N/m s)	287.84	4048.64	930.95
Frctn Loss (m)	6.11	Cum Volume (cu m x 10^	0.02	0.01	0.02
C & E Loss (m)	0.02	Cum SA (1000 m2)	20.95	5.78	22.64

CROSS SECTION OUTPUT Riv Sta: 6 Profile # 100 yr Storm

E.G. Elev (m)	483.33	Element	Left OB	Channel	Right OB
Vel Head (m)	1.33	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	482.00	Reach Len. (m)	75.47	84.47	93.41
Crit W.S. (m)	482.41	Flow Area (m2)	15.20	7.25	19.64
E.G. Slope (m/m)	0.021198	Area (m2)	15.20	7.25	19.64
Q Total (m3/s)	134.14	Flow (m3/s)	38.28	54.54	41.32
Top Width (m)	38.48	Top Width (m)	12.48	2.41	23.59
Vel Total (m/s)	3.19	Avg. Vel. (m/s)	2.52	7.52	2.10
Max Chl Dpth (m)	3.11	Hydr. Depth (m)	1.22	3.02	0.83
Conv. Total (m3/s)	921.3	Conv. (m3/s)	262.9	374.6	283.8
Length Wtd. (m)	82.64	Wetted Per. (m)	14.39	2.44	24.32
Min Ch El (m)	478.89	Shear (N/sq m)	219.69	617.04	167.86
Alpha	2.58	Stream Power (N/m s)	553.07	4638.69	353.21
Frctn Loss (m)	5.86	Cum Volume (cu m x 10^	0.07	0.02	0.04
C & E Loss (m)	0.01	Cum SA (1000 m2)	25.35	5.78	29.17

CROSS SECTION INPUT River Station: 7
Description:

Station Elevation Data, num = 35

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
0	488.7	3563.7	85535	488.19	617.1	40158	487.2	5438.9	98403
487.0	56111.7	9225	487.1659						
14.33128	487.5	46915.8	0596	487.671	819.7	2659	487.6	87120.9	2414
488.2	29623.2	9532	488.5344						
27.5768	487.7	57229.1	4978	487.336	630.3	1576	487.3	79231.5	8016
487.4	98132.5	0662	486.6569						
33.09403	486.4	61834.1	8162	486.129	535.6	9498	486.4	89237.7	0682
486.7	2738.9	1814	488.0864						
39.80942	487.9	94941.1	1482	487.522	541.8	5693	487.3	91442.3	7117
487.1	50644.8	4859	487.4432						

46.95822487.522549.88897 487.99853.22802488.052854.88131487.571358.22156487.4432
 63.7201487.665770.65943487.214672.38439486.873377.13106487.001379.81062487.6414

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
0	.06	33.09	.04	35.69	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 33.094 35.695 186.99 190.79 157.72 0.1 0.3

CROSS SECTION OUTPUT Riv Sta: 7 Profile # Storm Event

E.G. Elev (m)	488.23	Element	Left OB	Channel	Right OB
Vel Head (m)	0.93	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	487.30	Reach Len. (m)	186.99	190.79	157.72
Crit W.S. (m)	487.50	Flow Area (m2)	1.54	2.60	4.10
E.G. Slope (m/m)	0.048298	Area (m2)	1.54	2.60	4.10
Q Total (m3/s)	23.79	Flow (m3/s)	2.29	13.94	7.56
Top Width (m)	22.86	Top Width (m)	7.03	2.60	13.22
Vel Total (m/s)	2.89	Avg. Vel. (m/s)	1.48	5.37	1.85
Max Chl Dpth (m)	1.17	Hydr. Depth (m)	0.22	1.00	0.31
Conv. Total (m3/s)	108.3	Conv. (m3/s)	10.4	63.4	34.4
Length Wtd. (m)	181.03	Wetted Per. (m)	7.35	2.69	13.61
Min Ch El (m)	486.13	Shear (N/sq m)	99.45	457.05	142.59
Alpha	2.18	Stream Power (N/m s)	147.42	2452.08	263.20
Frctn Loss (m)	4.80	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	0.05	Cum SA (1000 m2)	15.82	6.26	14.33

CROSS SECTION OUTPUT Riv Sta: 7 Profile # 25 yr Storm

E.G. Elev (m)	488.97	Element	Left OB	Channel	Right OB
Vel Head (m)	1.15	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	487.83	Reach Len. (m)	186.99	190.79	157.72
Crit W.S. (m)	488.18	Flow Area (m2)	8.88	3.96	18.30
E.G. Slope (m/m)	0.055884	Area (m2)	8.88	3.96	18.30
Q Total (m3/s)	95.54	Flow (m3/s)	19.52	30.29	45.73
Top Width (m)	60.80	Top Width (m)	20.84	2.60	37.36
Vel Total (m/s)	3.07	Avg. Vel. (m/s)	2.20	7.65	2.50
Max Chl Dpth (m)	1.70	Hydr. Depth (m)	0.43	1.52	0.49
Conv. Total (m3/s)	404.1	Conv. (m3/s)	82.6	128.1	193.4
Length Wtd. (m)	175.97	Wetted Per. (m)	21.42	2.69	38.38
Min Ch El (m)	486.13	Shear (N/sq m)	227.23	806.42	261.24
Alpha	2.39	Stream Power (N/m s)	499.41	6165.55	652.95
Frctn Loss (m)	4.94	Cum Volume (cu m x 10^	0.02	0.01	0.02
C & E Loss (m)	0.05	Cum SA (1000 m2)	24.07	6.26	26.24

CROSS SECTION OUTPUT Riv Sta: 7 Profile # 100 yr Storm

E.G. Elev (m)	489.20	Element	Left OB	Channel	Right OB
Vel Head (m)	1.24	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	487.96	Reach Len. (m)	186.99	190.79	157.72
Crit W.S. (m)	488.32	Flow Area (m2)	11.74	4.31	23.36
E.G. Slope (m/m)	0.059514	Area (m2)	11.74	4.31	23.36
Q Total (m3/s)	134.14	Flow (m3/s)	30.51	35.92	67.71
Top Width (m)	64.05	Top Width (m)	22.33	2.60	39.11
Vel Total (m/s)	3.40	Avg. Vel. (m/s)	2.60	8.34	2.90
Max Chl Dpth (m)	1.83	Hydr. Depth (m)	0.53	1.66	0.60
Conv. Total (m3/s)	549.9	Conv. (m3/s)	125.1	147.2	277.5
Length Wtd. (m)	176.37	Wetted Per. (m)	22.97	2.69	40.38
Min Ch El (m)	486.13	Shear (N/sq m)	298.24	933.41	337.59
Alpha	2.11	Stream Power (N/m s)	775.37	7785.25	978.61
Frctn Loss (m)	5.04	Cum Volume (cu m x 10^	0.08	0.02	0.04
C & E Loss (m)	0.05	Cum SA (1000 m2)	28.61	6.26	34.11

CROSS SECTION INPUT   River Station: 8
Description:

Station Elevation Data, num = 19

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
5.77	500	7.56	499	9.63	498	12.04	497	15.2	496
44.07	494	52.35	493	71.56	492	73.61	491.87	74.92	491.63
76.11	491.92	78.12	492	86.09	493	90.96	494	94.99	496
96.73	497	98.56	498	100.47	499	102.35	500		

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
5.77	.06	73.61	.04	76.11	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 73.61 76.11 115.18 132.33 137.37 0.1 0.3

CROSS SECTION OUTPUT Riv Sta: 8 Profile # Storm Event

E.G. Elev (m)	493.07	Element	Left OB	Channel	Right OB
Vel Head (m)	0.39	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	492.68	Reach Len. (m)	115.18	132.33	137.37
Crit W.S. (m)	492.79	Flow Area (m2)	5.97	2.30	3.29
E.G. Slope (m/m)	0.029440	Area (m2)	5.97	2.30	3.29
Q Total (m3/s)	23.79	Flow (m3/s)	9.18	9.16	5.45
Top Width (m)	25.04	Top Width (m)	15.11	2.50	7.43
Vel Total (m/s)	2.06	Avg. Vel. (m/s)	1.54	3.99	1.65
Max Chl Dpth (m)	1.05	Hydr. Depth (m)	0.39	0.92	0.44
Conv. Total (m3/s)	138.7	Conv. (m3/s)	53.5	53.4	31.7
Length Wtd. (m)	129.57	Wetted Per. (m)	15.14	2.56	7.47
Min Ch El (m)	491.63	Shear (N/sq m)	113.87	259.21	127.10
Alpha	1.81	Stream Power (N/m s)	175.14	1034.76	210.34

* Frctn Loss (m)	* 7.10	* Cum Volume (cu m x 10^	* 0.01	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.26	* Cum SA (1000 m2)	* 17.10	* 6.60	* 15.75	*

CROSS SECTION OUTPUT Riv Sta: 8 Profile # 25 yr Storm

* E.G. Elev (m)	* 493.97	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.62	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 493.35	* Reach Len. (m)	* 115.18	* 132.33	* 137.37	*
* Crit W.S. (m)	* 493.49	* Flow Area (m2)	* 19.79	* 3.98	* 9.89	*
* E.G. Slope (m/m)	* 0.028267	* Area (m2)	* 19.79	* 3.98	* 9.89	*
* Q Total (m3/s)	* 95.54	* Flow (m3/s)	* 48.46	* 22.43	* 24.65	*
* Top Width (m)	* 38.37	* Top Width (m)	* 24.18	* 2.50	* 11.70	*
* Vel Total (m/s)	* 2.84	* Avg. Vel. (m/s)	* 2.45	* 5.64	* 2.49	*
* Max Chl Dpth (m)	* 1.72	* Hydr. Depth (m)	* 0.82	* 1.59	* 0.85	*
* Conv. Total (m3/s)	* 568.3	* Conv. (m3/s)	* 288.2	* 133.4	* 146.6	*
* Length Wtd. (m)	* 128.09	* Wetted Per. (m)	* 24.23	* 2.56	* 11.80	*
* Min Ch El (m)	* 491.63	* Shear (N/sq m)	* 226.44	* 431.07	* 232.50	*
* Alpha	* 1.50	* Stream Power (N/m s)	* 554.46	* 2431.94	* 579.41	*
* Frctn Loss (m)	* 7.13	* Cum Volume (cu m x 10^	* 0.02	* 0.01	* 0.03	*
* C & E Loss (m)	* 0.43	* Cum SA (1000 m2)	* 26.66	* 6.60	* 29.61	*

CROSS SECTION OUTPUT Riv Sta: 8 Profile # 100 yr Storm

* E.G. Elev (m)	* 494.30	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 0.71	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 493.59	* Reach Len. (m)	* 115.18	* 132.33	* 137.37	*
* Crit W.S. (m)	* 493.73	* Flow Area (m2)	* 25.68	* 4.56	* 12.76	*
* E.G. Slope (m/m)	* 0.028059	* Area (m2)	* 25.68	* 4.56	* 12.76	*
* Q Total (m3/s)	* 134.14	* Flow (m3/s)	* 70.77	* 28.10	* 35.28	*
* Top Width (m)	* 41.45	* Top Width (m)	* 26.11	* 2.50	* 12.84	*
* Vel Total (m/s)	* 3.12	* Avg. Vel. (m/s)	* 2.76	* 6.16	* 2.76	*
* Max Chl Dpth (m)	* 1.96	* Hydr. Depth (m)	* 0.98	* 1.82	* 0.99	*
* Conv. Total (m3/s)	* 800.8	* Conv. (m3/s)	* 422.5	* 167.7	* 210.6	*
* Length Wtd. (m)	* 127.79	* Wetted Per. (m)	* 26.18	* 2.56	* 12.96	*
* Min Ch El (m)	* 491.63	* Shear (N/sq m)	* 269.89	* 490.90	* 271.04	*
* Alpha	* 1.44	* Stream Power (N/m s)	* 743.81	* 3023.85	* 749.09	*
* Frctn Loss (m)	* 6.98	* Cum Volume (cu m x 10^	* 0.08	* 0.02	* 0.05	*
* C & E Loss (m)	* 0.42	* Cum SA (1000 m2)	* 31.40	* 6.60	* 37.68	*

CROSS SECTION INPUT River Station: 9
Description:

Station Elevation Data, num = 19

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
5.57	506	7.33	505	11.27	503	13.68	502	18.78	501
36.81	500	40.37	500	41.39	500	53.46	499	55.86	498.87
57.06	498.68	58.13	498.87	60.65	499	93.21	500	95.41	501
97.04	502	98.4	503	100.74	505	101.8	506		

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
5.57	.06	55.86	.04	58.13	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55.86	58.13	162.4	169.24	151.77	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 9 Profile # Storm Event

* E.G. Elev (m)	* 500.43	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 1.26	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 499.17	* Reach Len. (m)	* 162.40	* 169.24	* 151.77	*
* Crit W.S. (m)	* 499.42	* Flow Area (m2)	* 0.74	* 0.90	* 1.06	*
* E.G. Slope (m/m)	* 0.217097	* Area (m2)	* 0.74	* 0.90	* 1.06	*
* Q Total (m3/s)	* 9.43	* Flow (m3/s)	* 1.73	* 5.57	* 2.14	*
* Top Width (m)	* 14.77	* Top Width (m)	* 4.45	* 2.27	* 8.05	*
* Vel Total (m/s)	* 3.50	* Avg. Vel. (m/s)	* 2.34	* 6.21	* 2.01	*
* Max Chl Dpth (m)	* 0.49	* Hydr. Depth (m)	* 0.17	* 0.39	* 0.13	*
* Conv. Total (m3/s)	* 20.2	* Conv. (m3/s)	* 3.7	* 12.0	* 4.6	*
* Length Wtd. (m)	* 163.01	* Wetted Per. (m)	* 4.46	* 2.30	* 8.06	*
* Min Ch El (m)	* 498.68	* Shear (N/sq m)	* 352.13	* 829.12	* 280.55	*
* Alpha	* 2.02	* Stream Power (N/m s)	* 823.94	* 5150.39	* 564.16	*
* Frctn Loss (m)	* 10.12	* Cum Volume (cu m x 10^	* 0.01	* 0.01	* 0.01	*
* C & E Loss (m)	* 0.11	* Cum SA (1000 m2)	* 18.69	* 7.00	* 16.92	*

CROSS SECTION OUTPUT Riv Sta: 9 Profile # 25 yr Storm

* E.G. Elev (m)	* 501.53	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 2.06	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*
* W.S. Elev (m)	* 499.48	* Reach Len. (m)	* 162.40	* 169.24	* 151.77	*
* Crit W.S. (m)	* 499.90	* Flow Area (m2)	* 2.66	* 1.59	* 5.04	*
* E.G. Slope (m/m)	* 0.237344	* Area (m2)	* 2.66	* 1.59	* 5.04	*
* Q Total (m3/s)	* 42.84	* Flow (m3/s)	* 10.22	* 15.12	* 17.49	*
* Top Width (m)	* 28.40	* Top Width (m)	* 8.14	* 2.27	* 17.99	*
* Vel Total (m/s)	* 4.61	* Avg. Vel. (m/s)	* 3.85	* 9.51	* 3.47	*
* Max Chl Dpth (m)	* 0.80	* Hydr. Depth (m)	* 0.33	* 0.70	* 0.28	*
* Conv. Total (m3/s)	* 87.9	* Conv. (m3/s)	* 21.0	* 31.0	* 35.9	*
* Length Wtd. (m)	* 161.02	* Wetted Per. (m)	* 8.16	* 2.30	* 18.00	*
* Min Ch El (m)	* 498.68	* Shear (N/sq m)	* 758.58	* 1607.14	* 651.25	*
* Alpha	* 1.90	* Stream Power (N/m s)	* 2917.00	* 15291.39	* 2262.11	*
* Frctn Loss (m)	* 9.71	* Cum Volume (cu m x 10^	* 0.03	* 0.01	* 0.03	*
* C & E Loss (m)	* 0.17	* Cum SA (1000 m2)	* 29.28	* 7.00	* 31.87	*

CROSS SECTION OUTPUT Riv Sta: 9 Profile # 100 yr Storm

* E.G. Elev (m)	* 501.70	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (m)	* 2.12	* Wt. n-Val	* 0.060	* 0.040	* 0.060	*

W.S. Elev (m)	499.58	Reach Len. (m)	162.40	169.24	151.77
Crit W.S. (m)	500.07	Flow Area (m2)	3.58	1.83	7.11
E.G. Slope (m/m)	0.220170	Area (m2)	3.58	1.83	7.11
Q Total (m3/s)	59.72	Flow (m3/s)	14.69	18.39	26.64
Top Width (m)	33.09	Top Width (m)	9.40	2.27	21.42
Vel Total (m/s)	4.77	Avg. Vel. (m/s)	4.10	10.06	3.75
Max Chl Dpth (m)	0.90	Hydr. Depth (m)	0.38	0.81	0.33
Conv. Total (m3/s)	127.3	Conv. (m3/s)	31.3	39.2	56.8
Length Wtd. (m)	160.64	Wetted Per. (m)	9.43	2.30	21.43
Min Ch El (m)	498.68	Shear (N/sq m)	819.82	1714.83	716.36
Alpha	1.83	Stream Power (N/m s)	3361.75	17251.54	2684.87
Frctn Loss (m)	9.80	Cum Volume (cu m x 10^	0.08	0.02	0.05
C & E Loss (m)	0.17	Cum SA (1000 m2)	34.28	7.00	40.28

CROSS SECTION INPUT River Station: 10
Description:

Station Elevation Data, num = 23

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
1.58	518	3.41	517	5.35	516	7.52	515	9.9	514
12.98	513	17.37	512	25.64	511	41.38	510	43.75	509.89
45.07	509.67	46.38	509.93	48.99	510	52.96	511	56.97	512
67.53	513	68.2	513	82.99	513	85.66	514	87.46	515
88.88	516	90.26	517	91.56	518				

Mannings n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
1.58	.06	43.75	.04	46.38	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
43.75	46.38	224.51	233.28	223.61	0.1	0.3

CROSS SECTION OUTPUT Riv Sta: 10 Profile # Storm Event

E.G. Elev (m)	510.65	Element	Left OB	Channel	Right OB
Vel Head (m)	0.19	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	510.46	Reach Len. (m)	224.51	233.28	223.61
Crit W.S. (m)	510.46	Flow Area (m2)	2.87	1.76	1.70
E.G. Slope (m/m)	0.018456	Area (m2)	2.87	1.76	1.70
Q Total (m3/s)	9.43	Flow (m3/s)	2.90	4.51	2.02
Top Width (m)	16.64	Top Width (m)	9.58	2.63	4.43
Vel Total (m/s)	1.49	Avg. Vel. (m/s)	1.01	2.57	1.19
Max Chl Dpth (m)	0.79	Hydr. Depth (m)	0.30	0.67	0.38
Conv. Total (m3/s)	69.4	Conv. (m3/s)	21.3	33.2	14.9
Length Wtd. (m)	228.99	Wetted Per. (m)	9.60	2.67	4.49
Min Ch El (m)	509.67	Shear (N/sq m)	54.07	118.91	68.70
Alpha	1.69	Stream Power (N/m s)	54.71	305.20	81.55
Frctn Loss (m)	4.10	Cum Volume (cu m x 10^	0.01	0.01	0.01
C & E Loss (m)	0.01	Cum SA (1000 m2)	20.26	7.57	18.32

CROSS SECTION OUTPUT Riv Sta: 10 Profile # 25 yr Storm

E.G. Elev (m)	511.44	Element	Left OB	Channel	Right OB
Vel Head (m)	0.34	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	511.10	Reach Len. (m)	224.51	233.28	223.61
Crit W.S. (m)	511.10	Flow Area (m2)	12.19	3.44	5.35
E.G. Slope (m/m)	0.017173	Area (m2)	12.19	3.44	5.35
Q Total (m3/s)	42.84	Flow (m3/s)	19.83	13.34	9.67
Top Width (m)	28.53	Top Width (m)	18.92	2.63	6.97
Vel Total (m/s)	2.04	Avg. Vel. (m/s)	1.63	3.88	1.81
Max Chl Dpth (m)	1.43	Hydr. Depth (m)	0.64	1.31	0.77
Conv. Total (m3/s)	326.9	Conv. (m3/s)	151.3	101.8	73.8
Length Wtd. (m)	227.14	Wetted Per. (m)	18.96	2.67	7.11
Min Ch El (m)	509.67	Shear (N/sq m)	108.26	216.72	126.76
Alpha	1.59	Stream Power (N/m s)	176.13	839.98	229.08
Frctn Loss (m)	4.09	Cum Volume (cu m x 10^	0.03	0.01	0.03
C & E Loss (m)	0.03	Cum SA (1000 m2)	32.32	7.57	34.66

CROSS SECTION OUTPUT Riv Sta: 10 Profile # 100 yr Storm

E.G. Elev (m)	511.68	Element	Left OB	Channel	Right OB
Vel Head (m)	0.40	Wt. n-Val	0.060	0.040	0.060
W.S. Elev (m)	511.28	Reach Len. (m)	224.51	233.28	223.61
Crit W.S. (m)	511.28	Flow Area (m2)	15.78	3.92	6.69
E.G. Slope (m/m)	0.017783	Area (m2)	15.78	3.92	6.69
Q Total (m3/s)	59.72	Flow (m3/s)	29.49	16.87	13.36
Top Width (m)	30.77	Top Width (m)	20.43	2.63	7.71
Vel Total (m/s)	2.26	Avg. Vel. (m/s)	1.87	4.30	2.00
Max Chl Dpth (m)	1.61	Hydr. Depth (m)	0.77	1.49	0.87
Conv. Total (m3/s)	447.8	Conv. (m3/s)	221.1	126.5	100.2
Length Wtd. (m)	226.80	Wetted Per. (m)	20.48	2.67	7.87
Min Ch El (m)	509.67	Shear (N/sq m)	134.39	255.75	148.39
Alpha	1.53	Stream Power (N/m s)	251.05	1100.59	296.15
Frctn Loss (m)	4.03	Cum Volume (cu m x 10^	0.08	0.02	0.05
C & E Loss (m)	0.04	Cum SA (1000 m2)	37.63	7.57	43.54

SUMMARY OF MANNING'S N VALUES

River Sta.	n1	n2	n3
10	0.06	0.04	0.06
9	0.06	0.04	0.06
8	0.06	0.04	0.06
7	0.06	0.04	0.06
6	0.06	0.04	0.06

5	0.06	0.04	0.06
4.8	0.06	0.04	0.06
4.6	0.06	0.04	0.06
4.4	0.06	0.04	0.06
4.2	0.06	0.04	0.06
4	0.06	0.04	0.06
3	0.06	0.04	0.06
2.75	0.06	0.04	0.06
2.5	0.06	0.04	0.06
2.25	0.06	0.04	0.06
2	0.06	0.04	0.06
1.5	0.06	0.04	0.06
1	0.06	0.04	0.06

SUMMARY OF REACH LENGTHS

River Sta.	Left	Channel	Right
10	224.51	233.28	223.61
9	162.4	169.24	151.77
8	115.18	132.33	137.37
7	186.99	190.79	157.72
6	75.47	84.47	93.41
5	169	176.96	175.79
4.8	169.58	158.82	139.13
4.6	135.23	139.59	140.8
4.4	154.92	192.59	191.85
4.2	96.26	96.2	99.7
4	173.53	195.31	170.8
3	139.83	141.64	137.17
2.75	72.52	90.36	97.87
2.5	120.7	127.05	118.85
2.25	116.8	108.92	106.61
2	90.46	94.97	85.25
1.5	104.02	100.38	91.36
1			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River Sta.	Contr.	Expan.
10	0.1	0.3
9	0.1	0.3
8	0.1	0.3
7	0.1	0.3
6	0.1	0.3
5	0.1	0.3
4.8	0.1	0.3
4.6	0.1	0.3
4.4	0.1	0.3
4.2	0.1	0.3
4	0.1	0.3
3	0.1	0.3
2.75	0.1	0.3
2.5	0.1	0.3
2.25	0.1	0.3
2	0.1	0.3
1.5	0.1	0.3
1	0.1	0.3

Profile Output - Standard Table 1

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	34.57	427.03	427.81	428.07	428.73	0.098284	5.97	10.06	25.63	2.33
1	123.97	427.03	428.21	428.78	430.38	0.152597	10.14	23.67	38.89	3.14
1	172.11	427.03	428.34	429.01	431.01	0.164125	11.34	28.67	39.53	3.32
1.5	34.57	429.75	431.14	431.17	431.62	0.013961	3.45	13.75	16.56	0.98
1.5	123.97	429.75	432.39	432.39	433.20	0.011296	4.90	40.83	27.87	0.99
1.5	172.11	429.75	432.87	432.87	433.75	0.010340	5.27	55.63	33.55	0.97
2	34.57	432.12	433.06	433.19	433.69	0.040246	4.67	13.25	29.42	1.57
2	123.97	432.12	433.68	433.96	434.67	0.039293	6.51	34.68	37.41	1.69
2	172.11	432.12	433.83	434.23	435.17	0.047180	7.62	40.69	38.34	1.88
2.25	34.57	434.78	436.07	436.20	436.65	0.019460	3.89	12.84	17.47	1.14
2.25	123.97	434.78	436.91	437.33	438.28	0.026604	6.49	31.25	26.64	1.46
2.25	172.11	434.78	437.29	437.72	438.73	0.023535	6.87	42.32	30.32	1.41
2.5	34.57	438.68	439.60	439.86	440.43	0.051478	4.88	10.58	19.79	1.74
2.5	123.97	438.68	440.57	440.82	441.51	0.025107	5.78	36.15	32.60	1.39
2.5	172.11	438.68	440.75	441.00	442.07	0.031670	6.93	42.42	34.90	1.58
2.75	34.57	441.60	442.71	442.71	443.06	0.019369	3.46	16.06	23.73	1.11
2.75	123.97	441.60	443.21	443.62	444.53	0.046970	7.07	29.40	29.35	1.84
2.75	172.11	441.60	443.64	443.95	444.82	0.031582	6.87	43.10	33.77	1.58
3	34.57	444.99	446.30	446.65	447.49	0.052389	6.31	8.31	8.95	1.84
3	123.97	444.99	447.86	448.28	449.28	0.025703	7.71	29.50	18.71	1.48
3	172.11	444.99	446.87	446.87	457.64	0.292766	19.37	13.76	11.19	4.64
4	28.96	451.63	452.84	453.04	453.40	0.019824	3.93	12.99	27.89	1.15
4	98.46	451.63	453.34	453.68	454.45	0.032516	6.38	29.94	36.74	1.57
4	136.57	451.63	458.75		458.76	0.000054	0.68	360.63	63.10	0.08

4.2		28.96	454.72	455.64	455.86	456.37	0.052168	4.99	9.27	16.20	1.75
4.2		98.46	454.72	456.56	456.80	457.48	0.029681	6.19	28.71	27.24	1.50
4.2		136.57	454.72	458.72	457.10	458.80	0.001286	2.21	130.37	64.70	0.36
4.4		28.96	460.68	461.87	461.92	462.20	0.022190	3.85	14.88	26.91	1.19
4.4		98.46	460.68	462.37	462.57	463.15	0.035286	6.26	30.07	32.16	1.59
4.4		136.57	460.68	462.68	462.83	463.47	0.028379	6.33	40.32	34.00	1.47
4.6		28.96	464.87	465.95	465.95	466.55	0.046103	5.36	11.01	21.49	1.70
4.6		98.46	464.87	466.66	466.71	467.11	0.023389	5.46	40.38	48.41	1.32
4.6		136.57	464.87	466.81	466.92	467.40	0.028552	6.36	47.56	50.97	1.48
4.8		28.96	470.63	471.88	471.93	472.47	0.031942	4.72	10.82	16.60	1.43
4.8		98.46	470.63	471.98	471.98	477.01	0.246761	13.95	12.64	17.83	4.03
4.8		136.57	470.63	471.99	471.99	481.53	0.467400	19.24	12.72	17.89	5.54
5		28.96	476.21	477.45	477.77	478.38	0.034602	5.13	9.61	26.42	1.52
5		98.46	476.21	479.13	478.41	479.31	0.003256	2.85	63.71	32.70	0.54
5		136.57	476.21	482.62	478.66	482.66	0.000270	1.40	177.69	32.70	0.18
6		23.79	478.89	480.25	480.55	481.21	0.031772	5.16	7.31	10.30	1.46
6		95.54	478.89	481.50	481.59	482.84	0.023665	7.04	26.67	23.21	1.42
6		134.14	478.89	482.00	482.41	483.33	0.021198	7.52	42.09	38.48	1.38
7		23.79	486.13	487.30	487.50	488.23	0.048298	5.37	8.24	22.86	1.71
7		95.54	486.13	487.83	488.18	488.97	0.055884	7.65	31.14	60.80	1.98
7		134.14	486.13	487.96	488.32	489.20	0.059514	8.34	39.40	64.05	2.07
8		23.79	491.63	492.68	492.79	493.07	0.029440	3.99	11.55	25.04	1.33
8		95.54	491.63	493.35	493.49	493.97	0.028267	5.64	33.66	38.37	1.43
8		134.14	491.63	493.59	493.73	494.30	0.028059	6.16	43.00	41.45	1.46
9		9.43	498.68	499.17	499.42	500.43	0.217097	6.21	2.70	14.77	3.16
9		42.84	498.68	499.48	499.90	501.53	0.237344	9.51	9.28	28.40	3.63
9		59.72	498.68	499.58	500.07	501.70	0.220170	10.06	12.52	33.09	3.58
10		9.43	509.67	510.46	510.46	510.65	0.018456	2.57	6.33	16.64	1.00
10		42.84	509.67	511.10	511.10	511.44	0.017173	3.88	20.98	28.53	1.08
10		59.72	509.67	511.28	511.28	511.68	0.017783	4.30	26.40	30.77	1.12

Profile Output - Standard Table 2

River Sta.	E.G. Elev (m)	W.S. Elev (m)	Vel Head (m)	Frctn Loss (m)	C & E Loss (m)	Q Left (m3/s)	Q Channel (m3/s)	Q Right (m3/s)	Top Width (m)
1	428.73	427.81	0.91	2.85	0.04	0.07	12.69	21.81	25.63
1	430.38	428.21	2.17	2.68	0.14	0.33	34.27	89.37	38.89
1	431.01	428.34	2.67	2.54	0.18	0.47	42.93	128.71	39.53
1.5	431.62	431.14	0.48	2.03	0.04	2.57	26.33	5.67	16.56
1.5	433.20	432.39	0.81	1.41	0.10	14.66	74.34	34.97	27.87
1.5	433.75	432.87	0.88	1.35	0.09	21.63	95.26	55.23	33.55
2	433.69	433.06	0.63	2.96	0.00	1.23	16.85	16.49	29.42
2	434.67	433.68	0.99	3.50	0.11	5.85	39.41	78.71	37.41
2	435.17	433.83	1.33	3.53	0.03	8.36	50.99	112.77	38.34
2.25	436.65	436.07	0.58	3.70	0.07	6.00	24.73	3.84	17.47
2.25	438.28	436.91	1.37	3.19	0.04	31.97	70.50	21.50	26.64
2.25	438.73	437.29	1.44	3.34	0.01	49.50	88.91	33.70	30.32
2.5	440.43	439.60	0.83	2.59	0.05	6.94	20.95	6.68	19.79
2.5	441.51	440.57	0.94	2.91	0.12	36.23	54.74	33.00	32.60
2.5	442.07	440.75	1.32	2.74	0.01	51.74	72.61	47.76	34.90
2.75	443.06	442.71	0.35	4.18	0.25	10.97	15.28	8.31	23.73
2.75	444.53	443.21	1.33	4.72	0.03	40.95	46.88	36.13	29.35
2.75	444.82	443.64	1.18	9.94	2.88	58.03	58.77	55.31	33.77
3	447.49	446.30	1.19	5.85	0.06	0.13	14.63	19.81	8.95
3	449.28	447.86	1.42	5.14	0.03	1.36	41.13	81.48	18.71
3	457.64	446.87	10.77	3.88	0.65	0.93	66.42	104.77	11.19
4	453.40	452.84	0.56	2.92	0.05	7.96	19.81	1.19	27.89
4	454.45	453.34	1.11	3.01	0.02	46.30	45.82	6.34	36.74
4	458.76	458.75	0.01	0.05	1.08	106.73	20.61	9.23	63.10
4.2	456.37	455.64	0.72	5.80	0.04	7.99	12.65	8.32	16.20
4.2	457.48	456.56	0.92	5.66	0.01	31.75	33.12	33.58	27.24
4.2	458.80	458.72	0.09	0.01	0.02	41.91	26.49	68.17	64.70
4.4	462.20	461.87	0.33	4.26	0.08	13.70	9.35	5.91	26.91
4.4	463.15	462.37	0.78	3.92	0.03	56.08	22.28	20.11	32.16
4.4	463.47	462.68	0.78	3.92	0.02	81.31	26.96	28.31	34.00
4.6	466.55	465.95	0.60	13.62	0.50	13.39	8.61	6.96	21.49
4.6	467.11	466.66	0.45	8.52	1.37	43.20	14.98	40.28	48.41
4.6	467.40	466.81	0.60	11.44	2.68	58.78	18.93	58.87	50.97
4.8	472.47	471.88	0.59	5.80	0.10	8.84	11.93	8.19	16.60
4.8	477.01	471.98	5.02	7.48	1.39	31.13	38.55	28.78	17.83
4.8	481.53	471.99	9.54			43.23	53.37	39.97	17.89
5	478.38	477.45	0.92	2.83	0.01	4.47	18.65	5.84	26.42
5	479.31	479.13	0.17	1.82	0.48	55.52	25.34	17.60	32.70
5	482.66	482.62	0.04	0.18	0.95	87.81	27.65	21.12	32.70
6	481.21	480.25	0.96	7.01	0.00	2.08	15.73	5.98	10.30
6	482.84	481.50	1.34	6.11	0.02	17.23	42.64	35.67	23.21
6	483.33	482.00	1.33	5.86	0.01	38.28	54.54	41.32	38.48
7	488.23	487.30	0.93	4.80	0.05	2.29	13.94	7.56	22.86
7	488.97	487.83	1.15	4.94	0.05	19.52	30.29	45.73	60.80

7	489.20	487.96	1.24	5.04	0.05	30.51	35.92	67.71	64.05
8	493.07	492.68	0.39	7.10	0.26	9.18	9.16	5.45	25.04
8	493.97	493.35	0.62	7.13	0.43	48.46	22.43	24.65	38.37
8	494.30	493.59	0.71	6.98	0.42	70.77	28.10	35.28	41.45
9	500.43	499.17	1.26	10.12	0.11	1.73	5.57	2.14	14.77
9	501.53	499.48	2.06	9.71	0.17	10.22	15.12	17.49	28.40
9	501.70	499.58	2.12	9.80	0.17	14.69	18.39	26.64	33.09
10	510.65	510.46	0.19	4.10	0.01	2.90	4.51	2.02	16.64
10	511.44	511.10	0.34	4.09	0.03	19.83	13.34	9.67	28.53
10	511.68	511.28	0.40	4.03	0.04	29.49	16.87	13.36	30.77

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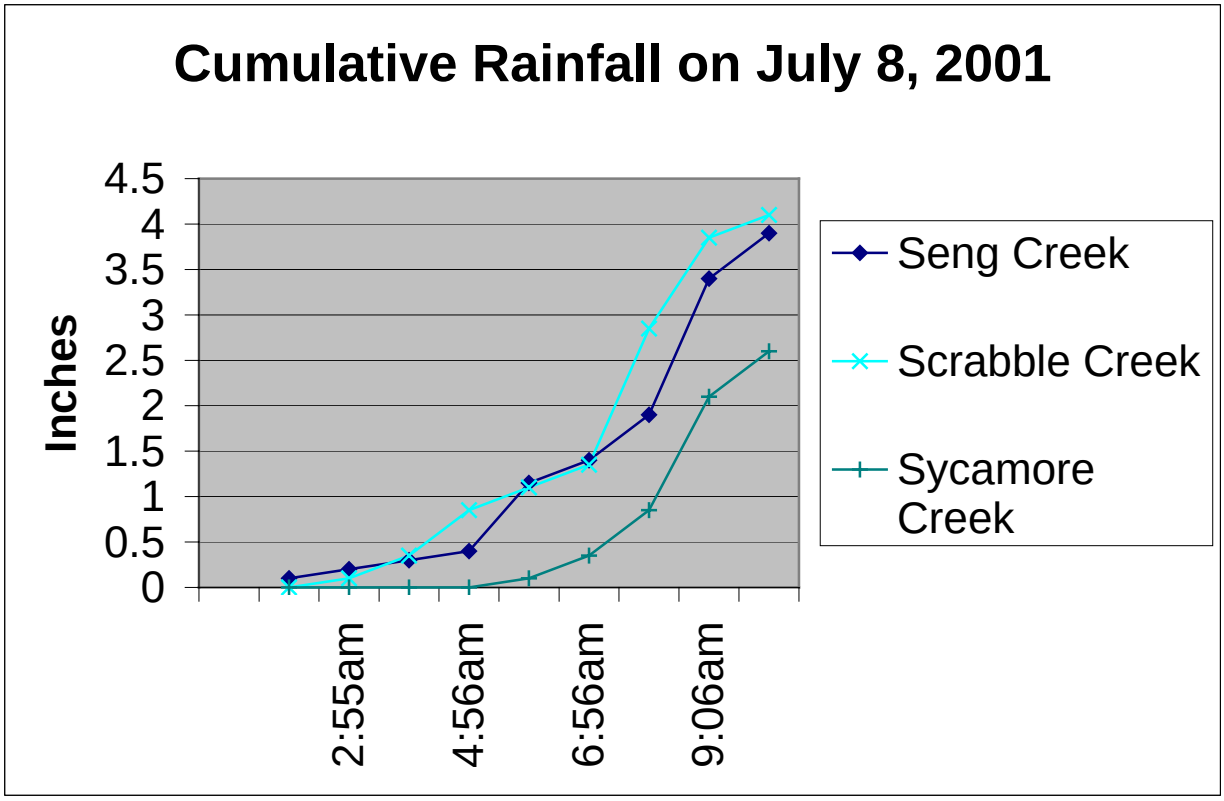
FATT Run-off Analyses

PART III - Appendices


Cumulative Rainfall on July 8, 2001
Inches
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2:55am
4:56am
6:56am
9:06am
Seng Creek
Scrabble Creek
Sycamore Creek

Runoff Conversion to CSM ($ft^3/sec/mile^2$)

Seng Creek (Event Storm = 3.9 inches)

Event Storm - Scenario 1 (w/ Mining, w/ Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	2595	5.36	484.1
Node 2C	2297	4.64	495.0
Node 3C	1995	3.93	507.6
Node 4C	1440	2.8	514.3
Node 5C	713	1.32	540.2

Event Storm - Scenario 2 (w/ Mining, w/o Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	2451	5.36	457.3
Node 2C	2171	4.64	467.9
Node 3C	1883	3.93	479.1
Node 4C	1364	2.8	487.1
Node 5C	686	1.32	519.7

Event Storm - Scenario 3 (w/ Reclaimed Mining, w/o Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	2379	5.36	443.8
Node 2C	2097	4.64	451.9
Node 3C	1810	3.93	460.6
Node 4C	1293	2.8	461.8
Node 5C	618	1.32	468.2

Event Storm - Scenario 4 (w/o Mining, w/o Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	2457	5.36	458.4
Node 2C	2190	4.64	472.0
Node 3C	1828	3.93	465.1
Node 4C	1374	2.8	490.7
Node 5C	705	1.32	534.1

Scrabble Creek (Event Storm = 4.1 inches)

Event Storm - Scenario 1 (w/Mining, w/Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	2045	4.18	489.2
Node 2C	1803	3.62	498.1
Node 3C	938	1.91	491.1
Node 4C	203	0.4	507.5
Node 5C	338	0.63	536.5
Node 6C	134	0.25	536.0
Node 7C	594	1.09	545.0

Event Storm - Scenario 2 (w/ Mining, w/o Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	1970	4.18	471.3
Node 2C	1738	3.62	480.1
Node 3C	928	1.91	485.9
Node 4C	203	0.4	507.5
Node 5C	338	0.63	536.5
Node 6C	134	0.25	536.0
Node 7C	571	1.09	523.9

Event Storm - Scenario 3 (w/ Reclaimed Mining, w/o Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	1663	4.18	397.8
Node 2C	1426	3.62	393.9
Node 3C	767	1.91	401.6
Node 4C	171	0.4	427.5
Node 5C	278	0.63	441.3
Node 6C	113	0.25	452.0
Node 7C	470	1.09	431.2

Event Storm - Scenario 4 (w/o Mining, w/o Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	1802	4.18	431.1
Node 2C	1533	3.62	423.5
Node 3C	818	1.91	428.3
Node 4C	173	0.4	432.5
Node 5C	279	0.63	442.9
Node 6C	112	0.25	448.0
Node 7C	503	1.09	461.5

Sycamore Creek (Event Storm = 2.6 inches)

Event Storm - Scenario 1 (w/ Mining, w/ Logging)

Node	Runoff	Area (mi^2)	CSM
Node 1C	1211	5.08	238.4

Comparison of Drainage Delineations Areas using LIDAR and DEM Data

Seng Creek Drainage Area

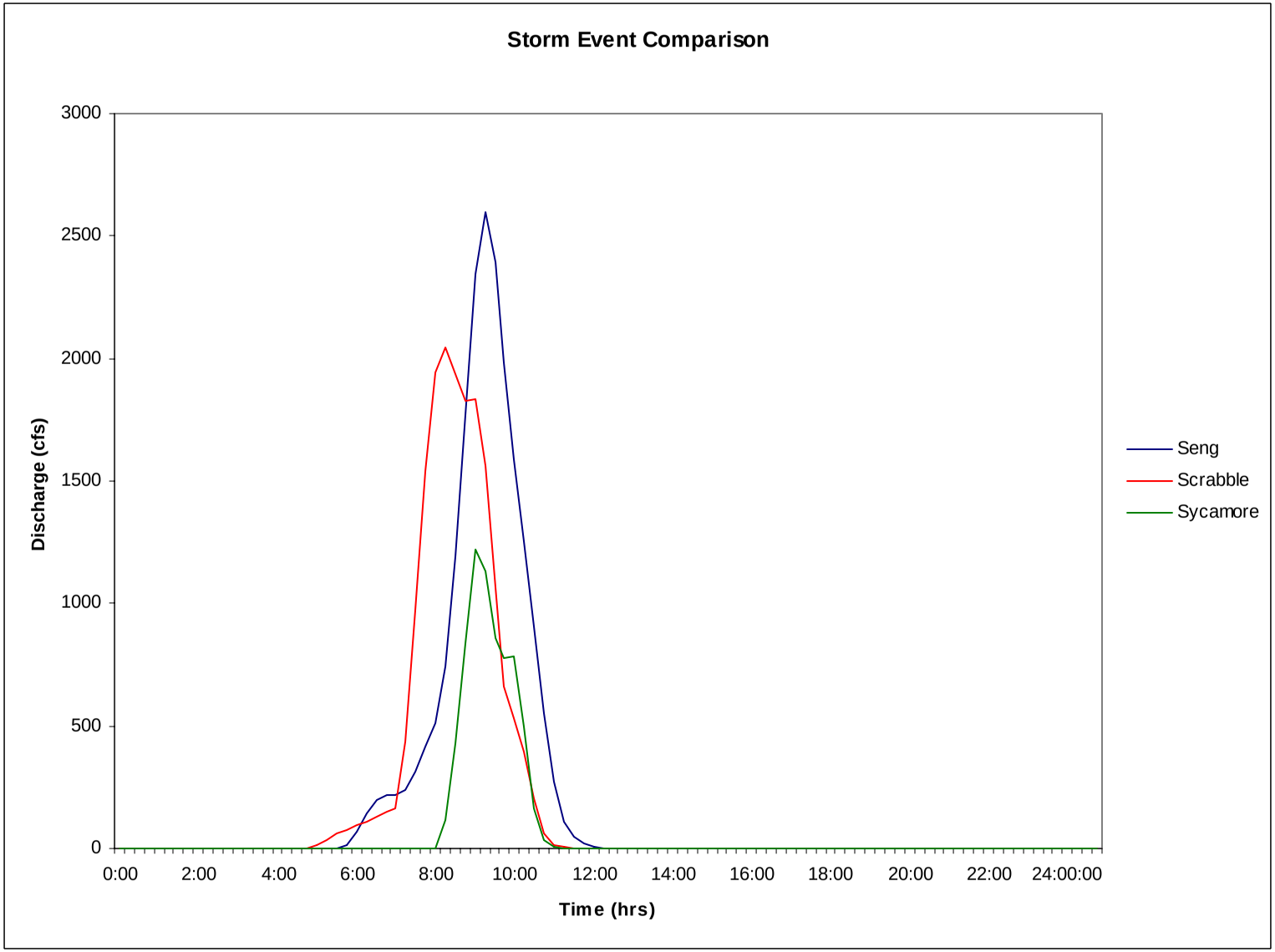
LIDAR	30m DEM
0.72	0.70
0.71	0.84
1.13	0.99
0.88	0.86
0.60	0.61
0.60	0.54
0.72	0.97
5.4 sq miles	*5.5 sq miles*
3430 acres	*3526 acres*

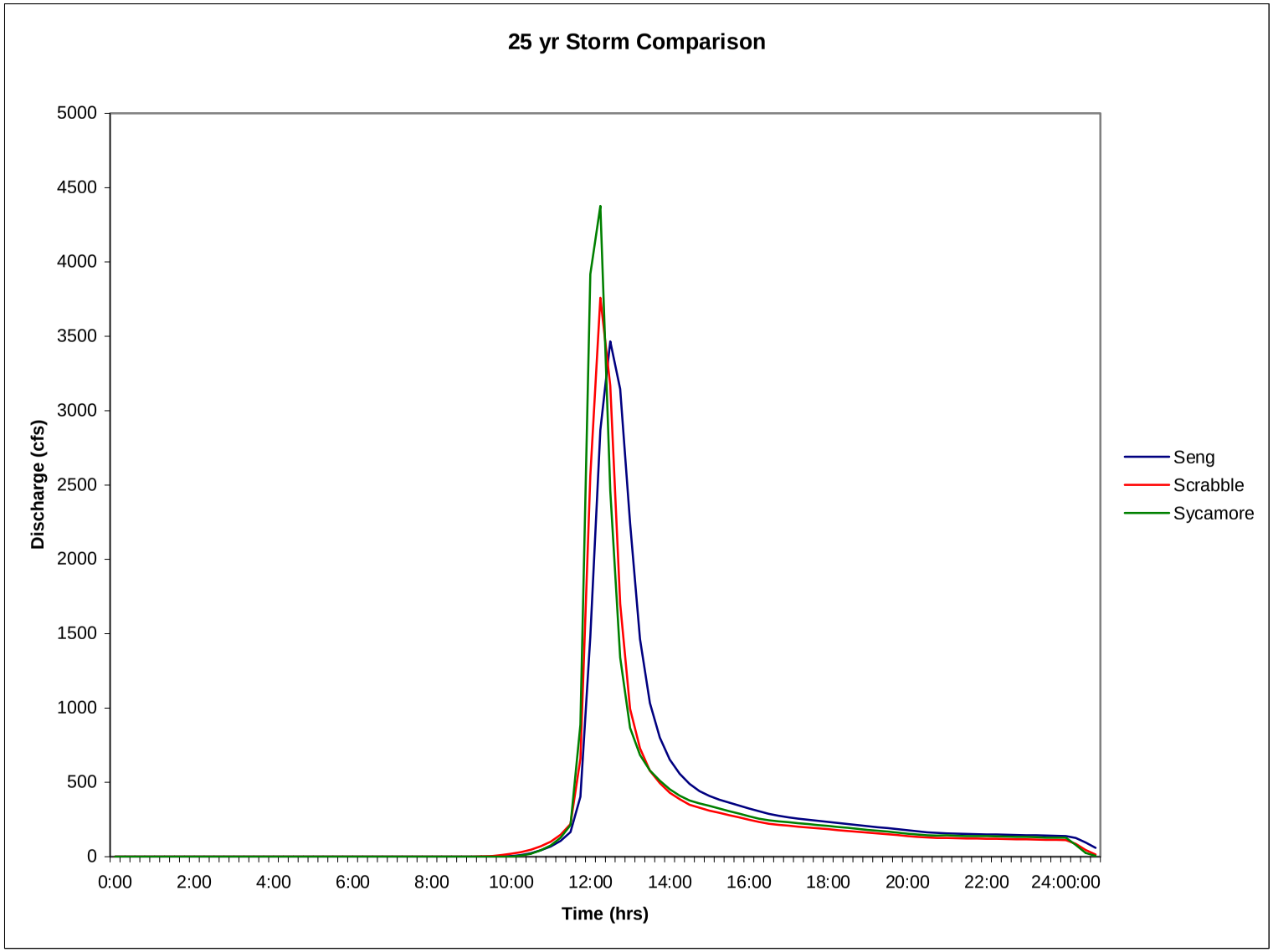
Scrabble Creek Drainage Area

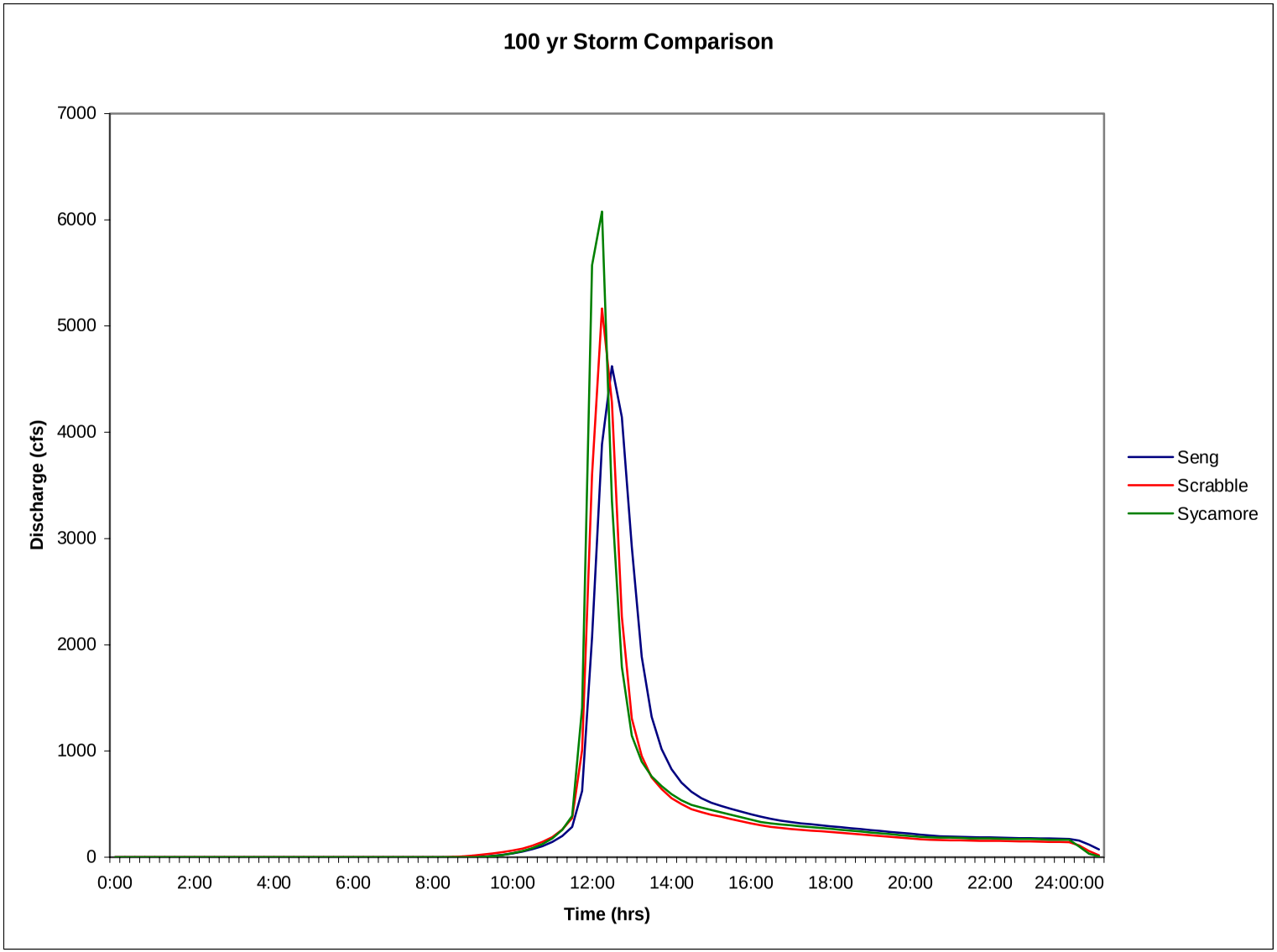
LIDAR	30m DEM	10m DEM
0.69		0.78
0.76		0.74
0.43		0.41
0.45		0.44
0.40		0.41
0.63		0.64
0.25		0.25
0.57		0.55
4.2 sq miles	*4.2 sq miles*	*4.2 sq miles*
2675 acres	*2662 acres*	*2701 acres*

Sycamore Creek Drainage Area

LIDAR
0.81
0.42
0.71
1.08
0.87
1.19
5.1 sq miles
3251 acres


Storm Event Comparison
3000
2500
2000
1500
1000
500
0
Discharge (cfs)
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00:00
Time (hrs)
Seng
Scrabble
Sycamore


25 yr Storm Comparison
Discharge (cfs)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00:00
Time (hrs)
Seng
Scrabble
Sycamore


100 yr Storm Comparison
7000
6000
5000
4000
3000
2000
1000
0
Discharge (cfs)
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00:00
Time (hrs)
Seng
Scrabble
Sycamore

Chapter 2 Estimating runoff

NRCS Runoff Curve Number method

The NRCS Runoff Curve Number (CN) method is described in detail in NEH-4 (SCS 1985). The NRCS runoff equation is

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S} \qquad \text{[eq. 2-1]}$$

where

Q = runoff (in)
P = rainfall (in)
S = potential maximum retention after runoff begins (in)
I_a = initial abstraction (in)

Initial abstraction (I_a) is all losses before runoff begins. It includes water retained in surface depressions, water intercepted by vegetation, evaporation, and infiltration. I_a is highly variable but generally is correlated with soil and cover parameters. Through studies of many small agricultural watersheds, I_a was found to be approximated by the following empirical equation:

$$I_a = 0.2S \qquad \text{[eq. 2-2]}$$

By removing I_a as an independent parameter, this approximation allows use of a combination of S and P to produce a unique runoff amount. Substituting equation 2-2 into equation 2-1 gives

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} \qquad \text{[eq. 2-3]}$$

S is related to the soil and cover conditions of the watershed through the CN. CN has a range of 0 to 100, and S is related to CN by

$$S = \frac{100}{CN} - 10 \qquad \text{[eq. 2-4]}$$

Figure 2-1 and table 2-1 solve equations 2-3 and 2-4 for a range of CN's and rainfall.

Factors considered in determining runoff curve numbers

The major factors that determine CN are the hydrologic soil group (HSG), cover type, treatment, hydrologic condition, and antecedent runoff condition (ARC). Another factor considered is whether impervious areas outlet directly to the drainage system (connected) or whether the flow spreads over pervious areas before entering the drainage system (unconnected). Figure 2-2 is provided to aid in selecting the appropriate figure or table for determining curve numbers.

CN's in table 2-2 (a to d) represent average antecedent runoff condition for urban, cultivated agricultural, other agricultural, and arid and semiarid rangeland uses. Table 2-2 assumes impervious areas are directly connected. The following sections explain how to determine CN's and how to modify them for urban conditions.

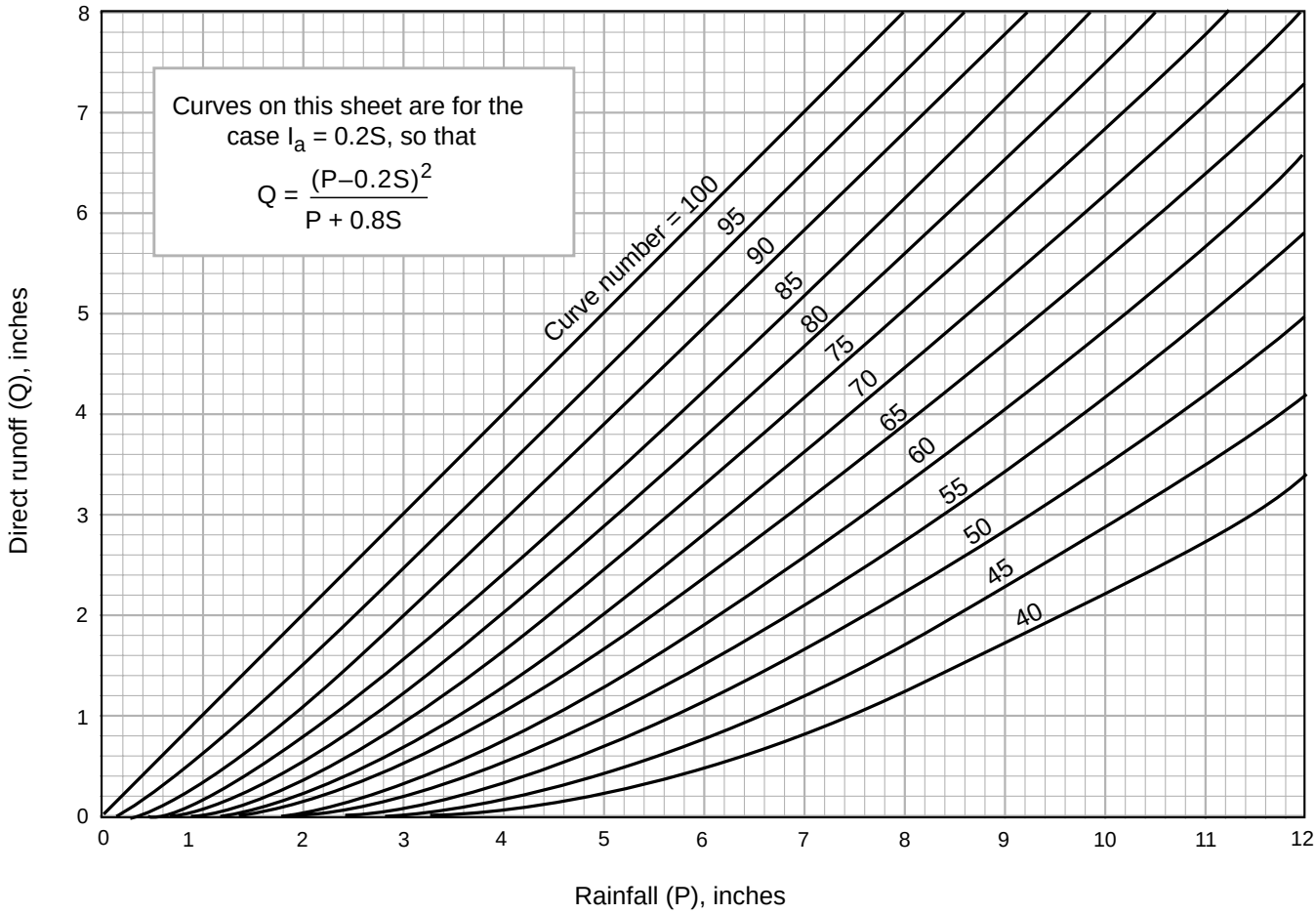
Hydrologic soil groups

Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSG's (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. Appendix A defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of interest may be identified from a soil survey report, which can be obtained from local NRCS offices or soil and water conservation district offices.

Most urban areas are only partially covered by impervious surfaces: the soil remains an important factor in runoff estimates. Urbanization has a greater effect on runoff in watersheds with soils having high infiltration rates (sands and gravels) than in watersheds predominantly of silts and clays, which generally have low infiltration rates.

Any disturbance of a soil profile can significantly change its infiltration characteristics. With urbanization, native soil profiles may be mixed or removed or fill material from other areas may be introduced. Therefore, a method based on soil texture is given in appendix A for determining the HSG classification for disturbed soils.

Figure 2-1 Solution of runoff equation.



Cover type

Table 2-2 addresses most cover types, such as vegetation, bare soil, and impervious surfaces. There are a number of methods for determining cover type. The most common are field reconnaissance, aerial photographs, and land use maps.

Treatment

Treatment is a cover type modifier (used only in table 2-2b) to describe the management of cultivated agricultural lands. It includes mechanical practices, such as contouring and terracing, and management practices, such as crop rotations and reduced or no tillage.

Hydrologic condition

*Hydrologic condition i*ndicates the effects of cover type and treatment on infiltration and runoff and is generally estimated from density of plant and residue cover on sample areas. *Good* hydrologic condition indicates that the soil usually has a low runoff potential for that specific hydrologic soil group, cover type, and treatment. Some factors to consider in estimating the effect of cover on infiltration and runoff are (a) canopy or density of lawns, crops, or other vegetative areas; (b) amount of year-round cover; (c) amount of grass or close-seeded legumes in rotations; (d) percent of residue cover; and (e) degree of surface roughness.

Table 2-1 Runoff depth for selected CN's and rainfall amounts [1/]

Rainfall	Runoff depth for curve number of—												
	40	45	50	55	60	65	70	75	80	85	90	95	98
	inches												
1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.17	0.32	0.56	0.79
1.2	.00	.00	.00	.00	.00	.00	.03	.07	.10	5.27	.46	.74	.99
1.4	.00	.00	.00	.00	.00	.02	.06	.13	.24	.39	.61	.92	1.18
1.6	.00	.00	.00	.00	.01	.05	.11	.20	.34	.52	.76	1.11	1.38
1.8	.00	.00	.00	.00	.03	.09	.17	.29	.44	.65	.93	1.29	1.58
2.0	.00	.00	.00	.02	.06	.14	.24	.38	.56	.80	1.09	1.48	1.77
2.5	.00	.00	.02	.08	.17	.30	.46	.65	.89	1.18	1.53	1.96	2.27
3.0	.00	.02	.09	.19	.33	.51	.71	.96	1.25	1.59	1.98	2.45	2.77
3.5	.02	.08	.20	.35	.53	.75	1.01	1.30	1.64	2.02	2.45	2.94	3.27
4.0	.06	.18	.33	.53	.76	1.03	1.33	1.67	2.04	2.46	2.92	3.43	3.77
4.5	.14	.30	.50	.74	1.02	1.33	1.67	2.05	2.46	2.91	3.40	3.92	4.26
5.0	.24	.44	.69	.98	1.30	1.65	2.04	2.45	2.89	3.37	3.88	4.42	4.76
6.0	.50	.80	1.14	1.52	1.92	2.35	2.81	3.28	3.78	4.30	4.85	5.41	5.76
7.0	.84	1.24	1.68	2.12	2.60	3.10	3.62	4.15	4.69	5.25	5.82	6.41	6.76
8.0	1.25	1.74	2.25	2.78	3.33	3.89	4.46	5.04	5.63	6.21	6.81	7.40	7.76
9.0	1.71	2.29	2.88	3.49	4.10	4.72	5.33	5.95	6.57	7.18	7.79	8.40	8.76
10.0	2.23	2.89	3.56	4.23	4.90	5.56	6.22	6.88	7.52	8.16	8.78	9.40	9.76
11.0	2.78	3.52	4.26	5.00	5.72	6.43	7.13	7.81	8.48	9.13	9.77	10.39	10.76
12.0	3.38	4.19	5.00	5.79	6.56	7.32	8.05	8.76	9.45	10.11	10.76	11.39	11.76
13.0	4.00	4.89	5.76	6.61	7.42	8.21	8.98	9.71	10.42	11.10	11.76	12.39	12.76
14.0	4.65	5.62	6.55	7.44	8.30	9.12	9.91	10.67	11.39	12.08	12.75	13.39	13.76
15.0	5.33	6.36	7.35	8.29	9.19	10.04	10.85	11.63	12.37	13.07	13.74	14.39	14.76

[1/] Interpolate the values shown to obtain runoff depths for CN's or rainfall amounts not shown.

Figure 2-2 Flow chart for selecting the appropriate figure or table for determining runoff curve numbers.

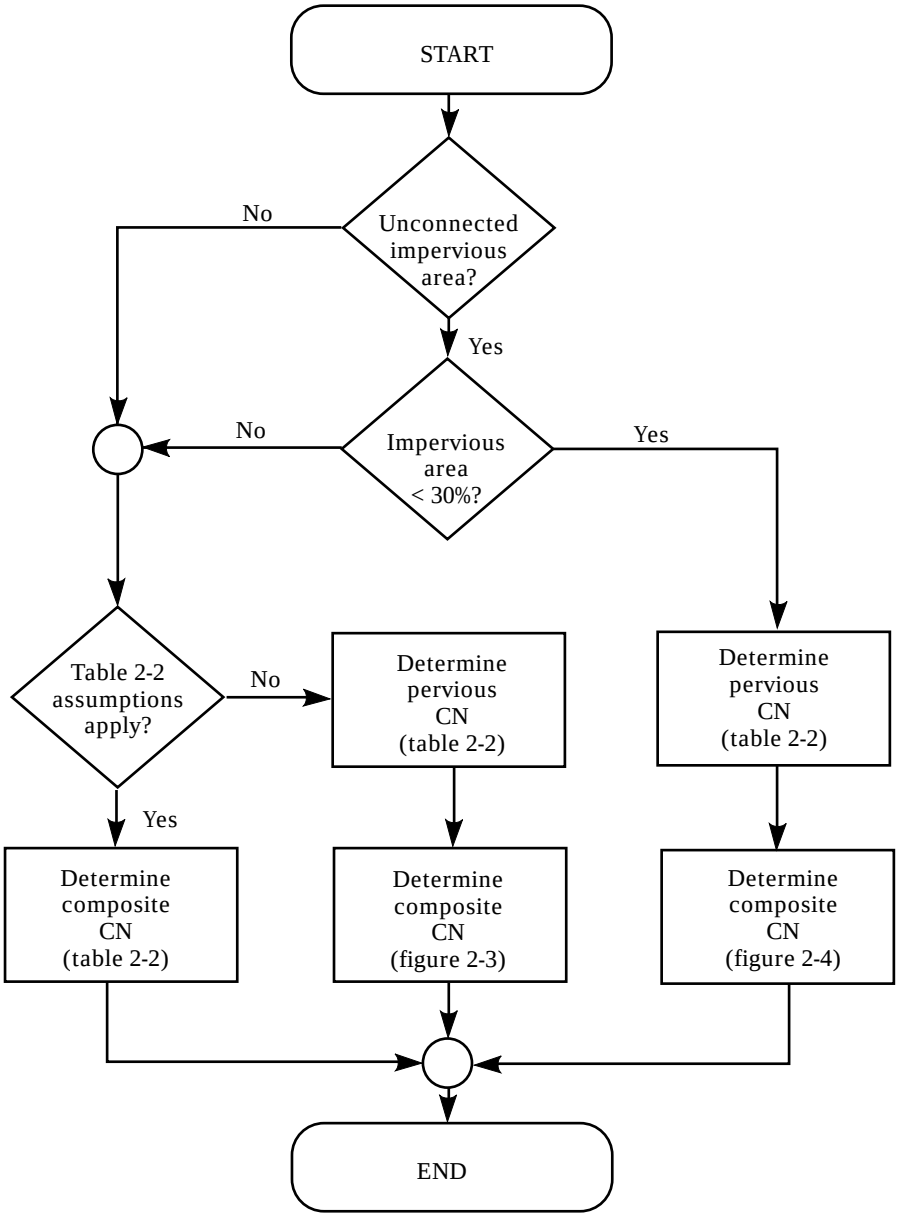


Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]	77	86	91	94	
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

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

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1/]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2/]	Hydrologic condition [3/]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2s

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing . [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and I_a, = 0.2S.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

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

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

Antecedent runoff condition

The index of runoff potential before a storm event is the antecedent runoff condition (ARC). ARC is an attempt to account for the variation in CN at a site from storm to storm. CN for the average ARC at a site is the median value as taken from sample rainfall and runoff data. The CN's in table 2-2 are for the average ARC, which is used primarily for design applications. See NEH-4 (SCS 1985) and Rallison and Miller (1981) for more detailed discussion of storm-tostorm variation and a demonstration of upper and lower enveloping curves.

Urban impervious area modifications

Several factors, such as the percentage of impervious area and the means of conveying runoff from impervious areas to the drainage system, should be considered in computing CN for urban areas (Rawls et al., 1981). For example, do the impervious areas connect directly to the drainage system, or do they outlet onto lawns or other pervious areas where infiltration can occur?

Connected impervious areas — An impervious area is considered connected if runoff from it flows directly into the drainage system. It is also considered connected if runoff from it occurs as concentrated shallow flow that runs over a pervious area and then into the drainage system.

Urban CN's (table 2-2a) were developed for typical land use relationships based on specific assumed percentages of impervious area. These CN vales were developed on the assumptions that (a) pervious urban areas are equivalent to pasture in good hydrologic condition and (b) impervious areas have a CN of 98 and are directly connected to the drainage system. Some assumed percentages of impervious area are shown in table 2-2a

If all of the impervious area is directly connected to the drainage system, but the impervious area percentages or the pervious land use assumptions in table 2-2a are not applicable, use figure 2-3 to compute a composite CN. For example, table 2-2a gives a CN of 70 for a 1/2-acre lot in HSG B, with assumed impervious area of 25 percent. However, if the lot has 20 percent impervious area and a pervious area CN of 61, the composite CN obtained from figure 2-3 is 68. The CN difference between 70 and 68 reflects the difference in percent impervious area.

Unconnected impervious areas — Runoff from these areas is spread over a pervious area as sheet flow. To determine CN when all or part of the impervious area is not directly connected to the drainage system, (1) use figure 2-4 if total impervious area is less than 30 percent or (2) use figure 2-3 if the total impervious area is equal to or greater than 30 percent, because the absorptive capacity of the remaining pervious areas will not significantly affect runoff.

When impervious area is less than 30 percent, obtain the composite CN by entering the right half of figure 2-4 with the percentage of total impervious area and the ratio of total unconnected impervious area to total impervious area. Then move left to the appropriate pervious CN and read down to find the composite CN. For example, for a 1/2-acre lot with 20 percent total impervious area (75 percent of which is unconnected) and pervious CN of 61, the composite CN from figure 2-4 is 66. If all of the impervious area is connected, the resulting CN (from figure 2-3) would be 68.

Figure 2-3 Composite CN with connected impervious area.

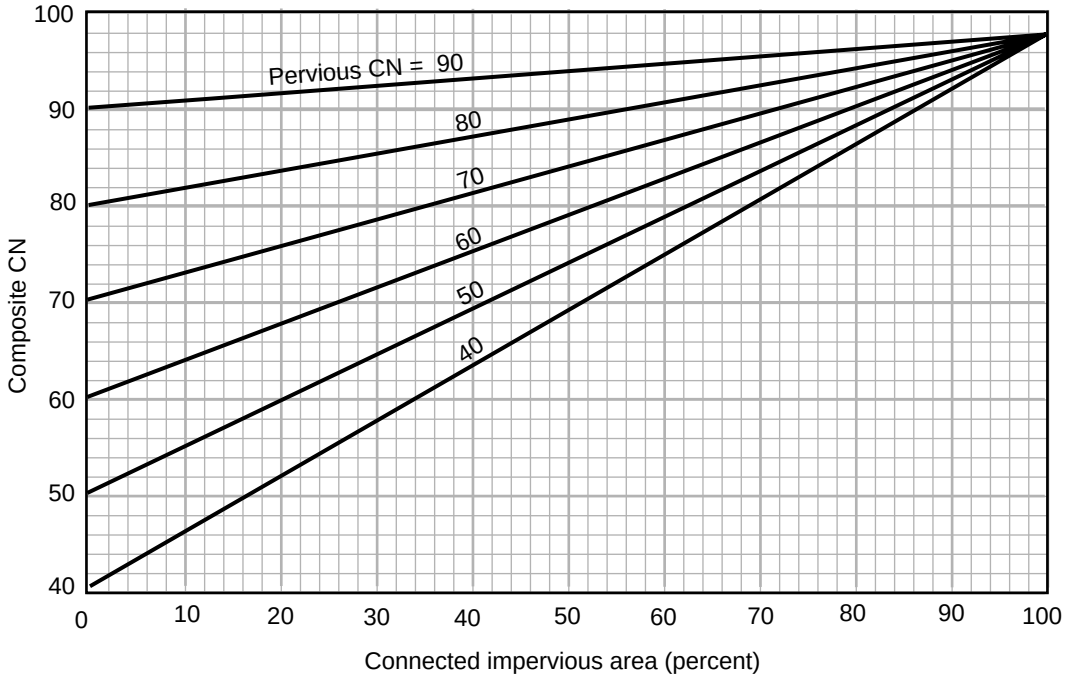
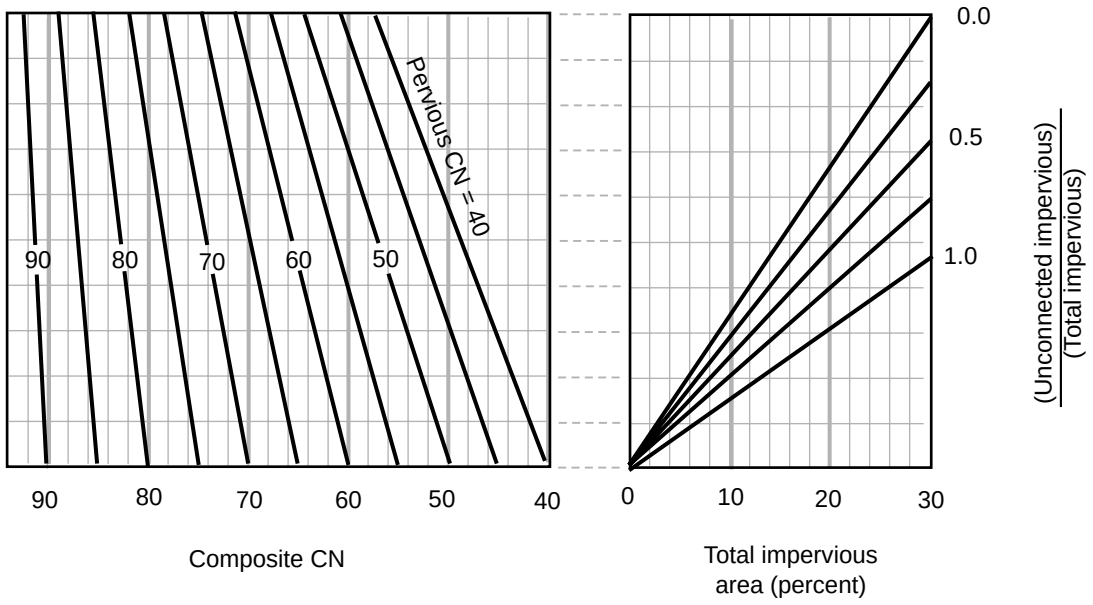


Figure 2-4 Composite CN with unconnected impervious areas and total impervious area less than 30%



Runoff

When CN and the amount of rainfall have been determined for the watershed, determine runoff by using figure 2-1, table 2-1, or equations 2-3 and 2-4. The runoff is usually rounded to the nearest hundredth of an inch.

Limitations

- Curve numbers describe average conditions that are useful for design purposes. If the rainfall event used is a historical storm, the modeling accuracy decreases.

- Use the runoff curve number equation with caution when recreating specific features of an actual storm. The equation does not contain an expression for time and, therefore, does not account for rainfall duration or intensity.

- The user should understand the assumption reflected in the initial abstraction term (I_a) and should ascertain that the assumption applies to the situation. I_a, which consists of interception, initial infiltration, surface depression storage, evapotranspiration, and other factors, was generalized as 0.2S based on data from agricultural watersheds (S is the potential maximum retention after runoff begins). This approximation can be especially important in an urban application because the combination of impervious areas with pervious areas can imply a significant initial loss that may not take place. The opposite effect, a greater initial loss, can occur if the impervious areas have surface depressions that store some runoff. To use a relationship other than $I_a = 0.2S$, one must redevelop equation 2-3, figure 2-1, table 2-1, and table 2-2 by using the original rainfall-runoff data to establish new S or CN relationships for each cover and hydrologic soil group.

- Runoff from snowmelt or rain on frozen ground cannot be estimated using these procedures.

- The CN procedure is less accurate when runoff is less than 0.5 inch. As a check, use another procedure to determine runoff.

- The NRCS runoff procedures apply only to direct surface runoff: do not overlook large sources of subsurface flow or high ground water levels that contribute to runoff. These conditions are often related to HSG A soils and forest areas that have been assigned relatively low CN's in table 2-2. Good judgment and experience based on stream gage records are needed to adjust CN's as conditions warrant.

- When the weighted CN is less than 40, use another procedure to determine runoff.

Examples

Four examples illustrate the procedure for computing runoff curve number (CN) and runoff (Q) in inches. Worksheet 2 in appendix D is provided to assist TR-55 users. Figures 2-5 to 2-8 represent the use of worksheet 2 for each example. All four examples are based on the same watershed and the same storm event.

The watershed covers 250 acres in Dyer County, northwestern Tennessee. Seventy percent (175 acres) is a Loring soil, which is in hydrologic soil group C. Thirty percent (75 acres) is a Memphis soil, which is in group B. The event is a 25-year frequency, 24-hour storm with total rainfall of 6 inches.

Cover type and conditions in the watershed are different for each example. The examples, therefore, illustrate how to compute CN and Q for various situations of proposed, planned, or present development.

Example 2-1

The present cover type is pasture in good hydrologic condition. (See figure 2-5 for worksheet 2 information.)

Example 2-2

Seventy percent (175 acres) of the watershed, consisting of all the Memphis soil and 100 acres of the Loring soil, is 1/2-acre residential lots with lawns in good hydrologic condition. The rest of the watershed is scattered open space in good hydrologic condition. (See figure 2-6.)

Example 2-3

This example is the same as example 2-2, except that the 1/2-acre lots have a total impervious area of 35 percent. For these lots, the pervious area is lawns in good hydrologic condition. Since the impervious area percentage differs from the percentage assumed in table 2-2, use figure 2-3 to compute CN. (See figure 2-7.)

Example 2-4

This example is also based on example 2-2, except that 50 percent of the impervious area associated with the 1/2-acre lots on the Loring soil is “unconnected,” that is, it is not directly connected to the drainage system. For these lots, the pervious area CN (lawn, good condition) is 74 and the impervious area is 25 percent. Use figure 2-4 to compute the CN for these lots. CN’s for the 1/2-acre lots on Memphis soil and the open space on Loring soil are the same as those in example 2-2. (See figure 2-8.)

Figure 2-5 Worksheet 2 for example 2-1

Worksheet 2: Runoff curve number and runoff

Project	By	Date
Heavenly Acres	WJR	10/1/85
Location	**Checked**	**Date**
Dyer County, Tennessee	UM	10/3/85

Check one: ☒ Present ☐ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☐ acres ☐ mi² ☒ %	Product of CN x area
Memphis, B	Pasture, good condition	61			30	1830
Loring, C	Pasture, good condition	74			70	5180
1/ Use only one CN source per line				Totals ➡	100	7010

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{7010}{100} = 70.1$; Use CN ➡ 70

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25		
Rainfall, P (24-hour)	in	6.0		
Runoff, Q	in	2.81		

(Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)

Figure 2-6 Worksheet 2 for example 2-2

Worksheet 2: Runoff curve number and runoff

Project	By	Date
Heavenly Acres	WJR	10/1/85
Location	**Checked**	**Date**
Dyer County, Tennessee	UM	10/3/85

Check one: ☒ Present ☐ Developed — 175 Acres residential

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☐ acres ☐ mi² ☒ %	Product of CN x area
Memphis, B	25% impervious 1/2 acre lots, good condition	70			75	5250
Loring, C	25% impervious 1/2 acre lots, good condition	80			100	8000
Loring, C	Open space, good condition	74			75	5550
1/ Use only one CN source per line				Totals ➡	250	18,800

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{18{,}800}{250} = 75.2$; **Use CN ➡** 75

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25		
Rainfall, P (24-hour) ..... in	6.0		
Runoff, Q ..... in (Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)	3.28		

Figure 2-7 Worksheet 2 for example 2-3

Worksheet 2: Runoff curve number and runoff

Project	By	Date
Heavenly Acres	WJR	10/1/85
Location Dyer County, Tennessee	**Checked** UM	**Date** 10/3/85

Check one: ☐ Present ☒ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
Memphis, B	35% impervious 1/2 acre lots, good condition		74		75	5550
Loring, C	35% impervious 1/2 acre lots, good condition		82		100	8200
Loring, C	Open space, good condition	74			75	5550
1/ Use only one CN source per line				**Totals** ➡	250	19,300

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{19{,}300}{250} = 77.2$; **Use CN** ➡ 77

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25		
Rainfall, P (24-hour)	in	6.0		
Runoff, Q (Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)	in	3.48		

Figure 2-8 Worksheet 2 for example 2-4

Worksheet 2: Runoff curve number and runoff

Project	By	Date
Heavenly Acres	WJR	10/1/85
Location	**Checked**	**Date**
Dyer County, Tennessee	UM	10/3/85

Check one: ☐ Present ☒ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
Memphis,B	25% connected impervious 1/2 acre lots, good condition	70			75	5250
Loring, C	25% impervious with 50% unconnected 1/2 acre lots, good condition			78	100	7800
Loring, C	Open space, good condition	74			75	5550
1/ Use only one CN source per line				Totals ➡	250	18,600

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{18{,}600}{250} = 74.4$; **Use CN ➡** 74

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25		
Rainfall, P (24-hour)	in	6.0		
Runoff, Q	in	3.19		

(Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)

Chapter 3 Time of concentration and travel time

Travel time (T_t)is the time it takes water to travel from one location to another in a watershed. T_t is a component of time of concentration (T_c), which is the time for runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. T_c is computed by summing all the travel times for consecutive components of the drainage conveyance system.

T_c influences the shape and peak of the runoff hydrograph. Urbanization usually decreases T_c, thereby increasing the peak discharge. But T_c can be increased as a result of (a) ponding behind small or inadequate drainage systems, including storm drain inlets and road culverts, or (b) reduction of land slope through grading.

Factors affecting time of concentration and travel time

Surface roughness

One of the most significant effects of urban development on flow velocity is less retardance to flow. That is, undeveloped areas with very slow and shallow overland flow through vegetation become modified by urban development: the flow is then delivered to streets, gutters, and storm sewers that transport runoff downstream more rapidly. Travel time through the watershed is generally decreased.

Channel shape and flow patterns

In small non-urban watersheds, much of the travel time results from overland flow in upstream areas. Typically, urbanization reduces overland flow lengths by conveying storm runoff into a channel as soon as possible. Since channel designs have efficient hydraulic characteristics, runoff flow velocity increases and travel time decreases.

Slope

Slopes may be increased or decreased by urbanization, depending on the extent of site grading or the extent to which storm sewers and street ditches are used in the design of the water management system. Slope will tend to increase when channels are straightened and decrease when overland flow is directed through storm sewers, street gutters, and diversions.

Computation of travel time and time of concentration

Water moves through a watershed as sheet flow, shallow concentrated flow, open channel flow, or some combination of these. The type that occurs is a function of the conveyance system and is best determined by field inspection.

Travel time (T_t) is the ratio of flow length to flow velocity:

$$T_t = \frac{L}{3600V} \qquad \text{[eq. 3-1]}$$

where:

T_t = travel time (hr)
L = flow length (ft)
V = average velocity (ft/s)
3600 = conversion factor from seconds to hours.

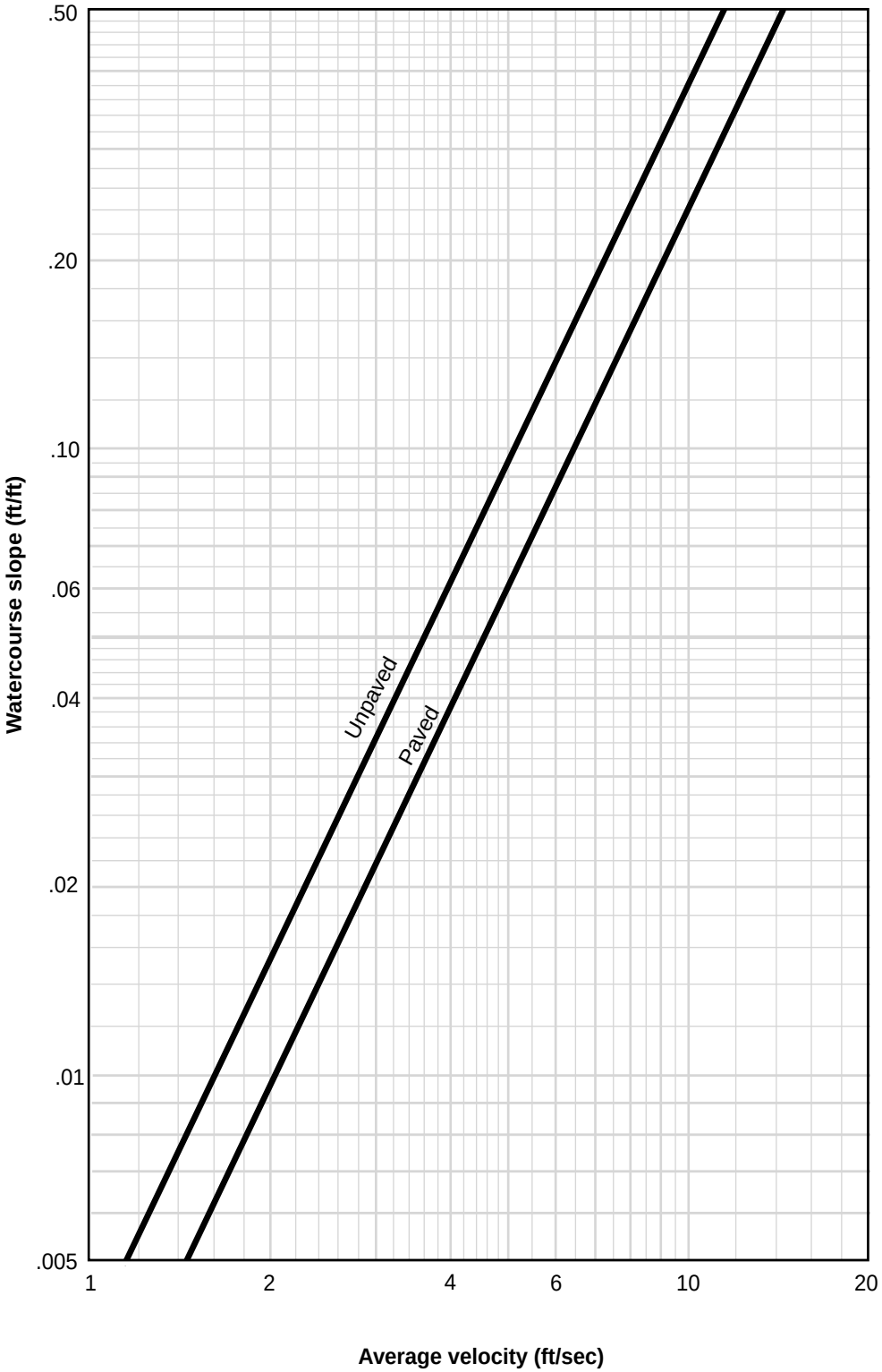
Time of concentration (T_c) is the sum of T_t values for the various consecutive flow segments:

$$T_c = T_{t1} + T_{t2} + \ldots T_{tm} \qquad \text{[eq. 3-2]}$$

where:

T_c = time of concentration (hr)
m = number of flow segments

Figure 3-1 Average velocities for estimating travel time for shallow concentrated flow.



Sheet flow

Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. With sheet flow, the friction value (Manning's *n*) is an effective roughness coefficient that includes the effect of raindrop impact; drag over the plane surface; obstacles such as litter, crop ridges, and rocks; and erosion and transportation of sediment. These *n* values are for very shallow flow depths of about 0.1 foot or so. Table 3-1 gives Manning's *n* values for sheet flow for various surface conditions.

Table 3-1 Roughness coefficients (Manning's *n*) for sheet flow

Surface description	*n* [1/]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤20%	0.06
Residue cover >20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses [2/]	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:[3]	
Light underbrush	0.40
Dense underbrush	0.80

[1] The n values are a composite of information compiled by Engman (1986).
[2] Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.
[3] When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

For sheet flow of less than 300 feet, use Manning's kinematic solution (Overtop and Meadows 1976) to compute T_t:

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}} \qquad \text{[eq. 3-3]}$$

where:

T_t = travel time (hr),
n = Manning's roughness coefficient (table 3-1)
L = flow length (ft)
P_2 = 2-year, 24-hour rainfall (in)
s = slope of hydraulic grade line (land slope, ft/ft)

This simplified form of the Manning's kinematic solution is based on the following: (1) shallow steady uniform flow, (2) constant intensity of rainfall excess (that part of a rain available for runoff), (3) rainfall duration of 24 hours, and (4) minor effect of infiltration on travel time. Rainfall depth can be obtained from appendix B.

Shallow concentrated flow

After a maximum of 300 feet, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from figure 3-1, in which average velocity is a function of watercourse slope and type of channel. For slopes less than 0.005 ft/ft, use equations given in appendix F for figure 3-1. Tillage can affect the direction of shallow concentrated flow. Flow may not always be directly down the watershed slope if tillage runs across the slope.

After determining average velocity in figure 3-1, use equation 3-1 to estimate travel time for the shallow concentrated flow segment.

Open channels

Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets. Manning's equation or water surface profile information can be used to estimate average flow velocity. Average flow velocity is usually determined for bankfull elevation.

Manning's equation is:

$$V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n} \qquad \text{[eq. 3-4]}$$

where:

V = average velocity (ft/s)
r = hydraulic radius (ft) and is equal to a/p_w
a = cross sectional flow area (ft^2)
P_w = wetted perimeter (ft)
s = slope of the hydraulic grade line (channel slope, ft/ft)
n = Manning's roughness coefficient for open channel flow.

Manning's n values for open channel flow can be obtained from standard textbooks such as Chow (1959) or Linsley et al. (1982). After average velocity is computed using equation 3-4, T_t for the channel segment can be estimated using equation 3-1.

Reservoirs or lakes

Sometimes it is necessary to estimate the velocity of flow through a reservoir or lake at the outlet of a watershed. This travel time is normally very small and can be assumed as zero.

Limitations

- Manning's kinematic solution should not be used for sheet flow longer than 300 feet. Equation 3-3 was developed for use with the four standard rainfall intensity-duration relationships.

- In watersheds with storm sewers, carefully identify the appropriate hydraulic flow path to estimate T_c. Storm sewers generally handle only a small portion of a large event. The rest of the peak flow travels by streets, lawns, and so on, to the outlet. Consult a standard hydraulics textbook to determine average velocity in pipes for either pressure or nonpressure flow.

- The minimum T_c used in TR-55 is 0.1 hour.

- A culvert or bridge can act as a reservoir outlet if there is significant storage behind it. The procedures in TR-55 can be used to determine the peak flow upstream of the culvert. Detailed storage routing procedures should be used to determine the outflow through the culvert.

Example 3-1

The sketch below shows a watershed in Dyer County, northwestern Tennessee. The problem is to compute T_c at the outlet of the watershed (point D). The 2-year 24-hour rainfall depth is 3.6 inches. All three types of flow occur from the hydraulically most distant point (A) to the point of interest (D). To compute T_c, first determine T_t for each segment from the following information:

Segment AB: Sheet flow; dense grass; slope (s) = 0.01 ft/ft; and length (L) = 100 ft. Segment BC: Shallow concentrated flow; unpaved; s = 0.01 ft/ft; and L = 1,400 ft. Segment CD: Channel flow; Manning's n = .05; flow area (a) = 27 ft^2; wetted perimeter (P_w) = 28.2 ft; s = 0.005 ft/ft; and L = 7,300 ft.

See figure 3-2 for the computations made on worksheet 3.

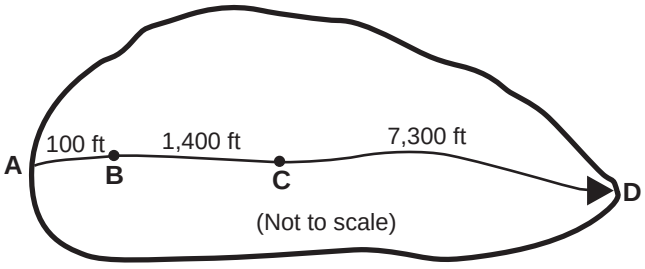


Figure 3-2 Worksheet 3 for example 3-1

Worksheet 3: Time of Consentration (T_c) or travel time (T_t)

Project	Heavenly Acres	By	DW	Date	10/6/85
Location	Dyer County, Tennessee	Checked	NM	Date	10/8/85

Check one: ☐ Present ☒ Developed

Check one: ☒ T_c ☐ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)

	Segment ID	AB	
1.	Surface description (table 3-1)	Dense Grass	
2.	Manning's roughness coefficient, n (table 3-1)	0.24	
3.	Flow length, L (total L ≥ 300 ft) ft	100	
4.	Two-year 24-hour rainfall, p_2 in	3.6	
5.	Land slope, s ft/ft	0.01	
6.	$T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t hr	0.30 +	= 0.30

Shallow concentrated flow

	Segment ID	BC	
7.	Surface description (paved or unpaved)	Unpaved	
8.	Flow length, L ft	1400	
9.	Watercourse slope, s ft/ft	0.01	
10.	Average velocity, V (figure 3-1) ft/s	1.6	
11.	$T_t = \frac{L}{3600\ V}$ Compute T_t hr	0.24 +	= 0.24

Channel flow

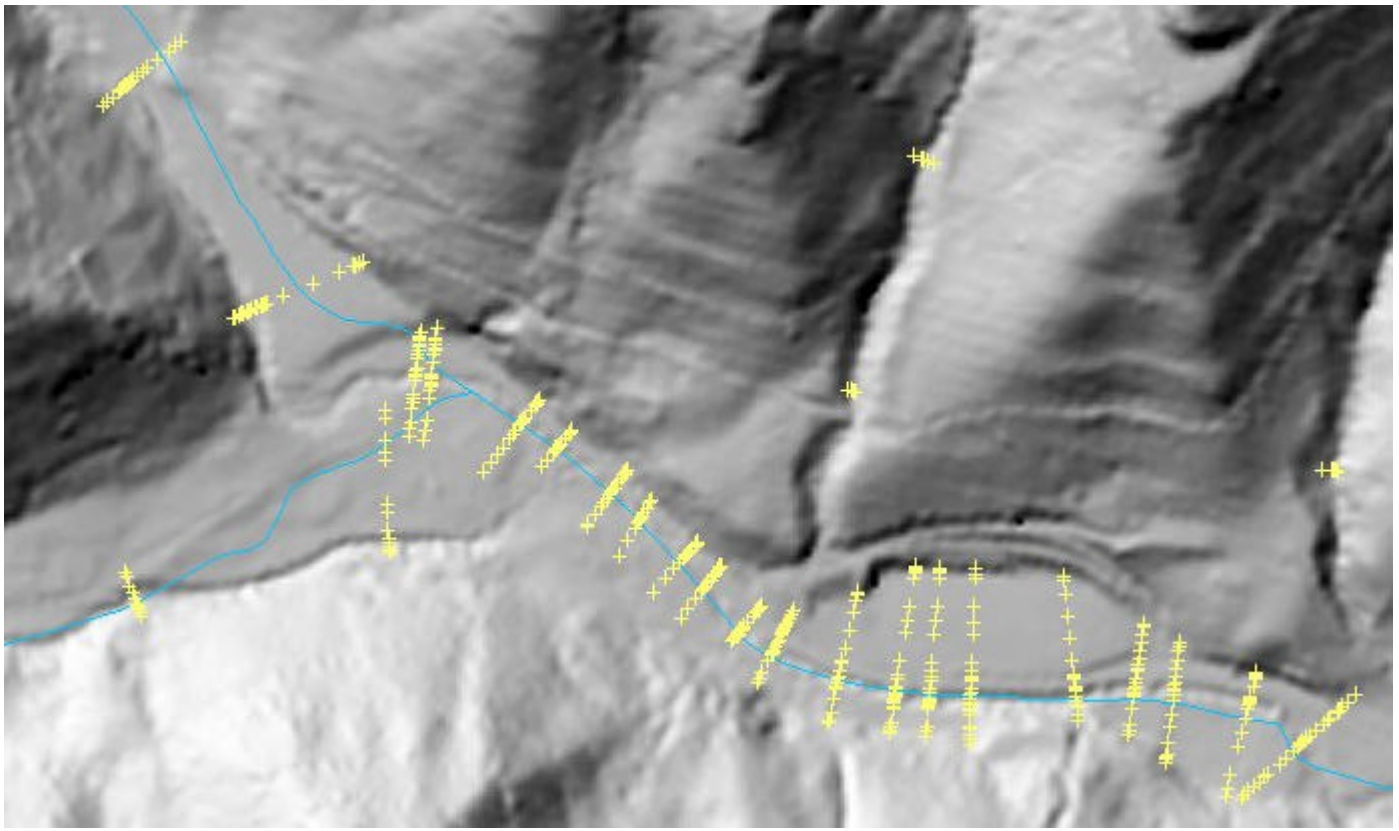
	Segement ID	CD	
12.	Cross sectional flow area, a ft^2	27	
13.	Wetted perimeter, P_w ft	28.2	
14.	Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft	0.957	
15	Channel slope, s ft/ft	0.005	
16.	Manning's roughness coefficient, n	0.05	
17.	$V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V ft/s	2.05	
18.	Flow length, L ft	7300	
19.	$T_t = \frac{L}{3600\ V}$ Compute T_t hr	0.99 +	= 0.99
20.	Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) Hr		1.53

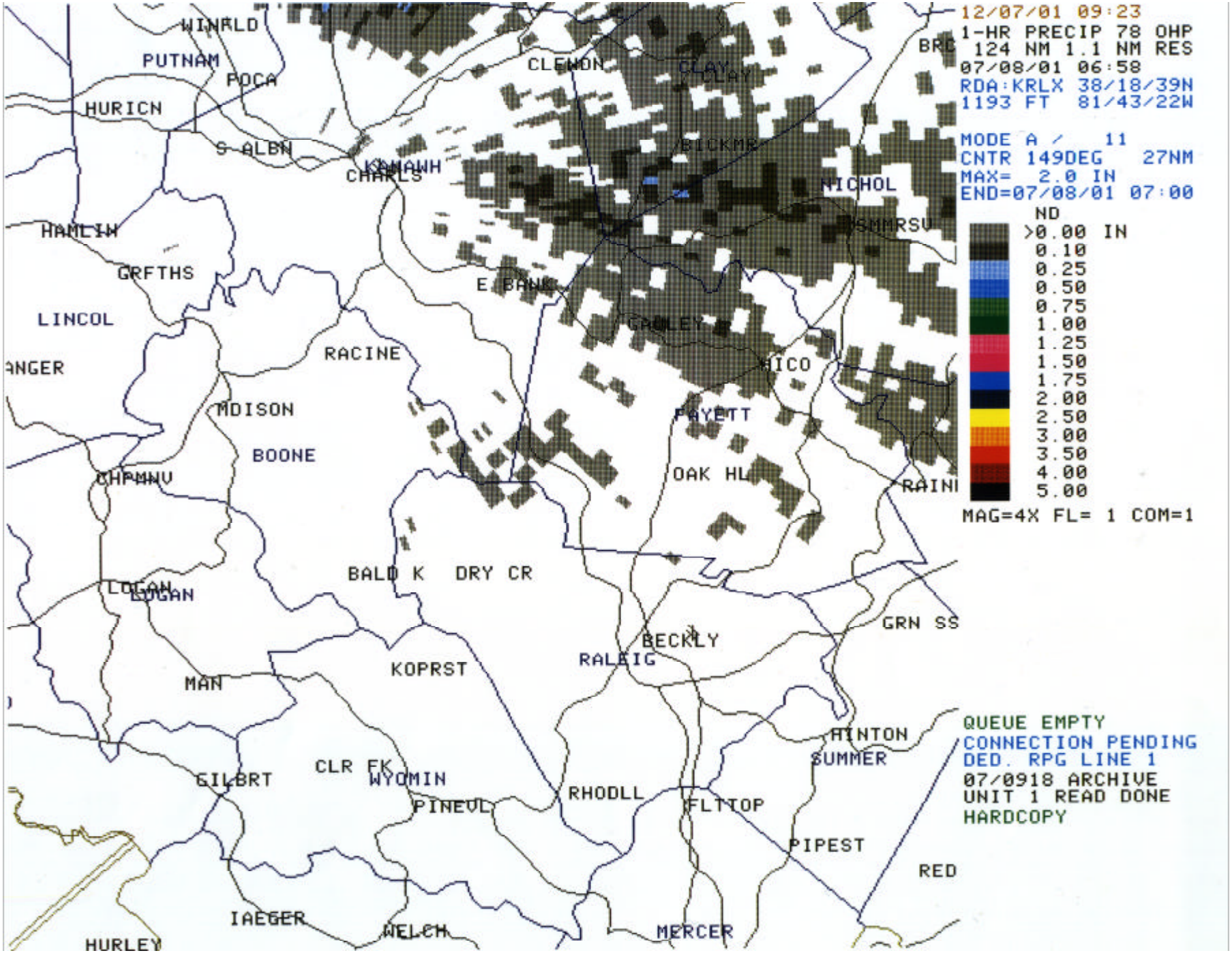
Example Photographs of Field Survey





Example of Surveyed Cross-Section Locations

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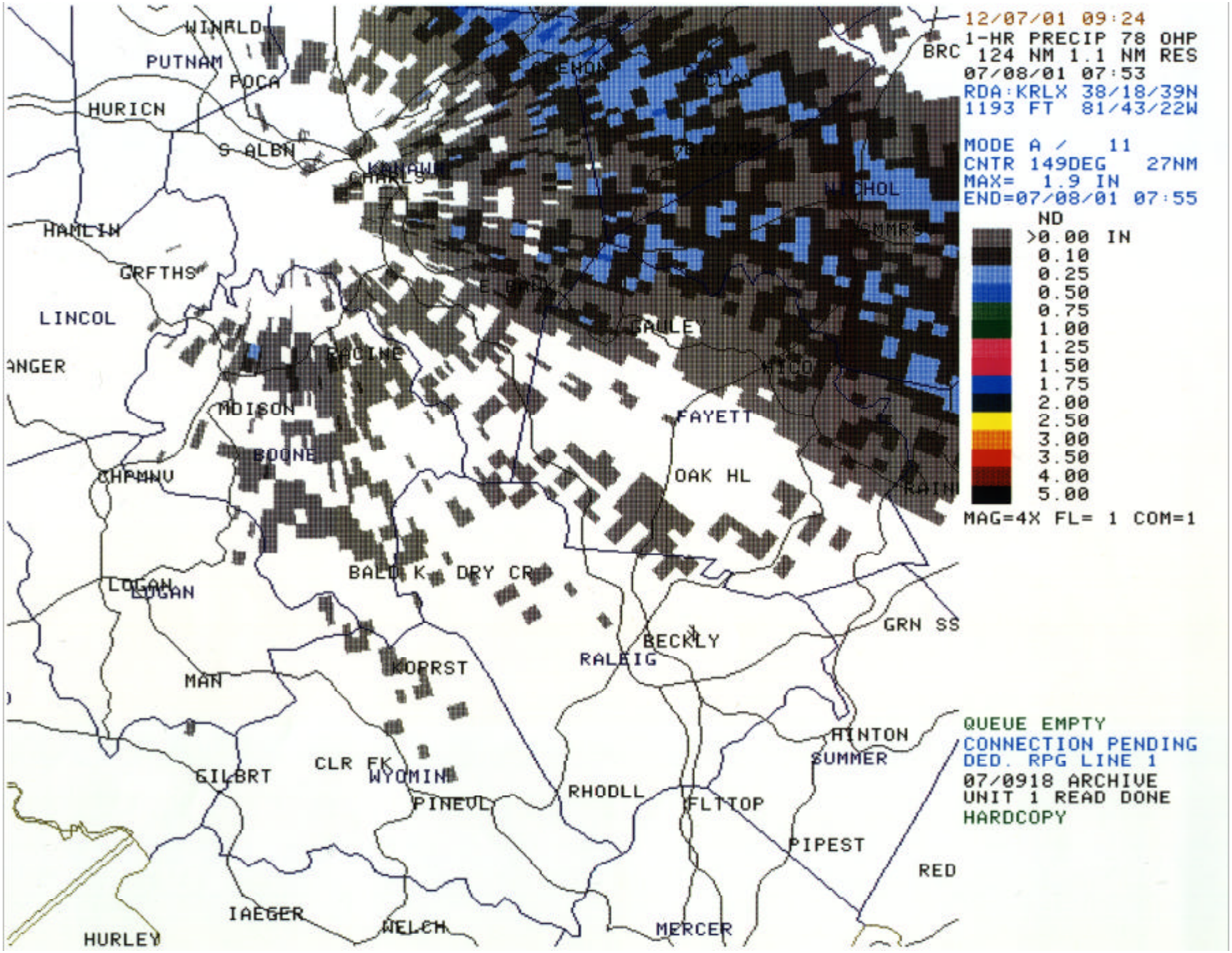
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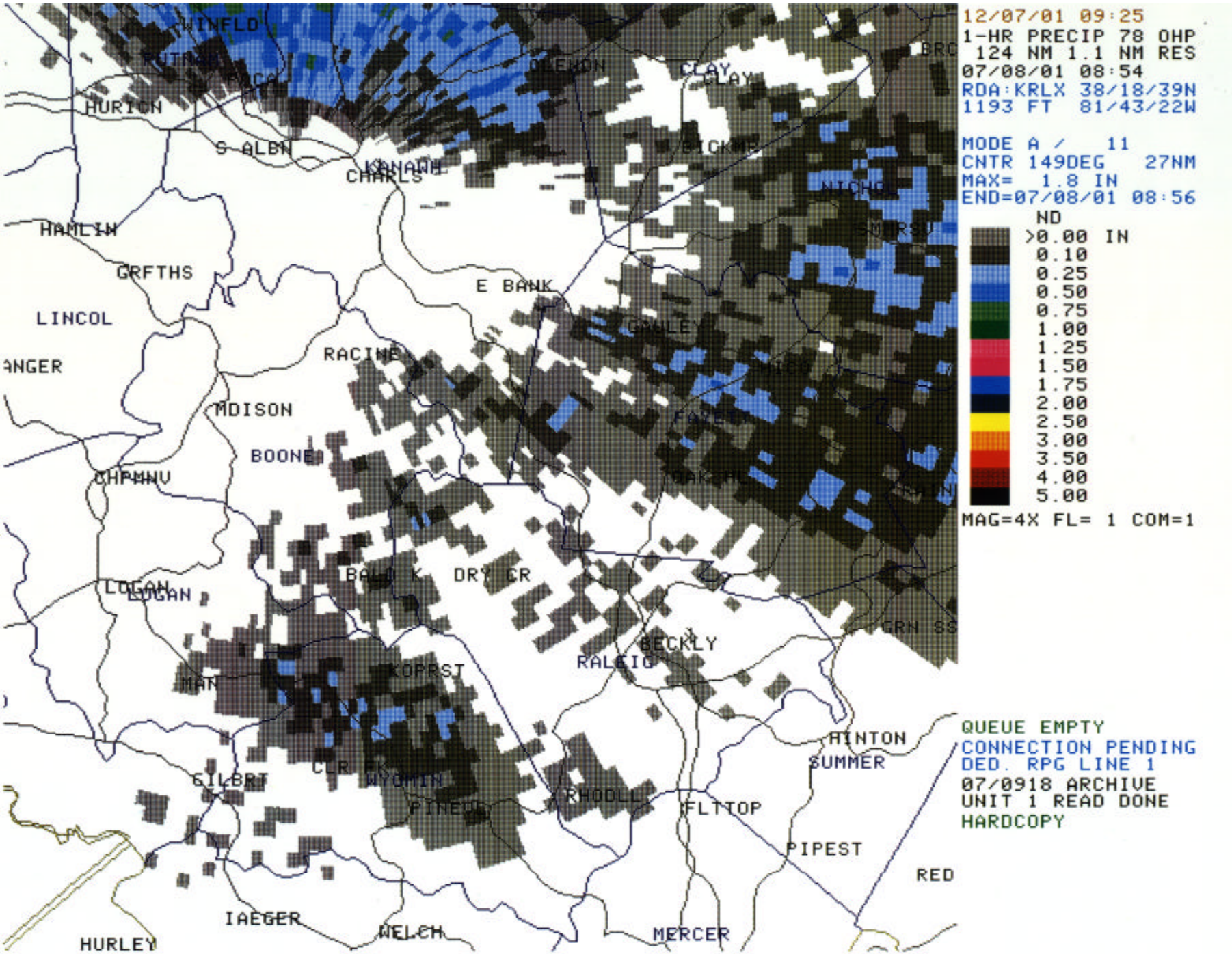
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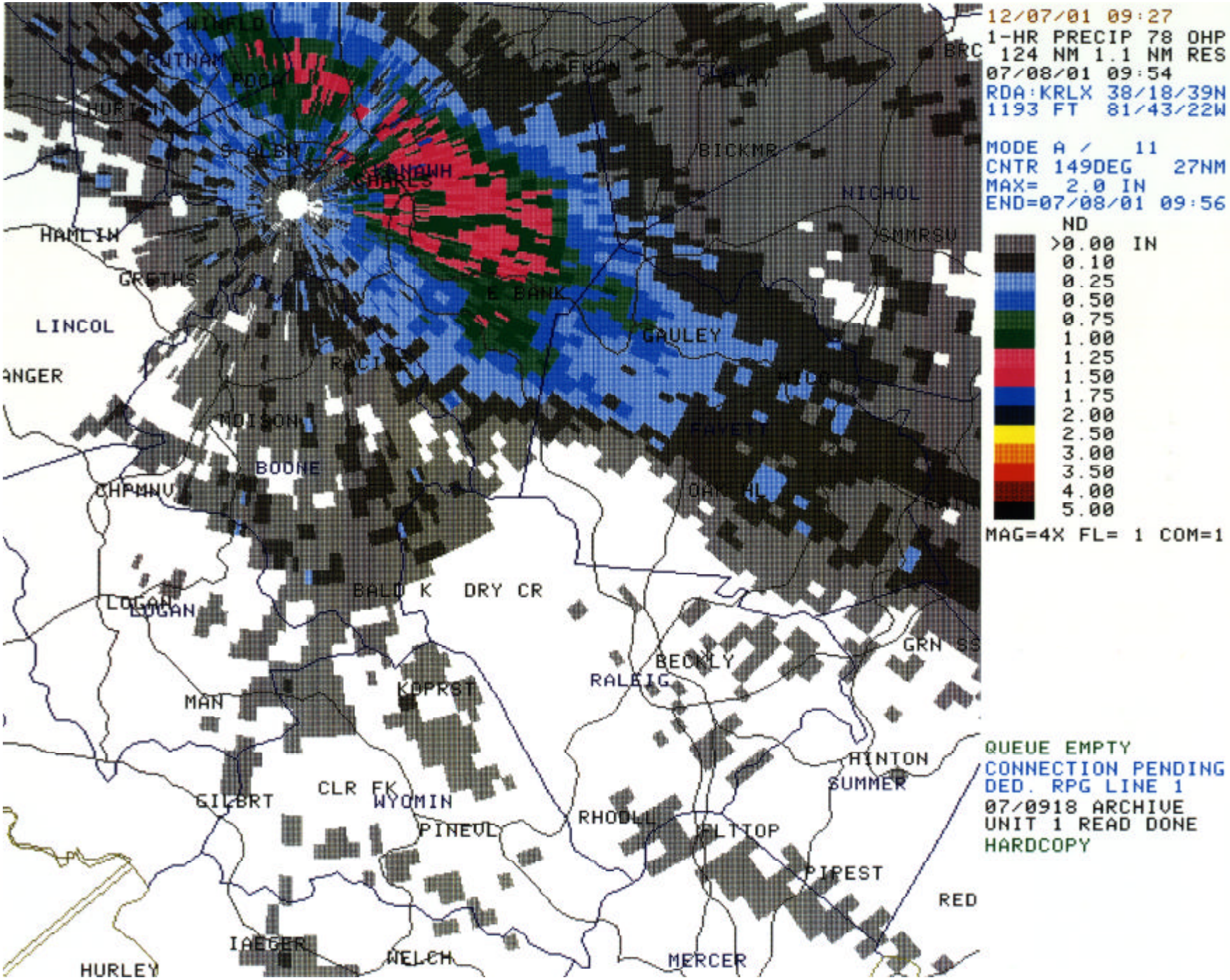
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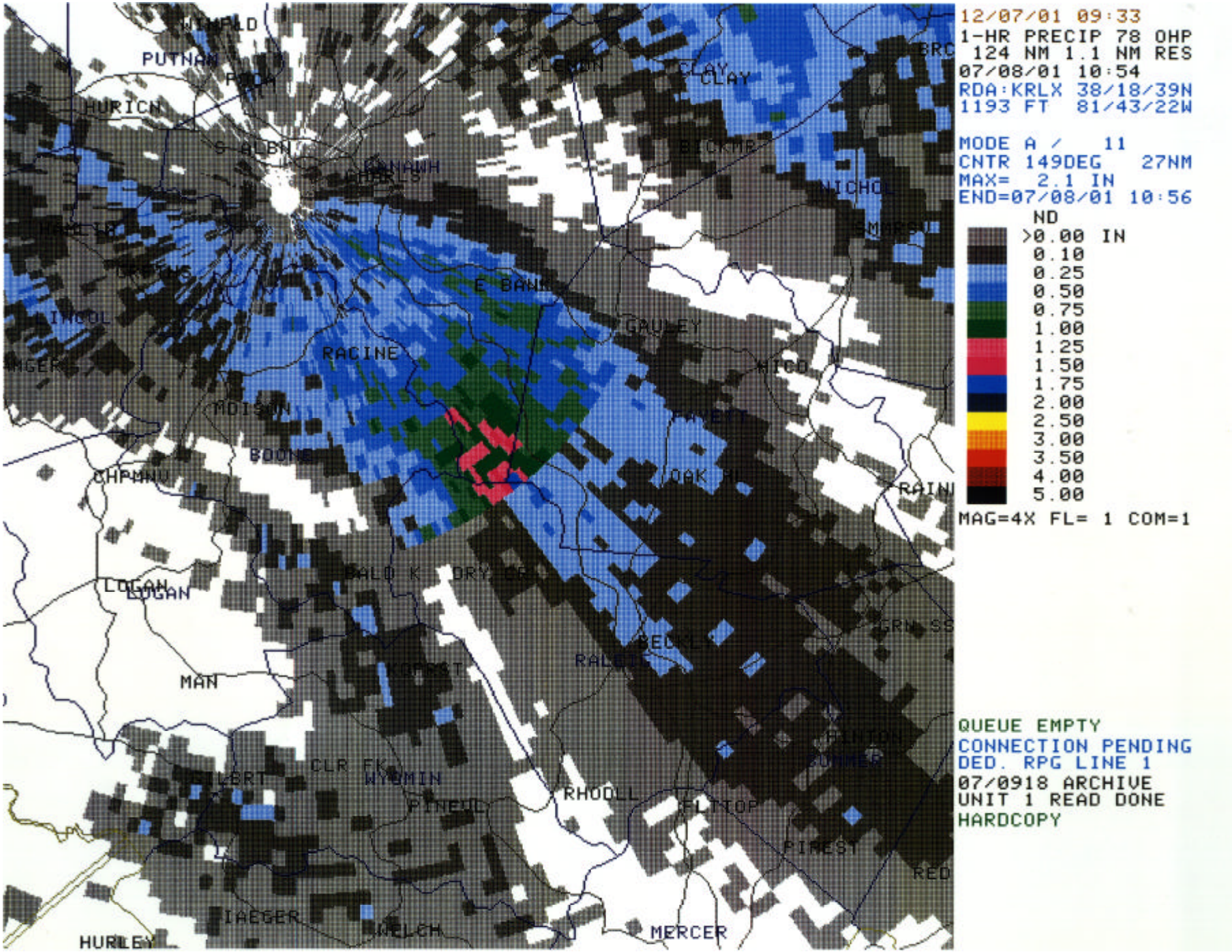
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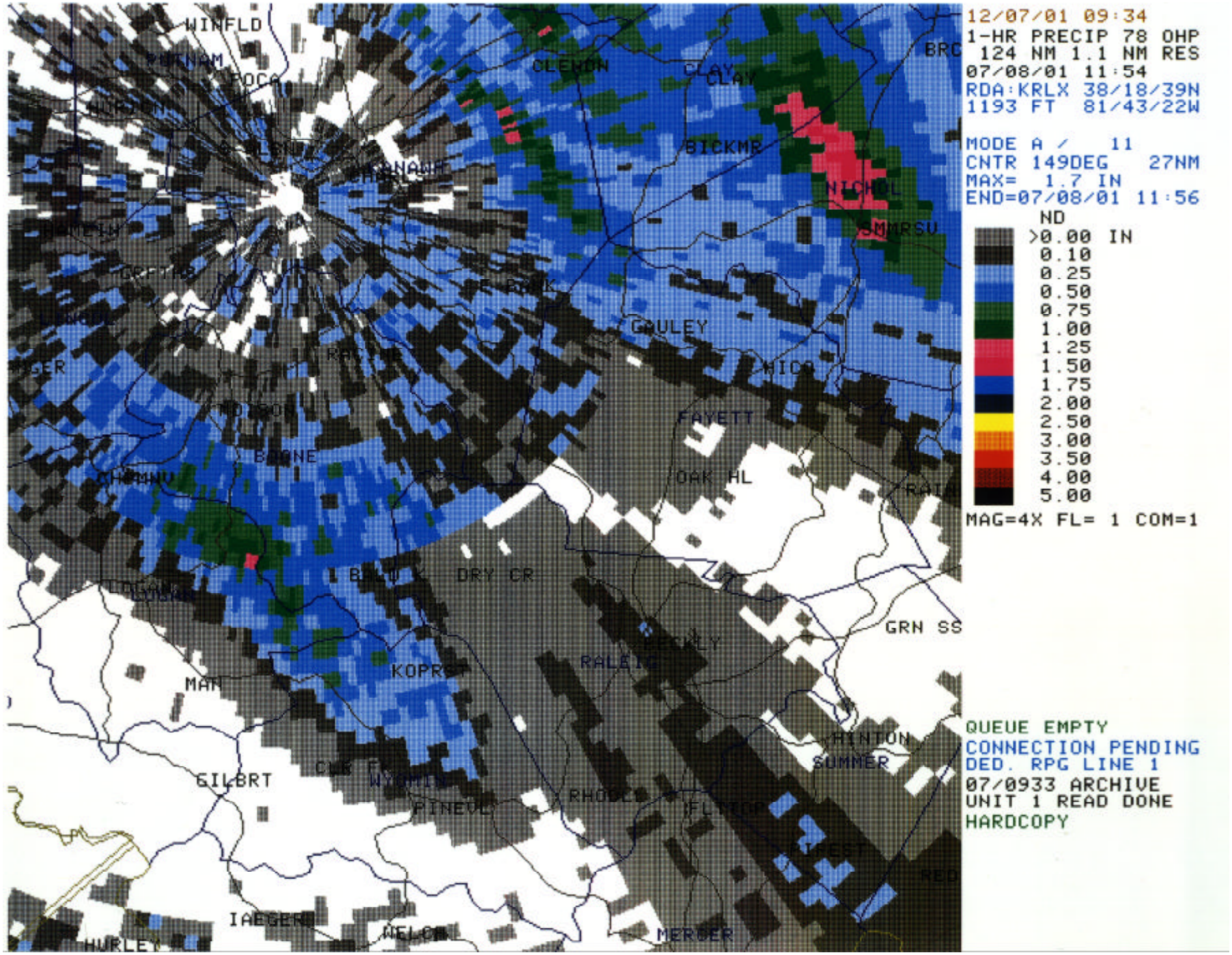
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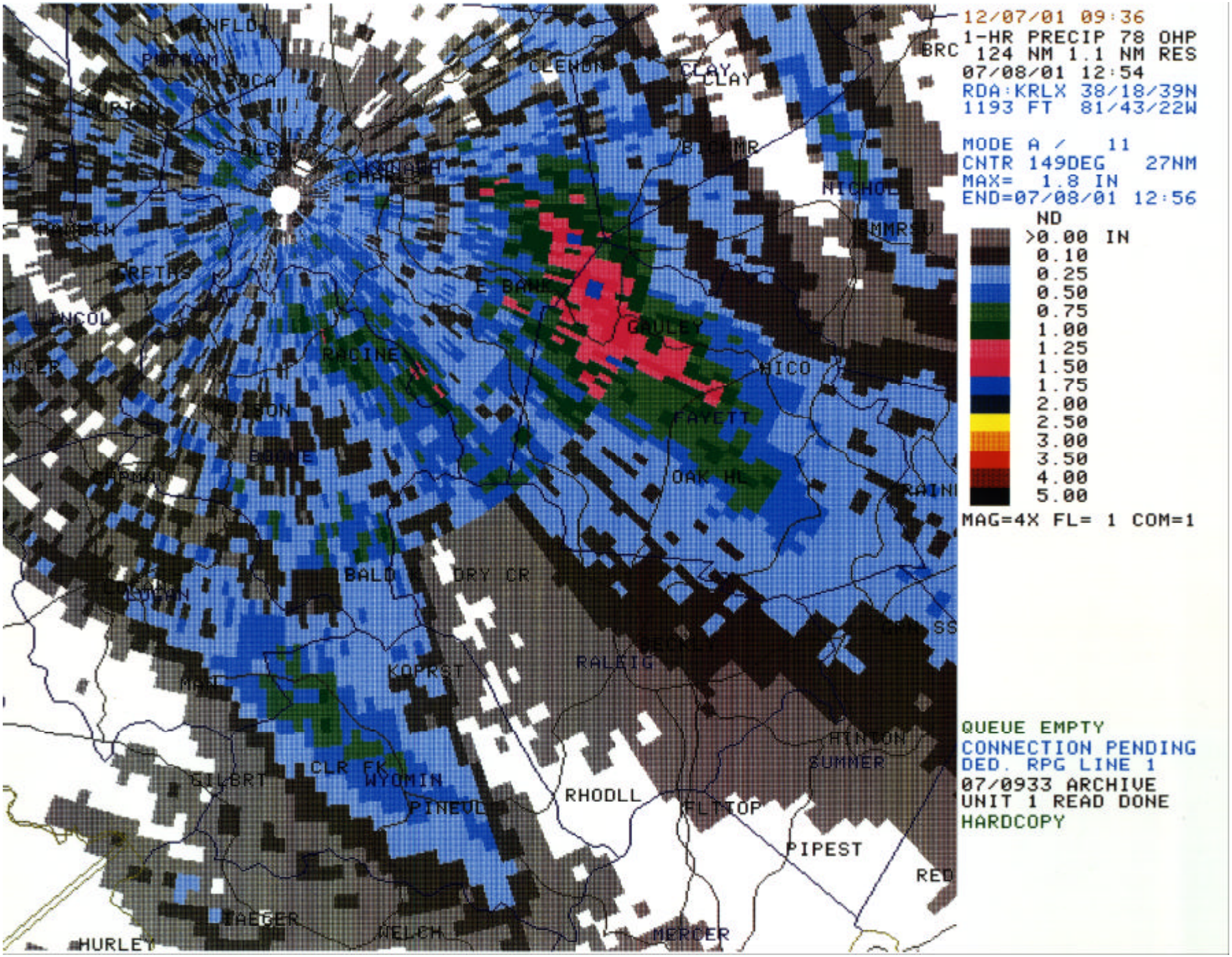
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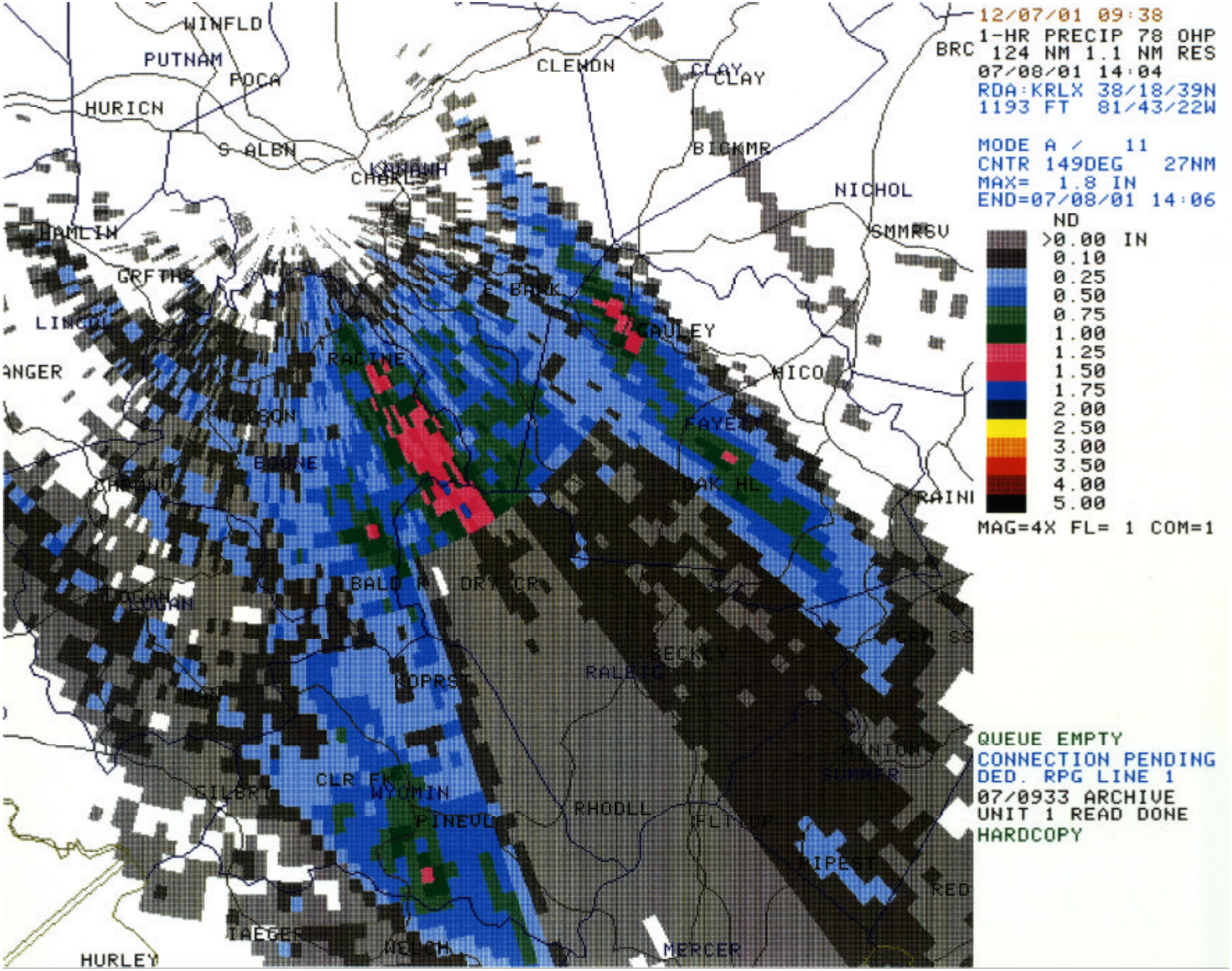
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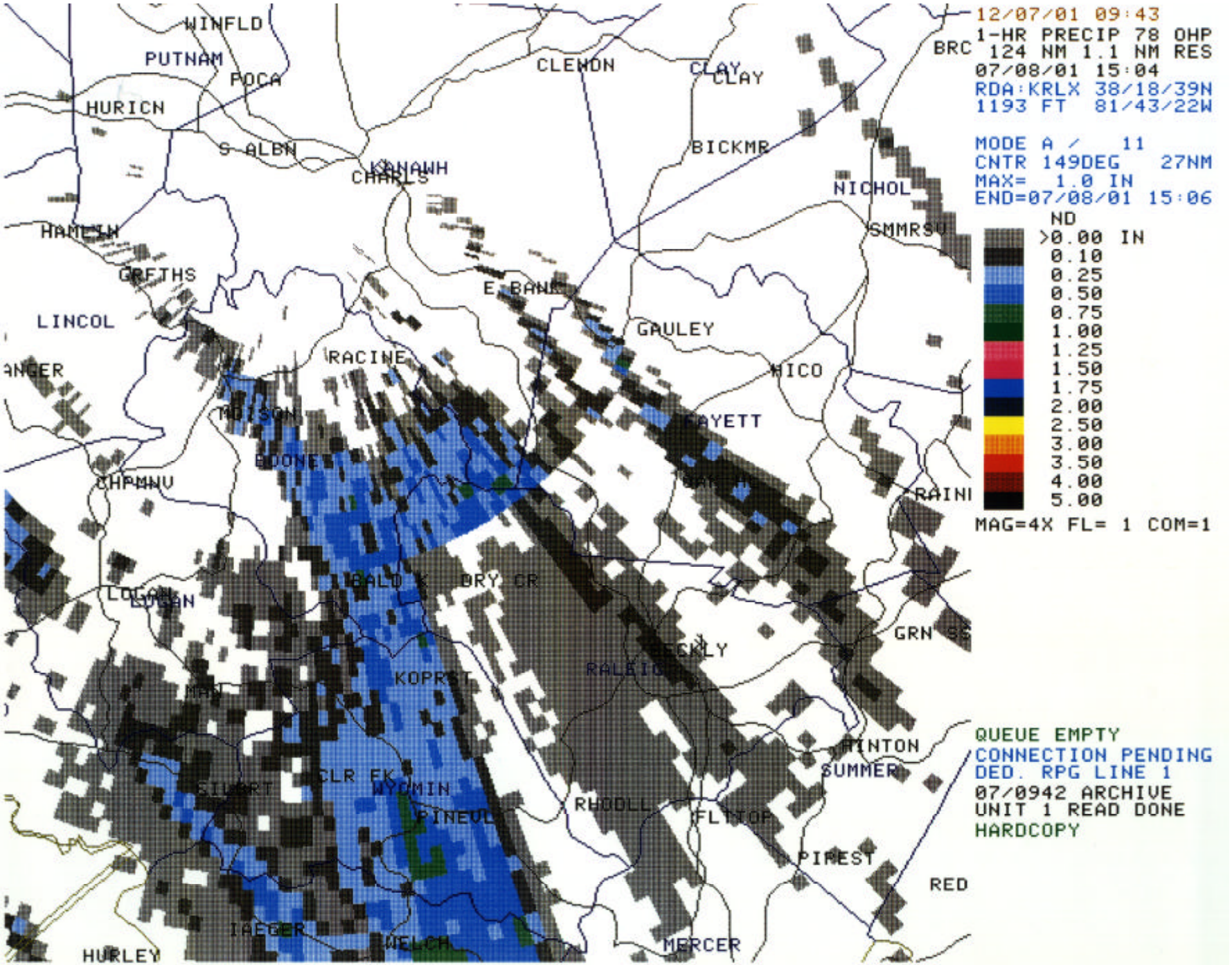
HURLEY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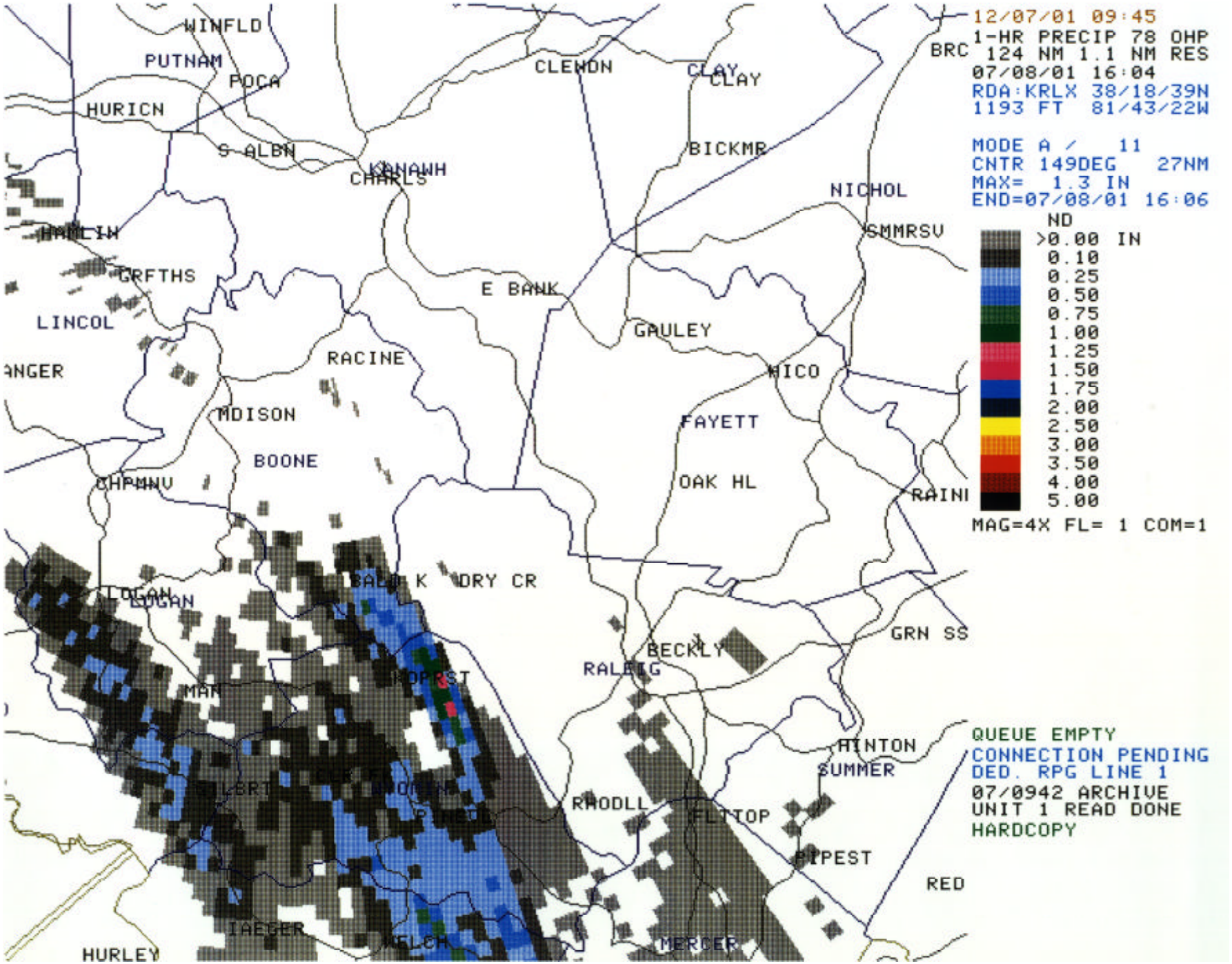
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Evaluation of LIDAR Accuracy

An evaluation of LIDAR accuracy was conducted by selecting LIDAR points falling less than 1 meter from a coincident survey point. This resulted in 414 test points for the comparison. The results are shown in table 1, where mean, median, min, and max values were calculated from absolute elevation differences, in meters, between LIDAR and survey points.

Watershed	Points	Mean	Median	Min	Max	<0.25m
Seng	154	0.3586	0.1835	0.0000	3.3360	63.00%
Sycamore	67	0.2600	0.1430	0.0000	3.2070	67.00%
Scrabble	193	0.3204	0.1280	0.0010	5.0410	74.00%

Table 1. Absolute elevation differences for coincident LIDAR and survey test points having <1m horizontal separation

Figure 1 shows the test points ordered by increasing absolute elevation difference. Figure 1 demonstrates that the mean elevation difference is influenced by a relatively limited number of outliers, whereas the majority of points meet the error threshold (0.25m) specified in the original LIDAR contract.

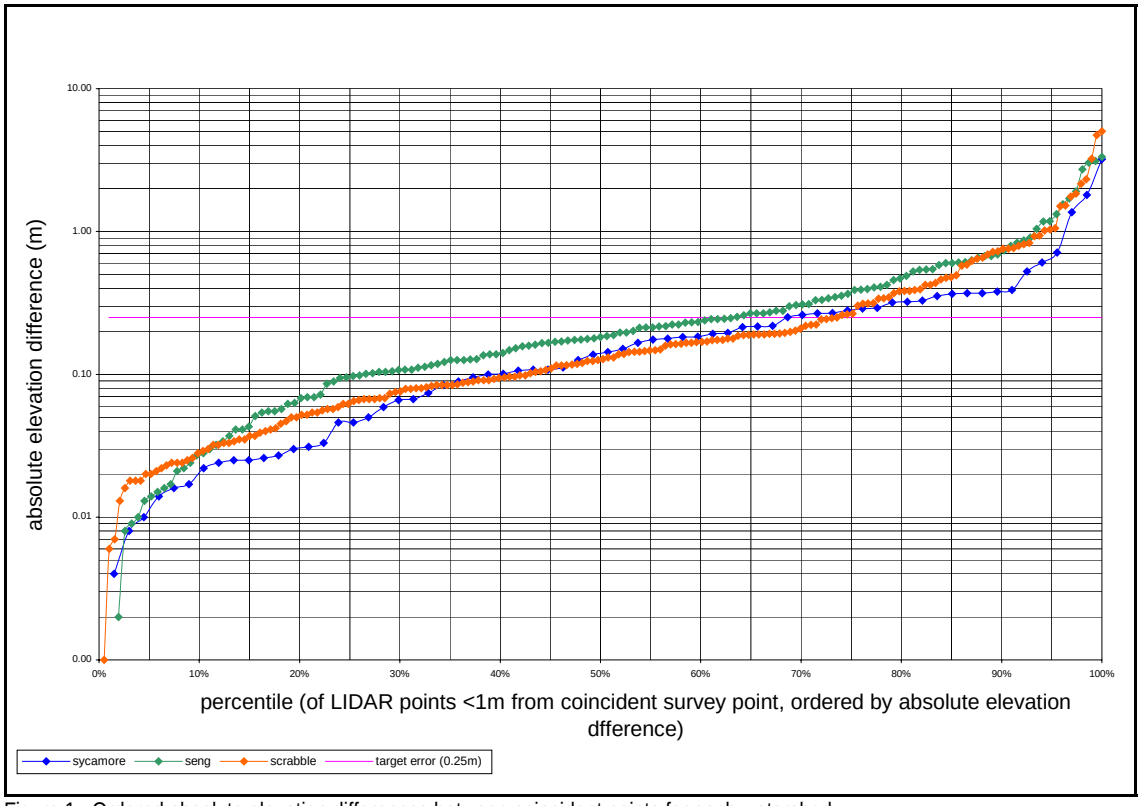

Figure 1. Ordered absolute elevation differences between coincident points for each watershed.

Limitations of this comparison relate to the fact that survey points were concentrated in stream channels, and as such do not fairly represent conditions throughout the entire watershed. Thus the results cannot be fairly asserted to maintain across the entire range of the LIDAR data. Also, it is fair to assume that a steep slope condition could bias results toward a higher error estimate. For example, a horizontal separation of 1 meter between LIDAR and survey points on a 45 degree slope could produce a real vertical difference of 1 meter, even if both measurements were perfectly accurate. Figure 2 depicts absolute elevation differences in coincident points ordered by slope for Scrabble Creek. The relationship between slope and error for Scrabble Creek is characterized by a positive correlation of 0.39, reflecting the fact that the worst errors are associated with outliers occurring in steep slope areas. The cumulative mean absolute difference line shown in Figure 2 reinforces the idea that steep slope conditions produce outliers that

adversely affect results. For example, if coincident test pairs are limited to points occurring on slopes less than 15 degrees, the outcome is substantially improved (table 2).

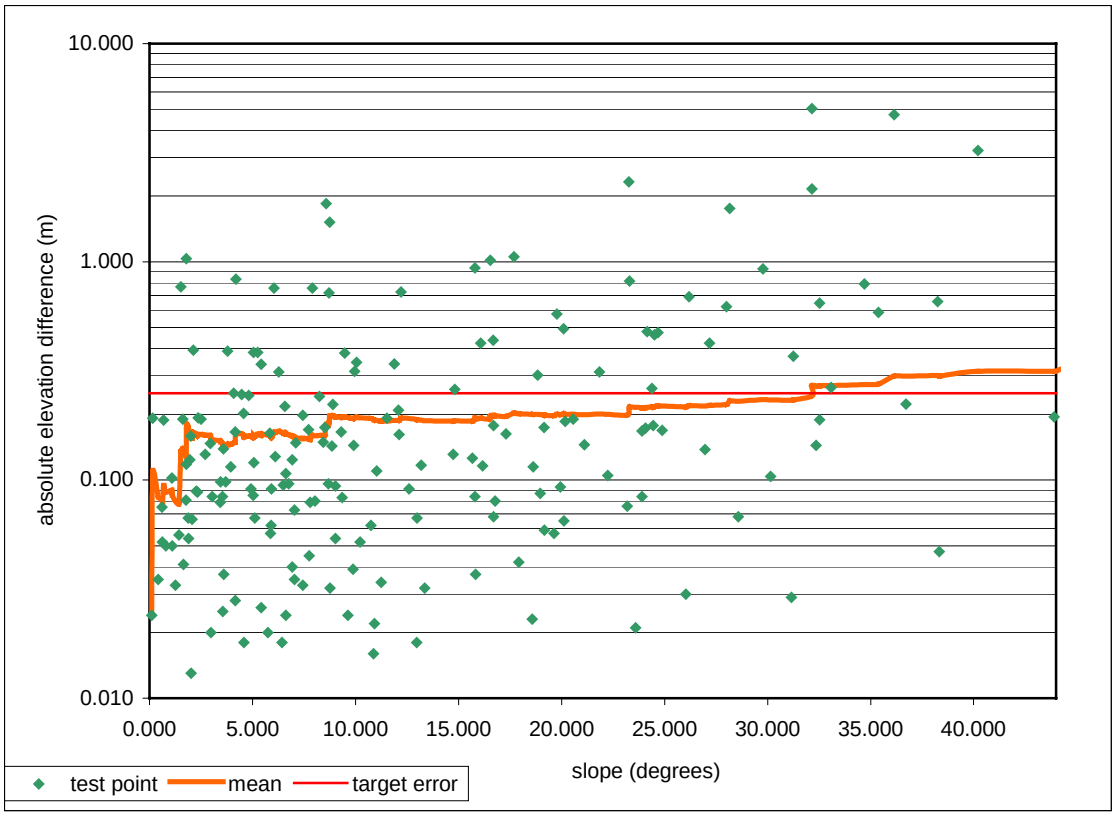

Figure 2. Relationship between slope and absolute elevation difference for coincident points in Scrabble Creek watershed.

Watershed	Points	Mean absolute difference (m)
Seng	98	0.296
Sycamore	49	0.186
Scrabble	122	0.186

Table 2. Absolute elevation differences, LIDAR vs. Survey, for points falling on slopes <15 degrees.

While omitting steep-slope cases from the comparison improves the apparent accuracy, it should be noted that steep slope areas may contain some degree of real error due to horizontal position errors inherent in LIDAR that may be aligned with slope direction. However, overall errors were remarkably low in both cases (with an without steep-slope points), considering there were many opportunities for LIDAR returns from obstacles near survey points, such as bridges, culverts, rocks, vegetation, and the sides of narrow washouts. LIDAR results may have been aided by a leaf-off condition that allowed more effective canopy penetration, as well as effective post processing of a multiple-return data set.

BEST MANAGEMENT PRACTICES FOR CONTROLLING

SOIL EROSION AND SEDIMENTATION



FROM LOGGING OPERATIONS IN WEST VIRGINIA

Revised 1989, 1995, 1996, 2001

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INTRODUCTION

It should be noted that the Best Management Practices recommended in this booklet are not the only acceptable ones. Situations will arise that require custom or alternative practices to be used to get the job done and minimize any erosion hazard as mandated by the Logging Sediment Control Act. However, the law does require that Best Management Practices, West Virginia Code 19-1b-7(g), be used for controlling erosion and soil movement into streams.

Excess soil sediment has been described as the greatest single contaminant by volume of lakes, streams and rivers. Sediment containing organic matter can create a biochemical oxygen demand in natural waters that damages the habitat of fish and other aquatic life, reduce recreational values, and adversely affect water supplies. It can also clog stream channels, contributing to increased stream bank and channel erosion. Eroded soil particles may carry pesticides, herbicides, fertilizers and other chemicals.

It is a proven fact that cutting trees does not cause erosion. However, improperly performed logging operations and related activities (especially improperly planned and constructed roads and landings), along with certain silviculture activities that expose mineral soil (such as site preparation, mechanical tree planting, etc.), are contributing factors causing soil loss and sedimentation.

Through positive efforts of people involved in the sediment control program, the objective of keeping sediment out of State waters will be met.

Logging Sediment Control Act Summary

1. Logger Licensing
2. Logger Certification
3. Timbering Operation Notification
4. Logging Operation Posting
5. Enforcement for activities causing erosion and/or stream sedimentation or the potential thereof.
6. Reclamation to be completed within 7 days of the planned completion date on the notification form. If it can't be done within 7 days, the Division of Forestry must be contacted.

The West Virginia Division of Forestry was designated by the Legislature as the agency responsible to carry out the mandates and provisions of the Logging Sediment Control Act.

The law states that after September 1, 1992, anyone conducting a logging operation, buying timber or buying logs for resale is required to be licensed by the Division of Forestry. The annual fee is $50. The fee covers any one or any combination of the three categories stated above. A person who is applying for a license must be registered and in compliance with the West Virginia Department of Tax and Revenue and Workers' and Unemployment Compensation Divisions. Acceptance of the license implies that the operator will protect environmental quality through the judicious use of silvicultural Best Management Practices.

The second main provision of the law provides for the certification of loggers. The fee for certification is also $50 annually. The requirements for certification are the satisfactory completion of courses in tree felling safety and personal safety equipment, first aid and silvicultural Best Management Practices. A logger certification can be renewed for two successive years, provided the logger's training is less than three years old. Retraining is required every three years.

Each logging crew is required to be supervised by a certified logger any time the timbering operation is being conducted. The certified logger must be on the job each day.

A third provision was for loggers to submit a timbering operation notification form within three days of starting a new harvesting operation. Along with notification, the logger is required to post the operation with a sign listing the logger's name and license number in letters that are at least 3". The posted sign must remain on each active log landing of the operation.

The law also specifies several ways in which licenses can be suspended and/or revoked. These provisions have been amplified by the writing of regulations available from the Division of Forestry.

The law empowers the Division of Forestry to issue compliance orders to correct problems and, when necessary, to suspend a logging operation until specified corrections are made to bring the operator or operation into compliance with the law. Instances include when human life is endangered, uncorrectable damage to the environment is imminent, an operation is not licensed, uncorrectable water pollution may result, or when a certified logger is not supervising the operation. Licenses may be suspended if the person is found to be in violation twice in any two-year period, and they may be revoked if the logger is found in violation for a third time in any two-year period.

If a logger feels that the Division of Forestry has acted improperly, the logger must appeal within 48 hours to the Division of Forestry. A conference panel, composed of three persons, will be brought together for an informal ruling.

The Director of Forestry may also seek civil penalties for violations of the law in the Circuit Court of the county in which the violation occurred, in an amount not to exceed $2,500 for the first offense and $5,000 for any subsequent offense. For less serious violations, the Director will generally give the logging operator a specified number of days to correct the situation.

All penalties collected are deposited in a Timbering Operations and Enforcement Fund for use in administering the law.

The law also provides that all State agencies shall cooperate with the Director in administering the law and that the Director shall cooperate with all other State agencies in the enforcement of their responsibilities and duties.

There are exceptions provided for in the law for utilities and right-of-way clearing, ground-disturbing construction, Christmas tree severing, companies regulated by the federal energy regulatory commission and for people harvesting on their own property for their own use, provided that the individual does not have the severing done by a person whose business is the severing or removal of trees. An exemption from licensing and certification can be applied for if a person who is severing or removing standing trees for sale occasionally, on their own property or property of another, where the aggregate gross income realized for all sales within any calendar year of the logs, props, posts, firewood, rails, or other products does not exceed $15,528. The exemption must be approved by the Division of Forestry and a Harvesting of Timber Notification form must be submitted.

To apply for a timber-harvesting exemption, contact one of the six Division of Forestry District offices listed on Page 18.

It should be noted that landowners also have a responsibility in preventing sedimentation of the State's streams. Under Chapter 22 of the Code of West Virginia and enforced by the Division of Water Resources of the State Department of Environmental Protection, landowners can be held legally responsible for allowing or contributing to stream sedimentation or even stream turbidity due to logging.

STREAM DEFINITIONS

Perennial stream--Identified by well defined banks and natural channels and have continuously flowing water most years. They are usually shown on a topographic map as a solid blue line.

Intermittent stream--Has well defined banks and natural channels, but typically has flowing water from a headwater source for only a portion of the year. They are usually shown on a topographic map as broken blue lines.

Ephemeral stream--A channel that flows as a result of wet weather conditions when the ground is saturated. Not shown on topographic maps.

STREAMSIDE MANAGEMENT ZONES and SHADE STRIP AREAS

Definitions

Streamside management zone. Vegetated land adjacent to perennial, intermittent and ephemeral streams and ponds or lakes requiring special attention during forestry operations. These are critical areas where nonpoint source pollutants can enter the aquatic system. An area of undisturbed forest soil between areas disturbed to mineral soil and a stream bank. It provides a protective zone to trap and filter out suspended sediments before these particulates reach the stream. Any forestry operations should establish or enhance the riparian area while meeting the landowner's objectives.

Shade Strip (buffer strip). A no-cut or light-cut area that provides adequate shading of perennial or intermittent streams so as to stabilize and preserve the biological value of the stream.

Conditions Where Streamside Management Zones Apply

Streamside management zones should be maintained among all streams, watercourses, truck haul roads, skid roads and landings where soil has been exposed and surface runoff will carry sediment loads. Streamside management zones should be at least 100' wide on each side of perennial or intermittent streams and 25' wide on each side of ephemeral streams. Adequate streamside management zones should be maintained around all lakes or ponds, perennial flowing natural springs, and all springs and reservoirs serving as a domestic water supply.

Streamside Management Zones (SMZ)



Stream Bed	Stream Bank	SMZ's	Log Haul Road

On perennial and intermittent streams, 100' wide; on ephemeral stream flows, 25' wide.

Streamside Management Zone Requirements

1. The minimum streamside management zone width or distance between roads or landings (exposed mineral soil) and a perennial or intermittent stream should be 100 ft. slope distance. On ephemeral streams, it should be 25 ft.

2. The streamside management zone should be protected to prevent exposure of mineral soil and subsequent erosion. Equipment operation in this area should be limited. However, cutting and pulling trees from the area is permitted. If mineral soil is exposed, it will be stabilized by seeding and mulching as soon as possible.

3. Log landings will be located outside the streamside management zone where practical. If circumstances or specific reasons prevent this, then the landing will be treated as a critical area.

4. Log landing fill areas within the streamside management zone will be seeded and mulched immediately after construction.

5. Truck roads and skid roads should not be within the streamside management zone except when entering and leaving stream crossings.

6. Truck haul roads built, under certain circumstances and for specific reasons, within a streamside management zone should be graveled and fill slopes seeded and mulched immediately after construction.

7. Existing roads within the streamside management zone can be utilized only if using them will cause less damage than constructing a new road. Existing roads will be maintained in accordance with all requirements of haul and skid roads that reduce soil erosion and sedimentation.

8. Recommended spacing of drainage structures such as culverts, water bars, turn-outs and broad-based dips should be used on truck and skid roads to intercept and properly discharge runoff in small quantities so the filter capacity within the streamside management zone will not be exceeded.

9. Rip-rap erosion control will be installed at culvert outlets or discharge points into or within the streamside management zone. *(See Page 13)*

10. To minimize erosion sources, cut and fill slopes within the streamside management zone should be minimized in accordance with safety and other design criteria.

11. Skid road fill slopes within the streamside management zone will be seeded and mulched immediately after construction.

LOGGING DEBRIS and TREE TOPS IN STREAMS

Directional felling should be used to minimize stream disturbance. Felled tops in streams will be pulled from the stream channel on all perennial and intermittent streams. Small logging debris can be harmful to the stream channel causing bank erosion and channel blockage. It is also recognized that large woody vegetation in the riparian areas and stream channels can be beneficial to aquatic life.

TRUCK HAUL ROADS

Definition--A road system, temporary or permanent, utilized for transportation of wood products from the harvest site by truck.

Purpose--To provide for an efficient, safe transportation system to effectively protect the forest land and water quality when removing forest products from the harvest site, developing the forest for recreation, wildfire control, or other forest management activities.

Conditions Where Practice Applies

When a road system is necessary to provide vehicular access for the purpose of harvesting and removing forest products.

Specifications

1. Final center line grade of road should be 10% or less. Final center line gradients not exceeding 15% are permissible for distances up to 200 ft. By breaking or changing grade frequently, less erosion problems will be encountered than on long, straight continuous gradients. There should be a minimum road surface width of 12' on the cut surface (not fill).

2. Streams should be crossed as close to a right angle to the stream as possible. Bridges or culverts should be sized so as not to impede stream flow in keeping with good drainage practices. *(See "Pipe Culvert" on Page 14.)* Stream fords are permissible as a last resort, but only when the stream bottom is rock based and can support truck traffic. The stream is to be crossed at a right angle, and approaches to the stream should be graveled for a distance of 100 feet each side.

3. Road gradients approaching water crossings should be broken and surface water dispersed so it will not flow directly into the stream. Roads should be located (with the exception of stream crossings) a minimum of 100 ft. or more from perennial or intermittent streams and 25' from ephemeral streams. Distance is measured from the stream bank to the bottom edge of soil disturbance, in case of fills, to the toe of the fill slope. *(See "Streamside Management Zone (SMZ) Requirements" on Page 4.)* If the recommended streamside management zone cannot be maintained, then alternative practices will be used, such as placing gravel on the road surface and immediately seeding and mulching the road fill areas.

4. Roads may be out-sloped for cross drainage. On side hills where a curb, fender or berm is necessary to protect the fill slope, the road should be in-sloped with cross drainage installed from the inside toe of slope to the outside or downhill side. *(See "Pipe Culvert" on Page 14 or "Broad-Based Drainage Dip" on Page 17.)* Where roads are in-sloped, cross drain interception of surface water is necessary.

5. Level areas where drainage is difficult to establish, and wet floodplain soils should be avoided for road location if possible.

6. Truck roads that intersect public roads should have gravel or other aggregate up to 200 ft. to keep mud off the highway. (Check county Division of Highways requirements for entering public roads.)

Truck Haul Road Maintenance

1. *During construction,* adequate drainage of the road surface using temporary cross drains, "turn-outs" or water bars on a day-to-day basis is desired in the event of storm flows prior to road completion and installation of a permanent drainage system.

2. During the harvest operation period, roads and their attendant drainage systems should be maintained to perform to standard. This may include additional seeding and mulching of fill slopes within the streamside management zone.

3. Operations that will cause adverse erosion and sediment problems should not be carried on in times of extreme weather conditions.

Post-Harvest Operations

If roads are to be used after logging, broad-based dips, culverts and bridges should be left intact and be periodically maintained by the landowner. If not to be used, drainage structures should be removed and road surfaces restored to a natural drainage by out-sloping smoothly at 3%, leaving existing dips and establishing water bars. Stream banks will be least disturbed if bridge abutments are left intact when bridges are removed.

SKID ROADS AND TRAILS

Definition--An unsurfaced trail or road, as narrow as safety will allow, used for skidding harvested products.

Purpose--To skid logs, tree lengths or other roundwood products from the stump to a common landing or concentration area.

Conditions Where Practice Applies

This practice is used where harvesting products requires centralizing for sawing or for loading on trucks or trailers and where topography and size of operation make skidding the primary means of collecting trees, logs or other roundwood products.

Standard

Locate landings first and lay out skid road approaches with minimum grade. Major skid roads should have planned locations to reduce erosion and sedimentation, minimize damage to the residual stand and provide the most desirable method for skidding products.

1. A goal of job planning and road layout should be to develop an average skid road spacing of about 200 feet apart.

2. Gradients should not be steeper than 15%, with the exception of short, steep segments not exceeding 20%. (Grades up to 40% are acceptable if no mineral soil is exposed.)

3. DURING LOGGING, cross drainage, including turn-outs, water bars or grade breaks for dispersing surface water, should be installed at least every 100 feet and maintained daily.

4. Skid roads should be located away from streams according to the “Streamside Management Zone (SMZ) Requirements” on Page 4.

5. Any skid road necessitating the crossing of a stream will require a bridge or culvert of acceptable design. Logs will not be skidded through any stream.

6. Approaches to stream crossings should be as near to right angles to the stream direction as possible.

7. UPON FINAL COMPLETION of skidding on a road, the logger should stabilize and retire the road before any other skidding occurs. This should be done by first removing the outer berm, outsloping and smoothing the skid road. Next establish water bars at these minimum grade intervals: Less than 10%-100 ft.; 10%-80 ft.; 15%-60 ft.; 20%-45 ft.; 25%-40 ft.; 30%-35 ft. Water bars should be installed at a near 30- to 45-degree angle downslope, with ends open to prevent water accumulation behind them. Seed and mulch according to guidelines on page 8. Scattered logging slash may supplement water bars and seeding.

8. NEVER skid in a stream or directly through a stream.

LOG LANDINGS

Definition--An area where logs are assembled. This Includes landings at the end of skid and haul roads.

Standard

This practice almost always results in the disturbance of the surface. Care should be taken to locate areas properly to minimize the chance of erosion and sedimentation.

The following points should be considered in the location and use of landings:

1. Adequate streamside management zones should be left between landings and streams. *(See "Streamside Management Zone (SMZ) Requirements" on Page 4.)*

2. Landings and yards should be located on dry, firm sites and have a slight slope to allow for drainage.

3. Provide for adequate drainage on approach roads so that road drainage does not enter landing area and cause "mudholes."

4. Provide diversion ditch around uphill side of landings where seepage and lateral flow of water is a problem.

5. When servicing equipment on site, drain old oil, etc., into containers and properly dispose of in accordance with proper solid waste disposal. All empty containers should be removed and disposed of properly.

6. Seed and mulch landings immediately following completion of operations or use of the landing. *(See "Reclamation Requirements" on Page 8.)*

7. Landing size should be kept to a minimum.

RECLAMATION REQUIREMENTS

The following areas will be SEEDED:

1. Truck haul roads that:

   - Exceed 10% slope.
   - Are within the streamside management zone.

2. All skid roads and trails that:

   - Exceed 15% slope. (Lopped slash can be placed on roads to supplement seeding.)
   - Are within the streamside management zone.

The following areas will be SEEDED and MULCHED:

- All landings.
- All mineral soil disturbed within the streamside management zone.
- Any road that disturbs mineral soil and exceeds 20% slope.

Note: Lime and fertilizer may be required with seeding depending on soil conditions

 # # Seeding and Mulching will be more successful if # #

1. For each section in the planned logging operation, all exposed mineral soil areas that are to be seeded or seeded and mulched should have the high berms removed, outsloped, surface smoothed, water barred then seeded and mulched immediately after they are no longer needed. **Don't wait!** Some areas may require lime and/or fertilizer.

2. Landing fills and road fills will be seeded and mulched immediately after construction when inside the streamside management zone. **Maintenance mulching and some additional seeding may be needed.**

3. All compacted exposed areas should have a seed bed prepared by scarifying the surface to a depth of 2" to 3".

4. All areas seeded should have the seed covered by dragging the dozer blade, brush, chain or cable.

RECOMMENDED SEED MIXTURE OPTIONS # # (RATES PER ACRE)

SHADED WOODLAND AREAS

Option 1. 30 lbs. lathco flat pea; 20 lbs. perennial ryegrass

Option 2. 30 lbs. creeping red fescue; 10 lbs. perennial ryegrass

Option 3. 20 lbs. tall fescue; 20 lbs. lathco flat pea

Option 4. 50 lbs. winter wheat; 8 lbs. orchard grass; 10 lbs. tall fescue (K-31)

WILDLIFE MIX ON LANDINGS

Option 1. 8 lbs. bird's-foot trefoil; 3 lbs. redtop; 4 lbs. orchard grass

Option 2. 8 lbs. tioga deertongue; 6 lbs. ladino clover

Option 3. 25 lbs. physter fescue or johnstone fescue; 2 lbs. ladino clover

Option 4. 25 lbs. physter fescue or johnstone fescue; 5 lbs. annual ryegrass; 2 lbs. orchard grass; 3 lbs. tioga deertongue; 2 lbs. bird's-foot trefoil; 4 lbs. foxtail millet

Option 5. 50 lbs. winter wheat; 8 lbs. orchard grass; 4 lbs. ladino clover; 6 lbs. timothy

EROSION CONTROL IN GRASSLAND OR PASTURES

Option 1. 8 lbs. bird's-foot trefoil; 4 lbs. timothy

Option 2. 1 lb. white clover; 6 lbs. Kentucky bluegrass; 2 lbs. timothy

Option 3. 10 lbs. orchard grass; 2 lbs. ladino clover; 3 lbs. redtop

Option 4. 50 lbs. winter wheat; 8 lbs. orchard grass; 6 lbs. timothy

CRITICAL AREAS, STREAM CROSSINGS, ETC., WHEN HEAVY GRASS COVER IS NEEDED

Option 1. 25 lbs. Kentucky-31-fescue; 5 lbs. ladino clover

Option 2. 50 lbs. winter wheat; 25 lbs. tall fescue (K-31)

SEEDING DATES AND RECOMMENDATIONS #

1. Best - March to June; late August through September, and early October
2. Frost Seeding - February through early March. Seeding on snow is acceptable.
3. Weather Conditions Limiting - Seeding can occur, but weather could limit success. June, July, late October, November, December, and January.
4. Add annual ryegrass (8lbs/acre) and/or winter wheat (50lbs/acre) to seed mixtures to provide quick ground cover and soil stabilization.
5. Lime and fertilizer will insure a continued grass cover on dry sites and areas where the subsoil is exposed.
6. All legume seeds must be inoculated before seeding.

WATER BARS on SKID ROADS

Definition--A water control structure constructed across a skid road (30° to 45°), usually from soil, to intercept and divert water from the road surface. Permanent water bars are usually constructed at least 1 foot to 30" in depth. Temporary water bars are usually constructed at least 6 inches to 1 foot in depth.

Conditions Where Practice Applies

On any sloping road where surface water runoff may cause erosion of the exposed road.

Specifications for Permanent Water Bars

1. Proper spacing between permanent water bars can be determined from the table on the following page.
2. Installation should be at an angle of 30° to 45° downslope or more to turn surface water off the road or trail.
3. A shallow trench should be dug 1 foot below the surface of the road or trail and extend beyond both sides.
4. Fill dirt from the dug water bar should be left intact.
5. The uphill end of the water bar should extend beyond the side ditch line of the road to fully intercept any ditch flows.
6. The outflow end of the bar should be fully open and extended far enough beyond the fill edge of the road or trail to safely disperse runoff water onto the undisturbed forest floor.

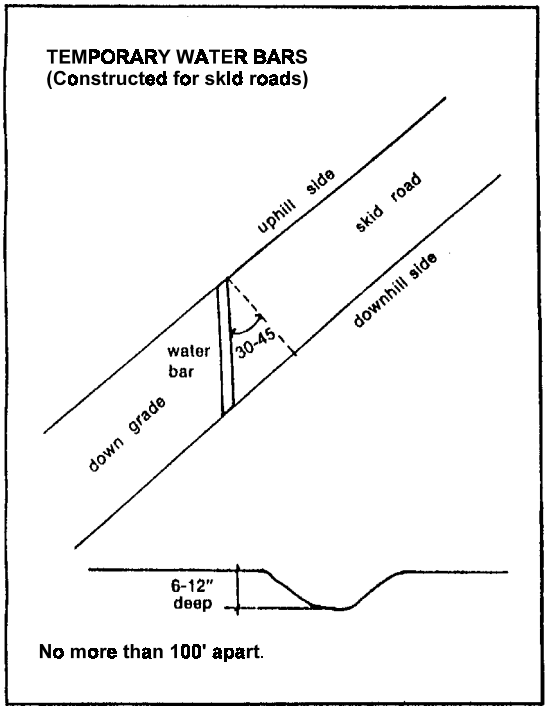
Specifications for Temporary Water Bars

1. Spacing for temporary water bars should not exceed 100' apart.
2. The depth of a temporary water bar should be 6 inches to 1 foot.
3. Temporary water bars are used for temporary shutdown, for overnight shutdown status or for erosion control during road construction.

SPACING TO USE
between
PERMANENT WATER BARS

% Grade of Road	Distance Between Water Bars
Less than 10%	100
10	80
15	60
20	45
25	40
30	35

TEMPORARY WATERBARS



OPEN-TOP BOX CULVERT

Definition--A wooden culvert placed across truck haul roads to convey road surface runoff and side ditch flows across road surface to downslope side.

Purpose--To collect and direct road surface storm runoff and upslope side ditch flows across road without eroding drainage system or road surfaces.

Conditions Where Practice Applies

This is a drainage structure for ongoing operations and is not recommended for permanent use. It can be used for cross drainage on truck haul roads on smaller operations as a substitute for pipe culverts; however, it silts in readily and requires frequent maintenance. This practice should not be used for handling intermittent or live streams or skid trail cross drainage.

Design Criteria

1. Box culvert is to be installed flush with road surface and at an angle not less than 30° downgrade.

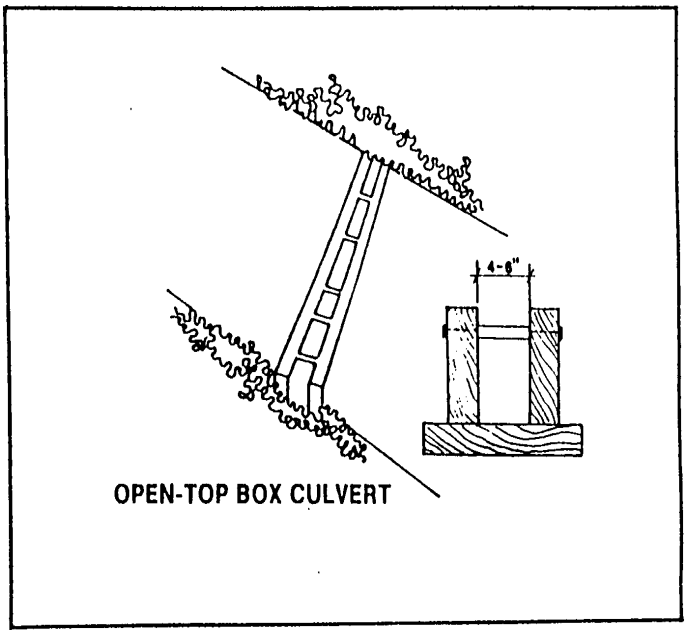
2. The box culvert will be installed at the same grade as the side ditch and extend into the toe of the cut slope.

3. The lower end of the culvert will extend beyond the road surface with adequate rip-rap or other material to slow water velocity to assure no erosion of the loose fill.

4. Place culverts about 100' apart or less.

5. Clean-out maintenance must be done periodically to remove sediment, gravel and logging debris to allow normal drainage of the culvert at all times.

OPEN-TOP BOX CULVERT



OPEN-TOP PIPE CULVERT

Definition--An eight- to 10-inch steel wall pipe with three-inch wide slots cut 24" long along the pipe. Used to intercept water on roads exceeding 10% slope where broad-based dips are impractical. Recommended spacing is the same as for a broad-based dip. (Recommend at least 100' apart, but no more than 150' apart.)

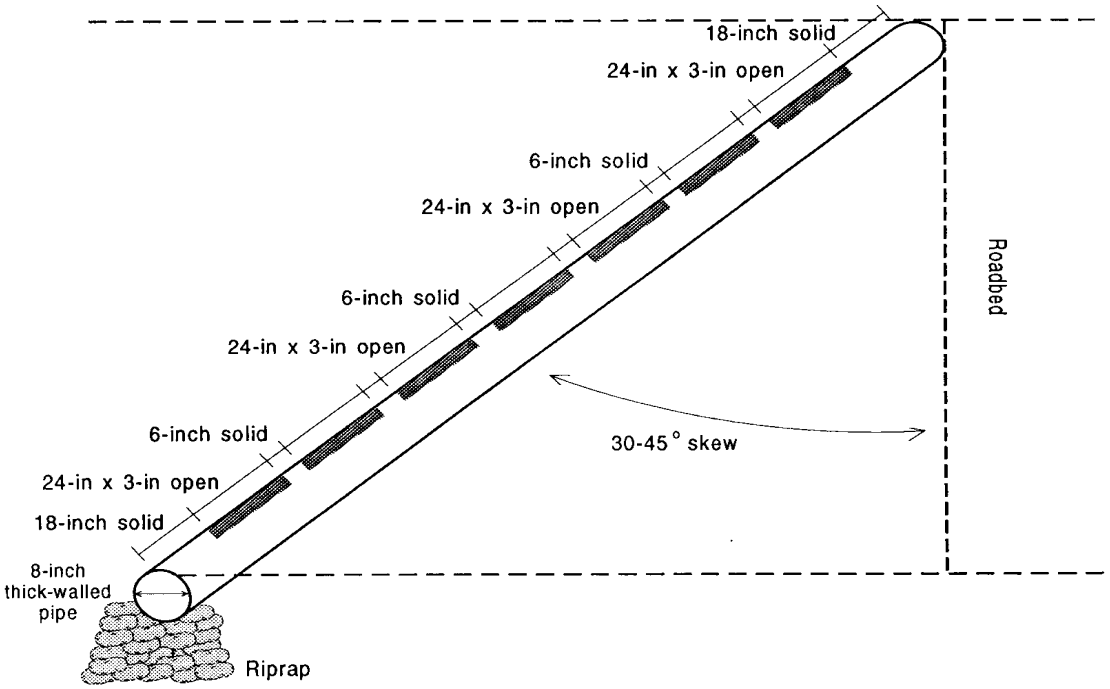


Figure 1.--Layout and dimensions of a 20' long open-top pipe culvert.

PIPE CULVERT

Definition--Corrugated metal pipe or other suitable material is placed under truck haul or skid roads.

Purpose--To collect and transmit water flows from side ditches, seeps or streams under haul and skid roads safely without eroding drainage system or road surface.

Conditions Where Practice Applies

Its use is for any size operation where cross drainage of storm water or diversion of small streams is needed for truck haul or skid roads. In such cases, it is a necessary drainage structure for temporary operations, but can be permanent.

Design Criteria

Cross Drainage (Streams):

1. Pipe length should be long enough so both ends extend beyond side slope toes. On truck haul roads, the minimum recommended length is 25'. On skids roads, the recommended minimum length is 20'.

2. When multiple pipes are used in a stream crossing, the space between the pipes should be ½ the pipe diameter, and the fill over the pipe should be at least 1 foot or more. *(See diagram on Page 15.)*

3. The minimum diameter pipe on permanent pipe installations should be according to the permanent culvert drainage table on Page 16.

4. The minimum diameter pipe recommended for use is 15"; however, smaller diameter pipes may be used temporarily as long as they are adequate to accommodate the stream channel at maximum flow.

5. Pipe and stream gradient should be the same, with the pipe alignment being the same as the stream course also.

Cross Drainage (Ditching):

1. Pipe length should be long enough so both ends extend beyond side slope toes (25' minimum on truck roads; 20' minimum length on skids roads).

2. Minimum diameter pipe recommended for use is 15"; however, smaller diameter pipes may be used temporarily as long as they are adequate to accommodate the ditch channel at maximum flow.

3. For use in disposing of collected surface water drainage, the culvert gradient should match that of the contributing ditch.

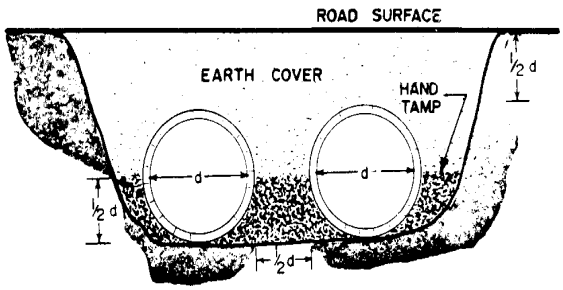
4. Installation should be skewed 30-45° downgrade.

5. Erosion protection should be provided for outflows of culverts to minimize erosion below the lower end of the culvert. It may also be needed on the upstream end of culverts on flowing streams. This protection can be in the form of rip-rap or plastic filter cloth and rip-rap, large stone, hay or straw bales, etc.

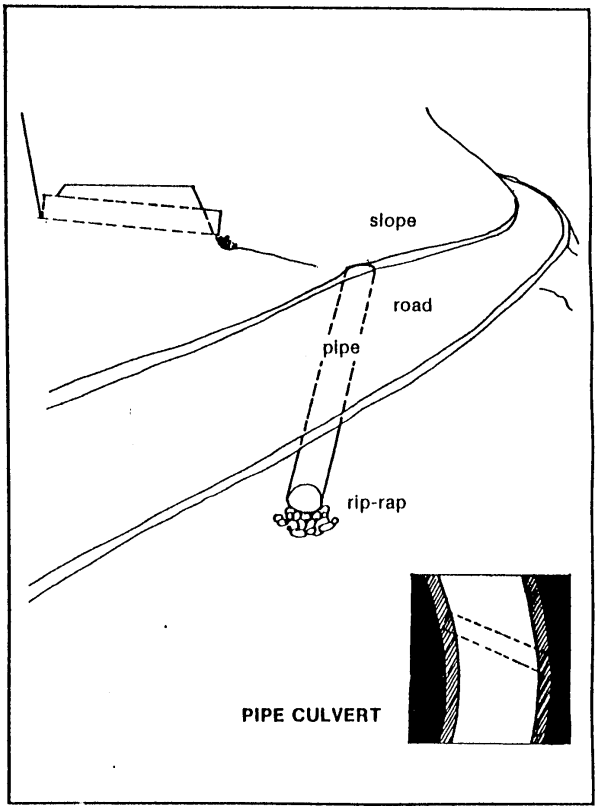
*Note: When pipe diameter smaller than 15" is used, frequent clean-out maintenance is necessary.

CULVERT SPACING GUIDE FOR CROSS DRAINAGE (DITCH DRAINAGE)	
Road Grade (Percent)	Metal Culvert Spacing (Feet)
2	400
4	350
6	300
8	250
10	200
12	150
14	100
16	50

Multiple Pipe Culvert Installation



Pipe culvert installation for ditching.



DRAINAGE TABLE

Estimated culvert diameter needed to carry flood water from forested areas ranging from 10 to 400 acres and at recurrence intervals of 10 to 50 years. Accuracy of values for areas exceeding 100 acres is uncertain. Land use disturbance and soil type above culvert locations can affect water flow peak levels and therefore should be considered when using this chart.

	Recurrence Interval (yr.)		
Area	**10**	**20**	**50**
acres	**---------- inches ----------**		
2-8	**15**	**15**	**15**
10	**16**	**16**	**18**
20	**18**	**18**	**20**
30	**18**	**20**	**24**
40	**20**	**22**	**26**
50	**22**	**24**	**28**
60	**22**	**24**	**28**
70	**24**	**26**	**30**
80	**24**	**26**	**30**
90	**24**	**28**	**32**
100	**26**	**28**	**34**
125	**28**	**30**	**36**
150	**28**	**32**	**38**
175	**30**	**34**	**40**
200	**32**	**36**	**42**
250	**34**	**38**	**46**
300	**36**	**40**	**48**
350	**38**	**42**	**54**
400	**40**	**48**	**54**

*Table modified from: Helvey, J. David, and Kochenderfer, James N., 1988. Culvert Sizes Needed for Small Drainage Areas in the Central Appalachians. USDA Forest Service, Northeastern Forest Experiment Station, Parsons, WV. Areas with heavy clay soils may require larger diameter pipes if used as a permanent structure.

TEMPORARY CULVERT DRAINAGE

For temporary culvert installations, the pipe diameter should be adequate to serve the water channel or ditch channel at maximum flow.

BROAD-BASED DRAINAGE DIP

Definition--A dip and reverse slope in a road surface with an outslope in the dip for natural cross drainage.

Purpose--To provide cross drainage on inslope truck roads to prevent buildup of excessive surface runoff and sheet erosion.

Conditions Where Practice Applies

Broad-based dips can be used on truck haul and heavily used skid roads having a gradient of 10% or less. They are not to be used for cross draining intermittent or live streams. This practice may be substituted for other surface water cross drain practices (pipe or box culvert).

Design Criteria

1. Installation takes place following basic roadbed construction.

2. A 20-foot, 3% reverse grade is constructed into the existing roadbed by cutting from upgrade of the dip location and using cut material for the reverse grade.

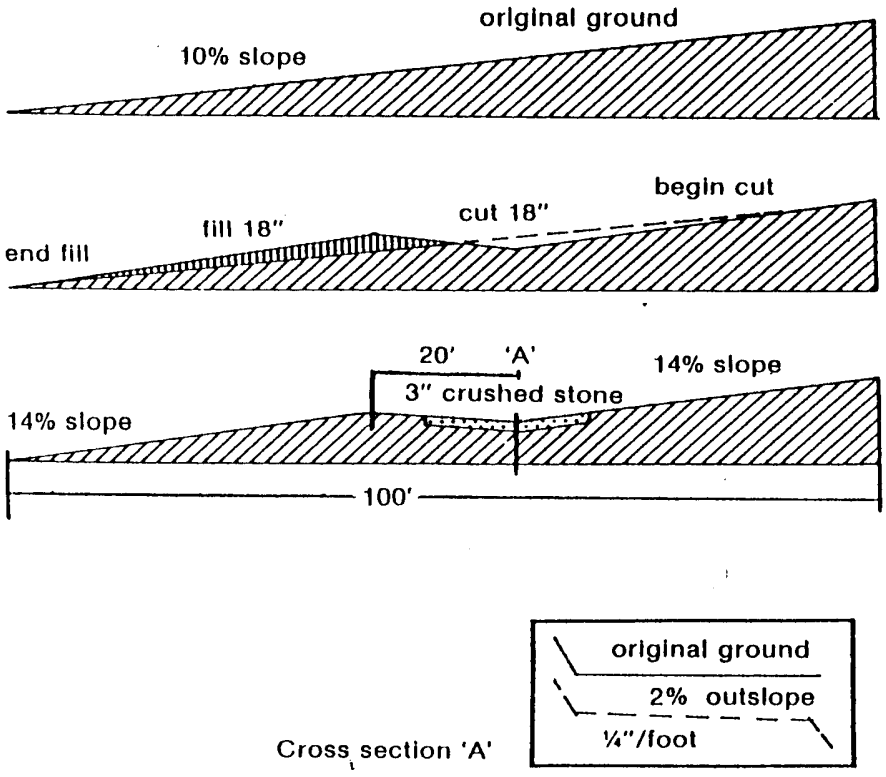
3. Spacing of broad-based dips should be approximately 100' apart but never exceed 150' apart.

4. Cross drain outslope will be 2-3% maximum.

5. Use rip-rap to control erosion on the loose fill below a dip as needed.

6. The dip and reverse grade section will require bedding with 20 ton of 3-inch crushed stone to avoid rutting of the road surface.

BROAD-BASED DRAINAGE DIP



W.VA. DIVISION OF FORESTRY STATE AND DISTRICT OFFICES

For more information on BMP's, the Logging Sediment Control Act, logger certification and recertification, contact the following:

W.Va. Division of Forestry
1900 Kanawha Boulevard, East
Charleston, WV 25305-0180
(304) 558-2788
FAX (304) 558-0143

District I
Route 2, Box 1100
Fairmont, WV 26554
(304) 367-2793
(Includes counties of Barbour, Brooke, Hancock, Harrison, Marion, Marshall, Monongalia, Ohio, Preston, Taylor, Tucker, Wetzel)

District II
1 Depot Street
Romney, WV 26757
(304) 822-4512
(Includes counties of Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral, Morgan, Pendleton)

District III
P. O. Box 38
State Route 20
French Creek, WV 26218
(304) 924-6266
(Includes counties of Braxton, Clay, Lewis, Nicholas, Pocahontas, Randolph, Upshur, Webster)

District IV
330 Harper Park Drive
Suite J
Beckley, WV 25801
(304) 256-6775
(Includes counties of Fayette, Greenbrier, McDowell, Mercer, Monroe, Raleigh, Summers, Wyoming)

District V
P. O. Box 189
878 East Main Street, Rear
Milton, WV 25541
(304) 743-6186
(Includes counties of Boone, Cabell, Kanawha, Lincoln, Logan, Mason, Mingo, Putnam, Wayne)

District VI
2309 Gihon Road
Parkersburg, WV 26101
(304) 420-4515
(Includes counties of Calhoun, Doddridge, Gilmer, Jackson, Pleasants, Ritchie, Roane, Tyler, Wirt, Wood)

WEST VIRGINIA'S LOGGING SEDIMENT CONTROL ACT

REVIEW

The following information is designed to give you a basic understanding of the law. If you have questions, contact the nearest office of the West Virginia Division of Forestry.

1. All logging companies, timber buyers, buyers of logs for resale, and other contractors working on a timbering operation MUST have a "Timbering License" for their company. This license costs $50.00 annually and can be obtained at the State Headquarters of the Division of Forestry (Guthrie Center). Allow two weeks' processing time.

2. All companies and individuals doing business in West Virginia MUST be registered with the State Tax Department (phone: 304-558-3333) and have a West Virginia business number.

   Must be in compliance with the West Virginia Workers Compensation Division and supply correct proof of coverage with the timbering license application. (Phone: 304-926-5000)

   Must be in compliance with the West Virginia Unemployment Compensation Division and supply an original compliance letter with the timbering license application. (Phone: 304-558-1281)

3. Each logging operation MUST be supervised by a "Certified Logger". To become a certified logger, an individual needs to have successfully completed training classes in first-aid, best management practices, and logging safety. Retraining is required every three years or after the second renewal. A card with photo, similar to your driver's license, will be issued stating that you are a Certified Logger in West Virginia. The cost of logger certification is $50.00 annually for each certified logger and can be obtained at the State Headquarters of the Division of Forestry (Guthrie Center). This is in addition to the license mentioned above. The law requires only one certified logger per logging operation. The certified logger must be on the active logging operation every day.

4. A "Timbering Operation Notification" form MUST be sent to the appropriate Division of Forestry District office for EACH logging operation within three days of start-up, including a sketch map or topographic map giving clear directions to the logging operation and showing the proposed operation, including the locations of roads and landings in relation to streams and ridges along with all stream crossings. A description of all the sediment control practices to be used by the logger should also be listed.

5. Each logging operation MUST have a SIGN visible at the active landing showing the company name and license number. Lettering on the sign must be at least three inches high.

6. Notify the Division of Forestry if you temporarily stop operating or finish a job 7 days or more outside of the predicted finish date indicated on the notification form.

7. Reclamation of the job should be completed within 7 days of the completion date of the job. If it can't be done within 7 days of completion, notify the DOF District office.

LOGGING OPERATIONS WILL BE SUSPENDED IF ANY ONE OF THE FIRST 5 ITEMS ABOVE IS MISSING

Logging operations are required to use Best Management Practices for controlling soil erosion and preventing sediment pollution into streams. Violations of these or certain water quality laws can result in compliance orders, job suspensions, citations, etc.

ARTICLE 3. SURFACE COAL MINING AND RECLAMATION ACT.

§22-3-1. Short title.

This article shall be known and cited as the "Surface Coal Mining and Reclamation Act."

§22-3-2. Legislative findings and purpose; jurisdiction vested in division of environmental protection; authority of director; inter-departmental cooperation.

(a) The Legislature finds that it is essential to the economic and social well-being of the citizens of the state of West Virginia to strike a careful balance between the protection of the environment and the economical mining of coal needed to meet energy requirements.

Further, the Legislature finds that there is great diversity in terrain, climate, biological, chemical and other physical conditions in parts of this nation where mining is conducted; that the state of West Virginia in particular needs an environmentally sound and economically healthy mining industry; and by reason of the above it may be necessary for the director to promulgate rules which vary from federal regulations as is provided for in sections 101 (f) and 201 (c)(9) of the federal Surface Mining Control and Reclamation Act of 1977, as amended, "Public Law 95-87."

Further, the Legislature finds that unregulated surface coal mining operations may result in disturbances of surface and underground areas that burden and adversely affect commerce, public welfare and safety by destroying or diminishing the utility of land for commercial, industrial, residential, recreational, agricultural and forestry purposes; by causing erosion and landslides; by contributing to floods; by polluting the water and river and stream beds; by destroying fish, aquatic life and wildlife habitats; by impairing natural beauty; by damaging the property of citizens; by creating hazards dangerous to life and property; and by degrading the quality of life in local communities, all where proper mining and reclamation is not practiced.

(b) Therefore, it is the purpose of this article to:

(1) Expand the established and effective statewide program to protect the public and the environment from the adverse effects of surface-mining operations;

(2) Assure that the rights of surface and mineral owners and other persons with legal interest in the land or appurtenances to land are adequately protected from such operations;

(3) Assure that surface-mining operations are not conducted where reclamation as required by this article is not feasible;

(4) Assure that surface-mining operations are conducted in a manner to adequately protect the environment;

(5) Assure that adequate procedures are undertaken to reclaim surface areas as contemporaneously as possible with the surface-mining operations;

(6) Assure that adequate procedures are provided for public participation where appropriate under this article;

(7) Assure the exercise of the full reach of state common law, statutory and constitutional powers for the protection of the public interest through effective control of surface-mining operations; and

(8) Assure that the coal production essential to the nation's energy requirements and to the state's economic and social well-being is provided.

(c) In recognition of these findings and purposes, the Legislature hereby vests authority in the director of the division of environmental protection to:

(1) Administer and enforce the provisions of this article as it relates to surface mining to accomplish the purposes of this article;

(2) Conduct hearings and conferences or appoint persons to conduct them in accordance with this article;

(3) Promulgate, administer and enforce rules pursuant to this article;

(4) Enter into a cooperative agreement with the secretary of the United States department of the interior to provide for state regulation of surface-mining operations on federal lands within West Virginia consistent with section 523 of the federal Surface Mining Control and Reclamation Act of 1977, as amended; and

(5) Administer and enforce rules promulgated pursuant to this chapter to accomplish the requirements of programs under the federal Surface Mining Control and Reclamation Act of 1977, as amended.

(d) The director of the division of environmental protection and the director of the office of miners' health, safety and training shall cooperate with respect to each agency's programs and records to effect an orderly and harmonious administration of the provisions of this article. The director of the division of environmental protection may avail himself or herself of any services which may be provided by other state agencies in this state and other states or by agencies of the federal government, and may reasonably compensate them for such services. Also, he or she may receive any federal funds, state funds or any other funds, and enter into cooperative agreements, for the reclamation of land affected by surface mining.

§22-3-3. Definitions.

As used in this article, unless used in a context that clearly requires a different meaning, the term:

(a) "Adequate treatment" means treatment of water by physical, chemical or other approved methods in a manner so that the treated water does not violate the effluent limitations or cause a violation of the water quality standards established for the river, stream or drainway into which the water is released.

(b) "Affected area" means, when used in the context of surface-mining activities, all land and water resources within the permit area which are disturbed or utilized during the term of the permit in the course of surface-mining and reclamation activities. "Affected area" means, when used in the context of underground mining activities, all surface land and water resources affected during the term of the permit: (1) By surface operations or facilities incident to underground mining activities; or (2) by underground operations.

(c) "Adjacent areas" means, for the purpose of permit application, renewal, revision, review and approval, those land and water resources, contiguous to or near a permit area, upon which surface-mining and reclamation operations conducted within a permit area during the life of the operations may have an impact. "Adjacent areas" means, for the purpose of conducting surface-mining and reclamation operations, those land and water resources contiguous to or near the affected area upon which surface-mining and reclamation operations conducted within a permit area during the life of the operations may have an impact.

(d) "Applicant" means any person who has or should have applied for any permit pursuant to this article.

(e) "Approximate original contour" means that surface configuration achieved by the backfilling and grading of the mined areas so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated: Provided, That water impoundments may be permitted pursuant to subdivision (8), subsection (b), section thirteen of this article: Provided, however, That minor deviations may be permitted in order to minimize erosion and sedimentation, retain moisture to assist revegetation, or to direct surface runoff.

(f) "Assessment officer" means an employee of the division, other than a surface-mining reclamation supervisor, inspector or inspector-in-training, appointed by the director to issue proposed penalty assessments and to conduct informal conferences to review notices, orders and proposed penalty assessments.

(g) "Breakthrough" means the release of water which has been trapped or impounded, or the release of air into any underground cavity, pocket or area as a result of surface-mining operations.

(h) "Coal processing wastes" means earth materials which are or have been combustible, physically unstable or acid-forming or toxic-forming, which are wasted or otherwise separated from product coal, and slurried or otherwise transported from coal processing plants after physical or chemical processing, cleaning or concentrating of coal.

(i) "Director" means the director of the division of environmental protection or other person to whom the director has delegated authority or duties pursuant to sections six or eight, article one of this chapter.

(j) "Disturbed area" means an area where vegetation, topsoil or overburden has been removed or placed by surface-mining operations, and reclamation is incomplete.

(k) "Division" means the division of environmental protection.

(l) "Imminent danger to the health or safety of the public" means the existence of a condition or practice, or any violation of a permit or other requirement of this article, which condition, practice or violation could reasonably be expected to cause substantial physical harm or death to any person outside the permit area before the condition, practice or violation can be abated. A reasonable expectation of death or serious injury before abatement exists if a rational person, subjected to the same conditions or practices giving rise to the peril, would not expose the person to the danger during the time necessary for the abatement.

(m) "Minerals" means clay, coal, flagstone, gravel, limestone, manganese, sand, sandstone, shale, iron ore and any other metal or metallurgical ore.

(n) "Operation" means those activities conducted by an operator who is subject to the jurisdiction of this article.

(o) "Operator" means any person who is granted or who should obtain a permit to engage in any activity covered by this article and any rule promulgated under this article and includes any person who engages in surface-mining or surface-mining and reclamation operations, or both. The term shall also be construed in a manner consistent with the federal program pursuant to the federal Surface-Mining Control and Reclamation Act of 1977, as amended.

(p) "Permit" means a permit to conduct surface-mining operations pursuant to this article.

(q) "Permit area" means the area of land indicated on the approved proposal map submitted by the operator as part of the operator's application showing the location of perimeter markers and monuments and shall be readily identifiable by appropriate markers on the site.

(r) "Permittee" means a person holding a permit issued under this article.

(s) "Person" means any individual, partnership, firm, society, association, trust, corporation, other business entity or any agency, unit or instrumentality of federal, state or local government.

(t) "Prime farmland" has the same meaning as that prescribed by the United States secretary of agriculture on the basis of such factors as moisture availability, temperature regime, chemical balance, permeability, surface layer composition, susceptibility to flooding and erosion characteristics, and which historically have been used for intensive agricultural purposes and as published in the federal register.

(u) "Surface mine", "surface-mining" or "surface-mining operations" means:

(1) Activities conducted on the surface of lands for the removal of coal, or, subject to the requirements of section fourteen of this article, surface operations and surface impacts incident to an underground coal mine, including the drainage and discharge from the mine. The activities include: Excavation for the purpose of obtaining coal, including, but not limited to, common methods as contour, strip, auger, mountaintop removal, box cut, open pit and area mining; the uses of explosives and blasting; reclamation; in situ distillation or retorting, leaching or other chemical or physical processing; the cleaning, concentrating or other processing or preparation and loading of coal for commercial purposes at or near the mine site; and

(2) The areas upon which the above activities occur or where the activities disturb the natural land surface. The areas also include any adjacent land, the use of which is incidental to the activities; all lands affected by the construction of new roads or the improvement or use of existing roads to gain access to the site of the activities and for haulage; and excavations, workings, impoundments, dams, ventilation shafts, entryways, refuse banks, dumps, stockpiles, overburden piles, spoil banks, culm banks, tailings, holes or depressions, repair areas, storage areas, processing areas, shipping areas and other areas upon which are sited structures, facilities, or other property or materials on the surface, resulting from or incident to the activities: Provided, That the activities do not include the extraction of coal incidental to the extraction of other minerals where coal does not exceed sixteen and two-thirds percent of the tonnage of minerals removed for purposes of commercial use or sale, or coal prospecting subject to section seven of this article. Surface-mining does not include any of the following:

(i) Coal extraction authorized pursuant to a government-financed reclamation contract;

(ii) Coal extraction authorized as an incidental part of development of land for commercial, residential, industrial, or civic use; or

(iii) The reclamation of an abandoned or forfeited mine by a no cost reclamation contract.

(v) "Underground mine" means the surface effects associated with the shaft, slopes, drifts or inclines connected with excavations penetrating coal seams or strata and the equipment connected therewith which contribute directly or indirectly to the mining, preparation or handling of coal.

(w) "Significant, imminent environmental harm to land, air or water resources" means the existence of any condition or practice, or any violation of a permit or other requirement of this article, which condition, practice or violation could reasonably be expected to cause significant and imminent environmental harm to land, air or water resources. The term "environmental harm" means any adverse impact on land, air or water resources, including, but not limited to, plant, wildlife and fish, and the environmental harm is imminent if a condition or practice exists which is causing the harm or may reasonably be expected to cause the harm at any time before the end of the abatement time set by the director. An environmental harm is significant if that harm is appreciable and not immediately repairable.

(x) "Unanticipated event or condition" as used in section eighteen of this article means an event or condition in a remining operation that was not contemplated by the applicable surface coal mining and reclamation permit.

(y) "Lands eligible for remining" means those lands that would be eligible for expenditures under section four, article two of this chapter. Surface-mining operations on lands eligible for remining do not affect the eligibility of the lands for reclamation and restoration under article two of this chapter. In event the bond or deposit for lands eligible for remining is forfeited, funds available under article two of this chapter may be used to provide for adequate

reclamation or abatement. However, if conditions constitute an emergency as provided in section 410 of the federal Surface-Mining Control and Reclamation Act of 1977, as amended, then those federal provisions apply.

(z) "Replacement of water supply" means with respect to water supplies contaminated, diminished, or interrupted, provision of water supply on both a temporary and permanent basis of equivalent quality and quantity. Replacement includes provision of an equivalent water delivery system and payment of operation and maintenance cost in excess of customary and reasonable delivery cost for the replaced water supplies.

Upon agreement by the permittee and the water supply owner, the obligation to pay the costs may be satisfied by a one-time payment in an amount which covers the present annual operation and maintenance costs for a period agreed to by the permittee and the water supply owner.

§22-3-4. Reclamation; duties and functions of director.

(a) The director shall administer the provisions of this article relating to surface-mining operations. The director has within his or her jurisdiction and supervision all lands and areas of the state, mined or susceptible of being mined, for the removal of coal and all other lands and areas of the state deforested, burned over, barren or otherwise denuded, unproductive and subject to soil erosion and waste. Included within such lands and areas are lands seared and denuded by chemical operations and processes, abandoned coal mining areas, swamplands, lands and areas subject to flowage easements and backwaters from river locks and dams, and river, stream, lake and pond shore areas subject to soil erosion and waste. The jurisdiction and supervision exercised by the director shall be consistent with other provisions of this chapter.

(b) The director has the authority to:

(1) Promulgate rules, in accordance with the provisions of chapter twenty-nine-a of this code, to implement the provisions of this article: Provided, That the director shall give notice by publication of the public hearing required in article three, chapter twenty-nine-a of this code: Provided, however, That any forms, handbooks or similar materials having the effect of a rule as defined in article three, chapter twenty-nine-a of this code were issued, developed or distributed by the director pursuant to or as a result of a rule are subject to the provisions of article three, chapter twenty-nine-a of this code;

(2) Make investigations or inspections necessary to ensure complete compliance with the provisions of this code;

(3) Conduct hearings or appoint persons to conduct hearings under provisions of this article or rules adopted by the director; and for the purpose of any investigation or hearing hereunder, the director or his or her designated representative, may administer oaths or affirmations, subpoena witnesses, compel their attendance, take evidence and require production of any books, papers, correspondence, memoranda, agreements, or other documents or records relevant or material to the inquiry;

(4) Enforce the provisions of this article as provided herein; and

(5) Appoint such advisory committees as may be of assistance to the director in the development of programs and policies: Provided, That such advisory committees shall, in each instance, include members representative of the general public.

(c) (1) After the director has adopted the rules required by this article, any person may petition the director to initiate a proceeding for the issuance, amendment or appeal of a rule under this article.

(2) The petition shall be filed with the director and shall set forth the facts which support the issuance, amendment or appeal of a rule under this article.

(3) The director may hold a public hearing or may conduct such investigation or proceeding as

he or she considers appropriate in order to determine whether the petition should be granted or denied.

(4) Within ninety days after filing of a petition described in subdivision (1) of this subsection, the director shall either grant or deny the petition. If the director grants the petition, he or she shall promptly commence an appropriate proceeding in accordance with the provisions of chapter twenty-nine-a of this code. If the director denies the petition, he or she shall notify the petitioner in writing setting forth the reasons for the denial.

§22-3-5. Surface-mining reclamation supervisors and inspectors; appointment and qualifications; salary.

The director shall determine the number of surface-mining reclamation supervisors and inspectors needed to carry out the purposes of this article and appoint them as such. All such appointees shall be qualified civil service employees, but no person is eligible for such appointment until he or she has served in a probationary status for a period of six months to the satisfaction of the director.

Every surface-mining reclamation supervisor shall be paid not less than thirty thousand dollars per year. Every surface-mining reclamation inspector shall be paid not less than twenty-five thousand dollars per year.

§22-3-6. Duties of surface-mining reclamation inspectors and inspectors in training.

Except as otherwise provided in this article, surface-mining reclamation inspectors and inspectors in training shall make all necessary surveys and inspections of surface-mining operations required by the provisions of this article, shall administer and enforce all surface-mining laws and rules and shall perform such other duties and services as may be prescribed by the director. Such inspectors shall give particular attention to all conditions of each permit to ensure complete compliance therewith. Such inspectors shall note and describe all violations of this article and immediately report such violations to the director in writing, furnishing at the same time a copy of such report to the operator concerned.

§22-3-7. Notice of intention to prospect, requirements therefor; bonding; director's authority to deny or limit; postponement of reclamation; prohibited acts; exceptions.

(a) Any person intending to prospect for coal in an area not covered by a surface-mining permit, in order to determine the location, quantity or quality of a natural coal deposit, making feasibility studies or for any other purpose, shall file with the director, at least fifteen days prior to commencement of any disturbance associated with prospecting, a notice of intention to prospect, which notice shall include a description of the prospecting area, the period of supposed prospecting and such other information as required by rules promulgated pursuant to this section: Provided, That prior to the commencement of such prospecting, the director may issue an order denying or limiting permission to prospect where the director finds that prospecting operations will damage or destroy a unique natural area, or will cause serious harm to water quality, or that the operator has failed to satisfactorily reclaim other prospecting sites, or that there has been an abuse of prospecting by previous prospecting operations in the area.

(b) Notice of intention to prospect shall be made in writing on forms prescribed by the director and shall be signed and verified by the applicant. The notice shall be accompanied by (1) a United States geological survey topographic map showing by proper marking the crop line and the name, where known, of the seam or seams to be prospected, and (2) a bond, or cash, or collateral securities or certificates of the same type and form and in the same manner as provided in section eleven of this article, in the amount of five hundred dollars per acre or fraction thereof for the total estimated disturbed area. If such bond is used, it shall be payable to the state of West Virginia and conditioned that the operator faithfully perform the requirements of this article as they relate to backfilling and revegetation of the disturbed area.

(c) Any person prospecting under the provisions of this section shall ensure that such prospecting operation is conducted in accordance with the performance standards in section thirteen of this article for all lands disturbed in explorations, including excavations, roads, drill holes, and the removal of necessary facilities and equipment.

(d) Information submitted to the director pursuant to this section as confidential, concerning trade secrets or privileged commercial or financial information, which relates to the competitive rights of the person or entity intended to prospect the described area, is not available for public examination.

(e) Any person who conducts any prospecting activities which substantially disturb the natural land surface in violation of this section or rules issued pursuant thereto is subject to the provisions of sections sixteen and seventeen of this article.

(f) No operator shall remove more than two hundred fifty tons of coal without the specific written approval of the director. Such approval shall be requested by the operator on forms prescribed by the director. The director shall promulgate rules governing such operations and setting forth information required in the application for approval. Each such application shall be accompanied by a two thousand dollar filing fee.

(g) The bond accompanying said notice of intention to prospect shall be released by the director when the operator demonstrates that a permanent species of vegetative cover is established.

(h) In the event an operator desires to mine the area currently being prospected, and has requested and received an appropriate surface mine application (S.M.A.) number, the director may permit the postponement of the reclamation of the area prospected. Any part of a prospecting operation, where reclamation has not been postponed as provided above, shall be reclaimed within a period of three months from disturbance.

(i) For the purpose of this section, the word "prospect" or "prospecting" does not include core drilling related solely to taxation or highway construction.

§22-3-8. Prohibition of surface mining without a permit; permit requirements; successor in interest; duration of permits; proof of insurance; termination of permits; permit fees.

No person may engage in surface-mining operations unless such person has first obtained a permit from the director in accordance with the following:

(1) All permits issued pursuant to the requirements of this article shall be issued for a term not to exceed five years: Provided, That if the applicant demonstrates that a specified longer term is reasonably needed to allow the applicant to obtain necessary financing for equipment and the opening of the operation, and if the application is full and complete for such specified longer term, the director may extend a permit for such longer term: Provided, however, That subject to the prior approval of the director, with such approval being subject to the provisions of subsection (c), section eighteen of this article, a successor in interest to a permittee who applies for a new permit, or transfer of a permit, within thirty days of succeeding to such interest, and who is able to obtain the bond coverage of the original permittee, may continue surface-mining and reclamation operations according to the approved mining and reclamation plan of the original permittee until such successor's permit application or application for transfer is granted or denied.

(2) Proof of insurance is required on an annual basis.

(3) A permit terminates if the permittee has not commenced the surface-mining operations covered by such permit within three years of the date the permit was issued: Provided, That the director may grant reasonable extensions of time

upon a timely showing that such extensions are necessary by reason of litigation precluding such commencement, or threatening substantial economic loss to the permittee, or by reason of conditions beyond the control and without the fault or negligence of the permittee: Provided, however, That with respect to coal to be mined for use in a synthetic fuel facility or specific major electric generating facility, the permittee shall be deemed to have commenced surface-mining operations at such time as the construction of the synthetic fuel or generating facility is initiated.

(4) Each application for a new surface-mining permit filed pursuant to this article shall be accompanied by a fee of one thousand dollars. All permit fees and renewal fees provided for in this section or elsewhere in this article shall be collected by the director and deposited with the treasurer of the state of West Virginia to the credit of the operating permit fees fund and shall be used, upon requisition of the director, for the administration of this article.

(5) Prior to the issuance of any permit, the director shall ascertain from the commissioner of the division of labor whether the applicant is in compliance with section fourteen, article five, chapter twenty-one of this code. Upon issuance of the permit, the director shall forward a copy to the commissioner of the division of labor, who shall assure continued compliance under such permit.

(6) (A) Prior to the issuance of any permit the director shall ascertain from the commissioner of the bureau of employment programs whether the applicant is in compliance with the provisions of section five, article two, chapter twenty-three of this code with regard to any required subscription to the workers' compensation fund, the payment of premiums to the fund, the timely filing of payroll reports and the maintenance of an adequate premium deposit. If the applicant is delinquent or defaulted, or has been terminated, then the permit shall not be issued until the applicant returns to compliance or is restored by the workers' compensation division under a reinstatement agreement: Provided, That in all such inquiries the commissioner of the bureau of employment programs shall make response to the division of environmental protection within fifteen calendar days, otherwise failure to respond timely shall be considered to indicate the applicant is in compliance and such failure will not be used to preclude issuance of the permit.

(B) It is a requirement of this article that each operator maintain continued compliance with the provisions of section five, article two, chapter twenty-three of this code and provide proof of compliance to the director on an annual basis.

§22-3-9. Permit application requirements and contents.

(a) The surface-mining permit application shall contain:

(1) The names and addresses of: (A) The permit applicant; (B) the owner of record of the property, surface and mineral, to be mined; (C) the holders of record of any leasehold interest in the property; (D) any purchaser of record of the property under a real estate contract; (E) the operator, if different from the applicant; and (F) if any of these are business entities other than a single proprietor, the names and addresses of the principals, officers and resident agent;

(2) The names and addresses of the owners of record of all surface and subsurface areas contiguous to any part of the proposed permit area: Provided, That all residents living on property contiguous to the proposed permit area shall be notified by the applicant, by registered or certified mail, of such application on or before the first day of publication of the notice provided for in subdivision (6) of this subsection;

(3) A statement of any current surface-mining permits held by the applicant in the state and the permit number and each pending application;

(4) If the applicant is a partnership, corporation, association or other business entity, the following where applicable: The names and addresses of every officer, partner, resident agent, director or person performing a function similar to a director, together with the names and addresses of any person owning of record ten percent or more of any class of voting stock of the applicant; and a list of all names under which the applicant, officer, director, partner or principal shareholder previously operated a surface-mining operation in the United States within the five-year period preceding the date of submission of the application;

(5) A statement of whether the applicant, or any officer, partner, director, principal shareholder of the applicant, any subsidiary, affiliate or persons controlled by or under common control with the applicant, has ever been an officer, partner, director or principal shareholder in a company which has ever held a federal or state mining permit which in the five-year period prior to the date of submission of the application has been permanently suspended or revoked or has had a mining bond or similar security deposited in lieu of bond forfeited and, if so, a brief explanation of the facts involved;

(6) A copy of the applicant's advertisement to be published in a newspaper of general circulation in the locality of the proposed permit area at least once a week for four successive weeks. The advertisement shall contain in abbreviated form the information required by this section including the ownership and map of the tract location and boundaries of the proposed site so that the proposed operation is readily locatable by local residents, the location of the office of the division where the application is available for public inspection and stating that written protests will be accepted by the director until a certain date which is at least thirty days after the last publication of the applicant's advertisement;

(7) A description of the type and method of surface-mining operation that exists or is proposed, the engineering techniques used or proposed, and the equipment used or proposed to be used;

(8) The anticipated starting and termination dates of each phase of the surface-mining operation and the number of acres of land to be affected;

(9) A description of the legal documents upon which the applicant's legal right to enter and conduct surface-mining operations on the proposed permit area is based and whether that right is the subject of pending court litigation: Provided, That nothing in this article may be construed as vesting in the director the jurisdiction to adjudicate property-rights disputes;

(10) The name of the watershed and location of the surface stream or tributary into which surface and pit drainage will be discharged;

(11) A determination of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site, with respect to the hydrologic regime, quantity and quality of water in surface and groundwater systems, including the dissolved and suspended solids under seasonal flow conditions and the collection of sufficient data for the mine site and surrounding areas so that an assessment can be made by the director of the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area, and particularly upon water availability: Provided, That this determination is not required until such time as hydrologic information on the general area prior to mining is made available from an appropriate federal or state agency or, if existing and in the possession of the applicant, from the applicant: Provided, however, That the permit application shall not be approved until the information is available and is incorporated into the application;

(12) Accurate maps to an appropriate scale clearly showing: (A) The land to be affected as of the date of application; (B) the area of land within the permit area upon which the applicant has the legal right to enter and conduct surface-mining operations; and (C) all types of information set forth on enlarged topographical maps of the United States geological survey of a

scale of 1:24,000 or larger, including all man-made features and significant known archaeological sites existing on the date of application. In addition to other things specified by the director, the map shall show the boundary lines and names of present owners of record of all surface areas abutting the proposed permit area and the location of all structures within one thousand feet of the proposed permit area;

(13) Cross-section maps or plans of the proposed affected area, including the actual area to be mined, prepared by or under the direction of and certified by a person approved by the director, showing pertinent elevation and location of test borings or core samplings, where required by the director, and depicting the following information: (A) The nature and depth of the various strata or overburden; (B) the location of subsurface water, if encountered, and its quality; (C) the nature and thickness of any coal or rider seams above the seam to be mined; (D) the nature of the stratum immediately beneath the coal seam to be mined; (E) all mineral crop lines and the strike and dip of the coal to be mined, within the area of land to be affected; (F) existing or previous surface-mining limits; (G) the location and extent of known workings of any underground mines, including mine openings to the surface; (H) the location of any significant aquifers; (I) the estimated elevation of the water table; (J) the location of spoil, waste or refuse areas and topsoil preservation areas; (K) the location of all impoundments for waste or erosion control; (L) any settling or water treatment facility or drainage system; (M) constructed or natural drainways and the location of any discharges to any surface body of water on the area of land to be affected or adjacent thereto; and (N) adequate profiles at appropriate cross sections of the anticipated final surface configuration that will be achieved pursuant to the operator's proposed reclamation plan;

(14) A statement of the result of test borings or core samples from the permit area, including: (A) Logs of the drill holes; (B) the thickness of the coal seam to be mined and analysis of the chemical and physical properties of the coal; (C) the sulfur content of any coal seam; (D) chemical analysis of potentially acid or toxic forming sections of the overburden; and (E) chemical analysis of the stratum lying immediately underneath the coal to be mined: Provided, That the provisions of this subdivision may be waived by the director with respect to the specific application by a written determination that such requirements are unnecessary;

(15) For those lands in the permit application which a reconnaissance inspection suggests may be prime farmlands, a soil survey shall be made or obtained according to standards established by the secretary of agriculture in order to confirm the exact location of such prime farmlands;

(16) A reclamation plan as presented in section ten of this article;

(17) Information pertaining to coal seams, test borings, core samplings or soil samples as required by this section shall be made available to any person with an interest which is or may be adversely affected: Provided, That information which pertains only to the analysis of the chemical and physical properties of the coal, except information regarding mineral or elemental content which is potentially toxic to the environment, shall be kept confidential and not made a matter of public record;

(18) When requested by the director, the climatological factors that are peculiar to the locality of the land to be affected, including the average seasonal precipitation, the average direction and velocity of prevailing winds, and the seasonal temperature ranges; and

(19) Other information that may be required by rules reasonably necessary to effectuate the purposes of this article.

(b) If the director finds that the probable total annual production at all locations of any coal surface-mining operator will not exceed three hundred thousand tons, the determination of probable hydrologic consequences including the engineering analyses and designs necessary as required by this article or rules promulgated

thereunder; the development of cross-section maps and plans as required by this article or rules promulgated thereunder; the geologic drilling and statement of results of test borings and core samplings as required by this article or rules promulgated thereunder; preblast surveys required by this article or rules promulgated thereunder; the collection of site-specific resource information and production of protection and enhancement plans for fish and wildlife habitats and other environmental values required by this article or rules promulgated thereunder; and the collection of archaeological and historical information required by this article and rules promulgated thereunder and any other archaeological and historical information required by the federal department of the interior and the preparation of plans that may be necessitated thereby shall, upon the written request of the operator, be performed by a qualified public or private laboratory designated by the director and a reasonable cost of the preparation of such determination and statement shall be assumed by the division from funds provided by the United States department of the interior pursuant to the federal Surface Mining Control and Reclamation Act of 1977, as amended.

(c) Before the first publication of the applicant's advertisement, each applicant for a surface-mining permit shall file, except for that information pertaining to the coal seam itself, a copy of the application for public inspection in the nearest office of the division as specified in the applicant's advertisement.

(d) Each applicant for a permit shall be required to submit to the director as a part of the permit application a certificate issued by an insurance company authorized to do business in this state covering the surface-mining operation for which the permit is sought, or evidence that the applicant has satisfied state self-insurance requirements. The policy shall provide for personal injury and property damage protection in an amount adequate to compensate any persons damaged as a result of surface coal mining and reclamation operations, including use of explosives, and entitled to compensation under the applicable provisions of state law. The policy shall be maintained in full force and effect during the terms of the permit or any renewal, including the length of all reclamation operations.

(e) Each applicant for a surface-mining permit shall submit to the director as part of the permit application a blasting plan where explosives are to be used, which shall outline the procedures and standards by which the operator will meet the provisions of the blasting performance standards.

(f) The applicant shall file as part of the permit application a schedule listing all notices of violation, bond forfeitures, permit revocations, cessation orders or permanent suspension orders resulting from a violation of the federal Surface Mining Control and Reclamation Act of 1977, as amended, this article or any law or regulation of the United States or any department or agency of any state pertaining to air or environmental protection received by the applicant in connection with any surface-mining operation during the three-year period prior to the date of application, and indicating the final resolution of any notice of violation, forfeiture, revocation, cessation or permanent suspension.

(g) Within five working days of receipt of an application for a permit, the director shall notify the operator in writing, stating whether the application is administratively complete and whether the operator's advertisement may be published. If the application is not administratively complete, the director shall state in writing why the application is not administratively complete.

§22-3-10. Reclamation plan requirements.

(a) Each reclamation plan submitted as part of a surface-mining permit application shall include, in the degree of detail necessary to demonstrate that reclamation required by this article can be accomplished, a statement of:

(1) The identification of the lands subject to surface mining over the estimated life of these operations and the size, sequence and timing of

the operations for which it is anticipated that individual permits for mining will be sought;

(2) The condition of the land to be covered by the permit prior to any mining, including: (A) The uses existing at the time of the application and, if the land has a history of previous mining, the uses which preceded any mining; (B) the capability of the land prior to any mining to support a variety of uses, giving consideration to soil and foundation characteristics, topography and vegetation cover and, if applicable, a soil survey prepared pursuant to subdivision (15), subsection (a), section nine of this article; and (C) the best information available on the productivity of the land prior to mining, including appropriate classification as prime farmlands, and the average yield of food, fiber, forage or wood products from the lands obtained under high levels of management;

(3) The use which is proposed to be made of the land following reclamation, including a discussion of the utility and capacity of the reclaimed land to support a variety of alternative uses and the relationship of the use to existing land use policies and plans, and the comments of any owner of the surface, other state agencies and local governments, which would have to initiate, implement, approve or authorize the proposed use of the land following reclamation;

(4) A detailed description of how the proposed postmining land use is to be achieved and the necessary support activities which may be needed to achieve the proposed land use;

(5) The engineering techniques proposed to be used in mining and reclamation and a description of the major equipment; a plan for the control of surface water drainage and of water accumulation; a plan where appropriate, for backfilling, soil stabilization and compacting, grading, revegetation and a plan for soil reconstruction, replacement and stabilization pursuant to the performance standards in subdivision (7), subsection (b), section thirteen of this article for those food, forage and forest lands identified therein; and a statement as to how the operator plans to comply with each of the applicable requirements set out in section thirteen or fourteen of this article;

(6) A detailed estimated timetable for the accomplishment of each major step in the reclamation plan;

(7) The consideration which has been given to conducting surface-mining operations in a manner consistent with surface owner plans and applicable state and local land use plans and programs;

(8) The steps to be taken to comply with applicable air and water quality laws and rules and any applicable health and safety standards;

(9) The consideration which has been given to developing the reclamation plan in a manner consistent with local physical environmental and climatological conditions;

(10) All lands, interests in lands or options on the interests held by the applicant or pending bids on interests in lands by the applicant, which lands are contiguous to the area to be covered by the permit;

(11) A detailed description of the measures to be taken during the surface-mining and reclamation process to assure the protection of: (A) The quality of surface and groundwater systems, both on and off-site, from adverse effects of the surface-mining operation; (B) the rights of present users to the water; and (C) the quantity of surface and groundwater systems, both on and off-site, from adverse effects of the surface-mining operation or to provide alternative sources of water where the protection of quantity cannot be assured;

(12) The results of tests borings which the applicant has made at the area to be covered by the permit, or other equivalent information and data in a form satisfactory to the director, including the location of subsurface water, and an analysis of the chemical properties, including acid forming properties of the mineral and overburden: Provided, That information which pertains only to the analysis of the chemical and physical properties of the coal, except

information regarding the mineral or elemental contents which are potentially toxic in the environment, shall be kept confidential and not made a matter of public record;

(13) The consideration which has been given to maximize the utilization and conservation of the solid fuel resource being recovered so that reaffecting the land in the future can be minimized; and

(14) Any other requirements as the director may prescribe by rule.

(b) Any surface mining permit application filed after the effective date of this subsection may contain, in addition to the requirements of subsection (a) of this section, a master land use plan, prepared in accordance with article two-a, chapter five-b of this code, as to the post-mining land use. A reclamation plan approved but not implemented may be amended to provide for a revised reclamation plan consistent with the provisions of this subsection.

(c) The reclamation plan shall be available to the public for review except for those portions thereof specifically exempted in subsection (a) of this section.

§22-3-11. Bonds; amount and method of bonding; bonding requirements; special reclamation tax and fund; prohibited acts; period of bond liability.

(a) After a surface-mining permit application has been approved pursuant to this article, but before a permit has been issued, each operator shall furnish a penal bond, on a form to be prescribed and furnished by the secretary, payable to the state of West Virginia and conditioned upon the operator faithfully performing all of the requirements of this article and of the permit. The penal amount of the bond shall be not less than one thousand dollars nor more than five thousand dollars for each acre or fraction thereof: Provided, that the minimum amount of bond furnished for any type of reclamation bonding shall be ten thousand dollars. The bond shall cover (1) the entire permit area, or (2) that increment of land within the permit area upon which the operator will initiate and conduct surface-mining and reclamation operations within the initial term of the permit. If the operator chooses to use incremental bonding, as succeeding increments of surface mining and reclamation operations are to be initiated and conducted within the permit area, the operator shall file with the secretary an additional bond or bonds to cover the increments in accordance with this section: Provided, however, That once the operator has chosen to proceed with bonding either the entire permit area or with incremental bonding, the operator shall continue bonding in that manner for the term of the permit.

(b) The period of liability for bond coverage begins with issuance of a permit and continues for the full term of the permit plus any additional period necessary to achieve compliance with the requirements in the reclamation plan of the permit.

(c) (1) The form of the bond shall be approved by the secretary and may include, at the option of the operator, surety bonding, collateral bonding (including cash and securities), establishment of an escrow account, self-bonding or a combination of these methods. If collateral bonding is used, the operator may elect to deposit cash, or collateral securities or certificates as follows: Bonds of the United States or its possessions, of the federal land bank, or of the homeowners' loan corporation; full faith and credit general obligation bonds of the state of West Virginia, or other states, and of any county, district or municipality of the state of West Virginia or other states; or certificates of deposit in a bank in this state, which certificates shall be in favor of the department. The cash deposit or market value of such securities or certificates shall be equal to or greater than the penal sum of the bond. The secretary shall, upon receipt of any deposit of cash, securities or certificates, promptly place the same with the treasurer of the state of West Virginia whose duty it is to receive and hold the same in the name of the state in trust for the purpose for which the deposit is made when the permit is issued. The operator making the deposit is entitled from time to time to receive from the state treasurer, upon the written

approval of the secretary, the whole or any portion of any cash, securities or certificates so deposited, upon depositing with him or her in lieu thereof, cash or other securities or certificates of the classes herein specified having value equal to or greater than the sum of the bond.

(2) The secretary may approve an alternative bonding system if it will (1) reasonably assure that sufficient funds will be available to complete the reclamation, restoration and abatement provisions for all permit areas which may be in default at any time, and (2) provide a substantial economic incentive for the permittee to comply with all reclamation provisions.

(d) The secretary may accept the bond of the applicant itself without separate surety when the applicant demonstrates to the satisfaction of the secretary the existence of a suitable agent to receive service of process and a history of financial solvency and continuous operation sufficient for authorization to self-insure.

(e) It is unlawful for the owner of surface or mineral rights to interfere with the present operator in the discharge of the operator's obligations to the state for the reclamation of lands disturbed by the operator.

(f) All bond releases shall be accomplished in accordance with the provisions of section twenty-three of this article.

(g) The special reclamation fund previously created is continued. The moneys accrued in the fund, including interest, are reserved solely and exclusively for the purposes set forth in this section and section seventeen, article one of this chapter. The fund shall be administered by the secretary who is authorized to expend the moneys in the fund for the reclamation and rehabilitation of lands which were subjected to permitted surface-mining operations and abandoned after the third day of August, one thousand nine hundred seventy-seven, where the amount of the bond posted and forfeited on the land is less than the actual cost of reclamation and where the land is not eligible for abandoned mine land reclamation funds under article two of this chapter. The secretary shall develop a long-range planning process for selection and prioritization of sites to be reclaimed so as to avoid inordinate short-term obligations of the assets in the fund of such magnitude that the solvency of the fund is jeopardized. The secretary may use the special reclamation fund for the purpose of designing, constructing and maintaining water treatment systems when they are required for a complete reclamation of the affected lands described in this subsection. The secretary may also expend an amount not to exceed ten percent of the total annual assets in the fund to implement and administer the provisions of this article and, as they apply to the surface mine board, articles one and four, chapter twenty-two-b of this code.

(h) Prior to the first day of January, two thousand two, every person conducting coal surface-mining operations shall contribute into the fund a sum equal to three cents per ton of clean coal mined. For tax periods commencing on and after the first day of January, two thousand two, every person conducting coal surface mining shall contribute into the fund as follows: (1) For a period not to exceed thirty-nine months, seven cents per ton of clean coal mines; and (2) an additional seven cents per ton of clean coal mined. The tax shall be levied upon each ton of clean coal severed or clean coal obtained from refuse pile and slurry pond recovery or clean coal from other mining methods extracting a combination of coal and waste material as part of a fuel supply on or after the first day of January, two thousand two. The additional seven-cent tax shall be reviewed and, if necessary, adjusted annually by the Legislature upon recommendation of the council pursuant to the provisions of section seventeen, article one of this chapter; Provided, That the tax may not be reduced until the special reclamation fund has sufficient moneys to meet the reclamation responsibilities of the state established in this section.

(i) This special reclamation_tax shall be collected by the state tax commissioner in the same manner, at the same time, and upon the same tonnage as the minimum severance tax imposed by article twelve-b, chapter eleven of

this code is collected: Provided, That under no circumstance shall the special reclamation tax be construed to be an increase in either the minimum severance tax imposed by said article twelve-b or the severance tax imposed by article thirteen of said chapter eleven.

(j) Every person liable for payment of the special reclamation tax shall pay the amount due without notice or demand for payment.

(k) The tax commissioner shall provide to the secretary a quarterly listing of all persons known to be delinquent in payment of the special reclamation tax. The secretary may take such delinquencies into account in making determinations on the issuance, renewal or revision of any permit.

(l) The tax commissioner shall deposit the fees collected with the treasurer of the state of West Virginia to the credit of the special reclamation fund. The moneys in the fund shall be placed by the treasurer in an interest bearing account with the interest being returned to the fund on an annual basis.

(m) At the beginning of each quarter, the secretary shall advise the state tax commissioner and the governor of the assets, excluding payments, expenditures and liabilities, in the fund.

(n) To the extend that this section modified any powers, duties, functions and responsibilities of the department that may require approval of one or more federal agencies or officials in order to avoid disruption of the federal-state relationship involved in the implementation of the federal Surface Mining Control and Reclamation Act, 30 U. S. C. §1270 by the state, the modifications will become effective upon the approval of the modifications by the appropriate federal agency or official.

§22-3-12. Site-specific bonding; legislative rule; contents of legislative rule; legislative intent; expiration of rule; reporting.

(a) Notwithstanding the provisions of section eleven of this article, the director may establish and implement a site-specific bonding system in accordance with the provisions of this section.

(b) A legislative rule proposed or promulgated pursuant to this section must provide, at a minimum, for the following:

(1) The penal amount of a bond shall be not less than one thousand dollars nor more than five thousand dollars per acre or fraction thereof.

(2) Every bond, subject to the limitations of subdivision (1) of this subsection, shall reflect a relative potential cost of reclamation associated with the activities proposed to be permitted, which cost would not otherwise be reflected by bonds calculated by merely applying a specific dollar amount per acre for the permit.

(3) Every bond, subject to the provisions of subdivision (1) of this subsection, shall also reflect an analysis under the legislative rule of various factors, as applicable, which affect the cost of reclamation, including, but not limited to: (A) The general category of mining, whether surface or underground; (B) mining techniques and methods proposed to be utilized; (C) support facilities, fixtures, improvements and equipment; (D) topography and geology; and (E) the potential for degrading or improving water quality.

(c) A legislative rule proposed or promulgated pursuant to the provisions of this section may, in addition to the requirements of subsection (b) of this section, provide for a consideration of other factors determined to be relevant by the secretary. For example, the rule may provide for the following:

(1) A consideration as to whether the bond relates to a new permit application, a renewal of an existing permit, an application for an incidental boundary revision, or the reactivation of an inactive permit;

(2) A consideration of factors which may result in environmental enhancement, as in a case where remining may improve water quality or reduce or eliminate existing highwalls, or a

permitted operation may create or improve wetlands; or

(3) An analysis of various factors related to the specific permit applicant, including, but not limited to: (A) The prior mining experience of the applicant with the activities sought to be permitted; and (B) the history of the applicant as it relates to prior compliance with statutory and regulatory requirements designed to protect, maintain or enhance the environment in this or any other state.

(d) It is the intent of the Legislature that a legislative rule proposed or promulgated pursuant to the provisions of this section shall be constructed so that when the findings of fact by the division of environmental protection with respect to the proposed mining activity and the particular permit applicant coincide with the particular factors or criteria to be considered and analyzed under the rule, the rule will direct a conclusion as to the amount of the bond to be required, subject to rebuttal and refutation of the findings by the applicant. To the extent practicable, the rule shall limit subjectivity and discretion by the secretary and the division in fixing the amount of the bond.

§22-3-13. General environmental protection performance standards for surface-mining; variances.

(a) Any permit issued by the director pursuant to this article to conduct surface-mining operations shall require that the surface-mining operations meet all applicable performance standards of this article and other requirements set forth in legislative rules proposed by the director.

(b) The following general performance standards are applicable to all surface mines and require the operation, at a minimum to:

(1) Maximize the utilization and conservation of the solid fuel resource being recovered to minimize reaffecting the land in the future through surface-mining;

(2) Restore the land affected to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses of which there is reasonable likelihood so long as the use or uses do not present any actual or probable hazard to public health or safety or pose any actual or probable threat of water diminution or pollution, and the permit applicants' declared proposed land use following reclamation is not deemed to be impractical or unreasonable, inconsistent with applicable land use policies and plans, involves unreasonable delay in implementation, or is violative of federal, state or local law;

(3) Except as provided in subsection (c) of this section, with respect to all surface mines, backfill, compact where advisable to ensure stability or to prevent leaching of toxic materials, and grade in order to restore the approximate original contour: Provided, That in surface-mining which is carried out at the same location over a substantial period of time where the operation transects the coal deposit, and the thickness of the coal deposits relative to the volume of the overburden is large and where the operator demonstrates that the overburden and other spoil and waste materials at a particular point in the permit area or otherwise available from the entire permit area is insufficient, giving due consideration to volumetric expansion, to restore the approximate original contour, the operator, at a minimum, shall backfill, grade and compact, where advisable, using all available overburden and other spoil and waste materials to attain the lowest practicable grade, but not more than the angle of repose, to provide adequate drainage and to cover all acid-forming and other toxic materials, in order to achieve an ecologically sound land use compatible with the surrounding region: Provided, however, That in surface-mining where the volume of overburden is large relative to the thickness of the coal deposit and where the operator demonstrates that due to volumetric expansion the amount of overburden and other spoil and waste materials removed in the course of the mining operation is more than sufficient to restore the approximate original contour, the operator shall, after restoring the approximate contour, backfill, grade and compact, where advisable, the excess

overburden and other spoil and waste materials to attain the lowest grade, but not more than the angle of repose, and to cover all acid-forming and other toxic materials, in order to achieve an ecologically sound land use compatible with the surrounding region and, the overburden or spoil shall be shaped and graded in a way as to prevent slides, erosion and water pollution and is revegetated in accordance with the requirements of this article: Provided further, That the director shall propose rules for legislative approval in accordance with article three, chapter twenty-nine-a of this code, governing variances to the requirements for return to approximate original contour or highwall elimination and where adequate material is not available from surface-mining operations permitted after the effective date of this article for: (A) Underground mining operations existing prior to the third day of August, one thousand nine hundred seventy-seven; or (B) for areas upon which surface-mining prior to the first day of July, one thousand nine hundred seventy-seven, created highwalls;

(4) Stabilize and protect all surface areas, including spoil piles, affected by the surface-mining operation to effectively control erosion and attendant air and water pollution;

(5) Remove the topsoil from the land in a separate layer, replace it on the backfill area, or if not utilized immediately, segregate it in a separate pile from other spoil and, when the topsoil is not replaced on a backfill area within a time short enough to avoid deterioration of the topsoil, maintain a successful vegetative cover by quick growing plants or by other similar means in order to protect topsoil from wind and water erosion and keep it free of any contamination by other acid or toxic material: Provided, That if topsoil is of insufficient quantity or of poor quality for sustaining vegetation, or if other strata can be shown to be more suitable for vegetation requirements, then the operator shall remove, segregate and preserve in a like manner any other strata which is best able to support vegetation;

(6) Restore the topsoil or the best available subsoil which is best able to support vegetation;

(7) Ensure that all prime farmlands are mined and reclaimed in accordance with the specifications for soil removal, storage, replacement and reconstruction established by the United States secretary of agriculture and the soil conservation service pertaining thereto. The operator, at a minimum, shall: (A) Segregate the A horizon of the natural soil, except where it can be shown that other available soil materials will create a final soil having a greater productive capacity, and if not utilized immediately, stockpile this material separately from other spoil, and provide needed protection from wind and water erosion or contamination by other acid or toxic material; (B) segregate the B horizon of the natural soil, or underlying C horizons or other strata, or a combination of the horizons or other strata that are shown to be both texturally and chemically suitable for plant growth and that can be shown to be equally or more favorable for plant growth than the B horizon, in sufficient quantities to create in the regraded final soil a root zone of comparable depth and quality to that which existed in the natural soil, and if not utilized immediately, stockpile this material separately from other spoil and provide needed protection from wind and water erosion or contamination by other acid or toxic material; (C) replace and regrade the root zone material described in paragraph (B) of this subdivision, with proper compaction and uniform depth over the regraded spoil material; and (D) redistribute and grade in a uniform manner the surface soil horizon described in paragraph (A) of this subdivision;

(8) Create, if authorized in the approved surface-mining and reclamation plan and permit, permanent impoundments of water on mining sites as part of reclamation activities in accordance with rules promulgated by the director;

(9) Where augering is the method of recovery, seal all auger holes with an impervious and noncombustible material in order to prevent drainage except where the director determines that the resulting impoundment of water in the auger holes may create a hazard to the environment or the public welfare and safety:

Provided, That the director may prohibit augering if necessary to maximize the utilization, recoverability or conservation of the mineral resources or to protect against adverse water quality impacts;

(10) Minimize the disturbances to the prevailing hydrologic balance at the mine site and in associated off-site areas and to the quality and quantity of water in surface and groundwater systems both during and after surface-mining operations and during reclamation by: (A) Avoiding acid or other toxic mine drainage by such measures as, but not limited to: (i) Preventing or removing water from contact with toxic producing deposits; (ii) treating drainage to reduce toxic content which adversely affects downstream water upon being released to water courses; and (iii) casing, sealing or otherwise managing boreholes, shafts and wells and keep acid or other toxic drainage from entering ground and surface waters; (B) conducting surface-mining operations so as to prevent to the extent possible, using the best technology currently available, additional contributions of suspended solids to streamflow or runoff outside the permit area, but in no event shall contributions be in excess of requirements set by applicable state or federal law; (C) constructing an approved drainage system pursuant to paragraph (B) of this subdivision, prior to commencement of surface-mining operations, the system to be certified by a person approved by the director to be constructed as designed and as approved in the reclamation plan; (D) avoiding channel deepening or enlargement in operations requiring the discharge of water from mines; (E) unless otherwise authorized by the director, cleaning out and removing temporary or large settling ponds or other siltation structures after disturbed areas are revegetated and stabilized, and depositing the silt and debris at a site and in a manner approved by the director; (F) restoring recharge capacity of the mined area to approximate premining conditions; and (G) any other actions prescribed by the director;

(11) With respect to surface disposal of mine wastes, tailings, coal processing wastes and other wastes in areas other than the mine working excavations, stabilize all waste piles in designated areas through construction in compacted layers, including the use of noncombustible and impervious materials if necessary, and assure the final contour of the waste pile will be compatible with natural surroundings and that the site will be stabilized and revegetated according to the provisions of this article;

(12) Design, locate, construct, operate, maintain, enlarge, modify and remove or abandon, in accordance with standards and criteria developed pursuant to subsection (f) of this section, all existing and new coal mine waste piles consisting of mine wastes, tailings, coal processing wastes or other liquid and solid wastes, and used either temporarily or permanently as dams or embankments;

(13) Refrain from surface-mining within five hundred feet of any active and abandoned underground mines in order to prevent breakthroughs and to protect health or safety of miners: Provided, That the director shall permit an operator to mine near, through or partially through an abandoned underground mine or closer to an active underground mine if: (A) The nature, timing and sequencing of the approximate coincidence of specific surface mine activities with specific underground mine activities are coordinated jointly by the operators involved and approved by the director; and (B) the operations will result in improved resource recovery, abatement of water pollution or elimination of hazards to the health and safety of the public: Provided, however, That any breakthrough which does occur shall be sealed;

(14) Ensure that all debris, acid-forming materials, toxic materials or materials constituting a fire hazard are treated or buried and compacted, or otherwise disposed of in a manner designed to prevent contamination of ground or surface waters, and that contingency plans are developed to prevent sustained combustion: Provided, That the operator shall remove or bury all metal, lumber, equipment and other debris resulting from the operation before grading release;

(15) Ensure that explosives are used only in accordance with existing state and federal law and the rules promulgated by the director, which shall include provisions to:

(A) Maintain for a period of at least three years and make available for public inspection, upon written request, a log detailing the location of the blasts, the pattern and depth of the drill holes, the amount of explosives used per hole and the order and length of delay in the blasts; and

(B) Require that all blasting operations be conducted by persons certified by the office of explosives and blasting.

(16) Ensure that all reclamation efforts proceed in an environmentally sound manner and as contemporaneously as practicable with the surface-mining operations. Time limits shall be established by the director requiring backfilling, grading and planting to be kept current: Provided, That where surface-mining operations and underground mining operations are proposed on the same area, which operations must be conducted under separate permits, the director may grant a variance from the requirement that reclamation efforts proceed as contemporaneously as practicable to permit underground mining operations prior to reclamation:

(A) If the director finds in writing that:

(i) The applicant has presented, as part of the permit application, specific, feasible plans for the proposed underground mining operations;

(ii) The proposed underground mining operations are necessary or desirable to assure maximum practical recovery of the mineral resource and will avoid multiple disturbance of the surface;

(iii) The applicant has satisfactorily demonstrated that the plan for the underground mining operations conforms to requirements for underground mining in the jurisdiction and that permits necessary for the underground mining operations have been issued by the appropriate authority;

(iv) The areas proposed for the variance have been shown by the applicant to be necessary for the implementing of the proposed underground mining operations;

(v) No substantial adverse environmental damage, either on-site or off-site, will result from the delay in completion of reclamation as required by this article; and

(vi) Provisions for the off-site storage of spoil will comply with subdivision (22), subsection (b) of this section;

(B) If the director has promulgated specific rules to govern the granting of the variances in accordance with the provisions of this subparagraph and has imposed any additional requirements as the director considers necessary;

(C) If variances granted under the provisions of this paragraph are reviewed by the director not more than three years from the date of issuance of the permit: Provided, That the underground mining permit shall terminate if the underground operations have not commenced within three years of the date the permit was issued, unless extended as set forth in subdivision (3), section eight of this article; and

(D) If liability under the bond filed by the applicant with the director pursuant to subsection (b), section eleven of this article is for the duration of the underground mining operations and until the requirements of subsection (g), section eleven and section twenty-three of this article have been fully complied with;

(17) Ensure that the construction, maintenance and postmining conditions of access and haulroads into and across the site of operations will control or prevent erosion and siltation, pollution of water, damage to fish or wildlife or their habitat, or public or private property: Provided, That access roads constructed for and used to provide infrequent service to surface facilities, such as ventilators

or monitoring devices, are exempt from specific construction criteria provided adequate stabilization to control erosion is achieved through alternative measures;

(18) Refrain from the construction of roads or other access ways up a stream bed or drainage channel or in proximity to the channel so as to significantly alter the normal flow of water;

(19) Establish on the regraded areas, and all other lands affected, a diverse, effective and permanent vegetative cover of the same seasonal variety native to the area of land to be affected or of a fruit, grape or berry producing variety suitable for human consumption and capable of self-regeneration and plant succession at least equal in extent of cover to the natural vegetation of the area, except that introduced species may be used in the revegetation process where desirable or when necessary to achieve the approved postmining land use plan;

(20) Assume the responsibility for successful revegetation, as required by subdivision (19) of this subsection, for a period of not less than five growing seasons, as defined by the director, after the last year of augmented seeding, fertilizing, irrigation or other work in order to assure compliance with subdivision (19) of this subsection: Provided, That when the director issues a written finding approving a long-term agricultural postmining land use as a part of the mining and reclamation plan, the director may grant exception to the provisions of subdivision (19) of this subsection: Provided, however, That when the director approves an agricultural postmining land use, the applicable five growing seasons of responsibility for revegetation begins on the date of initial planting for the agricultural postmining land use;

On lands eligible for remining assume the responsibility for successful revegetation, as required by subdivision (19) of this subsection, for a period of not less than two growing seasons, as defined by the director after the last year of augmented seeding, fertilizing, irrigation or other work in order to assure compliance with subdivision (19) of this subsection;

(21) Protect off-site areas from slides or damage occurring during surface-mining operations and not deposit spoil material or locate any part of the operations or waste accumulations outside the permit area: Provided, That spoil material may be placed outside the permit area, if approved by the director after a finding that environmental benefits will result from the placing of spoil material outside the permit area;

(22) Place all excess spoil material resulting from surface-mining activities in a manner that: (A) Spoil is transported and placed in a controlled manner in position for concurrent compaction and in a way as to assure mass stability and to prevent mass movement; (B) the areas of disposal are within the bonded permit areas and all organic matter is removed immediately prior to spoil placements; (C) appropriate surface and internal drainage system or diversion ditches are used to prevent spoil erosion and movement; (D) the disposal area does not contain springs, natural water courses or wet weather seeps, unless lateral drains are constructed from the wet areas to the main underdrains in a manner that filtration of the water into the spoil pile will be prevented; (E) if placed on a slope, the spoil is placed upon the most moderate slope among those upon which, in the judgment of the director, the spoil could be placed in compliance with all the requirements of this article, and is placed, where possible, upon, or above, a natural terrace, bench or berm, if placement provides additional stability and prevents mass movement; (F) where the toe of the spoil rests on a downslope, a rock toe buttress, of sufficient size to prevent mass movement, is constructed; (G) the final configuration is compatible with the natural drainage pattern and surroundings and suitable for intended uses; (H) the design of the spoil disposal area is certified by a qualified registered professional engineer in conformance with professional standards; and (I) all other provisions of this article are met: Provided, That where the excess spoil material consists of at least eighty percent, by volume, sandstone, limestone or other rocks that do not slake in water and will not degrade to soil material, the director may approve alternate methods for

disposal of excess spoil material, including fill placement by dumping in a single lift, on a site specific basis: Provided, however, That the services of a qualified registered professional engineer experienced in the design and construction of earth and rockfill embankment are utilized: Provided further, That the approval may not be unreasonably withheld if the site is suitable;

(23) Meet any other criteria necessary to achieve reclamation in accordance with the purposes of this article, taking into consideration the physical, climatological and other characteristics of the site;

(24) To the extent possible, using the best technology currently available, minimize disturbances and adverse impacts of the operation on fish, wildlife and related environmental values, and achieve enhancement of these resources where practicable; and

(25) Retain a natural barrier to inhibit slides and erosion on permit areas where outcrop barriers are required: Provided, That constructed barriers may be allowed where: (A) natural barriers do not provide adequate stability; (B) natural barriers would result in potential future water quality deterioration; and (C) natural barriers would conflict with the goal of maximum utilization of the mineral resource: Provided, however, That at a minimum, the constructed barrier shall be of sufficient width and height to provide adequate stability and the stability factor shall equal or exceed that of the natural outcrop barrier: Provided further, That where water quality is paramount, the constructed barrier shall be composed of impervious material with controlled discharge points.

(c) (1) The director may prescribe procedures pursuant to which he or she may permit surface-mining operations for the purposes set forth in subdivision (3) of this subsection.

(2) Where an applicant meets the requirements of subdivisions (3) and (4) of this subsection, a permit without regard to the requirement to restore to approximate original contour set forth in subsection (b) or (d) of this section may be granted for the surface-mining of coal where the mining operation will remove an entire coal seam or seams running through the upper fraction of a mountain, ridge or hill, except as provided in subparagraph (A), subdivision (4) of this subsection, by removing all of the overburden and creating a level plateau or a gently rolling contour with no highwalls remaining, and capable of supporting postmining uses in accordance with the requirements of this subsection.

(3) In cases where an industrial, commercial, commercial forestry, agricultural, residential, public facility including recreation lands use is proposed for the postmining use of the affected land, the director may grant a permit for a surface-mining operation of the nature described in subdivision (2) of this subsection where: (A) The proposed postmining land use is determined to constitute an equal or better use of the affected land, as compared with premining use; (B) the applicant presents specific plans for the proposed postmining land use and appropriate assurances that the use will be: (i) Compatible with adjacent land uses; (ii) practicable with respect to achieving the proposed use; (iii) obtainable according to data regarding expected need and market; (iv) supported by commitments from public agencies where appropriate; (v) practicable with respect to private financial capability for completion of the proposed use; (vi) planned pursuant to a schedule attached to the reclamation plan so as to integrate the mining operation and reclamation with the postmining land use; and (vii) designed by a person approved by the director in conformance with standards established to assure the stability, drainage and configuration necessary for the intended use of the site; (C) the proposed use would be compatible with adjacent land uses, and existing state and local land use plans and programs; (D) the director provides the county commission of the county in which the land is located and any state or federal agency which the director, in his or her discretion, determines to have an interest in the proposed use, an opportunity of not more than sixty days to review and comment on the

proposed use; and (E) all other requirements of this article will be met.

(4) In granting any permit pursuant to this subsection, the director shall require that: (A) A natural barrier be retained to inhibit slides and erosion on permit areas where outcrop barriers are required: Provided, That constructed barriers may be allowed where: (i) Natural barriers do not provide adequate stability; (ii) natural barriers would result in potential future water quality deterioration; and (iii) natural barriers would conflict with the goal of maximum utilization of the mineral resource: Provided, however, That, at a minimum, the constructed barrier shall be sufficient in width and height to provide adequate stability and the stability factor shall equal or exceed that of the natural outcrop barrier: Provided further, That where water quality is paramount, the constructed barrier shall be composed of impervious material with controlled discharge points; (B) the reclaimed area is stable; (C) the resulting plateau or rolling contour drains inward from the outslopes except at specific points; (D) no damage will be done to natural watercourses; (E) spoil will be placed on the mountaintop bench as is necessary to achieve the planned postmining land use: And provided further, That all excess spoil material not retained on the mountaintop shall be placed in accordance with the provisions of subdivision (22), subsection (b) of this section; and (F) ensure stability of the spoil retained on the mountaintop and meet the other requirements of this article.

(5) All permits granted under the provisions of this subsection shall be reviewed not more than three years from the date of issuance of the permit; unless the applicant affirmatively demonstrates that the proposed development is proceeding in accordance with the terms of the approved schedule and reclamation plan.

(d) In addition to those general performance standards required by this section, when surface-mining occurs on slopes of twenty degrees or greater, or on lesser slopes as may be defined by rule after consideration of soil and climate, no debris, abandoned or disabled equipment, spoil material or waste mineral matter will be placed on the natural downslope below the initial bench or mining cut: Provided, That soil or spoil material from the initial cut of earth in a new surface-mining operation may be placed on a limited specified area of the downslope below the initial cut if the permittee can establish to the satisfaction of the director that the soil or spoil will not slide and that the other requirements of this section can still be met.

(e) The director may propose rules for legislative approval in accordance with article three, chapter twenty-nine-a of this code, that permit variances from the approximate original contour requirements of this section: Provided, That the watershed control of the area is improved: Provided, however, That complete backfilling with spoil material is required to completely cover the highwall, which material will maintain stability following mining and reclamation.

(f) The director shall propose rules for legislative approval in accordance with article three, chapter twenty-nine-a of this code, for the design, location, construction, maintenance, operation, enlargement, modification, removal and abandonment of new and existing coal mine waste piles. In addition to engineering and other technical specifications, the standards and criteria developed pursuant to this subsection shall include provisions for review and approval of plans and specifications prior to construction, enlargement, modification, removal or abandonment; performance of periodic inspections during construction; issuance of certificates of approval upon completion of construction; performance of periodic safety inspections; and issuance of notices and orders for required remedial or maintenance work or affirmative action: Provided, That whenever the director finds that any coal processing waste pile constitutes an imminent danger to human life, he or she may, in addition to all other remedies and without the necessity of obtaining the permission of any person prior or present who operated or operates a pile or the landowners involved, enter upon the premises where any coal processing waste pile exists and may take or order to be taken any remedial action that may be necessary or expedient to secure the coal

processing waste pile and to abate the conditions which cause the danger to human life: Provided, however, That the cost reasonably incurred in any remedial action taken by the director under this subsection may be paid for initially by funds appropriated to the division for these purposes, and the sums so expended shall be recovered from any responsible operator or landowner, individually or jointly, by suit initiated by the attorney general at the request of the director. For purposes of this subsection "operates" or "operated" means to enter upon a coal processing waste pile, or part of a coal processing waste pile, for the purpose of disposing, depositing, dumping coal processing wastes on the pile or removing coal processing waste from the pile, or to employ a coal processing waste pile for retarding the flow of or for the impoundment of water.

§22-3-13a. Pre-blast survey requirements.

(a) At least thirty days prior to commencing blasting, as defined in section twenty-two-a of this article, an operator or an operator's designee shall make the following notifications in writing to all owners and occupants of man-made dwellings or structures that the operator or operator's designee will perform pre-blast surveys in accordance with subsection (f) of this section:

(1) For surface-mining operations that are less than two hundred acres in a single permitted area or less than three hundred acres of contiguous or nearly contiguous area of two or more permitted areas, the required notifications shall be to all owners and occupants of man-made dwellings or structures within five tenths of a mile of the permitted area or areas;

(2) For all other surface-mining operations, the required notifications shall be to all owners and occupants of man-made dwellings or structures within five tenths of a mile of the permitted area or areas or seven tenths of a mile of the proposed blasting site, whichever is greater.

(b) Within thirty days of the effective date of this section, any operator identified in subdivision (2), subsection (a) of this section, that has already completed pre-blast surveys for man-made dwellings or structures within five tenths of a mile of the permit area and has commenced operations by the effective date of this section, shall be required to notify in writing all additional owners and occupants or man-made dwellings or structures within seven tenths of a mile of the proposed blasting site. Except for those dwellings or structures for which the operator secures a written waiver or executes an affidavit in accordance with the requirements of subsection (c) of this section, the operator or the operator's designee must perform the additional pre-blast surveys in accordance with subsection (f) of this section within ninety days of the effective date of this section.

(c) An occupant or owner of a man-made dwelling or structure within the areas described in subdivisions (1) or (2) of subsection (a) of this section, may waive the right to a pre-blast survey in writing. If a dwelling is occupied by a person other than the owner, both the owner and the occupant must waive the right to a pre-blast survey in writing. If an occupant or owner of a man-made dwelling or structure refuses to allow the operator or the operator's designee access to the dwelling or structure and refuses to waive in writing the right to a pre-blast survey or to the extent that access to any portion of the structure, underground water supply or well is impossible or impractical under the circumstances, the pre-blast survey shall indicate that access was refused, impossible or impractical. The operator or the operator's designee shall execute a sworn affidavit explaining the reasons and circumstances surrounding the refusals. The office of explosives and blasting shall not determine the pre-blast survey to be incomplete because it indicates that access to a particular structure, underground water supply or well was refused, impossible or impractical. The operator shall send copies of all written waivers and affidavits executed pursuant to this subsection to the office of explosives and blasting.

(d) If a pre-blast survey was waived by the owner and was within the requisite area and the property was sold, the new owner may request a pre-blast survey from the operator.

(e) An owner within the requisite area may request, from the operator, a pre-blast survey on structures constructed after the original pre-blast survey.

(f) The pre-blast survey shall include:

(1) The names, addresses or description of structure location and telephone numbers of the owner and the residents of the structure being surveyed and the structure number from the permit blasting map;

(2) The current home insurer of the owner and the residents of the structure;

(3) The names, addresses and telephone numbers of the surface-mining operator and the permit number;

(4) The current general liability insurer of the surface-mining operator;

(5) The name, address and telephone number of the person or firm performing the pre-blast survey;

(6) The current general liability insurer of the person or firm performing the pre-blast survey;

(7) The date of the pre-blast survey and the date it was mailed or delivered to the office of explosives and blasting;

(8) A general description of the structure and its appurtenances including, but not limited to: (A) The number of stories; (B) the construction materials for the frame and the exterior and interior finish; (C) the type of construction including any unusual or substandard construction; and (D) the approximate age of the structure;

(9) A general description of the survey methods and the direction of progression of the survey, including a key to abbreviations used;

(10) Written documentation and drawings, videos or photographs of the pre-blast defects and other physical conditions of all structures, appurtenances and water sources which could be affected by blasting;

(11) Written documentation and drawings, videos or photographs of the exterior and interior of the structure to indicate pre-blast defects and condition;

(12) Written documentation and drawings, videos or photographs of the exterior and interior of any appurtenance of the structure to indicate pre-blast defects and condition;

(13) Sufficient exterior and interior photographs or videos, using a variety of angles, of the structure and its appurtenances to indicate pre-blast defects and the condition of the structure and appurtenances;

(14) Written documentation and drawings, videos or photographs of any unusual or substandard construction technique and materials used on the structure and/or its appurtenances;

(15) Written documentation relating to the type of water supply, including a description of the type of system and treatment being used, an analysis of untreated water supplies, a water analysis of water supplies other than public utilities, and information relating to the quantity and quality of water;

(16) When the water supply is a well, written documentation, where available, relating to the type of well; the well log; the depth, age and type of casing or lining; the static water level; flow data; the pump capacity; the drilling contractor; and the source or sources of the documentation;

(17) A description of any portion of the structure and appurtenances not documented or photographed and the reasons;

(18) The signature of the person performing the survey; and

(19) Any other information required by the chief which additional information shall be

established by rule in accordance with article three, chapter twenty-nine-a of this code.

(g) Except for additional pre-blast surveys prepared within one hundred twenty days of the effective date of this section, pursuant to subsection (b) of this section, the pre-blast survey shall be submitted to the office of explosives and blasting at least fifteen days prior to the commencement of any production blasting. The office of explosives and blasting shall review each pre-blast survey as to form and completeness only and notify the operator of any deficiencies. The office of explosives and blasting shall notify the owner and occupant of the location and availability of the pre-blast survey and a copy of the pre-blast survey shall be provided to the owner and/or occupant upon request.

(h) The surface-mining operator shall file notice of the pre-blast survey or the waiver in the office of the county clerk of the county commission of the county where the man-made dwelling or structure is located to notify the public that a pre-blast survey has been conducted or waived. The notice shall be on a form prescribed by the office of explosives and blasting.

(i) The chief of the office of explosives and blasting shall propose rules for legislative approval in accordance with article three, chapter twenty-nine-a of this code, dealing with pre-blast survey requirements and setting the qualifications for individuals and firms performing pre-blast surveys.

(j) The provisions of this section shall not apply to the following: (1) Underground coal mining operations; and (2) the extraction of minerals by underground mining methods or the surface impacts of the underground mining methods.

§22-3-14. General environmental protection performance standards for the surface effects of underground mining; application of other provisions of article to surface effects of underground mining.

(a) The director shall promulgate separate rules directed toward the surface effects of underground coal mining operations, embodying the requirements in subsection (b) of this section: Provided, That in adopting such rules, the director shall consider the distinct difference between surface coal mines and underground coal mines in West Virginia. Such rules may not conflict with or supersede any provision of the federal or state coal mine health and safety laws or any rule issued pursuant thereto.

(b) Each permit issued by the director pursuant to this article and relating to underground coal mining shall require the operation at a minimum to:

(1) Adopt measures consistent with known technology in order to prevent subsidence causing material damage to the extent technologically and economically feasible, maximize mine stability and maintain the value and reasonably foreseeable use of overlying surface lands, except in those instances where the mining technology used requires planned subsidence in a predictable and controlled manner: Provided, That this subsection does not prohibit the standard method of room and pillar mining;

(2) Seal all portals, entryways, drifts, shafts or other openings that connect the earth's surface to the underground mine workings when no longer needed for the conduct of the mining operations in accordance with the requirements of all applicable federal and state law and rules promulgated pursuant thereto;

(3) Fill or seal exploratory holes no longer necessary for mining and maximize to the extent technologically and economically feasible, if environmentally acceptable, return of mine and processing waste, tailings and any other waste incident to the mining operation to the mine workings or excavations;

(4) With respect to surface disposal of mine wastes, tailings, coal processing wastes and other wastes in areas other than the mine workings or excavations, stabilize all waste piles created by the operator from current operations

through construction in compacted layers, including the use of incombustible and impervious materials, if necessary, and assure that any leachate therefrom will not degrade surface or groundwaters below water quality standards established pursuant to applicable federal and state law and that the final contour of the waste accumulation will be compatible with natural surroundings and that the site is stabilized and revegetated according to the provisions of this section;

(5) Design, locate, construct, operate, maintain, enlarge, modify and remove or abandon, in accordance with the standards and criteria developed pursuant to subsection (f), section thirteen of this article, all existing and new coal mine waste piles consisting of mine wastes, tailings, coal processing wastes and solid wastes and used either temporarily or permanently as dams or embankments;

(6) Establish on regraded areas and all other disturbed areas a diverse and permanent vegetative cover capable of self-regeneration and plant succession and at least equal in extent of cover to the natural vegetation of the area within the time period prescribed in subdivision (20), subsection (b), section thirteen of this article;

(7) Protect off-site areas from damages which may result from such mining operations;

(8) Eliminate fire hazards and otherwise eliminate conditions which constitute a hazard to health and safety of the public;

(9) Minimize the disturbance of the prevailing hydrologic balance at the mine site and in associated off-site areas and to the quantity and the quality of water in surface and groundwater systems both during and after mining operations and during reclamation by: (A) Avoiding acid or other toxic mine drainage by such measures as, but not limited to: (i) Preventing or removing water from contact with toxic producing deposits; (ii) treating drainage to reduce toxic content which adversely affects downstream water before being released to water courses; and (iii) casing, sealing or otherwise managing boreholes, shafts and wells to keep acid or other toxic drainage from entering ground and surface waters; and (B) conducting mining operations so as to prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow or runoff outside the permit area, but in no event shall the contributions be in excess of requirements set by applicable state or federal law, and avoiding channel deepening or enlargement in operations requiring the discharge of water from mines: Provided, That in recognition of the distinct differences between surface and underground mining the monitoring of water from underground coal mine workings shall be in accordance with the provisions of the Clean Water Act of 1977;

(10) With respect to other surface impacts of underground mining not specified in this subsection, including the construction of new roads or the improvement or use of existing roads to gain access to the site of such activities and for haulage, repair areas, storage areas, processing areas, shipping areas, and other areas upon which are sited structures, facilities or other property or materials on the surface, resulting from or incident to such activities, operate in accordance with the standards established under section thirteen of this article for such effects which result from surface-mining operations: Provided, That the director shall make such modifications in the requirements imposed by this subdivision as are necessary to accommodate the distinct difference between surface and underground mining in West Virginia;

(11) To the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the operation on fish, aquatic life, wildlife and related environmental values, and achieve enhancement of such resources where practicable; and

(12) Unless otherwise permitted by the director and in consideration of the relevant safety and environmental factors, locate openings for all new drift mines working in acid

producing or iron producing coal seams in a manner as to prevent a gravity discharge of water from the mine.

(c) In order to protect the stability of the land, the director shall suspend underground mining under urbanized areas, cities, towns and communities and adjacent to industrial or commercial buildings, major impoundments or permanent streams if he or she finds imminent danger to inhabitants of the urbanized areas, cities, towns or communities.

(d) The provisions of this article relating to permits, bonds, insurance, inspections, reclamation and enforcement, public review and administrative and judicial review are also applicable to surface operations and surface impacts incident to an underground mine with such modifications by rule to the permit application requirements, permit approval or denial procedures and bond requirements as are necessary to accommodate the distinct difference between surface mines and underground mines in West Virginia.

§22-3-15. Inspections; monitoring; right of entry; inspection of records; identification signs; progress maps.

(a) The director shall cause to be made inspections of surface-mining operations as are necessary to effectively enforce the requirements of this article and for such purposes the director or his or her authorized representative shall without advance notice and upon presentation of appropriate credentials: (A) Have the right of entry to, upon or through surface-mining operations or any premises in which any records required to be maintained under subdivision (1), subsection (b) of this section are located; and (B) at reasonable times and without delay, have access to and copy any records and inspect any monitoring equipment or method of operation required under this article.

(b) For the purpose of enforcement under this article, in the administration and enforcement of any permit under this article, or for determining whether any person is in violation of any requirement of this article:

(1) The director shall, at a minimum, require any operator to: (A) Establish and maintain appropriate records; (B) make monthly reports to the division; (C) install, use and maintain any necessary monitoring equipment or methods consistent with subdivision (11), subsection (a), section nine of this article; (D) evaluate results in accordance with such methods, at such locations, intervals and in such manner as the director prescribes; and (E) provide any other information relative to surface-mining operations as the director finds reasonable and necessary; and

(2) For those surface-mining operations which remove or disturb strata that serve as aquifers which significantly ensure the hydrologic balance of water use either on or off the mining site, the director shall require that: (A) Monitoring sites be established to record the quantity and quality of surface drainage above and below the mine site as well as in the potential zone of influence; (B) monitoring sites be established to record level, amount and samples of groundwater and aquifers potentially affected by the surface-mining and also below the lowermost mineral seam to be mined; (C) records or well logs and borehole data be maintained; and (D) monitoring sites be established to record precipitation. The monitoring, data collection and analysis required by this section shall be conducted according to standards and procedures set forth by the director in order to assure their reliability and validity.

(c) All surface-mining operations shall be inspected at least once every thirty days. The inspections shall be made on an irregular basis without prior notice to the operator or the operator's agents or employees, except for necessary on-site meetings with the operator. The inspections shall include the filing of inspection reports adequate to enforce the requirements, terms and purposes of this article.

(d) Each permittee shall maintain at the entrances to the surface-mining operations a clearly visible monument which sets forth the name, business address and telephone number of

the permittee and the permit number of the surface-mining operations.

(e) Copies of any records, reports, inspection materials or information obtained under this article by the director shall be made immediately available to the public at central and sufficient locations in the county, multicounty or state area of mining so that they are conveniently available to residents in the areas of mining unless specifically exempted by this article.

(f) Within thirty days after service of a copy of an order of the director upon an operator by registered or certified mail, the operator shall furnish to the director five copies of a progress map prepared by or under the supervision of a person approved by the director showing the disturbed area to the date of such map. Such progress map shall contain information identical to that required for both the proposed and final maps required by this article, and shall show in detail completed reclamation work as required by the director. Such progress map shall include a geologic survey sketch showing the location of the operation, shall be properly referenced to a permanent landmark, and shall be within such reasonable degree of accuracy as may be prescribed by the director. If no land has been disturbed by operations during the preceding year, the operator shall notify the director of that fact.

(g) Whenever on the basis of available information, including reliable information from any person, the director has cause to believe that any person is in violation of this article, any permit condition or any rule promulgated under this article, the director shall immediately order state inspection of the surface-mining operation at which the alleged violation is occurring unless the information is available as a result of a prior state inspection. The director shall notify any person who supplied such reliable information when the state inspection will be carried out. Such person may accompany the inspector during the inspection.

(h) When requested by the permittee, the director may provide for a compliance conference with his or her authorized representative to review the compliance status of any coal exploration or surface-coal mining and reclamation operation. Any such conference may not constitute an inspection as defined in this section.

§22-3-16. Cessation of operation by order of inspector; informal conference; imposition of affirmative obligations; appeal.

(a) Notwithstanding any other provisions of this article, a surface-mining reclamation inspector has the authority to issue a cessation order for any portion of a surface-mining operation when an inspector determines that any condition or practice exists, or that any permittee is in violation of any requirements of this article or any permit condition required by this article, which condition, practice or violation also creates an imminent danger to the health or safety of the public, or is causing or can reasonably be expected to cause significant, imminent environmental harm to land, air or water resources. The cessation order takes effect immediately. Unless waived in writing, an informal conference shall be held at or near the site relevant to the violation set forth in the cessation order within twenty-four hours after the order becomes effective or such order shall expire. The conference shall be held before a surface-mining reclamation supervisor who shall, immediately upon conclusion of said hearing, determine when and if the operation or portion thereof may resume. Operators who believe they are aggrieved by the decision of the surface-mining reclamation supervisor may immediately appeal to the director, setting forth reasons why the operation should not be halted. The director forthwith shall determine when the operation or portion thereof may be resumed.

(b) The cessation order remains in effect until the director determines that the condition, practice or violation has been abated, or until modified, vacated or released by the director. Where the director finds that the ordered cessation of any portion of a surface coal mining operation will not completely abate the imminent danger to health or safety of the public or the significant imminent environmental harm to land, air or water resources, the director shall,

in addition to the cessation order, impose affirmative obligations on the operator requiring the operator to take whatever steps the director determines necessary to abate the imminent danger or the significant environmental harm.

(c) Any cessation order issued pursuant to this section or any other provision of this article may be released by any inspector. An inspector shall be readily available to terminate a cessation order upon abatement of the violation.

§22-3-17. Notice of violation; procedure and actions; enforcement; permit revocation and bond forfeiture; civil and criminal penalties; appeals to the board; prosecution; injunctive relief.

(a) If any of the requirements of this article, rules promulgated pursuant thereto or permit conditions have not been complied with, the director shall cause a notice of violation to be served upon the operator or the operator's duly authorized agent. A copy of the notice shall be handed to the operator or the operator's duly authorized agent in person or served by certified mail addressed to the operator at the permanent address shown on the application for a permit. The notice shall specify in what respects the operator has failed to comply with this article, rules or permit conditions and shall specify a reasonable time for abatement of the violation not to exceed thirty days. If the operator has not abated the violation within the time specified in the notice, or any reasonable extension thereof, not to exceed sixty days, the director shall order the cessation of the operation or the portion thereof causing the violation, unless the operator affirmatively demonstrates that compliance is unattainable due to conditions totally beyond the control of the operator. If a violation is not abated within the time specified or any extension thereof, or any cessation order is issued, a mandatory civil penalty of not less than seven hundred fifty dollars per day per violation shall be assessed. A cessation order remains in effect until the director determines that the violation has been abated or until modified, vacated or terminated by the director or by a court. In any cessation order issued under this subsection, the director shall determine the steps necessary to abate the violation in the most expeditious manner possible and shall include the necessary measures in the order.

(b) If the director determines that a pattern of violations of any requirement of this article or any permit condition exists or has existed, as a result of the operator's lack of reasonable care and diligence, or that the violations are willfully caused by the operator, the director shall immediately issue an order directing the operator to show cause why the permit should not be suspended or revoked and giving the operator thirty days in which to request a public hearing. If a hearing is requested, the director shall inform all interested parties of the time and place of the hearing. Any hearing under this section shall be recorded and is subject to the provisions of chapter twenty-nine-a of this code. Within sixty days following the public hearing, the director shall issue and furnish to the permittee and all other parties to the hearing a written decision, and the reasons therefor, concerning suspension or revocation of the permit. Upon the operator's failure to show cause why the permit should not be suspended or revoked, the director shall immediately suspend or revoke the operator's permit. If the permit is revoked, the director shall initiate procedures in accordance with rules promulgated by the director to forfeit the entire amount of the operator's bond, or other security posted pursuant to section eleven or twelve of this article, and give notice to the attorney general, who shall collect the forfeiture without delay: Provided, That the entire proceeds of such forfeiture shall be deposited with the treasurer of the state of West Virginia to the credit of the special reclamation fund. All forfeitures collected shall be deposited in the special reclamation fund and shall be expended back upon the areas for which the bond was posted: Provided, however, That any excess therefrom shall remain in the special reclamation fund.

Within one year following the notice of permit revocation, subject to the discretion of the director and based upon a petition for reinstatement, the revoked permit may be reinstated. The reinstated permit may be

assigned to any person who meets the permit eligibility requirements of this article.

(c) Any person engaged in surface-mining operations who violates any permit condition or who violates any other provision of this article or rules promulgated pursuant thereto may also be assessed a civil penalty. The penalty may not exceed five thousand dollars. Each day of continuing violation may be deemed a separate violation for purposes of penalty assessments. In determining the amount of the penalty, consideration shall be given to the operator's history of previous violations at the particular surface-mining operation, the seriousness of the violation, including any irreparable harm to the environment and any hazard to the health or safety of the public, whether the operator was negligent, and the demonstrated good faith of the operator charged in attempting to achieve rapid compliance after notification of the violation.

(d) (1) Upon the issuance of a notice or order pursuant to this section, the assessment officer shall, within thirty days, set a proposed penalty assessment and notify the operator in writing of such proposed penalty assessment. The proposed penalty assessment must be paid in full within thirty days of receipt or, if the operator wishes to contest either the amount of the penalty or the fact of violation, an informal conference with the assessment officer may be requested within fifteen days or a formal hearing before the surface mine board may be requested within thirty days. The notice of proposed penalty assessment shall advise the operator of the right to an informal conference and a formal hearing pursuant to this section. When an informal conference is requested, the operator has fifteen days from receipt of the assessment officer's decision to request a formal hearing before the board.

(A) When an informal conference is held, the assessment officer has authority to affirm, modify or vacate the notice, order or proposed penalty assessment.

(B) When a formal hearing is requested, the amount of the proposed penalty assessment shall be forwarded to the director for placement in an escrow account. Formal hearings shall be of record and subject to the provisions of article five, chapter twenty-nine-a of this code. Following the hearing the board shall affirm, modify or vacate the notice, order or proposed penalty assessment and, when appropriate, incorporate an assessment order requiring that the assessment be paid.

(2) Civil penalties owed under this section may be recovered by the director in the circuit court of Kanawha County. Civil penalties collected under this article shall be deposited with the treasurer of the state of West Virginia to the credit of the special reclamation fund established in section eleven of this article. If, through the administrative or judicial review of the proposed penalty it is determined that no violation occurred or that the amount of the penalty should be reduced, the director shall within thirty days remit the appropriate amount to the person, with interest at the rate of six percent or at the prevailing United States department of the treasury rate, whichever is greater. Failure to forward the money to the director within thirty days is a waiver of all legal rights to contest the violation or the amount of the penalty.

(e) Any person having an interest which is or may be adversely affected by any order of the director or the surface mine board may file an appeal only in accordance with the provisions of article one, chapter twenty-two-b of this code, within thirty days after receipt of the order.

(f) The filing of an appeal or a request for an informal conference or formal hearing provided for in this section does not stay execution of the order appealed from. Pending completion of the investigation and conference or hearing required by this section, the applicant may file with the director a written request that the director grant temporary relief from any notice or order issued under section sixteen or seventeen of this article, together with a detailed statement giving reasons for granting such relief. The director shall issue an order or decision granting or denying such relief expeditiously: Provided, That where the applicant requests relief from an order for

cessation of surface-mining and reclamation operations, the decision on the request shall be issued within five days of its receipt. The director may grant such relief, under such conditions as he or she may prescribe if:

(1) All parties to the proceedings have been notified and given an opportunity to be heard on a request for temporary relief;

(2) The person requesting the relief shows that there is a substantial likelihood that they will prevail on the merits in the final determination of the proceedings;

(3) The relief will not adversely affect the public health or safety or cause significant imminent environmental harm to land, air or water resources; and

(4) The relief sought is not the issuance of a permit where a permit has been denied, in whole or in part, by the director.

(g) Any person who willfully and knowingly violates a condition of a permit issued pursuant to this article or rules promulgated pursuant thereto, or fails or refuses to comply with any order issued under said article and rules or any order incorporated in a final decision issued by the director, is guilty of a misdemeanor and, upon conviction thereof, shall be fined not less than one hundred dollars nor more than ten thousand dollars, or imprisoned in the county jail not more than one year, or both fined and imprisoned.

(h) Whenever a corporate operator violates a condition of a permit issued pursuant to this article, rules promulgated pursuant thereto, or any order incorporated in a final decision issued by the director, any director, officer or agent of the corporation who willfully and knowingly authorized, ordered or carried out the failure or refusal, is subject to the same civil penalties, fines and imprisonment that may be imposed upon a person under subsections (c) and (g) of this section.

(i) Any person who knowingly makes any false statement, representation or certification, or knowingly fails to make any statement, representation or certification in any application, petition, record, report, plan or other document filed or required to be maintained pursuant to this article or rules promulgated pursuant thereto, is guilty of a misdemeanor and, upon conviction thereof, shall be fined not less than one hundred dollars nor more than ten thousand dollars, or imprisoned in the county jail not more than one year, or both fined and imprisoned.

(j) Whenever any person: (A) Violates or fails or refuses to comply with any order or decision issued by the director under this article; or (B) interferes with, hinders or delays the director in carrying out the provisions of this article; or (C) refuses to admit the director to the mine; or (D) refuses to permit inspection of the mine by the director; or (E) refuses to furnish any reasonable information or report requested by the director in furtherance of the provisions of this article; or (F) refuses to permit access to, and copying of, such records as the director determines necessary in carrying out the provisions of this article; or (G) violates any other provisions of this article, the rules promulgated pursuant thereto, or the terms and conditions of any permit, the director, the attorney general or the prosecuting attorney of the county in which the major portion of the permit area is located may institute a civil action for relief, including a permanent or temporary injunction, restraining order or any other appropriate order, in the circuit court of Kanawha County or any court of competent jurisdiction to compel compliance with and enjoin such violations, failures or refusals. The court or the judge thereof may issue a preliminary injunction in any case pending a decision on the merits of any application filed without requiring the filing of a bond or other equivalent security.

(k) Any person who, except as permitted by law, willfully resists, prevents, impedes or interferes with the director or any of his or her agents in the performance of duties pursuant to this article is guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than five thousand dollars or by

imprisonment for not more than one year, or both.

§22-3-18. Approval, denial, revision and prohibition of permit.

(a) Upon the receipt of a complete surface-mining application or significant revision or renewal thereof, including public notification and an opportunity for a public hearing, the director shall grant, require revision of, or deny the application for a permit within sixty days and notify the applicant in writing of the decision. The applicant for a permit, or revision of a permit, has the burden of establishing that the application is in compliance with all the requirements of this article and the rules promulgated hereunder.

(b) No permit or significant revision of a permit may be approved unless the applicant affirmatively demonstrates and the director finds in writing on the basis of the information set forth in the application or from information otherwise available which shall be documented in the approval and made available to the applicant that:

(1) The permit application is accurate and complete and that all the requirements of this article and rules thereunder have been complied with;

(2) The applicant has demonstrated that reclamation as required by this article can be accomplished under the reclamation plan contained in the permit application;

(3) The assessment of the probable cumulative impact of all anticipated mining in the area on the hydrologic balance, as specified in section nine of this article, has been made by the director and the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area;

(4) The area proposed to be mined is not included within an area designated unsuitable for surface-mining pursuant to section twenty-two of this article or is not within an area under administrative study by the director for such designation; and

(5) In cases where the private mineral estate has been severed from the private surface estate, the applicant has submitted: (A) The written consent of the surface owner to the extraction of coal by surface-mining; or (B) a conveyance that expressly grants or reserves the right to extract the coal by surface-mining; or (C) if the conveyance does not expressly grant the right to extract coal by surface-mining, the surface subsurface legal relationship shall be determined in accordance with applicable law: Provided, That nothing in this article shall be construed to authorize the director to adjudicate property rights disputes.

(c) Where information available to the division indicates that any surface-mining operation owned or controlled by the applicant is currently in violation of this article or other environmental laws or rules, the permit may not be issued until the applicant submits proof that such violation has been corrected or is in the process of being corrected to the satisfaction of the director or the department or agency which has jurisdiction over the violation, and no permit may be issued to any applicant after a finding by the director, after an opportunity for hearing, that the applicant or the operator specified in the application controls or has controlled mining operations with a demonstrated pattern of willful violations of this article or of other state or federal programs implementing the federal Surface-Mining Control and Reclamation Act of 1977, as amended, of such nature and duration with such irreparable damage to the environment as to indicate an intent not to comply with the provisions of this article or the federal Surface-Mining Control and Reclamation Act of 1977, as amended: Provided, That if the director finds that the applicant is or has been affiliated with, or managed or controlled by, or is or has been under the common control of, other than as an employee, a person who has had a surface-mining permit revoked or bond or other security forfeited for failure to reclaim lands as required by the laws of this state, he or she may not issue a permit to the applicant: Provided, however, That subject to the discretion of the director and

based upon a petition for reinstatement, permits may be issued to any applicant if:

(1) After the revocation or forfeiture, the operator whose permit has been revoked or bond forfeited has paid into the special reclamation fund any additional sum of money determined by the director to be adequate to reclaim the disturbed area; (2) the violations which resulted in the revocation or forfeiture have not caused irreparable damage to the environment; and (3) the director is satisfied that the petitioner will comply with this article.

(d) (1) In addition to finding the application in compliance with subsection (b) of this section, if the area proposed to be mined contains prime farmland, the director may, pursuant to rules promulgated hereunder, grant a permit to mine on prime farmland if the operator affirmatively demonstrates that the operator has the technological capability to restore such mined area, within a reasonable time, to equivalent or higher levels of yield as nonmined prime farmland in the surrounding area under equivalent levels of management, and can meet the soil reconstruction standards in subdivision (7), subsection (b), section thirteen of this article. Except for compliance with subsection (b) of this section, the requirements of this subdivision apply to all permits issued after the third day of August, one thousand nine hundred seventy-seven.

(2) Nothing in this subsection applies to any permit issued prior to the third day of August, one thousand nine hundred seventy-seven, or to any revisions or renewals thereof, or to any existing surface-mining operations for which a permit was issued prior to said date.

(e) If the director finds that the overburden on any part of the area of land described in the application for a permit is such that experience in the state with a similar type of operation upon land with similar overburden shows that one or more of the following conditions cannot feasibly be prevented: (1) Substantial deposition of sediment in stream beds; (2) landslides; or (3) acid-water pollution, the director may delete such part of the land described in the application upon which such overburden exists.

(f) The prohibition of subsection (c) of this section may not apply to a permit application due to any violation resulting from an unanticipated event or condition at a surface coal mine eligible for remining under a permit held by the applicant.

§22-3-19. Permit revision and renewal requirements; incidental boundary revisions; requirements for transfer; assignment and sale of permit rights; and operator reassignment.

(a) (1) Any valid permit issued pursuant to this article carries with it the right of successive renewal upon expiration with respect to areas within the boundaries of the existing permit. The holders of the permit may apply for renewal and the renewal shall be issued: Provided, That on application for renewal, the burden is on the opponents of renewal, unless it is established that and written findings by the director are made that: (A) The terms and conditions of the existing permit are not being satisfactorily met: Provided, however, That if the permittee is required to modify operations pursuant to mining or reclamation requirements which become applicable after the original date of permit issuance, the permittee shall be provided an opportunity to submit a schedule allowing a reasonable period to comply with such revised requirements; (B) the present surface-mining operation is not in compliance with the applicable environmental protection standards of this article; (C) the renewal requested substantially jeopardizes the operator's continuing responsibility on existing permit areas; (D) the operator has not provided evidence that the bond in effect for said operation will continue in effect for any renewal requested as required pursuant to sections eleven or twelve of this article; or (E) any additional revised or updated information as required pursuant to rules promulgated by the director has not been provided.

(2) If an application for renewal of a valid permit includes a proposal to extend the surface-

mining operation beyond the boundaries authorized in the existing permit, that portion of the application for renewal which addresses any new land area is subject to the full standards of this article, which includes, but is not limited to: (A) Adequate bond; (B) a map showing the disturbed area and facilities; and (C) a reclamation plan.

(3) Any permit renewal shall be for a term not to exceed the period of time for which the original permit was issued. Application for permit renewal shall be made at least one hundred twenty days prior to the expiration of the valid permit.

(4) Any renewal application for an active permit shall be on forms prescribed by the director and shall be accompanied by a filing fee of two thousand dollars. The application shall contain such information as the director requires pursuant to rule.

(b)(1) During the term of the permit, the permittee may submit to the director an application for a revision of the permit, together with a revised reclamation plan.

(2) An application for a significant revision of a permit is subject to all requirements of this article and rules promulgated pursuant thereto.

(3) Any extension to an area already covered by the permit, except incidental boundary revisions, shall be made by application for another permit. If the permittee desires to add the new area to his or her existing permit in order to have existing areas and new areas under one permit, the director may so amend the original permit: Provided, That the application for the new area is subject to all procedures and requirements applicable to applications for original permits under this article.

(c) The director shall review outstanding permits of a five-year term before the end of the third year of the permit. Other permits shall be reviewed within the time established by rules. The director may require reasonable revision or modification of the permit following review: Provided, That such revision or modification shall be based upon written findings and shall be preceded by notice to the permittee of an opportunity for hearing.

(d) No transfer, assignment or sale of the rights granted under any permit issued pursuant to this article shall be made without the prior written approval of the director.

§22-3-20. Public notice; written objections; public hearings; informal conferences.

(a) At the time of submission of an application for a surface-mining permit or a significant revision of an existing permit pursuant to the provisions of this article, the applicant shall submit to the division a copy of the required advertisement. At the time of submission, the applicant shall place the advertisement in a local newspaper of general circulation in the county of the proposed surface-mining operation at least once a week for four consecutive weeks. The director shall notify various appropriate federal and state agencies as well as local governmental bodies, planning agencies and sewage and water treatment authorities or water companies in the locality in which the proposed surface-mining operation will take place, notifying them of the operator's intention to mine on a particularly described tract of land and indicating the application number and where a copy of the proposed mining and reclamation plan may be inspected. These local bodies, agencies, authorities or companies may submit written comments within a reasonable period established by the director on the mining application with respect to the effect of the proposed operation on the environment which is within their area of responsibility. Such comments shall be immediately transmitted by the director to the applicant and to the appropriate office of the division. The director shall provide the name and address of each applicant to the commissioner of the division of labor who shall within fifteen days from receipt notify the director as to the applicant's compliance, if necessary, with section fourteen, article five, chapter twenty-one of this code.

(b) Any person having an interest which is or may be adversely affected, or the officer or head of any federal, state or local governmental agency, has the right to file written objections to the proposed initial or revised permit application for a surface-mining operation with the director within thirty days after the last publication of the advertisement required in subsection (a) of this section. Such objections shall be immediately transmitted to the applicant by the director and shall be made available to the public. If written objections are filed and an informal conference requested within thirty days of the last publication of the above notice, the director shall then hold a conference in the locality of the proposed mining within three weeks after the close of the public comment period. Those requesting the conference shall be notified and the date, time and location of the informal conference shall also be advertised by the director in a newspaper of general circulation in the locality at least two weeks prior to the scheduled conference date. The director may arrange with the applicant, upon request by any party to the conference proceeding, access to the proposed mining area for the purpose of gathering information relevant to the proceeding. An electronic or stenographic record shall be made of the conference proceeding unless waived by all parties. Such record shall be maintained and shall be accessible to the parties at their respective expense until final release of the applicant's bond or other security posted in lieu thereof. The director's authorized agent will preside over the conference. In the event all parties requesting the informal conference stipulate agreement prior to the conference and withdraw their request, a conference need not be held.

§22-3-21. Decision of director on permit application; hearing thereon.

(a) If an informal conference has been held, the director shall issue and furnish the applicant for a permit and persons who were parties to the informal conference with the written finding granting or denying the permit, in whole or in part, and stating the reasons therefor within thirty days of the informal conference, notwithstanding the requirements of subsection (a), section eighteen of this article.

(b) If the application is approved, the permit shall be issued. If the application is disapproved, specific reasons therefor must be set forth in the notification. Within thirty days after the applicant is notified of the director's decision, the applicant or any person with an interest which is or may be adversely affected may request a hearing before the surface mine board as provided in article one, chapter twenty-two-b of this code to review the director's decision.

§22-3-22. Designation of areas unsuitable for surface mining; petition for removal of designation; prohibition of surface mining on certain areas; exceptions; taxation of minerals underlying land designated unsuitable.

(a) The director shall establish a planning process to enable objective decisions based upon competent and scientifically sound data and information as to which, if any, land areas of this state are unsuitable for all or certain types of surface-mining operations pursuant to the standards set forth in subdivisions (1) and (2) of this subsection: Provided, That such designation shall not prevent prospecting pursuant to section seven of this article on any area so designated.

(1) Upon petition pursuant to subsection (b) of this section, the director shall designate an area as unsuitable for all or certain types of surface-mining operations, if it determines that reclamation pursuant to the requirements of this article is not technologically and economically feasible.

(2) Upon petition pursuant to subsection (b) of this section, a surface area may be designated unsuitable for certain types of surface-mining operations, if the operations: (A) Conflict with existing state or local land use plans or programs; (B) affect fragile or historic lands in which the operations could result in significant damage to important historic, cultural, scientific and aesthetic values and natural systems; (C) affect renewable resource lands, including significant aquifers and aquifer recharge areas,

in which the operations could result in a substantial loss or reduction of long-range productivity of water supply, food or fiber products; or (D) affect natural hazard lands in which the operations could substantially endanger life and property. Such lands shall include lands subject to frequent flooding and areas of unstable geology.

(3) The director shall develop a process which includes: (A) The review of surface-mining lands; (B) a data base and an inventory system which will permit proper evaluation of the capacity of different land areas of the state to support and permit reclamation of surface-mining operations; (C) a method for implementing land use planning decisions concerning surface-mining operations; and (D) proper notice and opportunities for public participation, including a public hearing prior to making any designation or redesignation pursuant to this section.

(4) Determinations of the unsuitability of land for surface mining, as provided for in this section, shall be integrated as closely as possible with present and future land use planning and regulation processes at federal, state and local levels.

(5) The requirements of this section do not apply to lands on which surface-mining operations were being conducted on the third day of August, one thousand nine hundred seventy-seven, or under a permit issued pursuant to this article, or where substantial legal and financial commitments in the operations were in existence prior to the fourth day of January, one thousand nine hundred seventy-seven.

(b) Any person having an interest which is or may be adversely affected has the right to petition the director to have an area designated as unsuitable for surface-mining operations or to have such a designation terminated. The petition shall contain allegations of fact with supporting evidence which would tend to establish the allegations. After receipt of the petition, the director shall immediately begin an administrative study of the area specified in the petition. Within ten months after receipt of the petition, the director shall hold a public hearing in the locality of the affected area after appropriate notice and publication of the date, time and location of the hearing. After the director or any person having an interest which is or may be adversely affected has filed a petition and before the hearing required by this subsection, any person may intervene by filing allegations of fact with supporting evidence which would tend to establish the allegations. Within sixty days after the hearing, the director shall issue and furnish to the petitioner and any other party to the hearing, a written decision regarding the petition and the reasons therefor. In the event that all the petitioners stipulate agreement prior to the requested hearing and withdraw their request, the hearing need not be held.

(c) Prior to designating any land areas as unsuitable for surface-mining operations, the director shall prepare a detailed statement on: (1) The potential coal resources of the area; (2) the demand for the coal resources; and (3) the impact of the designation on the environment, the economy and the supply of coal.

(d) After the third day of August, one thousand nine hundred seventy-seven, and subject to valid existing rights, no surface-mining operations, except those which existed on that date, shall be permitted:

(1) On any lands in this state within the boundaries of units of the national park system, the national wildlife refuge systems, the national system of trails, the national wilderness preservation system, the wild and scenic rivers system, including study rivers designated under section five-a of the Wild and Scenic Rivers Act, and national recreation areas designated by act of Congress;

(2) Which will adversely affect any publicly owned park or places included in the national register of historic sites, or national register of natural landmarks unless approved jointly by the director and the federal, state or local agency with jurisdiction over the park, the historic site or natural landmark;

(3) Within one hundred feet of the outside right-of-way line on any public road, except where mine access roads or haulage roads join such right-of-way line, and except that the director may permit the roads to be relocated or the area affected to lie within one hundred feet of the road if, after public notice and an opportunity for a public hearing in the locality, the director makes a written finding that the interests of the public and the landowners affected thereby will be protected;

(4) Within three hundred feet from any occupied dwelling, unless waived by the owner thereof, or within three hundred feet of any public building, school, church, community or institutional building, public park, or within one hundred feet of a cemetery; or

(5) On any federal lands within the boundaries of any national forest: Provided, That surface coal mining operations may be permitted on the lands if the secretary of the interior finds that there are no significant recreational, timber, economic or other values which may be incompatible with the surface-mining operations: Provided, however, That the surface operations and impacts are incident to an underground coal mine.

(e) Notwithstanding any other provision of this code, the coal underlying any lands designated unsuitable for surface-mining operations under any provisions of this article or underlying any land upon which mining is prohibited by any provisions of this article shall be assessed for taxation purposes according to their value and the Legislature hereby finds that the coal has no value for the duration of the designation or prohibition unless suitable for underground mining not in violation of this article: Provided, That the owner of the coal shall forthwith notify the proper assessing authorities if the designation or prohibition is removed so that the coal may be reassessed.

§22-3-22a. Blasting restrictions; site specific blasting design requirement.

(a) For purposes of this section, the term "production blasting" means blasting that removes the overburden to expose underlying coal seams and shall not include construction blasting.

(b) For purposes of this section, the term "construction blasting" means blasting to develop haul roads, mine access roads, coal preparation plants, drainage structures, or underground coal mine sites and shall not include production blasting.

(c) For purposes of this section, the term "protected structure" means any of the following structures that are situated outside the permit area: An occupied dwelling, a temporarily unoccupied dwelling which has been occupied within the past ninety days, a public building, a structure for commercial purposes, a school, a church, a community or institutional building, a public park or a water well.

(d) Production blasting is prohibited within three hundred feet of a protected structure or within one hundred feet of a cemetery.

(e) Blasting within one thousand feet of a protected structure shall have a site specific blast design approved by the office of explosives and blasting. The site specific blast design shall limit the type of explosives and detonating equipment, the size, the timing and frequency of blasts to do the following:

(1) Prevent injury to persons; (2) prevent damage to public and private property outside the permit area; (3) prevent adverse impacts on any underground mine; (4) prevent change in the course, channel or availability of ground or surface water outside the permit area; and (5) reduce dust outside the permit area.

In the development of a site specific blasting plan consideration shall be given, but is not limited to, the physical condition, type and quality of construction of the protected structure, the current use of the protected structure and the concerns of the owner or occupant living in the protected structure in the blasting schedule.

(f) An owner or occupant of a protected structure may waive the blasting prohibition

within three hundred feet or the site specific restriction within one thousand feet in writing. If a protected structure is occupied by a person other than the owner, both the owner and the occupant of the protected structure shall waive the blasting prohibition within three hundred feet or the site specific restriction within one thousand feet in writing. The operator shall send copies of all written waivers executed pursuant to this subsection to the office of explosives and blasting. Written waivers executed and filed with the office of explosives and blasting shall be valid during the life of the permit or any renewals of the permit and shall be enforceable against any subsequent owners or occupants of the protected structure.

(g) The provisions of this section shall not apply to the following: (1) Underground coal mining operations; (2) the surface operations and surface impacts incident to an underground coal mine; and (3) the extraction of minerals by underground mining methods or the surface impacts of the underground mining methods: Provided, That nothing contained in this section shall be construed to exempt any coal mining operation from the general performance standards as contained in section thirteen of this article and any rules promulgated pursuant thereto.

§22-3-23. Release of bond or deposits; application; notice; duties of director; public hearings; final maps on grade release.

(a) The permittee may file a request with the director for the release of a bond or deposit. The permittee shall publish an advertisement regarding the request for release in the same manner as is required of advertisements for permit applications. A copy of the advertisement shall be submitted to the director as part of any bond release application and shall contain a notification of the precise location of the land affected, the number of acres, the permit and the date approved, the amount of the bond filed and the portion sought to be released, the type and appropriate dates of reclamation work performed and a description of the results achieved as they relate to the permittee's approved reclamation plan. In addition, as part of any bond release application, the permittee shall submit copies of letters which the permittee has sent to adjoining property owners, local government bodies, planning agencies, sewage and water treatment authorities or water companies in the locality in which the surface-mining operation is located, notifying them of the permittee's intention to seek release from the bond. Any request for grade release shall also be accompanied by final maps.

(b) Upon receipt of the application for bond release, the director, within thirty days, taking into consideration existing weather conditions, shall conduct an inspection and evaluation of the reclamation work involved. The evaluation shall consider, among other things, the degree of difficulty to complete any remaining reclamation, whether pollution of surface and subsurface water is occurring, the probability of continuance or future occurrence of the pollution and the estimated cost of abating the pollution. The director shall notify the permittee in writing of his or her decision to release or not to release all or part of the bond or deposit within sixty days from the date of the initial publication of the advertisement if no public hearing is requested. If a public hearing is held, the director's decision shall be issued within thirty days thereafter.

(c) If the director is satisfied that reclamation covered by the bond or deposit or portion thereof has been accomplished as required by this article, he or she may release said bond or deposit, in whole or in part, according to the following schedule:

(1) For all operations except those with an approved variance from approximate original contour:

(A) When the operator completes the backfilling, regrading and drainage control of a bonded area in accordance with the operator's approved reclamation plan, the release of sixty percent of the bond or collateral for the applicable bonded area: Provided, That a minimum bond of ten thousand dollars shall be retained after grade release;

(B) Two years after the last augmented seeding, fertilizing, irrigation or other work to ensure compliance with subdivision (19), subsection (b), section thirteen of this article, the release of an additional twenty-five percent of the bond or collateral for the applicable bonded area: Provided, That a minimum bond of ten thousand dollars shall be retained after the release provided for in this subdivision; and

(C) When the operator has completed successfully all surface mining and reclamation activities, the release of the remaining portion of the bond, but not before the expiration of the period specified in subdivision (20), subsection (b), section thirteen of this article: Provided, That the revegetation has been established on the regraded mined lands in accordance with the approved reclamation plan: Provided, however, That a release may be made where the quality of the untreated post-mining water discharged is better than or equal to the premining water quality discharged form the mining site.

(2) For operations with an approved variance from approximate original contour;

(A) When the operator completes the backfilling, regrading and drainage control of a bonded area in accordance with the operator's approved reclamation plan, the release of fifty percent of the bond or collateral for the applicable bonded area: Provided, That a minimum bond of ten thousand dollars shall be retained after grade release;

(B) Two years after the last augmented seeding, fertilizing, irrigation or other work to ensure compliance with subdivision (19), subsecction (b), section thirteen of this article, the release of an additional ten percent of the bond or collateral for the applicable bonded area: Provided, That a minimum bond of ten thousand dollars shall be retained after the release provided for in this subdivision; and

(C) When the operator has completed successfully all surface mining and reclamation activities, the release of the remaining portion of the bond, but not before the expiration of the period specified in subdivision (20), subsection (b), section thirteen of this article: Provided, That the revegetation has been established on the regraded mined lands in accordance with the approved reclamation plan and if applicable the necessary postmining infrastructure is established and any necessary financing is completed; Provided, however, That the release may be made where the quality of the untreated postmining water discharged is better than or equal to the premining water quality discharged from the mining site.

No part of the bond or deposit may be released under this subsection so long as the lands to which the release would be applicable are contributing additional suspended solids to streamflow or runoff outside the permit area in excess of the requirements set by section thirteen of this article, or until soil productivity for prime farmlands has returned to equivalent levels of yield as nonmined land of the same soil type in the surrounding area under equivalent management practices as determined from the soil survey performed pursuant to section nine of this article. Where a sediment dam is to be retained as a permanent impoundment pursuant to section thirteen of this article, or where a road or minor deviation is to be retained for sound future maintenance of the operation, the portion of the bond may be released under this subsection so long as provisions for sound future maintenance by the operator or the landowner have been made with the director.

Notwithstanding the bond release scheduling provisions of subdivisions (1), (2) and (3) of this subsection, if the operator completes the backfilling and reclamation in accordance with an approved post-mining land use plan that has been approved by the division of environmental protection and accepted by a local or regional economic development or planning agency for the county or region in which the operation is located, provisions for sound future maintenance are assured by the local or regional economic development or planning agency, and the quality of any untreated postmining water discharge complies with applicable water quality criteria for bond release, the director may release the entire amount of the bond or deposit. The director shall

propose rules for legislative approval in accordance with the provisions of article three, chapter twenty-nine-a of this code, to govern a bond release pursuant to the terms of this paragraph.

(d) If the director disapproves the application for release of the bond or portion thereof, the director shall notify the permittee, in writing, stating the reasons for disapproval and recommending corrective actions necessary to secure the release and notifying the operator of the right to a hearing.

(e) When any application for total or partial bond release is filed with the director, he or she shall notify the municipality in which a surface-mining operation is located by registered or certified mail at least thirty days prior to the release of all or a portion of the bond.

(f) Any person with a valid legal interest which is or may be adversely affected by release of the bond or the responsible officer or head of any federal, state or local governmental agency which has jurisdiction by law or special expertise with respect to any environmental, social or economic impact involved in the operation, or is authorized to develop and enforce environmental standards with respect to the operations, has the right to file written objections to the proposed bond release and request a hearing with the director within thirty days after the last publication of the permittee's advertisement. If written objections are filed and a hearing requested, the director shall inform all of the interested parties of the time and place of the hearing and shall hold a public hearing in the locality of the surface-mining operation proposed for bond release within three weeks after the close of the public comment period. The date, time and location of the public hearing shall also be advertised by the director in a newspaper of general circulation in the same locality.

(g) Without prejudice to the rights of the objectors, the applicant, or the responsibilities of the director pursuant to this section, the director may hold an informal conference to resolve any written objections and satisfy the hearing requirements of this section thereby.

(h) For the purpose of the hearing, the director has the authority and is hereby empowered to administer oaths, subpoena witnesses and written or printed materials, compel the attendance of witnesses, or production of materials, and take evidence including, but not limited to, inspections of the land affected and other surface-mining operations carried on by the applicant in the general vicinity. A verbatim record of each public hearing required by this section shall be made and a transcript made available on the motion of any party or by order of the director at the cost of the person requesting the transcript.

§22-3-24. Water rights and replacement; waiver of replacement.

(a) Nothing in this article affects in any way the rights of any person to enforce or protect, under applicable law, the person's interest in water resources affected by a surface-mining operation.

(b) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of the owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source where such supply has been affected by contamination, diminution or interruption proximately caused by such surface-mining operation, unless waived by said owner.

(c) There is a rebuttable presumption that a mining operation caused damage to an owner’s underground water supply if the inspector determines the following: (1) Contamination, diminution or damage to an owner’s underground water supply exists; and (2) a pre-blast survey was performed, consistent with the provisions of section thirteen-a of this article, on the owner’s property including the underground water supply that indicated that contamination, diminution or damage to the underground water supply did not exist prior to the mining conducted at the mining operation. The operator conducting the mining operation shall: (1)

Provide an emergency drinking water supply within twenty-four hours; (2) provide a temporary water supply within seventy-two hours; (3) provide a permanent water supply within thirty days; and (4) pay all reasonable costs incurred by the owner in securing a water supply.

(d) An owner aggrieved under the provisions of subsections (b) or (c) of this section, may seek relief in court or pursuant to the provisions of section five, article three-a of this chapter.

(e) The director shall propose rules for legislative approval in accordance with the provisions of article three, chapter twenty-nine-a of this code, to implement the requirements of this section.

(f) The provisions of subsection (c) of this section shall not apply to the following: (1) Underground coal mining operations; (2) the surface operations and surface impacts incident to an underground coal mine; and (3) the extraction of minerals by underground mining methods or the surface impacts of the underground mining methods.

§22-3-25. Citizen suits; order of court; damages.

(a) Except as provided in subsection (b) of this section, any person having an interest which is or may be adversely affected may commence a civil action in the circuit court of the county to which the surface-mining operation is located on the person's own behalf to compel compliance with this article:

(1) Against the state of West Virginia or any other governmental instrumentality or agency thereof, to the extent permitted by the West Virginia constitution and by law, which is alleged to be in violation of the provisions of this article or any rule, order or permit issued pursuant thereto, or against any other person who is alleged to be in violation of any rule, order or permit issued pursuant to this article; or

(2) Against the director, division, surface mine board or appropriate division employees, to the extent permitted by the West Virginia constitution and by law, where there is alleged a failure of the above to perform any act or duty under this article which is not discretionary.

(b) No action may be commenced:

(1) Under subdivision (1), subsection (a) of this section: (A) Prior to sixty days after the plaintiff has given notice in writing of the violation to the director or to any alleged violator, or (B) if the director has commenced and is diligently prosecuting a civil action in a circuit court to require compliance with the provisions of this article or any rule, order or permit issued pursuant to this article; or

(2) Under subdivision (2), subsection (a) of this section prior to sixty days after the plaintiff has given notice in writing of such action to the director, except that such action may be brought immediately after such notification in the case where the violation or order complained of constitutes an imminent threat to the health or safety of the plaintiff or would immediately affect a legal interest of the plaintiff.

(c) Any action respecting a violation of this article or the rules thereunder may be brought in any appropriate circuit court. In such action under this section, the director, if not a party, may intervene as a matter of right.

(d) The court in issuing any final order in any action brought pursuant to subsection (a) of this section may award costs of litigation, including reasonable attorney and expert witness fees, to any party whenever the court determines such award is appropriate. The court may, if a temporary restraining order or preliminary injunction is sought, require the filing of a bond or equivalent security.

(e) Nothing in this section restricts any right which any person or class of persons may have under any statute or common law to seek enforcement of any of the provisions of this article and the rules thereunder or to seek any other relief.

(f) Any person or property who is injured through the violation by any operator of any rule, order or permit issued pursuant to this article may bring an action for damages, including reasonable attorney and expert witness fees, in any court of competent jurisdiction. Nothing in this subsection affects the rights established by or limits imposed under state workers' compensation laws.

(g) This section applies to violations of this article and the rules promulgated thereto, or orders or permits issued pursuant to said article insofar as said violations, rules, orders and permits relate to surface-mining operations.

§22-3-26. Surface-mining operations not subject to article.

The provisions of this article do not apply to any of the following activities:

(a) The extraction of coal by a landowner for the landowner's own noncommercial use from land owned or leased by the landowner.

(b) The extraction of coal as an incidental part of federal, state, county, municipal or other local government-financed highway or other construction: Provided, That the provisions of the construction contract require the furnishing of a suitable bond which provides for reclamation, wherever practicable, of the area affected by such extraction.

§22-3-27. Leasing of lands owned by state for surface mining of coal.

No land or interest in land owned by the state may be leased, and no present lease may be renewed by the state, nor any agency of the state, for the purpose of conducting surface-mining operations thereon unless said lease or renewal has been first authorized by an act of the Legislature: Provided, That the provisions of this section do not apply to underground mining on such land.

§22-3-28. Special authorization for reclamation of existing abandoned coal processing waste piles; coal extraction pursuant to a government-financed reclamation contract; coal extraction as an incidental part of development of land for commercial, residential, industrial or civic use; no cost reclamation contract.

(a) Except where exempted by section twenty-six of this article, it is unlawful for any person to engage in surface-mining as defined in this article as an incident to the development of land for commercial, residential, industrial or civic use without having first obtained from the director a permit therefor as provided in section eight of this article, unless a special authorization therefor has been first obtained from the director as provided in this section.

Application for a special authorization to engage in surface-mining as an incident to the development of land for commercial, residential, industrial or civic use shall be made in writing on forms prescribed by the director and shall be signed and verified by the applicant. The application shall be accompanied by:

(1) A site preparation plan, prepared and certified by or under the supervision of a person approved by the director, showing the tract of land which the applicant proposes to develop for commercial, residential, industrial or civic use; the probable boundaries and areas of the coal deposit to be mined and removed from said tract of land incident to the proposed commercial, residential, industrial or civic use thereof; and such other information as prescribed by the director;

(2) A development plan for the proposed commercial, residential, industrial or civic use of said land;

(3) The name of owner of the surface of the land to be developed;

(4) The name of owner of the coal to be mined incident to the development of the land;

(5) A reasonable estimate of the number of acres of coal that would be mined as a result of the proposed development of said land: Provided, That in no event may such number of

acres to be mined, excluding roadways, exceed five acres; and

(6) Such other information as the director may require to satisfy and assure the director that the surface-mining under special authorization is incidental or secondary to the proposed commercial, residential, industrial or civic use of said land.

(b) There shall be attached to the application for the special authorization a certificate of insurance certifying that the applicant has in force a public liability insurance policy issued by an insurance company authorized to do business in this state affording personal injury protection in accordance with subsection (d), section nine of this article.

The application for the special authorization shall also be accompanied by a bond, or cash or collateral securities or certificates of the same type, in the form as prescribed by the director and in the minimum amount of two thousand dollars per acre, for a maximum disturbance of five acres.

The bond shall be payable to the state of West Virginia and conditioned that the applicant complete the site preparation for the proposed commercial, residential, industrial or civic use of said land. At the conclusion of the site preparation, in accordance with the site preparation plan submitted with the application, the bond conditions are satisfied and the bond and any cash, securities or certificates furnished with said bond may be released and returned to the applicant. The filing fee for the special authorization is five hundred dollars. The special authorization is valid for two years.

(c) The purpose of this section is to vest jurisdiction in the director, where the surface-mining is incidental or secondary to the preparation of land for commercial, residential, industrial or civic use and where, as an incident to such preparation of land, minerals must be removed, including, but not limited to, the building and construction of railroads, shopping malls, factory and industrial sites, residential and building sites and recreational areas. Anyone who has been issued a special authorization may not be issued an additional special authorization on the same or adjacent tract of land unless satisfactory evidence has been submitted to the director that such authorization is necessary to subsequent development or construction. As long as the operator complies with the purpose and provisions of this section, the other sections of this article are not applicable to the operator holding a special authorization: Provided, That the director shall promulgate rules establishing applicable performance standards for operations permitted under this section.

(d) The director may, in the exercise of his or her sound discretion, when not in conflict with the purposes and findings of this article and to bring about a more desirable land use or to protect the public and the environment, issue a reclamation contract solely for the removal of existing abandoned coal processing waste piles: Provided, That a bond and a reclamation plan is required for such operations.

(e) No person may engage in coal extraction pursuant to a government-financed reclamation contract without a valid surface-mining permit issued pursuant to this article unless such person affirmatively demonstrates that he is eligible to secure special authorization pursuant to this section to engage in a government-financed reclamation contract authorizing incidental and necessary coal extraction. The director shall determine eligibility before entering into a government-financed reclamation contract authorizing incidental and necessary coal extraction. The director may provide the special authorization as part of the government-financed reclamation contract: Provided, That the contract contains and does not violate the requirements of this section. The director may not be required to grant a special authorization to any eligible person. The director may, however, in his or her discretion, grant a special authorization allowing incidental and necessary coal extraction pursuant to a government-financed reclamation contract in accordance with this section.

Only eligible persons may secure special authorization to engage in incidental and necessary coal extraction pursuant to a

government-financed reclamation contract. Any eligible person who proposes to engage in coal extraction pursuant to a government-financed reclamation contract may request and secure special authorization from the director to conduct such activities under this section. A special authorization can only be obtained if a clause is inserted in a government-financed reclamation contract authorizing such extraction and the person requesting such authorization has affirmatively demonstrated to the director's satisfaction that he or she has satisfied the provisions of this section. A special authorization shall only be granted by the director prior to the commencement of coal extraction on a project area. In order to be considered for a special authorization by the director, an eligible person must meet the permit eligibility requirements of this article and demonstrate at a minimum that:

(1) The primary purpose of the operation to be undertaken is the reclamation of abandoned or forfeited mine lands;

(2) The extraction of coal will be incidental and necessary to accomplish the reclamation of abandoned or forfeited mine lands pursuant to a government-financed reclamation contract;

(3) Incidental and necessary coal extraction will be confined to the project area being reclaimed; or

(4) All coal extraction and reclamation activity undertaken pursuant to a government-financed reclamation project will be accomplished pursuant to the applicable environmental protection performance standards and conditions included in the government-financed reclamation contract.

Prior to commencing coal extraction pursuant to a government-financed reclamation project, the contractor shall file with the director a performance bond conditioned upon the contractor's performance of all the requirements of the government-financed reclamation contract pursuant to this article. For a no cost reclamation contract, the criteria for establishing the amount of the performance bond shall be the engineering estimate, determined by the director: Provided, That the director may establish a lesser bond amount for long term, no cost reclamation projects in which the reclamation schedule extends beyond two years. In these contracts, the director may in the alternative establish a bond amount which reflects the cost of the proportionate amount of reclamation which will occur during a specified period. The performance bond which is provided by the contractor under a federally financed or state financed reclamation contract shall be deemed to satisfy the requirements of this section: Provided, however, That the amount of such bond is equivalent to or greater than the amount determined by the criteria set forth in this subsection.

(f) Any person engaging in coal extraction pursuant to this section is subject to the following:

(1) Payment of all applicable taxes and fees related to coal extraction;

(2) Replacement or restoration of the water supply of an owner of interest in real property who obtains all or part of the owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source where such supply has been affected by contamination, diminution or interruption proximately caused by coal extraction;

(3) Extraction pursuant to this section cannot be initiated without the consent of the surface owner for right of entry and consent of the mineral owner for extraction of coal.

§22-3-29. Experimental practices.

In order to encourage advances in surface mining and reclamation practices or to allow postmining land use for industrial, commercial, residential, agricultural or public use, including recreational facilities, the director may authorize departures, in individual cases and on an experimental basis, from the environmental protection performance standards promulgated under this article. Such departures may be

authorized if the experimental practices are potentially more or at least as environmentally protective during and after surface-mining operations as those required by promulgated standards; the surface-mining operations approved for particular land use or other purposes are not larger or more numerous than necessary to determine the effectiveness and economic feasibility of the experimental practices; and the experimental practices do not reduce the protection afforded health or safety of the public below that provided by promulgated standards.

§22-3-30. Certification and training of blasters.

The director is responsible for the training, examination and certification of persons engaging in or directly responsible for blasting or use of explosives in surface-mining operations.

§22-3-30a. Blasting requirements; liability and civil penalties in the event of property damage.

(a) Blasting of overburden and coal shall be conducted in accordance with the rules and laws established to regulate blasting.

(b) If the division of environmental protection establishes after an inspection that a blast was not in compliance with the regulations governing blasting parameters and resulted in property damage to a protected structure, as defined in section twenty-two-a of this article, other than water wells, the following penalties shall be imposed for each permit area or contiguous permit areas where the blasting was out of compliance:

(1) For the first offense, the operator shall be assessed a penalty of not less than one thousand dollars nor more than five thousand dollars.

(2) For the second offense and each subsequent offense within one year of the first offense, the surface-mining operator shall be assessed a penalty of not less than five thousand dollars nor more than ten thousand dollars.

(3) For the third offense and any subsequent offense within one year of the first offense, or for the failure to pay any assessment set forth within a reasonable time established by the director, the surface-mining operator's permit shall be subject to an immediate issuance of a cessation order, as set out in section sixteen of this article. The cessation order shall only be released upon written order of the director of the division of environmental protection when the following conditions have been met:

(A) A written plan has been established and filed with the director assuring that additional violations will not occur;

(B) The permittee has provided compensation for the property damages or the assurance of adequate compensation for the property damages that have occurred; and

(C) A permittee shall provide such monetary and other assurances as the director shall determine appropriate to compensate for future property damages. The monetary assurances required shall be in an amount at least equal to the amount of compensation required in paragraph (B), subdivision (3) of this subsection.

(4) In addition to the penalties described in subdivisions (1), (2) and (3) of this subsection, for the second and subsequent offenses on any one permitted area regardless of the time period, the owner of the protected structure is entitled to a rebuttable presumption that the property damage is a result of the blast if: (A) A pre-blast survey was performed; and (B) the blasting site to which the second or subsequent offense relates is within seven tenths of a mile of the protected structure.

(5) No more than one offense shall arise out of any one shot. For purposes of this section, "shot" means a single blasting event composed of one or multiple detonations of explosive material, or the assembly of explosive materials for this purpose. One "shot" may be composed of numerous explosive charges detonated at intervals measured in milliseconds.

(c) Notwithstanding the provisions of subsections (a) and (b) of this section, the division of environmental protection may not impose penalties on an operator for the violation of any rule identified in subsection (a) of this section that is merely administrative in nature.

(d) The remedies provided in this section are not exclusive and shall not bar an owner or occupant from any other remedy accorded by law.

(e) Where inspection by the division of environmental protection establishes that production blasting, in violation of section twenty-two-a of this article, was done within three hundred feet or was not site specific production blasting within one thousand feet of any protected structure as defined in section twenty-two-a of this article, or within one hundred feet of a cemetery, the monetary penalties and revocation, as set out in subsection (b) of this section, apply.

(f) All penalties and liabilities as set forth in this section shall be assessed by the director, collected by the director and deposited with the treasurer of the state of West Virginia, in the "general school fund".

(g) The director shall propose rules for legislative approval pursuant to article three, chapter twenty-nine-a of this code for the implementation of this section.

(h) The provisions of this section shall not apply to the following: (1) Underground coal mining operations; (2) the surface operations and surface impacts incident to an underground coal mine; and (3) the extraction of minerals by underground mining methods or the surface impacts of the underground mining methods: Provided, That nothing contained in this section shall be construed to exempt any coal mining operation from the general performance standards as contained in section thirteen of this article and any rules promulgated pursuant thereto.

§22-3-31. Conflict of interest prohibited; criminal penalties therefor; employee protection.

(a) No employee of the division engaged in the enforcement or administration of this article or employee of the surface mine board performing any function or duty under this article shall have a direct or indirect financial interest in any surface-mining operation. Whoever knowingly violates the provisions of this subsection is guilty of a misdemeanor, and, upon conviction thereof, shall be fined not more than two thousand five hundred dollars, or imprisoned in the county jail not more than one year, or both fined and imprisoned. The director shall establish methods by which the provisions of this subsection will be monitored and enforced, including appropriate provisions for the filing and the review of statements and supplements thereto concerning any financial interest which may be affected by this subsection.

(b) No person shall discharge or in any other way discriminate against, or cause to be fired or discriminated against, any employee or any authorized representative of employees by reason of the fact that the employee or representative has filed, instituted, or caused to be filed or instituted, any proceeding under this article, or has testified or is about to testify in any proceeding resulting from the administration or enforcement of the provisions of this article.

(c) Any employee or a representative of employees who has reason to believe that he or she has been fired or otherwise discriminated against by any person in violation of subsection (b) of this section may, within thirty days after the alleged violation occurs, petition to the surface mine board for a review of the firing or discrimination. The employee or representative is the petitioner and shall serve a copy of the petition upon the person or operator who will be the respondent. The participants shall be given ten days' written notice of the hearing before the board and the hearing shall be held within thirty days of the filing of the petition. The board shall have the same powers and shall hear the petition

in the same manner as provided in article one, chapter twenty-two-b of this code.

(d) If the board finds that the alleged violation did occur, it shall issue an order incorporating therein findings of fact and conclusions requiring the participant committing the violation to take such affirmative action to abate the violation by appropriate action, including, but not limited to, the hiring or reinstatement of the employee or representative to his former position with compensation. If the board finds no violation, it shall issue a finding to that effect. Orders issued by the board under this section shall be subject to judicial review in the same manner as other orders of the board issued under this article or article one, chapter twenty-two-b of this code.

(e) Whenever an order is issued under this section to abate any violation, at the request of the petitioner a sum equal to the aggregate costs and expenses, including attorneys' fees to have been reasonably incurred by the petitioner for, or in connection with, the institution and prosecution of the proceedings, shall be assessed against the person committing the violation.

§22-3-32. Special tax on coal production; mines and minerals operations fund.

(a) Imposition of tax. -- Upon every person in this state engaging in the privilege of severing, extracting, reducing to possession or producing coal for sale, profit or commercial use, there is hereby imposed an annual tax equal to two cents per ton of coal produced by such person for sale, profit or commercial use during such person's taxable year. The special tax imposed by this section is in addition to all other taxes levied by law. In no event may a ton of coal be taxed more than once under the provisions of this section.

(b) Payment and collection of tax. -- The tax imposed by this section shall be collected by the tax commissioner in the same manner, at the same time, and upon the same tonnage as the minimum severance tax imposed by article twelve-b, chapter eleven of this code is collected: Provided, That under no circumstance shall this tax be construed to be an increase in either the minimum severance tax imposed by said article twelve-b or the severance tax imposed by article thirteen of said chapter eleven. Every person liable for payment of this special tax shall pay the amount due without notice or demand for payment. The tax commissioner shall provide to the director a quarterly listing of all persons known to be delinquent in payment of the special tax. The director may take such delinquencies into account in making determinations on the issuance, renewal or revision of any permit.

(c) Mining and Reclamation Operations Fund. -- The special fund previously created in the state treasury known as the "Mines and Minerals Operations Fund" is renamed the "Mining and Reclamation Operations Fund". The tax commissioner shall, at least quarterly, deposit into the fund the net amount of tax collected under this section, including any additions to tax, penalties and interest collected with respect thereto. The treasurer shall deposit all moneys deposited in or credited to this fund in an interest-bearing account, with the amount of interest earned being credited to this fund as it is earned. The moneys in this special fund shall be expended solely for the purposes of carrying out those statutory duties relating to the enforcement of environmental regulatory programs for the coal industry as imposed by this chapter and the federal Surface Mining Control and Reclamation Act of 1977 and any amendments thereto. Expenditures from the fund are not authorized from collections but are to be made only in accordance with appropriations by the Legislature and in accordance with the provisions of article three, chapter twelve of this code and upon fulfillment of the provisions set forth in article two, chapter five-a of this code.

(d) General procedure and administration. -- Each and every provision of the "West Virginia Tax Procedure and Administration Act" set forth in article ten, chapter eleven of the code applies to the special tax imposed by this section with like effect as if such act were applicable only to the special tax imposed by this section and were

set forth in extenso in this article, notwithstanding the provisions of section three of said article ten.

(e) Crimes and penalties. -- Each and every provision of the "West Virginia Tax Crimes and Penalties Act" set forth in article nine of said chapter eleven applies to the special tax imposed by this section with like effect as if such act were applicable only to the special tax imposed by this section and set forth in extenso in this article, notwithstanding the provisions of section two of said article nine.

(f) Effective date. -- The special tax imposed by this section applies to all coal produced in this state after the thirtieth day of September, one thousand nine hundred ninety-one.

ARTICLE 3A. OFFICE OF EXPLOSIVES AND BLASTING.

§22-3A-1. Legislative findings; policy and purposes.

(a) The Legislature declares that the establishment of an office within the division of environmental protection to enforce blasting laws pursuant to surface mining within the state of West Virginia is in the public interest and will promote the protection of the property and citizens of the state of West Virginia without sacrificing economic development. It is the policy of the state of West Virginia, in cooperation with other governmental agencies, public and private organizations, and the citizens of this state, to use reasonable means and measures to prevent harm from the effects of blasting to its property and citizens.

(b) It is the purpose of this article to create the office of explosives and blasting within the division of environmental protection, and to vest in the office the authority to enforce all the rules and laws established to regulate blasting consistent with the authority granted in this article.

§22-3A-2. Office of explosives and blasting created; transfer of functions; responsibilities.

(a) There is hereby created the office of explosives and blasting within the division of environmental protection. The director shall appoint a chief to administer the office. The chief shall serve at the will and pleasure of the director.

(b) As of the effective date of this article, the office of explosives and blasting shall assume responsibility for the enforcement of all the rules and laws established to regulate blasting consistent with the authority granted in this article.

(c) Terms used in this article shall have the definitions set forth in article three of this chapter, unless used in a context that clearly requires a different meaning or as otherwise defined herein.

§22-3A-3. Powers and duties.

The duties of the office shall include, but are not limited to:

(a) Regulating blasting on all surface-mining operations;

(b) Implementing and overseeing the pre-blast survey process, as set forth in section thirteen-a, article three of this chapter;

(c) Maintaining and operating a system to receive and address questions, concerns and complaints relating to mining operations;

(d) Setting the qualifications for individuals and firms performing pre-blast surveys;

(e) The education, training, examination and certification of blasters; and

(f) Proposing rules for legislative approval pursuant to article three, chapter twenty-nine-a of this code for the implementation of this article.

§22-3A-4. Legislative rules on surface-mining blasting; disciplinary procedures for certified blasters.

(a) The office of explosives and blasting shall propose rules for legislative approval in accordance with the provisions of article three, chapter twenty-nine-a of this code, for the purposes of implementing this article. The rules shall include, but not be limited to, the following:

(1) A procedure for the review, modification and approval, prior to the issuance of any permit, of any blasting plan required to be submitted with any application for a permit to be issued by the director pursuant to article three of this chapter, which sets forth procedures for the inspection and monitoring of blasting operations for compliance with blasting laws and rules, and for the review and modification of the blasting plan of any operator against whom an enforcement action is taken by the division of environmental protection;

(2) Specific minimum requirements for pre-blast surveys, as set forth in section thirteen-a, article three of this chapter;

(3) A procedure for review of pre-blast surveys required to be submitted under section thirteen-a, article three of this chapter;

(4) A procedure for the use of seismographs for production blasting which shall be made part of the blasting log;

(5) A procedure to warn of impending blasting to the owners or occupants adjoining the blasting area;

(6) A procedure to limit the type of explosives and detonating equipment, the size, the timing and frequency of blasts based upon the physical conditions of the site so as to: (A) Prevent injury to persons; (B) prevent damage to public and private property outside the permit area; (C) prevent adverse impacts on any underground mine; (D) prevent change in the course, channel or availability of ground or surface water outside the permit area; and (E) reduce dust outside the permit area;

(7) Provisions for requiring mining operators to publish the planned blasting schedule in a newspaper of general circulation in the locality of the mining operation; and

(8) Provisions for requiring mining operators to provide adequate advance written notice of the proposed blasting schedule to local governments, owners and occupants living within the distances prescribed in subsection (a), section thirteen-a, article three of this chapter.

(b) The office of explosives and blasting shall propose rules for legislative approval in accordance with the provisions of article three, chapter twenty-nine-a of this code. The rules shall include, but not be limited to, the following:

(1) Provisions for establishing a process for the education, training, examination and certification of blasters working on surface-mining operations; and

(2) Provisions for establishing disciplinary procedures for all certified blasters responsible for blasting on surface-mining operations conducted within this state in violation of any law or rule promulgated by the division of environmental protection to regulate blasting.

§22-3A-5. Claims process.

(a) The office of explosives and blasting shall establish and manage a process for the filing, administration and resolution of claims related to blasting.

(b) Claims which may be filed and determined under the provisions of this section shall be those arising from both of the following:

(1) Damage to property arising from blasting activities conducted pursuant to a permit granted under article three of this chapter; and

(2) The damage is incurred by a claimant who is the owner or occupant of the property.

(c) The claims process established by the office of explosives and blasting shall include the following:

(1) An initial determination by the office of the merit of the claim; and

(2) An arbitration process whereby the claim can be determined and resolved by an arbitrator in a manner which is inexpensive, prompt and fair to all parties.

The office shall propose rules for legislative approval in accordance with article three, chapter twenty-nine-a of this code for the development of standards for establishing rules relating to the initial claim determination and the arbitration process provided in this subsection.

(d) If the operator disagrees with the initial determination made by the office and requests arbitration, then the following shall apply:

(1) Any party may be represented by a representative of their choice;

(2) At the request of the claimant, the office shall provide the claimant with representation in the arbitration process, which representation shall not necessarily be an attorney-at-law; and

(3) If the claim is upheld in whole or in part, then the operator shall pay the costs of the proceeding, as well as reasonable representation fees and costs of the claimant, in an amount not to exceed one thousand dollars.

(e) Participation in the claims process created by this section shall be voluntary for the claimant. However, once the claimant has submitted a claim for determination under the provisions of this section, it is intended that the finding of the office, if not taken to arbitration, shall be final. If arbitration is requested, it is intended that the results of such arbitration shall be final. The office shall provide written notification to the claimant of the provisions of this subsection and shall secure a written acknowledgment from the claimant prior to processing a claim pursuant to the provisions of this section.

(f) The operator shall pay any claim for which the operator is adjudged liable within thirty days of a final determination. If the claim is not paid within thirty days, the director shall issue a cessation order pursuant to section sixteen, article three of this chapter for all sites operated by the operator.

(g) No permit to mine coal shall be granted unless the permit applicant agrees to be subject to the terms of this section.

(h) To fulfill its responsibilities pursuant to this section, the office may retain the services of inspectors, experts and other persons or firms as may be necessary.

§22-3A-6. Rules, orders and permits to remain in effect; proceedings not affected.

(a) All orders, determinations, rules, permits, grants, contracts, certificates, licenses, waivers, bonds, authorizations and privileges which have been issued, made, granted or allowed to become effective prior to the enactment of this article shall remain in effect according to their terms until modified, terminated, superseded, set aside or revoked pursuant to this article, by a court of competent jurisdiction, or by operation of law.

(b) Any proceedings, including notices of proposed rule-making, or any application for any license, permit or certificate pending before the division are not affected by this enactment.

§22-3A-7. Funding.

(a) The office shall assess each operator permitted under the provisions of this chapter a fee on each quantity of explosive material used for any purpose on the surface-mining operations.

(b) The office shall propose a legislative rule for promulgation in accordance with article three, chapter twenty-nine-a of this code, establishing the fees required by this section. The fees shall be calculated to generate sufficient money to provide for the operation of

this office and the office of coalfield community development as provided for in article two-a, chapter five-b of this code.

(c) The office shall deposit all moneys received from these fees into a special revenue fund to be known as the "mountaintop removal fund" in the state treasury to be expended by the offices in the performance of their duties. The expenditure of moneys in the fund is not authorized from collections, but shall be appropriated by the Legislature.

§22-3A-8. Transfer of personnel and assets.

The director shall transfer to the office any personnel and assets presently used to perform or used in the performance of the duties and functions required by this article.

§22-3A-9. Limitation of article.

Except for sections five and seven of this article, all provisions of this article are also applicable to surface-blasting activities related to underground mining operations.

§22-3A-10. Office to conduct study.

(a) The office shall conduct or participate in studies or research to develop scientifically based data and recommendations of the following:

(1) Ground vibrations associated with blasting and how the vibrations impact protected structures;

(2) The proper size and shot parameters to assure protection of protected structures;

(3) The necessity of expanding the parameters where blasting is prohibited in relation to protected structures to assure that the shots do not cause damage to protected structures;

(4) The appropriateness of modifying pre-blast survey requirements that reflect a pattern of excessive ground vibration and air blast has occurred within a measured distance;

(5) Analysis of the appropriate air blast limitations to determine damage criteria; and

(6) Any other data or recommendations the office deems appropriate.

(b) The office shall report the data and recommendations to the joint committee on government and finance on or before the first day of January, two thousand one, and annually thereafter or as otherwise required.

§22-3A-11. Termination of office.

The office of explosives and blasting is continued until the first day of July, two thousand two, pursuant to the provisions of article ten, chapter four of this code.

TITLE 38
LEGISLATIVE RULE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF MINING AND RECLAMATION

SERIES 2
WEST VIRGINIA SURFACE MINING RECLAMATION RULE

§38-2-1. General.

1.1. Scope. -- This rule establishes general and specific rules for permit application requirements and contents; haulageways or access roads; drainage and sediment control systems; blasting; premining and postmining land use; fish and wildlife considerations; revegetation; prime farmlands; insurance and bonding; replacement, release, and forfeiture of bonds; requirements of a notice of intent to prospect; performance standards; performance standards applicable to underground mining operations; subsidence control; small operator assistance program; citizen's actions; designation of areas unsuitable for mining; inspection and enforcement; Surface Mine Board; and Coal Refuse.

1.2. Applicability.

1.2.a. This rule applies to all prospecting and surface mining operations in the State of West Virginia, except the applicable subsections in W. Va. Code §22-3-26. The provisions of this subdivision do not constitute the issuance of a new permit for purposes of permit renewal or mid-term review of existing permits.

1.2.b. Permits issued after the effective date of this rule shall incorporate in the application all of the requirements of this rule.

1.2.c. The Secretary may terminate jurisdiction over a reclaimed site of a completed surface mining and reclamation operation, or increment thereof, when:

1.2.c.1. The Secretary determines in writing that under the initial program all applicable requirements imposed by the Act, this rule, and the terms and conditions of the permit have been successfully complied with; or

1.2.c.2. The Secretary determines in writing that under the permanent program, all requirements imposed under the Act, this rule, and the terms and conditions of the permit have been successfully complied with or, where a bond was required, the Secretary has made a final decision to release the bond fully.

1.2.d. Following termination under subdivision 1.2.c of this section, the Secretary shall reassert jurisdiction over a site if it is demonstrated that the bond release or written determination referred to in subdivision 1.2.c. was based upon fraud, collusion, or misrepresentation of a material fact.

1.3. Authority. -- W. Va. Code §22-1-3, 3a and 22-3-4.

1.4. Filing Date. – April 2002

1.5. Effective Date. -- May 1, 2002

§38-2-2. Definitions.

As used in this rule unless used in a context that clearly requires a different meaning, the term:

2.1. Abandoned Coal Waste Disposal Area means any coal refuse disposal area which is not part of an active surface mining operation. This definition does not relieve any operator from his reclamation responsibility for the abandoned coal waste disposal area.

2.2. Acidity means the quantitative capacity of an aqueous medium to donate protons in a

reaction with hydroxyl ions.

2.3. Acid Mine Drainage means water discharged from an active, inactive, or abandoned surface mine and reclamation operations or from areas affected by surface mining and reclamation operations with said water having a pH of less than six (6.0) in which total acidity exceeds total alkalinity.

2.4. Acid-Producing Coal Seam means coal seams commonly associated with other minerals which create acid mine drainage. Site specific data may, on a case-by-case basis, be accepted as an affirmative demonstration that this seam is not acid producing.

2.5. Acid-Producing Overburden means overburden which upon appropriate analysis shows a potential for producing acid mine drainage.

2.6. Acid-Test Ratio means the relation of quick assets to current liabilities.

2.7. Act means the West Virginia Surface Coal Mining and Reclamation Act, W. Va. Code §22-3 et seq.

2.8. Active Surface Mining Operation means, for the purpose of permit renewal as provided in subsection 3.27 of this rule, an operation where a Phase I bond reduction has not been approved.

2.9. Administratively Complete Application means an application for permit approval or approval for prospecting, which the Secretary determines to contain information addressing each application requirement of the regulatory program and to contain all information necessary to initiate processing and public review.

2.10. Affected Area means, when used in the context of surface-mining activities, all land and water resources within the permit area which are disturbed or utilized during the term of the permit in the course of surface-mining and reclamation activities. Affected area means, when used in the context of underground mining activities, all surface land and water resources affected during the term of the permit (1) by surface operations or facilities incident to underground mining activities or (2) by underground operations. The term also includes other lands the use of which is incidental to surface coal mining and reclamation operations; all areas covered by new or existing roads used to gain access to, or for hauling coal to or from, surface coal mining and reclamation operations; any areas covered by surface excavations, workings, impoundments, dams, ventilation shafts, entryways, refuse banks, dumps, stockpiles, overburden piles, spoil banks, culm banks, tailings, holes or depressions, repair areas, storage areas, shipping areas; any areas upon which are sited structures, facilities, or other property; material on the surface resulting from, or incident to, surface coal mining and reclamation operations; and the area located above underground workings.

2.11. Area Mining Operation means a mining operation where all disturbed areas are restored to approximate original contour (AOC) unless the operation is located in steep slope areas and a steep slope AOC variance in accordance with subsection 14.12 of this rule has been approved. An area mining operation may remove all or part of coal seam(s) in the upper fraction of a mountain, ridge, or hill. However, it is not classified as a mountaintop operation for one or more of the following reasons:

2.11.a. The site may be restored to AOC; or

2.11.b. The entire coal seam may not be removed.

2.12. Asset Ratio means the relation of total assets to total liabilities.

2.13. Auger Mining means a method of mining coal at the surface by drilling or cutting horizontally into an exposed coal seam at the highwall.

2.14. Bearing Capacity means a measure, as determined by standard engineering evaluation, of the ability of a foundation material to carry loads imposed by an embankment or other structure.

2.15. Best Technology Currently Available means equipment, devices, systems, methods or techniques which will:

2.15.a. Prevent, to the extent possible, additional contributions of suspended solids to stream flow or runoff outside the permit area, but in no event result in contributions of suspended solids in excess of requirements set by applicable State or Federal laws and rules and regulations; and

2.15.b. Minimize, to the extent possible, disturbances and adverse impacts on fish, wildlife, and related environmental values and achieve enhancement of those resources where practicable.

2.16. Buffer Zone means an undisturbed border along or around an intermittent or perennial stream.

2.17. Capital Assets means those assets such as land, buildings and equipment held for use in the production or sale of other assets or services.

2.18. Cash means:

2.18.a. all cash items except cash (1) restricted by an agreement, or (2) described as earmarked for a particular purpose; and

2.18.b. short-term investment such as stocks, bonds, notes, and certificates of deposit, where the intent and ability to sell them in the near future is established by the operator.

2.19. Cemetery means any area of land where human bodies are interred.

2.20. Channel Protection means any measures taken to prevent or control erosion, scouring, or other deteriorating processes in channels such as diversion ditches and spillways.

2.21. Chemical Treatment means the treatment of water from a surface coal mining operation using chemical reagents such as but not limited to sodium hydroxide, calcium carbonate, or anhydrous ammonia for purposes of meeting applicable state and federal effluent limitations. Chemical treatment does not include passive treatment systems such as but not limited to limestone drains, wetlands, alkaline addition, application of flyash, agricultural lime, or injection of flyash, limestone, or other minerals into underground coal operations.

2.22. Coal Preparation means chemical or physical processing and the cleaning, concentrating, or other processing or preparation of coal.

2.23. Coal Preparation Plant means a facility operated in connection with a mine where coal is subjected to chemical or physical processing or cleaning, crushing (by any means) concentrating, screening or sizing, or other processing or preparation. It includes facilities associated with coal preparation activities, including, but not limited to the following: loading facilities; storage and stockpile facilities; sheds; shops, and other buildings; water-treatment and water-storage facilities; settling basins and impoundments; and coal processing and other waste disposal areas.

2.24. Coal Processing Waste means materials which are separated and wasted from the product coal during its physical or chemical processing, cleaning or concentrating.

2.25. Coal Refuse Site means a deposit of coal processing waste or underground development waste.

2.26. Coal Remining Operation means a coal mining operation on lands which would be eligible for expenditures under section 4, Article 2 of Chapter 22 .

2.27. Coarse Coal Refuse means coal processing waste predominantly within a size range greater than the number twenty-eight (#28) sieve size.

2.28. Collateral Bond means an indemnity agreement in sum certain executed by the permittee and supported by one or more of the following:

2.28.a. The deposit of cash in one or more federally insured accounts, payable only to the Secretary upon demand;

2.28.b. Negotiable bonds of the United States, a State, or a municipality, endorsed to the order of, and in the possession of, the Secretary;

2.28.c. Negotiable certificates of deposit, payable only to the Secretary, and in his possession;

2.28.d. An irrevocable letter of credit of any bank organized or authorized to transact business in the State of West Virginia, payable only upon presentation by the Secretary;

2.28.e. A perfected, first-lien security interest in real property, in favor of the Secretary;

2.28.f. Investment-grade rated securities, having the highest rating issued by a nationally recognized securities rating service, endorsed to the order of, and in the possession of, the Secretary, excluding all issues of the type traded on a commodity exchange such as contracts for future delivery of goods; or

2.28.g. A whole life insurance policy assigned to the Department of Environmental Protection and in the possession of the Secretary, said policy having been issued by only those companies with an independent financial rating of A+, Aaa, or the equivalent authorized to do business in the State of West Virginia and are member insurers of the West Virginia Life and Health Insurance Guaranty Association.

2.29. Combined Coal Refuse means a mixture of coarse coal refuse and dewatered fine coal refuse.

2.30. Combustible Materials means organic materials that are capable of burning by fire or through oxidation, accompanied by the evolution of heat and a significant temperature rise.

2.31. Commercial Forestry and Forestry.

2.31.a. Commercial Forestry, as used in subsection 7.4 of this rule, means a long-term postmining land use designed to accomplish the following:

2.31.a.1. Achieve greater forest productivity than that found on the mine site before mining;

2.31.a.2. Minimize erosion and/or sediment yield and serve the hydrologic functions of infiltrating, holding, and yielding water commonly found in undisturbed forests;

2.31.a.3. Result in biodiversity by facilitating rapid recruitment of native species of plants and animals via the process of natural succession;

2.31.a.4. Result in a premium forest that will thrive under stressful conditions; and

2.31.a.5. Result in landscape, vegetation and water resources that create habitat for forest-dwelling wildlife.

2.31.b. Forestry, as used in subsection 7.4 of this rule, means a long-term postmining land use designed to accomplish the following:

2.31.b.1. Forestry, as used in subsection 7.4 of this rule, means a long-term postmining land use for the production of wood or wood products designed to accomplish the following:

2.31.b.1.A. Achieve forest productivity equal to that found on the mine site before mining;

2.31.b.1.B. Minimize erosion and/or sediment yield and serve the hydrologic functions of infiltrating, holding, and yielding water commonly found in undisturbed forests;

2.31.1.C. Result in biodiverstiy by facilitating rapid recruitment of native species of plants and animals via the process of natural succession; and

2.31.1.D. Result in landscape, vegetation and water resources that create habitat for forest-dwelling wildlife.

2.32. Common Size Comparative Balance Sheet means item amounts from a number of the permittee's or applicant's successive yearly balance sheets arranged side by side in a single statement followed by common size percentages whereby:

2.32.a. The asset total is assigned a value of one hundred percent (100%);

2.32.b. The total of liabilities and owner equity is also assigned a value of one hundred percent (100%); and

2.32.c. Each individual asset, liability, and owner equity item is shown as a fraction of one of the one hundred percent (100%) totals.

2.33. Common Size Comparative Income Statement means an operator's income statement amounts for a number of successive yearly periods arranged side by side in a single statement followed by common size percentages whereby net sales are assigned a one hundred percent (100%) value, and then each statement item is shown as a percentage of net sales.

2.34. Community or Institutional Building means any structure, other than a public building or an occupied dwelling, which is used primarily for meetings, gatherings or functions of local civic organizations or other community groups; functions as an educational, cultural, historic, religious, scientific, correctional, mental health or physical health care facility; or is used for public services, including, but not limited to, water supply, power generation or sewage treatment.

2.35. Compaction means the densification of a soil or soil-like material by means of mechanical manipulation.

2.36. Complete and Accurate Application means an application for a surface mining permit or prospecting approval which, immediately prior to issuance, contains all maps, plans, designs and other application materials required by the Act and this rule, excluding bond, which are necessary for the Secretary to make a decision on approval or denial.

2.37. Completion of Reclamation means that all terms and conditions of the permit have been satisfied, the final inspection report has been approved by the Secretary, that all applicable effluent and applicable water quality standards are met, and the total bond has been released.

2.38. Construction Pore Pressures means water pressures generated in foundation soils or embankments due to compression by loads imposed by construction of an embankment or other structure.

2.39. Cumulative Impact Area means the area, including the permit area, within which impacts resulting from the proposed operation may interact with the impacts of all anticipated mining on surface and groundwater systems. Anticipated mining shall include the entire projected lives through bond releases of:

2.39.a. The proposed operation;

2.39.b. All existing operations;

2.39.c. Any operation for which a permit application has been submitted to the Secretary, and;

2.39.d. All operations required to meet diligent development requirements for leased Federal coal for which there is actual mine development information available.

2.40. Current Ratio means the relation of current assets to current liabilities.

2.41. Density means the weight of soil or soil-like solids per unit of total volume of soil or similar mass.

2.42. Design Storm means predicted precipitation of given intensity, frequency and duration based on United States Weather Bureau

data.

2.43. Downslope means the land surface between the projected outcrop of the lowest coal seam being mined along each highwall or any mining-related construction, and the valley floor.

2.44. Embankment means a man made deposit of earth or waste materials, usually exhibiting at least one sloping face, that is raised above the natural surface of the land.

2.45. Embankment Stability means the degree of safety relative to a structural failure of the embankment.

2.46. Emergency Spillway means a hydraulic structure designed to pass water in excess of that which an impoundment is designed to store or which cannot be passed through a principal spillway.

2.47. Excess Spoil means overburden material disposed of in a location other than the pit.

2.48. Existing Coal Refuse Area means a refuse disposal area that is part of an active surface mining operation.

2. 49. Existing Structure means a structure or facility used with or to facilitate surface coal mining and reclamation operations for which construction began prior to January 18, 1981.

2.50. Face-Up means the result of an excavation where a vertical or near vertical highwall is created that exposes the overburden and the mineral face.

2.51. Fine Coal Refuse means coal processing waste which may be disposed of in a slurry form or in a dewatered or treated state.

2.52. Foundation means soil, bedrock, or other earth material on or against which an embankment or other structure is placed.

2.53. Fragile Lands means geographic areas containing natural, ecologic, scientific or aesthetic resources that could be significantly damaged or destroyed by surface coal mining operations. Examples of fragile lands include valuable habitats for fish or wildlife, critical habitats for endangered or threatened species of animals or plants, uncommon geologic formations, national natural landmark sites, areas where mining may result in flooding, environmental corridors containing a concentration of ecologic and aesthetic features, and areas of recreational value due to high environmental quality.

2.54. Freeboard means:

2.54.a. The vertical distance between the lowest point of the crest of the embankment and the reservoir water surface; or

2.54.b. The vertical distance between the top of a ditch or channel and the water surface during the design flow.

2.55. Gravity Discharge means, with respect to underground mining activities, mine drainage that flows freely down gradient in an open channel. Mine drainage that occurs as a result of flooding a mine to the level of the discharge is not gravity discharge.

2.56. Groundwater means subsurface water in the zone of saturation.

2.57. Growing Season means one (1) year.

2.58. Handbook means the Technical Handbook of Standards and Specifications for Mining Operations in West Virginia.

2.59. Haulageway Road or Access Road means a surface right-of-way for purposes of travel by land vehicles used in surface mining and reclamation or prospecting operations. A road consists of the entire area within the right-of-way, including the roadbed, shoulders, parking and side areas, approaches, ditches, and other related structures. The term includes access and haulroads constructed, used, reconstructed, improved, or maintained for use in surface mining and reclamation or prospecting operations, including use by coal hauling vehicles to and from transfer, processing, or storage areas. The term

does not include ramps and routes of travel within the immediate mining area or within spoil or coal mine waste disposal areas.

2.60. Hazard Potential means a classification rating assigned to a structure based on engineering evaluations and judgment predicting the potential damage to human life, property and environment should a failure of the structure occur.

2.61. Highwall means the face of exposed overburden or coal in an open cut of a surface mining operation or for entry to an underground mining operation.

2.62. Historic Lands means historic, archaeological, cultural, and scientific areas. Examples of historic lands include archaeological sites, sites listed on or eligible for listing on a state or national register of historic places, national historic landmarks, sites having cultural significance to native Americans, or religious significance to religious groups, and sites for which historic designation is pending.

2.63. Hydrologic Balance means the relationship between the quality and quantity of water inflow to, water outflow from a hydrologic unit including water stored in the unit. It encompasses the dynamic relationships among precipitation, runoff, evaporation and changes in ground and surface water levels and storage capacity.

2.64. Hydrological Isolated Operations means a surface mining operation where hydrologic impacts are negligible or are dissipated before reaching points in the system where they are additive to hydrologic impacts of other surface mining operations.

2.65. Hydrologic Regime means the entire state of water movement in a given area.

2.66. Impoundment or Impounding Structure means a basin either naturally formed or artificially built for the retention of water, sediment, slurry, or other liquid or semi-liquid material.

2.67. Infiltration means the flow or movement of water through the surface of soil or soil like material into the ground.

2.68. Inspection means a visual review of prospecting, surface or other mining operations to assure compliance with applicable laws, rules, regulations or permit conditions under jurisdiction of the Secretary.

2.69. Intermittent Stream means:

2. 69.a. A stream or reach of a stream that drains a watershed of at least one square mile; or

2. 69.b. A stream or reach of a stream that is below the local water table for at least some part of the year, and obtains its flow from both surface runoff and ground water discharge.

2.70. Irreparable Damage to the Environment means any damage to the environment in violation of the Act and this rule which cannot be corrected by activities of the responsible person.

2.71. Knowingly means that an individual knew or had reason to know in authorizing, ordering or carrying out an act or omission on the part of a corporate permittee that such act or omission constituted a violation, failure or refusal.

2.72. Leachate means a liquid that has percolated through soil, rock or waste and has extracted dissolved or suspended materials.

2.73. Lightly Buffered Stream means any stream or its tributaries that contains less than fifteen (15) PPM methyl orange alkalinity (to pH 4.5) and a conductivity of less than fifty (50) micro MHO.

2.74. Liquefaction means a phenomenon wherein a saturated granular soil or soil like material loses strength and flows in a manner resembling a liquid.

2.75. Liquidity Ratio means the relation of cash to current liabilities.

2.76. Mineral Face means the exposed

vertical cross section of the natural coal seam or mineral deposit.

2.77. Mountaintop Mining Operation means a mining operation that removes an entire coal seam or seam(s) in an upper fraction of a mountain, ridge, or hill and creating a level plateau or a gently rolling contour with no highwalls. The approved postmining land use must be in accordance with §22-3-13(c)(3).

2.78. Natural Drainway means any natural water course which may carry water to the tributaries and rivers of the watershed.

2.79. Natural Hazard Lands means geographic areas in which natural conditions exist which pose or, as a result of surface coal mining operations, may pose a threat to the health, safety or welfare of people, property or the environment, including areas subject to landslides, cave-ins, severe wind or soil erosion, frequent flooding and areas of unstable geology.

2.80. Net Profit means the bottom line of the income statement after taxes, including taxes based on income, adjustments, all extraordinary income and expense, but before preferred and common stock dividends.

2.81. Occupied Dwelling means any building that is currently being used on a regular or temporary basis for human habitation.

2.82. Operator means any person who is granted or who should obtain a permit to engage in any activity covered by the Act or this rule, or anyone who engages in surface mining and/or surface mining and reclamation operations. Further, the term shall be construed in a manner consistent with the federal program pursuant to Public Law 95-87.

2.83. Outer Spoil or Outer Slope means a disturbed area extending from the outer point of the bench to the extreme lower limit of the disturbed land.

2.84. Overburden means consolidated or unconsolidated material of any nature which overlies a mineral deposit, excluding topsoil.

2.85. Owned or Controlled and Owns or Controls means any one or a combination of the relationships specified in subdivisions 85.a through d of this subsection:

2.85.a. Being a permittee of a surface coal mining operation;

2.85.b. Based on instrument of ownership or voting securities, owning of record in excess of fifty (50) percent of an entity; or

2.85.c. Having any other relationship which gives one person authority directly or indirectly to determine the manner in which an applicant, an operator, or other entity conducts surface mining operations.

2.85.d. The following relationships are presumed to constitute ownership or control unless a person can demonstrate that the person subject to the presumption does not in fact have the authority directly or indirectly to determine the manner in which the relevant surface mining operation is conducted:

2.85.d.1. Being an officer or director of an entity;

2.85.d.2. Being the operator of a surface mining operation;

2.85.d.3. Having the ability to commit the financial or real property assets or working resources of an entity;

2.85.d.4. Being a general partner in a partnership;

2.85.d.5. Based on the instruments of ownership or the voting securities of a corporate entity, owning of record ten (10) through fifty (50) percent of the entity; or

2.85.d.6. Owning or controlling coal to be mined by another person under a lease, sublease or other contract and having the right to receive such coal after mining or having authority

to determine the manner in which that person or another person conducts a surface mining operation.

2.86. Peak Runoff means the maximum flow in a specified geographic location resulting from a given design storm.

2.87. Perennial Stream means a stream or portion of a stream that flows continuously.

2.88. Person having an interest which is or may be adversely affected or person with a valid legal interest means any person:

2.88.a. Who uses any resource of economic, recreational, aesthetic, or environmental value that may be adversely affected by prospecting or surface mining and reclamation operations or any related action of the Secretary; or

2.88.b. Whose property is or may be adversely affected by prospecting or surface mining and reclamation operations or any related action of the Secretary.

2.89. Piping means a process of internal erosion which occurs when water transports soil or soil like materials through unprotected exits, developing unseen channels or pipes through an embankment or its foundation.

2.90. Pit means that part of the surface mining operation from which the mineral is being actively removed or where the mineral has been removed and the area has not been backfilled.

2.91. Pre-Existing Discharge means any water discharge from the proposed disturbed area prior to disturbance as approved in a permit or a prospecting approval.

2.92. Preplan means the total application submitted to the Secretary including the application forms, mining and reclamation plan, drainage plan, blasting plan, planting plan, maps, drawings, data, cross-sections, bonds and other information as may be required to obtain a permit.

2.93. Principal Shareholder means any person who is the record or beneficial owner of ten percent (10%) or more of any class of voting stock.

2.94. Principal Spillway means a hydraulic structure which passes water at levels between normal pool and the emergency spillway invert elevations.

2.95. Probable Maximum Precipitation means the depth-duration-area rainfall for a particular area that represents the maximizing of meteorological conditions.

2.96. Prospecting means the field gathering of surface or subsurface geologic, physical, or chemical data by trenching, drilling, geophysical, or other techniques necessary to determine the quality and quantity of overburden and coal of an area; or the gathering of environmental data to establish the conditions of an area before beginning surface mining and reclamation operations, where such activity may cause any disturbance of the land surface or may cause any appreciable effect on land, air, water, or other environmental resources. Regardless of whether or not any disturbance is anticipated, the gathering of environmental data on lands designated unsuitable pursuant to section 22 of the Act shall be considered prospecting and subject to the requirements of section 13 of this rule.

2.97. Protected Structures means for purposes of blasting, dwellings, public buildings, schools, churches, or community or institutional buildings.

2.98. Public Building means any structure that is owned or leased by a public agency or used primarily for public business or meetings.

2.99. Quick Assets means cash and current assets that can be quickly turned into cash.

2.100. Reasonably Available Spoil means spoil and suitable coal mine waste material generated by the remining operation or other spoil or suitable coal mine waste material located in the permit area that is accessible and available for use

and that when rehandled will not cause a hazard to public safety or significant damage to the environment.

2.101. Recharge Capacity means the ability of the soils and underlying materials to allow precipitation to infiltrate and reach the zone of saturation.

2.102. Reclamation means those actions taken to restore mined land to the approved post mining land use.

2.103. Remined Area means only that area of any coal remining operation.

2.104. Renewable Resource Lands means aquifers and areas for the recharge of aquifers and other underground waters, areas for agricultural or silvicultural production of food and fiber, and grazing lands.

2.105. Retained Earnings means stockholder's equity that has arisen from retained assets from earnings in the business. This shall include only earnings from normal operations and not gains from such transactions as the sale of plant assets or investments.

2.106. Return On Investment means the relation of net profit for the last yearly period to ending net worth.

2.107. Safety Factor means the ratio of the sum of the resisting forces to the sum of the loading or driving forces.

2.108 Secretary means the Secretary of the Department of Environmental Protection or his authorized agent.

2.109. Sediment means solid material that is either in suspension, is being transported, or has been moved from its site of origin and has come to rest on the earth's surface.

2.110. Sediment Control or Other Water Retention Structure, Sediment Control or Other Water Retention System, or Sediment Pond means an impoundment designed, constructed, and maintained in accordance with this rule for the purpose of removing solids from water in order to meet applicable water quality standards or effluent limitations before the water is discharged into the receiving stream. Examples include wildlife ponds, settling basins and all ponds and facilities or structures used for water treatment.

2.111. Self-Bond means an indemnity agreement in a sum certain payable to the Secretary, executed by the permittee and by each individual and business organization capable of influencing or controlling the investment or financial practices of the permittee by virtue of his authority as an officer or ownership of all or a significant part of the permittee, and supported by agreements granting the Secretary a security interest in real or personal property pledged to secure performance by the permittee.

2.112. Significant Aquifer means a stratum or group of strata that can store and transmit water in significant quantities for a specific use.

2.113. Slope Protection means measures taken to control erosion on slopes.

2.114. Slope Stability means the relative degree of safety from the development of a landslide in a slope, as defined by one or more standard engineering methods of analysis.

2.115. Spoil means overburden that has been removed during surface mining operations.

2.116. Stabilize means to control movement of soil, spoil piles or areas of disturbed earth.

2.117. Strength Parameters mean those engineering values obtained from standard engineering shear strength tests of soil or soil like material.

2.118. Structure means, except as used in the context of subsection 3.8 of this rule, any man-made structures within or outside the permit areas which include, but is not limited to: dwellings, outbuildings, commercial buildings, public buildings, community buildings, institutional buildings, gas lines, water lines, towers, airports,

underground mines, tunnels and dams. The term does not include structures built and/or utilized for the purpose of carrying out the surface mining operation.

2.119. Sub-Drainage System means a designed and constructed system provided for the conveyance of subsurface water.

2.120. Subsidence means, as it relates to underground mining operations or auger mining, a sinking, collapsing or cracking of a portion of the earth's surface caused by voids beneath the surface created by mining.

2.121. Substantial Legal and Financial Commitments in a Surface Coal Mining Operation means that significant investments and legal commitments have been made in activities and facilities such as power plants, railroads, coal handling, preparation, extraction or storage facilities and other capital-intensive activities on the basis of a long term coal contract.

2.122. Substantially Disturb means, for purposes of prospecting, to significantly impact land or water resources by blasting; by removal of vegetation, topsoil, or overburden; by construction of roads or other access routes; by placement of excavated earth or waste material on the natural land surface or by other such activities; or to remove more than 250 tons of coal.

2.123. Successor in Interest means any person who succeeds to rights granted under a permit by transfer, assignment or sale of those rights.

2.124. Surety Bond means an indemnity agreement in a sum certain payable to the Secretary executed by the permittee which is supported by the performance guarantee of a corporation licensed to do business as a surety in the State of West Virginia.

2.125. Surface Mining and Reclamation Operation means surface coal mining operations and all activities necessary or incidental to the reclamation of such operations.

2.126. Surface Water means water on the surface of the earth.

2.127. Topsoil means the A and E-horizon soil layer of the four (4) major soil horizons.

2.128. Toxic-Forming Materials means earth materials or wastes which, if acted upon by air, water, weathering or microbiological processes, are likely to produce chemical or physical conditions in soils, air or water that are detrimental to the environment.

2.129. Toxic Mine Drainage means water that is discharged from active or abandoned mines or other areas affected by surface mining operations, reclamation operations, or prospecting operations which contains a substance which through chemical action or physical effects, is likely to kill, injure or impair biota commonly present in the area that might be exposed to it.

2.130. Transfer, Assignment or Sale of Rights means a change in ownership pursuant to subsection 2.88 or other effective control over the right granted in a permit or approval to conduct surface mining operations.

2.131. Underground Development Waste means waste rock mixtures of coal, shale, claystone, siltstone or other related materials that are brought to the surface for disposal.

2.132. Valid Existing Rights exists, except for haulroads, in each case in which a person demonstrates that the limitation provided for in the Act would result in the unconstitutional taking of that person's rights. For haulroads, valid existing rights means a road or recorded right-of-way or easement for a road which was in existence prior to August 3, 1977. A person possesses valid existing rights if he can demonstrate that the coal is immediately adjacent to an ongoing mining operation which existed on August 3, 1977 and is needed to make the operation as a whole economically viable. Valid existing rights shall also be found for an area where a person can demonstrate that an SMA number had been issued prior to the time when the structure, road, cemetery or other entity came into existence.

2.133. Valley or Head-of-Hollow Fill means a fill structure consisting of any material, other than organic material, placed in a valley where side slopes of the existing valley measured at the steepest point are greater than twenty (20) degrees or the average slope of the profile of the hollow from the toe of the fill to the top of the fill is greater than ten (10) degrees. In head-of-hollow fills the top surface of the fill, when completed, is at approximately the same elevation as the adjacent ridge line, and no significant area of natural drainage occurs above the fill draining into the fill area.

2.134. Violation, Failure or Refusal means a violation of a condition of a permit issued pursuant to the Act or this rule; or a failure or refusal to comply with any order issued under Sections 15, 16, or 17 of the Act, or any order incorporated in a final decision issued by the Secretary under the Act, except an order incorporated in a decision issued under paragraph (1), subsection (d), section 17 of the Act.

2.135. Willfully means that an individual acted:

2.135.a. Either intentionally, voluntarily or consciously; and

2.135.b. With intentional disregard or plain indifference to legal requirements in authorizing, ordering or carrying out a corporate permittee's action or omission that constituted a violation, failure or refusal.

2.136. Working Capital means the excess of the operator's current assets over its current liabilities.

2.137. Zone of Saturation means the zone below the piezometric surface in which all voids are filled with groundwater.

§38-2-3. Permit Application Requirements and Contents.

3.1. Applicant Information. All information provided by an applicant in an application for a surface mining permit shall be clear and concise and shall be provided in a format prescribed by the Secretary and/or a format required by the Federal Office of Surface Mining Reclamation and Enforcement. In addition to the information requirements of section 9 of the Act, each application for a permit shall contain the following information except that submittal of a social security number is at the option of the applicant:

3.1.a. A statement as to whether the applicant is a corporation, partnership, sole proprietorship, association, or other business entity.

3.1.b. The name, address, telephone number and, as applicable, social security number and employer identification number of the:

3.1.b.1. Applicant;

3.1.b.2. Applicant's resident agent; and

3.1.b.3. Person who will pay the abandoned mine land reclamation fee.

3.1.c. List, for each person who owns or controls the applicant under the definition of "owned or controlled" and "owns and controls" in subsection 2.87 of this rule (as applicable):

3.1.c.1. The person's name, address, social security number, and employer identification number;

3.1.c.2. The person's ownership or control relationship to the applicant, including percentage of ownership and location in organizational structure;

3.1.c.3. The title of the person's position, date position was assumed, and when submitted under subdivision 3.33.h of this rule, date of departure from the position;

3.1.c.4. Each additional name and identifying number, including employer identification number, federal or state permit number, and MSHA number with date of issuance, under which the person owns or controls, or

previously owned or controlled, a surface coal mining and reclamation operation in the United States within the five (5) years preceding the date of the application; and

3.1.c.5. The application number or other identifier of, and the regulatory authority for, any other pending surface coal mining operation permit application filed by the person in any state in the United States.

3.1.d. List, for any surface coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant under the definition of "owned or controlled" and "owns or controls" in subsection 2.8~~7~~5 of this rule, the operation's:

3.1.d.1. Name, address, identifying numbers, including employer identification number, Federal or State permit number and MSHA number, the date of issuance of the MSHA number, and the regulatory authority; and

3.1.d.2. Ownership or control relationship to the applicant, including percentage of ownership and location in organizational structure.

3.1.e. The name and address of each legal or equitable owner of record of the surface and mineral property to be mined, each holder of record of any leasehold interest in the property to be mined, and any purchaser of record under a real estate contract for the property to be mined.

3.1.f. The name and address of each owner of record of all property (surface and subsurface) within one hundred (100) feet of any part of the proposed permit area.

3.1.g. The Mine Safety and Health Administration (MSHA) numbers for all mine-associated structures identified in the permit that require MSHA approval.

3.1.h. A statement of all lands, interest in lands, options, or pending bids on interests held or made by the applicant for lands contiguous to the area described in the permit application. If requested by the applicant, any information required by this paragraph which is not on public file pursuant to the Act shall be held in confidence.

3.1.i. A statement of whether the applicant or any subsidiary, affiliate, or persons owned or controlled or under control or ownership with the applicant has:

3.1.i.1. Had a Federal or State coal mining permit suspended or revoked in the five (5) years preceding the date of submission of the application; or

3.1.i.2. Forfeited a bond or similar security deposited in lieu of bond.

3.1.j. A brief explanation of the facts involved if any such suspension, revocation, or forfeiture referred to in paragraphs 3.1.i.1 and 3.1.i.2 of this subdivision has occurred, including:

3.1.j.1. Identification number and date of issuance of the permit, and the date and amount of bond or similar security;

3.1.j.2. Identification of the authority that suspended or revoked the permit or forfeited the bond and the stated reasons for the action;

3.1.j.3. The current status of the permit and bond, or similar security involved;

3.1.j.4. The date, location, and type of any administrative or judicial proceedings initiated concerning the suspension, revocation, or forfeiture; and

3.1.j.5. The current status of any administrative or judicial proceedings.

3.1.k. A list for any violation of a provision of the Act or this rule and any other Federal or State laws, rules and regulations pertaining to air or water environmental protection incurred in connection with any surface mining operation received by the applicant during the three (3) year period preceding the application date, and a list of all unabated cessation orders,

and unabated air and water quality violation notices received prior to the date of the application by any surface mining and reclamation operation owned or controlled by either the applicant or by any person who owns or controls the applicant For each violation notice or cessation order reported, the lists shall include the following information as applicable:

3.1.k.1. Any identifying numbers for the operation, including the Federal or State permit number and MSHA number, the dates of issuance of the violation notice and MSHA number, the name of the person to whom the violation notice was issued, and the name of the issuing regulatory authority, department or agency;

3.1.k.2. A brief description of the violation alleged in the notice;

3.1.k.3. The date, location, and type of any administrative or judicial proceedings initiated concerning the violation, including, but not limited to, proceedings initiated by any person to obtain administrative or judicial review of the violation;

3.1.k.4. The current status of both the proceedings and the violation notice; and

3.1.k.5. The actions, if any, taken by any person to abate the violation.

3.1.l. Each application for a permit shall contain a sworn statement as follows: "The information contained in this application is true and correct to the best of my knowledge and belief." Such statement shall be signed by an accountable official of the applicant and shall be notarized.

3.1.m. The applicant for a permit or a revision of a permit shall have the burden of establishing that his application is in compliance with all the requirements of the Act and this rule.

3.1.n. After an applicant is notified that the application is approved, but before the permit is issued, the applicant shall update and correct the information previously submitted under this subsection or indicate that no change in such information has occurred.

3.1.o. Upon request by one or more permittees related through ownership and control, and with the approval of the Secretary, a permittee, or permittees related through ownership and control, may submit and maintain a centralized ownership and control file.

Any permit application which references an approved centralized ownership and control file may be determined to be complete and accurate for the purposes of this subsection. Each centralized ownership and control file shall at a minimum:

3.1.o.1. Contain the information required by subdivisions 3.1.a, 3.1.c, 3.1.d, and 3.1.l of this subsection on such forms, or in the format, as may be required by the Secretary;

3.1.o.2. Provide a procedure for the file to be updated at least quarterly, although this requirement does not relieve an applicant from having complete and accurate information in the centralized ownership and control file during the time it has an application pending; and

3.1.o.3. Provide that the applicant maintain a copy or copies of the file in any required courthouses, regional offices, and other public offices, during any required public notice period, when referenced in an application that is otherwise required to be made available in such offices.

3.2. Advertisement.

3.2.a. SMA File Number. Prior to the publication of an advertisement for a surface mining permit in accordance with paragraph (6), subsection (a), section 9 of the Act, the applicant shall submit an administratively complete surface mining permit application and obtain a surface mining application (SMA) file number. Each SMA number shall be valid for one year; provided, that the Secretary may extend an SMA number beyond one year, if the application has

been diligently pursued by the applicant throughout the life of the SMA number. In order for an SMA number to be extended, the applicant must submit to the Secretary a written request, which shall state the reason(s) and which shall demonstrate good cause for the extension.

3.2.b. Advertisement Information. Each advertisement will contain at a minimum:

3.2.b.1. The surface mining application (SMA) file number;

3.2.b.2. A clear and accurate location map of a scale and detail found in the West Virginia General Highway Map. The map size will be at a minimum four inches (4") x four inches (4"). Longitude and latitude lines and north arrow will be indicated on the map and such lines will cross at or near the center of the proposed permit area;

3.2.b.3. The names and business address of the applicant to include a street address or route number;

3.2.b.4. A narrative description clearly describing the location of the proposed permit area;

3.2.b.5. The name(s) of the coal seam(s) to be mined;

3.2.b.6. The name(s) of the receiving stream(s) into which drainage from the permit area will be discharged;

3.2.b.7. The location where a copy of the application is available for public review;

3.2.b.8. The name and address of the Department of Environmental Protection Office where written comments or requests for informal conferences on the application may be submitted;

3.2.b.9. The type of operation;

3.2.b.10. Surface and mineral ownership of the tract(s) to be permitted;

3.2.b.11. Surface and mineral ownership of property within one hundred (100) feet of the permit area;

3.2.b.12. Where the permit application reflects that mining will occur within one-hundred feet (100') of the outside right-of-way of a public road (except where mine access roads or haulage roads join such right-of-way), the applicant may choose one of the following procedures to satisfy the additional public notice requirement:

3.2.b.12.A. Include in the advertisement required in this section a concise statement:

3.2.b.12.A.1. Identifying the road to be affected;

3.2.b.12.A.2. Identifying the affected segment; and

3.2.b.12.A.3. Advising that a public hearing may be requested; or

3.2.b.12.B. A separate public notice may be published, prior to issuance of a permit, which:

3.2.b.12.B.1. Identifies the road to be affected;

3.2.b.12.B.2. Identifies the affected segment; and

3.2.b.12.B.3. Advises that a public hearing may be requested.

3.2.b.13. Where the permit applicant proposes to relocate or close a public road, the advertisement shall include a concise statement which:

3.2.b.13.A. Describes the identification number and geographic location of the road;

3.2.b.13.B. Describes the particular segment to be relocated or closed;

3.2.b.13.C. Describes where the relocated segment is to be sited;

3.2.b.13.D. Describes the approximate time and duration of the relocation or closure; and

3.2.b.13.E. Advises that a public hearing may be requested.

3.2.b.14. Where an alternative land use is proposed, indicate the premining land use and the proposed postmining land use; and

3.2.b.15. Where an experimental practice is proposed, the advertisement shall contain a statement indicating such and identifying applicable provisions for which a variance is requested.

3.2.c. Notice to Governmental Agencies. Upon receipt of an administratively complete application for a surface mining and reclamation permit, a permit revision or a permit renewal, the Secretary shall notify all Federal or State government agencies with authority to issue permits and licenses applicable to the proposed surface mining and reclamation operation or those agencies with an interest in the proposed operation, including the U. S. Department of Agriculture Soil Conservation Service district office, the local U. S. Army Corps of Engineers district engineer, the National Park Service, State and Federal fish and wildlife agencies, and the historic preservation officer.

3.2.d. Availability of Comments. The Secretary shall place on file at the regional office in which a permit, permit revision or renewal of a permit is filed, a copy of all public comments received as a result of the advertisement and shall provide the applicant with such comments. When a permit, permit revision or renewal of a permit is issued or approved, the Secretary shall notify within ten (10) days each person who filed comments or objections to the application, each party to an informal conference, and the appropriate local governmental agencies including the clerk of the county commission. The Secretary shall also cause to be published at least monthly a listing of all permits issued, which listing shall include a description of the location of the land to be affected. The listing shall also be forwarded to the Clerk of the County Commission.

3.2.e. Readvertisement. After a Surface Mine Application (SMA) has been advertised once a week for four successive weeks, and is determined by the Secretary to have had a limited number of minor changes that do not significantly affect the health, safety or welfare of the public and which do not significantly affect the method of operation, the reclamation plan, and/or the original advertisement, he may require one (1) additional advertisement to be published with a ten (10) day public comment period.

3.2.f. Renotification. A renotification letter shall be sent to all commentors of a surface mine application (SMA) when a determination has been made by the Secretary that readvertisement is required in accordance with subdivision 3.2.e of this subsection.

3.2.g. Certification of Publication. The advertisement and publication dates for all permit applications, permit renewal applications, applications for revision of a permit, and transfer assignment and sale of permits, shall be certified and notarized by the publishing newspaper. The certificate of publication shall be made a part of the approved application no later than four (4) weeks after the last date of publication.

3.3. Occupied Dwellings.

3.3.a. Valid Existing Rights. Where the proposed surface coal mining operations would be conducted within three hundred (300) feet, measured horizontally, of any occupied dwelling, the permit applicant shall submit with the application a notarized written waiver by lease, deed, or other conveyance from the owner of the dwelling, clarifying that the owner and signator had the legal right to deny mining and knowingly waived that right. The waiver shall act as consent to such operations within a closer distance of the dwelling as specified.

3.3.b. Waiver. Where the applicant for a

permit had obtained a valid waiver prior to August 3, 1977, from the owner of an occupied dwelling to mine within three hundred (300) feet of such dwelling, a new waiver shall not be required:

3.3.b.1. Where the applicant for a permit had obtained a valid waiver from the owner of an occupied dwelling, that waiver shall remain effective against subsequent purchasers who had actual or constructive knowledge of the existing waiver at the time of purchase.

3.3.b.2. A subsequent purchaser shall be deemed to have constructive knowledge if the waiver has been properly filed in public property records pursuant to state laws or if the mining has proceeded to within the three hundred (300) feet limit prior to the date of purchase.

3.4. Maps.

3.4.a. Scale for Maps. Except as otherwise noted in this rule, the scale required for all maps shall be as follows:

3.4.a.1. The preferred scale of maps prepared from United States Geological Survey topographic maps on 7.5 minute quadrangle shall be five hundred feet (500') to the inch;

3.4.a.2. The preferred scale for maps associated with underground coal mining operations and facilities incidental to coal mining shall be two hundred feet (200') to the inch; and

3.4.a.3. Other scales may be used where improved clarity and accuracy are achieved.

3.4.b. Map Size. All maps and plans shall be submitted on print paper, thirty inches (30") by forty-two inches (42") or less. If supplementary maps or plans are attached, match lines shall be used.

3.4.c. Color Code. A color code shall be used in preparing all maps to indicate critical features of the permit area as follows; provided, that drafted or computer generated graphic symbols or shading may be used in place of a color code, if a separate, uniquely identifiable, and clearly discernible symbol or shading is provided in place of each color as specified below, and if the symbols or shading are clearly defined on map legends and used consistently throughout the permit application, and in any subsequent permit revisions, progress maps, or other submittals relating to the permit:

3.4.c.1. Red shall indicate mineral to be removed;

3.4.c.2. Blue shall indicate water and drainage patterns;

3.4.c.3. Green shall indicate areas regraded;

3.4.c.4. Yellow shall indicate all other areas within the permit boundary; and

3.4.c.5. Purple shall be used to outline adjacent mining permits.

3.4.d. Preplan. In addition to the requirements of paragraphs (12) and (13) of subsection (a) section 9 of the Act and section 10 of the Act, the application shall include as applicable the following information:

3.4.d.1. The location and current use of all structures within one thousand feet (1000') of the proposed permit area;

3.4.d.2. All public roads located on or within one hundred feet (100') of the proposed permit area;

3.4.d.3. The boundaries of any public park or historic lands within or adjacent to the permit area;

3.4.d.4. All cemeteries located on or within one hundred feet (100') of the proposed permit area;

3.4.d.5. Any portion of a unit of the National System of Trails or the Wild and Scenic River System, including study rivers designated under section 5(a) of the Wild and Scenic Rivers Act which are located within or adjacent to the proposed permit area;

3.4.d.6. The current use and land use classifications of the area of land and adjacent lands upon which the permit is sited and adjacent lands;

3.4.d.7. The location of all existing structures to be used for surface mining operations which are to be exempt from design standards;

3.4.d.8. The date the map was prepared, a north arrow, quadrangle name and location map;

3.4.d.9. Where the natural slope of the land below the coal outcrop is less than twenty (20) degrees and downslope placement of overburden or spoil is proposed, the map shall indicate percent slope of the land at two hundred foot (200') intervals along the cropline;

3.4.d.10. The location of each facility to be used to protect or enhance fish and wildlife and related environmental values;

3.4.d.11. Where the proposed permit area has been previously mined and to the extent that such information is available, list the type of mining used, the coal seam or other mineral mined, the extent of mineral removed, and the approximate date of mining;

3.4.d.12. Extent of proposed auger operations;

3.4.d.13. Surface and mineral owners and property lines within the permit area and within one hundred (100) feet of any point of the permit area;

3.4.d.14. Location of water supply intakes for current users of surface water;

3.4.d.15. Location and identification of sub-areas if incremental bonding is to be used;

3.4.d.16. Location and extent of subsurface water, if encountered, within the proposed permit or adjacent areas, including, but not limited to, areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross sections and contour maps;

3.4.d.17. The location of all oil and gas wells and other utilities within the proposed permit area are to be shown;

3.4.d.18. The location and extent of topsoil borrow areas, and the location of topsoil storage areas;

3.4.d.19. Air pollution monitoring and control facility and subsidence monitoring location;

3.4.d.20. Any permanent facility to remain after mining;

3.4.d.21. All coal storage, cleaning, loading, and refuse disposal areas;

3.4.d.22. The location of any non-coal waste storage areas;

3.4.d.23. The location of any explosive storage and handling facility; which will remain in place for an extended period of time during the life of the operation and

3.4.d.24. The area of land to be affected within the proposed permit area according to the sequence of mining and reclamation.

3.4.e. Drainage Map. Unless the information required by this subdivision can be shown on the preplan map in a clear and legible fashion, a separate drainage map of the same size scale and detail of the preplan map shall be made a part of the permit application and shall contain the following:

3.4.e.1. The directional flow of water on and away from the permit area;

3.4.e.2. Location of all monitoring sites used to develop surface and groundwater base line information;

3.4.e.3. Location of all surface and

ground water monitoring sites to be used for satisfying reporting requirements during the mining operation;

3.4.e.4. Location of all erosion and sedimentation control structures; and

3.4.e.5. The extent and boundaries of each component drainage area.

3.4.f. Supplemental maps for underground coal mining permit applications. In addition to other maps required in this section, each permit application for underground mining operations shall include supplemental maps as follows:

3.4.f.1. A U.S.G.S. topographic map of the area extending beyond the proposed mining limits and showing the following:

3.4.f.1.A. Name and series of the sheet;

3.4.f.1.B. Scale, latitude, and longitude;

3.4.f.1.C. Limits of underground mining operation proposed;

3.4.f.1.D. Surface area to be permitted;

3.4.f.1.E. Cropline of the coal seam to be mined;

3.4.f.1.F. Location and identification of all mine openings for the proposed mine including shafts, slopes, drifts, boreholes, etc; and

3.4.f.1.G. Location of all surface structures not owned by the applicant over the area to be mined.

3.4.f.2. A mine development map drawn to scale showing:

3.4.f.2.A. Boundaries of underground mining operation and any adjacent active or abandoned mines in the same seam;

3.4.f.2.B. All owners of property and all residents within the area above the proposed underground workings. The area above the underground works shall mean within the angle of critical deformation but at least 15° from any coal removal;

3.4.f.2.C. Present extent of underground mining as well as projected headings;

3.4.f.2.D. Date, scale, north arrow, dip, strike, and average dip of the coal seam to be mined;

3.4.f.2.E. All gas wells, oil wells, water wells, and test drill holes;

3.4.f.2.F. Location of all known faults;

3.4.f.2.G. Area and extent of previous or proposed auger or strip mining in the same seam;

3.4.f.2.H. Location and thickness of outcrop barriers; and

3.4.f.2.I. Elevation of all entries, fanways and boreholes.

3.5. Cross Sections and Profiles. The application shall contain cross-sections and/or profiles which accurately depict:

3.5.a. The existing premining surface configuration and the final surface configuration that will be achieved. Cross sections shall be developed from sufficient slope measurements to adequately represent the existing land surface configuration of the proposed permit area. Slope measurements shall take into account natural variations in slope, to provide accurate representation of the range of natural slopes and reflect geomorphic differences of the area to be disturbed. The Secretary may require additional slope measurements at specified intervals and locations on a site-by-site basis;

3.5.b. The vertical distribution of aquifers

showing seasonal differences in head, if available, for the proposed permit area;

3.5.c. Cross sectional area and profiles of excess spoil disposal areas with all appurtenances shown including rock cores, subsurface drains, surface drainage structures, foundations, etc;

3.5.d. Cross sectional areas and profiles of all drainage and sediment control structures including ponds, impoundments, diversions, sumps, etc; and

3.5.e. Cross sectional areas and profiles of all roads.

3.6. Operation Plans and Specifications. Each application shall contain in addition to other plans, specifications, and descriptions required by the Act and this rule, a description of the mining operations proposed to be conducted during the life of the mine within the proposed permit area, including, at a minimum, the following:

3.6.a. A narrative description of the type and method of coal mining procedures and proposed engineering techniques, anticipated annual and total production of coal, by tonnage, and the major equipment to be used for all aspects of those operations; and

3.6.b. A narrative explaining the construction, modification, use, maintenance, and unless retention of such facilities is necessary for postmining land use, removal of the following facilities:

3.6.b.1. Dams, embankments, and other impoundments;

3.6.b.2. Overburden and topsoil handling and storage areas and structures;

3.6.b.3. Coal removal, handling, storage, cleaning, and transportation areas and structures;

3.6.b.4. Spoil, coal processing waste, and non-coal waste removal, handling, storage, transportation, and disposal areas and structures;

3.6.b.5. Mine facilities; and

3.6.b.6. Water and air pollution control facilities.

3.6.c. A description of how the applicant will case, seal or otherwise manage auger holes, boreholes, shafts, wells and other openings;

3.6.d. A description of how the applicant will remove, store and redistribute topsoil, subsoil or topsoil substitutes, and other materials. When topsoil substitutes are proposed, the suitability determination, analytical data, and laboratory certification required in subdivision 14.3.c of this rule shall be made a part of the permit application;

3.6.e. Where topsoil borrow areas are proposed, the applicant shall submit a reclamation plan for such areas;

3.6.f. A description of how the applicant will handle acid forming and toxic forming materials and materials constituting a fire hazard;

3.6.g. The design and construction of excess spoil disposal areas; and

3.6.h. The design and construction of a drainage and sediment control system to include:

3.6.h.1. A description, map, and cross section of the structure and its location;

3.6.h.2. Preliminary hydrologic and geologic information required to assess the hydrologic impact of the structure;

3.6.h.3. A survey describing the potential effect on the structure from subsidence of the subsurface strata resulting from past underground mining operation if underground mining has occurred;

3.6.h.4. A certification statement which includes a schedule for the submission of any detailed design plans for structures that are not submitted with the general plan. The Secretary shall have approved, in writing, the detailed

design plan for a structure before construction begins;

3.6.h.5. Each structure design plan that is of such size or storage capacity that it is a dam as defined in W. Va. Code §22-14 et seq., shall be prepared by, or under direction of, and certified by a qualified registered professional engineer;

3.6.h.6. The design shall include any geotechnical investigation and construction requirements for the structure;

3.6.h.7. A description of the operation and maintenance requirements for each structure;

3.6.h.8. A timetable and plans to remove each structure, if appropriate;

3.6.i. The design and construction of all roads;

3.6.j. A vegetation plan.

3.6.k. A plan for fugitive dust control practices as required in subsection 14.16 of this rule; and

3.6.l. For area mining operations, as referenced in paragraph 14.15.b.4 of this subsection, mountaintop removal operations as referenced in paragraph 14.15.b.5 of this subsection, and for multiple seam mining operations, the applicant shall include a site specific and detailed plan showing the sequence and schedule for backfilling and regrading.

3.7. Disposal of Excess Spoil.

3.7.a. Each application shall contain descriptions, including appropriate maps, cross sections, drawings, and design of the excess spoil disposal structures which will comply with the standards of subsection 14.14 of this rule. These plans shall describe the design, construction, operation, maintenance, and if appropriate, removal of the site and structures.

3.7.b. Each application shall contain the results of a geotechnical investigation of the proposed disposal site, including the following:

3.7.b.1. The character of bedrock and any adverse geologic conditions in the disposal area;

3.7.b.2. A survey identifying all springs, seepage, and ground water flow observed or anticipated during wet periods in the area of the disposal site;

3.7.b.3. A survey of the potential effects of subsidence of the subsurface strata due to past and future mining operations;

3.7.b.4. A technical description of the rock materials to be utilized in the construction of those disposal structures containing rock chimney cores or underlain using a rock drainage blanket;

3.7.b.5. A stability analysis including, but not limited to, strength parameters, pore pressures and long-term seepage conditions. These data shall be accompanied by a description of all engineering design assumptions and calculations and the alternatives considered in selecting the specific design specifications and methods; and

3.7.b.6. An explicit identification, by narrative and by mapping, of the critical foundation area(s) for the structure, as the term is applied in subsection 14.14. The selection of the critical foundation area(s) shall be based on the results of the geotechnical investigation, shall be certified as a part of the design by a registered professional engineer, and shall be subject to review and approval by the Secretary.

3.7.c. If rock-toe buttresses or key-way cuts are required, the application shall include the following:

3.7.c.1. The number, location, and depth of borings or test pits which shall be determined with respect to the size of the spoil disposal structure and subsurface conditions; and

3.7.c.2. Engineering specifications utilized to design the rock-toe buttresses or key-way cuts which shall be determined in accordance with paragraph 3.7.b.5 of this subsection.

3.8. New and Existing Structures and Support Facilities:

3.8.a. Each application for a permit will contain a description, plans, and drawings for each support facility to be constructed, used, or maintained within the proposed permit area. The plans and drawings shall include a map, appropriate cross sections, design drawings, and specifications sufficient to demonstrate compliance with subsection 4.11 of this rule.

3.8.b. Each application shall contain a description of each existing structure or facility proposed to be used in connection with or to facilitate the surface mining and reclamation operation. The description shall include:

3.8.b.1. Location;

3.8.b.2. Plans of the structure which describe its current condition;

3.8.b.3. Approximate dates on which construction of the existing structure was begun and completed;

3.8.b.4. A showing, including relevant monitoring data or other evidence, as to whether or not the structure meets the performance standards of the Act and this rule; and

3.8.b.5. A compliance plan for each existing structure proposed to be modified or reconstructed for use in connection with or to facilitate the surface coal mining and reclamation operation. The compliance plan shall include:

3.8.b.5.A. Design specifications required for the modification or reconstruction of the structure to bring it into compliance with current design requirements and performance standards of the Act and this rule.

3.8.b.5.B. A construction schedule which shows dates for beginning and completing interim steps and final construction.

3.8.b.5.C. Provisions for monitoring the structure during and after modification or reconstruction to ensure that the performance standards of the Act and this rule are met.

3.8.b.5.D. A showing that the risk of harm to the environment or to public health or safety is not significant during the period of modification or reconstruction.

3.8.c. Structures and facilities designed, constructed or in use pursuant to an approved surface mining permit or prospecting approval prior to the effective date of this rule may be subject to revision or reconstruction where the Secretary determines that such revision or reconstruction is necessary to comply with the performance standards set forth in the Act and this rule; provided, that the Secretary will notify the permittee that such revision or reconstruction is necessary and shall provide a reasonable time for compliance. *Provided*, that those structures and facilities, where it can be demonstrated that reconstruction or revision would result in greater environmental harm and the performance standards set forth in the Act and this rule can otherwise be met, may be exempt from revision or reconstruction. This exemption shall not apply to new and existing coal waste facilities.

3.8.d. The plans of a facility or structure that is to be shared by two or more separately permitted mining operations may be included in one permit application and referenced in the other application. Each permittee shall bond the facility or structure unless the permittees sharing it agree to another arrangement for assuming their respective responsibilities. If such agreement is reached, then the application shall include a copy of the agreement between or among the parties setting forth the respective bonding responsibilities of each party for the facility or structure. The agreement shall demonstrate to the satisfaction of the Secretary that all responsibilities under the Act for the facility or structure will be met.

3.9. Operation(s) Near Public Road.

3.9.a. Where the proposed mining operation is to be conducted within one hundred feet (100') (measured horizontally) of the outside right-of-way of any public road (except where mine access roads or haulage roads join such right-of-way) or where the applicant proposes to relocate or close any public road, the Secretary shall:

3.9.a.1. Where the public road is to be closed or relocated, require the applicant to obtain necessary permission from the authority with jurisdiction over the public road.

3.9.a.2. Provide an opportunity for a public hearing in the locality of the proposed mining operation for the purpose of determining that the interests of the public and affected landowners will be protected.

3.9.a.3. Upon request for a public hearing by any person, require the applicant to hold a public hearing and give notice of the date, time, and place of the hearing in a newspaper of general circulation in the area of the proposed mining operation at least two (2) weeks in advance of the hearing date.

3.9.a.4. Make a written finding within thirty (30) days following the hearing or after the close of the comment period as to whether or not the interests of the public and the affected landowners will be protected. Each participant of record at the public hearing shall be notified of the Secretary's findings.

3.10. Experimental Practices.

3.10.a. Each permit application or permit revision shall contain plans and specifications of any proposed experimental practices to be employed as a part of the mining and reclamation operation. All experimental practices shall have prior approval of the Secretary and the director of the Federal Office of Surface Mining Reclamation and Enforcement before a permit or revision can be issued. An application for an experimental practice shall contain descriptions, maps, plans, and data which show:

3.10.a.1. The nature of the experimental practice, including a description of any performance standards for which variances are requested, the duration of the experimental practice, and any special monitoring which will be conducted;

3.10.a.2. How use of the experimental practice encourages advances in mining and reclamation technology or allows a postmining land use for industrial, commercial, residential, or public use (including recreation facilities) on an experimental basis;

3.10.a.3. The experimental practice:

3.10.a.3.A. Is potentially more, or at least as, environmentally protective, during and after mining operations, as would otherwise be required by the Act and this rule.

3.10.a.3.B. Will not reduce the protection afforded public health and safety below that provided by the requirements of the rules.

3.10.a.4. That the applicant will conduct monitoring of the effects of the experimental practice. The monitoring program shall ensure the collection, analysis, and reporting of reliable data that are sufficient to enable the Secretary and the director of the Federal Office of Surface Mining Reclamation and Enforcement to:

3.10.a.4.A. Evaluate the effectiveness of the experimental practice; and

3.10.a.4.B. Identify, at the earliest possible time, potential risk to the environment and public health and safety which may be caused by the experimental practice during and after mining.

3.10.a.5. That the applications for experimental practice under this section will comply with the public notice requirements of the Act and this rule.

3.10.b. Each permit approved for experimental practices shall be reviewed by the Secretary at least annually following date of issuance. The Secretary may, on the basis of this review, require modifications to the experimental practice.

3.11. In Situ Mining. Any application for a permit for operations covered by this subsection shall be made according to all requirements of this section applicable to underground mining activities. In addition, the mining and reclamation operations plan for operations involving in situ processing activities shall contain information establishing how those operations will be conducted in compliance with the requirements of section 15 of this rule, including:

3.11.a. Delineation of proposed holes and wells and production zone for approval of the Secretary;

3.11.b. Specifications of drill holes and casings proposed to be used;

3.11.c. A plan for treatment, confinement or disposal of all acid-forming, toxic-forming or radioactive gases, solids, or liquids constituting a fire, health, safety or environmental hazard caused by the mining and recovery process; and

3.11.d. Plans for monitoring surface and ground water and air quality, as required by the Secretary.

3.12. Subsidence Control Plan.

3.12.a. Each application for an underground coal mining permit shall contain a subsidence control plan which includes the following:

3.12.a.1. A survey that identifies, on a topographic map of a scale of 1" = 1,000' or less, structures, location and type of water supplies, perennial and intermittent streams or renewable resource lands and a narrative indicating whether or not subsidence could cause material damage or diminution of value or use of such structures or renewable resource lands; or could contaminate, diminish or interrupt water supplies both on the permit area and adjacent areas within an angle of draw of at least 30°. Provided; however, an angle of draw other than 30° can be used based upon results of site specific analyses and demonstration that a different angle of draw is justified. Computer program packages predicting surface movement and deformation caused by underground coal extraction can be utilized;

3.12.a.2. A survey of the quality and quantity of water supplies that could be contaminated, diminish or interrupt water supplies by subsidence within the area encompassed by the applicable angle of draw.

A survey of the condition of all non-commercial building or residential dwellings and structures related thereto that may be materially damaged or for which the foreseeable use may be diminished by subsidence within the area encompassed by the applicable angle of draw, Provided; however:

3.12.a.2.A. For areas of extraction that is less than or equal to 60 percent, a pre-subsidence structural survey exemption may be requested by the permittee; provided, it is demonstrated to the satisfaction of the Secretary that damage to the structure(s) will not occur.

3.12.a.2.B. In areas of developmental mining *(*less than or equal to 60 percent extraction*)*, a postponement of the pre-subsidence structural survey may be requested by the permittee; provided, it is demonstrated that damage to the structure(s) will not occur. No mining (extraction greater than 60 percent) within the applicable angle of draw shall occur until the pre-subsidence structural survey is completed.

In areas for which a pre-subsidence structure survey exemption and/or postponement is granted and the percent extraction exceeds 60 percent, the exemption and/or postponement for the structural survey is voided for the entire underground mining operation. In addition, the presumption of causation will apply to any damage to structure(s) as a result of earth movement within a 30° angle of draw from any underground extraction.

If the permittee was denied access to the land or property for the purpose of conducting the pre-subsidence survey, the permittee will notify the owner, in writing, no presumption of causation will exist.

A written report of the survey shall be prepared and signed by the person or persons who conducted the survey. Copies of the report shall be provided to the property owner and to the Secretary.

Non-commercial building as used in this section means any building, other than an occupied residential dwelling, that the time subsidence occurs, is used on a regular basis as a public building or community or institutional building as those terms are defined in 2.33 of this rule. Any building used only for commercial agricultural, industrial, retail or other commercial enterprises is excluded.

3.12.a.3. A general description of the technique of coal removal, such as longwall, room and pillar, pillar removal, hydraulic mining or other extraction methods and the size, sequence, and timing of underground development of the mine;

3.12.a.4. An isopach map or other map showing surface contours and bottom of coal contours and the location and extent of areas in which planned subsidence is projected, including anticipated effects, and all areas in which measures described in paragraphs 3.12.a.7 and 3.12.a.8. of this subdivision will be taken to prevent or minimize subsidence and related damage and where appropriate to correct subsidence related damage;

3.12.a.5. A description of the physical conditions, such as depth of cover, seam thickness, strike and dip, lithology, and other geologic and hydrologic conditions, which affect the likelihood or extent of subsidence and subsidence-related damage;

3.12.a.6. A description of the measures to be taken, in accordance with subdivisions 16.2.a, 16.2.c, and 16.2.d of this rule, to mitigate or remedy any material damage or diminution in value or foreseeable use that may occur to surface lands, structures, or facilities due to subsidence;

3.12.a.7. An acknowledgment that if subsidence causes material damage or reduces the value or reasonably foreseeable use of the surface lands, then the operator shall restore the land to a condition capable of supporting uses it was capable of supporting before subsidence regardless of the right to subside;

3.12.a.8. Except for those areas where planned subsidence is projected to be used, a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to:

3.12.a.8.A. Backstowing or backfilling of voids;

3.12.a.8.B. Leaving support pillars of coal;

3.12.a.8.C. Leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place; and

3.12.a.8.D. Taking measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface.

3.12.a.9. A description of monitoring plans, if any, to determine the commencement and degree of subsidence so that other appropriate measures can be taken to prevent, reduce, or correct material damage.

3.12.b. The Secretary may waive the remainder of the requirements for a subsidence control plan if the survey required by paragraph 3.12.a.1. of this subsection demonstrates, and the Secretary determines, that no material damage or diminution of value or foreseeable use of the land or structures could be caused by subsidence.

3.12.c. When an applicant feels it has the right to subside, it will provide adequate documentation of same.

3.12.d. Where longwall mining or room and pillar mining with 80% recovery or greater is proposed, the following information shall be made a part of the plan:

3.12.d.1. Typical predicted subsidence profile(s) for areas of planned subsidence. Specify from what source information was obtained to develop the predicted profile(s) including an explanation of the method and calculations used to develop prediction.

3.12.d.2. For all areas identified by the survey, indicate what measures will be taken to minimize material damage or reduction in value or reasonably foreseeable use. Indicate those areas in which measures are to be taken. Such measures may include, but not be limited to, relocating panels, mining without interruption, exposing gas lines, supporting foundations of structures, and insuring that any damage is repaired.

3.12.d.3. Specify anticipated effects of planned subsidence.

3.12.e. Where room and pillar mining with less than 80% coal extraction is proposed, the following information shall be made a part of the plan:

3.12.e.1. On the development map, show all first mining and areas of planned pillar extraction.

3.12.e.2. Describe anticipated secondary mining plans including percent extraction.

3.12.e.3. Under all structures and renewable resource lands, demonstrate what methods will be used to protect that structure or lands (i. e., leaving solid coal or limited extraction). Under structures and perennial streams, the area addressed must extend to the angle of critical deformation, but not less than 15° unless otherwise approved. If mining is planned under or adjacent to a structure or perennial stream (for structures this need not be addressed when the applicant demonstrates the right to subside), it must be demonstrated to the extent technologically and economically feasible that the pillar design will support the overburden. If it is not technologically and economically feasible, a detailed explanation must be included.

3.13. Underground Mine Abandonment Plan. Each application for an underground coal mine operation shall contain an abandonment plan which complies with the requirements of Federal Mine Health Administration regulations at 30 CFR 75.1711. The abandonment plan shall also contain the following specifications:

3.13.a. The width of outcrop barriers;

3.13.b. The type and number of permanent seals proposed, their design details, and the proposed materials to be used for construction;

3.13.c. The maximum head of water expected on the outcrop barriers and mine seals; and

3.13.d. The type and design details of seals for boreholes.

3.14. Removal of Abandoned Coal Refuse Disposal Piles.

3.14.a. In accordance with subsection (d) section 28 of the Act, the Secretary may, when not in conflict with the purposes and findings of the Act, issue a reclamation contract solely for the removal of existing abandoned coal processing waste piles; provided that, if the average quality of the refuse material meets the minimum BTU value standards to be classified as coal, as set forth in ASTM standard D 388-99, and if not AML eligible, a permit application which meets all applicable requirements of this rule shall be required. The criteria for issuing such reclamation contract are as follows:

3.14.a.1. The removal of the existing abandoned coal processing waste pile will bring

about a more desirable land use or;

3.14.a.2. The removal of the existing abandoned coal processing waste pile will result in greater protection of the safety and welfare of the public; or

3.14.a.3. The removal of the existing abandoned coal processing waste pile will result in greater protection of the environment.

3.14.b. A request for a reclamation contract for the removal of existing abandoned coal processing waste piles shall be submitted on forms prescribed by the Secretary containing the following information:

3.14.b.1. All information required by subsection 3.1 of this rule except subdivisions 3.1.c, 3.1.d, 3.1.k, 3.1.n, and 3.1.o of this section.

3.14.b.2. A public notice containing the same information required by subdivision 3.2.b of this rule, excluding paragraph 3.2.b.5. The notice shall be published in a newspaper of general circulation in the county in which the removal operation is located. The notice shall be published once and provide for a ten (10) day comment period. A certification of publication will be made a part of the permit application;

3.14.b.3. A statement in accordance with paragraph (9), subsection (a), section 9 of the Act;

3.14.b.4. A project narrative which describes:

3.14.b.4.A. Existing site conditions;

3.14.b.4.B. How the removal operation will meet the criteria of subdivision 3.14.a of this rule;

3.14.b.4.C. The design life of the operation;

3.14.b.4.D. Type and quantity of material to be removed; and

3.14.b.4.E. Permits or approvals as necessary from the appropriate environmental agencies or other agencies.

3.14.b.5. A plan for emergency procedures as required in subdivision 22.4.e of this rule.

3.14.b.6. A description and results of sampling and analysis procedures used to develop a representative assay of the physical and chemical properties of the existing abandoned coal processing material;

3.14.b.7. A revegetation plan which conforms to the requirements of subdivision 14.16.m of this rule;

3.14.b.8. A fire control plan which conforms to the requirements of subdivision 22.5.m. of this rule;

3.14.b.9. A procedure for inspections and certifications which conforms to the applicable requirements of subsection 22.6 of this rule;

3.14.b.10. A map of the scale, size and color code as described in subdivisions 3,4,a, 3.4.b, and 3.4.c of this rule which contains the following information:

3.14.b.10.A. All types of information set forth on topographical maps of the United States Geological Survey including all manmade features;

3.14.b.10.B. The area of land to be affected by the removal operation, including any coal storage and topsoil borrow and storage areas;

3.14.b.10.C. The property boundaries of all surface owners within one hundred (100) feet of any part of the proposed permit area;

3.14.b.10.D. The location and direction of flow of the drainage patterns both

within and outside the proposed permit area and the outline of each component drainage area;

3.14.b.10.E. The location of all drainage and sediment control structures and monitoring sites for water sampling and analysis;

3.14.b.10.F. A location map; and

3.14.b.10.G. A signed, notarized, and dated statement as follows: "The information contained herein is true and correct to the best of my knowledge and belief."

3.14.b.11. Cross sections plans and specifications prepared by or under the direction of a registered professional engineer as follows:

3.14.b.11.A. Cross sections and profile of the existing surface configuration and the final surface configuration of all areas to be affected by the removal operation;

3.14.b.11.B. Cross sections, plans, and specifications for all drainage and sediment control structures;

3.14.b.11.C. Cross sections, profiles and design specifications for any roads to be utilized for the removal operation;

3.14.b.11.D. Specifications for the removal of the existing coal processing refuse by either excavating the material in successive horizontal lifts with a maximum elevation differential between working benches of twelve (12) feet or excavation down the face of the existing slope from top to toe, provided that the slope is no steeper than 2H:1V, provided further that no material will be removed from the toe in advance of upper level material in a manner which reduces stability of the working face; and

3.14.b.11.E. If requested by the Secretary, a stability analysis of the existing abandoned coal processing waste pile.

3.14.b.12. Where the existing coal processing refuse pile will only be partially removed, the request will contain additional information and specifications which include:

3.14.b.12.A. Design and configuration of the final graded area which reflects that no water will be impounded above the remaining material and that final graded slopes are no steeper than 2H:1V;

3.14.b.12.B. Surface water must be diverted around or over the material by properly designed and stabilized diversion channels which have been designed using the best current technology to provide protection to the environment or the health, welfare and safety of the public. The channel shall be designed and constructed to ensure stability of the remaining material, control erosion, and minimize water infiltration into the remaining material;

3.14.b.12.C. Procedure for performing stability analysis of the remaining material to assure mass stability;

3.14.b.12.D. A plan for long range prevention of combustion of the remaining material; and

3.14.b.12.E. Baseline water quality data.

3.14.b.13. Where the existing coal processing refuse pile does impound water, or has the capacity to impound water, the application will contain the additional plans, design data, and specifications:

3.14.b.13.A. A plan for drawing down the water behind the impoundment to a level and in a manner which assures the protection of the environment and the safety of operation personnel and the public prior to any removal operations;

3.14.b.13.B. Plans, design data and specifications for the construction of a spillway which will pass the peak runoff from a 100 year, 24 hour precipitation event and how such structure will be functionally maintained throughout the life of the operation;

3.14.b.13.C. A description of

how the existing coal processing material will be removed maintaining a five (5) foot elevation differential between the breach invert elevation of the excavated embankment and the elevation of any slurry which may be impounded behind the embankment; and

3.14.b.13.D. Provide plans, design data, and specifications for the regrading of any remaining refuse material such that the regraded area blends into the surrounding drainage pattern and will not impound water.

3.14.b.14. A reclamation plan which conforms to the requirements of subdivisions 3.6.d, 3.6.e, 3.6.f, 3.6.h, 3.6.i, and 3.6.j of this rule.

3.14.c. Where a coal reprocessing operation involves disposal of coal processing refuse generated either on site or off site, the design, construction, and maintenance of the new structure will be subject to all the requirements of section 22 of this rule and will be subject to all the permitting requirements of the Act and this rule.

3.14.d. Insurance and filing fee in accordance with subsection b, section 28, of the Act.

3.14.e. Removal operations permitted under this subsection shall be subject to subdivision 22.5.l of this rule and all other applicable performance standards of the Act and the reclamation contract

3.14.f. All persons conducting removal of abandoned coal disposal piles under a reclamation contract shall have on site, a copy of the written approval for such activities issued by the Secretary.

3.15. Approved Persons.

3.15.a. Any person approved by the Secretary, unless otherwise provided in the Act and this rule, may prepare, sign, or certify permit applications, maps, plans, and design specifications or other similar materials necessary to complete an application; provided, however, that for purposes of Sections 9(a)(13) and 13(b)(10) of the Act an approved person shall be a registered professional engineer or licensed land surveyor.

3.15.b. The Secretary's approval shall be in writing and shall be granted on the basis of the following:

3.15.b.1. A resume of the persons prior experience and training relating to the preparation of permit application materials and certification of associated facilities; provided, that registered professional engineers, registered mining or civil engineers and licensed land surveyors currently registered or licensed in the State of West Virginia shall submit a copy of their registration or license in addition to a resume; and

3.15.b.2. Any person seeking an approval must demonstrate that he possesses adequate knowledge of the Act and rules and regulations and possess such other skills and qualifications as may be necessary to prepare an application and certify facilities by successfully passing an examination administered by the Secretary. Examinations will be given upon request.

3.15.c. All technical data in the application shall bear the name of the person collecting and analyzing the data, dates of collection and analysis, and description of the methodology used to collect and analyze the data. Any referenced materials not included in the application shall be made available to the Secretary upon request.

3.15.d. Technical analysis shall be planned by, or under the direction of, a professional person qualified in the subject to be analyzed.

3.16. Fish and Wildlife Resources Information.

3.16.a. Each application shall include fish and wildlife resource information for the permit area and adjacent area.

3.16.a.1. The scope and level of detail for such information shall be determined by the Secretary in consultation with State and Federal agencies with responsibilities for fish and wildlife resources and shall be sufficient to develop the protection and enhancement plan required under subdivision 3.16.b. of this subsection.

3.16.a.2. The Secretary shall provide for coordination of review of surface mining and reclamation permits where such coordination is appropriate pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.).

3.16.a.3. Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

3.16.a.3.A. Listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar state statutes;

3.16.a.3.B. Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or

3.16.a.3.C. Other species or habitats identified through agency consultation as requiring special protection under State or Federal Law to include the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 et seq. and the Bald Eagle Protection Act (16 U.S.C. 668 et seq.).

3.16.b. Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface mining and reclamation operations and how enhancement of these resources will be achieved where practicable. This description shall:

3.16.b.1. Be consistent with the requirements of section 8 of this rule;

3.16.b.2. Apply, at a minimum, to species and habitats identified under subdivision 3.16.a. of this subsection; and

3.16.b.3. Include:

3.16.b.3.A. Protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and power lines, and the monitoring of surface water quality and quantity; and

3.16.b.3.B. Enhancement measures that will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the replacement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

3.16.c. Upon request, the Secretary shall provide the resource information required under subdivision 3.16.a of this subsection and the protection and enhancement plan required under subdivision 3.16.b of this subsection to the appropriate State and/or Federal Fish and Wildlife agencies for their review. This information shall be provided within ten (10) days of receipt of the request.

3.17. Parks and Historic Lands.

3.17.a. Each permit application shall contain a description of the nature of cultural, historic and archaeological resources listed or eligible for listing on the National Register of Historic Places and known archaeological sites within the proposed permit and adjacent areas. The description shall be based on all available

information, including, but not limited to, information from the State Historic Preservation Officer and from local archaeological, historical, and cultural preservation agencies.

3.17.b. The Secretary may require the applicant to identify and evaluate important historic and archaeological resources within the proposed permit and adjacent areas that may be eligible for listing on the National Register of Historic Places, through the collection of additional information by conducting field investigations or other appropriate analysis.

3.17.c. Adverse impacts to any publicly owned park and any place listed on the National Register of Historic Places shall be prohibited unless the permit applicant has valid existing rights or unless joint agency approval is obtained in accordance with subsection 3.19 of this section. In either case all adverse impacts must be minimized.

3.17.d. The Secretary may require the applicant to protect historic or archaeological properties listed on or eligible for listing on the National Register of Historic Places through appropriate mitigation and treatment measures. Appropriate mitigation and treatment measures may be required to be taken after permit issuance provided that the required measures are completed before the properties are affected by any mining operation.

3.18. Endangered Species. When the proposed mining operation will affect threatened or endangered species of plants or animals or their critical habitats, the application shall describe control measures, management techniques, and monitoring methods to be employed in order to protect or enhance such species and habitats. Endangered or threatened species are as listed by the Director of Interior under the Endangered Species Act of 1973 (16 U.S.C. 1521 et seq.).

3.19. Effect on Historic Places and Archaeological Sites. Where the proposed surface coal mining operation will adversely affect any publicly owned park, any place listed on the national Register of Historic Places or archaeological sites, the Secretary shall transmit to the Federal, State or local agencies with jurisdiction over the park or historic place the applicable parts of the permit application, together with a request for the agency's approval or disapproval of the operation. Consideration and coordination of the permit review shall be in accordance with the National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.) and the Archaeological Resource Protection Act of 1979 (16 U.S.C. 470 et seq.). The agency shall have thirty (30) days from receipt of the request within which to respond unless an additional thirty (30) day extension is requested and granted by the Secretary. A permit for such operation shall have joint approval of all affected agencies. Failure of the agency to respond to the Secretary's request within the prescribed time period shall constitute approval.

3.20. Prime Farmlands. Prior to issuing a permit which involves prime farmland, the Secretary shall consult with the U.S. Soil Conservation Service. On the basis of this consultation and other information available to him, the Secretary shall make a written finding that:

3.20.a. The approved postmining land use will be cropland;

3.20.b. The permit incorporates the prime farmland reconstruction plan as a permit condition;

3.20.c. The applicant has the technological capability to restore the land within a reasonable time period to conditions capable of producing levels of yield equivalent to or higher than those of non-mined prime farmland in the surrounding area under equivalent levels of management; and

3.20.d. Mining will be conducted in accordance with prime farmland performance standards and all other applicable environmental protection performance standards of the Act and this rule.

3.21. Prohibitions and Limitations on Mining.

Upon receipt of a complete application for a surface mining permit, the Secretary shall review the application to determine whether the surface coal mining operation is limited or prohibited under section 22 of the Act including any study rivers or corridors thereof as established in any official guidelines issued pursuant to the Wild and Scenic Rivers Act.

3.21.a. If the Secretary is unable to determine whether the proposed operation is located within the boundaries of any of the lands described in paragraph (1), subsection (d), section 22 of the Act, or closer than the limits provided in paragraph (4), subsection (d), section 22 of the Act, the Secretary shall transmit a copy of the relevant portions of the permit application to the appropriate Federal, State or local government agency for a determination or clarification of the relevant boundaries or distances. The agency shall make such determinations within thirty (30) days of receipt of the Secretary's request. The Secretary may extend the response period by thirty (30) days upon written request.

3.21.b. When the Secretary receives any request for determination of valid existing rights on lands within the area of jurisdiction of the National Park Service or the U. S. Fish and Wildlife Service, a notification shall be made to the appropriate agency, and they shall have thirty (30) days in which to respond. The Secretary may, upon written request, extend the response period by an additional thirty (30) days.

3.21.c. Where the proposed operation would include Federal lands within the boundaries of any national forest when the applicant seeks a determination that mining is permissible under paragraph (5), subsection (d), section 22 of the Act, the applicant shall submit a permit application to the field office of the Federal Office of Surface Mine Reclamation and Enforcement with a request that such determinations be made.

3.22. Hydrologic Information.

3.22.a. PHC. Each permit application shall, in addition to the requirements of the Act, contain a statement describing the probable hydrologic consequences (PHC) of the proposed mining operation, with respect to the hydrologic balance, on both the permit area and adjacent areas. The statement shall be based on base line information developed from sampling and analysis of surface and groundwater at monitoring sites established both on the permit area and adjacent areas. Sampling and analysis shall be performed in accordance with methods approved by the Office of Surface Mining Reclamation and Enforcement. The longitude, latitude and elevation shall be given for each of the monitoring sites. Mathematical modeling techniques may be used to aid in the development of the required information. The PHC determination shall include findings on: whether adverse impacts may occur to the hydrologic balance; whether acid-forming or toxic-forming materials are present that could result in the contamination of surface or ground-water, and whether the proposed operation may proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for domestic, agricultural, industrial, or other legitimate purpose; and what impact the proposed operation will have on:

3.22.a.1. Sediment yield from the disturbed area;

3.22.a.2. Acidity, total suspended and dissolved solids, and other important water quality parameters;

3.22.a.3. Flooding or stream flow alteration;

3.22.a.4. Ground-water and surface-water availability; and

3.22.a.5. Other characteristics as required by the Secretary.

3.22.b. Base Line Ground Water Information. Each application for a permit shall contain:

3.22.b.1. The location, ownership, and use (if any) of known existing wells, springs, and other groundwater resources including

discharges from other active or abandoned mines on the proposed permit area and adjacent areas in sufficient numbers to allow the applicant to make a reasonable approximation of the base line groundwater conditions and use;

3.22.b.2. Water quality analysis including, at a minimum, total dissolved solids, alkalinity, acidity, sulfates, specific conductance, pH, total iron and total manganese. Correlation data from other monitoring sites within the general area of the proposed mining operations may be accepted; provided, that a limited number of validation samples from the permit area may be required; provided further, that in areas where prior mining experience has shown acid production to be a possibility, or in acid producing seams in areas with no prior mining history, site specific water sampling and analysis data shall be required;

3.22.b.3. For significant aquifers, groundwater quantity descriptions including discharge rates or usage and depth to water under seasonal conditions in each water-bearing stratum above the coal seam and each potentially impacted stratum below the coal seam. Where deemed appropriate and feasible by the Secretary the operator may calculate water usage for water status discharge determinations; and

3.22.b.4. If the determination of the probable hydrologic consequences (PHC) indicates that a currently used or significant groundwater resources is likely to be contaminated, diminished, or interrupted, additional information shall be provided as necessary to fully evaluate such probable hydrologic consequences as water availability and suitability for both the premining and postmining land use in order to plan remedial and reclamation activities such as alternative water sources.

3.22.c. Base Line Surface Water Information. Each application for a permit shall contain:

3.22.c.1. The name, location, ownership, and description of all surface water bodies on the permit area and adjacent areas;

3.22.c.2. Water quality descriptions including information on total suspended solids, total dissolved solids, specific conductance, pH, acidity, alkalinity, sulfates, total iron and total manganese sufficient to demonstrate seasonal variations; provided, that correlation data from other monitoring which does not include one or more of the above parameters may be accepted; provided further, that a limited number of validation samples may be required. In areas where prior mining experience has shown acid production to be a possibility, or in acid producing seams in areas with no prior mining history, site specific water sampling and analysis data shall be required;

3.22.c.3. Water quantity descriptions including information on seasonal flow rates, variation, and usage; and

3.22.c.4. If the determination of the probable hydrologic consequences (PHC) indicates that a currently used or significant surface water resource (including all lightly buffered streams) is likely to be contaminated, diminished, or interrupted, additional information shall be provided on the flood flows, base flows, and other characteristics or information as necessary to fully evaluate such probable hydrologic consequences as water availability and suitability for both the premining and postmining land use in order to plan remedial and reclamation activities such as alternative water sources.

3.22.d. The applicant shall submit with the application all available data and analysis described in subdivisions 3.22.b and 3.22.c of this subsection for use in preparing the cumulative hydrologic impact assessment (CHIA).

3.22.e. The Secretary shall perform a separate CHIA for the cumulative impact area of each permit application. This evaluation shall be sufficient to determine whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. Material damage to the hydrologic balance outside the permit areas means means any long term or permanent change in the hydrologic

balance caused by surface mining operation(s) which has a significant adverse impact on the capability of the affected water resource(s) to support existing conditions and uses.

3.22.f. Each permit application shall contain a hydrologic reclamation plan. The plan shall be specific to the local hydrologic conditions. It shall contain in the form of maps and descriptions the steps to be taken during mining and reclamation through bond release to minimize disturbances to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; to meet applicable Federal and State water quality laws and regulations; and to protect the rights of present water users. The plan shall include the measures to be taken to:

3.22.f.1. Avoid acid or toxic drainage;

3.22.f.2. Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow;

3.22.f.3. Provide water treatment facilities when needed;

3.22.f.4. Control drainage;

3.22.f.5. Restore, protect, or replace water supply of present water users in accordance with section 24 of the Act. The plan shall specifically address the potential adverse hydrologic consequences identified in the PHC determination and shall include preventive and remedial measures; and

3.22.f.6. Restore approximate premining recharge capacity provided that underground mining operations are exempt from this requirement.

3.22.g. Each application for a permit shall contain a surface water monitoring plans based on the PHC determination and base line hydrologic and geologic information. These plans shall identify monitoring site locations, quantity and quality parameters, sampling frequency, and describe how the data will be used to determine the impact of the operation on the hydrologic balance both on the permit area and adjacent areas. Monitoring sites shall be located in the surface water bodies such as streams, lakes, and impoundments that are potentially impacted or into which water will be discharged at both upstream and downstream locations from the discharge. Monitoring parameters shall include but are not limited to total dissolved solids or specific conductance corrected at 25°C, total suspended solids, flow measurements, pH, acidity, alkalinity, total iron and total manganese. The selection of these parameters must be based on current and approved postmining land uses and all hydrologic balance protection objectives.

3.22.h. Each application for a permit shall contain a ground water monitoring plan for all significant groundwater resources provided that monitoring shall not be required if the applicant can demonstrate that the aquifer is not one which significantly ensures the hydrologic balance within the cumulative impact area as provided in subdivision 14.7.c of this rule. The decision of need will be based on the PHC determination and base line hydrologic and geologic information gathered both on and off the mine site. These plans shall identify monitoring site locations (latitude, longitude, and ground level elevations), quantity and quality parameters to be monitored, sampling frequency and duration, and describe how the data will be used to determine the impact of the operation on the hydrologic balance both on and off the mine site. Monitoring parameters shall include, but are not limited to, total dissolved solids or specific conductance corrected at 25°C, pH, acidity, alkalinity, total iron, total manganese, and water levels or discharge rates. The selection of these parameters must be based on current and approved postmining land uses and all hydrologic balance protection objectives.

3.22.i. If the PHC indicates that adverse impact may occur to the hydrologic balance or that acid forming or toxic forming material is present that may result in contamination of surface or groundwater supplies, then additional information supplemental to that required in subdivisions

3.22.b and 3.22.c. of this subsection shall be provided to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities.

3.23. Geology. Each application for a permit shall contain the following geologic and related information:

3.23.a. Geologic cross sections, maps or plans of the proposed permit area and adjacent areas, prepared by or under the direction of and certified by a person approved by the Secretary. When required by the Secretary, test borings or core samplings shall be analyzed to determine the following information:

3.23.a.1. The locations (latitude and longitude) and elevations of all bore holes;

3.23.a.2. The nature and depth of the various strata or overburden including geologic formation names and/or geologic members;

3.23.a.3. The elevation location of subsurface water, if encountered, and its quality;

3.23.a.4. The nature and thickness of any coal or rider seams above the seam to be mined;

3.23.a.5. The nature of the stratum immediately beneath the coal seam to be mined;

3.23.a.6. All mineral crop lines and the strike and dip of the coal to be mined, within the area of land to be affected;

3.23.a.7. Existing or previous surface mining limits; and

3.23.a.8. The location and extent of known workings of any underground mines, including mine openings to the surface.

3.23.b. Information concerning the areal and structural geology of both the proposed permit and adjacent areas, down to the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer which may be adversely impacted below the lowest coal seam to be mined. Areal geology may include information such as mapped outcrop locations shown on a 7½ minute United State Geological Survey (U.S.G.S.) topographic map, aerial photographs, and published geologic reports for the area of concern. Structural geology may include mapped lineament traces from aerial photography or topographic maps and any published structural geologic reports for the area of concern;

3.23.c. Areal and vertical distribution of aquifers with seasonal differences in head and the name(s) of the stratum (or strata) in which the water is found;

3.23.d. Location and depth of all oil and gas wells within the proposed permit area for both surface and underground mines;

3.23.e. For underground mining operations, indicate whether or not there will be a gravity discharge; and

3.23.f. A statement of the result of test borings or core samples from the permit and adjacent areas including:

3.23.f.1. The results of test borings including the lithologic logs of the drill holes displaying the physical properties and thickness of each stratum encountered which the applicant has made at the area to be covered by the permit, or other equivalent information and data in a form satisfactory to the Secretary including the structural geology, thickness of the coal seam to be mined, location of subsurface water, if encountered, and an analysis of the chemical and physical properties, including but not limited to the sulfur content of any coal seam, the chemical analysis of potentially acid or toxic-forming sections of the overburden, and the chemical analysis of the stratum lying immediately underneath the coal to be mined: Provided, that information which pertains only to the analysis of the chemical and physical properties of the coal, except information regarding such mineral or elemental contents which are potentially toxic in the environment, shall be kept confidential and not a matter of public record;

3.23.f.2. Premining overburden sampling and analysis or previous experience and correlation data, shall be made a part of each permit application for all acid-producing seams. Overburden sampling and analysis is to be performed in accordance with standard procedures set forth in Environmental Protection Agency Manual No. 600/2-78-054 (Field and Laboratory Methods Applicable to Overburdens and Mine Soils) or other methods approved by the Secretary;

3.23.f.3. For standard room and pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined;

3.23.f.4. Cross sectional or areal maps illustrating faults, crop lines, dip/strike, synclines, anticlines and other known geologic structural features which have a bearing on the extraction of the coal and/or the hydrologic regime. The maps shall be accompanied by a detailed description of the illustrated data including a brief description of the degree of fracturing and weathering noted during the exploration drilling if it is believed to have a potential influence on the extraction of the coal and/or the hydrologic regime;

3.23.f.5. An explanation of the anticipated potential impacts of the proposed mining operation on the hydrology and geology of the area; and

3.23.f.6. An applicant may be granted a waiver for the requirements of paragraphs 3.23.f.1 and 3.23.f.3 of this subdivision only after the Secretary finds in writing that the collection and analysis of such data is unnecessary because other equivalent information exists and is available to the Secretary; provided, that in areas where mining history has shown acid production to be a possibility, or in acid producing seams in areas with no prior mining history, site specific overburden sampling and analysis data shall be required.

3.24. Protection of Adjacent Operations. Surface mining activities shall be designed to protect disturbed surface areas, including spoil disposal sites, so as not to endanger any present or future operations of either surface or underground mining activities.

3.25. Transfer, Reinstatement, Assignment, or Sale of Permit Rights and Obtaining Approval; Sale, Conveyance or Assumption of Control or Ownership of an Operation.

3.25.a. The Secretary may grant written approval of the transfer, reinstatement, assignment, or sale of a permit under the following terms and conditions:

3.25.a.1. The applicant shall affirmatively demonstrate to the Secretary that a bond in the full amount of that required for the permit will be kept in full force and effect before, during, and after the transfer, assignment, or sale.

3.25.a.2. The application for transfer, reinstatement, assignment, or sale, shall set forth on forms prescribed by the Secretary, the information required in paragraphs 1. through 6., subsection a., section 9; and paragraph 9. subsection a. of section 9, subsections d. and f. of section 9; paragraph 10., subsection a. of section 10; and paragraph 5. subsection b. of section 18 of the Act and subdivisions 3.1.a, 3.1.b, 3.1.c, 3.1.d, 3.1.i, 3.1.j, and 3.1.k of this rule.

3.25.a.3. The applicant for transfer, reinstatement, assignment, or sale of a permit shall, upon filing of the application with the Secretary, give notice of the filing in a newspaper of general circulation in the locality of the operation. The notice shall be in the form of a legal advertisement containing information as set forth on forms provided by the Secretary, the name and address of the original permittee and the permit number and shall provide for a thirty (30) day comment period. Any person whose interests are or may be adversely affected, may submit written comments to the Secretary within thirty (30) days of the date of publication.

3.25.a.4. Approval of the application for transfer, reinstatement, assignment, or sale of a

permit may be granted upon a written finding by the Secretary that the applicant is eligible to receive a permit in accordance with subdivisions 3.32.b, 3.32.c and paragraph 3.32.d.7 of this rule, has submitted a bond or other guarantee or will be covered by the bond of the original permittee, and will conduct mining operations in accordance with the purposes and intent of the Act, this rule, and the terms and conditions of the permit. Such findings will be based on information set forth in the application for transfer, assignment, or sale and any other information made available to the Secretary. Such approval may be granted in advance of the close of the public comment period Provided; That where information is made available to the Secretary as a result of public comment that would preclude approval, such approval shall be immediately withdrawn.

3.25.a.5. The Secretary shall notify the permittee, the successor, all commentors, and the Charleston field office of the Office of Surface Mining Reclamation and Enforcement of his findings.

3.25.a.6. The successor shall immediately notify the Secretary upon consummation of the transfer, assignment, or sale.

3.25.a.7. Each application for a transfer, reinstatement, assignment, or sale of a permit shall contain a sworn statement as follows: "The information contained in this application is true and correct to the best of my knowledge and belief." Such statement shall be signed by an accountable official of the applicant and shall be notarized.

3.25.b. Any person who, through whatever means, assumes ownership or control directly or indirectly of a surface mining and reclamation operation shall become responsible for the correction of all outstanding unabated violations. The payment of all delinquent civil penalties and unpaid reclamation fees for the operation remain the responsibility of the prior permittee, unless it is determined by the Secretary pursuant to subsection 2.85 of this rule that the person assuming control owned or controlled the operation at the time such penalties or fees were incurred. As a condition of reinstatement, the Secretary may require a modification to the mining and reclamation plan.

3.25.c. A permittee who wishes to assign the mining operation through an agreement, contract, job contract, etc., to another person, but retain the permit must:

3.25.c.1. Request prior written approval of such assignment on forms prescribed by the Secretary. Under this arrangement the permittee remains subject to all provisions of the Act, this rule, and the terms and conditions of the permit;

3.25.c.2. Advertise the application pursuant to paragraph 3.25.a..3 of. this subsection; and

3.25.c.3. Provide, with respect to the assignee, the ownership and control information required by subdivisions 3.1,a, 3.1.b, 3.1.c, 3.1.d, 3.1.i, 3.1.j, and 3.1.k of this rule.

3.25.d. Each assignee who will function as an operator pursuant to the provisions of subdivision 3.25.c of this subsection, shall be subject to the eligibility requirements of subdivisions 3.32.c and 3.32.d of this rule.

3.25.e. The sale or other conveyance of a surface coal mining and reclamation operation which has outstanding violation(s), outstanding civil penalties, or reclamation fees, or the sale or other conveyance of any interest in any entity with outstanding violations, penalties, or fees, or the sale or conveyance of an entity which owns or controls an entity, or is owned or controlled by an entity which owns or controls a surface coal mining and reclamation operation with an outstanding violation, penalties or fees shall not in any way affect the application of the permit block sanction set forth in this rule.

3.26. Ownership and Control Changes.

3.26.a. All changes including name changes, replacements and additions to the ownership and control data relating to a permittee

or assignee who will function as an operator pursuant to the provisions of subdivision 3.25.c of this subsection shall be reported to the Secretary. In the case of immediate owners and controllers of the permittee or the operator and/or name change, the change must be reported within thirty (30) days of the change. In all other cases, the change must be reported within one hundred twenty (120) days of the change. The Secretary will approve the appropriate permit modifications in the following situations:

3.26.a.1. If the notification is made within the prescribed periods;

3.26.a.2. The notification is made on forms prescribed for this purpose;

3.26.a.3. The change is not a Transfer, Assignment, or Sale of Rights as defined in subsection 2.131 of this rule;

3.26.a.4. The information required by subdivisions 3.1.c, 3.1.d, 3.1.i, 3.1.j, and 3.1.k of this rule is supplied relating to all newly identified owners and controllers;

3.26.a.5. Any newly-identified owner or controller is not prohibited from being issued a surface coal mining and reclamation permit. In the event that a newly-identified owner or controller is prohibited from being issued a surface coal mining and reclamation permit, the Secretary shall, notwithstanding the fact that the person became an owner or controller subsequent to the issuance of any affected permit, declare all affected permits to be improvidently issued and take action pursuant to subdivisions 3.34.c, 3.34.d, and 3.34.e of this section; and

3.26.a.6. In the event that a permittee or operator has incurred no changes in its ownership and control information and therefore has not been obligated to file a report within any consecutive twelve-month period, that permittee or operator is required to notify the Secretary in writing that no changes to the information required by subdivisions 3.1.b, 3.1.c, 3.1.d, and 3.1.i of this section have occurred.

3.26.b. The applicant has the burden of proving that any change in ownership or control is not a Transfer, Assignment, or Sale of Rights as defined in subsection 2.131 of this rule.

3.26.c. The change may require public notice.

3.27. Permit Renewals and Permit Extensions.

All active surface mining operations shall be subject to the renewal requirements and provisions for issuance of a renewal discussed in section 19 of the Act: Provided, That the Secretary shall waive the requirements for renewal if the permittee certifies in writing that all coal extraction is completed, that all backfilling and regrading will be completed and reclamation activities are ongoing.

Those operations which have been granted inactive status in accordance with subsection 14.11 of this rule shall also be subject to the renewal requirements of section 19 of the Act.

Applications for renewal shall be filed on forms provided by the Secretary and shall contain at a minimum the following information:

3.27.a.1. The name and address of the permittee, location of the permit area including the county, the magisterial district, the nearest post office and the permit number;

3.27.a.2. A statement that the terms and conditions of the preplan are being satisfactorily met;

3.27.a.3. A statement that the operation is in compliance with the applicable environmental protection standards of the Act and this rule;

3.27.a.4. A statement that the bond and insurance policy for the operation will continue in effect;

3.27.a.5. A progress map of an approved size and scale as the proposal maps for

all operations except those operations which have obtained a bond release or those operations with no disturbance and which have not started into operation;

3.27.a.6. Each application for a permit renewal shall contain a sworn statement as follows: "The information contained in this application is true and correct to the best of my knowledge and belief." Such statement shall be signed by an accountable official of the applicant and shall be notarized; and

3.27.a.7. A copy of the proposed newspaper advertisement in accordance with subsection (a) section 20 of the Act and subsection 3.2 of this rule.

3.27.b. Each application for renewal of a permit shall be administratively complete prior to public notice. The Secretary shall notify the appropriate agencies of the application for renewal as required in subsection (a) of section 20 of the Act.

3.27.c. Any person having an interest which is or may be adversely affected by the decision on the application, or an officer or a head of a Federal, State, or local government agency, may request in writing that the Secretary hold an informal conference on the application for a permit renewal.

3.27.c.1. The request shall:

3.27.c.1.A. Briefly summarize the issues to be raised by the requestor at the conference;

3.27.c.1.B. State whether the requestor desires to have the conference conducted in the locality of the proposed operation; and

3.27.c.1.C. Be filed with the Secretary no later than thirty (30) days after the last publication of the newspaper advertisement required under paragraph 3.27.a.7. of this subdivision.

3.27.c.2. Except as provided in paragraph 3.27.c.3 of this subsection, if any informal conference is requested the Secretary shall hold an informal conference within a reasonable time following the receipt of the request. The informal conference shall be conducted as follows:

3.27.c.2.A. If requested, it shall be held in the locality of the proposed surface mining and reclamation operation.

3.27.c.2.B. The date, time, and location of the informal conference shall be sent to the applicant and other parties to the conference and advertised by the Secretary in a newspaper of general circulation in the locality of the proposed surface mining and reclamation operation at least two (2) weeks before the scheduled conference.

3.27.c.2.C. If requested in writing by a conference requestor at a reasonable time before the conference, the Secretary may arrange with the applicant to grant parties to the conference access to the proposed permit area and, to the extent that the applicant has the right to grant access to it, to the adjacent area prior to the established date of the conference for the purpose of gathering information relevant to the conference.

3.27.c.2.D. The conference shall be conducted by the Secretary, who may accept oral or written statements and any other relevant information from any party to the conference. An electronic or stenographic record shall be made of the conference, unless waived by all the parties. The record shall be maintained and shall be accessible to the parties of the conference until final release of the applicant's bond or other equivalent guarantee.

3.27.c.3. If all parties requesting the informal conference withdraw their request before the conference is held, the informal conference may be canceled.

3.27.d. A time extension of sixty (60) days may be granted by the Secretary for permit renewal which has been submitted but is logistically impractical to process before the expiration date.

3.27.e. Extensions of time for a permit as provided in subsection 3, section 8 of the Act shall be specifically set forth in a written approval and made part of the permit. Such extension shall be made public by the Secretary.

3.27.f. Extensions of the initial permit term in excess of five (5) years as provided in subsection (1) of section 8 of the Act may be granted upon written request by the applicant. Such request shall be accompanied by a written verification. Any permit extension which is approved under this subdivision shall be reviewed by the Secretary at its mid-term or every five (5) years, whichever is more frequent.

3.28. Permit Revisions.

3.28.a. Each request for a permit revision will be submitted on forms prescribed by the Secretary which shall be signed by the accountable official of the applicant and shall be notarized.

3.28.b. Each application for a permit revision shall be subject to review and approval by the Secretary. Each application shall be reviewed by the Secretary to determine if an updated probable hydrologic consequences determination or cumulative hydrologic impact assessment is required. The Secretary shall make a determination, on the basis of information provided in the permit revision application, whether or not the revision is of a significant or non-significant nature. The following criteria shall provide guidance for making such a determination.

3.28.b.1. Where the permit revision constitutes a significant departure from the terms and conditions of the existing permit which may result in a significant impact in any of the following areas, it shall be deemed to be a significant revision and be subject to the public notice requirements of subdivisions 3.2.a and 3.2.b of this rule:

3.28.b.1.A. The health, safety, or welfare of the public;

3.28.b.1.B. The hydrologic balance in the area of operation;

3.28.b.1.C. The postmining land use;

3.28.b.1.D. Areas prohibited from mining pursuant to the provisions of subsection (d) section 22 of the Act; and

3.28.b.1.E. An individual's legal right to receive notice, as prescribed by the provisions of this rule.

3.28.b.2. Where the permit revision constitutes only an insignificant departure from the terms and conditions of the approved permit, it shall be deemed to be a non-significant revision requiring no public notice.

3.28.c. The Secretary may require reasonable revisions to surface mining permits or prospecting approvals where such revisions are necessary to assure compliance with the Act and this rule; provided, that the Secretary shall notify the permittee that such revisions are necessary and shall provide a reasonable time for compliance.

3.29. Incidental Boundary Revisions (IBRs).

3.29.a. Incidental Boundary Revisions (IBRs) shall be limited to minor shifts or extensions of the permit boundary into non-coal areas or areas where any coal extraction is incidental to or of only secondary consideration to the intended purpose of the IBR or where it has been demonstrated to the satisfaction of the Secretary that limited coal removal on areas immediately adjacent to the existing permit is the only practical alternative to recovery of unanticipated reserves or necessary to enhance reclamation efforts or environmental protection. IBRs shall also include the deletion of bonded acreage which is overbonded by another valid permit and for which full liability is assumed in writing by the successive permittee. Incidental Boundary Revisions shall not be granted for any prospecting operations, or to abate a violation where encroachment beyond the permit boundary

is involved, unless an equal amount of acreage covered under the IBR for encroachment is deleted from the permitted area and transferred to the encroachment area.

3.29.b. General. Applications for IBRs shall be as follows:

3.29.b.1. The application shall be filed on forms provided by the Secretary.

3.29.b.2. For purposes of surface mining operations, the maximum total acreage to be permitted under one or more IBR(s) shall not exceed twenty (20) percent of the original permitted acreage or a maximum of fifty (50) acres, whichever is less, throughout the life of the permit. Acreage limitation for IBR(s) on underground mining operations shall be limited to one hundred fifty (150) percent of the original permitted acreage or a maximum of fifty (50) acres, whichever is less, throughout the life of the permit; Provided, That the Secretary may grant a waiver specifying larger acre limits where the applicant demonstrates that the nature and complexity of the operation clearly requires more than fifty (50) acres for additional facilities to include but not be limited to site development, air shafts, fan ways, vent holes, roads, staging areas, etc.

3.29.b.3. The application shall be accompanied by adequate bond.

3.29.b.4. The application shall be accompanied by a map showing the areas covered by the IBR.

3.29.b.5. The application shall be accompanied by a reclamation plan for the area of the IBR which is consistent with the existing reclamation plan.

3.29.b.6. The application shall be subject to review and approval by the Secretary.

3.29.c. An IBR may not be implemented by any operator until written approval of the Secretary has been granted.

3.29.d. The Secretary shall make the following findings prior to approval of an IBR:

3.29.d.1. The IBR does not constitute a change in the postmining land use.

3.29.d.2. The IBR will only involve lands for which the approved PHC is applicable.

3.29.d.3. The IBR does not constitute a change in the method of mining.

3.29.d.4. The IBR will not result in adverse environmental impacts of a larger scope or different nature from those described in the approved permit.

3.29.d.5. IBR will facilitate the orderly and continuous conduct of mining and reclamation operations.

3.29.d.6. Except for underground operations, an area permitted under an IBR must be contiguous to the original permitted area.

3.29.e. Upon review of an application for an Incidental Boundary Revision, the Secretary may require an advertisement to be published which provides for a ten (10) day public comment period. The advertisement shall contain such information as set forth on a form prescribed by the Secretary.

3.30. Variance.

3.30.a. Approximate Original Contour. All permits approved with variances from approximate original contour shall be reviewed by the Secretary two and one-half (2 ½) years after issuance to determine whether or not the operation is proceeding in accordance with the terms of the variance.

3.30.b. Contemporaneous Reclamation. The Secretary may grant a request for variance from contemporaneous reclamation in accordance with paragraph (16), subsection (b), section 13 of the Act, if such request is made a part of the surface mining permit application or a subsequent revision to a permit, and if the area reserved for the underground mining operation is permitted

under a separate permit. If the underground mining operation is not activated within three (3) years of the date of issuance of the permit, the permit shall terminate, unless extended as provided for in subsection (3), section 8 of the Act. Upon termination of the permit, the mine site shall be reclaimed in accordance with the Act, this rule, and the reclamation plan approved in the permit.

3.30.c. Any person desiring a variance under subdivision 3.30.b of this subsection shall file with the Secretary complete applications for both the surface mining activities and underground mining activities which are to be combined. The reclamation and operation plans for these permits shall contain appropriate narratives, maps, and plans which:

3.30.c.1. Show why the proposed underground mining activities are necessary or desirable to assure maximum practical recovery of the coal;

3.30.c.2. Show how multiple future disturbances of surface lands or waters will be avoided;

3.30.c.3. Identify the specific surface areas for which a variance is sought and the sections of the Act or this rule from which a variance is being sought;

3.30.c.4. Show how the activities will comply with subsections 3.24 and 14.13 of this rule;

3.30.c.5. Show why the variance sought is necessary for the implementation of the proposed underground mining activities;

3.30.c.6. Provide an assessment of the adverse environmental consequences and damages, if any, that will result if the reclamation of surface mining activities is delayed; and

3.30.c.7. Show how offsite storage of spoil will be conducted to comply with the requirements of the Act and subsection 14.14 of this rule.

3.30.d. Issuance of Permit. A permit incorporating a variance granted under subdivision 3.30.b. of this subsection may be issued by the Secretary if it is first determined, in writing, upon the basis of a complete application filed in accordance with this subsection, that:

3.30.d.1. The applicant has presented, as part of the permit application, specific, feasible plans for the proposed underground mining activities;

3.30.d.2. The proposed underground mining activities are necessary or desirable to assure maximum practical recovery of the mineral resources and will avoid multiple future disturbances of surface land or waters;

3.30.d.3. The applicant has satisfactorily demonstrated that the applications for the surface mining activities and underground mining activities conform to the requirements of the Act and this rule and that all other permits necessary for the underground mining activities have been issued by the appropriate authority;

3.30.d.4. The surface area of surface mining activities proposed for the variance has been shown by the applicant to be necessary for implementing the proposed underground mining activities;

3.30.d.5. No substantial adverse environmental damage, either onsite or offsite, will result from the delay in completion of reclamation;

3.30.d.6. The operations will, insofar as a variance is authorized, be conducted in compliance with the requirements of subsections 3.24 and 14.13 of this rule;

3.30.d.7. Provisions for offsite storage of spoil will comply with the requirements of the Act and subsection 14.14 of this rule;

3.30.d.8. Liability under the bond required to be filed by the applicant will be for the duration of the underground mining activities and

until all requirements of the Act and this rule have been complied with;

3.30.d.9. The permit for the surface mining activities contains specific conditions:

3.30.d.9.A. Delineating the particular surface areas for which a variance is authorized;

3.30.d.9.B. Identifying the applicable provisions of the Act and this rule; and

3.30.d.9.C. Providing a detailed schedule for compliance with the provisions of this subsection.

3.30.e. Variances granted under subdivision 3.30.b of this subsection shall be reviewed by the Secretary no later than three (3) years from the dates of issuance of the permit and any permit renewals.

3.31. Federal, State, County, Municipal, or Other Local Government-Financed Highway or Other Construction Exemption.

3.31.a. To qualify as a Federal, State, County, Municipal or other local government-financed highway or other construction project, the construction must be funded fifty percent (50%) or more by the relevant government agency and once the exemption is granted, the person doing the construction must have on site available for inspection, the following:

3.31.a.1. Descriptions of the project to include, but not be limited to, the exact location of the limits of all of the area to be affected by the construction; and

3.31.a.2. Authorization from the agency or agencies providing the funding and, if different, the agency or agencies responsible for the construction, giving permission to proceed and the amount of funding provided as a percent of the total project cost.

3.31.b. The extraction of coal shall be limited to areas within the highway right-of-way or within the boundaries of the area directly affected by other construction activities.

3.31.c. Funding less than fifty percent (50%) may qualify if the construction is undertaken as part of an approved reclamation project in accordance with WV Code §22-3-28.

3.32. Findings - Permit Issuance.

3.32.a. The Secretary shall review an application for a permit, a permit revision, or a permit renewal, written comments and objections submitted relative to the application, records of any informal conference or hearing held relative to the application, and issue a written decision either granting, requiring modification of, or denying the application. If an informal conference is held, the decision shall be made within thirty (30) days of the close of the conference, unless a later time is necessary to provide an opportunity for an appeal. The applicant for a permit or revision of a permit shall have the burden of establishing that his application is in compliance with all the requirements of the Act and this rule.

3.32.b. Based on the information provided by applicants for surface mining permits pursuant to subdivisions 3.1.a, 3.1.b, 3.1.c, 3.1.d, 3.1.i, 3.1.j, and 3.1.k of this rule and any other reasonably available information, the Secretary will compile and maintain an accurate and up-to-date computerized listing of all persons who own or control surface mining operations with outstanding unabated cessation orders, delinquent civil penalties, delinquent reclamation fees, and bond forfeitures of record in the state since May 3, 1978. The listing will include, to the extent reasonably possible, all owners and controllers of the violator(s), described in subdivision 3.1.c of this rule. The Secretary will make reasonable efforts to determine the owners and controllers of the permittee, the operator if different from the permittee, and the lessor or mineral owner, where a contract mining situation exists. The procedures and listings described in this subsection do not apply to notices of violations and are subject to rights of rebuttable presumption. The Secretary is not obligated to use this information to conduct a

systematic review of all existing permits for the purpose of identifying and subsequently suspending those, if any, which may have been improvidently issued.

The Secretary will systematically prioritize the data collection and data compilation effort required by this paragraph on the ownership and control of violators in the following order: bond forfeitures, outstanding unabated cessation orders, delinquent civil penalties, and delinquent reclamation fees.

To accomplish this objective, the Secretary will utilize the data in the Federal Applicant Violator System, the Environmental Resources Information Network, the Mine Safety and Health Administration R.31 Data Base, and the Energy Information Administration Data Base together with such other information as may be readily available. In addition, the Secretary will make reasonable efforts to identify and include the Mine Safety and Health Administration identification number for sites on the violation listing.

The Secretary will, using the computerized data bases, review prior to permit issuance all applications received after the effective date of this rule and make all reasonable efforts to determine at a minimum in each case whether outstanding violations (except for notices of violations), unabated cessation orders, delinquent civil penalties, and/or bond forfeitures exist on the part of the applicant, the owners or controllers of the operator, and the lessor and entities controlled by the lessor, (if the lessor retains rights to the coal after extraction) and, if so, withhold approval of the application until all violations are abated or otherwise resolved in accordance with the requirements of the Act and this rule.

Where the information in the subject data bases is incomplete and where the information is not available or has not been made available to the Secretary prior to issuance of the permit, the Secretary shall not be held in violation of any of the requirements of the Act and this rule. However, where it is later determined that permits were improvidently issued as a result of inadequate information in the subject data bases or other sources available at the time the permit is issued, the Secretary shall initiate the procedures set forth in subsection 3.34 of this section.

3.32.c. Based on reasonably available information concerning Federal and State failure-to-abate cessation orders, unabated Federal and State imminent harm cessation orders, delinquent civil penalties, bond forfeitures where violations upon which the forfeitures were based have not been corrected, delinquent abandoned mine reclamation fees, and unabated violations of Federal and State laws, rules and regulations pertaining to air or water environmental protection incurred in connection with any surface mining operation, the Secretary shall not issue the permit if any surface mining and reclamation operations owned or controlled by either the applicant or by any person who owns or controls the applicant is currently in violation of the Act or any other law, rule or regulation referred to in this paragraph. In the absence of a failure-to-abate cessation order, the Secretary may presume that a notice of violation has been or is being corrected to the satisfaction of the agency with jurisdiction over the violation, except where evidence to the contrary is set forth in the permit application, or where the notice of violation is issued for nonpayment of abandoned mine reclamation fees or civil penalties. If a current violation exists, the Secretary shall require the applicant, or person who owns or controls the applicant, before the issuance of the permit, to either:

3.32.c.1. Submit proof that the current violation has been or is in the process of being corrected to the satisfaction of the agency that has jurisdiction over the violation; or

3.32.c.2. Establish that the applicant or any person owned or controlled by either the applicant or any person who owns or controls the applicant, has filed and is presently pursuing, in good faith, a direct administrative or judicial appeal to contest the validity of the current violation. If the initial judicial review authority either denies a stay applied for in the appeal or affirms the violation, then the applicant shall within thirty (30) days submit the proof required under paragraph 3.32.c.1 of this subdivision.

3.32.c.3. Any permit that is issued on the basis of proof submitted under paragraph 3.32.c.1. of this subdivision that a violation is in the process of being corrected, or pending the outcome of an appeal described in paragraph 3.32.c.2 of this subdivision, shall be conditionally issued.

3.32.c.4. If the Secretary makes a finding that the applicant, or any person who owns or controls the applicant, or the operator specified in the application, controls or has controlled surface coal mining and reclamation operations with a demonstrated pattern of willful violations of the Act and this rule of such nature and duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the Act, or this rule, the permit shall not be granted. Before such a finding becomes final, the applicant or operator shall be afforded an opportunity for an adjudicatory hearing.

3.32.d. No permit application or application for a significant revision of a permit shall be approved unless the application affirmatively demonstrates and the Secretary finds, in writing, on the basis of information set forth in the application or from information otherwise available that is documented in the approval, the following:

3.32.d.1. The application is complete and accurate and the applicant has complied with all requirements of the Act and this rule.

3.32.d.2. The applicant has demonstrated that reclamation as required by the Act and this rule can be accomplished under the reclamation plan contained in the permit application.

3.32.d.3. The proposed permit area is:

3.32.d.3.A. Not within an area under study or administrative proceedings under a petition filed, to have an area designated as unsuitable for surface coal mining operations, unless the applicant demonstrates that before January 4, 1977, he had made substantial legal and financial commitments in relation to the operation covered by the permit application; or

3.32.d.3.B. Not within an area designated as unsuitable for mining and subject to the prohibitions or limitations of subsection (d), section 22, of the Act.

3.32.d.4. Where the private mineral estate to be mined has been severed from the private surface estate, an applicant shall also submit:

3.32.d.4.A. A copy of the written consent of the surface owner for the extraction of coal by surface mining methods;

3.32.d.4.B. A copy of the conveyance that expressly grants or reserves the right to extract coal by surface mining methods; or

3.32.d.4.C. If the conveyance does not expressly grant the right to extract the coal by surface mining methods, documentation that under State law, the applicant has the legal authority to extract the coal by those methods.

3.32.d.5. The Secretary has made an assessment of the probable cumulative impacts of all anticipated coal mining on the hydrologic balance in the cumulative impact area and has determined that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

3.32.d.6. The applicant has demonstrated that any existing structure will comply with subsection 3.8 and section 14 of this rule.

3.32.d.7. The applicant has paid all reclamation fees from previous and existing operations.

3.32.d.8. The applicant has satisfied the applicable requirements for experimental practices, steep slope mining, mountaintop removal mining, variances from approximate original contour, variances for delay in contemporaneous reclamation, prime farmland,

auger mining, in situ processing, and coal preparation plants not located within the permit area of a mine, when such are proposed in the application.

3.32.d.9. The applicant has, if applicable, satisfied the requirements for approval of a long-term intensive agricultural postmining land use.

3.32.d.10. The operation would not affect the continued existence of endangered or threatened species or result in destruction or adverse modification of their critical habitats, as determined under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).

3.32.d.11. The Secretary has taken into account the effect of the proposed permitting action on properties listed on and eligible for listing on the National Register of Historic Places. This finding may be supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources, or a documented decision that the Secretary has determined that no additional protection measures are necessary.

3.32.d.12. For a proposed remining operation where the applicant intends to reclaim in accordance with the requirements of section 24 of this rule, the site of the proposed operation is an area which was previously mined would be eligible for expenditures under section 4, Article, Chapter 22 of the Act.

3.32.d.13. The applicant has provided evidence that liability insurance in accordance with subsection 11.1 of this rule is in effect.

3.32.e. If the application is approved, the Secretary shall require that the applicant file a bond as provided in sections 11 and 12 of the Act and section 11 of this rule.

3.32.f. After an application is approved, but before a surface mining permit is issued, the Secretary shall reconsider his decision to approve the application, based on the compliance review required by subdivision 3.32.c of this subsection in light of any new information submitted under subdivision 3.1.n of this rule. Permit revisions and permit renewals are not subject to the provisions of this subdivision.

3.32.g. The prohibition of subdivision 3.32.c shall not apply to a permit application due to any violation resulting from an unanticipated event or condition at a surface mine eligible for remining under permit held by the applicant that meets the requirements of 30CFR773.15(4)(i). An event will be presumed to be unanticipated for purposes of this paragraph if it:

3.32.g.1. Arose after remining permit was issued.

3.32.g.2. Was related to prior mining; and

3.32.g.3. Was not identified in the remining permit.

3.33. Permit Conditions. Each permit issued by the Secretary shall be subject to the following conditions:

3.33.a. The permittee shall conduct surface coal mining and reclamation operations only on those lands that are specifically designated as the permit area on the maps submitted with the application and authorized for the term of the permit and that are subject to the bond or other equivalent guarantee in effect pursuant to section 11 and section 12 of the Act and section 11 of this rule.

3.33.b. The permittee shall conduct all surface coal mining and reclamation operations only as described in the approved application, except to the extent that the Secretary otherwise directs in the permit.

3.33.c. The permittee shall comply with the terms and conditions of the permit, all applicable performance standards of the Act, and this rule.

3.33.d. Without advance notice, delay, or a search warrant, upon presentation of appropriate credentials, the permittee shall allow the Secretary

to:

3.33.d.1. Have the right of entry provided for in subsection (a), section 15 of the Act; and

3.33.d.2. Be accompanied by private persons for the purpose of conducting an inspection in accordance with subsection 18.2 of this rule when the inspection is in response to an alleged violation reported to the Secretary by the private person.

3.33.e. The permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from non-compliance with any term or condition of the permit, including, but not limited to:

3.33.e.1. Any accelerated or additional monitoring necessary to determine the nature and extent of non-compliance and the results of the non-compliance;

3.33.e.2. Immediate implementation of measures necessary to comply; and

3.33.e.3. Warning, as soon as possible after learning of such non-compliance, any person whose health and safety is in imminent danger due to the non-compliance.

3.33.f. As applicable, the permittee shall comply with subsection 3.8 of this rule and all applicable performance standards for compliance, modification, or abandonment of existing structures.

3.33.g. The operator shall pay all reclamation fees for coal produced under the permit for sale, transfer or use.

3.33.h. Within thirty (30) days after a cessation order is issued for operations conducted under the permit, except where a stay of the cessation order is granted and remains in effect, the permittee shall either submit to the Secretary the following information, current to the date the cessation order was issued, or notify the Secretary in writing that there has been no change since the immediately preceding submittal of such information:

3.33.h.1. Any new information needed to correct or update the information previously submitted to the Secretary by the permittee under subdivision 3.1.c of this rule; or

3.33.h.2. If not previously submitted, the information required from a permit applicant by subdivision 3.1.c of this rule.

3.33.i. The obligations established under the permit, the Act, and this rule shall continue regardless of whether the permit has expired, or has been terminated, suspended, or revoked. The bond and liability insurance shall remain in effect throughout the life of the permit, any renewal thereof, and the liability period necessary to ensure completion of reclamation.

3.34. Improvidently issued permits: General Procedures.

3.34.a. Where the Secretary has reason to believe that an improvidently issued surface coal mining and reclamation permit exists, he shall review the circumstances under which the permit was issued. If, using the criteria set forth in subdivision 3.34.b of this subsection, the Secretary finds that the permit was improvidently issued, he shall take action in accordance with subdivision 3.34.c of this subsection.

3.34.b. A surface coal mining and reclamation permit shall be determined to have been improvidently issued if under the violations review criteria in subdivision 3.32.b of this subsection at the time the permit was issued:

3.34.b.1. The permit should not have been issued because of an unabated violation or a delinquent penalty or fee and the violation, penalty or fee remains unabated or delinquent and is not the subject of a good faith appeal, or an abatement plan or payment schedule with which the permittee or other person responsible is complying to the satisfaction of the responsible

agency;

3.34.b.2. The permit was issued on the presumption that a notice of violation was in the process of being corrected to the satisfaction of the agency with jurisdiction over the violation, but a cessation order subsequently was issued;

3.34.b.3. The permittee was linked to a violation, penalty, or fee through ownership or control, under the violation review criteria, paragraph b. of subsection 3.32 of this Section at the time the permit was issued and an ownership or control link between the permittee and the person responsible for the violation, penalty, or fee still exists, or when the link was severed the permittee continues to be responsible for the violation, penalty, or fee; or

3.34.b.4. The permit should not have been approved because the permittee had a permit revoked or bond forfeited and has not been reinstated, or the permittee was linked to a permit revocation or bond forfeiture through ownership or control, at the time the permit was issued and an ownership or control link between the permittee and the person whose permit was revoked or whose bond was forfeited still exists, or when the link was severed the permittee continues to be responsible for the permit revocation or bond forfeiture.

3.34.c. When the Secretary finds, under subdivision 3.34.b of this subsection, that because of an unabated violation or a delinquent penalty or fee, permit revocation or a bond forfeiture, a permit was improvidently issued, he shall take one or more of the following remedial measures:

3.34.c.1. Implement, with the cooperation of the permittee or other person responsible, and the responsible agency, a plan for abatement of the violation or a schedule for payment of the penalty or fee;

3.34.c.2. Impose on the permit a condition requiring that in a reasonable period of time the permittee or other person responsible abate the violation or pay the penalty or fee ;

3.34.c.3. Suspend the permit until the violation is abated or the penalty or fee is paid; or

3.34.c.4. Rescind the permit in accordance with subdivision 3.34.d of this subsection.

3.34.d. When the Secretary elects to rescind an improvidently issued permit, he shall serve on the permittee a notice of proposed suspension and rescission which includes the reasons for the finding and states that:

3.34.d.1. After a specified period of time not to exceed ninety (90) days, the permit automatically will become suspended, and not to exceed ninety (90) days thereafter rescinded, unless within those periods the permittee submits proof, and the regulatory authority finds, that:

3.34.d.1.A. The finding of the Secretary under subdivision 3.34.b of this subsection was erroneous;

3.34.d.1.B. The permittee or other person responsible has abated the violation on which the finding was based, or paid the penalty or fee, to the satisfaction of the Secretary;

3.34.d.1.C. The violation, penalty or fee is the subject of a good faith appeal, or of an abatement plan or payment schedule with which the permittee or other person responsible is complying to the satisfaction of the responsible agency; or

3.34.d.1.D. Since the finding was made, the permittee, has severed any ownership or control link with the person responsible for, and does not continue to be responsible for, the violation, penalty, or fee.

3.34.d.1.E. The permittee or other person responsible for the permit revocation or bond forfeiture has been reinstated, pursuant to subsection (c), section 18, of the Act.

3.34.e. Cessation of Operations. After permit suspension or rescission, the permittee shall cease all surface mining operations under the

permit, except for violation abatement and for reclamation and other environmental protection measures as required by the Act and this rule and the terms and conditions of the permit.

3.34.f. The permittee may file an appeal for administrative review of the notice in accordance with the provisions of subsection (e), section 17 of the Act.

3.34.g. For purposes of this subsection, a permit is issued when it is originally approved, as well as when a transfer, assignment, or sale of permit rights is approved pursuant to subdivisions 3.25.a or 3.25.c of this rule, or when a permit is revised pursuant to subsection 3.26 of this rule.

3.35. Construction Tolerance. All grade measurements and linear measurements in this rule shall be subject to a tolerance of two percent (2%). All angles in this rule shall be measured from the horizontal and shall be subject to a tolerance of five percent (5%). Provided, however, this allowable deviation from the approved plan does not affect storage capacity and/or performance standards.

§38-2-4. Haulageways, Roads or Access Roads.

4.1. Road Classification System.

4.1.a. Each haulageway, road, or access road as defined in subsection 2.61 of this rule shall be classified as either a primary road or an infrequently used access road.

4.1.a.1. A primary road is any road which is:

4.1.a.1.A. Used for transporting coal or spoil;

4.1.a.1.B. Frequently used for access or other purposes for a period in excess of six months; or

4.1.a.1.C. To be retained for an approved postmining land use.

4.1.a.2. An infrequently used access road is any road not classified as a primary road.

4.2. Plans and Specifications.

4.2.a. Each application for a surface coal mining and reclamation permit shall contain plans and specifications for each road to be constructed, used, or maintained within the proposed permit area. The plans and specifications shall include a map, appropriate cross sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures. These shall include at a minimum:

4.2.a.1. A plan view of the road drawn to scale showing:

4.2.a.1.A. The station base line;

4.2.a.1.B. Location of culverts;

4.2.a.1.C. Flow directions;

4.2.a.1.D. Location of intermittent or perennial streams; and

4.2.a.1.E. Other pertinent data as required by the Secretary.

4.2.a.2. A surveyed profile or a profile drawing drawn to scale developed from a topographic contour map of sufficient scale and detail to provide the necessary level of accuracy showing:

4.2.a.2.A. Profile of finished road surfaces;

4.2.a.2.B. Location and size of culverts;

4.2.a.2.C. Station elevations;

4.2.a.2.D. Profile of original ground; and

4.2.a.2.E. Percent grades.

4.2.a.3. A typical cross-section or sections showing:

4.2.a.3.A. Culvert placement;

4.2.a.3.B. Slope of culvert;

4.2.a.3.C. Fill material;

4.2.a.3.D. Original ground;

4.2.a.3.E. Ditches; and

4.2.a.3.F. Sediment control devices.

4.2.a.4. Construction specifications which explain in detail:

4.2.a.4.A. Excavation;

4.2.a.4.B. Selection and placement of materials;

4.2.a.4.C. Vegetative protection against erosion;

4.2.a.4.D. Road surfacing; and

4.2.a.4.E. Drainage and sediment control measures.

4.2.a.5. A description of the plans to remove, reclaim, and abandon each road that would not be retained under an approved postmining land use, and the schedule for removal, reclamation, and abandonment.

4.2.a.6. The center line of the proposed haulageways or access roads shall be visibly marked or delineated by visible offset markings on the site at one hundred feet (100') intervals at the time of preinspection. Preexisting haulageways or access roads shall be exempt from this requirement.

4.2.a.7. The plans, drawings, and design specifications for roads shall be prepared and certified by, or under the direction of, a qualified registered professional engineer or a qualified licensed land surveyor with experience in design and construction of roads. The engineer or land surveyor shall certify that the design of the road meets requirements of the Act, this rule, current prudent engineering practices, and any other design criteria established by the Secretary.

4.2.b. No part of any road shall be located in the channel of an intermittent or perennial stream unless specifically approved by the Secretary in accordance with the following:

4.2.b.1. Roads shall be located to minimize downstream sedimentation and flooding.

4.2.b.2. Drawings and specifications must be provided for each proposed ford, low water crossing or other road crossing of an intermittent or perennial stream, as necessary for approval of the road by the Secretary in accordance with this subsection.

4.2.b.3. A description must be provided indicating measures to be taken to obtain approval of the Secretary for alteration or relocation of a natural stream channel under subsections 5.2 and 5.3 of this rule.

4.2.b.4. The drawings and specifications for low-water crossings of perennial or intermittent stream channels must indicate measures to be taken so as to maximize the protection of the stream in accordance with subsection 5.2 of this rule.

4.3. Existing Haulageways or Access Roads. Where existing roads are to be used for access or haulage and it can be demonstrated that reconstruction to meet the design and construction requirements of this section would result in greater environmental harm and the drainage and sediment control requirements of section 5 of this rule can otherwise be met, paragraphs 4.5.a.1. and 4.5.a.2, and subparagraphs 4.6.a.2.A. and 4.6.a.2.B. of this section will not apply.

4.4. Infrequently Used Access Roads. Prospecting roads are to be designed, constructed, maintained, and reclaimed in accordance with the provisions of subsection 13.6 of this rule. Other

access roads constructed for and used only to provide infrequent service to facilities used in support of mining and reclamation operations may be exempt from the requirements of this section with the exception of the requirements of subsections 4.2, 4.7.a., 4.8, 4.9, and 5.3; provided, That such roads will be designed to ensure environmental protection appropriate for their planned duration and use, including consideration of the type and size of equipment used, the design and construction or reconstruction of roads shall incorporate appropriate limits for grade, width, surface materials, surface drainage control, culvert placement, and culvert size, in accordance with current, prudent engineering practices, and any necessary design criteria established by the Secretary.

4.5. Construction.

4.5.a. Construction of haulageways or access roads shall be done in accordance with the following:

4.5.a.1. The overall grade shall not exceed ten percent (10%);

4.5.a.2. The maximum pitch grade shall not exceed fifteen percent (15%) for three hundred feet (300') in each one thousand feet (1,000');

4.5.a.3. The surface shall pitch toward the ditch line at the minimum slope of one-half inch (½") per foot of surface width or shall be crowned at the minimum slope of one-half inch (½") per foot of surface width as measured from the center line;

4.5.a.4. The grade on switchback curves shall be reduced to less than the approach grade and should not be greater than ten percent (10%); and

4.5.a.5. Cut slopes shall not be steeper than 1:1 in soils or 1/4:1 in rock.

4.5.b. All grade measurements and linear measurements in this section shall be subject to a tolerance of two percent (2%). All angles in this section shall be measured from the horizontal and shall be subject to a tolerance of five percent (5%).

4.6. Drainage Design.

4.6.a. All drainage designs of haulageways or access roads shall be in accordance with the following:

4.6.a.1. A ditch shall be provided on both sides of a throughcut and on the inside shoulder of a cut-fill section, with ditch relief culverts being spaced according to grade. Water shall be intercepted or directed around and away from a switchback. All ditch lines shall be capable of passing the peak discharge of a ten (10) year, twenty-four (24) hour precipitation event. Where super elevation to the inside of a curve will improve the safety of a haulroad such as in the head of a hollow, a ditch line may be located on the outside shoulder of cut fill section if the ditch line is designed so that it will remain stable and that drainage control is also provided for water on the outside of the curve.

4.6.a.2. Ditch relief culverts shall be installed wherever necessary to insure proper drainage of runoff water beneath or through the haulageways or access road, according to the following specifications:

4.6.a.2.A.

Road Grade in Percent:	Spacing of Culverts In Feet
0-5	300-800
6-10	200-300
11-15	100-200

4.6.a.2.B. The culvert shall cross the haulageway or access road at a thirty (30) degree horizontal angle downgrade with a minimum grade of three percent (3%) from inlet to outlet, except in intermittent or perennial streams where the pipe shall be straight and coincide with the normal flow;

4.6.a.2.C. The inlet end shall be protected by a headwall of durable material and

the slope at the outlet end shall be protected with an apron of rock riprap, an energy dissipator or other similar structure;

4.6.a.2.D. Culverts shall be installed and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of the vehicles using the road;

4.6.a.2.E. Alternative design criteria for culverts may be approved by the Secretary where the design criteria of this section is demonstrated to be impractical or unnecessary; and

4.6.a.2.F. The cross sectional area of all culverts installed on haulageways and access roads shall be adequate to pass the peak discharge storm runoff from a one (1) year twenty-four (24) hour precipitation event from the contributing watershed, but in no event shall the cross sectional area be less than one hundred square inches.

4.6.b. Culverts, bridges or other structures shall be used to cross intermittent or perennial streams. During construction, consideration shall be given to such factors as weather conditions, season of the year, time period for construction, etc., in order to minimize adverse impacts on the water quality and to the stream channel. These structures shall be capable of passing the peak flow for a ten (10) year, twenty-four (24) hour precipitation event from the contributing watershed. Structures of a lesser design capacity may be approved by the Secretary if the flow through capacity of the structure itself is at least equal to or greater than the flow capacity of the stream channel as measured immediately upstream and downstream of the crossing; provided that the structure shall pass the peak of a one (1) year, twenty-four (24) hour precipitation event.

4.7. Performance Standards.

4.7.a. Each road shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

4.7.a.1. Minimize downstream sedimentation and flooding;

4.7.a.2. Control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust as well as dust occurring on other exposed surfaces, by measures such as vegetating, watering, using chemical or other dust suppressants, or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices;

4.7.a.3. Control or prevent damages to fish, wildlife, or their habitat and related environmental values;

4.7.a.4. Control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area;

4.7.a.5. Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standards applicable to receiving waters;

4.7.a.6. Refrain from seriously altering the normal flow of water in streambeds or drainage channels;

4.7.a.7. Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers and National Recreation Areas designated by Act of Congress; and

4.7.a.8. Use non-acid and non-toxic forming substances in road surfacing.

4.7.b. All sediment control structures shall have an adequate sediment storage volume and detention time. The optimum design factor for achieving this criteria is 0.125 acre/feet for each acre of disturbed area within the watershed of the structure; however, lesser storage values may be approved by the Secretary if the lesser values will achieve compliance with applicable effluent limits and the requirements of subdivision 4.7.a of

this subsection.

4.8. Maintenance.

4.8.a. A road shall be maintained to meet the performance standards of this part and any additional criteria specified by the Secretary.

4.8.b. A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.

4.9. Reclamation. A road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer needed for mining and reclamation operations. This reclamation shall include:

4.9.a. Closing the road to traffic;

4.9.b. Removing all bridges and culverts unless approved as part of the postmining land use;

4.9.c. Removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements;

4.9.d. Reshaping cut and fill slopes as necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain; and

4.9.e. Haulageways or access roads shall be abandoned in accordance with the following:

4.9.e.1. Prior to abandonment of haulageways or access roads, efforts shall be made to prevent erosion by the use of culverts, water bars or other devices. Water bars or earth berms shall be installed according to the following table of spacings:

Percent Grade of Haulageway or Access Road	Spacing of Water Bars in Lineal Feet
2	250
5	135
10	80
15	60
20	45
Above 20	25

4.9.e.2. Upon abandonment, all areas of haulageways or access roads shall be immediately seeded and mulched.

4.9.f. Scarifying or ripping the roadbed; replacing topsoil or substitute material, and revegetating disturbed surfaces in accordance with subsection 14.3 and section 9 of this rule.

4.10. Primary Roads.

4.10.a. Primary roads shall meet the requirements of this section and the following additional requirements:

4.10.a.1. The construction or reconstruction of primary roads shall be certified in a report to the Secretary by a qualified registered professional engineer, or a licensed land surveyor with experience in the design and construction of roads. The report shall indicate that the primary road has been constructed or reconstructed as designed and in accordance with the approved plan.

4.10.a.2. Each primary road embankment shall have a minimum static factor of 1.3.

4.10.a.3. To minimize erosion, a primary road shall be located, insofar as is practicable, on the most stable available surface.

4.10.a.4. Fords of perennial or intermittent streams by primary roads are prohibited unless they are specifically approved by the Secretary as temporary routes during periods of road construction.

4.10.a.5. Each primary road shall be constructed or reconstructed and maintained to have adequate drainage control, using structures such as, but not limited to, bridges, ditches, cross

drains, and ditch relief drains. The drainage control system shall be designed to safely pass the peak runoff from a ten (10) year, twenty-four (24) hour precipitation event;

4.10.a.6. Drainage pipes and culverts shall be installed as designed, and maintained in a free and operating condition and to prevent or control erosion at inlets and outlets;

4.10.a.7. Drainage ditches shall be constructed and maintained to prevent uncontrolled drainage over the road surface and embankment;

4.10.a.8. Culverts shall be installed and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road; and

4.10.a.9. Natural stream channels shall not be altered or relocated without the prior approval of the Secretary.

4.10.b. Except as provided in paragraph 4.10.a.4 of this subsection, structures for perennial or intermittent stream channel crossings shall be made using bridges, culverts, low-water crossings, or other structures designed, constructed, and maintained using current, prudent engineering practices. The Secretary shall ensure that low-water crossings are designed, constructed, and maintained to prevent erosion of the structure or stream bed and additional contributions of suspended solids to stream flow.

4.10.c. Primary roads shall be surfaced with material approved by the Secretary as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

4.11. Support Facilities and Transportation Facilities.

4.11.a. Railroad loops, spurs, sidings, surface conveyor systems, chutes, aerial tramways or other transportation facilities which are under the control of the permittee shall be designed, constructed, maintained and abandoned so as to comply with the following:

4.11.a.1. Control or prevent erosion, siltation, and the air pollution attendant to erosion;

4.11.a.2. Control or prevent damage to fish, wildlife or their habitat and related environmental values;

4.11.a.3. Control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area;

4.11.a.4. Neither cause nor contribute, directly or indirectly, to the violation of State or Federal water quality standards applicable to receiving waters; and

4.11.a.5. Prevent or control damage to public or private property.

4.12. Certification. Upon completion of construction or reconstruction, all primary roads for which design criteria were approved as part of the permit shall be certified. Such certification shall affirm that construction was done in accordance with the approved criteria except as otherwise noted in the certification statement. Where the certification statement indicates a change from the design standards or construction requirements approved in the permit, such changes will be documented in as-built plans. If as-built plans are submitted, the certification shall describe how and to what extent the construction deviates from the proposed design, and shall explain how and certify that the road will meet performance standards. The certification shall be on forms approved by the Secretary and signed by an approved licensed engineer or an approved licensed land surveyor with experience in design and construction of roads. All roads used for transportation of coal or spoil, and which are constructed outside the permitted coal extraction area, shall be certified before they are used for such transportation. Any road which lies within the coal extraction area, and which is therefore constructed concurrent with progress of mining activities, shall be certified in sections of one thousand (1,000) linear feet or less as measured from the active pit.

§38-2-5. Drainage and Sediment Control Systems.

5.1. Natural Drainways. Natural drainways in the permit area shall be kept free of overburden except where overburden placement has been approved. Overburden placement and haulageways constructed across natural drainways shall not materially increase the sediment load, or materially affect stream quality.

5.2. Intermittent or Perennial Stream.

5.2.a. Intermittent or Perennial Stream. No land within one hundred feet (100') of an intermittent or perennial stream shall be disturbed by surface mining operations including roads unless specifically authorized by the Secretary. The Secretary will authorize such operations only upon finding that surface mining activities will not adversely affect the water quantity and quality or other environmental resources of the stream and will not cause or contribute to violations of applicable State or Federal water quality standards. The area not to be disturbed shall be designated a buffer zone and marked accordingly.

5.3. Stream Channel Diversions and Diversion Ditches.

5.3.a. All stream channel diversions and diversion ditches shall be designed for safety and stability, shall be constructed in such a manner so as to avoid additional contributions of suspended solids to streams, and shall provide protection against flooding and resulting damage to life and property. The design and construction shall be certified by a registered professional engineer.

5.3.b. Stream Channel Diversions:

5.3.b.1. Temporary and permanent stream channel diversions shall be designed so as to have at a minimum the capacity to carry the flow of the existing stream channel. The maximum flow carrying capacity of the existing stream channel shall be determined on the basis of cross-sectional area of the stream channel at points immediately upstream and downstream of the segment to be diverted. A combination of the cross-sectional area of the stream channel diversion, the stream bank, and the flood-plain configuration shall be adequate to pass safely the peak runoff of a ten (10) year, twenty-four (24) hour precipitation event for a temporary stream channel diversion and a one hundred (100) year, twenty-four (24) hour precipitation event for a permanent stream channel diversion.

5.3.b.2. The following information shall be made a part of the permit application when stream channel diversions are proposed:

5.3.b.2.A. "stream channel design computation sheet" for each proposed temporary or permanent stream channel diversion;

5.3.b.2.B. Construction plans which contain:

5.3.b.2.B.1. A plan view of the area showing center line profiles of the existing stream channel and proposed location of the temporary or permanent stream channel;

5.3.b.2.B.2. A profile along the center line of the existing stream channel showing gradient of the stream bottom and top of channel;

5.3.b.2.B.3. A profile along the center line of the proposed temporary or permanent stream channel diversion showing gradient of the stream bottom and top of channel;

5.3.b.2.B.4. A cross section showing original ground limits, bottom width, side slopes, depth of flow, floodplain configuration; and

5.3.b.2.B.5. A detailed description of the sequence of installation of temporary or permanent stream channel diversion.

5.3.b.2.C. Construction specifications; and

5.3.b.2.D. Maintenance schedule and procedures for maintenance.

5.3.c. Diversion Ditches:

5.3.c.1. Diversions shall have the capacity to pass safely the peak discharge from a ten (10) year, twenty-four (24) hour precipitation event.

5.3.c.2. Plans, Design Data and Specifications. Where the permit application proposes the use of diversion ditches, the drainage plan shall contain the following:

5.3.c.2.A. A "Diversion Design Computation Sheet" for each proposed diversion;

5.3.c.2.B. Construction plans showing:

5.3.c.2.B.1. A surveyed profile along the center line of the diversion showing the original ground line and proposed depth of the diversion;

5.3.c.2.B.2. A cross section showing the original ground line, bottom width, side slopes, depth of flow, freeboard and other pertinent information;

5.3.c.2.B.3. The type of soil in which the diversion will be excavated. The soil shall be sampled and classified at five hundred feet (500') intervals along the center line of the diversion;

5.3.c.2.B.4. The type and design of the outlet proposed for each diversion;

5.3.c.2.B.5. A maintenance schedule and procedures for maintenance;

5.3.c.2.B.6. Construction specifications; and

5.3.c.2.B.7. A vegetation plan.

5.4. Sediment Control.

5.4.a. General.

Sediment control or other water retention structures shall be constructed in appropriate locations for the purposes of controlling sedimentation. All runoff from the disturbed area shall pass through a sedimentation control system. All such systems or other water retaining structures used in association with the mining operation shall be designed, constructed, located, maintained, and used in accordance with this rule and in such a manner as to minimize adverse hydrologic impacts in the permit and adjacent areas, to prevent material damage outside the permit area and to assure safety to the public.

5.4.b. Design and Construction Requirements. All sediment control or other water retention structures used in association with the mining operation shall:

5.4.b.1. Be constructed in accordance with the plans, design criteria, and specifications set forth in the preplan. Any deviations from the approved preplan which result from unforeseen site specific circumstances arising during construction, shall be reflected in as-built plans submitted by the operator and approved by the Secretary immediately following construction. The as-built plans shall indicate the original design, the extent of changes, and reference points. Sediment control structures shall be certified in accordance with the requirements of subdivision 5.4.d. of this subsection.

5.4.b.2. Be located as near as possible to the disturbed area and out of perennial streams unless the applicant demonstrates and the Secretary finds that there is no other suitable location for such structures.

5.4.b.3. Comply with applicable State and Federal water quality standards and meet effluent limitations as specified in an NPDES permit for all discharges.

5.4.b.4. Have the capacity to store 0.125 Acre/ft. of sediment for each acre of disturbed area in the structures watershed; provided, that consideration may be given for reduced storage volume where the preplan and site

conditions reflect controlled placement, concurrent reclamation practices, or use of sediment control structures; provided further, that reduced storage volume will be approved only where the operator demonstrates that the effluent limitations of subdivision 14.5.b of this rule will be met. The disturbed area for which the structure is to be designed will include all land affected by previous surface mining operations that are not presently stabilized and all land that will be disturbed throughout the life of the permit.

5.4.b.5. Be equipped with a nonclogging dewatering device of an adequate design and size to maintain the storage requirements of paragraph 5.4.b.4, of this subdivision.

5.4.b.6. Be designed, constructed and maintained to prevent short-circuiting.

5.4.b.7. Be cleaned out when the sediment accumulation reaches sixty percent (60%) of design capacity. Clean-out elevation shall be to a level so as to restore design storage capacity as indicated on plans submitted for each structure. Sediment removal and disposal shall be done in a manner and at a frequency that minimizes adverse impacts on surface and groundwater quality.

5.4.b.8. Be designed to safely pass a twenty-five (25) year, twenty-four (24) hour precipitation event. The combination of both principal and/or emergency spillway of the structures shall be designed to safely pass the peak discharge of a twenty-five (25) year, twenty-four (24) hour precipitation event, provided, that a single open channel spillway may be used only if it is of non-erodable construction and designed to carry sustained flows; or earth or grass-lined and designed to carry short term, infrequent flows at non-erosive velocities where sustained flows are not expected; provided, however, that excavated sediment control structures which are at ground level and which have an open exit channel constructed of non-erodible material may be designed to pass the peak discharge of a ten (10) year twenty-four (24) hour precipitation event.

5.4.b.9. Provide adequate freeboard to resist overtopping by waves or sudden increases in volume and adequate slope protection against surface erosion and sudden drawdown.

5.4.b.10. Provide that an impoundment meeting the size or other criteria of 30 CFR 77.216(a) or W. Va. Code §22-14 et seq., or located where failure would be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2. Impoundments not meeting the size or other criteria of 30 CFR 77.216 (a) or W. Va.Code §22-14 et seq., except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions.

5.4.b.11. Control discharge by use of energy dissipaters, riprap channels or other devices to reduce erosion, to prevent deepening or enlargement of stream channels and to minimize disturbance of the hydrologic balance. Discharge structures shall be designed using standard engineering procedures.

5.4.b.12. Provide for stable foundations during all phases of construction and operation and be designed based on adequate and accurate information on the foundation conditions. For structures meeting the criteria of paragraph 5.4.b.10 of this subdivision, provide foundation investigations and any necessary laboratory testing.

5.4.b.13. Prior to construction, all such structures shall be certified to be in accordance with design requirements of the Act, this rule, and other design criteria established by the Secretary.

5.4.c. In addition to the requirements of subsection (b) of this section, all embankment type sediment control or other water retention structures shall be designed, constructed and maintained to meet the following safety standards:

5.4.c.1. Embankment type sediment control and water retention structures shall be designed with a combination of principal and/or emergency spillways that will safely pass a twenty-five (25) year, twenty-four (24) hour precipitation event. The principal spillway requirements may be waived if the emergency spillway is an open channel constructed of nonerodable material, is capable of maintaining sustained flows, and is designed to safely pass the peak discharge of a twenty-five (25) year, twenty-four (24) hour precipitation event;

5.4.c.2. All embankment type sediment control or water retention structures shall be properly stabilized and revegetated upon completion of construction and regrading of the embankment and surrounding areas;

5.4.c.3. In constructing the embankment, the operator shall remove all organic matter from the foundation, install cutoff trenches where necessary to ensure stability, provide for proper compaction and ensure against excessive settlement by excluding sod, roots, frozen soil or coal processing wastes from the embankment;

5.4.c.4. If an inspection or examination discloses that a potential hazard exists, the person who inspected or examined the embankment shall promptly inform the Department of Environmental Protection of the findings and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Department of Environmental Protection shall be notified immediately and then notify the appropriate agencies that other emergency procedures are required to protect the public;

5.4.c.5. A sediment control or water retention structure which is constructed in such a manner that it: (1) Rises twenty-five (25) feet or more above the natural bed of a stream or watercourse as measured from the downstream toe of the embankment and which does or can impound fifteen (15) acre-feet or more of water; or, (2) Rises six (6) feet or more above the natural bed of a stream or watercourse as measured from the downstream toe of the embankment and which does or can impound fifty (50) acre-feet or more of water, is by definition a dam and is thereby subject to the provisions of the West Virginia Dam Control Act set forth in W. Va. Code §22-14 et seq.; and

5.4.c.6. Embankment type sediment control or water retention structures which impound water at an elevation of five feet (5') or more above the upstream toe of the structure and can have a storage volume of twenty (20) acre-feet or more; which impound water at an elevation of twenty feet (20') or more above the upstream toe of the structure; or which present a hazard to coal miners as determined by an MSHA District Manager; shall be designed, constructed, inspected, and abandoned in accordance with Federal regulations set forth in 30 CFR 77.216. All design plans, and specifications shall be made a part of the permit application. In addition to these requirements, the following minimum standards shall be met:

5.4.c.6.A. An appropriate combination of principal and emergency spillways shall be provided to pass safely the runoff resulting from a one hundred (100) year, twenty-four (24) hour precipitation event, or a larger event as specified by the Secretary;

5.4.c.6.B. The embankment shall be designed, constructed, and maintained with a static safety factor of at least 1.5 or a specified higher safety factor as required to ensure long-term stability and a seismic factor of safety of 1.2;

5.4.c.6.C. Appropriate barriers to control seepage shall be installed along the conduits that extend through the embankments; and

5.4.c.6.D. The detailed design plan shall include a stability analysis which includes but is not limited to strength parameters, pore pressures, and long-term seepage conditions. The design plan will also include a description of each engineering design assumption and calculation.

5.4.d. Certification.

5.4.d.1. Prior to any surface mining activities in the component drainage area of a permit controlled by a sediment control structure, that specific structure shall be certified as to construction in accordance with the plans, designs, and specifications set forth in the preplan, or in accordance with as-built plans. If as-built plans are submitted, the certification shall describe how and to what extent the construction deviates from the proposed design, and shall explain how and certify that the structure will meet performance standards. Such certification shall be submitted on forms prescribed by the Secretary. Where sediment control or other water retention structures are constructed in sequence with the advance of the mining operation to allow for on-bench construction, such systems shall be constructed and certified in sections of one thousand (1,000) linear feet or less as measured from the active pit. This certification shall include a map showing the exact location of the section being certified.

5.4.d.2. Design and construction certification of non-embankment type sediment control structures may be performed by a registered professional engineer or a licensed land surveyor.

5.4.d.3. Design and construction certification of embankment type sediment control structures may be performed only by a registered professional engineer or licensed land surveyor experienced in construction of embankments.

5.4.d.4. Design and construction certification of coal refuse impoundments and embankment type impoundments meeting or exceeding the size requirements or other criteria of Federal MSHA regulations at 30 CFR 77.216 (a) may be performed only by a registered professional engineer experienced in the design and construction of impoundments.

5.4.e. Inspections.

Inspection of impoundments, including sediment control or other water retention structures, shall be in accordance with the following:

5.4.e.1. A qualified registered professional engineer or other qualified professional specialist, under the direction of the professional engineer, shall inspect each impoundment or sediment control structure provided, that a licensed land surveyor may inspect those impoundments or sediment control or other water retention structures which do not meet the size or other criteria of 30 CFR 77.216(a) or W. Va. Code §22-14 et seq., and which are not constructed of coal processing waste or coal refuse. The professional engineer, licensed land surveyor, or specialist shall be experienced in the construction of impoundments and sediment control structures.

5.4.e.2. Inspections shall be made regularly but not less than quarterly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the bond.

5.4.e.3. The qualified registered professional engineer or licensed land surveyor shall promptly, after each inspection, provide to the Secretary a certified report that the impoundment or sediment control structure has been constructed and maintained as designed and in accordance with the approved preplan. The report shall include discussion of any appearances of instability, structural weakness or other hazardous conditions, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation and any other aspects of the structure affecting stability.

5.4.e.4. A copy of the report shall be retained at or near the mine site.

5.4.f. Examinations. Embankments subject to Federal MSHA regulations at 30 CFR 77.216 must be examined in accordance with 77.216-3 of said regulations. Other embankments shall be examined at least quarterly by a qualified person designated by the operator for appearance

of structural weakness and other hazardous conditions. Examination reports shall be retained for review at or near the operation.

5.4.g. Maintenance. Prior to Phase 1 bond release, all sediment control structures shall be cleaned out so as to meet design storage capacity in all areas not revegetated and stabilized.

5.4.h. Abandonment Procedures. Abandonment and/or removal of sediment control or other water retention structures shall not occur until two (2) years after the last augmented seeding nor less than two (2) years before final bond release. Minimum requirements for abandoning sediment control or other water retention structures prior to full bond release are as follows:

5.4.h.1. Unless otherwise approved in the reclamation plan, dugout-type sediment control or other water retention structures, diversion ditches, and other non-impounding sediment control or other water retention structures shall be removed and the land upon which they are situated shall be regraded and revegetated in accordance with the reclamation plan. Sediment control or other water retention structures approved by the Secretary as permanent structures are exempt from these requirements.

5.4.h.2. Embankment type sediment dams, embankment type excavated sediment dams and crib and gabion dams, and all accumulated sediment behind the dam shall be removed from the natural drainway. The natural drainway shall be returned as nearly as practicable to its original profile and cross section with the channel sides and bottom rock ripraped up to the top of the channels banks. The riprap requirement may be waived where the bottom and sides of the channel consist of bedrock.

5.4.h.3. All areas disturbed during abandonment of a sediment control or other water retention structures shall be seeded and mulched immediately to stabilize the area.

5.4.h.4. Waste material shall be spread over an area within the permit boundaries in accordance with the following specifications:

5.4.h.4.A. Provisions shall be made for the diversion or safe passage of surface water concentrating on the land side of the waste bank.

5.4.h.4.B. The waste shall be placed so as not to endanger the stability of the stream bank and shall not exceed three feet (3') in height above the natural ground surface, except by special design. Special designs shall be submitted with the drainage plan. The finished surface shall slope away from the edge of the stream or drainway insofar as feasible.

5.4.h.4.C. Surface of waste shall not be steeper than two (2) horizontal to one (1) vertical. If the waste is spread to the edge of the stream bank, the stream side slope of the waste shall be shaped to join the side slope of the stream bank.

5.5. Permanent Impoundments. Those sediment control or other water retention structures or impounding structures to be left in place after final bond release shall be considered permanent and, if authorized by the Secretary as part of the permit application or a revision to a permit, may be left in accordance with the following requirements; provided, that a structure which is subject to the requirements of either 30 CFR 77.216 or W. Va. Code §22-14 et seq., may not be retained as a permanent impoundment, but shall be reclaimed:

5.5.a. A request to leave the structure will be made on forms prescribed by the Secretary and submitted as a permit revision;

5.5.b. The request will contain a statement as to the present conditions of the structure;

5.5.c. The request will contain a statement signed by the landowner requesting the permanent structures be left for recreational or wildlife propagation purposes or for any beneficial uses to the landowner;

5.5.d. The size and configuration of such permanent structure will be adequate for its intended purposes;

5.5.e. The quality of water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable State and Federal water quality standards, and discharges will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable State and Federal water quality standards;

5.5.f. The water level will be sufficiently stable and be capable of supporting the intended use;

5.5.g. Final grading will provide for adequate safety and access for proposed water users;

5.5.h. The permanent structure will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic use; and

5.5.i. The permanent structure will be suitable for the approved postmining land use.

§38-2-6. Blasting.

6.1. General Requirements. Each operator shall comply with all applicable state and federal laws in the use of explosives. A blaster certified by the Department of Environmental Protection shall be responsible for all blasting operations including the transportation, storage and use of explosives within the permit area in accordance with the blasting plan.

6.2. Blasting Plan. Each application for a permit, where blasting is anticipated, shall include a blasting plan. The blasting plan shall explain how the applicant will comply with the blasting requirements of the Act, this rule, and the terms and conditions of the permit. This plan shall include, at a minimum, information setting forth the limitations the operator will meet with regard to ground vibration and airblast, the basis for those limitations, and the methods to be applied in controlling the adverse effects of blasting operations.

6.3. Public Notice of Blasting Operations.

6.3.a. At least ten (10) days, but not more than thirty (30) days, prior to any blasting operations which detonate five (5) pounds or more of explosives at any given time, the operator shall publish, a blasting schedule in a newspaper of general circulation in the county of the proposed permit area. Copies of the schedule shall be distributed by certified mail to local governments, public utilities and each resident within one-half (½) mile of the blasting site. Unless blasting will occur on drainage structures and roads, such structures will be exempt from the one-half (½) mile notification area. The operator shall republish and redistribute the schedule at least every twelve (12) months and revise and republish the schedule at least ten (10) days, but not more than thirty (30) days, prior to blasting whenever the area covered by the schedule changes or actual time periods for blasting significantly differ from that set forth in the prior schedule. The schedule shall contain at a minimum:

6.3.a.1. Name, address and telephone number of the operator;

6.3.a.2. Identification of the specific areas in which blasting will take place;

6.3.a.3. Dates and times when explosives are to be detonated;

6.3.a.4. Methods to be used to control access to the blasting area; and

6.3.a.5. Types and patterns of audible warning and all clear signals to be used before and after blasting.

6.3.b. Surface blasting activities incident to underground coal mining are not subject to the requirements of subdivision 6.3.a of this subsection so long as all local governments and residents or owners of dwellings or structures located within one-half (½) mile of the blast site

are notified in writing by the operator of proposed times and locations of the blasting operation. Such notice of times that blasting is to be conducted may be announced weekly, but in no case less than twenty-four (24) hours before the blasting will occur.

6.4. Blast Record.

6.4.a. A blasting log book formatted in a manner prescribed by the Secretary shall be kept current daily and made available for inspection at the site by the Secretary and upon written request by the public.

6.4.b. The blasting log shall be retained by the operator for three (3) years.

6.4.c. The blasting log shall, at a minimum, contain the following information:

6.4.c.1. Name of permittee, operator or other person conducting the blast;

6.4.c.2. Location, date and time of blast;

6.4.c.3. Name, signature and certification number of blaster-in-charge;

6.4.c.4. Identification of nearest structure not owned or leased by the operator and direction and distance, in feet, to such structure;

6.4.c.5. Weather conditions;

6.4.c.6. Type of material blasted;

6.4.c.7. Number of holes, burden and spacing;

6.4.c.8. Diameter and depth of holes;

6.4.c.9. Types of explosives used;

6.4.c.10. Weight of explosives used per hole;

6.4.c.11. Total weight of explosives used;

6.4.c.12. Maximum weight of explosives detonated within any eight (8) millisecond period;

6.4.c.13. Method of firing and type of circuit;

6.4.c.14. Type and length of stemming;

6.4.c.15. If mats or other protections were used;

6.4.c.16. Type of delay detonator used and delay periods used;

6.4.c.17. Seismograph records and air blast records shall include but not be limited to:

6.4.c.17.A. Seismograph and air blast reading, including exact location, date, and time of reading and its distance from the blast;

6.4.c.17.B. Name of person and firm taking the readings;

6.4.c.17.C. Name of person and firm analyzing the record, where analysis is necessary; and

6.4.c.17.D. Type of instrument, sensitivity and calibration signal or certification of annual calibration;

6.4.c.18. Shot location;

6.4.c.19. Sketch of delay pattern to include the entire blast pattern and all decks; and

6.4.c.20. Reasons and conditions for unscheduled blasts.

6.5. Blasting Procedures.

6.5.a. All blasting shall be conducted during daytime hours, between sunrise and sunset; provided, that the Secretary may specify more restrictive time periods based on public requests or other consideration, including the proximity to

residential areas. No blasting shall be conducted on Sunday. Provided, however, the Secretary may grant approval of a request for Sunday blasting if the operator demonstrates to the satisfaction of the Secretary that the blasting is necessary and there has been an opportunity for a public hearing. Blasting shall not be conducted at times different from those announced in the blasting schedule except in emergency situations where rain, lightning or other atmospheric conditions, or operator or public safety requires unscheduled detonations. Blasting shall be conducted in such a way so as to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course channel, or availability of surface or groundwater outside the permit area.

6.5.b. Safety precautions:

6.5.b.1. Three (3) minutes prior to blasting, a warning signal audible to a range of one-half (½) mile from the blast site will be given. This preblast warning shall consist of three (3) short warning signals of five (5) seconds duration with five (5) seconds between each signal. One (1) long warning signal of twenty (20) seconds duration shall be the "all clear" signal. Each person in the permit area, and each person who resides or regularly works within one-half (½) mile of the permit area shall be notified of the meaning of these signals;

6.5.b.2. All approaches to the blast area shall be guarded against unauthorized entry prior to and immediately after blasting;

6.5.b.3. All charged holes shall be guarded and posted against unauthorized entry; and

6.5.b.4. The certified blaster shall be accompanied by at least one other person at the time of firing of the blast.

6.5.c. Airblast Limits:

6.5.c.1. Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public buildings, school, church, or community or institutional building outside the permit area.

Lower frequency limit of measuring system in Hz ($^{+}_{-}$ 3 dB)	maximum level, in db
0.1 Hz or lower --flat response [1]	134 peak.
2 Hz or lower -- flat response	133 peak.
6 Hz or lower -- flat response	129 peak.
C-weighted--slow response [1]	105 peak dBC.

[1] Only when approved by the Secretary

6.5.c.2. If necessary to prevent damage, the Secretary may specify lower maximum allowable airblast levels for use in the vicinity of a specific blasting operation.

6.5.c.3. Monitoring. The operator shall conduct periodic monitoring to ensure compliance with the airblast standards. The Secretary may require airblast measurement of any or all blasts and may specify the locations at which such measurements are taken. The air blast measuring systems used shall have an upper-end flat-frequency response of at least 200 Hz.

6.5.d. Flyrock, including blasted material, shall not be cast from the blasting site more than half way to the nearest dwelling or other occupied structure, beyond the area of control specified in subdivision 6.5.e of this subsection, or in no case beyond the bounds of the permit area.

6.5.e. Access to the blast area shall be controlled against the entrance of livestock or unauthorized personnel during blasting and for a period thereafter until an authorized person has reasonably determined:

6.5.e.1. That no unusual circumstances exist such as imminent slides or undetonated charges, etc.; and

6.5.e.2. That access to and travel in or through the area can be safely resumed.

6.5.f. At the request of the Secretary, the

operator shall monitor air blast levels using an instrument with an upper-end flat-frequency response of at least 200 Hz.

6.5.g. Blast design.

6.5.g.1. An anticipated blast design shall be submitted if blasting operations will be conducted within:

6.5.g.1.A. 1,000 feet of any building used as a dwelling, public building, school, church, or community or institutional building outside the permit area; or

6.5.g.1.B. 500 feet of an active or abandoned underground mine.

6.5.g.2. The blast design may be presented as part of a permit application or at a time, before the blast as approved by the Secretary.

6.5.g.3. The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures, including protected structures, to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable airblast, flyrock, and ground-vibration standards.

6.5.g.4. The blast design shall be prepared and signed by a certified blaster.

6.5.g.5. The Secretary may require changes to the design submitted.

6.5.h. No blasting within five hundred (500) feet of an underground mine not totally abandoned shall be permitted except with the concurrence of the Department of Environmental Protection, the operator of the underground mine and MSHA. The Secretary may prohibit blasting on specific areas where it is deemed necessary for the protection of public or private property or the general welfare and safety of the public.

6.5.i. The operator may use the following scaled distance formulas to determine the allowable maximum weight of explosives (lbs) to be detonated in any eight millisecond period without seismic monitoring:

Formula	Distance in Feet from the Blasting Site to the Nearest Protected
$W = (D/50)^2$	0 - 300 feet
$W = (D/55)^2$	301 - 5,000 feet
$W = (D/65)^2$	5,001 feet or greater

W = Weight of explosives in pounds
D = Distance to the nearest structure

6.5.j. The scaled distance formulas need not be used if a seismograph measurement at the nearest protected structure is recorded and maintained for every blast. The peak particle velocity in inches per second in any one of the three mutually perpendicular directions shall not exceed the following values at any protected structure:

Seismograph Measurement	Distance to the Nearest Protected Structure
1.25	0 - 300 feet
1.0	301 - 5,000 feet
0.75	5,001 feet or greater

6.5.k. The Secretary may require a seismograph recording of any or all blasts based on the physical conditions of the site in order to prevent injury to persons or damage to property.

6.5.l. The maximum allowable ground vibration as provided in subdivisions 6.5.i and 6.5.j of this subsection shall be reduced by the Secretary, if determined necessary to provide damage protection.

6.5.m. The maximum airblast and ground-vibration standards of subdivisions 6.5.c and 6.5.j of this subsection shall not apply at the following locations:

6.5.m.1. At structures owned by the

permittee and not leased to another person.

6.5.m.2. At structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the Secretary before blasting.

6.6. Blasting Control for Other Structures.

6.6.a. All other structures in the vicinity of the blasting area which are not defined as protected structures at subsection 2.~~9~~7 of this rule shall be protected from damage by establishment of a maximum allowable limit on ground vibration, specified by the operator in the blasting plan and approved by the Secretary.

6.6.b. The plan submitted under this subsection shall not reduce the level of protection for other structures otherwise provided for in this rule.

6.7. Certified Blasting Personnel. Each person responsible for blasting operations shall be certified. Each certified blaster shall have proof of certification either on his person or on file at the permit area during blasting operations. Certified blasters shall be familiar with the blasting plan and blasting related performance standards for the operation at which they are working.

6.8. Preblast Survey.

6.8.a. At least thirty (30) days prior to beginning of blasting operations, the operator shall inform in writing all residents or owners of manmade dwellings or structures located within one-half (½) mile of the permit area on how to request a preblast survey. Requirements for a preblasting survey shall be the following:

6.8.a.1. Upon a written request to the Secretary by a resident or owner of a manmade dwelling or structure that is located within one-half (½) mile of the permit area, the operator shall conduct a preblast survey of the dwelling or structure and submit a report of the survey to the Secretary. If a structure is added to or renovated subsequent to a preblast survey, a survey of such additions and/or renovation shall be performed upon request of the resident or owner.

6.8.a.2. The operator shall conduct the preblast survey in such a manner which will determine the condition of the dwelling or structure, and to document any preblasting damage and to document other physical factors that could reasonably be affected by the blasting. Assessments of the preblasting condition of structures such as pipes, cables, transmission lines, wells and water systems shall be based on the exterior or ground surface conditions and other readily available data. Special attention shall be given to the preblasting condition of wells and other water systems.

6.8.a.3. A written report of the survey shall be prepared and signed by the person or persons approved by the Secretary who conducted the survey. Copies of the report shall be provided to the person requesting the survey and to the Secretary.

6.8.a.4. Surveys requested more than ten (10) days before the planned initiation of blasting shall be completed before blasting operations begin.

6.8.a.5. Any person who requests a survey who disagrees with the results of the survey may submit a detailed description of the specific areas of disagreement.

§38-2-7. Premining and Postmining Land Use.

7.1. General. In addition to the requirements of section 10 of the Act, the following requirements for postmining land use shall be applicable:

7.1.a. All areas disturbed by surface mining operations shall be restored in a timely manner to conditions that are capable of supporting those land uses which they were capable of supporting prior to any mining.

7.1.b. The premining uses of land to which the postmining land use is to be compared shall be those uses which the land previously supported where the land has not been previously

mined and has been properly managed.

7.1.c. The appropriate postmining land use for land that has been previously mined and not reclaimed shall be determined on the basis of the land use that existed prior to any mining. If the land cannot be reclaimed to the land use that existed prior to any mining, the appropriate postmining land use shall be determined on the basis of the highest and best use that can be achieved and which is compatible with surrounding undisturbed areas.

7.1.d. The postmining land use for land that has received improper management shall be determined on the basis of the premining use of surrounding lands that have received proper management.

7.1.e. If the premining use of the land was changed within five (5) years of the beginning of mining, the comparison of postmining use to premining use shall include a comparison with the historic use of the land as well as its use immediately preceding mining.

7.1.f. An application for a permit shall contain a narrative description of land capability and productivity which analyzes the premining land-use description required in 22-3-10(a)(2) of the Act. Productivity shall be determined by yield data or estimates from similar sites based on current data from USDA or state agricultural universities or state agricultural agencies.

7.2. Land Use Categories. Land use is categorized in the following groups:

7.2.a. Heavy Industry. Manufacturing facilities, power plants, airports or similar facilities;

7.2.b. Light Industry and Commercial Services. Office buildings, stores, parking facilities, apartment houses, motels, hotels or similar facilities;

7.2.c. Public Services. Schools, hospitals, churches, libraries, water treatment facilities, solid waste disposal facilities, public parks and recreation facilities, major transmission lines, major pipelines, highways, underground and surface utilities and other servicing structures and appurtenances;

7.2.d. Residential. Single and multiple-family housing (other than apartment houses) with necessary support facilities. Support facilities may include commercial services incorporated in and comprising less than five percent (5%) of the total land area of housing capacity, associated open space and minor vehicle parking and recreation facilities supporting the housing;

7.2.e. Cropland. Land used primarily for the production of cultivated and close-growing crops for harvest alone or in association with sod crops. Land used for facilities in support of farming operations are included;

7.2.f. Rangeland. Includes rangelands and forestlands which support a cover of herbaceous or scrubby vegetation suitable for grazing or browsing use;

7.2.g. Hayland or pasture. Land used primarily for the long-term production of adapted, domesticated forage plants to be grazed by livestock or cut and cured for livestock feed;

7.2.h. Forestland. Land with at least a twenty-five percent (25%) tree canopy or land at least ten percent (10%) stocked by forest trees of any size, including land formerly having had such tree cover and that will be naturally or artificially reforested;

7.2.i. Commercial Forestry. Where forest cover is managed for commercial production of timber products;

7.2.j. Impoundments of water. Land used for storing water for beneficial uses such as stock ponds, irrigation, fire protection, recreation or water supply;

7.2.k. Fish and wildlife habitat and recreation lands. Wetlands, fish and wildlife habitat, and areas managed primarily for fish and wildlife or recreation; or

7.2.k.1. Combined uses. Any appropriate combination of land uses where one land use is designated as the primary land use and one or more other land uses are designated as secondary land uses.

7.3. Criteria for Approving Alternative Postmining Use of Land.

7.3.a. Changing from one land use category before mining to another category after mining constitutes an alternative postmining land use. An alternative postmining land use may be approved by the Secretary after consultation with the landowner or the land management agency having jurisdiction over state or federal lands if the following criteria are met:

7.3.a.1. There is a reasonable likelihood for achievement of the proposed use;

7.3.a.2. The use does not present any actual or probable hazard to the public health or safety or threat of water diminution or pollution; and

7.3.a.3. The proposed postmining use is not:

7.3.a.3.A. Impractical or unreasonable;

7.3.a.3.B. Inconsistent with applicable land use policies or plans;

7.3.a.3.C. Going to involve unreasonable delays in implementation; or

7.3.a.3.D. In violation of any applicable law.

7.3.b. A change in postmining land use during mining shall be done in accordance with subdivision 7.3.a of this subsection and in accordance with subsection 3.28 of this rule.

7.3.c. A change in postmining land use to grassland uses such as rangeland and/or hayland or pasture is prohibited on operations that obtain an approximate original contour variance described in W. Va. Code §22-3-13(c). Provided, however, That this subdivision is not effective until subsections 7.4 and 7.5 of this rule are approved by the federal Office of Surface Mining.

7.4. Standards Applicable to Approximate Original Contour Variance Operations with a Postmining Land Use of Commercial Forestry and Forestry.

7.4.a. Applicability.

7.4.a.1. Commercial forestry and forestry may be approved as a postmining land use for surface mining operations that receive variances from the general requirement to restore the postmining site to its approximate original contour. An applicant may request AOC variance for purposes of this section for the entire permit area or any segment thereof. Commercial forestry shall be established on areas receiving a variance from AOC and either commercial forestry or forestry shall be established on all portions of the permit area. Provided, that the faces of valley fills shall be reclaimed as described in subparagraph 7.4.b.1.J of this rule.

7.4.b. Requirements.

7.4.b.1. The Secretary may authorize commercial forestry and forestry as a postmining use only if the following conditions have been satisfied:

7.4.b.1.A. Planting and Management Plan Development.

7.4.b.1.A.1. A registered professional forester shall develop a planting plan and long-term management plan for the permitted area that meets the requirements of the West Virginia Surface Coal Mining and Reclamation Act. These plans shall be made a part of the surface mining permit application and shall be the basis for determining the capability of the applicant to meet the requirements of this rule. The plans shall be in sufficient detail to demonstrate that the requirements of the commercial forestry and forestry uses can be met. The plans shall contain a signed statement of

intent from the landowner demonstrating its commitment to long-term implementation and management in accordance with the plan. Once final bond release is authorized, the permittee's responsibility for implementing the long-term management plan ceases. Upon final bond release, the jurisdiction of the Secretary over the permittee, the operator, the landowner or any other responsible party shall cease. The minimum required content of these plans shall be as follows:

7.4.b.1.A.2. The landowner or other responsible party shall submit their objectives for achieving commercial forestry and forestry postmining land uses. The Secretary may approve the uses only when the planting plan and long-term management plan demonstrate that the forest will be managed only for long-term forest products, such as sawlogs or veneer, that take 50 to 80 years to mature.

7.4.b.1.A.3. A commercial species planting plan and prescription shall be developed by the registered professional forester to achieve the commercial forestry and forestry use. The plan shall include the following:

7.4.b.1.A.3.(a). A topographic map of the permit area, 1:12000 or finer, showing the mapped location of premining native soil. A description of each soil mapping unit that includes, at a minimum, total depth and volume to bedrock, soil horizons, including the O,A.E,B,C, and Cr horizon depths, soil texture, structure, color, reaction and bedrock type and a site index for common native tree species. An approved certified professional soil scientist shall conduct a detailed on-site survey, create the maps, and provide the written description of the soils. As part of the field survey, the soil scientist shall map and certify the slopes that are 50% or less with a confidence level of $\forall$ 2%.

7.4.b.1.A.3.(b). An approved geologist shall create a certified geology map showing the location, depth, and volume of all strata in the mined area, the physical and chemical properties of each stratum to include rock texture, pH, potential acidity and alkalinity, total soluble salts, degree of weathering, extractable levels of phosphorus, potassium, calcium, magnesium, manganese, and iron and other properties required by the Secretary to select best available materials for mine soils.

7.4.b.1.A.3.(c) A description of the present soils and soil substitutes to be used as the plant medium and the proposed handling, and placement of these materials. The handling plan shall include procedures to:

7.4.b.1.A.3.(c)(1) Protect native soil organisms and the native seed pool;

7.4.b.1.A.3.(c)(2) Include organic debris such as litter, branches, small logs, roots, and stumps in the soil;

7.4.b.1.A.3.(c)(3) Inoculate the mine soil with native soil organisms;

7.4.b.1.A.3.(c)(4) Increase soil fertility; and

7.4.b.1.A.3.(c)(5) Encourage plant succession.

7.4.b.1.A.3.(d). A surface preparation plan which includes a description of the methods for replacing and grading the soil and other soil substitutes and their preparation for seeding and tree planting.

7.4.b.1.A.3.(e). Liming and fertilization plans.

7.4.b.1.A.3.(f). Mulching type, rates and procedures.

7.4.b.1.A.3.(g). Species seeding rates and procedures for application of perennial and annual herbaceous, shrub, and vine plant materials for ground cover.

7.4.b.1.A.3.(h). A tree planting prescription to establish commercial forestry and forestry, to include species, stems per acre, planting mixes, and site-specific arrangements to maximize productivity.

7.4.b.1.A.4. A long-term management plan shall be developed by a registered professional forester. The plan shall include:

7.4.b.1.A.4.(a). A topographic map, with a minimum scale of 1:12000 shall be used to show the boundaries and extent of the proposed surface mining operation, the boundaries of areas being planned for commercial forestry and forestry land uses, and the proposed postmining surface configuration, stream drainages and wetlands, and the plant species mix that will be planted in each area.

7.4.b.1.A.4.(b). A proposed schedule of all silvicultural activities necessary to develop the forest resources for commercial forestry and forestry.

7.4.b.1.A.4.(c). A description of activities necessary to protect the forest resources from vandalism, wildfire, insects, diseases, exotic organisms and herbivory detrimental to long-term success.

7.4.b.1.A.4.(d). A plan to assure forest access for future management, protection, and eventual utilization of the forest resources. The plan shall be developed to minimize adverse environmental impacts, including additional road building and other land disturbances. Forestry best management practices shall be followed.

7.4.b.1.A.4.(e). A plan for using forestry best management practices to minimize silvicultural and harvesting impacts on the permit area and on waters of the state. Best Management Practices shall be sufficient to assure compliance with applicable state and federal water quality standards.

7.4.b.1.A.5. A signed statement from the permittee containing financial information and data sufficient to demonstrate:

7.4.b.1.A.5.(a). That achieving the commercial forestry use is practicable with respect to the private financial capability necessary to achieve the use; and

7.4.b.1.A.5.(b). That the commercial forestry use will be obtainable according to data regarding expected need and market.

7.4.b.1.A.6. Two copies of the planting plan, management plan, pertinent maps and statement of intent shall be submitted to the appropriate Division of Forestry District Forester and two copies of each plan shall be submitted to the Secretary of the Department of Environmental Protection.

7.4.b.1.B. Oversight Procedures for Achieving Commercial Forestry and Forestry.

7.4.b.1.B.1. Before approving a commercial forestry and forestry reclamation plan, the Secretary shall assure that the planting plan, long-term management plan, and statement of intent are reviewed and approved by a registered professional forester employed either by the West Virginia Division of Forestry or the Secretary of the Department of Environmental Protection and that a certified professional soil scientist employed by the Secretary reviews and field verifies the soil slope and sandstone mapping. Before approving the reclamation plan, the Secretary shall assure that the reviewing forester has made site-specific written findings adequately addressing each of the elements of the plans and statements. The reviewing forester and soil scientist shall make these findings within 45 days of receipt of the plans and maps.

7.4.b.1.B.2. If after reviewing the plans, the reviewing forester and soil scientist find that the plans and statements comply with the requirements of this land use, they shall prepare written findings stating the basis of approval. A copy of the findings shall be sent to the Secretary and to the surface mining permit supervisor for the region in which the permit is located. The written findings shall be made part of the facts and findings section of the surface mining permit application file. The Secretary shall assure that the plans and statements comply with the

requirements of this rule and other provisions of the approved state surface mining program.

7.4.b.1.B.3. If the reviewing forester finds the plans to be insufficient, the forester shall either:

7.4.b.1.B.3.(a). Contact the preparing forester or the permittee and provide the permittee with an opportunity to make the changes necessary to bring the reclamation plan into compliance with the regulations, or

7.4.b.1.B.3.(b). Notify the Secretary that the reclamation plan does not meet the requirements of the regulations. The Secretary may not approve the surface mining permit until finding that the reclamation plans satisfy all of the requirements of the regulations.

7.4.b.1.C. Landscape Criteria.

7.4.b.1.C.1. For commercial forestry, the Secretary shall assure that the postmining landscape is rolling, and diverse. The backfill on the mine bench shall be configured to create a postmining topography that includes the principles of land forming (e.g., the creation of swales) to reflect the premining irregularities in the land. Postmining landlord shall provide a rolling topography with slopes of both 5% and 15% with an average slope of 10% to 12.5%. The elevation change between the ridgeline and the valleys shall be varied. The slope lengths shall not exceed 500 feet. The minimum thickness of backfill, including mine soil, placed on the pavement of the basal seam mined in any particular area shall be ten (10) feet.

7.4.b.1.C.2. For commercial forestry, the surface pattern shall contain watersheds of various sizes, shall exhibit a dendritic drainage pattern that simulates the premining pattern, and shall include the drainage channels, sediment control or other water retention surfaces, which shall remain on the site after bond release.

7.4.b.1.C.3. For commercial forestry, in areas where drainage channel design criteria do not mandate erosion control materials, and in other drainage areas where applicable, bioengineering techniques such as fascines, branch packings, live crib walls, and plantings of native herbs and shrubs appropriate for the site shall be used, to the extent possible, to increase the site biodiversity. Only native stone shall be used for erosion control.

7.4.b.1.C.4. For commercial forestry, at least 3 ponds, permanent impoundments or wetlands totaling at least 3.0 acres shall be created on each 200 acres of permitted area. They shall be dispersed throughout the landscape and each water body shall be no smaller than 0.20 acres. All ponds, permanent impoundments or wetlands shall be subject to the requirements of subsection 5.5 of this rule, and shall be left in place after final bond release. The substrate of the ponds and wetlands must be capable of retaining water to support aquatic and littoral vegetation.

7.4.b.1.C.5. For forestry, all ponds and impoundments, except for ponds and impoundments located below the valley fills created during mining shall be left in place after bond release. Any pond or impoundment left in place is subject to requirements under subsection 5.5 of this rule. The substrate of the ponds and wetlands must be capable of retaining water to support aquatic and littoral vegetation.

7.4.b.1.C.6. Before Phase III bond release may be approved, the ponds, permanent impoundments or wetlands used to satisfy parts 7.4.d.1.C.4 and 5 of this rule shall be vegetated on the perimeter with at least six native herbaceous species typical of the region at the density of not less than 1 plant per linear foot of edge, and at least 4 native shrub species at a density of not less than 1 shrub per 6 linear feet of edge. No species of herbaceous or shrub species shall be less than 15% of the total for its life form. This requirement may be met by planted vegetation or that which naturally colonizes the site.

7.4.b.1.C.7. The landscape criteria in parts 7.4.b.1.C.1, 2, 3, 4, 5, and 6 above

do not apply to valley fills.

7.4.b.1.D. Soil and Soil Substitutes.

7.4.b.1.D.1. Soil is defined as and shall consist of the O, A, E, B, C and Cr horizons. O horizon means the top-most horizon or layer of soil dominated by organic material derived from dead plants and animals at various stages of decomposition; it is sometimes referred to as the duff or litter layer or the forest floor. Cr horizon means the horizon or layer below the C horizon, consisting of weathered or soft bedrock including saprolite or partly consolidated soft sandstone, siltstone, or shale.

7.4.b.1.D.2. The Secretary shall require the operator to recover and use the soil volume equal to the total soil volume on the mined area, as shown on the soil maps and survey except for those areas with a slope of at least 50%. The Secretary shall assure that all saved soil includes all of the material from the O through Cr horizons.

7.4.b.1.D.3. When the soil volume recovered in part 7.4.b.1.D.2. above is sufficient to meet the depth requirements, selected overburden materials may be used as soil substitutes. In such cases, the Secretary shall require the operator to recover and use all of the weathered, slightly acid brown sandstone from within ten (10) feet of the soil surface on the mined area. This weathered, slightly acid, brown sandstone material may contain or be supplemented with up to 25% by-volume weathered, slightly acid brown shale or siltstone from within ten (10) feet of the soil surface. Material from this layer may be removed with the soil and mixed with the soil in order to meet the depth requirement. Provided, that once the operator has recovered material sufficient to meet the depth requirements, it may cease recovering such material.

7.4.b.1.D.4. When the materials described in parts 7.4.b.1.D.2 and 3 of this rule are insufficient to meet the depth requirements, then the Secretary shall require the operator to recover and use all of the weathered, slightly acid, brown sandstone from below ten feet of the soil surface on the mined area. Provided, that once the operator has recovered material sufficient to meet the depth requirements, it may cease recovering such material.

7.4.b.1.D.5. If the applicant affirmatively demonstrates that the materials described in parts 7.4.b.1.D.2, 3, and 4 of this rule within the mined area are insufficient to meet the depth requirements, then up to 2/3 of the mine soil may consist of the best available material or mix of materials.

7.4.b.1.D.6. Before approving the use of soil substitutes, the Secretary shall require the permittee to demonstrate that the selected overburden material is suitable for restoring land capability and productivity. This will be demonstrated by the results of chemical and physical analyses that show that this material is at least 75% sandstone, has at least 15% fines (<2mm), has a net acid-base accounting between -3 and +3 calcium carbonate equivalent per 1000 tons of material excluding siderite effects, a soluble salt level less than 1.0 mmhos/cm, to result in a long-term equilibrium pH of between 5.0 and 6.5 and additional analyses as the Secretary deems necessary. If this spoil is made up of strongly contrasting materials with respect to acid/base accounting these materials shall be blended.

7.4.b.1.D.7. The mine soils shall be distributed across the disturbed areas, except the faces of valley fills, in a uniform and consistent mix.

7.4.b.1.D.8. For commercial forestry, the final surface material used as the planting and growth medium (hereinafter referred to as commercial forestry mine soil) shall consist of a minimum of four feet, and an average of at least five feet, of soil or a mixture of materials consisting of no less than one-third soil and two-thirds of the materials described in parts 7.4.b.1.D.3. and 4. of this rule.

7.4.b.1.D.9. For forestry, the final surface material used as the planting and

growth medium (forestry mine soil) shall consist of a minimum of 4 feet of soil, or a mixture of soil and suitable soil substitutes described in parts 7.4.b.1.D.4 through 6 of this rule.

7.4.b.1.D.10. Commercial forestry mine soil shall be placed on that portion of the mined area which receives an AOC variance. For a proposed mine permit area or any specifically defined segment of the proposed permit area that does not satisfy the volumetric criteria for AOC, an AOC variance shall be required. In order to define the portion of the permit classified as AOC-compliant or AOC-variant, the permit may be divided into segments. The number of segments shall not exceed the number of excess spoil disposal areas proposed and each segment shall include at least one associated fill. In no event will there be more variance segments than there are excess spoil disposal areas on the permit area. For each segment, the AOC status shall be defined as complying with AOC if that segment meets the backfill volume, valley fill design, backfill inflection point tests and other criteria as described in the AOC policy adopted by the Secretary.

7.4.b.1.D.11. Forestry mine soil shall, at a minimum, be placed on all areas achieving AOC.

7.4.b.1.D.12. If the applicant does not demonstrate that there is sufficient material available on the permit area to satisfy the requirements of subparagraph 7.4.d.1.D., then the Secretary may not authorize this post mining land use.

7.4.b.1.D.13. The Secretary shall require the operator to include, as part of the commercial forestry and forestry mine soil mix, organic debris such as forest litter, branches, small logs, roots and stumps in the soil to help reseed and resprout the native vegetation, inoculate the mine soil with native soil organisms, increase soil fertility, and encourage plant succession.

7.4.b.1.D.14. The Secretary shall require that soil be removed and re-applied in a manner that minimizes stockpiling to protect seed pools and soil organisms. Only soil removed from the mined area during the one-year period immediately following commencement of soil removal may be placed in a long-term stockpile. Except for soil in a long-term stockpile, soil redistribution shall be done within six months of soil removal. Except for soil in a long-term stockpile, soil shall be stored for less than six months in piles less than six feet high and 24 feet wide in a stable area within the permit area where it will not be disturbed and will be protected from water or wind erosion or contaminants that lessen its capability to support vegetation. Long-term stockpiles shall be seeded with the legumes specified in the ground cover mixes used for reforestation (part 7.4.d.1.G.1. of this rule).

7.4.b.1.E. Soil Placement and Grading.

7.4.b.1.E.1. The Secretary shall require the permittee to place mine soil loosely and in a non-compacted manner while meeting static safety factor requirements. Mine soil shall be graded only when necessary to maintain stability or on slopes greater than 20% unless otherwise approved by the Secretary. Grading shall be minimized to reduce compaction. When grading is approved by the Secretary, only light grading equipment may be used to grade the tops off the piles, roughly leveling the area with no more than one or two passes. Tracking in and rubber-tired equipment shall not be used. Non-permanent roads, equipment yards, and other trafficked areas shall be deep-ripped (24" to 36") to mitigate compaction and to allow these areas to be restored to productive commercial forestry. Soil physical quality shall be inadequate if it inhibits water infiltration or prevents root penetration or if their physical properties or water-supplying capacities cause them to restrict root growth of trees common to the area. Slopes greater than 50% shall be compacted no more than is necessary to achieve stability and non-erodability.

7.4.b.1.E.2. The Secretary shall require the permittee to leave soil surfaces rough with random depressions across the

entire surface to catch seed and sediment, conserve soil water, and promote revegetation. Organic debris such as forest litter, logs, and stumps shall be left on and in the soil.

7.4.b.1.F. Liming and Fertilizing.

7.4.b.1.F.1. The Secretary shall require the permittee to apply lime where the average soil pH is less than 5.5. Lime rates will be used to achieve a uniform soil pH of 6.0. An alternate maximum or minimum soil pH may be approved, however, based on the optimum pH for the forest revegetation species. Soil pH may vary from 4.5 to a maximum of 7.0 from place to place across the reclaimed area with no more than 10% of the site below pH 5.0 and/or no more than 10% of the site above pH 6.5. Low and high pH levels may be approved only when tree species tolerant of the pH range have been approved for planting.

7.4.b.1.F.2. The Secretary shall require the permittee to fertilize based on the needs of trees and ground cover vegetation. The permittee shall apply up to 300 pounds/acre of diammonium phosphate (18-46-0) and up to 100 pounds/acre potassium sulfate (0-0-52) with the ground cover seeding. Other fertilizer materials and rates may be used only if the Secretary finds that the substitutions are appropriate based on soil tests performed by state certified laboratories.

7.4.b.1.G. Ground Cover Vegetation.

7.4.b.1.G.1. The Secretary shall require the permittee to establish a temporary erosion control vegetative cover as contemporaneously as practicable with backfilling and grading until a permanent tree cover can be established. This cover shall consist of a combination of native and domesticated non-competitive and non-invasive cool and warm season grasses and other herbaceous vine or shrub species including legume species and ericaceous shrubs. All species shall be slow growing, tolerant of low pH, and compatible with tree establishment and growth. The ground cover vegetation shall be capable of stabilizing the soil from excessive erosion, but it should be minimized to control tree-damaging rodent population, and allow the establishment and unrestricted growth of native herbaceous plants and trees. Seeding rates and composition must be in the planting plan. The following ground cover mix and seeding rates (pounds/acre) shall be used: winter wheat (15 lbs/acre, fall seeding), foxtail millet (5 lbs/acre, summer seeding), redtop (2 lbs/acre), perennial ryegrass (2 lbs/acre), orchardgrass (5 lbs/acre), weeping lovegrass (2 lbs/acre) kobe lespedeza (5 lbs/acre), birdsfoot trefoil (10 lbs/acre), and white clover (3 lbs/acre). Kentucky-31 fescue, serecia lespedeza, all vetches, clovers (except ladino and white clover) and other aggressive or invasive species shall not be used. South- and west-facing slopes with a soil pH of 6.0 or greater, the four grasses in the mixture shall be replaced with 20 lbs/acre of warm-season grasses consisting of the following species: Niagara big bluestem (5 lbs/acre), Camper little bluestem (2 lbs/acre), Indian grass (2 lbs/acre), and Shelter switch grass (1 lb/acre), or other varieties of these species approved by the Secretary. Also, a selection of at least 3 native shrub species native of the area shall be included in the ground cover mix. Provided, that on slopes less than 20%, the Secretary may approve lesser or no vegetative cover when tree growth and productivity will be enhanced and sedimentation will not result. Lesser or no vegetative cover may only be authorized by the Secretary when mulch or other soil stabilizing practices have been used to protect all disturbed areas unless demonstrated that the reduced cover is sufficient to control erosion and air pollution attendant to erosion regardless of slope.

7.4.b.1.G.2. All mixes shall be compatible with the plant and animal species of the region and the commercial forestry use. The Secretary shall require the use of a variety of site-specific ground cover treatments so that different ground cover treatments are used on different parts of the reclamation area to add biodiversity and landscape mosaic to the overall plan.

7.4.b.1.G.3. The

permittee may regrade and reseed only those rills and gullies that are unstable and/or disrupt the approved postmining land use or the establishment of vegetative cover or cause or contribute to a violation of the water quality standards for the receiving stream.

7.4.b.1.H. Tree Species and Compositions.

7.4.b.1.H.1. Commercial tree and nurse tree species selection shall be based on site-specific characteristics and long-term goals outlined in the forest management plan and approved by a registered professional forester. For commercial forestry, the Secretary shall assure that all areas suitable for hardwoods are planted with native hardwoods at a rate of 500 seedlings per acre in continuous mixtures across the permitted area with at least six (6) species from the following list: white and red oaks, other native oaks, white ash, yellow-poplar, black walnut, sugar maple, black cherry, or native hickories. For forestry, the Secretary shall assure that all areas suitable for hardwoods are planted with native hardwoods at a rate of 450 seedlings per acre in continuous mixtures across the permitted area with at least three (3) or four (4) species from the following list: white and red oaks, other native oaks, white ash, yellow-poplar, black walnut, sugar maple, black cherry, or native hickories.

7.4.b.1.H.2. For commercial forestry, each of the species shall be not less than 10% of the total planted composition and at least 75% of the total planted woody plant composition shall be from the list of species in part 7.4.b.1.H.1. Species shall be selected based on their compatibility and expected site-specific long-term dynamics. For forestry, if only three species from the above list are planted, then each of the species shall be not less than 20% of the total planted composition. If four species from the list in part 7.4.b.1.H.1. are planted, then each of the species shall be not less than 15% of the total planted composition. Species shall be selected based on their compatibility and expected site-specific long-term dynamics.

7.4.b.1.H.3. Between 5% and 10% of the required number of woody plants shall be a planted in a continuous mix of three or more nurse tree and shrub species that improve soil quality and habitat for wildlife. They shall consist of black alder, black locust, bristley locust, redbud, or bi-color lespedeza or other non-invasive, native nurse tree or shrub species, approved by the Secretary. One to five acres within each 100 acres of the permit area shall be left unplanted with trees, but left with ponds, wetlands or ground cover vegetation only. These areas may be continuous or divided into 2-4 separate parcels, each at least 0.25 acres large.

7.4.b.1.H.4. On areas unsuitable for hardwoods, the Secretary may authorize the following conifers: Virginia pine, red pine, white pine, pitch pine, or pitch x loblolly hybrid pine. Areas unsuitable for hardwoods shall be limited to southwest-facing slopes greater than 10% or areas where the soil pH is less than 5.5. These conifers shall be planted as single-species stands less than 10 acres in size at the same rate as the hardwood requirements in part 7.4.b.1.H.1 of this rule. The Secretary shall assure that no reclaimed area of the permit area contains a total of more than 15% conifers.

7.4.b.1.H.5. The Secretary shall assure that the specific species and selection of trees and shrubs shall be based on the suitability of the planting site for each species' site requirements based on soil type, degree of compaction, ground cover, competition, topographic position, and aspect.

7.4.b.1.H.6. For commercial forestry only, in addition to the trees and shrubs required in the sections above, 2-0 white pine seedlings shall be planted across all sites at a rate of 5 to 10 trees per acre. These trees will be used for the productivity check required for Phase III bond release.

7.4.b.1.I. Standards of Success.

7.4.b.1.I.1. The Secretary shall assure the ability of the commercial forestry and forestry areas to produce a high-quality commercial forest by confirming, after on-site soil

testing, that the mine soil selection, placement, and preparation criteria in parts 7.4.d.1.D.7 through 11 of this rule are met before Phase I bond release may occur. Before approving Phase I bond release, a certified soil scientist shall certify, and the Secretary shall make a written finding that the mine soil meets these criteria.

7.4.b.1.I.2. The Secretary shall not authorize Phase II bond release for commercial forestry before the end of the fifth tree growing season. The Secretary may approve Phase II bond release only if the tree survival is equal to or greater than 300 commercial trees per acre (80% of which must be commercial hardwood species listed in part 7.4.b.1.H.1 of this rule) or the rate specified in the forest management plan, whichever is greater. For forestry, Phase II bond release may be granted by the Secretary at the end of the second growing season only if the tree survival is equal to or greater than 300 trees per acre, 60% of which must be commercial hardwood species listed in part 7.4.b.1.H.1 of this rule, or the rate specified in the forest management plan, whichever is greater. Furthermore, for both commercial forestry and forestry, there shall be 70% ground cover where ground cover includes tree canopy, shrub and herbaceous cover, and organic litter, except where a lesser vegetation cover has been authorized, and at least 80% of all trees and shrubs used to determine re-vegetation success must have been in place for at least 60% of the applicable minimum period of responsibility. Trees and shrubs counted in determining such success shall be healthy and shall have been in place for not less than two growing seasons with no evidence of die back.

7.4.b.1.I.3. The Secretary may approve Phase III bond release for commercial forestry and forestry only if all criteria for Phase II bond release in part 7.4.b.1.I.2 of this rule are still being met at the time Phase III bond release is considered. For forestry, Phase III bond release may not be authorized until at least five growing seasons have passed since the trees were planted. Above and beyond all other standards in effect, for commercial forestry, phase III bond release may not be authorized unless commercial forest productivity has been achieved by the end of the twelfth growing season or, if such productivity has not been achieved, if a commercial forestry mitigation plan is submitted to the Secretary, approved and completed. Commercial forest productivity is achieved only when annual height increments of the white pine indicator species, based on the average of four or more consecutive annual height increments, is equal to or greater than 1.5 feet. The Secretary shall measure the average four-year growth increment of all trees along two perpendicular transects across the site that will achieve a tree sample size of no less than two trees per acre.

7.4.b.1.I.4. A commercial forestry mitigation plan shall require a permittee who has not achieved commercial forestry productivity requirements by the end of the twelfth growing season to either pay to the Special Reclamation Fund an amount equal to twice the remaining bond amount or to perform an equivalent amount of in-kind mitigation. The Secretary shall use any money collected under this plan to establish forests on bond forfeiture sites. In-kind mitigation requires establishing forests on AML or bond forfeiture sites. After completion of the mitigation plan, Phase III bond release may be approved if the Secretary finds that the failure to achieve productivity did not result from a failure to follow the provisions of this rule and did not result in environmental damage.

7.4.b.1.I.5. The Secretary may release all or part of the bond for the commercial forestry and forestry variance or increment thereof in accordance with this subsection and 38-2-12.2.d. and 12.2.e. of this rule. The Secretary may release the variance portion if all appropriate standards have been met without regard to the bonding scheme selected for the permit.

7.4.b.1.J. Front Faces of Valley Fills.

7.4.b.1.J.1. Front faces of valley fills shall be exempt from the requirements of this rule except that:

7.4.b.1.J.1.(a). They

shall be graded and compacted no more than is necessary to achieve stability and non-erodability;

7.4.b.1.J.1.(b). No unweathered shales may be present in the upper four feet of surface material;

7.4.b.1.J.1.(c). The upper four feet of surface material shall be composed of soil and the materials described in subparagraph 7.4.b.1.D. of this rule, when available, unless the Secretary determines other material is necessary to achieve stability;

7.4.b.1.J.1.(d). The groundcover mixes described in subparagraph 7.4.d.1.G. shall be used unless the Secretary requires a different mixture;

7.4.b.1.J.1.(e). Kentucky 31 fescue, serecia lespedeza, vetches, clovers (except ladino and white clover) or other invasive species may not be used; and

7.4.b.1.J.2. Although not required by this rule, native, non-invasive trees may be planted on the faces of fills.

7.4.b.1.K. Long-term Monitoring and Adaptive Management. The Secretary shall under-take, with the assistance of the Division of Forestry or other forestry research units, a performance assessment of all Commercial Forestland permits within 10 years of Phase III bond release. Species composition, biodiversity, productivity, carbon capture, wildlife habitat, stream and wetland biota, and hydrologic function will be assessed. Results will be reported, analyzed, interpreted and used as part of an adaptive management program to improve the regulations and guidelines for Commercial Forestland.

7.5. The Homestead land use meets the requirements for a variance from the AOC requirements of the Act (W.Va. Code §22-3-13(c)). An appropriately planned Homestead will promote sustainable settlement patterns that protect the environment and support the region's economic development.

7.5.a. Operations receiving a variance from AOC for this use shall establish homesteading on at least one-half (½) of the permit area. The remainder of the permit area shall support an alternate AOC variance use.

7.5.b. The following terms are applicable only to this subsection of this rule.

7.5.b.1. Building pad means an accessible, designated, and properly drained area where the soil and/or mine-spoil has been specially placed and compacted to minimize post-mining surface settlement. After the building pad is completed, a registered professional engineer shall certify that the building pad was constructed as designed. This certification shall accompany the deed of conveyance.

7.5.b.2. Civic parcel means a parcel designated in the land plan for public use.

7.5.b.3. Commercial parcel means a parcel retained by the landowner of record and incorporated within the homestead area on which the landowner or its designee may develop commercial uses. The size and location of commercial parcels shall comply with the requirements of this regulation.

7.5.b.4. Community association means an association of all the homesteaders. This association shall receive title to the civic parcels, conservation easements and nurseries at the time of final bond release.

7.5.b.5. Conservation easement means an area, typically a strip no less than 200 feet wide, designated in the land plan for the purpose of establishing a natural habitat for the development and migration of native species of fauna and flora. These easements shall extend through the mined areas of the land, starting and ending in natural, undisturbed land. These areas shall be permanent easements maintained for conservation and not commercial purposes.

7.5.b.6. Entity administering The civic parcels means the community association or

its designee shall administer the civic parcels.

7.5.b.7. Escrow agent means the Attorney General of the State of West Virginia shall be the escrow agent.

7.5.b.8. Homesteader means a citizen of the State that fulfills the requirements of this regulation and who is selected by lottery to reside on a designated homestead parcel.

7.5.b.9. Homestead area means the entire area designated for homestead use, including roads.

7.5.b.10. Homestead infrastructure means the facilities necessary to sustain residential use, including roads, electricity, telephone, water and sewage or septic systems.

7.5.b.11. Homestead parcel means an individual segment of a homestead area designated as either a rural or village parcel. The permittee shall assure that each parcel has been surveyed by a licensed land surveyor before Phase I bond release.

7.5.b.12. Homestead plan means all the required documentation, engineered drawings, authorizations, agreements and schedules which are to be submitted and approved by the Secretary.

7.5.b.13. Homestead selection lottery means a lottery sanctioned by the state, operated under rules established and administered by the Secretary or the Secretary's designee as soon as practicable after Phase I bond release.

7.5.b.14. Landowner of record means the surface estate owner at the time the mining permit is submitted to the Secretary. More than one landowner of record may be involved in a homestead plan. The landowner of record shall transfer the title to the surface estate of the homestead area to the escrow agent prior to the beginning of mining. The cost of transfer shall be paid by the landowner of record.

7.5.b.15. Land plan means the depiction, with supporting documentation, including surveys and narratives, of the homestead parcels, building pads, roads, easements, civic parcels, commercial parcels, and other features of the Homestead Area.

7.5.b.16. Machine passable grade means the maximum grade that can be safely accommodated by commonly used, self-propelled, rubber-tired farming equipment.

7.5.b.17. Rural parcels means homesteading parcels planned to promote rural uses such as farming, orchard growing, timber management, viticulture, and morret gardening. The rural parcels shall be an appropriate size for the designated use and may be up to 40 acres. Rural homesteaders may receive title only to that portion of the land that they have improved over the five-year period.

7.5.b.18. Service drop means the overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

7.5.b.19. Service-entrance conductors, overhead system means the service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

7.5.b.20. Service-entrance conductors, underground system means the service conductors between the terminals of the service equipment and the point of connection to the service lateral.

7.5.b.21. Service lateral means the underground service conductors between the street main, including any risers at a pole or other structure or from transformers, and the first point of connection to the service-entrance conductors in a terminal box or meter or other enclosure with adequate space, inside or outside the building wall. Where there is no terminal box, meter, or other enclosure with adequate space, the point of connection shall be considered to be the point of entrance of the service conductors into the

building.

7.5.b.22. Soil plan means the maps and descriptions of premining and postmining soil included in the homestead plan.

7.5.b.23. Village parcels means homesteading parcels that provide a higher density of residential population than rural parcels.

7.5.c. Eligibility Requirements And Responsibilities For Homesteaders.

7.5.c.1. Homesteader shall meet the following eligibility requirements:

7.5.c.1.A.. Be a resident of the State of West Virginia and be at least 18 years old;

7.5.c.1.B. Apply for a homestead as required by this rule;

7.5.c.1.C. Abide by the rules of the homestead selection lottery;

7.5.c.1.D. Reside on the subject parcel within 12 months after the property is certified as ready for use. Provided that subject to the approval of the escrow agent, occupancy may be delayed up to 6 additional months for good cause shown.

7.5.d. Rules For The Lottery.

7.5.d.1. The rules for the lottery are as follows:

7.5.d.1.A. Each household may receive no more than one homestead.

7.5.d.1.B. Homestead parcels shall be distributed by anonymous lottery.

7.5.d.1.C. For any given homestead, the lottery shall first be opened only to West Virginians living within three (3) miles of the permitted area within five years of the date of the filing of the permit application. Provided, however, that if parcels remain after an initial lottery, subsequent lotteries shall be held in the following order. The first subsequent lottery shall be open to any resident of a county (or counties, if more than one) in which the mine is located. Further, lotteries, if necessary, shall be open to any resident of West Virginia, and shall be held at six (6) month intervals.

7.5.d.1.D. The lottery shall be held as soon as practicable after Phase I bond release is approved. Adequate notice shall be provided at least six (6) months in advance of the lottery.

7.5.d.1.E. The lottery shall be fair, impartial, and open to the public.

7.5.d.1.F. A lottery participant who receives a parcel may decline a parcel, but may not sell the right to homestead on the parcel.

7.5.d.1.G. The right to participate in the lottery is not assignable or saleable.

7.5.d.1.H. Each lottery participant shall, before the lottery, apply for either a rural or a village parcel.

7.5.e. Homestead Plan Development.

7.5.e.1. The Secretary may authorize homesteading as a post-mining use only if the following conditions have been satisfied:

7.5.e.1.A. The homestead plan and any subsequent modifications shall be prepared under the direction of and certified by a professional engineer, a soil scientist, and a design professional that is either a licensed architect, landscape architect, or AICP certified land planner.

7.5.e.1.B. The homestead plan shall identify each member of a specialty group that contributed to the plan. The plan shall be sufficiently detailed to ensure success in achieving the designated use of each homestead panel and to ensure sound future management of the homestead.

7.5.e.1.C. Homestead plan may be used alone or in conjunction with any other alternate land use plan. The homesteading area, minus commercial parcels, shall occupy at least 50% of the permitted area. In the event that the Homestead use is used in conjunction with another land use, the landowner of record shall provide for the homestead use at least as much land on the mining bench as it retains for alternate land use.

7.5.e.1.D. The permittee shall submit plans prepared at a preferred scale of at least 1 inch = 200 feet, which include the following:

7.5.e.1.D.1. A land plan showing the homestead boundaries, homestead parcels, building pads, roads, easements, civic parcels, and commercial parcels, as applicable.

7.5.e.1.D.2. A site plan and description of the following:

7.5.e.1.D.2.(a). Wastewater and sewage systems;

7.5.e.1.D.2.(b). Potable water supply;

7.5.e.1.D.2.(c). Non-potable water supply (if applicable);

7.5.e.1.D.2.(d). Electrical service; and

7.5.e.1.D.2.(e). Telephone service.

7.5.e.1.D.3. A grading plan showing contours at an interval appropriate for the map scale and slopes, and including surface drainage and stormwater provisions. The Secretary shall require maps at specific scales and contour intervals to satisfy the designated uses of the homestead parcels and the land plan.

7.5.e.1.D.4. A map showing all off-bench fill areas and the outcrop of the lowest coal bed.

7.5.e.1.D.5. A soil Plan showing soil and weathered spoil storage areas. The plan shall describe the methods to be used to distribute, protect, and enhance the stored material upon final regrading of the disturbed surfaces. The plan shall identify the proposed depths of soil and subsoil for each specific use within the homestead area. These specific uses may include, but shall not be limited to, the following:

7.5.e.1.D.5.(a). Haul roads;

7.5.e.1.D.5.(b). Conservation easements;

7.5.e.1.D.5.(c). Building pads;

7.5.e.1.D.5.(d). Garden plots;

7.5.e.1.D.5.(e). Waste water and sewage disposal facilities;

7.5.e.1.D.5.(f). Storm drainage facilities;

7.5.e.1.D.5.(g). Wetland facilities;

7.5.e.1.D.5.(h). Utility easements;

7.5.e.1.D.5.(I). Civic/public facilities; and

7.5.e.1.D.5.(j). Commercial areas.

7.5.e.1.D.6. Soil maps.

7.5.f.. Financial Commitments.

7.5.f.1. A contract between the permittee and the Secretary, binding the permittee to complete the homestead use as soon practicable but no later than two years after the completion of mining, shall be required.

7.5.f.2. The contract between the permittee and the Secretary shall, at a minimum, require the permittee to follow the homesteading reclamation plan.

7.5.f.3. To receive approval for a homestead use, the permittee shall demonstrate that it has the financial capability to achieve the use and carry out the reclamation plan. The permittee shall submit signed statements containing financial information and data sufficient to demonstrate that the permittee has the financial capability to achieve the homesteading use.

7.5.f.4. Before approving the permit, the Secretary shall find, in writing, that the permittee has the financial capability to achieve the use.

7.5.g. Required Elements For All Homestead Plans.

7.5.g.1. Boundary of the homestead area:

7.5.g.1.A. The homestead area shall be defined by a metes and bounds description prepared and certified by a professional engineer or licensed land surveyor registered with the State of West Virginia.

7.5.g.1.B. Non-mined areas may be included in the homestead area.

7.5.g.1.C. In the event that any portion of the land transferred to the escrow agent is not mined, that land may revert to the landowner of record.

7.5.g.2. General Requirements of all Parcels:

7.5.g.2.A. Each individual parcel shall be delineated by metes and bounds description prepared by a professional engineer or licensed land surveyor registered with the State of West Virginia.

7.5.g.2.B. Parcels shall support their designated land uses.

7.5.g.2.C. Parcels shall be configured and arranged to minimize adverse environmental impacts.

7.5.g.2.D. The permittee shall provide adequate road frontage for access to each homestead, public nursery, civic and commercial parcel.

7.5.g.2.E. Houses and appurtenant facilities shall be no closer than 50 feet from the edge of a designated conservation easement.

7.5.g.3. Homestead Parcels.

7.5.g.3.A. Homestead parcels shall be designated as either rural or village parcels. All parcels shall contain machine passable land appropriate to the designated use.

7.5.g.3.B. Each rural homestead parcel shall be provided with a garden area of at least 5,000 square feet. Each village homestead parcel shall be provided with a garden area of at least 600 square feet. The garden areas shall be constructed in compliance with the soil requirements set forth in subdivision 7.5.j. of this rule.

7.5.g.3.C. Each rural and village homestead parcel shall contain a building pad of a minimum of 2,500 square feet for a dwelling. Each rural homestead parcel shall also contain a building pad of a minimum of 2,500 square feet for an outbuilding.

7.5.g.4. Civic Parcels.

7.5.g.4.A. The homestead plan shall delineate one or more appropriate sites within the total proposed homestead area for civic parcels. These uses may include, but are not limited to, the following: park land, playing fields, schools, post office, and community administrative facilities. This area shall occupy at least 10% of the post-mining permit area.

7.5.g.4.B. The civic parcels may be one contiguous parcel or appropriately sized non-contiguous parcels.

7.5.g.4.C. The civic parcels shall be deeded at no charge to the duly recognized community association.

7.5.g.4.D. The civic parcels shall be provided with an access road and utilities that are consistent with the proposed civic land use.

7.5.g.5. Commercial Parcels.

7.5.g.5.A. The landowner of record may elect to retain up to 15% of the land in the proposed homestead area for the purpose of commercial development; provided that the landowner of record may retain no more than 50% of the permitted area.

7.5.g.5.B. The retained commercial area may be comprised of one or more parcels and shall be indicated on the land plan.

7.5.g.5.C. In the area for the commercial parcel the mine spoil shall be placed, compacted, and regraded in a manner consistent with the proposed commercial land use.

7.5.g.6. Approval.

7.5.g.6.A. Before approving a homesteading reclamation plan, the Secretary shall assure that homestead plan is reviewed and approved by either a licensed architect, landscape architect, or AICP certified land planner employed by or under contract to the Secretary. In addition, the Secretary shall assure that the plans for rural parcels are reviewed and approved by an agronomist employed by or under contract with the Secretary. The applicants shall pay for any review under this subsection.

7.5.h. Construction And Conveyance Of Homestead Parcels. All construction projects not performed by the homesteaders on homestead areas shall be performed by the permittee, using a West Virginia licensed contractor.

7.5.h.1. Stabilization of the Homestead Area.

7.5.h.1.A. The Homestead plan shall describe the methods that will be used during the placement of mine spoil to minimize mine spoil consolidation and its associated ground settlement, where such settlement will adversely affect the use of the homestead. Conditions relating to the placement of structures on the mine-spoil shall be clearly identified in the plan.

7.5.h.1.B. The plan must delineate the areas on each parcel where the mine-spoil will be placed in a manner to minimize post-mining land surface settlement on building pads, roads and other appropriate areas.

7.5.h.1.C. The placement methodology shall be specified by a qualified engineer. The plan shall indicate the type and style of structure appropriate for each building pad. The plan shall include the requirement that a professional engineer will monitor the construction of the building pads to certify compliance with the specifications of the plan.

7.5.h.2. Construction Of The Building Pad.

7.5.h.2.A. Building pads shall be designed by a registered professional engineer.

7.5.h.2.B. The registered professional engineer shall supervise the placement of the uppermost 20 feet of spoil for building pads to minimize consolidation.

7.5.h.2.C. The engineer shall certify the integrity of the building pad and that the mine soil will not settle more than **2** inch after the expected structure is in place.

7.5.h.2.D. Building pads shall be designed to accommodate the type of building expected to be placed on the pad.

7.5.h.2.E. Building pads shall

not be placed on valley fills.

7.5.h.3. Conveyance Of Homestead Parcels.

7.5.h.3.A. Estimated short and long-term costs to homesteaders shall be designated in the homestead plan and presented to homesteaders immediately after the lottery on a parcel specific basis.

7.5.h.3.B. The rights to the surface estate shall be deeded to each homesteader free and clear of all liens and encumbrances as soon after bond release as the escrow agent determines that the property is ready for use. The deeds shall not retain right of entry onto the homestead parcels to conduct future surface mining activities.

7.5.h.3.C Consistent with state and federal law, the transfer of the surface to the escrow agent may be for surface rights only and need not include any minerals, oil or gas and shall be subject to usual and customary mining or extraction rights.

7.5.h.3.D. Before receiving the homestead parcel, each homesteader shall:

7.5.h.3.D.1 Install and reside in a dwelling whose structure complies with the homestead plan community association rules, and all applicable local, county and state laws;

7.5.h.3.D.2 Reside on the parcel for at least forty-five weeks each year for five (5) consecutive years prior to receipt of title to the land; and

7.5.h.3.D.3. Use and improve the parcel by completing a dwelling that complies with this rule, installing an approved septic system and maintaining vegetative cover on all parts of the homestead parcel and plant trees from the public nursery in accordance with paragraph 7.5.l.4. of this rule.

7.5.h.3.E. In the event extreme hardship causes a homesteader to be forced to sell his property before the five-year occupancy period has expired, the escrow agent shall convey title early. The escrow agent's determination of extreme hardship shall be reasonable by the circuit court of county in which the homestead parcel is located.

7.5.i. Required Infrastructure.

7.5.i.1. Roads:

7.5.i.1.A. The land plan shall designate an all-weather road connecting the homestead area to a public road or highway. The road shall meet State Department of Highways' standards, and shall be certified as safe for passenger car traffic by registered professional engineer.

7.5.i.1.B. The land plan shall incorporate adequate road frontage to all parcels. Such roads shall be designated in the plan and referred to as "main roads." Main roads shall meet State Department of Highways standards, meet the primary road requirements of section 2.4 of this rule, and shall be certified as built as safe for passenger car traffic by registered civil engineer. Before the Secretary may approve a surface mining application for this use, the county or state road authority shall conditionally agree to accept responsibility for maintaining the all-weather and main roads after mining is complete.

7.5.i.1.C. The land plan shall provide an entrance from the main road to each parcel, complete with culvert as needed. The Homesteader shall be responsible for extending the driveway from the entrance to the building pad.

7.5.i.2. Wastewater And Sewage.

7.5.i.2.A. The homestead plan shall incorporate a wastewater and sewage disposal plan conditionally approved by the Secretary, the West Virginia Bureau of Public Health or the public health authority of the county. The wastewater/sewage disposal system shall be approved by the appropriate entities before Phase II bond release shall be authorized. No such approval may be granted unless the system meets

local health department standards.

7.5.i.2.B. A variety of wastewater and sewage disposal systems, including individual septic systems, may be proposed. Alternative/innovative systems shall be consistent with all State and federal regulations. The reclamation, topsoiling, grading, and revegetation plan of each parcel shall be designed to accommodate the proposed wastewater/sewage system.

7.5.i.2.C. The homestead plan shall provide a functional wastewater and sewage system for each civic, commercial or homestead parcel. The system shall describe an approved hookup/cleanout point no more than 50 feet from such homestead and civic building pads.

7.5.i.2.D. Each homesteader shall be responsible for all costs incurred to connect structures on the homestead parcel to the wastewater and sewage system. Additionally, if necessary, each homesteader shall be responsible for all costs incurred to install an individual septic system.

7.5.i.2.E. The entity administering the civic parcel shall be responsible for all costs incurred to connect structures on the civic parcel to the wastewater and sewage system.

7.5.i.2.F. The homestead plan shall describe the maintenance and upkeep demands of any proposed sewage disposal system, and shall designate the entity responsible for such maintenance. Phase III bond release may not be approved until the designated entity has accepted responsibility for such maintenance.

7.5.i.3. Water Supply:

7.5.i.3.A. The Homestead plan shall include a potable water supply source or sources adequate for each homestead parcel. The supply of water shall be provided by one of the following methods in the following order of priority: a) water piped from an existing public water supply; b) from wells; or c) from reservoirs with catchment basins adequate to supply the homestead area. Before authorizing any system of potable water supply that is not piped from an existing water supply, the Secretary shall find, in writing, that the higher order methods of delivery of potable water are not feasible. The Secretary may rely on the sewers if an appropriate Public Health Authority.

7.5.i.3.B. The permittee shall establish and pay for the potable water supply system.

7.5.i.3.C. The water shall be delivered at a constant rate and at water industry accepted pressure and flow.

7.5.i.3.D. The homestead plan shall describe the future maintenance of the water supply system. If the water system is public, the plan shall designate the entity responsible for its upkeep. Homesteaders may be required to pay a fair market price for the water. Homesteaders shall not be charged for water from their own individual well, although homesteaders shall be responsible for maintenance of their own wells.

7.5.i.3.E. Individual supply systems shall, at a minimum, meet all applicable health standards, comply with all state and federal laws, and be approved by the appropriate public health authority. Appropriate wellhead protection or watershed protection practices shall be incorporated into the homestead plan, and shall be protect water from potential vulnerability from future land use.

7.5.i.3.F. The source or sources of potable water must be identified within the homesteading plan, along with a demonstration of the adequacy of quantity and quality. Upon completion of the reclamation plan, the permittee shall install and demonstrate the quality and adequacy of the supply. If the originally proposed water supply system proves to be inadequate or unsuitable, the permittee shall immediately make application with the Secretary for approval of alternate supplies or adequate improvements to the water supply system. The resulting improvements and/or alternate supplies shall comply with the requirements in this rule and

shall be subject to the approval of the appropriate public health authority. Phase I bond release may not be approved until the Secretary finds that the installed water supply complies with this rule and applicable state and federal law.

7.5.i.3.G. The homestead plan shall describe a water supply plan that is adequate to meet the needs of the homestead area. The water supply plan shall address the anticipated future land use of the homestead area, and must be reviewed and approved by the Secretary and the appropriate public health authorities.

7.5.i.3.H. The potable water supply sources shall meet the Federal Primary Drinking Water Maximum Contaminant Level Standards. (40 CFR 141, Subpart B). Verification of such quality shall be provided to the appropriate public health authority.

7.5.i.3.I. The supply source means the contiguous water body or contiguous aquifer from which supplies are drawn. If multiple homestead unit supplies are withdrawn from the same source, determination of water quality of the source shall be made at points that are representative of the water that will be withdrawn from the source.

7.5.i.3.J. The potable water supply shall provide for a minimum quantity of 12,500 gallons per month per homestead unit. The supply may incorporate one or a combination of sources and storage facilities demonstrated to provide an adequate supply for each homestead parcel.

7.5.i.3.K. If a ground water source is to be used, the plan and the confirmation of the installed ground water supply system shall be conducted under the direction of a qualified ground water professional. The locations of drilled wells shall be consistent with appropriate public health requirements.

7.5.i.3.L. The water supply shall be developed (or extended as applicable) free of charge to the homesteader to a point within 50 feet of the designated residence and civic parcel construction pads for each homestead unit.

7.5.i.3.M. After initial establishment of compliant water quality and quantity, responsibility for maintenance of the water supply shall revert to the homesteader or, in the event that the supply is community- or publicly-controlled, to the appropriate and capable public authority.

7.5.i.3.N. When the potable water supply is insufficient to meet the needs of the proposed use for rural homestead parcels, the homestead plan shall include nonpotable water supplies for uses that do not require potable water. Before approving Phase I bond release, the Secretary shall find that the non-potable water supply is sufficient in both quality and quantity for such uses, including agricultural uses. The plan for the system shall indicate the provisions that will be taken to assure that the potable water supply shall not be compromised. The approval of nonpotable water supplies distribution and handling system shall be consistent with state and federal law.

7.5.i.3.O. Each homesteader shall be responsible for costs incurred to connect dwellings to water facilities.

7.5.i.3.P. The entity administering the civic parcel shall be responsible for costs incurred to connect structures on the civic parcel to water facilities.

7.5.i.3.Q. If a reservoir is used, a registered professional engineer shall certify its integrity. The engineer shall also certify that, taking account of inflow, seepage and evaporation, the reservoir will provide the amount of water and water pressure required by the homestead use. The reservoir is subject to requirements under subsection 5.5 of this rule.

7.5.i.4. Electrical Utilities.

7.5.i.4.A. The homestead plan shall provide access to electrical power for all

homestead parcels and for all civic parcels requiring electric power. The quantity of electricity supplied shall be sufficient to support the proposed use. Phase II bond release may not be approved until all the necessary facilities have been rendered operational and extended to a point where the service drop for the homestead or civic parcel can be accomplished in no more than one span. If a service lateral is proposed, access to electrical power shall be deemed to have been satisfactorily provided when the service lateral is no more than 50 feet in length. Such electrical power facilities shall be designated in the plan and referred to as "main electrical power facilities".

7.5.i.4.B. All line work shall conform to the practices of the electric power utility servicing the area. The installed main utilities and associated equipment shall be conveyed to the electric power utility servicing the area.

7.5.i.4.C. Each homesteader shall be responsible for all costs incurred to install a service drop or service lateral the building pads.

7.5.i.4.D. The entity administering the civic parcel shall be responsible for all costs incurred to install a service drop or service lateral to structures on the civic parcel.

7.5.i.4.E. Each homesteader shall be responsible for cost of electrical service.

7.5.i.5. Communication Services.

7.5.i.5.A. The permittee shall provide access to telephone service for all homestead parcels and for all civic parcels requiring telephone service. Phase II bond release may not be approved until access to telephone service has been rendered operational and extended to a point within 50 feet of the parcel's building pads. Such telephone or equivalent utilities shall be designated in the plan and referred to as "main telephone facilities".

7.5.i.5.B. All service line work shall conform to the practices of the telephone service provider of the area. All line work and associated equipment shall be conveyed to the local telephone service provider.

7.5.i.5.C. Each homesteader shall be responsible for all costs incurred to extend and connect main telephone facilities to the building pads.

7.5.i.5.D. The entity administering the civic parcel shall be responsible for all costs incurred to extend and connect main telephone facilities to the civic parcels.

7.5.i.5.E. Each homesteader shall be responsible for the cost of telephone service.

7.5.i.6. Solid Waste.

7.5.i.6.A. The homestead plan shall contain a plan for the off-site disposal of solid waste that is acceptable to the Secretary and the appropriate public health authority.

7.5.i.7. Surface Drainage And Stormwater.

7.5.i.7.A. The homestead plan shall contain a detailed surface drainage pattern and stormwater runoff control plan. This plan shall be certified by a registered professional engineer.

7.5.i.7.B. The surface drainage pattern and stormwater plan shall be consistent with a surface drainage pattern that would be found on natural topography similar to the post-mining topography proposed in the homestead plan. The beds of the surface and stormwater drainways shall contain material that is as natural as practicable.

7.5.i.8. Reforested Conservation Easements.

7.5.i.8.A. The homestead plan shall identify areas within the homestead Area reserved for reforested conservation easements. These areas shall be reforested by the permittee at no cost to homesteaders.

7.5.i.8.B. In the event that an isolated forest patch exists as a result of mining activities, the conservation easement shall serve as a corridor to establish a wind break and a forested connection with the isolated forest patch and to facilitate the adequate movement of fauna out of and into the isolated forest patch.

7.5.i.8.C. Conservation easements may serve the purpose of a stormwater management systems. In such case, the technical specifications applicable to the design and construction of the storm water channels and their associated structures shall be satisfied.

7.5.i.8.D. Conservation easement shall compromise at least 10% of the homestead area, including the commercial parcels.

7.5.i.8.E. The Secretary shall assure that all areas suitable for hardwoods in the conservation easement are planted with native hardwoods at a rate of 500 seedings per acre in continuous mixtures across the conservation easement with at least six (6) species from the following list: white and red oaks, other native oaks, white ash, yellow-poplar, black walnut, sugar maple, black cherry, or native hickories. Plants shall be a minimum of **3/4**" in diameter at breast height at planting.

7.5.i.8.F. Each of the species shall not be less than 10% of the total planted composition and at least 75% of the total planted woody plant composition shall be from the above list of species. Species shall be selected based on their compatibility and expected site-specific long-term dynamics.

7.5.i.8.G. At least 10% of the required number of woody plants shall be a planted continuous mix of three or more nurse tree and shrub species that improve soil quality and habitat for wildlife. They shall consist of black alder, black locust, bristley locust, redbud, or bi-color lespedeza.

7.5.i.8.H. On areas unsuitable for hardwoods, the Secretary may authorize the following conifers: Virginia pine, red pine, white pine, pitch pine, or pitch x loblolly hybrid pine. Areas unsuitable for hardwoods shall be limited to southwest-facing slopes of greater than 10% or areas where the soil pH is less than 5.5. These conifers shall be planted as single-species stands less than 10 acres in size at the same rate as the hardwood requirements in this rule. The Secretary shall assure that no conservation easement area contains a total of more than 15% conifers.

7.5.i.8.I. The Secretary shall assure that the specific species and selection of trees and shrubs shall be based on the suitability of the planting site for each species site requirements based on soil type, degree of compaction, ground cover, competition, topographic position, and aspect.

7.5.i.8.J. The Secretary shall assure that the total planting rate of trees and nurse plants is not less than 500 stems per acre.

7.5.i.9. Perpetual Easements.

7.5.i.9.A. The homestead plan shall describe areas within the homestead reserved for perpetual easements relating to storm water management, protection of outslopes and steep slopes, protection of water sources, public roads of all kinds, and utilities. These areas shall be included within homesteader's deeded parcels and may have permanent development restrictions included within the Homesteader's deeds of conveyance.

7.5.i.9.B. Fill faces shall be placed under perpetual easements that prohibit activities that may lead to instability or erodability. Trees may be planted on the faces of the fills.

7.5.i.10. Wetlands. Each homestead plan may describe areas within the homestead area reserved for created wetlands. These created wetlands may be ponds, permanent impoundments or wetlands created during mining. They may be left in place after final bond release. Any pond or impoundment left in place is subject to requirements under subsection 5.5 of this rule.

7.5.j. Soils, Soil Placement And Grading.

7.5.j.1. General Requirements:

7.5.j.1.A. Phase I bond release shall not be approved until a soil scientist certifies and the Secretary finds that the soil meets the criteria established in this rule and has been placed in accordance with this rule.

7.5.j.1.B. The homestead plan shall include a topographic map of the permit area, 1:12000 or finer, showing the location of pre-mining native solids, weathered slightly-acidic brown sandstone and drainages which includes site index for common native tree species. A profile description of each soil mapping unit that includes, at minimum, soil horizons, including the O. horizon depths, soil texture, structure, color, reaction and bedrock type. A certified professional soil scientist shall conduct a detailed on-site survey, create the maps, and provide the written description of the soils and sandstones.

7.5.j.1.C. The homesteading plan shall include a description of the present soils and soil substitutes to be used as the plant medium, and a description of the proposed handling, and placement of these materials. The handling plan shall include procedures to:

7.5.j.1.C.1. Protect native soil organisms and the native seed pool;

7.5.j.1.C.2. Include organic debris such as litter, branches, small logs, roots and stumps in the soil;

7.5.j.1.C.3. Inoculate the mine soil with native soil organisms; and

7.5.j.1.C.4. Increase soil fertility.

7.5.j.1.D. A surface preparation plan which includes a description of the methods for replacing and grading the soil and other soil substitutes and their preparation for homesteading.

7.5.j.2. Landscape Criteria.

7.5.j.2.A. The Secretary shall assure that the postmining landscape is rolling, and diverse. The backfill on the mine bench, shall be configured to create a postmining topography that includes the principles of land forming to reflect the premining irregularities in the land. Postmining landlord shall provide a rolling topography with slopes of between 5% and 15%. The elevation change between the ridgeline and the valleys shall be varied. The slope lengths shall not exceed 500 feet. The minimum thickness of backfill, including mine soil, placed on the pavement of the basal seam mined in any particular area shall be 10 feet.

7.5.j.2.B. At least 3 ponds, permanent impoundments or wetlands totaling at least 3.0 acres shall be created on each 200 acres of permitted area. They shall be dispersed throughout the landscape and each water body shall be no smaller than 0.20 acres. All ponds, permanent impoundments or wetlands shall comply with all requirements of this rule, and shall be left in place after final bond release.

7.5.j.2.C. All ponds and impoundments created during mining shall be left in place after bond release and shall comply with all the requirements of this rule.

7.5.j.2.D. The ponds, permanent impoundments, surface water channels and wetlands on the Permit Area shall be vegetated on the perimeter with at least six native herbaceous specifies typical of the region at a density of not less than 1 plant per linear foot of edge, and at least 4 native shrub species at a density of not less than 1 shrub per 6 linear feet of edge. No species of herbaceous or shrub species shall be less than 15% of the total for its life form.

7.5.j.2.E. The landscape criteria in this rule do not apply to valley fills.

7.5.j.3. Soil.

7.5.j.3.A. Soil is defined as and shall consist of the O, A, B, C, and Cr horizons. O horizon means the top-most horizon or layer of soil dominated by organic material derived from dead plants and animals at various stages of decomposition; it is sometimes referred to as the duff or litter layer or the forest floor. Cr horizon means the horizon or layer below the C horizon, consisting of weathered or soft bedrock including saprolite or partly consolidated soft sandstone, siltstone, or shale.

7.5.j.3.B. The Secretary shall require the operator to recover and use all the soil on the mined area, as shown on the soil maps, except for those areas with a slope of at least 50%, and other areas from which the applicant affirmatively demonstrates and the Secretary finds that soil cannot reasonably be recovered. The Secretary shall assure that all saved soil includes all of the material from the O and A horizons.

7.5.j.3.C. When the Secretary determines that available soil volume on the permit area is not sufficient to meet the depth requirements, selected overburden materials may be used as soil substitutes. Soil substitutes shall consist of weathered, slightly acid, brown sandstone from within 10 feet of the soil surface if the Secretary determines that such material is available. Material from this layer may be removed with the soil and mixed with the soil in order to meet the depth requirement.

7.5.j.3.D. If the applicant affirmatively demonstrates and the Secretary finds that weathered, slightly acid, brown sandstone from within 10 feet of the soil surface cannot reasonably be recovered, weathered, slightly acid, brown sandstone taken from below 10 feet of the soil surface from anywhere in the permit area may be substituted. Materials may be suitable for this purpose only if their bulk pH in water is between 5.0 and 7.0. Materials with net potential acidity greater than 5 tons of calcium carbonate equivalence per 1000 tons may not be used.

7.5.j.3.E. Before approving the use of soil substitutes, the Secretary shall require the permittee to demonstrate that the selected overburden material is suitable for restoring land capability and productivity. This will be demonstrated by the results of chemical and physical analyses, including pH, total soluble salts, phosphorus, potassium, calcium, texture class, acid-base accounting, and other such analyses as necessary.

7.5.j.3.F. The final surface material used on all parts of the permit area except roads, building pads, and valley fill faces shall consist of a minimum of 4 feet of soil, or a mixture of soil and suitable soil substitutes. Homesteading soil depth shall contain at least 33% soil. If the applicant affirmatively demonstrate and the Secretary finds, that sufficient weathered slightly acid brown sandstone cannot reasonably be recovered from the mined area to satisfy the mine soil depth requirement, then up to one quarter of the total volume of the mine soil may consist of highly-fractured sandstone, as long as it has been demonstrated that the physical and chemical quality of this material is suitable.

7.5.j.3.G. If the applicant does not demonstrate that there is sufficient material available on the permit area to satisfy the requirements of this rule, then the director may not authorize a homesteading variance.

7.5.j.3.H. The Secretary may require the operator to include as part of the mine soil mix organic debris such as forest litter, branches, small logs, roots and stumps in the soil to help reseed the native vegetation, inoculate the mine soil with native soil organisms and increase soil fertility.

7.5.j.3.I. The Secretary shall require that soil be removed and reapplied in a manner that minimizes stockpiling such that seed pools and soil organisms remain biological viable. No more than 10% of the available soil, described in the Secretary's findings, may be placed in a long-term stockpile, soil redistribution shall be done within one month of soil removal. Except for soil in a long-term stockpile, soil shall be stored for less than one month in piles less than six feet high and 24 feet wide in a stable area within the permit area where it will not be disturbed and

will be protected from water or wind erosion or contaminants that lessen its capability to support vegetation. Long-term stockpiles shall be seeded with ground cover mixes used for reforestation.

7.5.j.4. Soil Placement And Grading.

7.5.j.4.A. Except for valley fill faces, building pads, roads, and other areas that must be compacted, the Secretary shall require the permittee to place mine soil loosely and in a non-compacted manner while meeting static safety factor requirements. Grading the final surface shall be minimized to reduce compaction. Once the material is placed, light grading equipment shall be used to grade the tops of the piles, roughly leveling the area with no more than one or two passes. Tracking in and rubber-tired equipment shall not be used. Non-permanent roads, equipment yards and other trafficked areas shall be deep-ripped (24" to 36") to mitigate compaction.

7.5.j.4.B. Soil physical quality shall be inadequate if it inhibits water infiltration or prevents root penetration or if their physical properties or water-supplying capacities cause them to restrict root growth of trees. Slopes greater than 50% shall be compacted no more is necessary to achieve stability and non-erodability.

7.5.j.4.C. The Secretary shall require the permittee to leave soil surfaces rough with random depressions across the entire surface to catch seed and sediment, conserve soil water. Organic debris such as forest litter, logs, and stumps may be left on and in the soil.

7.5.j.5. Limiting And Fertilizing. The permittee shall submit a liming and fertilizing plan. The Secretary shall assure that the liming and fertilizing plan is appropriate for establishing the ground cover vegetation.

7.5.j.6. Ground Cover Vegetation.

7.5.j.6.A. The Secretary shall require the permittee to establish a temporary vegetative cover as contemporaneously as practicable with backfilling and grading. This cover shall consist of a combination of native and domesticated non-invasive cool and warm season grasses and other herbaceous vine or shrub species including legume species and ericaceous shrubs. All species shall be slow growing. The ground cover vegetation shall be capable of stabilizing the soil from excessive erosion. Seeding rates and composition must be in the homestead plan. The following ground cover mix and seeding rates (pounds/acre) shall be used: winter wheat (15 lbs/acre, fall seeding), foxtail millet (5 lbs./acre, summer seeding), redtop (2 lbs/acre), perennial ryegrass (2 lbs/acre), orchardgrass (5 lbs/acre), weeping lovegrass (2 lbs/acre) kobe lespedeza (5 lbs/acre), birdsfoot trefoil (10 lbs./acre), and white clover (3 lbs/acre). Kentucky-31 fescue, serecia lespedeza, all vetches, clovers (except ladino and white clover) and other aggressive or invasive species shall not be used. On south- and west-facing slopes with a soil pH of 6.0 or greater, the four grasses in the mixture shall be replaced with 20 lbs/acre of warm-season grasses consisting of the following specifies: Niagara big bluestem 95 lbs/acre), Camper little bluestem (2 lbs/acre), Indian grass (2 lbs/acre), and Shelter switch grass (1 lb/acre), or other varieties of these specifies approved by the Secretary. Also, a selection of at least 3 ericaceous shrub species shall be included in the ground cover mix.

7.5.j.6.B. The permittee may regrade and reseed only those rills and gullies that are unstable and/or disrupt the approved postmining land use or the establishment of vegetative cover or cause or contribute to a violation of the water quality standards for the receiving stream.

7.5.j.7. Front Faces Of Valley Fills.

7.5.j.7.A. Front faces of valley fills shall be exempt from the requirements of this rule except that:

7.5.j.7.A.1. They shall be graded and compacted no more than is necessary to achieve stability and non-erodability;

7.5.j.7.A.2. No shales may be present in the upper four feet of surface

material;

7.5.j.7.A.3. The upper four feet of surface material shall be composed of soil and weathered brown sandstone when available, unless the Secretary determines other material is necessary to achieve stability;

7.5.j.7.A.4. The groundcover mixes described in subparagraph shall be used unless the Secretary requires a different mixture; and

7.5.j.7.A.5. Kentucky 31 fescue, serecia lespedeza, vetches, clovers (except ladino and white clover) or other invasive species may not be used.

7.5.j.7.B. Although not required by this rule, native, non-invasive trees may be planted on the faces of fills.

7.5.k. Requirements For Reclamation Maps. An appropriately scaled, "as-built" topographic map of the homestead area shall be prepared and submitted as part of the permit application. An identically scaled *overlay* map showing the elevation contours at the base of all mined areas as well as the original ground contour of all excess mine spoil storage areas shall accompany the as-built map. The overlay map shall identify all backfilled mine sites and excess mine-spoil storage areas. The overlay map shall depict the boundaries of all parcels, areas of mine spoil specifically compacted for the placement of structures, easements, and areas that the Secretary may designate for special or limited uses. All post-reclamation maps shall be prepared under the direction of and certified by a registered professional engineer and shall be recorded with the county within one year following the final reclamation of the proposed homestead area.

7.5.l. Homestead Village.

7.5.l.1. The homestead village provides for a residential development at a higher density than in rural homestead parcels. The village is intended to:

7.5.l.1.A. Encourage mixed residential and commercial land uses, and

7.5.l.1.B. At least 20% of the homestead area shall be composed of village parcels.

7.5.l.2. Village Parcel Requirements.

7.5.l.2.A. Each village homestead parcel shall be no larger than one acre in size.

7.5.l.2.B. Each parcel shall have a minimum road frontage of 40 feet. No pipe stem parcel arrangements are permitted.

7.5.l.2.C. Each parcel shall be graded evenly to 5% maximum.

7.5.l.3. Common Lands. In addition to the civic parcels and conservation easements, each homestead area shall include a reserve of 10% of the land as a common area. The common land shall be conveyed to the community association. The planning and maintenance of the common land shall be the responsibility of the community association.

7.5.l.4. Public Nursery: Each village homestead shall designate an area for a public nursery constructed and planted by the permittee at no cost to the homesteaders. The nursery may be located adjacent to the common land but shall not constitute the required common land area. The nursery shall provide woody plants of high quality and appearance for the use of the homesteaders as specified below.

7.5.l.4.A. The nursery shall be 1 acre per 30 acres of homestead area. The public nursery shall be a civil parcel. The permittee shall plant the nursery with the same species and to the same standards as required in the conservation easement. Once bond is released, the community association shall be responsible for maintaining the nursery. Success standards shall be the same as for the conservation easements.

7.5.l.4.B. The nursery plants shall consist of at least six species from the following list: white oak, red oak, other native oaks, white ash, yellow poplar, black walnut, sugar maple, black cherry, or native hickories.

7.5.l.4.C. Adequate water supply shall be provided for the nursery. This may be achieved through any of the water supply means specified or through the stormwater drainage system.

7.5.l.4.D. The nursery shall be maintained in manner consistent with the healthy development of the plants. The nursery plants shall meet the following criteria upon conveyance: 1) in regular form for the species, 2) 80% live branches, and 3) color consistent with the species. Materials not meeting the specifications shall be replaced with like species by the permittee. After final bond release, the nursery shall be conveyed to the community association.

7.5.l.4.E. Each homesteader shall be allowed to take trees from the nursery as determined by the community association. The remainder of the trees shall be for the common landscapes.

7.5.m. Community Association.

7.5.m.1. At the completion of the lottery, a community association shall be established among the designated homesteaders for each homestead area. The association shall maintain and administer the public areas, conservation easements and civic parcels of the homestead and may levy membership fees.

7.5.m.2. By-laws for the community association shall be developed by the escrow agent, working with the homesteaders and a qualified design professional as defined by this rule. The permittee shall pay the qualified land designer for such services. The by-laws may establish rules for building standards and other homestead area rules, as appropriate.

7.5.m.3. Membership in the association is mandatory for all homesteaders and their successors.

7.5.m.4. The association shall obtain liability insurance for its property and shall be responsible for maintenance of insurance and taxes on undivided open space. The association may place liens on the homes or house lots of its members who fail to pay their association dues in a timely manner. Such liens may require the imposition of penalty interest charges.

7.5.m.5. The association shall administer common facilities and pay for maintaining and developing such facilities.

7.5.n. Interim Homestead Management.

7.5.n.1. The Secretary or the Secretary's designee shall administer the homestead selection lotteries.

7.5.n.2. The escrow agent shall monitor the 5-year occupancy requirement for each homestead parcel and transfer of the titles of the surface estates to the qualified homesteaders.

7.5.n.3. The escrow agent shall manage and administer the homestead between final bond release and the time when all of the titles to the homestead parcels have been transferred and duly recorded with the clerk of the county.

7.5.n.4. Funding these services shall be guaranteed by an insured bank account established by the permittee.

7.5.n.5. Before approving any homestead variance, the Secretary shall find, in writing, that the funds in the account are sufficient to pay for these services.

7.5.n.6. After final bond release, this account shall be administered by the escrow agent.

7.5.n.7. The escrow agent shall receive the surface rights to the entire homestead area and all-weather and main roads before mining begins.

7.5.n.8. The escrow agent shall be charged with responsibility for transferring the surface rights in escrow to the homesteaders, the community association, or the state or county road authority.

7.5.n.9. Such transfers shall promptly occur upon certification by the escrow agent that the homesteader has met the requirements of this rule.

7.5.n.10. Before the homesteader receives title, property may revert to the escrow agent, when after notice and hearing, the escrow agent determines that the homesteader has not abided by this rule. The escrow agent's determination shall be reviewable by the circuit court of the county in which the homestead parcel is located.

7.5.n.11. If developed property reverts to escrow, the escrow agent shall promptly sell the property and remit proceeds, less costs, to the homesteader, up to the value of the homesteader's investment.

7.5.n.12. Because deeds to homestead parcels will not be transferred to homesteaders before a homesteader has lived on a parcel for five years, lending institutions may be reluctant to make loans to homesteaders before the five-year period has expired. Accordingly, to assure that lending institutions are willing to make loans to homesteaders during this period, the escrow agent shall establish a system to provide mortgage insurance to homesteaders so that lenders will be able to finance private development of homestead parcels. The escrow agent shall have all powers necessary to structure loans and other necessary transactions so lenders are reasonably secure.

7.5.o. Bond Release.

7.5.o.1. Before approving Phase I bond release, the Secretary shall assure that the soil is in place, the vegetative cover has been established, that the water system has been completed, that the roads have been completed and transferred to the State or county road authority, and that the main electricity transmission line is in place.

7.5.o.2. Phase II bond release may not occur before two years have passed since Phase I bond release. Before approving Phase II bond release, the Secretary shall assure that the vegetative cover is still in place. The Secretary shall further assure that the tree survival on the conservation easements and public nurseries are no less than 300 trees per acre (80% of which must be species from the approved list). Furthermore, in the conservation easement and public nursery areas, there shall be a 70% ground cover where ground cover includes tree canopy, shrub and herbaceous cover, and organic litter. Trees and shrubs counted in considering success shall be healthy and shall have been in place at least two years, and no evidence of inappropriate dieback. Phase II bond release shall not occur until the service drops for the utilities and communications have been installed to each homestead parcel.

7.5.o.3. The Secretary may authorize Phase III bond release only after all parcels in the homestead areas are certified and ready for occupancy.

7.5.o.4. Once final bond release is authorized, the permittee's responsibility for implementing the homestead plan shall cease.

§38-2-8. Fish and Wildlife Considerations.

8.1. Protection of Fish, Wildlife and Related Environmental Values.

8.1.a. The operator shall, to the extent possible using the best technology currently available, minimize disturbances and adverse impacts on fish, wildlife, and related environmental values and shall achieve enhancement of such resources where practicable.

8.1.b. No surface mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species or which are likely to result in the

destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act (16 U.S.C. 1531 et seq.). The operator shall promptly report to the Secretary any state or federally listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the Secretary shall consult with appropriate state and federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

8.1.c. No surface mining activity shall be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. The operator shall promptly report to the Secretary any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the Secretary shall consult with the U. S. Fish and Wildlife Service and also, where appropriate, the state fish and wildlife agency and, after consultation, shall identify whether, and under what conditions the operator may proceed.

8.1.d. Nothing in this chapter shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation, of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

8.1.e. Each operator shall, to the extent possible using the best technology currently available:

8.1.e.1. Ensure that electric power lines and other transmission facilities used for, or incidental to, surface mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Secretary determines that such requirements are unnecessary;

8.1.e.2. Locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law;

8.1.e.3. Design fences, overland conveyors, and other potential barriers to permit passage for large mammals, except where the Secretary determines that such requirements are unnecessary; and

8.1.e.4. Fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

8.2. Habitat Development.

8.2.a. The operator shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands, and riparian vegetation along rivers and streams and bordering ponds and lakes. Surface mining activities shall avoid disturbances to, enhance where practicable, or restore, habitats of unusually high value for fish and wildlife.

8.2.b. Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas shall be selected on the basis of the following criteria:

8.2.b.1. Their proven nutritional value for fish or wildlife.

8.2.b.2. Their use as cover for fish or wildlife.

8.2.b.3. Their ability to support and enhance fish or wildlife habitat after the release of bonds. The selected plants shall be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

8.2.c. Where cropland is to be the postmining land use, and where appropriate for wildlife and crop-management practices, the operator shall intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals.

8.2.d. Where residential, public service, or industrial uses are to be the postmining land use, and where consistent with the approved postmining land use, the operator shall intersperse reclaimed lands with green belts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

8.2.e. In order to promote the enhancement of food, shelter and habitat for wildlife, the practice of creating a timber windrow is encouraged. All unmarketable timber may be used to create a windrow within the permitted area as approved by the Secretary in the mining and reclamation plan. The windrow shall be designed and approved as part of a wildlife planting plan and authorized where the postmining land use includes wildlife habitat. In planning and constructing the windrow, care shall be taken not to impound water or block natural drainways. The windrow shall be placed in a uniform and workmanlike parallel line and located so as to improve habitat, food and shelter for wildlife. Areas in and around the windrow shall be seeded after construction with approved, native plant species to provide for erosion control and wildlife enhancement. Construction of the wildlife timber windrow shall take place within the permit area and should be placed immediately below or adjacent to the sediment control system, maintaining a sufficient distance to prevent mixing of spoil material with the selectively placed timber. The placement of spoil material, debris, abandoned equipment, root balls and other undesirable material in the windrow are prohibited.

§38-2-9. Revegetation.

9.1. General Requirements.

9.1.a. Each surface mine operator shall establish on all regraded areas and all other disturbed areas a diverse, effective and permanent vegetative cover of the same seasonal variety native to the area of disturbed land, or introduced species that are compatible with the approved postmining land use.

9.1.b. The established vegetative cover shall be capable of stabilizing the soil from erosion.

9.1.c. The established vegetative cover shall be capable of regeneration and plant succession.

9.1.d. Revegetation efforts will be kept concurrent with the mining operation as mining and backfilling progresses and shall be carried out in a manner that encourages a prompt vegetative cover and rapid recovery of productivity levels compatible with the approved postmining land use.

9.1.e. A temporary vegetative cover shall be established as contemporaneously as practicable with backfilling and grading until a permanent vegetative cover can be established. At a minimum, a temporary or permanent vegetative cover shall be established by the end of the first growing season and a permanent vegetative cover shall be established by the end of the second growing season.

9.2. Revegetation Plan. A complete revegetation plan shall be made a part of each permit application. The revegetation plan shall be developed in a manner which is compatible with the following requirements:

9.2.a. Plant species and seed mixtures that will give a quick, permanent vegetative cover and enrich the soil will be given priority. Plant species and seed mixtures shall be considered of the same seasonal variety when they consist of a mixture of species of equal or superior utility as compared with the seasonal utility of naturally-occurring vegetation. All revegetation mixtures must include at least one herbaceous legume species.

9.2.b. All species shall be compatible with the plant and animal species of the region and the approved post mining land use.

9.2.c. All species shall comply with State and Federal seed, poisonous and noxious plant, and introduced species, laws and rules and regulations.

9.2.d. If both the premining and postmining land uses are cropland, planting of the crops normally grown will meet the requirements of subdivision 9.2.a of this subsection.

9.2.e. The revegetation plan shall contain a statement asserting that rills and gullies which form in areas that have been regraded and topsoiled and which disrupt the approved postmining land use, interfere with the reestablishment of the vegetation cover, or cause or contribute to a violation of applicable water quality standards will be filled, regraded, stabilized, topsoiled, and reseeded or replanted.

9.2.f. The revegetation plan shall specify that the operator will rapidly establish temporary vegetation cover on disturbed and regraded areas around sediment control structures, haulage ways, stockpiles, storage areas, and other areas where excessive erosion is likely to occur. Immediate seeding of approved annuals and biennials on such areas shall be considered as a means for achieving temporary vegetative cover only.

9.2.g. A planting plan shall be made a part of the revegetation plan and shall contain the following:

9.2.g.1. A prediction of the mine soil character based on overburden analysis, soil analysis, and other available information;

9.2.g.2. The proposed treatment to neutralize acidity;

9.2.g.3. The method of mechanical seed bed preparation;

9.2.g.4. The application rates and analysis of fertilization;

9.2.g.5. The application rates and types of mulch;

9.2.g.6. The application rates and species of perennial vegetation including herbaceous and woody plants in accordance with the Handbook or other appropriate sources;

9.2.g.7. The areas to be planted or seeded to trees and shrubs;

9.2.g.8. The land use objective; and

9.2.g.9. A maintenance schedule.

9.2.h. Alternative species of trees, shrubs, grasses, legumes, or vines may be substituted for native species if approved by the Secretary. Use of substitute species may be approved on the basis of the following:

9.2.h.1. The species are compatible with the plant and animal species of the region and are necessary to and compatible with achieving the approved postmining land use; and

9.2.h.2. The species meet the requirements of applicable State and Federal seed, poisonous and noxious plant, or introduced species laws and regulations.

9.2.i. The vegetation plan shall contain a plan for soil treatment and amendments which meet the following minimum standards:

9.2.i.1. 600 lbs/ac of 10-20-10 or 10-20-20 fertilizer. Alternative rates and fertilizer analysis based on soil analysis performed by a qualified soils laboratory may be substituted.

9.2.i.2. Lime shall be required where soil pH is less than 5.5. Lime rates shall be such that a uniform soil pH of 6.0 will be achieved. An alternate maximum or minimum soil pH may be approved based on the optimum pH for the revegetation species.

9.2.i.3. Mulch Specifications: Mulch shall be used on all disturbed areas. Approved materials and minimum rates to be applied are as follows:

Material	Rate/Acre
Straw or hay	1 ½-2 tons materials may be anchored with asphalt

	emulsion or other techniques approved by the ~~Director~~Secretary.
Wood Fiber or Wood Cellulose	1,000 lbs.
Shredded Bark	50 cubic yards

Adhesives or tackifiers may be used with wood fiber or wood cellulose at the rates indicated in the following table:

Minimum Rate/Acre for Wood Fiber or Wood Cellulose

Material	Rate/Acre	
Genaqua 743	25 gallons	500 lbs.
Curasol AK or HA	25 gallons	500 lbs.
Aerospray 70	25 gallons	500 lbs.

9.2.j. In implementing the revegetation plan, the operator shall take into consideration the character of the mine soil. Factors to be considered are the following:

9.2.j.1. Fertility;

9.2.j.2. Stoniness;

9.2.j.3. Texture;

9.2.j.4. Steepness of slope;

9.2.j.5. Standard field and laboratory overburden analysis; and

9.2.j.6. Premining overburden analysis.

9.2.k. Mine soils which have a demonstrated history of acidity or other chemical parameters which may limit vegetative success shall be analyzed by a qualified soils laboratory. The results of such analysis shall be made a part of the final planting plan.

9.3. Standards for Evaluating Vegetative Cover.

9.3.a. The planting plan may be amended or modified prior to implementation to reflect the results of analyses of mine soils and to make minor adjustments to application rates and species composition. Any amendments or modifications which reflect major changes in seeding or planting rates and species composition shall be submitted as a permit revision.

9.3.b. Final Planting Report. A final planting plan report shall be submitted to the Secretary within sixty (60) days after Phase 1 bond reductions. The report shall contain the actual acreage planted, application rates of soil amendments, seed and seedlings mixtures and rates. Where tree plantings are a part of the revegetation plan, the report may reflect only grasses and legumes with a subsequent and separate report to be filed after the tree plantings are completed during the appropriate planting season.

9.3.c. Time for Inspection. Prior to the recognized spring and fall planting seasons, the operator shall review all areas which were seeded and/or planted during previous planting seasons. The operator shall then cause those areas deficient in vegetative cover to be retreated (graded, seeded, planted, mulched, limed, etc.) to establish the required level of vegetation success.

9.3.d. Not less than two (2) years following the last date of augmented seeding, the Secretary shall conduct a vegetative inspection to determine that applicable standards for vegetative success have been met. In evaluating vegetative success, the Secretary shall use a statistically valid sampling technique with a ninety (90) percent statistical confidence interval from the Handbook. An inspection report shall be filed for each inspection and when the standard is met, the Secretary shall execute a Phase II bond release.

9.3.e. After five (5) growing seasons following the last augmented seeding, planting, fertilization, revegetation, or other work, the operator may request a final inspection and final bond release. Upon receipt of such request, the

Secretary shall conduct a final vegetative evaluation using approved, statistically valid sampling techniques. A final report shall be filed and if the applicable standards have been met, the Secretary shall release the remainder of the bond. Ground cover, production, or stocking shall be considered equal to the approved success standard when they are not less than 90 (ninety) percent of the success standard.

9.3.f. Where the post mining land use requires legumes and perennial grasses, the operator shall achieve at least a ninety (90) percent ground cover and a productivity level as set forth in the Handbook during any two years of the responsibility period except for the first year. Substandard areas shall not exceed one-fourth (1/4) acre in size nor total more than ten (10) percent of the area seeded. Exceptions to this standard may be authorized by the Secretary based on the following:

9.3.f.1. For areas to be developed for industrial or residential use less than two (2) years after regrading is completed, the ground cover of living plants shall not be less than required to control erosion.

9.3.f.2. For areas to be used for cropland, the success of crop production from the mined area shall be equal to or greater than that of the approved standard for the crop being grown over last two (2) consecutive growing seasons of the five growing season liability period. The applicable five growing season period of responsibility for revegetation shall commence at the date of initial planting of the crop being grown.

9.3.g. On areas to be developed for forest land and/or wildlife use, success of vegetation shall be determined on the basis of tree and shrub survival and ground cover. Minimum standards for woody plants shall be seventy percent (70%) ground cover of legumes and perennial grasses, and four hundred fifty (450) trees (including volunteer tree species) and/or planted shrubs per acre for the growing season of the last year of the responsibility period.

Substandard areas shall not exceed one-fourth (1/4) acre in size nor total more than twenty percent (20%) of the area seeded or planted. Provided, that where a wildlife planting plan has been approved by a professional wildlife biologist and proposes a stocking rate of less than four hundred fifty (450) trees or shrubs per acre the standard for grasses and legumes shall meet those standards contained in subdivision 9.3.f of this subsection. At the time of final bond release, at least eighty (80) percent of all trees and shrubs used to determine revegetation success must have been in place for at least sixty (60) percent of the applicable minimum period of responsibility. Trees and shrubs counted in determining such success shall be healthy and shall have been in place for not less than two (2) growing seasons.

9.3.h. Forest resource conservation standards for commercial reforestation operations are as follows:

9.3.h.1. The minimum stocking rate of commercial tree species shall be in accordance with the approved forest management plan prepared by a registered professional forester. In no case may the rate be less than four hundred fifty (450) stems per acre of commercial tree species;

9.3.h.2. A request for bond release shall be approved by the Secretary if the tree survival is equal to or greater than three hundred (300) trees per acre or the rate specified in the forest management plan and there is seventy percent (70%) herbaceous cover during the growing season of the last year of the responsibility period; and

9.3.h.3. At the time of final bond release, at least eighty (80) percent of all trees and shrubs used to determine revegetation success must have been in place for at least sixty (60) percent of the applicable minimum period of responsibility. Trees and shrubs counted in determining such success shall be healthy and shall have been in place for not less than two (2) growing seasons.

§38-2-10. Prime Farmlands.

10.1. Identification of Prime Farmlands.

10.1.a. Each permit application shall include the results of a reconnaissance inspection to determine whether or not all or part of the permit area is prime farmland. All or any part of a proposed permit area may be designated by the Secretary as prime farmland on the basis of a reconnaissance inspection, soil surveys, and other required information submitted as part of a permit application. For the purposes of this section, said surveys shall mean surveys developed in accordance with standards of the National Cooperative Soil Survey which includes the procedures set forth in the U. S. Department of Agriculture Handbook 436 (Soil Taxonomy) and 18 (Soil Survey).

10.1.b. The requirements for said surveys may be waived by the Secretary if the applicant can demonstrate that a basis exists for making a negative determination of prime farmland.

10.2. Negative Determination of Prime Farmland.

10.2.a. Land within the proposed permit area shall not be considered as prime farmland where the applicant can demonstrate one or more of the following situations:

10.2.a.1. No land within the proposed permit boundaries have been historically used for cropland. For purposes of prime farmland determinations, historically used for cropland means:

10.2.a.1.A. Lands that have been used for cropland for any five (5) years or more out of the ten (10) years immediately preceding the acquisition, including purchase, lease, or option, of the land for the purpose of conducting or allowing through resale, lease or option the conduct of surface coal mining and reclamation operations;

10.2.a.1.B. Lands that the Secretary determines, on the basis of additional cropland history of the surrounding lands and the lands under consideration, that the permit area is clearly cropland but falls outside the specific five (5) years in ten (10) criterion, in which case the rules for prime farmland may be applied to include more years to cropland history only to increase the prime farmland acreage to be preserved; or

10.2.a.1.C. Lands that would likely have been used as cropland for any five (5) out of the last ten (10) years, immediately preceding such acquisition but for the same fact of ownership or control of the land unrelated to the productivity of the land.

10.2.a.2. The slope of all land within the permit area is ten percent (10%) or greater;

10.2.a.3. Other factors exist, such as a very rocky surface, or the land is frequently flooded during the spring or fall season more often than once in two (2) years, which clearly places all land within the area outside the purview of prime farmland; or

10.2.a.4. A written determination based on soil surveys and other scientific findings made by a qualified person other than the applicant that land within the proposed mining area does not meet the requirements for prime farmlands. The soil survey shall be of the detail used by the U. S. Soil Conservation Service for operational conservation planning and shall contain at a minimum a description of soil mapping units, pH, soil horizon depths and soil densities.

10.3. Plan for Restoration of Prime Farmland.

10.3.a. The applicant shall propose a plan for the mining and restoration of any prime farmland within the proposed permit area. This plan shall be made a part of the permit application and shall be the basis for determining the technological capability of the applicant to restore prime farmlands. The plan shall include:

10.3.a.1. A soil survey of the

original undisturbed soil profile showing the depth and thickness of each of the soil horizons that collectively constitute the root zone. The soil survey shall be of the detail used by the U. S. Soil Conservation Service for operational conservation planning and shall contain, at a minimum, a description of soil mapping units, pH, soil density, and the depth and thickness of each soil horizon;

10.3.a.2. The proposed types of equipment and methodology to be used for removal, storage, and replacement of the soil in accordance with subsection 10.4 of this section;

10.3.a.3. The location of areas to be used for the separate stockpiling of the soil horizons and plans for soil stabilization before redistribution;

10.3.a.4. The use of topsoil substitutes may be approved by the Secretary on the basis of scientific information provided by the applicant that the substitute material is suitable for the proposed postmining land use. Such information shall be made a part of the permit application;

10.3.a.5. Plans for seeding and/or planting the regraded area and the conservation practices proposed to control erosion and sedimentation during the first twelve (12) months after regrading is completed;

10.3.a.6. Scientific data from comparable areas that demonstrate that the applicant will achieve, within a reasonable period of time, equivalent or higher levels of yield after mining as existed before mining; and

10.3.a.7. Information regarding productivity prior to mining, including the average yield of food, fiber, forage or wood products obtained under a high level of management.

10.4. Special Requirements.

10.4.a. For all proposed mining operations on prime farmlands, the applicant shall meet the following special requirements:

10.4.a.1. All soil horizons to be used in the reconstruction of the soil shall be removed and stockpiled before drilling, blasting, or mining. Where removal of soil horizons result in erosion that may cause air and water pollution, the application shall specify methods or treatment to control erosion of exposed overburden. The application shall describe procedures to be used to:

10.4.a.1.A. Remove separately the entire A horizon or other suitable soil materials which will be used to create a final soil having a greater productive capacity than that which existed prior to mining. Such operations will be carried out in a manner that prevents mixing or contamination with other material before replacement;

10.4.a.1.B. Remove separately the B horizon of the natural soil or a combination of B horizon and underlying C horizon or other suitable soil material that will create a reconstructed root zone of greater productive capacity than that which existed prior to mining. Such operations shall be carried out in a manner that prevents mixing or contamination with other material; and

10.4.a.1.C. Remove separately the underlying C horizons or other strata, or a combination of such horizons or other strata to be used instead of the B horizon that are of greater thickness and that can be shown to be more favorable for plant growth than the B horizon, and that when replaced will create in the reconstructed soil a final root zone of greater depth and quality to that which existed in the natural soil.

10.4.a.1.D. The aggregate total prime farmland acreage shall not be decreased from that which existed prior to mining. Water bodies, if any, constructed during mining and reclamation must be located within the post reclamation non-prime farmland portions of the permit area. The creation of such water bodies must be approved by the Department of Environmental Protection and have the consent of all affected property owners within the permit area.

10.4.b. If stockpiling of soil horizons is necessary, the A horizon and B horizon shall be stored separately from each other. The stockpiles shall be sited within the permit area at a suitable location where they will not be disturbed or exposed to excessive erosion by water or wind before the stockpiled horizons can be redistributed on the regraded surface. Stockpiles in place for more than thirty (30) days shall be protected from erosion.

10.4.c. Soil Replacement.

10.4.c.1. Soil reconstruction specifications established by the U. S. Soil Conservation Service shall be based upon the standards of the National Cooperative Soil Survey and shall include, as a minimum, physical and chemical characteristics of reconstructed soils and soil descriptions containing soil-horizon depths, soil densities, soil pH, and other specifications such that constructed soils will have the capability of achieving levels of yield equal to, or higher than, those of nonmined prime farmland in the surrounding area.

10.4.c.2. The minimum depth of soil and substitute soil material to be reconstructed shall be forty-eight (48) inches, or a lesser depth equal to the depth to a subsurface horizon in the natural soil that inhibits or prevents root penetration, or a greater depth if determined necessary to restore the original soil productivity capacity. Soil horizons shall be considered as inhibiting or preventing root penetration if their physical or chemical properties or water-supplying capacities cause them to restrict or prevent penetration by roots of plants common to the vicinity of the permit area and if these properties or capacities have little or no beneficial effect on soil productive capacity.

10.4.c.3. The operator shall replace and regrade the soil horizons or other root-zone material with proper compaction and uniform depth.

10.4.c.4. The operator shall replace the B horizon, C horizon, or other approved substitute material to the thickness needed to meet the requirements of paragraph 10.4.c.2 of this subsection.

10.4.c.5. The operator shall replace the topsoil or other approved substitute materials as the final surface soil layer. This surface soil layer shall equal or exceed the thickness of the original surface soil layer, as determined by the soil survey.

10.4.d. Apply nutrients and soil amendments as needed to establish quick vegetative growth.

10.4.e. In those areas where the B or C horizons were not removed but may have been compacted or otherwise damaged during the mining operation, the operator shall engage in deep tilling or other appropriate means to restore premining capabilities.

10.5. Revegetation. Each person who conducts surface coal mining and reclamation operations on prime farmland shall meet the following revegetation requirements during reclamation:

10.5.a. Following soil replacement, the operator shall establish a vegetative cover of the type and in the manner set forth in the approved permit. Seeding and/or planting shall be accomplished during the next period for favorable planting conditions. Suitable mulch and other soil stabilizing practices shall be used on all areas; and

10.5.b. Within the time period specified in the permit, but not more than ten (10) years after completion of backfilling and rough grading, any portion of the permit area which is prime farmland must be used for crops. The crops may be grown in rotation with hay or pasture crops. The Secretary may approve the use of perennial plants for hay where this is a common long term use of prime farmland soils in the surrounding area.

10.6. Revegetation and Restoration of Soil Productivity.

10.6.a. Following prime farmland soil replacement, the soil surface shall be stabilized with a vegetative cover or other means that effectively controls soil loss by wind and water erosion.

10.6.b. Prime farmland soil productivity shall be restored in accordance with the following provisions:

10.6.b.1. Measurement of soil productivity shall be initiated within ten (10) years after completion of soil replacement.

10.6.b.2. Soil productivity shall be measured on a representative sample or on all of the mined and reclaimed prime farmland area using the reference crop determined under paragraph 10.6.b.6 of this subdivision. A statistically valid sampling technique at a ninety (90) percent or greater statistical confidence level shall be used as set forth in the Handbook and in consultation with the U. S. Soil Conservation Service.

10.6.b.3. The measurement period for determining average annual crop production (yield) shall be a minimum of three (3) crop years prior to release of the bond.

10.6.b.4. The level of management applied during the measurement period shall be the same as the level of management used on nonmined prime farmland in the surrounding area.

10.6.b.5. Restoration of soil productivity shall be considered achieved when the average yield during the measurement period equals or exceeds the average yield of the reference crop established for the same period for nonmined soils of the same or similar texture or slope phase of the soil series in the surrounding area under equivalent management practices.

10.6.b.6. The reference crop on which restoration of soil productivity is proven shall be selected from the crops most commonly produced on the surrounding prime farmland. Where row crops are the dominant crops grown on prime farmland in the area, the row crop requiring the greatest rooting depth shall be chosen as one of the reference crops.

10.6.b.7. Reference crop yields for a given crop season are to be determined from:

10.6.b.7.A. The current yield records of representative local farms in the surrounding area, with concurrence by the U. S. Soil Conservation Service; or

10.6.b.7.B. The average county yields recognized by the U. S. Department of Agriculture, which have been adjusted by the U. S. Soil Conservation Service for local yield variation within the county that is associated with differences between nonmined prime farmland soil and all other soils that produce the reference crop.

10.6.b.8. Under either procedure in paragraph 10.6.b.7 of this subdivision, the average reference crop yield may be adjusted, with the concurrence of the U. S. Soil Conservation Service, for:

10.6.b.8.A. Disease, pest, and weather-induced seasonal variations; or

10.6.b.8.B. Differences in specific management practices where the overall management practices of the crops being compared are equivalent.

§38-2-11. Insurance and Bonding.

11.1. Insurance.

11.1.a. The applicant shall provide liability insurance for each surface mining and reclamation operation and maintain such insurance throughout the life of the permit or any renewal thereof, and the liability period necessary to complete all reclamation operations, in the following minimum amounts for each surface mining and reclamation operation:

11.1.a.1. For bodily injury $300,000 for each occurrence and $500,000 aggregate.

11.1.a.2. For property damage $300,000 for each occurrence and $500,000 aggregate with no exclusions for blasting, landslides, or water loss.

11.1.b. A statement shall be affixed to each certificate of insurance affirming that the insurer will promptly notify the Secretary of any substantive change in policy including cancellations, termination, or failure to renew.

11.1.c. Insurance coverage for blasting damage may be terminated prior to final bond release but not before blasting activities have ceased provided that the full amount of liability coverage shall continue as required by the Act and this rule.

11.2. General Requirements For All Bonds.

11.2.a. Prior to issuance of a permit and prior to initiation of surface mining operations, the operator shall provide a bond in accordance with sections 11 and 12 of the Act and in accordance with this section.

11.2.b. All bonds shall provide a mechanism for a bank or surety company to give prompt notice to the Secretary and the permittee of any action filed alleging the insolvency or bankruptcy of the surety company, the bank, or the permittee; or alleging any violations which would result in suspension or revocation of the surety's license or bank's charter to do business.

11.2.c. Upon incapacity of the bank or surety company by reason of bankruptcy, insolvency, or suspension or revocation of a charter or license, the permittee shall be deemed to be without bond coverage and shall promptly notify the Secretary.

11.2.d. The Secretary shall issue a notice of violation against any operator who is without bond coverage. The notice of violation shall specify a period of time to replace bond coverage not to exceed fifteen (15) days. During this period the Secretary shall conduct weekly inspections to ensure continuing compliance with permit requirements, this rule, and the Act. Such notice of violation, if abated within the specified time period, shall not be counted as a notice of violation for purposes of civil or criminal penalties determining a "pattern of violations" and need not be reported as a past violation in subsequent permit applications. If such a notice of violation is not abated in accordance with the specified time period, a cessation order shall be issued, at which time the operator shall initiate and complete as contemporaneously as possible total reclamation of all disturbed areas. Mining operations shall not resume until the Secretary has determined that an acceptable bond has been posted.

11.2.e. For bonds and permits which are to be transferred, assigned or sold under the provisions of subsection 3.25 of this rule and which have significant long-term environmental liabilities the Secretary may require a showing that either the bond is sufficient to cover the liability or that the assignee has the financial resources and capability to assume the liability.

11.3. Bond Instruments.

11.3.a. Surety bonds shall be subject to the following conditions:

11.3.a.1. A surety bond shall be executed by the operator and a corporate surety licensed to do business in the State of West Virginia and approved by the Secretary.

11.3.a.2. Surety bonds shall be noncancellable during their term except that surety bond coverage may be adjusted in accordance with the provisions of subsection 12.3 of this rule.

11.3.a.3. Surety received after July 1, 2001 must be recognized by the treasurer of state as holding a current certificate of authority from the United States Department of the Treasury as an acceptable surety on federal bonds.

11.3.b. Collateral bonds will be negotiable and guaranteed and subject to the following conditions:

11.3.b.1. The form of the collateral bond shall be:

11.3.b.1.A. Bonds of the United States or its possessions;

11.3.b.1.B. Full faith and credit general obligation bonds of the State of West Virginia, or other states, and any county, district municipality of the state of West Virginia or other states;

11.3.b.1.C. Certificate of deposit;

11.3.b.1.D. Cash;

11.3.b.1.E. Real property posted as a collateral bond shall meet the following conditions:

11.3.b.1.E.1. The applicant shall grant the Department of Environmental Protection a first mortgage, first deed of trust, or perfected first-lien security interest in real property with a right to sell or otherwise dispose of the property in the event of forfeiture;

11.3.b.1.E.2. In order for the Secretary to evaluate the adequacy of the real property offered to satisfy collateral requirements, the applicant shall submit a schedule of the real property which shall be mortgaged or pledged to secure the obligations under the indemnity agreement. The list shall include: (1) A description of the property; (2) The fair market value as determined by an independent appraisal conducted by a certified appraiser; and (3) Proof of possession and title to the real property; and

11.3.b.1.E.3. The property may include land which is part of the permit area; however, land pledged as collateral for a bond under this section shall not be disturbed under any permit while it is serving as security.

11.3.b.1.F. Whole life insurance policies posted as a collateral bond shall meet the following conditions:

11.3.b.1.F.1. The corporation, partnership, or sole proprietorship applying for the permit shall own the said policy;

11.3.b.1.F.2. The Secretary shall obtain possession of and keep in custody all policies assigned by the applicant, until authorized for release or replacement;

11.3.b.1.F.3. The Secretary shall, at a minimum, value this collateral at net cash surrender value so as to ensure that such policies, less all penalties and administrative expenses incurred at the time of redemption, shall equal or exceed the amounts of the bond required to be posted;

11.3.b.1.F.4. The net cash surrender value of the whole life insurance policy shall not exceed $300,000.00;

11.3.b.1.F.5. The Secretary shall accept only whole life policies which are not interest sensitive and have a guaranteed rate of interest;

11.3.b.1.F.6. The Secretary shall require that whole life policies be assigned to the Department of Environmental Protection, in writing, and reflect this assignment upon the books of the company issuing such policies and be recorded by the applicant as required by the Secretary;

11.3.b.1.F.7. Upon and during the assignment, such policies shall bear no liens, loans or encumbrances, and none shall become effective without the prior written consent of the Secretary, with the exception of allowing future dividends distributed to such policies to offset annual premiums, so long as the net cash surrender value meets or exceeds the amounts of the bond required; and

11.3.b.1.F.8. The Secretary shall only accept those policies issued by companies licensed to conduct business in the State of West Virginia. Furthermore, such companies shall be member insurers of the West Virginia Life and Health Insurance Guaranty Association and have an independent financial

rating by A. M. Best Company of A+ (Superior), Aaa by Moody's Investor Service, or the equivalent.

11.3.b.1.G. Letters of credit shall be subject to the following conditions:

11.3.b.1.G.1. The letter may only be issued by a bank organized or authorized to do business in the State of West Virginia;

11.3.b.1.G.2. Letters of credit shall be irrevocable during their terms. The Secretary may approve the use of letters of credit as security in accordance with a schedule approved with the permit. Any bank issuing a letter of credit for the purposes of this part shall notify the Secretary in writing at least ninety (90) days prior to the maturity date of such letter of credit or the expiration of the letter of credit agreement. Letters of credit utilized as securities in areas requiring continuous bond coverage shall be forfeited and collected by the Office of Attorney General, if not replaced by other suitable bond or letter of credit at least thirty (30) days before the expiration date of the letter of credit agreement;

11.3.b.1.G.3. The letter must be payable to the Department of Environmental Protection in part or in full upon demand and receipt from the Secretary of a notice of forfeiture;

11.3.b.1.G.4. The Secretary shall not accept a letter of credit in excess of ten percent (10%) of the bank's capital surplus account as shown on a balance sheet certified by a certified public accountant;

11.3.b.1.G.5. The Secretary shall not accept letters of credit from a bank for any person, on all permits held by that person, in excess of three times the company's maximum single obligation as provided by State law;

11.3.b.1.G.6. The Secretary shall provide in the indemnity agreement that the amount shall be confessed to judgment upon forfeiture; and

11.3.b.1.G.7. The bond shall provide that:

11.3.b.1.G.7.(a) The bank will give prompt notice to the permittee and the Secretary of any notice received or action filed alleging the insolvency or bankruptcy of the bank, or alleging any violations of regulatory requirements which could result in suspension or revocation of the bank's charter of license to do business;

11.3.b.1.G.7.(b) In the event the bank becomes unable to fulfill its obligations under the letter of credit for any reason, notice shall be given immediately to the permittee and the Secretary; and

11.3.b.1.G.7.(c) Upon the incapacity of a bank by reason of bankruptcy, insolvency or suspension or revocation of its charter or license, the permittee shall be deemed to be without bond coverage in violation of section 11 and/or section 12 of the Act. The Secretary shall issue a notice of violation against any permittee who is without bond coverage. The notice shall specify a reasonable period to replace bond coverage, not to exceed ninety (90) days. During this period the Secretary shall conduct weekly inspections to ensure continuing compliance with other permit requirements, the regulatory program and the Code of West Virginia. Such notice of violation, if abated within the period allowed, shall not be counted as a notice of violation for purposes of determining a "pattern of willful violations" and need not be reported as a past violation in permit applications. If such a notice of violation is not abated in accordance with the schedule, a cessation order shall be issued, at which time the operator shall begin and complete, as contemporaneously as possible, total reclamation of the area.

11.3.b.1.G.7.(d) Persons with an interest in letters of credit posted as a bond, and who desire notification of actions

pursuant to the bond, shall request the notification in writing to the Secretary at the time collateral is offered.

11.3.b.2. The Secretary shall obtain possession of and keep in custody all collateral deposited by the applicant, until authorized for release or replacement;

11.3.b.3. The Secretary shall require that certificates of deposit be assigned to the Department of Environmental Protection, in writing, and reflect this assignment upon the books of the bank issuing such certificates;

11.3.b.4. The Secretary shall not accept an individual certificate for a denomination in excess of maximum insurable amount as determined by F.D.I.C.;

11.3.b.5. The Secretary shall require the banks issuing these certificates to waive all rights of setoff or liens which it has or might have against those certificates;

11.3.b.6. The Secretary shall only accept certificates of deposit in a bank in this State;

11.3.b.7. Persons with an interest in collateral posted as a bond, and who desire notification of actions pursuant to the bond, shall request the notification in writing to the Secretary at the time collateral is offered;

11.3.b.8. The estimated bond value of all collateral posted as bond assurance under this paragraph shall be subject to a margin which is a ratio of bond value to market value as determined by the Secretary. This margin shall reflect legal and liquidation fees, as well as value depreciation, marketability and fluctuations which might affect the net cash available to the Secretary for performing reclamation. The bond value of collateral may be evaluated at any time, but shall be evaluated as part of permit renewal and if necessary the bond value increased or decreased. In no case shall the market value be less than the required bond value; and

11.3.b.9. For those permits issued prior to January 1, 1993, which have collateral bonds other than these specified in this paragraph, such bond may remain in effect unless they are determined by the Secretary to be insufficient or otherwise invalid.

11.3.c. Escrow Bonding.

11.3.c.1. The Secretary may authorize the operator to supplement a bonding program through the establishment of an escrow account deposited in one or more federally insured accounts payable on demand only to the Secretary or deposited with the Secretary directly. Contributions to the account may be based on acres affected or tons of coal produced or any other rate approved by the Secretary. In all cases, the total bond including the escrow amount, as determined by the Secretary in the bonding schedule, shall not be less than the amount required under Sections 11 and 12 of the Act.

11.3.c.2. Escrow funds deposited in federally insured accounts shall not exceed the maximum insured amount under applicable Federal insurance programs such as by F.D.I.C.

11.3.c.3. Interest paid on an escrow account shall be retained in the escrow account and applied to the bond value of the escrow account unless the Secretary has approved that the interest be paid to the operator. In order to qualify for interest payment, the operator shall request such action in writing during the permit application process.

11.3.c.4. Certificates of deposit may be substituted for escrow accounts upon approval of the Secretary.

11.3.d. Self-Bonding.

11.3.d.1. Definitions. For the purposes of this subsection only:

11.3.d.1.A. Current assets means cash or other assets or resources which are reasonably expected to be converted to cash or sold or consumed within one (1) year or within the

normal operating cycle of the business.

11.3.d.1.B. Current liabilities means obligations which are reasonably expected to be paid or liquidated within one (1) year or within the normal operating cycle of the business.

11.3.d.1.C. Fixed assets means plants and equipment, but does not include land or coal in place.

11.3.d.1.D. Liabilities means obligations to transfer assets or provide services to other entities in the future as a result of past transactions.

11.3.d.1.E. Net worth means total assets minus total liabilities and is equivalent to owners equity.

11.3.d.1.F. Parent corporation means corporation which owns or controls the applicant.

11.3.d.1.G. Tangible net worth means net worth minus intangibles such as goodwill and rights to patents or royalties.

11.3.d.2. The Secretary may accept a self-bond from an applicant for a permit if all of the following conditions are met by the applicant or its parent corporation guarantor:

11.3.d.2.A. The applicant designates a suitable agent to receive service of process in the state where the proposed surface coal mining operation is to be conducted.

11.3.d.2.B. The applicant has been in continuous operation as a business entity for a period of not less than five (5) years. Continuous operation shall mean that business was conducted over a period of five (5) years immediately preceding the time of application.

11.3.d.2.B.1. The Secretary may allow a joint venture or syndicate with less than five (5) years of continuous operation to qualify under this requirement, if each member of the joint venture or syndicate has been in continuous operation for at least five (5) years immediately preceding the time of application.

11.3.d.2.B.2. When calculating the period of continuous operation, the Secretary may exclude past periods of interruption to the operation of the business entity that were beyond the applicant's control and that do not affect the applicant's likelihood of remaining in business during the proposed surface coal mining and reclamation operations.

11.3.d.2.C. The applicant submits financial information in sufficient detail to show that the applicant meets one of the following criteria:

11.3.d.2.C.1. The applicant has a current rating for its most recent bond issuance of "A" or higher as issued by either Moody's Investor Service or Standard and Poor's Corporation;

11.3.d.2.C.2. The applicant has a tangible net worth of at least ten (10) million dollars, a ratio of total liabilities to net worth of 2.5 times or less, and a ratio of current assets to current liabilities of 1.2 times or greater; or

11.3.d.2.C.3. The applicant's fixed assets in the United State total at least twenty (20) million dollars, and the applicant has a ratio of total liabilities to net worth of 2.5 times or less, and a ratio of current assets to current liabilities of 1.2 times or greater.

11.3.d.2.D. The applicant submits:

11.3.d.2.D.1. Financial statements for the most recently completed fiscal year accompanied by a report prepared by an independent certified public accountant in conformity with generally accepted accounting principles and containing the accountant's audit opinion or review opinion of the financial statements with no adverse opinion;

11.3.d.2.D.2. Unaudited

financial statements for completed quarters in the current fiscal year; and

11.3.d.2.D.3. Additional unaudited information as requested by the Secretary.

11.3.d.3. The Secretary may accept a written guarantee for an applicant's self-bond from a parent corporation guarantor, if the guarantor meets the conditions of subparagraphs 11.3.d.2.A through 11.3.d.2.D of this paragraph as if it were the applicant. Such a written guarantee shall be referred to as a "corporate guarantee". The terms of the corporate guarantee shall provide for the following:

11.3.d.3.A. If the applicant fails to complete the reclamation plan, the guarantor shall do so or the guarantor shall be liable under the indemnity agreement to provide funds to the Secretary sufficient to complete the reclamation plan, but not to exceed the bond amount.

11.3.d.3.B. The corporate guarantee shall remain in force unless the guarantor sends notice of cancellation by certified mail to the applicant and to the Secretary at least ninety (90) days in advance of the cancellation date, and the Secretary accepts the cancellation.

11.3.d.3.C. The cancellation may be accepted by the Secretary if the applicant obtains suitable replacement bond before the cancellation date or if the lands for which the self-bond, or portion thereof, was accepted have not been disturbed.

11.3.d.4. For the Secretary to accept an applicant's self-bond, the total amount of the outstanding and proposed self-bonds of the applicant for surface coal mining and reclamation operations shall not exceed twenty-five (25) percent of the applicant's tangible net worth in the United States. For the Secretary to accept a corporate guarantee, the total amount of the parent corporation guarantor's present and proposed self-bonds and guaranteed self-bonds for surface coal mining and reclamation operations shall not exceed twenty-five (25) percent of the guarantor's tangible net worth in the United States.

11.3.d.5. If the Secretary accepts an applicant's self-bond, an indemnity agreement shall be submitted subject to the following requirements:

11.3.d.5.A. The indemnity agreement shall be executed by all persons and parties who are to be bound by it, including the parent corporation guarantor, and shall bind each jointly and severally.

11.3.d.5.B. The indemnity agreement shall be accompanied by an affidavit certifying that the agreement is valid under all applicable State and Federal laws.

11.3.d.5.C. Corporations applying for a self-bond or parent corporations guaranteeing a subsidiary's self-bond shall submit an indemnity agreement signed by two (2) corporate officers who are authorized to bind the corporation. A copy of such authorization shall be provided to the Secretary. The guarantor shall provide a copy of the corporate authorization demonstrating that the corporation may guarantee the self-bond and execute the indemnity agreement.

11.3.d.5.D. If the applicant is a partnership, joint venture or syndicate, the agreement shall bind each partner or party who has a beneficial interest, directly or indirectly, in the applicant.

11.3.d.5.E. Pursuant to the bond forfeiture provisions of subsection (b) of section 17 of the Act, the applicant or parent corporation guarantor shall be required to complete the approved reclamation plan for the lands in default or to pay to the Secretary an amount necessary to complete the approved reclamation plan, not to exceed the bond amount. The indemnity agreement when under forfeiture shall operate as a judgment against those parties liable under the indemnity agreement.

11.3.d.6. The Secretary may

require self-bonded applicants and parent guarantors to submit an update of the information required under subparagraph 11.3.d.2.A. through 11.3.d.2.D. of this paragraph within ninety (90) days after the close of each fiscal year following the issuance of the self-bond or corporate guarantee.

11.3.d.7. If at any time during the period when a self-bond is posted, the financial conditions of the applicant or the parent corporation guarantor change so that the criteria under subparagraph 11.3.d.2.C of this paragraph are not satisfied, the permittee shall notify the Secretary immediately and shall within ninety (90) days post an alternate form of bond in the same amount as the self-bond.

11.3.e. Combined Surety/Escrow Bonding.

11.3.e.1. The Secretary may accept a combined surety/escrow bonding schedule provided that:

11.3.e.1.A. A surety bond payable to the Secretary is posted in the amount determined under Sections 11 and 12 of the Act for reclamation of each successive increment; and

11.3.e.1.B. An interest-bearing escrow account, payable to the Secretary with a predetermined deposit amount and frequency, is established.

11.3.e.2. Conditions of the combined surety/escrow bonding method shall be as follows:

11.3.e.2.A. Surety bond:

11.3.e.2.A.1. The term of the surety bond shall be not less than two (2) years.

11.3.e.2.A.2. The amount of the surety bond shall always be sufficient to cover the difference between the escrow balance and the total reclamation cost.

11.3.e.2.A.3. The surety bond may be reduced in amount, but the liability remaining shall depend on the escrow-deposit rate which shall be subject to the requirements of subdivisions 11.3.b and 11.3.c of this subsection.

11.3.e.2.A.4. The surety bond shall be noncancellable by the surety during the bond term.

11.3.e.2.A.5. Surety bond coverage may be released by the Secretary without applying the bond-release criteria of the Act and section 12 of this rule at any time during the bond term, provided provisions of part 11.3.e.2.B.5 of this subparagraph are met or are in accordance with the provisions of bond replacement under subsection 12.1 of this rule.

11.3.e.2.A.6. The surety bond is subject to the conditions of bond forfeiture including noncompliance with the escrow-account provisions of subparagraph 11.3.e.2.B of this paragraph.

11.3.e.2.B. Escrow account:

11.3.e.2.B.1. The terms and conditions of the escrow account shall be developed jointly by the operator, surety and Secretary. For the purposes of this section, the development of the escrow account shall be based on a production basis in an amount not less than that required to make the escrow account equal to or greater than the bond requirement within the term of the surety bond as agreed on jointly by the operator, the surety and the Secretary. Deposits to the escrow account by the operator shall be made monthly and so reported to the Secretary. Failure to make deposits on schedule shall be just cause for action by the Secretary.

11.3.e.2.B.2. A certified escrow-account balance statement shall be provided quarterly to the surety and the Secretary.

11.3.e.2.B.3. Provisions of the escrow account shall be in accordance with subdivision 11.3.b of this subsection.

11.3.e.2.B.4. The escrow account shall be subject to bond-forfeiture.

11.3.e.2.B.5. The escrow account balance shall equal the initial bond amount, plus any adjustments required by subdivision i. of this subpart, one hundred twenty (120) days prior to surety bond termination, unless the total bond amount required has been previously reduced through the bond-release procedures.

11.3.e.3. Provisions of the Act and section 12 of this rule may be applied to both surety and escrow bond coverage during the bond term.

11.3.e.4. The surety escrow combination may be repeated successively or amended during the term by replacing the escrow account with a surety bond, and reestablishing the escrow terms and deposit rate, subject to Secretary approval.

11.4. Incremental Bonding.

11.4.a. When the applicant elects to bond in increments as specified in subsection (a), section 11, of the Act, the following conditions shall apply

11.4.a.1. A bond in the appropriate amount shall be filed with the Secretary for that increment of land within the permit area upon which the operator will initiate and conduct surface mining and reclamation operations. As succeeding increments of surface mining and reclamation operations are to be initiated and conducted within the permit area, the operator shall prior to land disturbance file with the Secretary and receive approval of an additional bond or bonds in accordance with subsection 11.3 of this section;

11.4.a.2. Once the operator has chosen to proceed with bonding either the entire permit area or with incremental bonding, he shall continue bonding in that manner for the term of the permit. The minimum amount of bond furnished shall be ten thousand dollars ($10,000).

11.4.a.3. A cumulative bond schedule shall be submitted to the Secretary listing the areas covered by the initial bond and for the addition of other acreage as it is affected. Independent increments will be of sufficient size and configurations so as to provide for efficient and contemporaneous reclamation operations. The amount of bond required to obtain a permit shall include the full reclamation cost of the initial area being affected; and

11.4.a.4. When the applicant elects to "increment" the amount of the bond during the term of the permit, he shall indicate the initial and successive incremental disturbed areas on the proposal map and shall specify the proportion of the total bond amount which will be filed prior to commencing operations on each incremental area. The scheduled amount of each bond increment shall be filed in the sequence approved in the permit, and shall be filed with the Secretary at least thirty (30) days prior to the commencement of surface coal mining and reclamation operations in the subject incremental area.

11.5. Site Specific Bonding.

11.5.a. Applicability. After the effective date of this subsection, the four major categories of mining identified in subdivision 11.5.b of this subsection shall be subject to the site specific bonding requirements of section 12 of the Act and this subsection. The site specific bond amount for a permit in any of these categories will be determined based on criteria set forth in this subsection, and as calculated from the tables set forth in subdivisions 11.5.c, 11.5.d, 11.5.e, and 11.5.f of this subsection. Separate permits for ancillary activities, i.e., haulroads, load outs, railroad spurs and sidings, etc., will post bond in the amount prescribed in section 11 of the Act: provided, That where such activities are incorporated into a permit application for one of the four major categories, the site specific bond rate provided for herein will apply; provided, however, that the bond required shall in no case be less than one thousand dollars ($1,000), nor more than five thousand dollars ($5,000) per acre or

fraction thereof.

Where a permit application includes two or more of the four major mining categories, the application will delineate the proposed disturbed acres for each category and the site specific per acre bond amount for each category will be calculated in accordance with the provisions of this subsection as if it were a separate permit and the respective bond amount shall be posted for each area of proposed disturbance in that category.

Where active or inactive operations are in compliance with the provisions of subsection 14.15 of this rule and coal extraction operations are completed, or nearly completed, or when the operations are eligible for or have received Phase I bond release, the site specific bond criteria of this subsection shall not apply.

All existing permits for surface mining operations in the four major categories set forth in subdivision 11.5.b of this subsection shall be reviewed by the Secretary and a determination made as to whether or not the surface mining operations are subject to the site specific bonding criteria set forth herein. The determinations shall be made in accordance with the following:

Existing permits in the four major categories described in subdivision 11.5.b of this subsection shall be reviewed by the Secretary at the time of renewal and a determination made as to the adequacy of existing bond and shall not be renewed by the Secretary until the appropriate amount of bond has been posted.

11.5.b. The four major categories of mining permits subject to the provisions of this subsection are surface mines, underground mines, coal refuse disposal sites, and coal preparation plants. The tables in subdivisions 11.5.c, 11.5.d, 11.5.e, and 11.5.f of this subsection display in matrix form the major criteria which influence the level of difficulty in achieving reclamation for the specific mining permit category. These include but are not limited to the following factors:

11.5.b.1. Cost factors which will be encountered in mine land reclamation of a forfeited site;

11.5.b.2. The risk of bond forfeiture incurred by the State;

11.5.b.3. Operator's history of performance; and

11.5.b.4 Environmental enhancement potential which may mitigate reclamation cost.

These are shown on the "x" axis of the matrix. Each of these criteria have been assigned a numerical criteria value for calculating the site specific per acre bond amount. The sum of the criteria values do not exceed 5,000, which is the maximum per acre dollar amount of the bond provided for in the Act.

Under each major criteria are listed two or more sub-criteria. These sub-criteria represent readily identifiable and quantifiable elements of a permit application. Each sub-criteria is assigned a numerical constant which when summed equals the numerical value of their respective criteria.

In order to determine the appropriate site specific bond amount for a specific permit, each sub-criteria constant is multiplied by a conversion factor which is displayed on the "y" axis of the matrix. The value of the conversion factors reflects a quantifiable element of the sub-criteria which influences the level of consideration each element must be given in determining reclamation costs or risk. The sum of the converted constants will be the total per acre bond amount for a specific permit.

11.5.c. Surface Mines. Table 1 displays the criteria, sub-criteria, and conversion factors for the surface mines category to be applied as follows:

11.5.c.1. The criteria of excess spoil disposal is assigned a maximum criteria value of 1000 subject to the following sub-criteria constants:

11.5.c.1.A. The type of excess spoil disposal fill is assigned a sub-criteria constant of 800 subject to the following conversion factors.

11.5.c.1.A.1. Excess spoil disposal on existing solid benches created by previous mining operations is assigned a conversion factor of 0.2.

11.5.c.1.A.2. Excess spoil disposal on natural slopes (side hill fills) utilizing controlled placement technology or in valleys where controlled placement and chimney rock core construction is employed, is assigned a conversion factor of 0.5.

11.5.c.1.A.3. Excess spoil disposal in valleys where single lift durable rock construction is employed is assigned a conversion factor of 1.0.

11.5.c.1.B. Where one or more excess spoil disposal fills are proposed, a sub-criteria constant of 200 is assigned subject to the following conversion factors: provided, That where two or more fills of different types are involved, the highest conversion factor will be applied for all fills.

11.5.c.1.B.1. Two or less fills proposed in a single permit application is assigned a conversion factor of 0.2.

11.5.c.1.B.2. Two to six fills proposed for a single permit application is assigned a conversion factor of 0.5.

11.5.c.1.B.3. More than six fills proposed on a single permit application is assigned a conversion factor of 1.0.

11.5.c.2. The mining plan contained in the permit application is assigned a maximum criteria value of 1000 subject to the following sub-criteria constants:

11.5.c.2.A. The type of surface mining operation proposed in the mining plan is assigned a sub-criteria constant of 500, subject to the following conversion factors:

11.5.c.2.A.1. Where the mining plan reflects that the mining operation is predominantly of the area mining type (level or gently rolling terrain), a conversion factor of 0.2 is assigned;

11.5.c.2.A.2. Where the mining plan reflects that the mining operation is predominantly of the contour strip type (on both steep and non-steep slopes), a conversion factor of 0.6 is assigned; and

11.5.c.2.A.3. Where the mining plan reflects that the mining operation is on steep slopes and a conversion factor of 1.0 is assigned.

11.5.c.2.B. A mining plan which reflects that multiple coal seams are to be mined is assigned a sub-criteria constant of 300 subject to the following conversion factors. Splits of the same coal seam will not be considered separate seams unless the partings between the splits are on the average greater than ten feet.

11.5.c.2.B.1. Where the mining plan reflects that no more than two seams of coal are to be mined, a conversion factor of 0.2 is assigned.

11.5.c.2.B.2. Where the mining plan reflects that two to four seams of coal or splits of the same seam are proposed to be mined, a conversion factor of 0.6 is assigned.

11.5.c.2.B.3. Where the mining plan reflects that more than four coal seams or splits of the same seams are proposed to be mined, a conversion factor of 1.0 is assigned.

11.5.c.2.C. Where the mining plan proposed that augering of the coal is proposed, a sub-criteria constant of 200 is assigned subject to the following conversion factors

11.5.c.2.C.1. Where the mining plan reflects that twenty-five percent or

less of the total lineal feet of coal outcrop for all seams or of any single seam is to be augered, a conversion factor of 0.2 is assigned;

11.5.c.2.C.2. Where the mining plan reflects that more than twenty-five percent of the total lineal feet of coal outcrop for all seams or of any single seam is to be augered by conventional screw-type augers, a conversion factor of 0.6 is assigned; and

11.5.c.2.C.3. Where the mining plan reflects that highwall mining is the augering method of choice, a conversion factor of 1.0 is assigned.

11.5.c.3. The topographic, geologic, and hydrologic criteria associated with the proposed permit application is assigned a maximum criteria value of 800, subject to the following sub-criteria constants:

11.5.c.3.A. Where the nature of the geology associated with the proposed permit area requires overburden analysis (acid/base accounting) in accordance with paragraphs 3.23.f.2 and 3.23.f.6 of this rule, a sub-criteria constant of 400 is assigned, subject to the following conversion factors.

11.5.c.3.A.1. Where, from the results of overburden analysis, a volume-weighted acid base balance calculation shows that the overburden on the proposed disturbed area contains a net excess calcium carbonate equivalent of greater than 20 tons per thousand tons of overburden, a conversion factor of 0.2 is assigned;

11.5.c.3.A.2. Where, from the results of overburden analysis, a volume-weighted acid base balance calculation shows that the overburden on the proposed disturbed area contains a net excess calcium carbonate equivalent of 10 to 20 tons per thousand tons of overburden, a conversion factor of 0.6 is assigned; and

11.5.c.3.A.3. Where, from the results of overburden analysis, a volume-weighted acid base balance calculation shows that the overburden on the proposed disturbed area contains a net excess calcium carbonate equivalent of less than 10 tons per thousand tons of overburden or a net calcium carbonate deficiency, a conversion factor of 1.0 is assigned.

11.5.c.3.B. The average steepness of slopes on the proposed permit area is assigned a sub-criteria constant of 200 subject to the following conversion factors:

11.5.c.3.B.1. Where the average slope of the proposed permit area is less than twenty percent (20%), a conversion factor of 0.2 is assigned: provided, That except for downslope placement of first cut material, where the mining plan reflects area mining or mountaintop removal utilizing excess spoil disposal sites, a conversion factor of 1.0 is assigned;

11.5.c.3.B.2. Where the average slope of the proposed permit area is between twenty (20) to forty (40) percent, a conversion factor of 0.6 is assigned: provided, That where the mining plan reflects area mining or mountaintop removal utilizing excess spoil disposal sites, a conversion factor of 1.0 is assigned; and

11.5.c.3.B.3. Where the average slope of the proposed permit area is greater than forty percent (40%), a conversion factor of 1.0 is assigned.

11.5.c.3.C. The overburden type, based on percent of total volume of overburden to be removed from the coal seam(s), is assigned a sub-criteria constant of 200, subject to the following conversion factors.

11.5.c.3.C.1. Where the overburden mass consists of less than twenty percent (20%) by volume sandstone or other highly abrasive spoil material, a conversion factor of 0.2 is assigned;

11.5.c.3.C.2. Where the overburden mass consists of between twenty to sixty percent (20% - 60%) by volume sandstone or other highly abrasive spoil material, a conversion

factor of 0.6 is assigned; and

11.5.c.3.C.3. Where the overburden mass consists of greater than sixty percent (60%) by volume sandstone or other highly abrasive spoil material, a conversion factor of 1.0 is assigned.

11.5.c.4. The overall reclamation plan contained in the proposed permit application (based on size, sequence, and timing of the proposed operation) is assigned a maximum criteria value of 1200 subject to the following sub-criteria constants:

11.5.c.4.A. The mining and reclamation sequence reflected in the proposed reclamation plan governing the expediency of achieving contemporaneous reclamation is assigned a sub-criteria constant of 600 subject to the following conversion factors:

11.5.c.4.A.1. Where the proposed reclamation plan contains specific time and distance criteria which clearly identify achievable mile posts to be reached during the life of the operation, a conversion factor of 0.2 is assigned: provided, That mountaintop removal and multiple seam contour mining operations utilizing single lift durable rock excess spoil fills are assigned a conversion factor of 1.0;

11.5.c.4.A.2. Where the proposed reclamation plan contains specific time and distance criteria in an incremental bond or open-acre limit bond scenario without clearly identified achievable mile posts to be reached during the life of the operation, a conversion factor of 0.6 is assigned: provided, That mountaintop removal and multiple seam contour mining operations utilizing single lift durable rock excess spoil disposal fills, are assigned a conversion factor of 1.0; and

11.5.c.4.A.3. Where the proposed reclamation plan contains time and distance criteria expressed as percentages, or where such criteria are vague, a conversion factor of 1.0 is assigned.

11.5.c.4.B. The size of the proposed permit area in acres disturbed is assigned a sub-criteria constant of 400, subject to the following conversion factors:

11.5.c.4.B.1. Where the total proposed disturbed area is less than 200 acres, a conversion factor of 0.2 is assigned;

11.5.c.4.B.2. Where the total proposed disturbed area is 200 to 500 acres, a conversion factor of 0.6 is assigned; and

11.5.c.4.B.3. Where the total proposed disturbed area is greater than 500 acres, a conversion factor of 1.0 is assigned.

11.5.c.4.C. The type, size, numbers, and configuration of earth-moving equipment as specified in the reclamation plan is assigned a sub-criteria value of 200, subject to the following conversion factors:

11.5.c.4.C.1. Where the equipment spread(s) identified in the reclamation plan consists only of trucks, loaders, and/or dozers, and/or power shovels or draglines with bucket capacity of less than 20 cubic yards, a conversion factor of 0.2 is assigned;

11.5.c.4.C.2. Where the equipment spread(s) identified in the reclamation plan includes the use of power shovels with a bucket capacity of 20 cubic yards or greater, a conversion factor of 0.6 is assigned; and

11.5.c.4.C.3. Where the equipment spread(s) identified in the reclamation plan includes the use of one or more draglines with a bucket capacity of 20 cubic yards or greater, a conversion factor of 1.0 is assigned.

11.5.c.5. The historical performance of the applicant in terms of level of performance of mining and reclamation activities in accordance with State law is assigned a maximum criteria value of 1000, subject to the following sub-criteria constants:

11.5.c.5.A. The violation

history in West Virginia of the applicant based on the average number of cessation orders and/or notices of violations with a seriousness rating of greater than 4 for all active permits held by the applicant, is assigned a sub-criteria constant of 600, subject to the following conversion factors: provided, That the violation history period includes the last full calendar year prior to the date an SMA is issued; provided, however, That when the applicant has no record of performance in the state, a conversion factor of 1.0 is assigned:

11.5.c.5.A.1. Where the average of the number of notices of violation and cessation orders per active permit is less than 3, a conversion factor of 0.2 is assigned;

11.5.c.5.A.2. Where the average of the number of notices of violation and cessation orders per active permit is 3 to 5, a conversion factor of 0.6 is assigned; and

11.5.c.5.A.3. Where the average of the number of notices of violations and cessation orders per active permit is greater than 5, a conversion factor of 1.0 is assigned.

11.5.c.5.B. The status of all active permits held by the applicant in West Virginia based on compliance with the law and this rule,, and compliance with the permits' reclamation plan during the public notice period, is assigned a sub-criteria constant of 400, subject to the following conversion factors: provided, That when the applicant holds no other permits in the state, a conversion factor of 1.0 is assigned:

11.5.c.5.B.1. Where status of full compliance (no notices of violation issued) with the law, this rule, and the reclamation plan, and one hundred percent (100%) contemporaneous reclamation exists during the public notice period for the subject application, a conversion factor of 0.2 is assigned;

11.5.c.5.B.2. Where status of compliance with the law and this rule (no negligence on the part of the operator in abatement action on notices of violation), and ninety percent (90%) contemporaneous reclamation, a conversion factor of 0.6 is assigned; and

11.5.c.5.B.3. A status of basic compliance with the law and this rule (negligence on the part of the operator in abatement action for notices of violation) and seventy percent (70%) contemporaneous reclamation, a conversion factor of 1.0 is assigned.

11.5.c.6. Where the applicant has demonstrated success in conducting mining and reclamation operations in such a manner that environmental resources have been extraordinarily enhanced, a bond reduction credit expressed as a negative criteria value of -1800 is assigned.

11.5.c.6.A. Where the applicant has successfully carried out remining operations, a sub-criteria constant of -800 is assigned, subject to the following conversion factors:

11.5.c.6.A.1. Where the remining operation(s) have complied with the reclamation plan, but did not result in the total elimination of highwalls, and did not result in an improvement in water quality, the conversion factor of 0.2 is assigned;

11.5.c.6.A.2. Where the remining operation(s) have complied with the reclamation plan and have resulted in total elimination of highwalls and/or improved water quality, a conversion factor of 0.6 is assigned; and

11.5.c.6.A.3. Where the remining operation(s) have complied with the reclamation plan and have resulted in total highwall elimination and water quality meets effluent limits and water quality standards, a conversion factor of 1.0 is assigned.

11.5.c.6.B. Where the applicant has received recognition for excellence in reclamation through local and/or national awards, from awards programs sanctioned by a regulatory authority as defined in Public Law (95-87), a sub-criteria constant of -600 is assigned, subject to the following conversion factors:

11.5.c.6.B.1. Where the applicant has received one local award but no national awards, a conversion factor of 0.2 is assigned;

11.5.c.6.B.2. Where the applicant has received more than one local award but no national awards, a conversion factor of 0.6 is assigned; and

11.5.c.6.B.3. Where the applicant has received both local and national awards, a conversion factor of 1.0 is assigned.

11.5.c.6.C. Where the applicant has demonstrated a history of restoration, development, or enhancement of wetlands in the State, a sub-criteria constant of -400 is assigned, subject to the following conversion factors:

11.5.c.6.C.1. Where the total cumulative area of wetlands restored, developed, or improved is less than one acre, a conversion factor of 0.2 is assigned;

11.5.c.6.C.2. Where the total cumulative area of wetlands restored, developed, or enhanced is between 1 and 5 acres, a conversion factor of 0.6 is assigned; and

11.5.c.6.C.3. Where the total cumulative area of wetlands restored, developed, or enhanced is greater than 5 acres, a conversion factor of 1.0 is assigned.

11.5.d. Underground Mines .Table 2 displays the criteria, sub-criteria, and conversion factors for the category of underground mines to be applied as follow:

11.5.d.1. The criteria of availability of backfill material to be used to backfill the mine face-up area and eliminate highwalls, is assigned a maximum criteria value of 1200, subject to the following sub-criteria constants:

11.5.d.1.A. The haulage distance in miles from the portal area to the stockpiled or otherwise available backfilling material (such as borrow pits) is assigned a sub-criteria constant of 600, subject to the following conversion factors: provided, That for underground mines which involve slopes or vertical shafts as main portals, a conversion factor of 1.0 is assigned:

11.5.d.1.A.1. Where the backfill material is less than one-fourth mile from the portal area, a conversion factor of 0.2 is assigned;

11.5.d.1.A.2. Where the backfill material is between one-fourth and one-half mile from the portal area, a conversion factor of 0.6 is assigned; and

11.5.d.1.A.3. Where the backfill material is over one-half mile from the portal area, a conversion factor of 1.0 is assigned.

11.5.d.1.B. The volume of backfilling material, measured in cubic yards, which must be transported from the storage or borrow area to the face-up area in order to achieve reclamation, is assigned a sub-criteria constant of 400, subject to the following conversion factors: provided, That for underground mines which involve slopes or vertical shafts as main portals, a conversion factor of 1.0 is assigned;

11.5.d.1.B.1. Where the amount of material necessary to backfill and reclaim the face-up area is less than one hundred thousand cubic yards, a conversion factor of 0.2 is assigned;

11.5.d.1.B.2. Where the amount of material necessary to backfill and reclaim the face-up area is between one hundred and two hundred fifty thousand cubic yards, a conversion factor of 0.6 is assigned; and

11.5.d.1.B.3. Where the amount of material necessary to backfill and reclaim the face-up area is over two hundred fifty thousand cubic yards, a conversion factor of 1.0 is assigned.

11.5.d.1.C. The topographic location of the stockpiled or otherwise available backfill material relative to the coal seam being mined is assigned a sub-criteria constant of 200, subject to the following conversion factors: provided, That underground mines which involve slopes or vertical shafts as main portals, a conversion factor of 1.0 is assigned:

11.5.d.1.C.1. Where the available backfill material is located above the coal seam, a conversion factor of 0.2 is assigned;

11.5.d.1.C.2. Where the available backfill material is located at the same level as the coal seam being mined, a conversion factor of 0.6 is assigned; and

11.5.d.1.C.3. Where the available backfill material is located below the coal seam being mined, a conversion factor of 1.0 is assigned.

11.5.d.2. The topographic, geologic, and hydrologic features of the proposed mine site are assigned a maximum criteria value of 1200, subject to the following sub-criteria constants:

11.5.d.2.A. The acid/base accounting analysis of the coal seam to be mined, including four feet of material above and four feet of material below the coal seam, is assigned a sub-criteria constant of 600, subject to the following conversion factors:

11.5.d.2.A.1. Where, as determined from the results of an acid/base balance calculation, the coal seam and associated strata have a net excess calcium carbonate equivalent of greater than twenty tons per thousand tons of material, a conversion factor of 0.2 is assigned;

11.5.d.2.A.2. Where, as determined from the results of an acid/base balance calculation, the coal seam and associated strata have a net excess calcium carbonate equivalent of between ten and twenty tons per thousand tons of material, a conversion factor of 0.6 is assigned; and

11.5.d.2.A.3. Where, as determined from the results of an acid/base balance calculation, the coal seam and associated strata have a net excess calcium carbonate equivalent of less than ten tons per thousand tons of material or a net calcium carbonate deficiency, a conversion factor of 1.0 is assigned.

11.5.d.2.B. The average steepness of slopes on the proposed permit area is assigned a sub-criteria constant of 400, subject to the following conversion factors: provided, That for underground mines which involve slopes or vertical shafts as main portals, a conversion factor of 1.0 is assigned:

11.5.d.2.B.1. Where the average slope of the proposed permit area is less than twenty percent (20%), a conversion factor of 0.2 is assigned;

11.5.d.2.B.2. Where the average slope of the proposed permit area is between twenty (20) to forty (40) percent, a conversion factor of 0.6 is assigned; and

11.5.d.2.B.3. Where the average slope of the proposed permit area is greater than forty percent (40%), a conversion factor of 1.0 is assigned.

11.5.d.2.C. The type of backfilling material which must be handled in order to backfill and reclaim the face-up area is assigned a sub-criteria constant of 200, subject to the following conversion factors:

11.5.d.2.C.1. Where the backfilling material consists of less than twenty percent (20%) sandstone or other abrasive material, a conversion factor of 0.2 is assigned;

11.5.d.2.C.2. Where the backfilling material consists of between twenty and sixty percent (20% and 60%) sandstone or other abrasive material, a conversion factor of 0.6 is assigned; and

11.5.d.2.C.3. Where the backfilling material consists of greater than sixty percent (60%) sandstone or other abrasive material, a conversion factor of 1.0 is assigned.

11.5.d.3. The overall reclamation plan contained in the proposed permit application is assigned a maximum criteria value of 1200, subject to the following sub-criteria constants:

11.5.d.3.A. The size of the proposed permit area in acres disturbed is assigned a sub-criteria value of 800, subject to the following conversion factors:

11.5.d.3.A.1. Where the proposed disturbed area is less than three acres, a conversion factor of 0.2 is assigned;

11.5.d.3.A.2. Where the proposed disturbed area is between three and ten acres, a conversion factor of 0.6 is assigned; and

11.5.d.3.A.3. Where the proposed disturbed area is greater than ten acres, a conversion factor of 1.0 is assigned.

11.5.d.3.B. The mining and reclamation sequence expressed in terms of the time in years to complete mining and reclamation is assigned a sub-criteria constant of 400, subject to the following conversion factors.

11.5.d.3.B.1. Where the proposed time required to complete mining and reclamation is less than three years, a conversion factor of 0.2 is assigned;

11.5.d.3.B.2. Where the proposed time required to complete mining and reclamation is between three and ten years, a conversion factor of 0.6 is assigned; and

11.5.d.3.B.3. Where the proposed time required to complete mining and reclamation is greater than ten years, a conversion factor of 1.0 is assigned.

11.5.d.4. Coal preparation plants, coal refuse disposal sites, and other associated ancillary facilities which are proposed for construction as part of the proposed application for underground mines is assigned a maximum criteria value of 800.

11.5.d.4.A. A coal preparation plant is assigned a sub-criteria constant of 400, subject to the following conversion factors:

11.5.d.4.A.1. Where the facility has a maximum capacity of processing less than 200 tons of raw coal per hour, a conversion factor of 0.2 is assigned;

11.5.d.4.A.2. Where the facility has a maximum capacity of processing between 200 and 500 tons of raw coal per hour, a conversion factor of 0.6 is assigned; and

11.5.d.4.A.3. Where the facility has a maximum capacity of processing greater than 500 tons of raw coal per hour, a conversion factor of 1.0 is assigned.

11.5.d.4.B. The size in acres of a proposed coal refuse disposal site is assigned a sub-criteria constant of 400, subject to the following conversion factors:

11.5.d.4.B.1. Where the size of the proposed coal refuse disposal site is five acres or less, a conversion factor of 0.2 is assigned;

11.5.d.4.B.2. Where the size of the coal refuse disposal site is between five and ten acres, a conversion factor of 0.6 is assigned; and

11.5.d.4.B.3. Where the size of the proposed coal refuse disposal site is greater than ten acres, a conversion factor of 1.0 is assigned.

11.5.d.5. The historical performance of the applicant in terms of level of performance of mining and reclamation activities in accordance with state law is assigned a maximum criteria value of 600, subject to the following sub-criteria constants:

11.5.d.5.A. The violation history in West Virginia of the applicant based on the average number of cessation orders and/or notices of violation with a seriousness rating of greater than 4, and any cessation order for all active permits, is assigned sub-criteria constant of 400, subject to the following conversion factors: provided, That the violation history period includes the last full calendar year prior to the date an SMA is issued; provided, however, That when the applicant has no record of performance in the state, a conversion factor of 1.0 is assigned:

11.5.d.5.A.1. Where the average number of notices of violation and cessation orders per active permit is less than 3, a conversion factor of 0.2 is assigned;

11.5.d.5.A.2. Where the average number of notices of violation and cessation orders per active permit is between 3 and 5, a conversion factor of 0.6 is assigned; and

11.5.d.5.A.3. Where the average number of notices of violation and cessation orders per active permit is greater than 5, a conversion factor of 1.0 is assigned.

11.5.d.5.B. The status of all active permits held by the applicant in West Virginia, based on compliance with the law and this rule and compliance with the permits reclamation plan during the public notice period for the subject proposed application is assigned a sub-criteria constant of 200, subject to the following conversion factors; provided, That where the applicant holds no other permits in the state a conversion factor of 1.0 is assigned:

11.5.d.5.B.1. Where a status of full compliance (no notices of violation are issued) with the law, this rule, and the reclamation plan and one hundred percent (100%) contemporaneous reclamation exists, a conversion factor of 0.2 is assigned;

11.5.d.5.B.2. Where a status of compliance with the law and this rule (no negligence on the part of the operator in abatement action on outstanding notices of violation) and ninety percent (90%) contemporaneous reclamation exists, a conversion factor of 0.6 is assigned; and

11.5.d.5.B.3. Where a status of basic compliance exists with the law and this rule, (negligence on the part of the operator in abatement action for outstanding notices of violation) and seventy percent (70%) contemporaneous reclamation exists, a conversion factor of 1.0 is assigned.

11.5.d.6. Where the applicant has demonstrated success in conducting mining and reclamation operations in such a manner that environmental resources have been extraordinarily enhanced, a bond reduction credit, expressed as a negative criteria value, of -1000 is assigned, subject to the following sub-criteria constants:

11.5.d.6.A. Gratuitous reclamation or restoration of abandoned coal mining areas by the applicant, as part of a surface or underground mining operation under permit by the applicant is assigned a sub-criteria constant of -600, subject to the following conversion factors:

11.5.d.6.A.1. Where the cumulative area of gratuitous reclamation is less than one acre, a conversion factor of 0.2 is assigned;

11.5.d.6.A.2. Where the cumulative area of gratuitous reclamation is between one and five acres, a conversion factor of 0.6 is assigned; and

11.5.d.6.A.3. Where the cumulative area of gratuitous reclamation is greater than five acres, a conversion factor of 1.0 is assigned.

11.5.d.6.B. Where the applicant has received recognition for excellence in reclamation through local and/or national awards from awards programs sanctioned by any regulatory authority as defined in Public Law 95-87, a sub-criteria constant of -400 is assigned, subject to the following conversion factors:

11.5.d.6.B.1. Where the applicant has received one local award, but no national awards, a conversion factor of 0.2 is assigned;

11.5.d.6.B.2. Where the applicant has received more than one local award, but no national awards, a conversion factor of 0.6 is assigned; and

11.5.d.6.B.3. Where the applicant has received both local and national awards, a conversion factor of 1.0 is assigned.

11.5.d.6.C. Where the applicant has demonstrated a history of restoration, development, or enhancement of wetlands, a sub-criteria constant of -200 is assigned, subject to the following conversion factors:

11.5.d.6.C.1. Where the cumulative area of wetlands which have been restored, developed, or enhanced is less than one acre, a conversion factor of 0.2 is assigned;

11.5.d.6.C.2. Where the cumulative area of wetlands which have been restored, developed, or enhanced is between one and five acres, a conversion factor of 0.6 is assigned; and

11.5.d.6.C.3. Where the cumulative area of wetlands which have been restored, developed, or enhanced is greater than five acres, a conversion factor of 1.0 is assigned.

11.5.e. Coal Preparation Plants. Table 3 displays the criteria, sub-criteria, and conversion factors for the category of coal preparation plants (which excludes coal-loading facilities) to be applied as follows:

11.5.e.1. The criteria of size is assigned a maximum criteria value of 1600, subject to the following sub-criteria constants:

11.5.e.1.A. The capacity of the specific plant in tons per hour of coal which the plant is designed to process is assigned a sub-criteria constant of 1000, subject to the following conversion factors:

11.5.e.1.A.1. Where the coal processing plant is designed to process less than 200 tons of raw coal per hour, a conversion factor of 0.2 is assigned;

11.5.e.1.A.2. Where the coal processing plant is designed to process between 200 and 750 tons of raw coal per hour, a conversion factor of 0.6 is assigned; and

11.5.e.1.A.3. Where the coal preparation plant is designed to process over 750 tons of raw coal per hour, a conversion factor of 1.0 is assigned.

11.5.e.1.B. The cumulative storage capacity of all proposed or existing coal storage silos is assigned a sub-criteria constant of 400, subject to the following conversion factors:

11.5.e.1.B.1. Where the silos are designed to store less than 2,500 tons of coal, a conversion factor of 0.2 is assigned;

11.5.e.1.B.2. Where the silos are designed to store between 2,500 and 5,000 tons of coal, a conversion factor of 0.6 is assigned; and

11.5.e.1.B.3. Where the proposed or existing silos are designed to store more than 5,000 tons of coal, a conversion factor of 1.0 is assigned.

11.5.e.1.C. The size in acres of the coal stockpile loading and operating area of the facility is assigned a sub-criteria constant of 200, subject to the following conversion factors:

11.5.e.1.C.1. Where the coal stockpile and operating area of the facility is less than five acres, a conversion factor of 0.2 is assigned;

11.5.e.1.C.2. Where the coal stockpile and operating area of the facility is

between five acres and ten acres, a conversion factor of 0.6 is assigned; and

11.5.e.1.C.3. Where the coal stockpile and operating area of the facility is greater than ten acres, a conversion factor of 1.0 is assigned.

11.5.e.2. The proposed construction of a coal refuse disposal site in conjunction with a coal preparation plant, or the use of an existing coal refuse disposal site is assigned a maximum criteria value of 1000, subject to the following sub-criteria constants:

11.5.e.2.A. The capacity of a coal refuse disposal site to impound water or slurry is assigned a sub-criteria constant of 800, subject to the following conversion factors:

11.5.e.2.A.1. Where the impounding capacity of the coal refuse disposal site is less than twenty acre/feet, a conversion factor of 0.2 is assigned;

11.5.e.2.A.2. Where the impounding capacity of the coal refuse disposal site is between twenty and fifty acre/feet, a conversion factor of 0.6 is assigned; and

11.5.e.2.A.3. Where the impounding capacity of the coal refuse disposal facility is greater than fifty acre/feet, a conversion factor of 1.0 is assigned.

11.5.e.2.B. A non-impounding coal refuse disposal site is assigned a sub-criteria constant of 200 based on its size in acres and subject to the following conversion factors:

11.5.e.2.B.1. Where a non-impounding coal refuse disposal site is less than ten acres in size, a conversion factor of 0.2 is assigned;

11.5.e.2.B.2. Where a non-impounding coal refuse disposal site is between ten and twenty acres, a conversion factor of 0.6 is assigned; and

11.5.e.2.B.3. Where a non-impounding coal refuse disposal site is greater than twenty acres in size, a conversion factor of 1.0 is assigned.

11.5.e.3. The reclamation plan for the coal preparation plant is assigned a maximum criteria value of 1200, subject to the following criteria constants:

11.5.e.3.A. The total disturbed area upon which the coal preparation plant and all ancillary facilities included in the permit is located and operated is assigned a sub-criteria constant of 800, subject to the following conversion factors:

11.5.e.3.A.1. Where the total disturbed area is less than twenty acres, a conversion factor of 0.2 is assigned;

11.5.e.3.A.2. Where the total disturbed area is between twenty and fifty acres, a conversion factor of 0.6 is assigned; and

11.5.e.3.A.3. Where the total disturbed area is greater than fifty acres, a conversion factor of 1.0 is assigned.

11.5.e.3.B. For the length of time in which the coal preparation plant is projected to be in operation a sub-criteria constant of 400 is assigned, subject to the following conversion factors:

11.5.e.3.B.1. Where the length of duration for the plant is less than five years, a conversion factor of 0.2 is assigned;

11.5.e.3.B.2. Where the length of duration of the plant is between five and ten years, a conversion factor of 0.6 is assigned; and,

11.5.e.3.B.3. Where the length of duration of the plant is greater than ten years, a conversion factor of 1.0 is assigned.

11.5.e.4. The history of performance of the applicant in terms of level of performance of mining and reclamation activities

in accordance with State law is assigned a maximum criteria value of 1200, subject to the following sub-criteria constants:

11.5.e.4.A. The violation history in West Virginia of the applicant based on the average number of cessation orders and/or notices of violations with a seriousness rating of greater than 4, and any cessation orders for all active permits is assigned a sub-criteria constant of 800 subject to the following conversion factors: provided, That the violation history period includes only the last full calendar year prior to the date an SMA is issued: provided, however, That where the applicant has no record of performance in the state, a conversion factor of 1.0 is assigned:

11.5.e.4.A.1. When the average number of notices of violation and cessation orders per active permit is less than 3, a conversion factor of 0.2 is assigned;

11.5.e.4.A.2. When the average number of notices of violation and cessation orders per active permit is between three and five, a conversion factor of 0.6 is assigned; and

11.5.e.4.A.3. When the average number of notices of violation and cessation orders per active permit of greater than five, a conversion factor of 1.0 is assigned.

11.5.e.4.B. The status of all active permits held by the applicant in West Virginia based on compliance with the law and this rule and compliance with the reclamation plan for these permits during the terms of the public notice for the proposed application is assigned a sub-criteria constant of 400, subject to the following conversion factors; provided, That when the applicant holds no permits in the state, a conversion factor of 1.0 is assigned:

11.5.e.4.B.1. A status of full compliance (no notices of violation are issued) with the laws, this rule, and the reclamation plan, and one hundred percent (100%) contemporaneous reclamation is assigned a conversion factor of 0.2;

11.5.e.4.B.2. A status of compliance (no negligence on the part of the operator in abatement action on outstanding notices of violation) and ninety percent (90%) contemporaneous reclamation exists, a conversion factor of 0.6 is assigned; and

11.5.e.4.B.3. A status of basic compliance with the law and this rule, (negligence on the part of the operator in abatement action for notices of violation) and seventy percent (70%) contemporaneous reclamation exists, a conversion factor of 1.0 is assigned.

11.5.e.5. Where the applicant has demonstrated success in conducting mining and reclamation operations in such a manner that environmental resources have been extraordinarily enhanced, a bond reduction credit expressed as a negative criteria value of no greater than -1000 is assigned subject to the following sub-criteria constants:

11.5.e.5.A. Where the applicant has received recognition for excellence in reclamation through local and/or national awards, from awards programs sanctioned by any regulatory authority as defined in Public Law 95-87, a sub-criteria constant of -600 is assigned:

11.5.e.5.A.1. Where the applicant has received one local award but no national awards, a conversion factor of 0.2 is assigned;

11.5.e.5.A.2. Where the applicant has received one or more local awards but no national awards, a conversion factor of 0.6 is assigned; and

11.5.e.5.A.3. Where the applicant has received one or more local and/or national awards, a conversion factor of 1.0 is assigned.

11.5.e.5.B. Where the applicant has demonstrated a history of

restoration, development, or enhancement of wetlands, a sub-criteria constant of -400 is assigned, subject to the following conversion factors:

11.5.e.5.B.1. Where the total cumulative area of wetlands which have been restored, developed, or enhanced is one acre or less, a conversion factor of 0.2 is assigned;

11.5.e.5.B.2. Where the total cumulative area of wetlands which have been restored, developed, or enhanced is between one and five acres, a conversion factor of 0.6 is assigned; and

11.5.e.5.B.3. Where the total cumulative area of wetlands which have been restored, developed, or enhanced is greater than five, a conversion factor of 1.0 is assigned.

11.5.f. Coal Refuse Disposal Sites. Table 4 displays the criteria, sub-criteria and conversion factors for the category of coal refuse disposal sites to be applied as follows:

11.5.f.1. The size of coal refuse disposal sites in terms of volumes of material and impounding capacity is assigned a maximum criteria value of 1200, subject to the following sub-criteria constants:

11.5.f.1.A. The capacity of the coal refuse disposal site to impound water is assigned a sub-criteria constant of 1200 subject to the following conversion factors:

11.5.f.1.A.1. Where the impounding capacity of the coal refuse disposal site is less than fifty acre/feet, a conversion factor of 0.2 is assigned;

11.5.f.1.A.2. Where the impounding capacity of the coal refuse disposal site is between fifty acre/feet and one hundred acre/feet, a conversion factor of 0.6 is assigned; and

11.5.f.1.A.3. Where the impounding capacity of the coal refuse disposal site is greater than one hundred acre/feet, a conversion factor of 1.0 is assigned.

11.5.f.1.B. The total permitted size in acres of a non-impounding coal refuse disposal site is assigned a sub-criteria constant of 1000, subject to the following conversion factors:

11.5.f.1.B.1. Where the size of the proposed coal refuse disposal site is twenty acres or less, a conversion factor of 0.2 is assigned;

11.5.f.1.B.2. Where the total permitted size of the coal refuse disposal site is between twenty and fifty acres, a conversion factor of 0.6 is assigned; and

11.5.f.1.B.3. Where the size of the proposed coal refuse disposal site is greater than fifty acres, a conversion factor of 1.0 is assigned.

11.5.f.2. The topography, geology, and water quality considerations of an impounding or non-impounding coal refuse disposal site is assigned a maximum criteria value of 1800, subject to the following sub-criteria constants:

11.5.f.2.A. The average slope of the area upon which the coal refuse disposal site is located is assigned a sub-criteria constant of 1000, subject to the following conversion factors. Where the site is located in a valley, the determining slope measurements will be taken from below the projected toe of the site to above the projected finished level:

11.5.f.2.A.1. Where the average slope of the area on which the coal refuse disposal site is located is less than seven percent (7%), a conversion factor of 0.2 is assigned;

11.5.f.2.A.2. Where the average slope of the area on which the coal refuse disposal site is located is between seven and ten percent (7% and 10%), a conversion factor of 0.6 is assigned; and

11.5.f.2.A.3. Where the

average slope of the area on which the coal refuse disposal site is located is greater than ten percent (10%), a conversion factor of 1.0 is assigned.

11.5.f.2.B. The acid/base accounting value of the coal refuse is assigned a sub-criteria constant of 800, subject to the following conversion factors:

11.5.f.2.B.1. Where the acid/base accounting analysis indicates a net excess of greater than twenty tons of calcium carbonate per thousand tons of material, a conversion factor of 0.2 is assigned;

11.5.f.2.B.2. Where the acid/base accounting analysis indicates a net excess of between ten and twenty tons of calcium carbonate equivalents per thousand tons of material, a conversion factor of 0.6 is assigned; and

11.5.f.2.B.3. Where the acid/base accounting analysis indicates less than ten tons net excess of calcium carbonate equivalents per thousand tons of material or a net calcium carbonate deficiency, a conversion factor of 1.0 is assigned.

11.5.f.3. The reclamation plan for the proposed coal refuse disposal site is assigned a maximum criteria value of 1000, subject to the following sub-criteria constants:

11.5.f.3.A. The requirements for and the availability of topsoil to cover the coal refuse disposal site for the purposes of establishing vegetation is assigned a sub-criteria constant of 600, subject to the following conversion factors:

11.5.f.3.A.1. Where the coal refuse disposal site requires topsoiling and the topsoil or topsoil substitute material is available on site, a conversion factor of 0.2 is assigned;

11.5.f.3.A.2. Where the coal refuse disposal site requires topsoiling and the topsoil or topsoil substitute material must be transported from adjacent off-site areas, a conversion factor of 0.6 is assigned; and

11.5.f.3.A.3. Where the coal refuse disposal site can be direct seeded, a conversion factor of 1.0 is assigned.

11.5.f.3.B. The projected life of the coal refuse disposal site in terms of years of operation is assigned a sub-criteria constant of 400, subject to the following conversion factors:

11.5.f.3.B.1. Where the projected life of the coal refuse disposal site is less than five years, a conversion factor of 0.2 is assigned;

11.5.f.3.B.2. Where the projected life of the coal refuse disposal site is between five and twenty years, a conversion factor of 0.6 is assigned; and

11.5.f.3.B.3. Where the projected life of the coal refuse disposal site is greater than twenty years, a conversion factor of 1.0 is assigned.

11.5.f.4. The historical performance of the operating company in terms of level of performance of mining and reclamation activities in accordance with state law is assigned a maximum criteria value of 1000, subject to the following sub-criteria constants:

11.5.f.4.A. The violation history in West Virginia of the applicant based on the average number of notices of violation with a seriousness rating of greater than 4, and any cessation order for all active permits, is assigned a sub-criteria constant of 600, subject to the following conversion factors: provided, That the violation history period includes only the last full calendar year prior to the date an SMA is assigned; provided, however, That when the applicant has no record performance in the state, a conversion factor of 1.0 is assigned:

11.5.f.4.A.1. Where the average number of notices of violation and cessation orders per active permit is less than 3, a

conversion factor of 0.2 is assigned;

11.5.f.4.A.2. Where the average number of notices of violation and cessation orders per active permit is between 3 and 5, a conversion factor of 0.6 is assigned; and

11.5.f.4.A.3. Where the average number of notices of violation and cessation orders per active permit is greater than 5, a conversion factor of 1.0 is assigned.

11.5.f.4.B. The status of all active permits held by the applicant in West Virginia, based on compliance with the law and this rule, and compliance with the permits reclamation plan during the public notice period for the subject proposed application is assigned a sub-criteria constant of 400, subject to the following conversion factors; provided, however, That where the applicant holds no permits in the state, a conversion factor of 1.0 is assigned:

11.5.f.4.B.1. Where a status of full compliance (no notices of violations were issued) with the law, this rule, and the reclamation plan and one hundred percent (100%) contemporaneous reclamation exists, a conversion factor of 0.2 is assigned;

11.5.f.4.B.2. Where a status of compliance exists with the law and this rule (no negligence on the part of the operator in abatement action on notices of violation) and ninety percent (90%) concurrent reclamation, a conversion factor of 0.6 is assigned; and

11.5.f.4.B.3. Where a status of basic compliance exits with the law and this rule, (negligence on the part of the operator in abatement action for notices of violation) and seventy percent (70%) concurrent reclamation, a conversion factor of 1.0 is assigned.

11.5.f.5. Where the applicant has demonstrated success in conducting mining and reclamation operations in such a manner that environmental resources have been extraordinarily enhanced, a bond reduction credit, expressed as a negative criteria value, of no greater than -500 is assigned, subject to the following sub-criteria constants:

11.5.f.5.A. Where the applicant has received recognition for excellence in reclamation through local and/or national awards, from awards programs sanctioned by any regulatory authority as defined in Public Law 95-87, a sub-criteria constant of -300 is assigned, subject to the following conversion factors:

11.5.f.5.A.1. Where the applicant has received one local award, but no national awards, a conversion factor of 0.2 is assigned;

11.5.f.5.A.2. Where the applicant has received more than one local award, but no national awards, a conversion factor of 0.6 is assigned; and

11.5.f.5.A.3. Where the applicant has received both local and national awards, a conversion factor of 1.0 is assigned.

11.5.f.5.B. Where the applicant has demonstrated a history of restoration, development, or enhancement, a sub-criteria constant of -200 is assigned, subject to the following conversion factors:

11.5.f.5.B.1. Where the cumulative area of wetlands which have been restored, developed, or enhanced is less than one acre, a conversion factor of 0.2 is assigned;

11.5.f.5.B.2. There the cumulative area of wetlands which have been restored, developed, or enhanced is between one and five acres, a conversion factor of 0.6 is assigned; and

11.5.f.5.B.3. Where the cumulative area of wetlands which have been restored, developed, or enhanced is greater than five acres, a conversion factor of 1.0 is assigned11.5.g. When the applicant believes that the per-acre amount of the bond derived pursuant to this subsection is inappropriate, the calculated amount of the bond may be rebutted as follows:

11.5.g.1. The applicant shall set forth in writing the reasons why it is believed that the bond amount is inappropriate to include a statement as to the amount which is believed to be appropriate.

11.5.g.2. Upon receipt of the written rebuttal the Secretary shall within fifteen (15) days hold an informal conference with the applicant to hear arguments as to the rebutted bond amount.

11.5.g.3. The Secretary shall issue a written decision within five (5) days following the informal conference setting forth a final bond amount.

11.5.g.4. The applicant may file an appeal of the Secretary's decision in accordance with W. Va. Code §22-5-21.

11.6. Environmental Security Account for Water Quality. The Secretary shall initiate and complete, within no more than two hundred forty days, a study of the desirability of establishing an environmental security account for water quality. In performing the study, the Secretary shall make provisions for public input.

The study shall address the desirability of establishing an environmental security account for water quality to include whether or not such account should be required or elective. The study shall include the following:

11.6.a. A screening process which will assist the Secretary and the applicant in conducting an environmental audit of a proposed mining operation in areas of the State which may have a potential for producing acid mine drainage.

11.6.b. A process for predicting whether acid mine drainage will be produced from the proposed operation and if so, its rate and duration.

11.6.c. A method estimating the cost of installing, operating, and maintaining a water treatment system for the treatment of acid mine drainage from the proposed operation.

11.6.d. A system to ensure that sufficient monies will be placed in an escrow account which will provide sufficient financial assurance that treatment of acid mine drainage will be accomplished and maintained as required by the Act and this rule. Default on the part of the operator shall be equivalent to a bond forfeiture and the operator shall be subject to all the enforcement sanctions and penalties as if a bond forfeiture had occurred.

11.6.e. In considering a system as provided in subdivision 11.7.d of this subsection, the Secretary shall establish procedures to expend the necessary funds from the escrow account in the event of default by the operator to comply with the Act and this rule.

11.6.f. Following completion of the study, the Secretary may propose, and after public comment, promulgate a rule in accordance with the procedures set forth in Chapter 29A of the Code to implement the environmental security account for water quality. This rule will not become effective until approved by the Legislature.

11.6.g. If statutory changes are necessary to fully implement an effective system for financial assurances, the Secretary shall so inform the Legislature, and shall stay promulgation of this rule until the Legislature has had an opportunity to consider the necessary statutory changes.

11.6.h. Nothing in this subsection shall authorize in any way the issuance of a permit in which acid mine drainage is anticipated, and which would violate applicable effluent limitations or water quality standards without treatment.

11.7. Selective Husbandry Practices. The Secretary may approve selective husbandry practices, excluding augmented seeding, fertilization or irrigation, without extending the period of bond liability if the permittee can demonstrate that discontinuance of such measures after the liability period expires will not reduce the

probability of permanent revegetation success.

Approved husbandry practices shall be limited to pest and vermin control, pruning and any reseeding and/or transplanting specifically necessitated by such actions, but shall be normal conservation practices within the region for unmined lands having land uses similar to the approved postmining land use of the area covered by the bond.

		0.2		0.6		1.0	
EXCESS SPOIL	**1000**						
Type of Fill	800	Existing Bench		Side Hill/Conventional		Single Lift	
Multiple Fills	200	Two or less		Two to Six		More Than Six	
MINING PLAN	**1000**						
Operation Type	500	Area Mining		Contour Strip		Mountaintop	
Multiple Seams	300	Two or less		Two to Four		More Than Four	
Augering	200	< 25% of Outcrop		> 25% & Conv. Auger		Highwall	
TOPO/GEO/WATER QUALITY	**800**						
Overburden Analysis	400	> 20 T $CaCO_3$/Thou T		10-20 T $CaCO_3$/Thou T		< 10 T $CaCO_3$/Thou T	
Slopes	200	Less Than 20%		20% To 40%		Over 40%	
Overburden Type	200	< 20% Sandstone		20% - 60% Sandstone		> 60% Sandstone	
RECLAMATION PLAN	**1200**						
Mining/Rec. Sequence	600	Specific Time/Dist.		Spec. T/D Open Acres		% Open Acres	
Permit Acreage	400	Less Than 200		200 To 500		More Than 500	
Equipment Spread	200	Loader/Dozer/Truck		Shovel/Dozer/Truck		Drag/Dozer/Truck	
OPERATOR PERFORMANCE	**1000**						
Violation History	600	Avg. <3 Viol/Permit		3 To 5 Viol/Permit		>5 Viol/Permit	
Status Existing Oper.	400	Full Comp. 100% Cur.		Comp. 90% Cur.		Basic Comp 70% Cur.	
ENVIRONMENTAL ENHAN.	**-1800**						
Remining	-800	W/O Highwall El.		Highwall Elim.		Highwall El/Wat Qual	
Reclamation Awards	-600	One Local		>1 Local		Local & National	
Wetlands	-400	<1 Acre		1 To 5 Acres		>5 Acres	
SUBTOTALS							

TABLE 1 SURFACE MINES TOTAL BOND AMOUNT $ _____ /ACRE

		0.2		0.6		1.0	
AVAILABILITY OF BACKFILL	**1200**						
Distance From Portals	600	< mile		¼ mile - ½ mile		> ½ mile	
Volume of Material	400	< 100 Thou. Cu Yd		100-250 Thou. Cu Yd		> 250 Thou. Cu Yd	
Relative To Outcrop	200	Above Outcrop		On The Outcrop		Below The Outcrop	
TOP/GEO/WATER QUALITY	**1200**						
Materials Analysis	600	> 20 T $CaCO_3$ /Thou T		10-20 T $CaCO_3$ /Thou T		< 10 T $CaCO_3$ /Thou T	
Slopes	400	< 20%		20% To 40%		> 40%	
Overburden Type	200	< 20% Sandstone		20%-60% Sandstone		> 60% Sandstone	
RECLAMATION PLAN	**1200**						
Permit Acreage	800	< 3 Acres		3 To 10 Acres		> 10 Acres	
Proj. Life of Mine	400	< 3 Years		3 To 10 Years		> 10 Years	
ANCILLARY FACILITIES	**800**						
Preparation Plant	400	< 200 Tons/Hr Cap.		200-500 Tons/Hr Cap.		> 500 Tons/Hr Cap.	
Coal Refuse Site	400	< 5 Acres		5 - 10 Acres		> 10 Acres	
OPERATOR PERFORMANCE	**600**						
Violation History	400	Avg. < 3 Viol/Permit		3 To 5 Viol/Permit		Avg. > 5 Viol/Permit	
Status Existing Oper.	200	Full Compliance		Compl. 90% Current		Basic Comp. 75% Cur.	
ENVIRONMENTAL ENHAN.	**-1000**						
Gratuitous Rec	-600	< 1 Acre		1 - 5 Acres		> 5 Acres	
Reclamation Awards	-400	One Local		>1 Local		Local & National	
Wetlands	-200	<1 Acre		1 To 5 Acres		>5 Acres	
SUBTOTALS							

TABLE 2 UNDER GROUND MINES _____ /ACRE

		0.2		0.6		1.0	
SIZE	**1600**						
Capacity Tons/Hour	1000	< 200		200 - 750		> 750	
Silo Capacity	400	< 2500 Tons		2500 - 5000 Tons		> 5000 Tons	
Stockpile Acreage	200	< 5 Acres		5 - 10 Acres		> 10 Acres	
REFUSE SITE	**1000**						
Impounding	800	< 20 Acre/Feet		20-50 Acre/Feet		> 50 Acre/Feet	
Non-Impounding	200	< 10 Acres		10 - 20 Acres		> 20 Acres	
RECLAMATION PLAN	**1200**						
Permit Acreage	800	< 20 Acres		20 - 50 Acres		> 50 Acres	
Duration	400	< 5 Years		5 To 10 Years		> 10 Years	
OPERATOR PERFORMANCE	**1200**						
Violation History	800	Avg. < 3 Viol/Permit		3 To 5 Viol/Permit		Avg. > 5 Viol/Permit	
Status Existing Oper.	400	Full Compliance		Compl. 90% Current		Basic Comp. 75% Cur.	
ENVIRONMENTAL ENHAN.	**-1000**						
Reclamation Awards	-600	One Local		>1 Local		Local & National	
Wetlands	-400	<1 Acre		1 To 5 Acres		>5 Acres	
SUBTOTALS							

TABLE 3 COAL PREPARATION PLANTS TOTAL BOND AMOUNT $ _____ /ACRE

		0.2		0.6		1.0	
SIZE	**1200**						
Impounding	1200	< 50 Acre/Feet		50 - 100 Acre/Feet		> 100 Acre/Feet	
Non-Impounding	1000	< 20 Acres		20 - 50 Acres		> 50 Acres	
TOPO/GEO/WATER QUALITY	**1800**						
Slopes	1000	< 7 %		7% - 10 %		> 10 %	
Materials Analysis	800	> 20 T $CaCO_3$ /Thou T		10-20 T $CaCO_3$ /Thou T		< 10 T $CaCO_3$ /Thou T	
RECLAMATION PLAN	**10002**						
Topsoil	600	On Site Material		Off Site Material		Direct Seeding	
Projected Life	400	< 5 Years		5 To 20 Years		> 20 Years	
OPERATOR PERFORMANCE	**1000**						
Violation History	600	Avg. < 3 Viol/Permit		3 To 5 Viol/Permit		Avg. > 5 Viol/Permit	
Status Existing Oper.	400	Full Compliance		Compl. 90% Current		Basic Comp. 75% Cur.	
ENVIRONMENTAL ENHAN.	**-500**						
Reclamation Awards	-300	One Local		>1 Local		Local & National	
Wetlands	-200	<1 Acre		1 To 5 Acres		>5 Acres	
SUBTOTALS							

TABLE 4 COAL REFUSE SITES TOTAL BOND AMOUNT $ _____ /ACRE

§38-2-12. Replacement, Release, and Forfeiture of Bonds.

12.1. Replacement of Bonds.

12.1.a. The Secretary may approve the replacement of existing bonds with other equivalent bonds.

12.1.b. Existing bonds shall not be released until the permittee has submitted, and the Secretary has approved, acceptable replacement bonds. Replacement of a bond pursuant to this section shall not constitute a release of bond.

12.2. Requirement to Release Bonds.

12.2.a. In addition to the requirements of section 23 of the Act, the following bond release procedures shall be observed:

12.2.a.1. The permittee may file an application with the Secretary for the release of all or part of a bond. Applications may be filed only at times or during seasons established by the Secretary which allow proper evaluation of the completed reclamation operations.

12.2.a.2. A certification of publication of the advertisement shall be made a part of any bond release application file. In addition to the requirement of section 23 of the Act, the advertisement shall indicate the name of the permittee, the type of bond filed, the address of the nearest regional office of the Department of Environmental Protection to which written comments or requests for public hearings and informal conferences on the specific bond release may be submitted, and the closing date for receipt of comments or requests. In addition, as part of any bond release application, the applicant shall submit copies of letters which have been sent to adjoining property owners, local governmental bodies, planning agencies, sewage and water treatment authorities, and water companies in the locality in which the surface coal mining and reclamation operation took place, notifying them of the intention to seek release from the bond.

12.2.b. Inspection by the Secretary.

12.2.b.1. Upon receipt of the bond release application, the Secretary shall, within thirty (30) days, or as soon thereafter as weather conditions permit, conduct an inspection and evaluation of the reclamation work involved. The surface owner, agent, or lessee shall be given notice of such inspection and may participate in making the bond release inspection.

12.2.b.2. Within sixty (60) days from the filing of the bond release application, if no public hearing is held, or within thirty (30) days after a public hearing or informal conference has been held, the Secretary shall notify in writing the permittee, the surety or other persons with an interest in bond collateral who have requested notification, and the persons who either filed objections in writing or objectors who were a party to the hearing proceedings, if any, of his decision to release or not to release all or part of the bond.

12.2.c. Except as provided in subdivisions 12.2.d and 12.2.e of this subsection, the Secretary may release all or part of the bond for the permit or increment thereof in accordance with the following schedule if no violations exist relative to the permitted site, and if the requirements of this subsection are met.

12.2.c.1. After the operator completes the backfilling, regrading (which may include the replacement of topsoil) and drainage control of a bonded area in accordance with the Act, this rule, and the terms and conditions of the permit to include the provisions of subsection 14.5 of this rule, Phase I reclamation shall be considered complete, and sixty (60) percent of the bond or collateral for the applicable area may be released

12.2.c.2. After revegetation has been established on the regraded mined lands in accordance with the approved reclamation plan, Phase II reclamation shall be considered complete and an additional twenty-five (25) percent of the original bond amount may be released, provided that:

12.2.c.2.A. Not less than two

years after the last augmented seeding, standards for revegetation success have been met.

12.2.c.2.B. The lands are not contributing suspended solids to stream flow or runoff outside the permit area in excess of the requirements of the Act, this rule, and the terms and conditions of the NPDES permit.

12.2.c.2.C. With respect to prime farmland, soil productivity has been returned to the level of yield as required by the Act, this rule, and the terms and conditions of the permit.

12.2.c.2.D. The provisions of a plan approved by the Secretary for the sound future management of any permanent impoundment by the permittee or landowner have been implemented.

12.2.c.2.E. The amount of the remaining bond shall be sufficient to cover the estimated cost of reestablishing vegetation and maintaining permanent drainage control structures.

12.2.c.3. Upon successful completion of the reclamation requirements of the Act, this rule, and the terms and conditions of the permit, Phase III reclamation shall be considered completed and the Secretary may release the remaining bond(s).

12.2.d. Notwithstanding any other provisions of the Act and this subsection, the Secretary may not release any portion of the bond posted in accordance with subsection 11.5 of this rule until all coal extraction operations for the permit or increment thereof are completed and the entire disturbed area for the permit or increment thereof has been completely backfilled and regraded.

12.2.e. Notwithstanding any other provisions of this rule, no bond release or reduction will be granted if, at the time, water discharged from or affected by the operation requires chemical or passive treatment in order to comply with applicable effluent limitations or water quality standards. Measures approved in the permit and taken during mining and reclamation to prevent the formation of acid drainage shall not be considered passive treatment; Provided, That the Secretary may approve a request for Phase I but not Phase II or III, release if the applicant demonstrates to the satisfaction of the Secretary that either:

12.2.e.1. The remaining bond is adequate to assure long term treatment of the drainage; or

12.2.e.2. The operator has irrevocably committed other financial resources which are adequate to assure long term treatment of the drainage; Provided, That the alternate financial resources must be in acceptable form, and meet the standards set forth in section 11 of the Act and section 11 of this rule; Provided, however, That the alternate financial arrangements shall provide a mechanism whereby the Secretary can assume management of the resources and treatment work in the event that the operator defaults for any reason; And provided further, That default on a treatment obligation under this paragraph shall be considered equivalent to a bond forfeiture, and the operator will be subject to penalties and sanctions, including permit blocking, as if a bond forfeiture had occurred.

In order to make such demonstration as referenced above, the applicant shall address, at a minimum, the current and projected quantity and quality of drainage to be treated, the anticipated duration of treatment, the estimated capital and operating cost of the treatment facility, and the calculations which demonstrate the adequacy of the remaining bond or of the alternate financial resources.

12.2.f. If the Secretary disapproves the application for release of the bond or portion thereof, he shall notify the permittee, the surety, and any person with an interest in collateral, in writing, stating the reasons for disapproval and recommending corrective actions necessary to secure the release and allowing an opportunity for a public hearing.

12.2.g. Any person with a valid legal interest which might be adversely affected by

release of the bond, or the responsible officer or head of any Federal, State, or local governmental agency which has jurisdiction by law or special expertise with respect to any environmental, social, or economic impact involved in the operation or which is authorized to develop and enforce environmental standards with respect to such operations, shall have the right to file written objections to the proposed release of bond with the Commission within thirty (30) days after the last publication of the notice required by paragraph 12.2.a.2, of this subdivision. If written objections are filed and a hearing is requested, the Secretary shall inform all the interested parties of the time and place of the hearing, and shall hold a public hearing, or informal conference, within thirty (30) days after receipt of the request for the hearing. The date, time, and location of the public hearing, or informal conference, shall be advertised by the Secretary in a newspaper of general circulation in the locality for two (2) consecutive weeks. The public hearing, or informal conference, shall be held in the locality of the surface coal mining operation from which bond release is sought.

12.2.h. Without prejudice to the right of an objector or the applicant, and when all parties agree, the Secretary may hold an informal conference in lieu of a public hearing to resolve such written objections. Unless waived by all parties, the Secretary shall make a record of the informal conference which shall be accessible to all parties. The Secretary shall also furnish all parties of the informal conference with written findings based on the informal conference, and the reasons for said findings.

12.3. Bond Adjustments.

12.3.a. Where the permittee demonstrates, on the basis of a sworn statement and a progress map, that a portion of the permit area will remain undisturbed or has been overbonded in accordance with subdivision 3.29.a of this rule, the Secretary may adjust the amount of the bond corresponding to the number of undisturbed or overbonded acres, provided that a minimum of $10,000.00 bond remains for the disturbed portion of the permit. Prior to a decision on the request for bond adjustment, the Secretary shall notify the surety, and any person with a property interest in collateral who has requested notification, of receipt of the request for adjustment to the bond amount. Within thirty (30) days, the Secretary shall make a decision on the request. If the request is denied, the Secretary shall provide the permittee with an opportunity for an informal conference on the decision.

12.3.b. Upon receipt of a permit revision, the Secretary may review the bond adequacy and if necessary may require an increase in the amount of the bond.

12.3.c. The provisions of this subsection are not subject to the provisions of subsection 12.2.

12.4. Forfeiture of Bonds.

12.4.a. If an operator refuses or is unable to conduct reclamation of an unabated violation, if the terms of the permit are not met, or if the operator defaults on the conditions under which the bond was accepted, the Secretary shall take the following action to forfeit all of the bond:

12.4.a.1. Send written notification by certified mail, return receipt requested, to the permittee and the surety on the bond, if any, informing them of the decision to forfeit the bond, including the reasons for the forfeiture and the amount to be forfeited. Bond liability shall extend to the entire permit area.

12.4.a.2. Advise the permittee and surety, if applicable, of the conditions under which forfeiture may be avoided. Such conditions may include, but are not limited to:

12.4.a.2.A. Agreement by the permittee or another party to perform reclamation operations in accordance with a compliance schedule which meets the conditions of the permit, the reclamation plan, and the regulatory program and a demonstration that such party has the ability to satisfy the conditions; or

12.4.a.2.B. The Secretary may allow a surety to complete the reclamation plan, or

the portion of the reclamation plan applicable to the bonded phase or increment, if the surety demonstrates the ability to complete the reclamation in accordance with the approved reclamation plan. No surety liability shall be released until successful completion of all reclamation under the terms of the permit and in accordance with the Act and this rule to include the revegetation liability period.

12.4.b. In the event forfeiture of the bond is required by this section, the Secretary shall proceed to collect the forfeiture amount as provided for in subsection b, section 17 of the Act. Where the bond is forfeited, the proceeds shall be used by the Secretary to accomplish completion of reclamation including the requirements of section 23 of the Act, this subsection, and subsection 12.5 of this rule governing water quality.

12.4.c. After the notice of forfeiture has been served, the Secretary shall in a timely manner, but not later than one hundred eighty (180) days after such notice, initiate reclamation operations to reclaim the site in accordance with the approved reclamation plan or modification thereof, including action to remediate any acid mine drainage from the site. The Secretary shall take the most effective actions possible to remediate acid mine drainage, including chemical treatment where appropriate, with the resources available.

12.4.d. Where the proceeds of bond forfeiture are less than the actual cost of reclamation, the Secretary shall make expenditures from the special reclamation fund to complete reclamation. The Secretary shall take the most effective actions possible to remediate acid mine drainage, including chemical treatment where appropriate, with the resources available.

12.4.e. The operator or permittee shall be liable for all costs in excess of the amount forfeited. The Secretary may commence civil, criminal or other appropriate action to collect such costs.

12.5. Water Quality Enhancement.

12.5.a. In accordance with subsection g., section 11 of the Act, the Secretary shall establish an inventory of all sites where bonds have been forfeited. Such inventory shall include data relating to the quality and quantity of water being discharged from the forfeited sites.

12.5.b. The Secretary shall establish a priority listing of such sites based upon the severity of the discharges, the quality of the receiving stream, effects on downstream water users, and other factors determined to affect the priority ranking.

12.5.c. Until the Legislature implements necessary adjustments or supplements to the special reclamation fund as set forth in subdivision 12.5.e of this subsection, the Secretary shall select from the priority listing such sites for the application of amelioration techniques to achieve water quality enhancement and to minimize long-term disturbance to the hydrologic balance.

12.5.d. In selecting such sites for water quality improvement projects, the Secretary shall determine the appropriate treatment techniques to be applied to the site. The selection process shall take into consideration the relative benefits and costs of the projects.

12.5.e. On or before the thirty-first day of December, two thousand and two and every year thereafter, the Secretary shall submit to the Legislature a detailed report and inventory, which includes but is not limited to dates of mining and abandonment, with all supporting data on acid mine drainage bond forfeiture sites. Acid mine drainage bond forfeiture sites means all surface coal mining operations which have had their reclamation bonds forfeited, which were not bonded but have been abandoned after the third day of August, one thousand nine hundred and seventy-seven, or which have a significant likelihood of bond forfeiture which are producing mine drainage which violates effluent limitations or applicable water quality standards. The report and inventory shall contain cost estimates of the long-term chemical treatment of drainage from each site to meet various standards to include all effluent limitations and applicable water quality

standards.

The report and inventory shall contain proposals for supplementing and adjusting the special reclamation fund to assure that the fund is adequate to pay for the long-term treatment of acid mine drainage from all acid mine drainage bond forfeiture sites so that the discharges from these sites meet the effluent limitations set forth at 40 CFR, part 434, of Federal Regulations for coal mining operations and applicable water quality standards. The report shall contain a recommendation from the Secretary on which proposal he believes will best insure that the acid mine drainage from bond forfeiture sites is effectively addressed.

§38-2-13. Requirements of a Notice of Intent to Prospect.

13.1. Notice of Intent to Prospect Without Land Disturbance. Where prospecting operations are proposed without surface disturbance and without appreciable impacts on land, air, water, or other environmental resources, the requirements of this section and the bonding requirements in section 7 of the Act may be waived by the Secretary subject to the following:

13.1.a. At least fifteen (15) days prior to commencement of any prospecting activities, the operator shall file with the Secretary a written notice of intent to prospect, which notice will include a description of the activities to be conducted and a USGS topographic map showing the area to be prospected.

13.1.b. The Secretary may approve the notice of intent subject to the findings required in subdivision 13.4.b of this section.

13.2. Notice of Intent to Prospect - two hundred fifty (250) tons or less. Any person who intends to commercially sell or use coal extracted pursuant to this subsection in any quantity for reasons other than test purposes shall first obtain a surface mining permit. In addition to the requirements of section 7 of the Act, all prospecting operations shall be subject to the requirements of this subsection.

13.2.a. Application. The Notice of Intent shall be filed in triplicate, in clasp-type binders, on forms prescribed by the Secretary, and shall contain the following information:

13.2.a.1. The name, street address or route number, and telephone number of the operator;

13.2.a.2. Indicate if the operator is a corporation, partnership, or individual;

13.2.a.3. The name, address, and telephone number of the person who will have responsibility for conducting prospecting;

13.2.a.4. The name and address of all owners of surface land and mineral rights;

13.2.a.5. The location of the operation (county, magisterial district and nearest post office);

13.2.a.6. The anticipated date of commencement and completion of operations;

13.2.a.7. Indicate whether or not the operator or any person, partnership, or corporation associated with the operator has on file, or has ever had on file, in the State of West Virginia a prospect permit and bond or an intent to prospect. If so, list all prospect permits and Notices of Intent to Prospect, together with an indication of their current reclamation status;

13.2.a.8. The operator's source of legal right to enter and conduct operations;

13.2.a.9. The notarized signature of a principal officer of the operator affixed to a statement declaring that the information contained in the Notice is true and correct to the best of his knowledge;

13.2.a.10. The name, address, and telephone number of the applicant's representative who will have on-site responsibility for conducting the operation;

13.2.a.11. A narrative description of the proposed operation including an estimated timetable for conducting and completing each phase of the operation to include reclamation;

13.2.a.12. A description of how the applicant will conduct prospecting operations so as to protect habitats of unique or unusually high value for fish, wildlife, and other related environmental values and critical habitats of threatened or endangered species identified pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.); and

13.2.a.13. A description of cultural or historical resources listed or known to be eligible for listing on the National Register of historic places and all known archaeological sites located within the proposed prospecting area.

13.2.b. Reclamation Plan. A reclamation plan which includes the following:

13.2.b.1. The method of prospecting;

13.2.b.2. The method for controlling runoff and sedimentation;

13.2.b.3. The method of regrading;

13.2.b.4. A plan for revegetation;

13.2.b.5. The method for sealing, casing or otherwise managing prospecting holes, bore holes, wells or other exposed underground openings created during the prospecting; and

13.2.b.6. The method of constructing and/or utilizing roads.

13.2.c. Maps. A map showing topographic features, streams, bodies of water, manmade structures, utility lines, etc. equivalent to that of a United States geological survey topographic quadrangle map (scale 1" = 2,000'). The following additional information shall also be shown:

13.2.c.1. The surface and mineral owners of the tract(s) and property lines within the area to be prospected, including occupied dwellings not otherwise shown on the map;

13.2.c.2. The quadrangle title with a north arrow;

13.2.c.3. Clearly indicate the name(s) of the receiving stream(s);

13.2.c.4. Show by proper markings the approximate location of the cropline(s) and name of the seam(s);

13.2.c.5. Show the area(s) to be disturbed and the approximate location of excavations, trenches, drill holes, proposed and existing roads, and list the number of disturbed acres and;

13.2.c.6. Show the location of critical habitats of any threatened or endangered species identified within the proposed prospecting area.

13.3. Notice of Intent to Prospect - Greater than two hundred fifty (250) Tons. Any person who intends to commercially sell or use coal extracted pursuant to this subsection in any quantity for reasons other than test purposes shall first obtain a surface mining permit. If prospecting will remove more than 250 tons of coal, the Notice of Intent to Prospect shall include, in addition to the requirements of subsection 13.2 of this section, the following:

13.3.a. The applicant shall prepare a narrative discussion of a feasibility study for the site, including the specific reasons for extraction of the amount of tonnage for which permission is requested. The narrative shall be of sufficient detail to enable the Secretary to make a determination that the proposed extraction and sale of the coal is incidental to testing of the coal to determine if it is of a mineable and merchandisable quality, so as to make it possible to conduct surface mining and reclamation operations on the site for which a permit application can be submitted at a later date. The narrative shall explain in detail why other means of prospecting/exploration, such as core drilling, involving extraction of less than 250 tons of coal,

are not adequate to determine the quality of the coal and the feasibility of future surface mining and reclamation operations on the site. Form, generic or general statements by the applicant of a need for quality testing of more than 250 tons shall not be adequate grounds for the Secretary's approval of removal of greater than 250 tons. The narrative shall contain at a minimum:

13.3.a.1. A demonstration that the amount of coal to be removed under the notice of intent to prospect application is not the total reserve of coal but is a random sampling of a larger reserve.

13.3.a.2. Demonstrates that the coal testing is necessary for the development of a surface coal mining and reclamation operation for which a surface coal mining operation permit application is to be submitted in the near future, and that the proposed commercial use or sale of coal extracted during prospecting operations is solely for the purpose of testing the coal.

13.3.a.3. A demonstration that the application is for prospecting and is not surface mining or an "early start-up" for a surface mining operation.

13.3.a.4. A statement that reclamation will be completed within three (3) months of initial disturbance of each site to be disturbed under the notice of intent to prospect.

13.3.a.5. A description of any endangered or threatened species identified within the prospecting area.

13.3.a.6. The location of cultural or historical resources listed or known to be eligible for listing on the National Register of historic places and all known archaeological sites located within the proposed prospecting area.

13.3.a.7. Any other information required by the Secretary regarding known or unknown historic or archaeological resources.

13.3.a.8. A narrative description of the methods and equipment to be used to conduct prospecting and reclamation.

13.3.b. The name of the company that will receive the tonnage for test burning or other testing purposes and further identify with specificity the precise tests that will be conducted on the coal and the location of the test site. Furthermore, the applicant shall state that the testing proposed in the application has already been agreed to by the applicant and the company that will receive the coal.

13.3.c. The intended end user and/or agent or broker shall provide a statement to be made a part of the application which will set forth the specific reasons for the test, including why the coal may be so different from the intended user's other coal supplies as to require testing; the amount of coal necessary for the test and why a lesser amount is not sufficient; and a description of the specific tests that will be conducted.

13.3.d. A map which contains all information required in subsection 13.1 of this section and which additionally shows the location of critical habitats of threatened or endangered species identified within the proposed prospecting area.

13.3.e. A copy of a legal notice to be published in a newspaper of general circulation in the county where prospecting will occur. The ad shall contain the following:

13.3.e.1. The name and business address of the operator;

13.3.e.2. The date the application was filed and the date of close of a public comment period which date shall not be less than fifteen (15) days after the date of publication;

13.3.e.3. The address of the office of the Department of Environmental Protection where any person whose interest is or may be adversely affected shall have the right to submit written comments;

13.3.e.4. A description of the general area where prospecting will occur;

13.3.e.5. A statement that an excess of two hundred fifty (250) tons of coal will be removed;

13.3.e.6. The purpose for removing more than two hundred fifty (250) tons; and

13.3.e.7. An estimate of the total tonnage to be removed.

13.4. Approval of Notice of Intent to Prospect - Greater than two hundred fifty (250) Tons.

13.4.a. The Secretary shall act upon an administratively complete application for a prospecting approval and any written comments within a reasonable period of time, but in no event shall action be taken prior to the close of the public comment period.

13.4.b. The Secretary shall approve a complete and accurate application for a prospecting approval filed in accordance with this section if he finds, in writing, that the applicant has demonstrated that the prospecting and reclamation operation described in the application will:

13.4.b.1. Be conducted in accordance with this section, and other applicable provisions of this rule, the Act, and the application;

13.4.b.2. Not jeopardize the continued existence of an endangered or threatened species listed pursuant to section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533) or result in the destruction or adverse modification of critical habitat of those species; and

13.4.b.3. Not adversely affect any cultural or historical resources listed on the National Register of Historic Places, pursuant to the National Historic Preservation Act, as amended (16 U.S.C. Sec. 470 et seq., 1976, Supp V), unless the proposed prospecting has been approved by both the Secretary and the agency with jurisdiction over such matters.

13.4.c. Terms of approval issued by the Secretary shall contain conditions necessary to ensure that the prospecting and reclamation operations will be conducted in compliance with this rule, the Act and the application.

13.4.d. The Secretary shall notify the applicant, the appropriate local government officials, and other commentors on the application, in writing, of his decision on the application. If the application is disapproved, the notice to the applicant shall include a statement of the reason for disapproval. Public notice of the decision on each application shall be posted by the Secretary at the nearest Department of Environmental Protection office in the vicinity of the proposed prospecting operations.

13.4.e. Any person having an interest which is or may be adversely affected by a decision of the Secretary pursuant to subdivision 13.4.d of this subsection shall have the opportunity for administrative and judicial review.

13.4.f. The Secretary shall not approve the extraction of more than 250 tons for any reason other than that the coal will be tested for quality and combustibility.

13.4.g. The Secretary shall monitor the operation of each and every prospecting approval granted for total compliance with the provisions of the Act, this rule, and the terms and conditions of the approval application.

13.4.h. The operator shall submit a sworn statement to the local surface mining reclamation inspector prior to the completion of coal removal which will verify that the coal was used for the purpose for which the notice of intent to prospect was originally granted.

13.4.i. If the Secretary determines that, or suspects on the basis of information made available to him that, a prospecting operation is not being conducted in the precise manner set forth in the notice of intent to prospect and/or the accompanying narrative, the Secretary shall take immediate steps to compel compliance or to establish that violations have occurred. Such steps

may include, but would not be limited to, checking weight tickets and the inspection of end-user records.

13.5. Performance Standards.

13.5.a. This subsection establishes minimum performance standards applicable to prospecting operations provided that upon an affirmative demonstration that drilling operations that do not substantially disturb the land and are to be conducted solely for establishing property values for purposes of taxation or highway construction purposes, such drilling shall be exempted from this section. The commercial sale or use of coal extracted under an approval pursuant to subsection 13.1 or 13.2 of this section except for test purposes as provided therein is prohibited.

13.5.b. Blasting. Blasting is prohibited on prospecting operations unless otherwise approved by the Secretary. Any blasting approved must be conducted in accordance with section 6 of this rule.

13.5.c. Drainage. All disturbances created by prospecting operations shall be conducted in such a manner as to prevent or control erosion, siltation, pollution of water, and to minimize disturbance to the prevailing hydrologic balance. Such operations shall be exempt from specific design and construction criteria for sediment control structures only if stabilization to control erosion is achieved through alternative measures. Any operation which will substantially disturb the natural land surface shall be required by the Secretary to install drainage control structures in accordance with section 5 of this rule.

13.5.d. All prospecting operations carried out in steep slope conditions shall be conducted in a manner consistent with the steep slope requirements provided for in subsection (d) of section 13 of the Act and subsection 14.8 of this rule.

13.5.e. The Secretary may limit prospecting operations from encroaching nearer than one hundred feet (100') of a perennial or intermittent stream, provided that roads or access ways may be located within one hundred feet (100') of an intermittent or perennial stream. Roads shall not be constructed up a stream bed or drainage channel or in close proximity to such channel so as to significantly alter the normal flow of water.

13.5.f. Each prospecting hole, borehole, well or other exposed underground opening created during prospecting shall be cased, sealed, or otherwise managed to prevent acid or toxic drainage from entering ground or surface water, or substantial degradation of ground water quality or quantity. All such holes or openings shall be sealed, plugged, or otherwise managed to insure the safety of people, livestock, fish and wildlife, machinery, etc., during prospecting. When no longer needed, such holes or openings shall be permanently closed.

13.5.g. All toxic or acid-forming materials encountered while prospecting shall be handled in accordance with the requirements of subsections 14.5 and 14.6 of this permit.

13.5.h. All facilities and equipment shall be removed from the prospecting area when they are no longer needed.

13.5.i. Topsoil shall be removed, stored and redistributed on disturbed areas as necessary to assure successful revegetation.

13.5.j. All areas disturbed during prospecting operations shall be regraded to approximate original contour within three months of initial disturbance unless reclamation has been waived pursuant to receipt of an appropriate surface mine application number (SMA); provided, that reclamation cannot be delayed more than one (1) year from receipt of a surface mine application number.

13.5.k. All disturbed areas must be revegetated in a manner consistent with section 9 of this permit.

13.5.l. The operation shall be conducted

so as to provide protection of endangered and threatened species and their critical habitats as determined by the Endangered Species Act of 1973 (16 U.S.C. 1531, et seq.) or habitats of unique or unusual high value for fish or wildlife.

13.6. Prospecting Roads.

13.6.a. Each prospecting road shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

13.6.a.1. Control or prevent erosion, siltation and the air pollution attendant to erosion, including road dust as well as dust occurring on other exposed surfaces, by measures such as vegetating, watering, using chemicals or other dust suppressants, or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices;

13.6.a.2. Control or prevent damage to fish, wildlife, or their habitat and related environmental values;

13.6.a.3. Control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area;

13.6.a.4. Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standards applicable to receiving waters;

13.6.a.5. Refrain from seriously altering the normal flow of water in streambeds or drainage channels;

13.6.a.6. Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress; and

13.6.a.7. Prevent the use of acid and toxic-forming substances in road surfacing.

13.6.b. To ensure environmental protection appropriate for their planned duration and use, including consideration of the type and size of equipment used, the design and construction or reconstruction of prospecting roads shall incorporate appropriate limits for grade, width, surface materials, surface drainage control, culvert placement, and culvert size, in accordance with current, prudent engineering practices, and any design criteria established by the Secretary.

13.6.c. No part of any prospecting road shall be located in the channel of an intermittent or perennial stream unless specifically approved by the Secretary in accordance with the applicable provisions of subdivision 4.2.b of this rule. Roads shall be located to minimize downstream sedimentation and flooding.

13.6.d. A prospecting road shall be maintained to meet the performance standards of this subsection and any additional criteria specified by the Secretary.

13.6.e. A prospecting road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.

13.6.f. Reclamation. A prospecting road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer need for prospecting operations. This reclamation shall include:

13.6.f.1. Closing the road to traffic;

13.6.f.2. Removing all bridges and culverts unless approved as part of the postmining land use;

13.6.f.3. Removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements;

13.6.f.4. Reshaping cut and fill slopes as

necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain;

13.6.f.5. Protecting the natural drainage patterns by installing dikes or cross drains as necessary to control surface runoff and erosion; and

13.6.f.6. Scarifying and ripping the roadbed; replacing topsoil or substitute material, and revegetating disturbed surfaces in accordance with section 9 and subsection 14.3 of this rule.

13.7. Expiration. A notice of intent to prospect shall be valid only for the time period indicated in the application, which period shall not exceed two (2) years. The Secretary may approve an extension of the time period upon a request by the operator subject to the reclamation requirements of paragraph (h), section 7 of the Act and this section.

13.8. Bond Release. The bond or other securities accompanying a notice of intent shall be released upon satisfactory regrading and establishment of a permanent vegetative cover. All applications for bond release shall be accompanied by a final map showing the total disturbed area of the prospecting operation.

13.9. Notice on Site. All operators conducting prospecting activities shall, while in the prospecting areas, have in their possession, a copy of the written approval of notice of intent for such activities issued by or submitted to the Secretary.

13.10. Public Records. All information submitted to the Department of Environmental Protection as a part of the notice of intent to prospect, as required in the Act and this section, shall be made available for public inspection and copying at the nearest Department of Environmental Protection office; provided, that information submitted to the Secretary pursuant to this subsection which contains trade secrets or privileged commercial or financial information which relates to the competitive rights of the person filing such information or other persons who may be affected, is certified information and shall not be available for public examination.

13.11. Lands Unsuitable Designation. Notwithstanding any other provision of this section, any person who proposes to conduct prospecting operations on lands which have been designated as unsuitable for surface mining pursuant to section 22 of the Act, shall prepare and file a notice of intent in accordance with subsection 13.3 of this section. Approval of the notice of intent shall be in accordance with subsection 13.4 of this section.

§38-2-14. Performance Standards.

In addition to the requirements of the Act, the following performance standards shall be applicable to both surface and underground mining operations.

14.1. Signs and Markers. Signs and markers as required in this subsection shall be erected and maintained throughout the life of the permit or term of the specified activities for which they are intended.

14.1.a. Permanent Monument. A permanent monument shall be posted at primary points of ingress and egress on the permit area from public roads and highways. The monument shall consist of a sign constructed of wood, metal or other suitable material measuring two feet by three feet (2' x 3') and mounted on a two-inch (2") diameter pipe driven three feet (3') into the ground with four feet (4') exposed. Any suitable substitute may be approved. The sign shall clearly indicate the company name, permit number, business address and telephone number.

14.1.b. Perimeter Marker. Prior to initial disturbance, suitable markers made of durable material shall be established to permanently mark the perimeter of the area under permit. The assigned permit number shall be affixed to the permanent perimeter marker. Other markers may be used to delineate the boundaries of the proposed permit area.

14.1.c. Buffer Zone Markers.

Appropriate markers will be established along a buffer zone. Markers shall consist of metal or wooden stakes or other suitable devices or methods.

14.1.d. Topsoil Markers. When topsoil or topsoil substitute material is segregated and stockpiled, the stockpiled material shall be marked. Markers shall remain in place until the materials are removed.

14.1.e. Blasting Signs. If blasting is necessary to conduct surface mining operations, the following signs and markers shall be required:

14.1.e.1. Warning signs shall be conspicuously displayed at all approaches to the blasting site, along haulageways and access roads to the mining operation and at all entrances to the permit area. The sign shall at a minimum be two feet by three feet (2' x 3') reading "WARNING! Explosives in Use" and explaining the blasting warning and the all clear signals and the marking of blasting areas and charged holes; and

14.1.e.2. Where blasting operations will be conducted within one hundred (100) feet of the outside right-of-way of a public road, signs reading "Blasting Area", shall be conspicuously placed along the perimeter of the blasting area.

14.2. Casing and sealing of holes and exposed underground openings.

14.2.a. General requirements. Each prospecting hole, other drillhole or borehole, shaft, well, or other exposed underground opening shall be cased, lined, sealed or otherwise managed as approved by the Secretary to prevent acid or other toxic drainage from entering ground and surface waters, to minimize disturbance to the prevailing hydrologic balance and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit and adjacent area. Each prospecting hole, drill hole or borehole well or opening that is uncovered or exposed by mining activities within the permit area shall be permanently closed, unless approved for water monitoring or otherwise managed in a manner approved by the Secretary. However, at the time of final release of bond, exploratory or monitoring wells must either be sealed in a safe and environmentally sound manner or with the prior approval of the Secretary, be transferred to another party for further use. The conditions of the transfer shall comply with State and local laws, regulations, and other requirements.

14.2.b. Temporary seals:

14.2.b.1. Each mine entry which is temporarily inactive, but has a further projected useful service under the approved permit, shall be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices shall be periodically inspected and maintained in good operating condition by the person who conducts the underground mining activities.

14.2.b.2. Each prospecting hole, other drill hole or borehole, shaft, well, and other exposed underground opening which has been identified in the approved permit for use to return underground development waste, coal processing waste or water to underground workings, or to be used to monitor ground water conditions, shall be temporarily sealed until actual use and protected during use by fences, barricades, or other protective devices.

14.2.c. Permanent seals. When no longer needed for monitoring or other use approved by the Secretary upon a finding of no adverse environmental or health and safety effects, each shaft, drift, adit, tunnel, prospecting hole, entryway or other opening to the surface from underground shall be capped, sealed, backfilled, or otherwise properly managed in accordance with subdivision 14.2.a of this subsection and in accordance with MSHA regulations at 30 CFR 75.1711. Permanent closure measures shall be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

14.3. Topsoil.

14.3.a. Removal. Prior to disturbance of an area, topsoil shall be removed from the area to be disturbed in a separate layer and if not immediately redistributed, it shall be segregated and stockpiled in a separate stable location as specified in the preplan. Stockpiled topsoil shall remain in place until used for redistribution unless otherwise approved by the Secretary. Stockpiled topsoil shall be protected from excessive compaction. Where the removal of vegetative material, topsoil or other materials may result in erosion, the Secretary may limit the size of the area from which these materials are removed at any one time.

14.3.b. Redistribution. Prior to redistribution of topsoil, the regraded land shall be treated, if necessary, to reduce the potential for slippage of the redistributed material and/or to enhance root penetration. Topsoil and other materials shall be redistributed in a manner that prevents excess compaction and that achieves an approximate uniform, stable thickness, consistent with the approved postmining land uses, contours, soil density, and surface water drainage system. Immediately after redistribution all topsoil areas shall be protected from wind and water erosion.

14.3.c. Top Soil Substitutes. Any substitute material used for top soiling must be capable of supporting and maintaining the approved postmining land use. This determination of capability shall be based on the results of appropriate chemical and physical analysis of overburden and topsoil. These analyses shall include at a minimum depth, thickness, and areal extent of the substitute structure or soil horizon, pH, texture class, percent coarse fragments and nutrient content. A certification of analysis shall be made by a qualified laboratory stating that:

14.3.c.1. The proposed substitute material is equally suitable for sustaining vegetation as the existing topsoil;

14.3.c.2. The resulting soil medium is the best reasonably available in the permit area to support vegetation; and

14.3.c.3. The analyses were conducted using standard testing procedures.

14.3.d. Soil Amendments. Nutrients and soil amendments in the amounts determined by soil tests shall be applied to the redistributed surface soil layer so that it supports the approved postmining land use and meets the revegetation requirements of section 9 of this rule. These tests shall include nutrient analysis and lime requirement tests. Results of these tests shall be submitted to the Secretary with the final planting report as required by this rule.

14.4. Diversions.

14.4.a. Stream Channel Diversions. Stream channel diversions and stream channels reclaimed after the removal of temporary diversions, shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel, including the natural riparian vegetation, to promote recovery and enhancement of the aquatic habitat.

14.4.b. Temporary Diversions. Temporary diversions shall be removed when they are no longer needed to achieve the purpose for which they were approved as long as downstream facilities which were being protected are modified or removed.

14.4.c. Reclamation of Diversions. All temporary diversions shall be removed and reclaimed prior to permit abandonment and all permanent diversions shall comply with the approved reclamation plan and be renovated if necessary prior to abandonment.

14.5. Hydrologic Balance. All surface mining and reclamation activities shall be conducted to minimize the disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, to assure the protection or replacement of water supplies, and to support the approved post mining land use.

14.5.a. Water Quality Control. All water

accumulation into the pit shall be removed at least once in a twenty-four (24) hour period whenever water quality or spoil stability may be adversely affected.

14.5.b. Effluent Limitations. Discharge from areas disturbed by surface mining shall not violate effluent limitations or cause a violation of applicable water quality standards. The monitoring frequency and effluent limitations shall be governed by the standards set forth in an NPDES permit issued pursuant to W. Va. Code §22-11 et seq., the Federal Water Pollution Control Act as amended, 33 U.S.C. 1251 et. seq. and the rules and regulations promulgated thereunder.

14.5.c. Treatment Facilities. Adequate facilities shall be installed, operated and maintained using the best technology currently available in accordance with the approved preplan to treat any water discharged from the permit area so that it complies with the requirements of subdivision 14.5.b of this subsection. Nonmechanical treatment systems may be utilized if flow is infrequent or small and timely and consistent treatment is assured.

14.5.d. Breakthrough. Any surface breakthrough of water caused by the operator during the course of his operations shall be sampled immediately and analyzed for total iron, total suspended solids and pH and if requested by the Secretary, any other parameter which is characteristic of the discharge. Such analysis shall be made by a competent water analyst or chemist. The original and at least one copy of such analysis shall be retained by the operator, and two (2) copies shall be submitted to the Secretary. Should said analysis indicate the water quality to be less than the applicable effluent limitations, seals shall be immediately constructed. These seals shall:

14.5.d.1. Prevent any air from entering the underground mine by way of the breakthrough;

14.5.d.2. Prevent any air from entering the breakthrough while allowing the water to flow from the breakthrough;

14.5.d.3. Seal the breakthrough of water so that it cannot flow. Such seals shall be constructed of stone, brick, block, earth or other impervious materials which are acid resistant; or

14.5.d.4. Alternate methods of handling discharges from breakthroughs may be employed where it can be established that applicable effluent limitations can be met.

14.5.e. Discharges Into Underground Workings.

14.5.e.1. On active underground mining operations, all reasonable measures shall be taken to intercept all surface water by the use of diversions, culverts, drainage ditches or other approved methods to prevent water from entering the working area. All surface drainage from the disturbed area must pass through a sediment pond or series of sediment ponds so that discharges from such areas will not cause a violation of water quality standards.

14.5.e.2. Discharges into underground mine workings are prohibited, nor shall water be discharged from one underground working to another, unless the operator demonstrates to the Secretary that such activities will:

14.5.e.2.A. Not cause, result in, or contribute to a violation of water quality standards and effluent limitations both on or outside the permit area;

14.5.e.2.B. Not be discharged without MSHA approval;

14.5.e.2.C. Minimize disturbance to the hydrologic balance on the permit area and prevent material damage outside the permit area; and

14.5.e.2.D. Be discharged at specified rates as a controlled flow meeting applicable effluent limitations for pH and total suspended solids, except that the pH and total suspended limitations may be exceeded if approved by the Secretary, and is limited to:

14.5.e.2.D.1. Coal processing waste;

14.5.e.2.D.2. Fly ash from a coal-fired facility;

14.5.e.2.D.3. Inert materials used for stabilizing underground mines;

14.5.e.2.D.4. Underground mine development wastes;

14.5.e.2.D.5. Sludge from an acid mine drainage treatment facility or flue-gas desulfurization; or

14.5.e.2.D.6. Water.

14.5.f. Co-mingling of Waters. Unless otherwise approved by the Secretary, water from underground works shall not be co-mingled with surface drainage. When separate treatment facilities are used for discharges from underground works, they shall be designed to adequately treat the anticipated quantity and quality of the raw discharge.

14.5.g. Gravity Flows. No person shall locate openings for new drift mines working in acid or iron producing coal seams in such a manner that the mine will have a gravity discharge. If there will be a gravity discharge and the seam to be mined meets the definition of acid-producing coal seam in subsection 2.4 of this rule, site specific data must be submitted demonstrating that this seam is not an acid or iron producing seam at this location.

14.5.h. A waiver of water supply replacement granted by a landowner as provided in subsection (b) of section 24 of the Act shall apply only to underground mining operations, provided that a waiver shall not exempt any operator from the responsibility of maintaining water quality.

14.6. Acid Producing and Toxic Materials.

14.6.a. Acid and Toxic Soils. Drainage from acid-forming and toxic-forming materials into ground and surface water shall be avoided by identifying, burying, blending, segregating, and/or treating spoil or other materials that will be toxic to vegetation or that will adversely affect water quality. Such materials shall be handled and treated in accordance with methods set forth in the approved preplan within thirty (30) days after initial exposure or a lesser period if required by the Secretary.

14.6.b. Burying Acid and Toxic Materials. Acid-forming or toxic-forming material shall not be buried or stored in proximity to a drainage course or groundwater system.

14.6.c. Treatment of Toxic Material. All exposed coal seams remaining after mining and any acid-forming, toxic-forming, or combustible materials or any other waste materials shall be covered with a minimum of four feet (4') of nontoxic and noncombustible material. Where necessary to protect against upward migration of salts, exposure by erosion, or to provide adequate depth for plant growth, the Secretary shall specify thicker amounts of cover.

14.7. Monitoring Requirements.

14.7.a. Surface Water. All surface water shall be sampled and analyzed and otherwise monitored in accordance with the approved surface water monitoring plan. Monitoring and analysis shall occur at each monitoring site no less frequently than quarterly. All measurements shall be submitted to the Secretary and all violations of applicable effluent limitations shall be reported to the Secretary within five (5) days of receipt of analytical results. The operator shall immediately implement remedial measures described in the hydrologic reclamation plan. Monitoring shall continue until bond release unless the operator demonstrates that continued monitoring is unnecessary to achieve the purpose of the monitoring plan.

14.7.b. Groundwater. Where adverse impacts to a significant groundwater resource are identified as provided in subdivision 3.22.h of this rule, the groundwater resources shall be monitored

in accordance with the groundwater monitoring plan. Monitoring and analysis shall occur no less frequently than quarterly. All measurements shall be submitted to the Secretary and all violations of standards established under section 24 of the Act shall be reported to the Secretary within five (5) days of receipt of analytical results. The operator shall immediately implement remedial measures described in the hydrologic reclamation plan. Monitoring shall continue until bond release unless the operator demonstrates that continued monitoring is unnecessary to achieve the purposes of the monitoring plan.

14.7.c. Ground Water Monitoring Waivers. - If an applicant can demonstrate by the use of the PHC determination and other available base line hydrologic and geologic information that a particular water-bearing stratum in the proposed permit and adjacent area is not one which serves or may potentially serve as a significant aquifer or ensure the hydrologic balance within the cumulative impact area, monitoring of the stratum may be waived by the Secretary. Waivers will be considered and granted separately and exclusively for each individual water-bearing stratum unless it is shown by the use of the PHC determination and base line hydrologic and geologic information that all individual water-bearing stratums of concern are hydraulically interconnected and can be waived as a complete unit.

14.7.d. Water Treatment. Where any discharge from the permit area requires treatment during the mining operation in order to meet the applicable effluent limitations, water monitoring of such discharges shall continue following grading approval. If it is established on the basis of such monitoring that the hydrologic balance is being preserved without treatment, the treatment facilities may be removed. A one (1) year history of meeting the applicable effluent limitations shall be adequate to establish that the hydrologic balance is being preserved.

14.7.e. Monitoring Equipment. Monitoring equipment located both at the permit area and at off-site areas shall be properly installed, operated, and maintained during the required monitoring period and removed when no longer required.

14.8. Steep Slope Mining.

14.8.a. Backfilling and Spoil Placement. In addition to other applicable performance standards set forth in the Act and this rule, the following standards shall apply where the natural slope of the land within the permit area exceeds an average of twenty (20) degrees as measured from the horizontal. These standards except the variance provisions of subsection 14.12 shall also apply to slopes of lesser steepness where the Secretary has determined, on the basis of soils, climates, method of operation, geology, and other site-specific characteristics, that special measures are required to protect the area below the mining operations from landslides or other hazards. The provisions of this section do not apply when mining is conducted on a flat or gently rolling terrain with an occasional steep slope through which the mining proceeds and leaves a plain or predominantly flat area.

14.8.a.1. Spoil, debris, or abandoned or disabled equipment shall not be placed on the downslope except as provided in subsection (d) of section 13 of the Act. Excess spoil may be placed in specified areas designed in the permit application for such placement, if such placement is done in accordance with the provisions of subsection 14.14 of this rule. Nothing in this section shall prohibit the placement of materials in haulroad or access road fills on slopes steeper than twenty (20) degrees so long as the fills are constructed in accordance with construction specifications set forth in subsection 14.14 of this section. Casting of spoil from a higher seam to a lower seam in multiple seam operations may only occur where: the highwall of the lower seam intersects the outcrop of the upper seam; the lowest seam is mined first or in advance of the upper seams; and minimum bench widths based on slopes are established on the lower bench sufficient to accommodate both spoil placement from the upper seam and bench drainage structures.

14.8.a.2. The highwall shall be eliminated and the disturbed area graded to the

approximate original contour. Spoil material in excess of that required for the reconstruction of the approximate original contour shall be permanently stored in areas designated in the permit for such use and designed and constructed in accordance with subsection 14.14 of this section.

14.8.a.3. Land above the highwall shall not be disturbed unless the disturbance is necessary to facilitate compliance with the environmental protection standards of this section and section 12 and 14 of the Act. Standards to be considered which justify such disturbance are the following:

14.8.a.3.A. Achieve the approximate original contour;

14.8.a.3.B. Control erosion, sedimentation, and water runoff;

14.8.a.3.C. Provide access to the area above the highwall for revegetation purposes; or

14.8.a.3.D. Comply with safety standards.

14.8.a.4. The material used to backfill and eliminate the highwall shall be sufficiently compacted or otherwise mechanically stabilized so as to insure stability of the backfill with a static safety factor of 1.3. Placement of woody materials in the fill shall be prohibited unless the Secretary first determines that the method of placement of woody material will not deteriorate the future stability of the backfilled area. The operator shall at a minimum retain all overburden and spoil on the solid portion of the existing or new benches and backfill and grade the area to the most moderate slope possible.

14.8.a.5. When mining through natural watercourses or when water is to be directed across or through the backfill, a drainage channel, flumes, culvert, or french drain shall be constructed across or through the backfill in order to insure stability and to prevent erosion. Such drainage channels, flumes, culvert or french drains shall be constructed of nontoxic durable rock, asphalt, pipe, concrete or other similar material. Channels, flumes, culvert, and drains shall be constructed in accordance with the applicable criteria set forth in the applicable requirements of this rule.

14.8.6. Constructed outcrop barriers shall be designed using standard engineering procedures to inhibit slides and erosion to ensure the long-term stability of the backfill. The constructed outcrop barriers shall have a minimum static safety factor of 1.3, and where water quality is paramount, the constructed barriers shall be composed of impervious material with controlled discharge points.

14.9. Auger Operations.

14.9.a. Prohibition and Variance. Augering shall be prohibited by the Secretary if it is determined that such operations pose a potential hazard to the environment, to the public welfare and safety, to water quality, or to structures or buildings as a result of subsidence.

14.9.b. All auger holes, except as provided in subdivision 14.9.c of this subsection, shall be:

14.9.b.1. Sealed within seventy-two (72) hours after coal extraction with an impervious and noncombustible material, if the holes are discharging water containing acid-or toxic-forming material. If sealing is not possible within seventy-two (72) hours, the discharge shall be collectively treated commencing within seventy-two (72) hours after completion to meet applicable effluent limitations and water-quality standards until the holes are sealed; and

14.9.b.2. Sealed with an impervious non-combustible material, as contemporaneously as practicable with the augering operation, if the holes are not discharging water containing acid-or toxic-forming material.

14.9.c. Auger holes need not be sealed with an impervious material so as to prevent drainage if the Secretary determines that:

14.9.c.1. The resulting impoundment of water may create a hazard to the environment or public health or safety, and

14.9.c.2. The drainage from the auger holes will:

14.9.c.2.A. Not pose a threat of pollution to surface water, and

14.9.c.2.B. Comply with applicable effluent limitations and water quality standards.

14.9.d. Spacing. Auger mining operations shall be conducted in a manner which maximizes recoverability of mineral reserves remaining after augering. The operator shall, at a minimum, leave areas of undisturbed coal to provide access for future underground mining activities, unless it is established by the operator that the coal reserves have been depleted or are so limited in thickness or extent that it would not be practicable to attempt further recovery.

14.9.e. Subsidence. Auger mining operations shall be conducted in such a manner so as to prevent or minimize subsidence and where material damage occurs the operator shall correct such damage in accordance with the requirements of subdivision 16.2.c of this rule.

14.9.f. Previously Mined Areas. Where auger mining operations affect previously mined areas and the volume of all reasonably available spoil is demonstrated in writing to the Secretary to be insufficient to completely backfill the highwall, the highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

14.9.f.1. The person who conducts the auger mining operation shall demonstrate to the Secretary that the backfill, designed by a qualified registered professional engineer, has a minimum static safety factor for the stability of the backfill of at least 1.3.

14.9.f.2. All spoil generated by the auger mining operation and any associated surface coal mining and reclamation operation, and any other reasonably available spoil, shall be used to backfill the area. Reasonably available spoil shall include spoil generated by the mining operation and other spoil located in the permit area that is accessible and available for use and that when rehandled will not cause a hazard to the public safety or significant damage to the environment. For this purpose, the permit area shall include spoil in the immediate vicinity of the auger mining operation.

14.9.f.3. The coal seam mined shall be covered with a minimum of four (4) feet of nonacid, nontoxic-forming material and the backfill graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.

14.9.f.4. Any remnant of the highwall shall be stable and not pose a hazard to the public health and safety or to the environment.

14.9.f.5. Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

14.9.f.6. Auger holes shall not extend closer than five hundred (500) feet to any abandoned or active underground mine workings except as approved in subsection 14.13.

14.10. Mountaintop Removal.

14.10.a. Backfilling and Regrading. In addition to the other performance standards set forth in this rule, the following performance standards will apply where the mountaintop removal method of mining is used:

14.10.a.1. The final graded top plateau slopes on the mined area shall be less than five (5) horizontal to one (1) vertical so as to create a level plateau or gently rolling configuration. The outslopes of the plateau shall

be no steeper than two (2) horizontal to one (1) vertical.

14.10.a.2. The resulting level or gently rolling contour shall be graded so that water will drain inward from the outslope except at specific points where it is released over the outslope in constructed channels. Such channels shall be protected from erosion and constructed in accordance with subdivision 5.3.c of this rule.

14.11. Procedures to Obtain Inactive Status.

14.11.a. A permittee may not cease mining and reclamation operations for a period of thirty (30) days or more unless the Secretary finds in writing that all the following requirements have been fully satisfied:

14.11.a.1. The site is in full compliance with all standards of the program and permit, including but not limited to contemporaneous reclamation, no outstanding violations or penalties exist, and adequate pictorial and narrative description of site conditions to date has been placed in the file;

14.11.a.2. Where the permit involves the extraction of coal, significant coal reserves for the mine remain;

14.11.a.3. All disturbed acreage is bonded in accordance with section 11 and 12 of the Act and section 11 of this rule;

14.11.a.4. All required and necessary backfilling, regrading, revegetation, environmental monitoring, and water treatment activities will continue on the mine site, and adequate provisions for other required and necessary maintenance work for the time period for which the application to cease operations has been made;

14.11.a.5. The site must be adequately secured to guard against hazards to the public;

14.11.a.6. A finding based on a detailed showing by the permittee that the cessation is necessary because of temporary market conditions which are likely to change in the period for which the temporarily inactive status is sought;

14.11.a.7. A color coded mine/progress map accurately depicting the extent and location of all disturbed area, the remaining undisturbed area, and the remaining coal reserves, if any, on the permit at the time of the request. The mine/progress map shall contain a legend which lists the respective acreages and/or tonnages for each of the above-described categories;

14.11.a.8. Each request for inactive status shall be submitted on forms prescribed by the Secretary and shall contain a sworn statement as follows: "The information contained in this application is true and correct to the best of my knowledge and belief." Such statement shall be signed by an accountable official of the applicant and shall be notarized; and

14.11.a.9. Inactive status shall not relieve the operator of any responsibility for complying with the Act, this rule, or the terms and conditions of the permit.

14.11.b. The Secretary may grant inactive status for a period not to exceed one-half the permit term if it is determined that the application contains sufficient information to meet all requirements of subdivision 14.11.a of this subsection: Provided, That where the applicant documents in the application that the operations will become inactive for more than thirty (30) days, but will be reactivated on an intermittent and/or irregular basis during the approval period, such operations are not required to reapply for inactive status except at the termination date of the initial term of approval: Provided however, That the Secretary may review the approval of inactive status during its term and require updated information pursuant to subdivision 14.11.a of this subsection, and based upon this or other information, may modify or rescind the approval prior to its initial termination date.

14.11.c. The Secretary shall within five (5) days of receipt of a request for inactive status, post the application and supporting documentation

in an appropriate public office in the area of the permit, and shall notify any persons who have requested notification of a request for inactive status on the relevant permit, that a request has been received. The Secretary shall provide for public comment and an opportunity for an informal conference. If a request for an informal conference is received within thirty (30) days of the Department's receipt of the request, the Secretary shall schedule the conference in the area of the permit.

14.11.d. Within thirty (30) days preceding the expiration of the initial time period granted for inactive status, the permittee may request an extension of the approved inactive period, and at that time must submit current information meeting the requirements of subdivision 14.11.a of this subsection. The Secretary shall make the same findings and provide for the same public review process before granting a request for extension. In no event may the total time granted for inactive status for any given surface coal extraction permit be in excess of three (3) years, provided, That further extensions may be granted on the basis of a showing by the permittee that such extension is necessary by reason of::

14.11.d.1. Litigation precluding reactivation of the site;

14.11.d.2. Labor strikes; or

14.11.d.3. Substantial equipment necessary for extraction, e.g. draglines, shovels, etc., remain on the site and are being maintained in working order.

14.11.e. The Secretary may grant inactive status for a period not to exceed ten years for preparation plants or load-out facilities, whether or not they are associated with a surface coal extraction permit. Provided, preparation plants or load outs are maintained in such condition the operations could be resumed within sixty (60) days.

14.11.f. The Secretary may grant inactive status for a period not to exceed current permit term plus five years for underground mining operations. Provided, the underground mining operation is maintained in such condition that the operations could be resumed within sixty (60) days and openings are protected from unauthorized entry.

14.11.g. The Secretary may grant inactive status for a period not to exceed ten years for coal refuse sites. Provided, the completed lifts of the coal refuse site is regraded (which may include top soiling), seeded and drainage control (e.g. diversions etc.); where possible, have been installed in accordance with the terms and conditions of the permit.

14.11.h. The Secretary may grant inactive status for a permit for a term longer than those set forth in e. and f. of this subsection. Provided, however, the permittee shall furnish and maintain bond that is equal to the estimated actual reclamation cost, as determined by the Secretary. The Secretary shall review the estimated actual reclamation cost at least every two and one half (2½)years.

14.11.i. The provisions set forth in this subsection shall be applicable to all surface mining and reclamation operations which currently have approved inactive status on the effective date of this rule.

14.12. Variance From Approximate Original Contour Requirements.

14.12.a. Procedures to Obtain a Variance. The Secretary may grant a variance from the requirements for restoring the mined land in steep slope areas to approximate original contour under the following terms and conditions:

14.12.a.1. The permit area is located on steep slopes as defined in subdivision 14.8.a of this rule and the land after reclamation is suitable for industrial, commercial, residential, or public use (including recreational facilities);

14.12.a.2. The alternative postmining land use requirements of subsection 7.3 of this rule are met;

14.12.a.3. All other applicable requirements of the Act and this rule, except for those relating to approximate original contour, are met;

14.12.a.4. All highwalls are completely backfilled in a manner which results in a static safety factor of 1.3;

14.12.a.5. Only spoil not necessary to achieve the postmining land use may be removed from the mine bench;

14.12.a.6. The watershed of the permit and adjacent area will be improved by reducing pollutants, environmental impacts, or flood hazards; provided that, the watershed will be deemed improved only if:

14.12.a.6.A. The amount of total suspended solids or other pollutants discharged to ground or surface water from the permit area will be reduced, so as to improve the public or private uses or the ecology of such water, or flood hazards within the watershed containing the permit area will be reduced by reduction of the peak flow discharge from precipitation events or thaws; and

14.12.a.6.B. The total volume of flow from the proposed permit area, during every season of the year, will not vary in a way that adversely affects the ecology of any surface water or any existing or planned use of surface or ground water.

14.12.a.7. Appropriate Federal, State and local government agencies have an opportunity to review and comment on the proposed postmining land use to determine that the potential use is shown to constitute an equal or better economic or public use;

14.12.a.8. The proposed use is designed and certified by a qualified registered professional engineer in conformance with professional standards established to assure the stability, drainage, and configuration necessary for the intended use of the site; and

14.12.a.9. The surface land owner(s) of the permit area has requested in writing that a variance be granted to achieve the approved alternative postmining land use.

14.13. MSHA Approval. No mining shall occur within five hundred (500) feet of an underground mine not totally abandoned without approval by the Federal Mine Safety and Health Administration.

14.14. Disposal of Excess Spoil.

14.14.a. General.

14.14.a.1. Spoil not required to achieve the approximate original contour shall be transported to and placed on designated disposal sites within the permit area; Provided, however, where environmental benefits will occur, spoil not needed to restore the approximate original contour of the land and reclaim the land within the permit area may, in a manner consistent with the Act , be deposited on abandoned mine lands and/or forfeited mine lands under a reclamation contract pursuant to section 28 of the Act and this rule. It will be the permittee's responsibility to obtain the consent of the surface owner for right of entry and to obtain any other permits or approvals as necessary from the appropriate environmental agencies or other agencies;

14.14.a.2. All excess spoil shall be placed in a controlled manner so as to minimize the adverse effects of leachate and surface water runoff from the fill on surface and groundwater;

14.14.a.3. Coal processing wastes and underground development waste shall not be placed in such fills unless the waste is placed in accordance with section 22 of this rule, contains no acid producing or toxic forming materials and is of the proper characteristics so as to assure the design stability of the fill;

14.14.a.4. Any excess spoil disposal in an underground mine shall be done in accordance with a plan approved by the Mine Safety and Health Administration in accordance with design standards subdivision 22.3.s of this

rule;

14.14.a.5. Excess spoil that is acid- or toxic-forming or combustible shall be adequately covered with nonacid, nontoxic and noncombustible material, or treated, to control the impact on surface and ground water in accordance with subsections 14.6 and 14.7 of this section, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use;

14.14.a.6. Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not ripraped or otherwise protected, shall be revegetated upon completion of construction; and

14.14.a.7. The final configuration of the fill shall be suitable for the approved post mining land use.

14.14.b. Certification - Inspections and Reporting. Certification of all excess spoil fills shall be required as follows:

14.14.b.1. The fill and appurtenant structures shall be designed in accordance with professional design standards, which meet the requirements of this subsection, and certified by a registered professional engineer experienced in the design of earth and rock fill embankments;

14.14.b.2. During construction, the fill shall be inspected quarterly for stability by a registered professional engineer experienced in the construction of earth or rock fills or other qualified professional specialist working under the direction of a professional engineer experienced in the construction of earth or rock fills. Regular inspections are also required during placement and compaction of fill materials and during critical construction periods such as foundation preparation, underdrain placement, installation of surface drainage systems, and construction of rock toe buttresses. Within two (2) weeks following completion of the inspections, a report certified by the registered professional engineer shall be submitted to the Secretary. The certified report shall contain a statement that the fill is being constructed and maintained as designed in accordance with the approved plan and this rule. The report will also note any instances of apparent instability, structural weaknesses, and other hazards. The report on the drainage system and protective filters shall include color photographs taken during and after construction, but before the underdrains are covered with excess spoil. Color photographs shall be of sufficient size and number to provide a relative scale and to clearly identify the site. If the underdrains are constructed in phases, each phase must be certified separately. If excess durable rock spoil is placed such that the underdrain system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, color photographs of the underdrains must be taken as they are formed. All color photographs shall be of adequate size and number to provide a relative scale and to clearly identify the site. A copy of the certified report shall be maintained at the mine site;

14.14.b.3. After total completion of the fill, a certification form shall be completed and submitted to the Secretary by the registered professional engineer overseeing construction of the fill; and

14.14.b.4. In addition to the requirements of paragraph 14.14.b.2 of this subdivision, certification forms for durable rock fills shall be accompanied by the following:

14.14.b.4.A. A statement attesting that the fill contains no more than twenty-percent (20%) non-durable material;

14.14.b.4.B. A statement attesting that foundation preparation is proceeding in accordance with the design plans;

14.14.b.4.C. A statement that prohibited materials are not being placed, deposited, or disposed of into the fill area; and

14.14.b.4.D. A statement that sediment control measures are constructed and being maintained in accordance with the approved

design plans and the terms and conditions of the permit.

14.14.c. Location. Excess spoil not required to achieve the approximate original contour on the permit areas may be deposited outside the permit area if the following conditions are met:

14.14.c.1. The excess spoil is deposited on another permit area; or

14.14.c.2. The excess spoil is placed on an abandoned mine land project conducted under the Abandoned Mine Land Program where:

14.14.c.2.A. A reclamation contract is in effect;

14.14.c.2.B. The project will result in improved environmental, aesthetic, or safety conditions; and

14.14.c.2.C. The project is designed and constructed in accordance with the Act and this rule.

14.14.d. Disposal of Excess Spoil on Existing Benches. Spoil material not required to return the area to the approximate original contour may be placed on an existing bench if the following conditions are met:

14.14.d.1. Sufficient foundation investigations and laboratory analysis of foundation materials which include the effects of underground workings below the solid bench, shall be performed. Based on information obtained from such investigations and analysis, the Secretary may require modification of design requirements from the spill. Fills which are proposed on pre-existing benches where the slope of the solid bench exceeds ten percent (10%) toward the outslope shall meet the design requirements of subdivision 14.14.f of this section.

14.14.d.2. All vegetation and organic material shall be removed from the disposal area prior to placement of excess spoil. All topsoil shall be removed and redistributed or stockpiled in accordance with subsection 14.3 of this section. All excess spoil shall be transported and placed only on the solid portion of the bench in a controlled manner in horizontal lifts not exceeding four (4) feet in thickness. The spoil must be compacted or otherwise mechanically stabilized to achieve a static safety factor of 1.3. The area shall be backfilled and graded to achieve the most moderate slope possible which does not exceed the angle of repose. The final graded configuration shall be such that the surface and subsurface drainage is compatible with the natural surroundings and the approved postmining land use. Terraces may be constructed on the outslope if required for stability, control of erosion, or to conserve soil moisture. The grade of the outslopes between terraces shall not be steeper than two (2) horizontal to one (1) vertical (50 percent).

14.14.d.3. No permanent impoundments are allowed on the completed fill. Small depressions may be allowed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

14.14.d.4. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill, and ensure stability. Diversions shall comply with the requirements of subdivision 5.3.c and subsection 14.4 of this rule. Underdrains shall be designed and constructed in accordance with paragraph 14.14.e.1 of this rule.

14.14.d.5. Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices and meet any design criteria established by the Act, this rule, and the terms and conditions of the permit.

14.14.d.6. The existing highwall shall be eliminated to the maximum extent technically practicable.

14.14.d.7. Disposal of excess spoil from an upper actively mined bench to a lower

pre-existing bench by means of gravity transport may be approved by the Secretary provided that:

14.14.d.7.A. The gravity transport courses are determined on a site-specific basis by the operator as part of the permit application and approved by the Secretary to minimize hazards to health and safety and to ensure that damage will be minimized between the benches, outside the set course, and downslope of the lower bench should excess spoil accidentally move;

14.14.d.7.B. All gravity transported excess spoil, including that excess spoil immediately below the gravity transport courses and any pre-existing spoil that is disturbed, is rehandled and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and to prevent mass movement, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and to ensure a minimum long-term static safety factor of 1.3. Excess spoil on the bench prior to the current mining operation that is not disturbed need not be rehandled except where necessary to ensure stability of the fill;

14.14.d.7.C. A safety berm is constructed on the solid portion of the lower bench prior to gravity transport of the excess spoil. Where there is insufficient material on the lower bench to construct a safety berm, only that amount of excess spoil necessary for the construction of the berm may be gravity transported to the lower bench prior to construction of the berm; and

14.14.d.7.D. Excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity transport courses properly prepared in accordance with subsection 14.3 of this section. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity transport course between the two benches and each transport course shall be reclaimed in accordance with the requirements of the Act, this rule, and the approved permit.

14.14.e. Valley Fills. Where the excess spoil disposal site is located in a valley, the following criteria shall be met:

14.14.e.1. If the fill area contains springs, natural water courses, or wet weather seeps, lateral underdrains shall be constructed from the wet areas to the rock core in such a manner that infiltration and entrapment of water within the fill will be prevented. Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices which will meet any design criteria established by the Secretary. The underdrain system and the rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil material, and which is free of coal, clay or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

14.14.e.2. The fill shall be designed to assure a long-term static safety factor of 1.5 or greater.

14.14.e.3. The outer slope or face of the valley fill shall be no steeper than two (2) horizontal to one (1) vertical with terraces constructed at a maximum of each fifty (50) feet vertical rise above the toe of the fill. The bench width of each terrace shall be no less than twenty (20) feet with a three (3) to five (5) percent slope toward the face and a one (1) percent slope toward the rock core located near the center of the valley fill.

14.14.e.4. A rock core chimney drain may be utilized for fills that will come to the level of the ridge line with no natural drainage area above the fill. A rock core chimney drain may also be used for fills that do not come to the ridge

line provided that the fill does not contain more than two hundred and fifty thousand (250,000) cubic yards of material unless located in an area where the valley floor is always above the local water table. Surface water runoff from areas above and adjacent to the fill shall be diverted into properly designed and constructed stabilized diversion channels which have been designed using best current technology to safely pass the peak runoff from a 100 year, 24-hour precipitation event. The channel shall be designed and constructed to ensure stability of the fill, control erosion, and minimize water infiltration into the fill.

14.14.e.5. The central rock core or "chimney drain" shall lie in the apex of the valley and extends throughout the depth and length of the fill. The rock core shall be designed and constructed in accordance with the following criteria:

14.14.e.5.A. The rock core shall consist of durable non-acid producing or toxic forming rock of a minimum average diameter of twelve (12) inches with no more than ten (10) percent of the core material consisting of fines, and which is free of coal, clay or other non-durable material.

14.14.e.5.B. The minimum width of the rock core shall be sixteen feet, and shall be protected by a filter system to ensure proper long-term functioning which is designed and constructed using current, prudent engineering practices. If no filter is designed for the underdrains, a rock core of sufficient capacity shall be provided to allow for partial plugging of the drain and/or rock core.

14.14.e.5.C. The core shall be constructed progressively and concurrently with each lift of the valley fill.

14.14.e.5.D. The finished surface of the rock core shall form a trapezoidal channel capable of permitting the peak runoff of a one-hundred (100) year twenty-four (24) hour precipitation event.

14.14.e.6. Where valley fills are designed for construction without a rock core, an underdrain shall be used. The underdrain shall be designed and constructed in accordance with standards set forth in paragraph 14.4.e.1 of this subdivision. Surface runoff from above and across the surface of the fill shall be carried through a surface diversion system capable of handling the peak runoff from a one-hundred (100) year twenty-four (24) hour precipitation event.

14.14.e.7. Sufficient foundation investigations and laboratory analysis of foundation materials which include the effects of underground workings, shall be performed in order to develop the necessary plans, design specifications, and standards set forth in the approved permit. Based on information obtained from such investigations and analysis, the Secretary may require modification of the design requirements of the fill.

14.14.e.8. Areas upon which a valley fill is to be constructed shall first be progressively cleared of all trees, brush, shrubs, and other organic material which is above ground level; provided that, in critical foundation areas, including, but not limited to, the toe of the fill, seepage or underdrain areas, and downstream portions of the fill that provide a resisting force against massive slope failure, all organic material both above and below the ground surface must be removed. This material shall be disposed of outside the fill area. No more than three (3) acres, excluding roadways, shall be cleared until the first lift of the valley fill is completed.

14.14.e.9. The valley fill shall be constructed in lifts not exceeding four (4) feet in thickness beginning at the toe of the fill. Where fills are designed and constructed using lifts exceeding four (4) feet in thickness, the design plans and specifications shall specify the thickness of the lifts. The operator shall demonstrate how and the engineer shall certify that such thickness will insure stability and meet all safety and environmental protection standards.

14.14.e.10. During and after

construction, grading may drain surface water away from the outslope of the fill and toward the rock core with a maximum slope of three percent (3%). A drainage pocket shall be maintained at the head of the fill at all times to intercept and direct surface runoff to the rock core. In no case shall this pocket have a potential for impounding more than ten thousand (10,000) cubic feet of water. No other impoundments may be constructed on the fill.

14.14.e.11. Where the toe of the spoil rests on a downslope which is in excess of thirty-six (36) percent, keyway cuts or rock toe buttresses shall be constructed of sufficient size so as to ensure stability of the fill as determined by stability analysis.

14.14.f. Side Hill Fills.

14.14.f.1. Side hill fills shall be constructed on the most stable and moderate slopes available with the natural downslope at the toe of the fill not to exceed thirty-six (36) percent. Where possible, the toe of the fill shall rest on or above a natural terrace, bench or berm in a manner which will provide additional stability and prevent mass movement.

14.14.f.2. Each design shall be based on the results of sufficient geotechnical investigation of the construction site. The investigations shall include such factors as geologic conditions, soil characteristics, depth of bedrock, springs, seeps and groundwater flow, and a description of materials to be placed in the fill.

14.14.f.3. The design and construction of all side hill fills must be certified by a registered professional engineer.

14.14.f.4. If the fill area contains springs, natural water courses or wet weather seeps, lateral drains shall be constructed from the wet areas in the same manner as set forth in paragraph 14.14.e.1 of this rule.

14.14.f.5. All areas upon which the fill is to be constructed shall be progressively cleared of all trees, brush, shrubs, and other organic material which is above ground level; provided that, in critical foundation areas, including, but not limited to, the toe of the fill, seepage or underdrain areas, and downstream portions of the fill that provide a resisting force against massive slope failure, all organic material both above and below the ground surface must be removed. This material shall be disposed of outside the fill area.

14.14.f.6. The fill shall be constructed in concurrently compacted lifts not exceeding four (4) feet in thickness.

14.14.f.7. The fill shall be designed and constructed to assure a static safety factor of at least 1.5.

14.14.f.8. The outer slope or face of the fill shall be no steeper than two (2) horizontal to one (1) vertical. Terraces shall be constructed on the face of the fill at each fifty (50) feet vertical rise above the toe of the fill. The terraces shall be a minimum of twenty (20) feet wide and shall slope three (3) to five (5) percent toward the face with a lateral slope of one (1) percent to a discharge channel capable of passing a one hundred (100) year twenty-four (24) hour precipitation event.

14.14.f.9. Surface water runoff from the fill and from surrounding areas shall be diverted away from the fill and into stabilized channels designed to pass safely the runoff from a one-hundred (100) year, twenty-four (24) hour precipitation event.

14.14.f.10. No permanent impoundments may be constructed on the completed fill except that small depressions may be allowed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

14.14.g. Durable Rock Fills.

14.14.g.1. The Secretary may approve the design, construction, and use of a single lift fill consisting of at least eighty (80)

percent durable rock if it can be determined, based on information provided by the operator, that the following conditions exist:

14.14.g.1.A. Examination of core borings and the geologic column show that the overburden consists of durable sandstone, limestone, or other durable material in sufficient thickness and amounts to generate spoil material that is eighty (80) percent or greater durable rock. Where the fill will contain non-cemented clay shale, clay spoil, or other nondurable material, such material must be mixed with the durable rock in a controlled manner such that no more than twenty (20) percent of the fill volume is not durable rock. Tests shall be performed by a Registered Professional Engineer and approved by the Secretary to demonstrate that no more than twenty (20) percent of the fill volume is not durable rock.

14.14.g.1.B. The durable rock shall not consist of acid-producing or toxic-forming material, will not slake in water, and will not degrade to soil material. For purposes of this paragraph only, soil material means material of which at least fifty (50) percent is finer than 0.074 mm, which exhibits plasticity, and which meets the criteria for group symbol ML, CL, OL, MH, CH, or OH, as determined by the Unified Soil Classification System (ASTM D-2487).

14.14.g.1.C. The toe of the fill will rest on natural slopes no steeper than twenty (20) percent.

14.14.g.2. The fill shall be designed based on the results of sufficient geotechnical investigations of the construction site. The investigation shall include such factors as geologic conditions, soil characteristics, depth to bedrock, location of springs, seeps and groundwater flow, potential effects of subsidence and a description of materials to be placed in rock cores and drains.

14.14.g.3. The design and construction of all durable rock fills must be certified by a registered professional engineer experienced in design and construction of earth and rock embankments.

14.14.g.4. The foundation of the fill and the fill shall be designed to assure a long-term static safety factor of 1.5 or greater, and meet an earthquake safety factor of 1.1.

14.14.g.5. The outer slope or face of the fill shall be no steeper than two (2) horizontal or one (1) vertical (2:1). Terraces shall be constructed on the fill at a maximum of every fifty (50) feet in vertical rise above the toe of the fill. The terraces shall be no less than twenty (20) feet in width and slope toward the fill at a three (3) to five (5) percent grade and slope laterally at one (1) percent grade to discharge channels capable of passing the peak runoff for a one-hundred (100) year twenty-four (24) hour precipitation event.

14.14.g.6. All areas upon which the fill is to be placed shall first be progressively cleared of all trees, brush, shrubs and other organic material which is above ground level; provided that, in critical foundation areas, including, but not limited to, the toe of the fill, seepage or underdrain areas, and downstream portions of the fill that provide a resisting force against massive slope failure, all organic material both above and below the ground surface must be removed. This material shall be disposed of outside the fill area.

14.14.g.7. The underdrain system may be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials; provided, that the resulting underdrain system shall be capable of carrying anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and the other requirements for drainage control shall be met. If the underdrain system is not constructed by natural segregation of dumped material, it shall be designed and constructed in accordance with paragraph 14.4.e.1 of this subdivision.

14.14.g.8. Surface water runoff from areas above and adjacent to the fill shall be diverted into properly designed and constructed stabilized diversion channels which have been

designed using best current technology to safely pass the peak runoff from a 100 year, 24-hour precipitation event. The channel shall be designed and constructed to ensure stability of the fill, control erosion, and minimize water infiltration into the fill.

14.14.g.9. The grade of the top surface of the completed fill shall not exceed five (5) percent and shall slope toward the drainage channel.

14.14.g.10. No permanent impoundments may be constructed on the completed fill except that small depressions may be allowed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

14.14.g.11. Notwithstanding any other provisions of this rule or the terms and conditions of a permit to the contrary, additional storage capacity or sediment control measures may be required through permit revision if sediment removal performance of the structure(s) during operation and construction of the fill is found to be deficient to the point that significant non-compliance with applicable effluent limits or water quality standards results.

14.14.g.12. The following materials are hereby prohibited from being placed, deposited, or disposed of into a durable rock fill or durable rock fill area:

14.14.g.12.A. Surface soils, provided that such soils used to establish vegetation on the surface of the fill are not prohibited; provided, however, that such soils may be placed in the fill if accounted for in design and construction as nondurable material and such soils are not deposited in critical zones of the fill;

14.14.g.12.B. Mud, silt, or sediment cleaned or removed from mining pits, roadways, sediment control structures and/or other areas of the operation;

14.14.g.12.C. Vegetative or organic materials cleared or grubbed from the permit or other areas;

14.14.g.12.D. Non-coal wastes; and

14.14.g.12.E. Coal refuse.

14.15. Contemporaneous Reclamation Standards.

14.15.a. General. This subsection establishes general performance standards relating to backfilling, regrading, and stabilization for all surface mining operations within the State. The mining and reclamation plan for each operation shall reflect these standards in describing how the mining operations and reclamation operations are to be coordinated to minimize total land disturbance and to keep reclamation operations as contemporaneous as possible with the advance of mining operations. Particular emphasis must be given to (1) limiting the size and number of excess spoil disposal fills; (2) locating and configuring excess spoil disposal fills in such a way so as to minimize land disturbance; (3) controlled handling and placement of all spoil material; and (4) the timing and sequence of backfilling and regrading operations which will minimize the ratio of disturbed and unreclaimed area versus undisturbed and reclaimed area. All surface mining operations shall be conducted in such a manner so as to comply with the approved reclamation plan and the standards set forth in this subsection.

14.15.a.1. Spoil returned to the mined-out area shall be backfilled and graded to the approximate original contour unless a waiver is granted pursuant to W. Va. Code §22-3-13(c)(2) with all highwalls eliminated. Backfilling and grading of all disturbed areas will be done in a manner which eliminates spoil piles and depressions, returns all slopes to the angle of repose or lesser slopes so as to achieve a static safety factor of 1.3 or greater, minimizes erosion and water pollution both off and on the site, supports the postmining land use, and covers all coal seams, acid-producing or toxic-forming materials, and combustible material with non-toxic and non-combustible material.

14.15.a.2. All permit applications shall incorporate into the required mining and reclamation plan a detailed site specific description of the timing, sequence, and areal extent of each progressive phase of the mining and reclamation operation which reflects how the mining operations and the reclamation operations will be coordinated so as to minimize the amount of disturbed, unreclaimed area, and to quickly establish and maintain a specified ratio of disturbed versus reclaimed area throughout the life of the operation.

14.15.b. Time, Distance, and Acreage Limits. Grading, backfilling, and water management practices shall be kept current as follows:

14.15.b.1. Where the operation consists of single seam contour mining only (no augering) on steep or non-steep slopes disturbed and unreclaimed acreage including all excess spoil disposal sites should not exceed thirty-five (35) acres, and grading and backfilling shall follow the mineral removal by a period not to exceed sixty (60) days or a distance of one thousand five hundred (1,500) linear feet.

14.15.b.2. Where the operation consists of single seam contour mining and augering or highwall mechanical mining on steep or non-steep slopes, disturbed and unreclaimed acreage including all excess spoil disposal sites shall not exceed fifty (50) acres, and the augering or highwall mechanical mining shall follow the advance of the mining pit by a period not to exceed sixty (60) days. The grading and backfilling shall follow the augering or highwall mechanical mining by a period of not more than thirty (30) days or a distance of not more than one thousand five hundred (1,500) linear feet; provided, That in no event shall more than three thousand (3,000) linear feet of pit be exposed at any time.

14.15.b.3. Where the operation consists of augering or highwall mechanical mining only on steep or non-steep slopes, disturbed and unreclaimed acreage shall not exceed thirty-five (35) acres, and the grading and backfilling shall follow the augering or highwall mechanical mining by a period not to exceed thirty (30) days or a distance of not more than one thousand (1,000) linear feet.

14.15.b.4. Where the operation consists of area mining only, on slopes which are on the average less than 20 degrees (20°) in steepness, disturbed and unreclaimed acreage including excess spoil disposal sites shall not exceed one hundred (100) acres or fifty (50) percent of the permit area, whichever is less, and backfilling and grading shall not be more than two spoil ridges or mining cuts behind the pit being worked. The maximum linear feet of open pit shall not exceed three thousand (3,000) feet at any time and backfilling and grading shall follow mineral removal within one hundred eighty (180) days.

14.15.b.5. Where the operation consists of multiple seam mining along the topographic contour on steep or non-steep slopes, and where the coal seams running through the mountain, hill, or ridge are only partially removed, disturbed and unreclaimed acreage including excess spoil disposal sites, shall not exceed two hundred (200) acres or fifty (50) percent of the permit area, whichever is less. Augering and/or highwall mechanical mining which becomes a part of these types of operations shall be incorporated into the operation in such a fashion so as to meet the subject acreage limitations. Regardless of the allowable limits contained in this section, any disturbed area other than those specified in subdivision 14.15.c of this rule must complete backfilling and rough grading within 180 days of final mineral removal.

14.15.b.6. Where the mining operation consists of removing entire coal seam(s) running through the upper fraction of a mountain, hill or ridge, or removing entire coal seam(s), running through the upper fraction of a mountain, hill, or ridge in conjunction with partially removing lower seam(s) along the topographic contour, the following contemporaneous reclamation requirements apply:

14.15.b.6.A. Disturbed and

unreclaimed acreage, including excess spoil disposal sites, shall not exceed thirty-five (35) percent of the total permit acreage, or three hundred (300) acres, whichever is less. Provided; however, the Secretary may grant a variance not to exceed five hundred (500) acres on operations which consist of multiple spreads of equipment. Where operations contemplated under this section are approved with incidental contour mining, which may include augering or highwall mining, the acreage must be calculated in the allowable disturbance authorized in this paragraph. The incidental contour pit length cannot exceed 3000 feet and backfilling/grading shall follow mineral removal within 180 days. Regardless of the allowable limits contained in section fourteen of this rule, any disturbed area other than those specified in subdivision 14.15.c. of this rule must complete backfilling and rough grading within 180 days of final mineral removal. Operations required to comply with AOC+ guidelines or approved specific post-mining land use requirements must complete backfilling and rough grading within 270 days of final mineral removal unless a waiver is otherwise granted by the Secretary pursuant to this section.

The ratio of disturbed and unreclaimed acreage versus reclaimed or undisturbed acreage shall be shown on progress maps submitted annually or as otherwise required by the Secretary. The subject ratios shall be verified by the Secretary to be consistent with the mining and reclamation plan on the next regular inspection following receipt of the progress map.

14.15.b.6.B. On operations which utilize draglines with a bucket capacity of greater than forty-five (45) cubic yards, the requirements of subparagraph 14.15.b.6.A of this paragraph is waived and the following contemporaneous reclamation requirements apply:

14.15.b.6.B.1. Pre-stripping or benching operations cannot exceed four hundred (400) acres for any single permit and cannot precede dragline operations more than twenty-four (24) months unless otherwise approved by the Secretary or necessary to satisfy AOC+ requirements, specific post-mining land use requirements or special materials handling facilities requirements. All fill construction must occur during this phase of operation and be conducted in accordance with subdivision 14.15.d. of this rule.

14.15.b.6.B.2. Rough backfilling and regrading shall be completed within one hundred (180) days following coal removal and not more than four (4) spoil ridges behind the pit being worked, the spoil from the active pit constituting the first spoil ridge; and

14.15.b.6.B.3. The ratio of disturbed acreage versus reclaimed or undisturbed acreage shall be shown on progress maps submitted annually or as otherwise required by the Secretary.

14.15.c. Reclaimed Area. For purposes of this subsection, reclaimed acreage shall be that portion of the permit area which has at a minimum been fully regraded and stabilized in accordance with the reclamation plan and meets Phase I standards. The following shall not be included in the calculation of disturbed area:

14.15.c.1. Semi-permanent ancillary facilities (haulroads, drainage control systems, parking areas, maintenance, storage and supply areas, etc.), and areas cleared but not grubbed, provided, that such areas have appropriate drainage control systems in place; Provided, That with the exception of permanent haulroads, drainage control systems and material handling facilities (including but are not limited to such facilities as preparation plants, fixed coal stockpiles/transfer areas and commercial forestry topsoil areas) the total acreage of all other semi-permanent ancillary facilities cannot exceed ten percent of the total permit acreage.

14.15.c.2. Areas within the confines of excess spoil disposal fills which are under construction provided the fill is being constructed in the “conventional” method, i.e., completed from the toe up, or those fills which are being

constructed progressively in lifts from the toe up or are being progressively completed from the toe up by constructing benches and appropriate drainage control structures (ditches, flumes, channels, etc.) from the toe up as soon as the area is available to do so;

14.15.c.3. Areas containing 30 aggregate acres or less which have been cleared and grubbed and have the appropriate drainage control (temporary or permanent) installed and certified, and which will become a part of the operational area within six months or less. Failure to incorporate these areas into the operational area within six months may result in the loss of this exemption; The Secretary may consider larger acreage for clearing operations where it can be demonstrated that it is necessary to comply with applicable National Environmental Policy Act requirements.

14.15.c.4. Areas that have been cleared and grubbed which exceed the thirty aggregate acres and/or those which will not be included in the operational area within six months may be excluded if the appropriate temporary or permanent drainage control structures are installed and certified and have temporary vegetative cover established; and

14.15.c.5. Areas which have been backfilled and graded with material placed in a stable, controlled manner which will not subsequently be moved to final grade, mechanically stabilized, and had appropriate drainage control structures installed in accordance with the approved mining and reclamation plans. The sediment control structures need not be certified to meet this requirement if the mining plan is such that it would make this unfeasible.

14.15.d.Excess Spoil Disposal Fills. All fills must be constructed contemporaneously and contiguously with that segment of the operations that contains the material that is designated to be placed in the fill. In addition to all other standards in effect, the following shall apply to excess spoil disposal fills.

14.15.d.1. All fills must be planned for continuous material placement until designed capacity is reached and cannot have a period of inactivity that exceeds 180 days unless otherwise approved by the secretary on a permit specific basis to accommodate AOC+, post-mining land use or special material handling situations.

14.15.d.2. The areas where contour mining is proposed within the confines of the fill are not eligible for the exemption contained in 14.15.c.2.

14.15.d.3. Operations that propose fills that are designed to use single lift top-down construction shall bond the proposed fill areas based upon the maximum amount per acre specified in WV Code §22-3-12(c)(1).

14.15.e. Applicability. Permit applications pending approval on the first day of January, two thousand three, shall within 120 days of permit approval have a mining and reclamation plan which is consistent with the criteria set forth in this subdivision. Permit applications which are submitted after the first day of January, two thousand three shall not be issued a permit without a mining and reclamation plan which is consistent with the criteria set forth in this subdivision.

14.15.e.1. After the first day of January, two thousand three, the mining and reclamation plan for all active mining operations must be consistent with the applicable time criteria set forth in this paragraph. Where permit revisions are necessary to satisfy this requirement, the revisions shall be prepared and submitted to the Secretary for approval within 180 days. Full compliance with the revised mining and reclamation plan shall be accomplished within twelve (12) months from the date of the Secretary's approval.

14.15.e.2. After the first day of January, two thousand three, the mining and reclamation plan for mining operations which

have approved inactive status or when permits have been issued but the operation has not started must be consistent with the applicable time criteria of this paragraph. Where permit revisions are necessary to satisfy this requirement, the revisions shall be prepared and submitted to the Secretary for approval within 180 days. Full compliance with the revised mining and reclamation plan shall be accomplished within twelve (12) months from the date of the Secretary's approval.

14.15.e.3. The Secretary may consider contemporaneous reclamation plans on multiple permitted areas with contiguous areas of disturbance to ensure that contemporaneous reclamation is practiced on a total operational basis. In order to establish a method of orderly transition between operations, plans submitted on multiple permitted areas cannot add allowable disturbed areas in such a manner as to result in increased disturbed areas on a single operation unless a variance is obtained pursuant to subdivision 14.15.g.

14.15.f. Revegetation. Revegetation shall be kept current by establishing a temporary or permanent vegetative cover on regraded areas by the end of the first growing season and a permanent cover by the end of the second growing season.

14.15.g.Variance – Permit Applications. The Secretary may grant approval of a mining and reclamation plan for a permit which seeks a variance to one or more of the standards set forth in this subsection, if on the basis of site specific conditions and sound scientific and/or engineering data, the applicant can demonstrate that compliance with one or more of these standards is not technologically or economically feasible. The Secretary shall make written findings in accordance with the applicable provisions of section 3.32 of this rule when granting or denying a request for variance under this section.

14.15.g.1. A description of the specific standard(s) for which a variance is sought.

14.15.g.2. A statement with supporting documentation and scientific and/or engineering data which describes how site specific conditions make compliance with the standard(s) technologically or economically infeasible, including a discussion and feasibility analysis of alternatives that were considered.

14.15.g.3. Specific alternative standards of the same type and specificity as the standards for which a variance is sought.

14.15.g.4. A sequential plan showing all phases of the proposed mining and reclamation operation to include specific time frames for completing each phase. The plan must at a minimum describe at what point reclamation operations will commence and how such operations will advance in relation to the mining operations throughout the remainder of operational sequence.

14.15.g.5. A detailed economic analysis including a discussion and feasibility analysis of possible alternatives that were considered must be submitted for variance requests that use economics as the basis for the request.

14.15.h. Variance - Existing and Ongoing Operations. The Secretary may grant approval of a request for a variance to the standards set forth in this subsection for existing and/or ongoing surface mining operations only after all reasonable steps have been taken by the operator to minimize land disturbance and if the operator demonstrates, through an on-site evaluation and sound scientific and/or engineering data, that compliance with these standards are technologically or economically infeasible. The variance request will be in writing and shall contain the elements set forth in subdivision 14,15.g. of this subsection.

14.15.i. Notwithstanding any provision of this rule to the contrary, revision of the mining and reclamation plan contained in a permit is required prior to any change in mining methods which would substantially affect the standards contained in this section.

14.15.j. Reclamation Equipment. Operable regrading equipment shall be kept on the permit area until satisfactory completion of grading of all disturbed area unless otherwise approved.

14.15.k. Exemptions. Backfilling and grading may be postponed on a permit where surface mining operations and underground mining operations are proposed on the same area; provided that all requirements set forth in paragraph 16, subsection (b), section 13 of the Act are met. Where the underground mining permit is terminated or revoked, backfilling, regrading, and reclamation shall commence and proceed in accordance with the provisions of subdivision 15.2.b of this subsection.

14.15.l. Grading Outer Spoil. All outer spoil shall be graded so as to blend into the adjoining undisturbed lands. All spoil must be placed in such a manner that the final surface of all slopes is mechanically stabilized using tracked equipment or other equivalent means.

14.15.m. Erosion Control. All disturbed areas shall be regraded and stabilized in a manner which effectively controls erosion.

14.15.n. Regraded Drainage Control. Drainage control on regraded areas shall prevent excessive erosion or additional contributions of suspended solids to the receiving stream, ensure safety and conserve soil moisture. Drainage control measures may include, but are not limited to, constructed drainways, flumes and riprap channels, tracking in, small depressions or other devices.

14.15.o. Coal Processing Waste Disposal. Where approval for placing coal processing waste in the backfill has been granted, such placement shall be done in accordance with the compaction requirements of subdivision 22.3.p. of this subsection. The final graded slope shall not exceed either the angle of repose or such other lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides.

14.15.o.1. The coal processing waste shall be placed in a controlled manner so as to:

14.15.o.1.A. Minimize adverse effects of leachate and surface-water runoff on surface and ground water quality and quantity;

14.15.o.1.B. Ensure mass stability and prevent mass movement during and after construction;

14.15.o.1.C. Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use;

14.15.o.1.D. Not create a public hazard; and

14.15.o.1.E. Prevent combustion.

14.15.o.2. The coal processing waste will not be placed in the backfill unless it has been demonstrated to the satisfaction of the Secretary that:

14.15.o.2.A. the coal processing waste to be placed based upon laboratory testing to be non-toxic and/or non-acid producing; or

14.15.o.2.B. an adequate handling plan including alkaline additives has been developed and the material after alkaline addition is non-toxic and/or non-acid producing.

The disposal facility shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Secretary. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall certify the design of the disposal facility. If any examination or inspection discloses that a potential hazard exists, the Secretary shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Secretary shall be notified immediately, and the Secretary will then

notify the appropriate agencies that other emergency procedures are required to protect the public.

14.16. Control of Fugitive Dust. All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion.

14.17. Utility Installations. All surface mining operations shall be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines; railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Secretary.

14.18. Disposal of Noncoal Mine Wastes.

14.18.a. Noncoal mine wastes, except coal refuse and/or timber from clearing and grubbing operations, includes, but is not limited to grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustible materials generated during mining activities shall be placed and stored in a controlled manner in a designated portion of the permit area. Placement and storage shall ensure that leachate and surface runoff do not degrade surface or ground water, that fires are prevented, and that the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings.

14.18.b. Final disposal of noncoal mine waste within the permit area will be in accordance with a permit issued pursuant to W. Va. Code §22-15 et seq. (Solid Waste Management Act).

14.18.c. At no time shall any noncoal mine waste be deposited in a refuse pile or impounding structure, nor shall an excavation for a noncoal mine waste disposal site be located within eight (8) feet of any coal outcrop or coal storage area.

§38-2-15. Performance Standards Applicable Only to Underground Mining Operations.

15.1. Site Development.

15.1.a. Time Schedule for Site Excavation. The time schedule for site excavation shall be consistent with the approved preplan and shall provide for minimum exposure of disturbed area over a given time frame in a manner consistent with environmentally sound procedures. Regrading and stabilization of all areas disturbed in the development of the mine site shall proceed as contemporaneously as practicable. In any event, all required drainage system components and roads necessary for site construction shall be installed in accordance with the approved preplan prior to any disturbance for site development.

15.1.b. Temporary Storage of Overburden to be Used for Backfilling and Regrading. All material to be used in final regrading must be placed within the permit area as specified in the approved plan in a manner which will insure mass stability in accordance with this rule and revegetated to prevent erosion.

15.1.c. Temporary Revegetation. All topsoil and spoil storage areas which will be in place for more than six (6) months but less than one (1) year shall at a minimum be seeded and mulched so as to establish a satisfactory stand of temporary vegetative cover. This seeding and mulching must be done promptly.

15.1.d. Permanent Revegetation. All topsoil, spoil storage and other disturbed areas which will be in place for longer than one (1) year shall be mulched promptly, seeded, and/or planted during the first seeding season following disturbance so as to establish a satisfactory permanent vegetative cover. Trees shall be required only on those areas that:

15.1.d.1. Will not be redisturbed by future reclamation activities; or

15.1.d.2. Are necessary in order to meet the approved postmining land use.

15.1.e. Mine Site Organization and

Aesthetics. Indiscriminate dumping or discarding of materials, litter, junked equipment, containers, or other waste materials such as lubricants, paints, flammable liquids, garbage, lumber or other combustible material generated or used shall be prohibited. These materials shall be properly placed in areas specifically designated for their storage or disposal or removed from the area. Regrading and revegetation of the disposal areas shall be planned and carried out where possible in a manner which results in the covering or screening of offensive and unsightly areas.

15.1.f. Noncoal waste disposal sites shall:

15.1.f.1. Be designed and constructed so as not to degrade surface or ground waters;

15.1.f.2. Not be located within eight (8) feet of any coal outcrop or coal storage area;

15.1.f.3. Not be deposited in a refuse pile or impounding structure;

15.1.f.4. Be compacted; and

15.1.f.5. Be covered with at least two (2) feet of soil, stabilized, and revegetated after completion.

15.2. Backfilling and Regrading.

15.2.a. General. Spoil returned to the mined-out area shall be backfilled and graded to approximate original contour with all highwalls eliminated and a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and prevent slides.

15.2.b. Time Schedule for Regrading and Backfilling. Regrading and backfilling will be completed as contemporaneously as practicable with mining operations and as reflected on the approved mining and reclamation plan; provided, however, that reclamation activities shall be initiated within thirty (30) days, and final backfilling and regrading shall be initiated within one hundred eighty (180) days of completion of underground operations. Should particular site conditions or weather make adherence to these guidelines impractical, the period of time required to be current may be reasonably extended.

15.2.c. Revegetation. Revegetation shall be kept current by establishing a temporary or permanent vegetative cover on regraded areas by the end of the first growing season and a permanent vegetative cover by the end of the second growing season. Standards and procedures for establishing a satisfactory vegetative cover and guidelines for species selection and application rates are found in section 9 of this rule.

15.2.d. Variances From Highwall Elimination. All underground mining operations which were in existence and which created highwalls prior to August 3, 1977, and which highwalls were not reaffected, may not be required to eliminate the highwall if the operator can demonstrate that it is technologically infeasible, by virtue of the fact that there is an insufficient amount of spoil material within the proximity of the mine site. The operator shall utilize all available material to eliminate as much of the highwall as possible or to achieve highwall elimination. At a minimum, the operator shall be required to seal all underground openings and to cover the exposed coal seam with a minimum of four (4) feet of nonacid producing materials. This paragraph does not constitute a variance from the requirement for highwall elimination except on previously mined areas (prior to May 3, 1978) which would involve exposing one area of highwall completely eliminated during the installation of the deep mine in order to eliminate another area of highwall.

15.2.e. All underground mining operations which were in existence and which created a highwall prior to August 3, 1977, and which were reaffected by those operations during the remaining lives of their operations shall comply with the provisions of subsection 14.16 of this rule.

15.2.f. Rehandling of Excess Spoil Piles. Rehandling of settled and revegetated fills to achieve approximate original contour at the conclusion of underground mining activities shall

not be required if the following conditions are met:

15.2.f.1. The fill is not located so as to be detrimental to the environment or to the health and safety of the public and is compatible with the approved post mining land use;

15.2.f.2. Stability of the fill shall be demonstrated through standard geotechnical analysis to be consistent with the backfilling and grading requirements; and maintain a static safety factor of 1.3 on solid benches and 1.5 on slopes;

15.2.f.3. Surface runoff around, through, and from the fill is controlled by drainage structures (diversions, rock cores, etc.), which are designed and constructed in accordance with the approved plans and design specifications;

15.2.f.4. Any underground development wastes used in the fill are non-toxic and non-acid producing; and

15.2.f.5. The surface of the fill has been vegetated in accordance with section 9 of this rule.

15.3. In situ processing: Performance standards.

15.3.a. General. Any person who conducts in situ processing activities shall comply with the applicable performance standards of the Act, this rule, and the terms and conditions of a permit.

15.3.b. Protection of Hydrologic Balance. In situ processing activities shall be planned and conducted to minimize disturbance to the prevailing hydrologic balance by:

15.3.b.1. Avoiding discharge of fluids into holes or wells, other than as approved by the Secretary;

15.3.b.2. Injecting process recovery fluids only into geologic zones or intervals approved as production zones by the Secretary and in accordance with applicable State and Federal underground injection control regulations;

15.3.b.3. Avoiding annular injection between the wall of the drill hole and the casing; and

15.3.b.4. Preventing discharge of process fluid into surface waters.

15.3.c. Control of Toxics. Each person who conducts in situ processing activities shall submit for approval as part of the application for a permit a plan that ensures that all acid-forming, toxic-forming, or radioactive gases, solids, or liquids constituting a fire, health, safety, or environmental hazard and caused by the mining and recovery process are promptly treated, confined, or disposed of, in a manner that prevents contamination of ground and surface waters, damage to fish, wildlife and related environmental values, and threats to the public health and safety.

15.3.d. Process Recovery Fluids. Each person who conducts in situ processing activities shall prevent flow of the process recovery fluid:

15.3.d.1. Horizontally beyond the affected area identified in the permit; and

15.3.d.2. Vertically into overlying or underlying aquifers.

15.3.e. Restoration of Groundwater Quality. Each person who conducts in situ processing activities shall restore the quality of affected ground water in the permit area and adjacent area, including ground water above and below the production zone, to the approximate premining levels or better, to ensure that the potential for use of the ground water is not diminished.

15.4. In situ processing: Monitoring.

15.4.a. Monitoring Requirements. Each person who conducts in situ processing activities shall monitor the quality and quantity of surface and ground water and the subsurface flow and storage characteristics, in a manner approved by the Secretary, to measure changes in the quantity

and quality of water in surface and ground water systems in the permit area and in adjacent areas.

15.4.b. Water Quality Standards. Air and water quality monitoring shall be conducted in accordance with monitoring programs approved by the Secretary as necessary according to appropriate Federal and State air and water quality standards.

§38-2-16. Subsidence Control.

16.1. Public Notice.

16.1.a. Notification Requirements. A notification shall be distributed by mail to all owners of property and residents within the area above the underground workings. Each such person shall be notified by certified mail (return receipt requested) at least six (6) months prior to mining, or other time period if approved by the Secretary, beneath his or her property or residence. The return receipt shall be kept at the mine office. The notification shall contain, at a minimum:

16.1.a.1. Company name, permit number and address;

16.1.a.2. Identification of specific areas in which mining will take place and the date specific areas will be undermined;

16.1.a.3. Dates of mining activities that could cause subsidence and affect specific structures; and

16.1.a.4. The location or locations where the subsidence control plan may be examined.

16.2. Surface Owner Protection.

16.2.a. General. Each person who conducts underground mining activities shall either adopt measures consistent with known technology which prevent subsidence from causing material damage to the extent technologically and economically feasible, maximize mine stability, and maintain the value and reasonably foreseeable use of surface lands; or adopt mining technology which provides for planned subsidence in a predictable and controlled manner. Nothing in this part shall be construed to prohibit the standard method of room-and-pillar mining.

16.2.b. Plan Requirements. The operator shall comply with all provisions of the approved subsidence control plan prepared pursuant to subsection 3.12 of this rule.

16.2.c. Material Damage. Material damage in the context of this section and 3.12 of this rule means: any functional impairment of surface lands, features, structures or facilities; any physical change that has a significant adverse impact on the affected land's capability to support current or reasonably foreseeable uses or causes significant loss in production or income; or any significant change in the condition, appearance or utility of any structure from its pre-subsidence condition. The operator shall:

16.2.c.1. Correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence;

16.2.c.2. Either correct material damage resulting from subsidence caused to any structures or facilities by repairing the damage or compensate the owner of such structures or facilities in the full amount of the diminution in value resulting from the subsidence. Repair of damage includes rehabilitation, restoration, or replacement of damaged structures or facilities. Compensation may be accomplished by the purchase prior to mining of a non-cancellable premium-prepaid insurance policy. The requirements of this paragraph only apply to subsidence related damage caused by underground mining activities conducted after October 24,1992; and

16.2.c.3. Presumption of Causation. If alleged subsidence damage to any non-

commercial or residential dwellings and structures related thereto occurs as the result of earth movement within the area which a pre-subsidence structural survey is required, a rebuttable presumption exist that the underground mining operation caused the damage.

16.2.c.3.A. If the permittee was denied access to the land or property for the purpose of conducting the pre-subsidence survey, no presumption of causation will exist.

16.2.c.3.B. The presumption will be rebutted if, for example, the evidence establishes that: the damage predated the mining in question; the damage was proximately caused by some other factors or was not proximately caused by subsidence; or the damage occurred outside the surface area within which subsidence was actually caused by the mining in question.

16.2.c.3.C. In any determination whether damage to protected structures was caused by subsidence from underground mining, all relevant and reasonably available information will be considered by the Secretary.

16.2.c.4. Bonding for Subsidence Damage: The Secretary shall issue a notice to the permittee that subsidence related material damage has occurred to lands, structures, or water supply, and that the permittee has ninety (90) days from the date of notice to complete repairs or replacement. The Secretary may extend the ninety (90) day abatement period but such extension shall not exceed one (1) year from the date of the notice. Provided, however, the permittee demonstrates in writing, and the Secretary concurs that subsidence is not complete, that not all probable subsidence related matrial has occurred to lands or structures; or that not all reasonably anticipated changes have occurred affecting the water supply, and that it would be unreasonable to complete repairs or replacement within the ninety (90) day abatement period. If extended beyond ninety (90) days, as part of the remedial measures, the permittee shall post an escrow bond to cover the estimated costs of repairs to land or structures, or the estimated cost to replace water supply.

16.2.d. Protection of Public Buildings and Dams. Underground mining activities shall not be conducted beneath or adjacent to public buildings and facilities, churches, schools, hospitals, or impoundments with a storage capacity of, or bodies of water containing, twenty (20) acre-feet or more, unless the Secretary finds that mining will not cause material damage or reduce the foreseeable use. The Secretary may, if necessary to minimize the potential for damage, limit the percent of coal extraction underneath or adjacent to such features or facilities. If subsidence causes material damage to such features or facilities, the Secretary may suspend mining under or adjacent to such features or facilities until the subsidence control plan is modified.

16.2.e. Progress Maps. Updated maps of underground workings as required in W. Va. Code §22A-2-1 et seq. shall be made available to the Secretary for determining compliance with the subsidence control plans required in subsection 3.12 of this rule, and projected location of potential subsidence. The maps and accompanying descriptions, as appropriate, shall identify significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measures taken to prevent or minimize subsidence and related damage, areas of full extraction, and other information required by the Secretary. Upon request of the operator, information submitted with the detailed plan may be held as confidential.

§38-2-17. Small Operator Assistance Program.

17.1. General. This section comprises the Small Operator Assistance Program (SOAP) and governs the procedures for providing assistance to qualified small operators for the determination of the probable hydrologic consequences of mining and reclamation required by the Act and this rule, including the engineering analyses and designs; the development of cross-section maps and plans; the geologic drilling and statement of results of test borings and core samplings; preblast surveys; the collection of site-specific resource information and production of protection and enhancement

plans for fish and wildlife habitats and other environmental values; and the collection of archaeological and historical information; and any other archaeological and historical information required by the federal department of the interior and the preparation of plans that may be necessitated thereby; and the Secretary shall provide or assume the cost of training coal operators that meet the qualifications concerning the preparation of permit applications and compliance with the regulatory program, and shall ensure that qualified coal operators are aware of the assistance available under this section.

The Secretary will develop a procedure for the interstate coordination and exchange of information collected under the Small Operators Assistance Program.

Data collected under this program shall be made available to all interested persons in accordance with subsection 18.4 of this rule, except information related to the chemical and physical properties of coal; provided, that information which pertains only to the analysis of the chemical and physical properties of coal, except information regarding such mineral or elemental content which is potentially toxic to the environment, shall be kept confidential.

17.2. Program Services. Where a qualified small operator requests in writing assistance, as provided by the Small Operator Assistance Program, the Department of Environmental Protection shall select and pay a qualified laboratory to determine the probable hydrologic consequences of mining and reclamation operations in the permit and adjacent areas and potentially impacted offsite areas. The probable hydrologic consequences shall be in accordance with paragraphs (7), (8), (10), (11), (12), (13) and (16) through (19) subsection (a) section 9 of the Act, subdivision 3.22.a of this rule, and subsection 3.23 of this rule.

17.3. Eligibility for Assistance. Applicants are eligible for assistance if they:

17.3.a. Intend to apply for a permit pursuant to the Act; and

17.3.b. Establish that their probable total attributed annual coal production from all locations during any consecutive twelve (12) month period either during the term of the permit or during the first five (5) years after issuance of the permit, whichever period is shorter, will not exceed three hundred thousand (300,000) tons. Production from the following operations shall be attributed to the applicant:

17.3.b.1. The pro rata share, based upon percentage of ownership of applicant, of coal produced by operations in which the applicant owns more than a ten percent (10%) interest;

17.3.b.2. The pro rata share, based upon percentage of ownership of applicant, of coal produced in other operations by persons who own more than ten percent (10%) of the applicant's operation;

17.3.b.3. All coal produced by operations which are owned by members of the applicant's family and relatives unless there is no direct or indirect business relationship between or among them; and

17.3.b.4. All coal produced by operations owned or controlled by the applicant, or by persons who directly or indirectly control the applicant by reason of direction of management.

17.3.c. Persons who are prohibited from receiving a permit for any reason, and persons who organize or reorganize a company for the sole purpose of obtaining assistance from SOAP, shall be deemed ineligible.

17.4. Request for Assistance. Each applicant requesting assistance shall provide information on forms provided by the Secretary in an application that shall be clear and concise and shall be provided in a format prescribed by the Secretary and/or a format required by the Federal Office of Surface Mining Reclamation and Enforcement. Each application for assistance shall include the following information:

17.4.a. A statement of the operator's intent to file a permit application;

17.4.b. The names and addresses of:

17.4.b.1. The permit applicant; and

17.4.b.2. The operator if different from the applicant.

17.4.c. A schedule of the estimated total production of coal from the proposed permit area and all other locations from which production is attributed to the applicant. The schedule shall include for each location:

17.4.c.1. The operator or company name under which coal is or will be mined;

17.4.c.2. The permit number and Mine Safety and Health Administration (MSHA) number;

17.4.c.3. The actual coal production during the year preceding the year for which the applicant applies for assistance and production that may be attributed to the applicant; and

17.4.c.4. The estimated coal production and any production which may be attributed to the applicant for each year of the proposed permit.

17.4.d. A description of:

17.4.d.1. The proposed method of coal mining;

17.4.d.2. The anticipated starting and termination dates of mining operations;

17.4.d.3. The number of acres of land to be affected by the proposed mining operation; and

17.4.d.4. A general statement on the probable depth and thickness of the coal resource including a statement of reserves in the permit area and the method by which they were calculated.

17.4.e. A U.S. Geological Survey topographic map at a scale of 1:24,000 or larger or other topographic map of equivalent detail which clearly shows:

17.4.e.1. The area of land to be affected;

17.4.e.2. The location of any existing or proposed test borings; and

17.4.e.3. The location and extent of known workings of any underground mines.

17.4.f. Copies of documents which show that:

17.4.f.1. The applicant has a legal right to enter and commence mining within the permit area; and

17.4.f.2. A legal right of entry has been obtained for the program administrator and laboratory personnel to inspect the lands to be mined and adjacent areas to collect environmental data or to install necessary instruments.

17.5. Application Approval and Notice.

17.5.a. The applicant shall be notified in writing if the application requesting assistance has been approved or denied, and if denied, the reasons shall be attached.

17.5.b. If application requesting assistance has been approved, then one or more qualified laboratory or contractor will be selected to perform this work. A copy of the contract or other appropriate work order and the final report shall be provided to the applicant.

17.5.c. The applicant shall arrange for any necessary right-of-entry for State personnel and the selected laboratory's or contractor's personnel to gain access to data collection and monitoring sites on the proposed permit area and adjacent areas and shall provide written agreements of such to the Secretary prior to entry.

17.6. Qualified Laboratories.

17.6.a. General. A qualified laboratory

means a designated public agency, private consulting firm, institution, or analytical laboratory that can provide the required determination of a probable hydrologic consequences or statement of results of test borings or core samplings or other services as specified under the Small Operator Assistance Program and that is approved by the Department of Environmental Protection as a SOAP contractor.

17.6.b. Basic Qualifications. To qualify for designation, the laboratory or contractor must demonstrate that it:

17.6.b.1. Is staffed with experienced, professional personnel in the field of hydrology, mining engineering, aquatic biology, geology, or chemistry applicable to the work to be performed;

17.6.b.2. Is capable of collecting necessary field data and samples;

17.6.b.3. Has adequate space for material preparation, cleaning and sterilizing necessary equipment, stationary equipment, storage, and space to accommodate periods of peak work loads;

17.6.b.4. Meets the requirements of the Occupational Safety and Health Act or the equivalent state safety and health program;

17.6.b.5. Has the financial capability and business organization necessary to perform the work required;

17.6.b.6. Has analytical, monitoring and measuring equipment capable of meeting the applicable standards and methods contained in the most current edition of the Standard Methods for the Examination of Water and Waste Water; Methods for Chemical Analysis of Water and Wastes; and EPA Manual 600/2-78-054 Field and Laboratory Methods Applicable to Overburden Mine Soils; and

17.6.b.7. Has the capability of making hydrologic field measurements and analytical laboratory determinations by acceptable hydrologic engineering or analytical methods.

17.6.c. The qualified laboratory or contractor shall be capable of performing the determination and statement, and other components of work as described in the work directive given to the contractor by the Secretary which are required components necessary to make a determination of the proposed permit's probable hydrological consequences. Subcontractors may be used to provide the services required provided their use is defined in the application for designation and prior written approval is granted by the Department of Environmental Protection.

17.7. Liability of Operators.

17.7.a. The applicant shall reimburse the Department of Environmental Protection for the cost of the program services performed if the applicant:

17.7.a.1. Submits false information on the application;

17.7.a.2. Fails to submit a surface mining permit application within one (1) year from the date of receipt of the approved probable hydrologic consequences report;

17.7.a.3. Fails to mine after obtaining a surface mining permit;

17.7.a.4. Has an actual and attributed annual production of coal for all locations exceeding three hundred thousand (300,000) tons during the twelve (12) month period immediately following permit issuance; or

17.7.a.5. Sells, transfers, or assigns the permit to another person and the transferee's total actual and attributed production exceeds the 300,000 ton annual production limit during any consecutive twelve-(12) month period of the remaining term of the permit. Under this paragraph, the applicant and its successor are jointly and severally obligated to reimburse the Secretary.

17.7.b. The Secretary can waive the

reimbursement obligation if he finds that the applicant at all times acted in good faith and the applicant submits to the Secretary written statements which sufficiently demonstrate that the applicant has acted in good faith at all times.

§38-2-18. Citizen's Actions.

18.1. Notice of Citizen's Suits. A person who intends to initiate a civil action on his own behalf under section 25 of the Act shall give notice of intent in accordance with the following:

18.1.a. Notice shall, in all cases, be given by certified mail to the Secretary. A copy of the notice shall also be sent by first class mail to the Office of Surface Mining Field Office Secretary;

18.1.b. In legal actions brought against any person, the State of West Virginia or any other governmental instrumentality, agency or agent thereof, notice shall be given by certified mail to the alleged violator, if the complaint alleges a violation of the Act or any regulation, order or permit issued under the Act;

18.1.c. Service of notice under this section is complete upon mailing to the last known address of the person being notified;

18.1.d. A person giving notice regarding an alleged violation shall state to the extent known:

18.1.d.1. Sufficient information to identify the provision of the Act, regulation or permit allegedly violated;

18.1.d.2. The act or omission alleged to constitute a violation;

18.1.d.3. The name, address and telephone numbers of the person or persons responsible for the alleged violation;

18.1.d.4. The date, time and location of the alleged violation(s);

18.1.d.5. The name, address and telephone number of the person giving notice; and

18.1.d.6. The name, address and telephone number of legal counsel, if any.

18.1.e. A person giving notice of an alleged failure by the Secretary, reclamation board of review, or appropriate Department employee, to perform a mandatory act or duty under the Act, shall state to the extent known:

18.1.e.1. The provision of the Act containing the mandatory act or duty allegedly not performed;

18.1.e.2. Sufficient information to identify the omission alleged to constitute the failure to perform a mandatory act or duty under the Act;

18.1.e.3. The name, address and telephone number of the person giving notice; and

18.1.e.4. The name, address and telephone number of legal counsel, if any, of the person giving notice.

18.2. Citizen's Request for State Inspections.

18.2.a. Any person may request a State inspection by furnishing to the Secretary a signed, written statement (or an oral report followed by a signed, written statement) giving the Secretary reason to believe that a violation exists or that a condition or practice which creates an imminent danger to the health or safety of the public or is causing or can reasonably be expected to cause a significant, imminent environmental harm to land, air, or water resources exists. The statement shall contain a phone number and address where the person can be contacted.

18.2.b. The identity of any person supplying information to the Secretary relating to a possible violation or imminent danger or harm shall remain confidential, if requested by that person, unless that person elects to accompany the inspector on the inspection.

18.2.c. If an inspection is conducted as a result of information provided to the Secretary by

a person as described in subdivision 18.2.a of this subsection, the person shall be notified as far in advance as practicable when the inspection is to occur and shall be allowed to accompany the State inspector during the inspection. Such person has a right of entry to, upon and through the coal exploration or surface coal mining and reclamation operation about which he or she supplied information, but only if he or she is in the presence of and is under the control, direction and supervision of a State inspector while on the mine property. Such right of entry does not include a right to enter buildings without consent of the person in control of the buildings or without a search warrant.

18.2.d. Within ten (10) days of the inspection or, if there is no inspection within fifteen (15) days of receipt of the person's written statement, the Secretary shall respond in writing as follows:

18.2.d.1. If an inspection was made, a description of the enforcement action taken, which may consist of copies of the State inspection report and all notices of violation and cessation orders;

18.2.d.2. If no state inspection was conducted or enforcement action taken, an explanation of the reason why;

18.2.d.3. An explanation of the person's right to informal review of the action or inaction of the Secretary; and

18.2.d.4. Copies of all materials in paragraphs 18.2.d.1 and 18.2.d.2. of this subdivision within the time limits specified to the person alleged to be in violation, except that the name of the person shall be removed unless disclosure of the person's identity is permitted under subdivision 18.2.b of this subsection.

18.2.e. Any person who is or may be adversely affected by a prospecting or surface coal mining operation may notify the Secretary in writing of any alleged failure to make adequate and complete inspections as required by law and regulation. The notification shall include sufficient information to create a reasonable belief that the law and regulations regarding inspections are not being complied with and to demonstrate how the person is or may be adversely affected. The Secretary shall, within fifteen (15) days of receipt of the notice, determine whether or not the statutes or rules concerning inspections are being complied with and if not, shall order an inspection. The Secretary shall furnish the complainant with a written decision of the reasons for his determination and actions, if any, he has taken.

18.3. Review of Decision Not to Inspect or Enforce.

18.3.a. Any person who is or may be adversely affected by a surface coal mining or prospecting operation may ask the Secretary to informally review an authorized representative's decision not to inspect or take appropriate enforcement action with respect to any violation alleged by that person in a request for inspection under section 15 of the Act. The request for review shall be in writing and shall include a statement of how the person is or may be adversely affected and why the decision merits review. The Secretary shall conduct the review within thirty (30) days of his receipt of the request and inform the person of the results. The person alleged to be in violation shall be given a copy of the results of the review, except that the name of the person who is or may be adversely affected by a prospecting or surface mining operation shall not be disclosed unless confidentiality has been waived or disclosure is required under the Freedom of Information Act or other State or Federal laws.

18.3.b. Any person who is or may be adversely affected by the decision of the Secretary may appeal such decision to the Surface Mine Board pursuant to W. Va. Code §22B-4-2.

18.3.c. Informal review under this section shall not affect any right to formal review or to a citizen's suit.

18.4. Public Record.

18.4.a. Availability of public records

shall be in accordance with W. Va. Code §29B-1-1 et. seq. Copies of all records, reports, inspection materials or information obtained under the Act, except information in subdivisions 18.2.b and 18.2.c of this subsection, shall be made immediately available to the public at regional offices in the area of mining so that they are conveniently available. Such information shall include copies of all documents relating to applications for and approvals of existing, new or revised prospecting approvals or surface coal mining and reclamation permits, including the revision, renewal, transfer, assignment or sale thereof, and all documents relating to inspection and enforcement actions.

18.4.b. All records will be maintained and preserved for a period of not less than five (5) years. Relative to prospecting approvals and surface mining permits, the five-year period applies after final bond release.

18.4.c. Information as to coal seams, test borings, core samplings or soil samples pertaining to the analysis of the chemical and physical properties of the coal, except information regarding mineral or element content which is potentially toxic to the environment, shall be kept confidential and shall not be made a matter of public record.

18.4.d. Information on the nature and location of archaeological resources shall be kept confidential to the extent required by the Archaeological Resources Protection Act of 1979.

18.4.e. Permit applications and other related materials requiring public notices shall be made immediately available in the county courthouse or other available public office approved by the Secretary, in the county in which the proposed mining operation is located.

18.4.f. The Secretary shall provide procedures, including notice and opportunity to be heard for persons both seeking and opposing disclosure, to ensure confidentiality of qualified confidential information, which shall be clearly identified by the applicant and submitted separately from the remainder of the application. Confidential information is limited to that information identified in paragraph 3.23.f.1 of this rule, subdivisions 18.2.b and 18.2.c. of this subsection, and information relating to the nature and location of archeological resources on public land as required under the Archeological Resources Protection Act of 1979.

§38-2-19. Designation of Areas Unsuitable for Mining.

19.1. Right to Petition.

19.1.a. Any person having an interest which is or may be adversely affected, or the Secretary, has the right to petition to have an area designated as unsuitable for surface coal mining operations, or to have an existing designation terminated. Such petition shall be filed in the Office of the Secretary.

19.1.b. Designation. The petitioner shall provide the following information:

19.1.b.1. A U.S.G.S. topographic map on which is noted the location and size of the area covered by the petition;

19.1.b.2. Allegations of facts and supporting evidence which would tend to establish that the area is unsuitable for all or certain types of surface coal mining operations;

19.1.b.3. A description of how mining of the area has affected or may adversely affect people, land, air, water or other resources;

19.1.b.4. The petitioner's name, notarized signature, address and telephone number; and

19.1.b.5. A statement which identifies the petitioner's interest which is or may be adversely affected, including how the petitioner meets an "injury in fact" test by describing the injury to his or her specific affected interests and demonstrates how he or she is among the injured.

19.1.c. Termination of the Designation. A petitioner requesting to terminate a designation

shall provide the following information:

19.1.c.1. A U.S.G.S. topographic map on which is noted the location and size of the area covered by the petition;

19.1.c.2. Allegations of facts with supporting evidence not contained in the record of the proceeding in which the area was designated unsuitable, which would tend to establish the statements or allegations, and which statements or allegations indicate that the designation should be terminated based on:

19.1.c.2.A. The nature or abundance of the protected resource or condition or other basis of the designation if the designation was based on criteria found in subdivision 19.7.b of this subsection;

19.1.c.2.B. Reclamation now being technologically and economically feasible, if the designation was based on the criteria found in subdivision 19.7.a of this section; or

19.1.c.2.C. The resources or condition not being affected by surface coal mining operations, or in the case of land use plans, not being incompatible with surface coal mining operations during and after mining, if the designation was based on the criteria found in subdivision 19.7.b of this section.

19.1.c.3. The petitioner's name, notarized signature, address and telephone number;

19.1.c.4. A statement which identifies the petitioner's interest which is or may be adversely affected by the continuation of the designation including how the petitioner meets an "injury in fact" test by describing the injury to his or her specific affected interests and demonstrating how he or she is among the injured; and

19.1.c.5. For areas previously and unsuccessfully proposed for termination, significantly new allegations of facts and supporting evidence must be presented in the petition.

19.2. Initial Processing, Record-keeping, and Notification Requirements.

19.2.a. Within thirty (30) days of receipt of a petition, the Secretary shall notify the petitioner by certified mail whether or not the petition is complete in accordance with subdivision 19.1.b, or 19.1.c of this subsection.

19.2.b. The Secretary shall determine whether any identified coal resources exist in the area covered by the petition, without requiring any showing from the petitioner. If the Secretary finds there are not any identified coal resources in that area, he shall return the petition to the petitioner with a statement of the findings.

19.2.c. The Secretary may reject petitions for designations or terminations of designations which are frivolous. Each petitioner must, at a minimum, satisfy the requirements of subdivisions 19.1.b or 19.1.c of this subsection. No party shall bear any burden of proof, and each accepted petition shall be considered and acted upon by the Secretary pursuant to the procedures of this section.

19.2.d. When considering a petition for an area which was previously and unsuccessfully proposed for designation, the Secretary shall determine if the new petition presents new allegations of facts. If the petition does not contain new allegations of facts, the Secretary shall not consider the petition and shall return the petition to the petitioner, with a statement of its findings and a reference to the record of the previous designation proceedings where the facts were considered.

19.2.e. If the Secretary determines that the petition is incomplete or frivolous, he shall return the petition to the petitioner, with a written statement of the reasons for the determination and the categories of information needed to make the petition complete.

19.2.f. The Secretary shall notify the person who submits a petition of any application

for a permit received which proposes to include any area covered by the petition.

19.2.g. Any petitions received after the first advertisement has been published on a permit application relating to the same mine plan area shall not prevent the Secretary from issuing a decision on that permit application. The Secretary may return any petition received thereafter to the petitioner with a statement why the petition cannot be considered. For the purposes of this section, close of the public comment period shall mean at the close of any informal conference or if no conference is requested, at the close of the period for filing written comments and objections.

19.2.h. Promptly after a petition is received, the Secretary shall notify the general public of the receipt of the petition by a conspicuous newspaper advertisement placed in the locale of the area covered by the petition, in the newspaper providing broadest circulation in the region of the petitioned area, and in the State Register. The Secretary shall also make copies of the petition available to the public and provide copies of the petition to other interested governmental agencies, interveners, persons with an ownership interest of record in the property, and other persons known to the Secretary to have an interest in the property. Notice to those persons with ownership interests in the property of record shall be in accordance with applicable State law.

19.2.i. Within three (3) weeks after the determination that a petition is complete, the Secretary shall make copies of the petition available to the public and other agencies and shall notify the general public of the receipt of the petition and request submissions of relevant information by a newspaper advertisement placed once a week for two (2) consecutive weeks in the locale of the area covered by the petition in the newspaper of largest circulation in the State and in any Official State register of public notices.

19.2.j. Until three (3) days before the Secretary holds a hearing under subsection 19.3 of this section, any person may intervene in the proceeding by filing allegations of facts, supporting evidence, a short statement identifying the petition to which the allegations pertain and the intervener's name, address, and telephone number.

19.2.k. Beginning immediately after a petition is filed, the Secretary shall compile and maintain a record consisting of the petition and all documents relating to the petition filed with or prepared by the Department of Environmental Protection. The Secretary shall make the record available for public inspection, free of charge, and copying, at reasonable cost, during all normal business hours at a central location of the county or multi-county area in which the land petitioned is located, and at the main office of the Department of Environmental Protection.

19.3. Hearing Requirements.

19.3.a. Within ten (10) months after receipt of a complete petition, the Secretary shall hold a public hearing in the locality of the area covered by the petition. If all petitioners and interveners agree, the hearing need not be held. The Secretary shall make a verbatim transcript of the hearing.

19.3.b. Not less than thirty (30) days prior to a hearing, the Secretary shall give notice by certified mail of the date, time, and location of the hearing to:

19.3.b.1. Local, State, and Federal agencies which may have an interest in the decision on the petition;

19.3.b.2. The petitioner and the interveners; and

19.3.b.3. Any person with an ownership or other interest known to the Secretary in the area covered by the petition.

19.3.c. The Secretary shall notify the general public of the date, time and location of the hearing by placing a conspicuous newspaper advertisement once a week for two (2) consecutive weeks in the locale of the area covered by the petition and once during the week prior to the scheduled date of the public hearing. The

consecutive weekly advertisement must begin between four (4) and five (5) weeks before the scheduled date of the public hearing.

19.3.d. The Secretary may consolidate in a single hearing the hearings required for each of several petitions which relate to areas in the same locale.

19.3.e. Prior to designating any land areas as unsuitable for surface coal mining operations, the Secretary shall prepare a detailed statement, using existing and available information, on the potential coal resources of the area, the demand for coal resources and the impact of such designation on the environment, the economy and the supply of coal.

19.3.f. In the event that all petitioners and interveners stipulate agreement prior to the hearing, the petition may be withdrawn from consideration.

19.4. Decision.

19.4.a. In reaching a decision, the Secretary shall use:

19.4.a.1. The relevant information contained in the data base and inventory system;

19.4.a.2. Information provided through public comment or by other governmental agencies;

19.4.a.3. The detailed statement prepared under subdivision 19.3.e of this subsection; and

19.4.a.4. Any other relevant information submitted during the comment period.

19.4.b. A final written decision shall be issued by the Secretary including a statement of reasons, within sixty (60) days of completion of the public hearing, or if no public hearing is held, then within twelve (12) months after receipt of the complete petition. The Secretary shall simultaneously send the decision by certified mail to the petitioner, every other party to the proceeding, and to the Field Office Secretary of the Office of Surface Mining.

19.4.c. The decision of the Secretary with respect to a petition, or the Secretary's failure to act within the time limits set forth herein shall be subject to judicial review by a court of competent jurisdiction in accordance with State law.

19.5. Data Base and Inventory System Requirements.

19.5.a. The Secretary shall develop a data base and inventory system which will permit evaluation of whether reclamation is feasible in areas covered by petitions.

19.5.b. The Secretary shall include in the system information relevant to the criteria in subdivision 19.7.b of this subsection, including but not limited to, information received from the United States Fish and Wildlife Service, the State Historic Preservation Officer and the Air Pollution Control Commission.

19.5.c. The Secretary shall add to the data base and inventory system information:

19.5.c.1. On potential coal resources of the State, demand for those resources, the environment, the economy and the supply of coal, sufficient to enable the Secretary to prepare the statements required by subdivision 19.3.e of this section; and

19.5.c.2. That which becomes available from petitions, publications, experiments, permit applications, mining and reclamation operations and other sources.

19.6. Public Information. The Secretary shall:

19.6.a. Make the information and data base system developed available to the public for inspection free of charge and for copying at a reasonable cost except that areas proposed for or included in the National Register of Historic Places may not be disclosed if the Secretary

determines that such disclosure might risk destruction or harm to these resources.

19.6.b. Provide information to the public on the petition procedures necessary to have an area designated as unsuitable for all or certain types of surface coal mining operations or to have designations terminated and describe how the inventory and data base system can be used.

19.7. Criteria for Designating Lands as Unsuitable.

19.7.a. Upon petition, an area shall be designated as unsuitable for all or certain types of surface mining operations, if the Secretary determines that reclamation is not technologically or economically feasible under the Act and this rule.

19.7.b. Upon petition, an area may be (but is not required to be) designated as unsuitable for all or certain types of surface mining operations, if the operations will:

19.7.b.1. Be incompatible with existing State or local land use plans or programs;

19.7.b.2. Affect fragile or historic lands in which the operations could result in significant damage to important historic, cultural, scientific or aesthetic values or natural systems;

19.7.b.3. Affect renewable resource lands in which the operations could result in a substantial loss or reduction of long range productivity of water supply or of food or fiber products (For the purposes of this section, the term "renewable resource lands" means geographical areas which contribute significantly to the long range productivity of a water supply, or food or fiber products); or

19.7.b.4. Affect natural hazard lands in which the operations could substantially endanger life and property. Such lands include areas subject to frequent flooding and areas of unstable geology.

19.8. Secretary's Responsibility for Implementation.

19.8.a. The Secretary shall not issue permits which are inconsistent with designations made pursuant to section 22 of the Act.

19.8.b. The Secretary shall maintain a cumulative map of areas designated as unsuitable for all or certain types of surface coal mining operations.

19.8.c. The Secretary shall make available to any person any information within his control regarding designations, including mineral or elemental content which is potentially toxic in the environment but excepting proprietary information on the chemical and physical properties of the coal.

19.9. Land Exempt From Designation as Unsuitable for Surface Coal Mining Operations.

19.9.a. The requirements of this section do not apply to:

19.9.a.1. Lands on which surface coal mining operations were being conducted prior to August 3, 1977;

19.9.a.2. Lands covered by a permit issued after August 3, 1977; and

19.9.a.3. Lands where substantial legal and financial commitments in surface coal mining operations were in existence prior to January 4, 1977.

§38-2-20. Inspection and Enforcement.

In addition to the requirements set forth in section 15, 16, and 17 of the Act, the following requirements shall be met.

20.1. Inspection Frequencies.

20.1.a. Scheduling. In addition to the requirements of subsection (a) of section 15 of the Act, the Secretary shall have a right of entry to, upon, and through any prospecting operation or surface coal mining and reclamation operation

without advance notice upon presentation of appropriate credentials. No search warrant shall be required, except with respect to entry into a building. The Secretary shall conduct:

20.1.a.1. An average of at least one partial inspection per month of each active surface mining operation.

20.1.a.2. One complete inspection per calendar quarter of each active and inactive surface mining operation. An inactive operation is one which has requested and received approval to temporarily cease operations as provided in subsection 14.11 of this rule, or one that has been granted Phase I bond release, and the revegetation on the surface coal mining and reclamation operation has been successfully established at the end of the first growing season with a minimum ground cover of sixty (60%) percent and the operation is in compliance with the requirements set by subparagraph (B), paragraph 10, subsection (b) of section 13 of the Act or until soil productivity for prime farmlands has returned to the equivalent levels of yield as nonmined land of the same soil type in the surrounding area under equivalent management practices as determined by the soil survey performed pursuant to paragraph (15) subsection (a) of section 9 of the Act and subsection 10.3 and section 10 of this rule.

20.1.a.3. Prospecting operations shall be inspected as necessary to assure compliance with the Act and this rule.

20.1.a.4. At least one partial inspection monthly and one complete inspection quarterly for each prospecting operation for which approval has been granted for coal removal in excess of 250 tons.

20.1.a.5. More frequent inspections shall be made on any prospecting, active surface mining operation, or inactive surface mining operation as necessary to assure compliance with the Act, this rule, and the terms and conditions of the permit.

20.1.b. Partial Inspection. For purposes of this section, a partial inspection is an on-site or aerial review of a person's compliance with some of the provisions of the Act, this rule, and the terms and conditions of the permit.

20.1.c. Complete Inspection. For purposes of this section, a complete inspection is an on-site review of a person's compliance with all the provisions of the Act, this rule, and the terms and conditions of the permit within the entire area disturbed or affected by the surface coal mining and reclamation operations.

20.1.d. Aerial Inspection. Aerial inspections shall be conducted in a manner which reasonably insures the identification and documentation of conditions at each surface coal mining and reclamation site inspected.

Any potential violation observed during an aerial inspection shall be investigated on-site within three days: provided, that any indication of a condition, practice or violation constituting cause for the issuance of a cessation order shall be investigated on-site immediately. An on-site investigation of a potential violation observed during an aerial inspection shall not be considered to be an additional partial or complete inspection for the purposes of subdivision 20.1.a of this subsection.

20.1.e. A permittee may request an on-site compliance conference to review the status of any condition or practice at any surface coal mining and reclamation operation. Any compliance conference shall not constitute an inspection within the meaning of W. Va. Code §22-3-15 and this section. The Secretary may accept or refuse any request to conduct a compliance conference. If accepted, authorized representative of the Secretary shall conduct the compliance conference and shall review conditions and/or practices at the operation in order to advise whether any conditions and/or practices has a potential to become a violation of the Act of any applicable permit condition. Neither the holding of a compliance conference or any opinion given by the authorized representative of the Secretary at a conference shall affect:

20.1.e.1. Any rights or obligations of

the Secretary or by the permittee with respect to any inspection, notice of violation, or cessation order, whether prior or subsequent to the compliance conference; or

20.1.e.2. The validity of any notice of violation or cessation order issued with any condition or practice reviewed at the compliance conference.

20.2. Notice of Violations.

20.2.a. When, on the basis of an inspection carried out pursuant to subsection 20.1 of this section, the Secretary determines that the surface mining and reclamation operation or prospecting operation is in violation of any of the requirements of the Act, this rule, and the terms and conditions of the permit or prospecting approval, a notice of violation shall be issued. Such notice of violation shall comply with all requirements and provisions of this subsection.

20.2.b. Notice Procedures. A notice of violation shall be in writing signed by the Secretary and shall set forth with reasonable specificity:

20.2.b.1. The nature of the violation;

20.2.b.2. The remedial action required, which may include interim steps;

20.2.b.3. A reasonable time for abatement, which may include time for accomplishment of interim steps, but in no case shall the initial abatement period be in excess of thirty (30) days; and

20.2.b.4. A reasonable description of the portion of the prospecting or surface coal mining and reclamation operation to which it applies.

20.2.c. Abatement. The Secretary may extend the time set for abatement or for accomplishment of an interim step, if the failure to meet the time previously set was not caused by lack of diligence on the part of the operator. The total time for abatement under a notice of violation, including all extensions, shall not exceed 90 days from the date of issuance, except upon a showing by the operator that it is not feasible to abate the violation within 90 calendar days due to one or more of the circumstances in subdivision 20.2.e of this subsection. An extended abatement date pursuant to this subsection shall not be granted when the operator's failure to abate within 90 days has been caused by a lack of diligence or intentional delay by the operator in completing the required remedial action.

20.2.d. Termination. The Secretary shall terminate a notice of violation by written notice to the permittee when he determines that all violations listed in the notice of violation have been abated. Notices of violations shall not be terminated or vacated because of the operator's inability to comply with the terms of abatement.

20.2.e. Criteria for Extensions of Abatement Period. Circumstances which may qualify an operator for an abatement period of more than 90 days are:

20.2.e.1. Where the operator of a permitted operation has made timely application for and diligently pursued a permit renewal or other necessary approval of designs or plans but such permit renewal or other approval has not been or will not be issued within 90 days after the time required for reasons not within the control of the operator;

20.2.e.2. Where there is a valid judicial order precluding abatement within 90 days as to which the operator has diligently pursued all rights of appeal and as to which there is no other effective legal remedy;

20.2.e.3. Where the operator cannot abate within 90 days due to a labor strike;

20.2.e.4. Where climatic conditions preclude abatement within 90 days, or where, due to climatic conditions, abatement within 90 days clearly would cause more environmental harm than it would prevent; or

20.2.e.5. Where abatement within 90 days requires action that would violate safety standards established by statute or regulation under the Mine Health and Safety Act of 1977.

20.2.f. Interim Procedures. Whenever an abatement time in excess of 90 days is permitted, interim abatement measures shall be imposed to the extent necessary to minimize harm to the public or the environment.

20.2.g. Grant of Extension. If any of the conditions in subdivision 20.2.e of this subsection exist, the operator may request that the Secretary grant an abatement period exceeding 90 days. An authorized representative of the Secretary shall grant the extension only with the concurrence of his immediate supervisor. The abatement period granted shall not exceed the shortest possible time necessary to abate the violation. The operator shall have the burden of establishing by clear and convincing proof that he is entitled to an extension. The authorized representative of the Secretary who grants or denies the extension shall promptly and fully document in the file the reasons for granting or denying the request. The immediate supervisor shall review this document before concurring in or disapproving the extended abatement date and shall promptly and fully document the reasons for concurrence or disapproval in the file.

20.2.h. Appeals. Any determination made under subdivision 20.2.g of this subsection shall carry with it a right of appeal.

20.2.i. Extension Period. No extension granted under subdivision 20.2.g of this subsection may exceed 90 days in length. Where the condition or circumstance which prevented abatement within 90 days exists at the expiration date of any such extension, the operator may request and the Secretary may grant a further extension pursuant to the procedures of subdivision 20.2.g of this subsection.

20.3. Cessation Orders.

20.3.a. Imminent Harm.

20.3.a.1. When the Secretary finds that a prospecting or surface mine operation creates an imminent danger to the health or safety of the public or is causing or can reasonably be expected to cause significant, imminent environmental harm to land, air, or water resources, a cessation order shall be issued forthwith.

20.3.a.2. Any cessation order issued under the provisions of subsection (a) of section 16 of the Act, shall remain in effect until the violation has been abated or until modified, vacated, or terminated by the Secretary or the Surface Mine Board or by a court.

20.3.a.3. In any cessation order, the Secretary shall determine the appropriate remedial measures to be taken to abate the violation in the most expeditious manner possible and shall set forth these measures and the time by which abatement shall be accomplished in the order.

20.3.a.4. Mining operations conducted by any person without a valid surface mining permit, or approval for prospecting, constitute a condition or practice which causes or can reasonably be expected to cause significant, imminent environmental harm to land, air, or water resources, unless such operations are an integral, uninterrupted extension of previously permitted operations, and the person conducting such operations has filed a timely and complete application for a permit or approval to conduct such operations.

20.3.b. Failure to Abate.

20.3.b.1. If the operator fails to meet the time set for abatement of a notice of violation issued pursuant to subsection 20.2 of this section, the Secretary shall issue a cessation order; or

20.3.b.2. If the operator fails to meet the time set for accomplishment of any interim step of a notice of violation issued pursuant to subsection 20.2 of this section, the Secretary may issue a cessation order.

20.3.c. All cessation orders shall be

issued as follows:

20.3.c.1. A cessation order shall set forth in writing with reasonable specificity:

20.3.c.1.A. The nature of the condition, practice or violation for which the order was issued;

20.3.c.1.B. The remedial action or affirmative obligation required by the operator, if any, including any interim steps;

20.3.c.1.C. The time established for abatement, if appropriate; and

20.3.c.1.D. A reasonable description of the portion of the prospecting or surface mining and reclamation operation to which it applies.

20.3.c.2. Reclamation operations and other activities intended to protect public health and safety and the environment shall continue during the period of any cessation order unless otherwise provided in the order.

20.3.c.3. The Secretary may modify, terminate or vacate a cessation order for good cause, and may extend the time for abatement if the failure to abate within the time previously set was not caused by lack of diligence on the part of the operator. A cessation order shall not be terminated or vacated because of the operator's inability to comply with the terms of abatement.

20.3.c.4. The Secretary shall terminate a cessation order by written notice when it is determined that all conditions, practices, or violations listed in the order have been abated. The termination notice must be in writing and shall not affect the right of the Secretary to assess civil penalties for the violation.

20.3.d. Notice of Informal Conference. Notices of informal conferences held as a result of a cessation order issued pursuant to the provisions of subsection (a), section 16 of the Act shall be posted at the nearest regional office and sent by mail or communicated verbally, whichever is more practicable, to any person who filed a report which led to a cessation order for which the informal conference is to be held. The results of the informal conference shall be provided to any person who filed a report which led to the order within five (5) days after the close of the informal conference.

20.3.e. Within sixty (60) days after issuing a cessation order, the Secretary shall notify in writing any person identified as owning or controlling the permittee, that the cessation order was issued and that the person has been identified as an owner or controller.

20.4. Show Cause Orders.

20.4.a. General. Where the Secretary determines that a pattern of violations of the Act, this rule or the terms and conditions of a permit exists or has existed, and that the violations were caused willfully or through an unwarranted failure to comply, the Secretary shall issue an order requiring the permittee to show cause why the permit and the permittee's right to mine under the Act should not be suspended or revoked. For purposes of this subsection a willfully caused violation is a violation resulting from an intentional act or omission, and an unwarranted failure to comply means the failure of the permittee to prevent the occurrence of any violation or the failure to abate any violation of the Act, this rule, or the terms and conditions of the permit due to indifference, lack of diligence or lack of reasonable care.

20.4.b. Criteria for Establishing a Pattern of Violations. The Secretary may determine that a pattern of violations exists or has existed, where violations were cited on two or more inspections of the permit area within any twelve (12) month period. In making such a determination, the Secretary shall take into consideration the following circumstances:

20.4.b.1. The number of previous violations cited on more than one occasion for the same or related requirements of the Act, this rule, or the terms and conditions of the permit;

20.4.b.2. The number of previous violations, cited on more than one occasion, of different requirements of the Act, this rule, or the terms and conditions of the permit; and

20.4.b.3. The extent to which the violations were isolated departures from lawful conduct.

20.4.c. Duplicate or Similar Violations. The Secretary shall promptly review the history of violations of any permittee who has been cited for violations of the same or related requirements of the Act, this rule, or the terms and conditions of the permit during three (3) or more inspections of the permit area within any twelve (12) month period. After such review, the Secretary shall determine whether or not a pattern of violations exists.

20.4.d. Permittee Responsibility. Violations by any persons conducting surface coal mining operations on behalf of the permittee shall be attributed to the permittee, unless the permittee establishes that they were acts of deliberate sabotage.

20.4.e. Hearings and Appeals. If the permittee files an answer to the show cause order and requests a hearing, a public hearing shall be held. The Secretary shall give thirty (30) days advance written notice to the permittee and any interested party who requests intervener status of the date, time, and place of the hearing. The Secretary shall publish the notice if practicable, in a newspaper of general circulation in the area of the operations, and shall also post the notice in the regional office of the Department of Environmental Protection nearest the operation.

20.4.f. Consent Agreement. When the permittee demonstrates that sufficient resources are available to him to abate the violation(s), the Secretary may enter into a consent agreement.

20.4.g. Hearing Record and Decisions. Within sixty (60) days following the hearing, the Secretary shall issue a written determination as to whether a pattern of violations exists, and furnish to the operator and all other parties to the hearing a written decision or consent order and the reason therefore, concerning suspension or revocation of the permit.

20.4.h. Revocation and Suspension. If the Secretary revokes or suspends the permit and the permittees right to mine under the Act, the permittee shall immediately cease surface coal mining operations in the subject permit area, and initiate the appropriate remedial action as follows:

20.4.h.1. If the permit and the right to mine under the Act are revoked, the operator shall complete reclamation within the time specified in the revocation order; or

20.4.h.2. If the permit and right to mine under the Act are suspended, the operator shall complete all affirmative obligations to abate all conditions, practices, or violations, as specified in the suspension order.

20.4.i. Failure to Abate. Whenever a permittee fails to abate a violation contained in a notice of violation or cessation order within the abatement period set in the notice or order or as subsequently extended, the Secretary shall review the permittee's history of violations to determine whether a pattern of violations exists and shall issue an order to show cause where appropriate.

20.4.j. Consent Agreement. If, at any point in the enforcement process following the issuance of a notice of violation, a cessation order or a show cause order, a consent agreement is reached between the Secretary and a permittee and/or operator, the following standards shall apply to that consent order:

20.4.j.1. The Secretary will require all abatement work mandated in the consent agreement to be performed in the most expeditious manner physically possible. In no event shall the time period in which remedial action must be completed exceed one (1) year, nor can extensions to abatement times in consent orders total more than one year; provided however, that for sites permitted before September 5, 1989, the Secretary may grant a future extension if he finds in writing that exceptional circumstances exist which

preclude abatement in the twelve-month period.

20.4.j.2. Violation of any term in a consent agreement shall result in immediate forfeiture of the bond for the site, unless the Secretary finds in writing that:

20.4.j.2.A. The operator and/or permittee have shown good faith in taking remedial actions required by the consent agreement; and

20.4.j.2.B. No environmental harm has resulted, or will result, from the subject violation.

20.4.j.3. No consent agreement shall be agreed to if the permittee, and/or operator or any entity owned or controlled by the permittee and/or the operator, has violated or is in violation of a previous consent agreement; provided however, that the Secretary is required to make only best efforts to determine if said violation or ownership and control ties exist.

20.4.j.4. No consent agreement can be reached on a site if the permittee and/or operator have previously entered into two consent orders on the same site.

The standards set forth in 1. through 4. above shall apply to any extension, modification, or other change in any existing consent agreement.

20.5. Civil Penalty Determinations.

20.5.a. Notice of Violation Assessments. The Secretary shall review each notice of violation and determine whether or not a civil penalty will be assessed and the amount of the penalty. The Secretary for each notice of violation, may assess a separate civil penalty for each day of the violation, beginning with the date of issuance of a notice of violation to the date of abatement of the violation. In determining whether or not to assess a separate daily civil penalty and determine the amount of the civil penalty, the Secretary shall consider those factors specified in subsection (c), section 17, of the Act, and subsection 20.7 of this rule and may consider the extent to which the operator may have gained any economic benefit as a result of a failure to comply. Any notice of violation which continued unabated for two or more days after the initial abatement period, and received a civil penalty assessment of $3,500 or more, shall be assessed the penalty amount for a minimum of two separate days. The determination as to whether or not to assess a civil penalty if the amount is less than one thousand dollars ($1,000) will be at the discretion of the Secretary. Notices of violations with a seriousness rating of 4 or greater shall be assessed regardless of the amount. Termination of a notice of violation shall not affect the right of the Secretary to assess a civil penalty for those violations.

20.5.b. Cessation Order Assessments. The Secretary shall, for any cessation order, assess a civil penalty in accordance with subsection (a), section 17, of the Act for each day of continuing violation, except that such penalty shall not be assessed for more than thirty (30) days. If the cessation order has not been abated within the thirty (30) day period, the Secretary shall initiate action pursuant to subsections (b), (g), (h) and (j), section 17, of the Act as appropriate. If the order is suspended in a temporary relief proceeding, the period specified for the abatement shall not end until the date on which the Secretary issues a final order with respect to the violation in question. If judicial review proceedings are initiated in which the order is suspended by court, the daily assessment of the civil penalty shall not be made for any period before entry of a final order by the court.

20.6. Procedure for Assessing Civil Penalties.

20.6.a. Assessment Officer - Duties. For the purposes of this section, the assessment officer shall not determine the proposed penalty assessment until such time as the Secretary has caused an inspection of the violation to be conducted and the findings of that inspection are submitted to the assessment officer in writing. The Secretary must conduct the inspection of the violation within the first fifteen (15) days after the notice or order was served. The assessment officer may continue conferences, conduct investigations, and interview witnesses as

necessary.

20.6.b. Determination of Civil Penalty Amounts. Civil penalty amounts for notices of violation shall be determined in accordance with the factors specified in paragraph (c), section 17, of the Act and the numerical point system in subsection 20.7 of this section. Within fifteen (15) days of service of a notice of violation or cessation order, the person to whom it was issued may submit written information about the violation to the Secretary and to the inspector who issued the notice of violation or cessation order.

20.6.c. Notice of Assessment. The Secretary shall provide a copy of the proposed assessment and the accompanying worksheet to the operator by certified mail, within thirty (30) days of the date of the issuance of a notice or order. If the mail is tendered at the address of the person set forth in the sign required under subdivision 14.1.a of this rule, or at any address at which that person is in fact located, and he or she refuses to accept delivery of or to collect such mail, the requirements of this paragraph shall be deemed to have been complied with upon such tender. Failure by the Secretary to serve any proposed assessment within thirty (30) days shall not be grounds for dismissal of all or part of such assessment unless the person against whom the proposed penalty has been assessed: (1) proves actual prejudice as a result of the delay; and (2) makes a timely objection to the delay. An objection shall be timely only if made in the normal course of administrative review. The Secretary shall also give notice including any worksheet, in person or by certified mail, to the operator of any penalty adjustment as a result of an informal conference within thirty (30) days following the date of the conference. The reasons for reassessment shall be documented in the file by the assessment officer. The Secretary shall consider any information submitted pursuant to subdivision 20.6.b of this subsection in determining the facts surrounding the violation and the amount of the penalty. Unless a conference has been requested, the Secretary shall review and if necessary reassess any penalty considering facts which were not reasonably available on the date of issuance of the proposed assessment because of the length of the abatement period. The Secretary shall serve a copy of any such reassessment and of the worksheet showing the computation of the reassessment within thirty (30) days after the date the violation is abated.

20.6.d. Notice of Informal Assessment Conference. The time and place of an informal assessment conference shall be posted at the nearest Department of Environmental Protection regional office to the operation, at least five days prior to the conference date. Any person shall have the right to attend and participate in the conference. Any person, other than the operator and Department of Environmental Protection representatives, may submit in writing at the time of the conference a request to present evidence concerning the violation(s) being conferenced. Such request shall be granted by the assessment officer. Should problems arise due to scheduling, the assessment officer may continue the conference to a later time and/or date as the assessment officer deems necessary to honor other scheduled conferences.

20.6.e. Informal Conference. An informal conference on the assessment or reassessment must be scheduled within 60 days of the receipt of a request, pursuant to paragraph (1) subsection (d) of section 17, of the Act. Failure to hold an informal conference in the time limits specified in this subsection will not be considered as grounds for dismissal of the assessment, unless the operator proves actual prejudice and makes timely objection to the delay. The assessment officer shall consider all relevant information on the violation including information which may be provided pursuant to subdivisions 20.6.b and 20.6.d of this subsection. Within thirty (30) days after the conference is held the assessment officer shall either:

20.6.e.1. Settle the issue, in which case a settlement agreement shall be prepared and signed by the assessment officer on behalf of the Secretary and by the person assessed;

20.6.e.2. Affirm, raise, lower, or vacate the penalty; or

20.6.e.3. Terminate the conference when it is determined that the issues cannot be resolved or that the person assessed is not diligently working toward resolution of the issues.

20.6.f. Settlement Agreement. If a settlement agreement is entered into, the person assessed will be deemed to have waived all rights to further review of the violation or penalty in question, except as otherwise expressly provided for in the settlement agreement. The settlement agreement shall contain a clause to this effect. If full payment of the amount specified in the settlement agreement is not received by the Secretary within thirty (30) days after the date of signing, the Secretary may enforce the agreement or rescind it and affirm, raise, lower or vacate the penalty within thirty (30) days from the date of the rescission.

20.6.g. Rules of Evidence. At formal review proceedings pursuant to section 17 of the Act, no evidence as to any statement made or evidence produced by one party at a conference shall be introduced as evidence by another party, or may be used to impeach a witness.

20.6.h. Fact of Violation. The fact of violation may not be contested in a civil penalty review proceeding, if it has already been decided in a formal review proceeding under paragraph 1 subsection (d) of section 17 of the Act.

20.6.i. Escrow. If a person requests judicial review of a proposed assessment, the proposed penalty assessment shall continue to be held in escrow until completion of the judicial review.

20.6.j. Penalty Adjustment. When an administrative or judicial review of a civil penalty order results in an order increasing the penalty, the person to whom the notice or order was issued shall pay the amount of the increase within fifteen (15) days after the order is mailed to each person.

20.6.k. Mitigation. Unless caused by lack of diligence, inability to comply may be considered in mitigation of the amount of civil penalty.

20.7. Assessment Rates.

20.7.a. History of Violations. History of previous violations is an accounting of all Notices of Violation and Cessation Orders that were written on the subject operation in the previous twelve (12) months. Notices of Violation and Cessation Orders which were withdrawn or vacated shall not be included in the accounting. The dollar amount to be assessed shall be determined by multiplying the number of violations by a factor of one hundred (100).

20.7.b. Seriousness of the violation.

1-2 Violation is of an administrative nature resulting in no harm or danger to the environment or public: or the standard is violated to such a minor degree that environmental harm or public danger will not result.

3-4 Violation results in potential or actual harm or danger remaining in the permit area; or in the case where the impact extends beyond the permit area; can be demonstrated that potential danger or harm or will not result.

5-6 Violation extends beyond the permit area and results in a minor degree of potential or actual harm or impact on the public.

7-8 Violation can reasonably be expected to result in significant imminent environmental harm or create an imminent danger to the health and safety of the public. A violation which initially has a seriousness rating of 7 or higher is one which must be an imminent harm cessation order, as set forth in subdivision 20.3.a of this rule.

9-10 Violation extends beyond the permit area and results in a significant degree of environmental harm or danger to the public.

Rating	0	1	2	3	4	5
Dollar Amount	-	100	200	400	900	1200

Rating	6	7	8	9	10
Dollar Amount	1200	1600	2100	2700	3500

20.7.c. Operator Negligence.

0 This violation is considered beyond the control of the operator or his employees and no negligence can be attributed to this violation.

1-2 This violation was a result of an oversight on the part of the operator and may have been avoided if more conscientious effort and/or reasonable care were given.

3-4 This violation was obvious and/or no action was taken by the operator to prevent the problem.

5-6 The operator failed to adequately respond to previous written instructions of the inspector to prevent this event.

7-8 The operator had been officially notified, in writing, of this problem and did not make any effort at correcting the problem.

Rating	0	1	2	3	4
Dollar Amount	0	100	225	350	475

Rating	5	6	7	8
Dollar Amount	600	725	875	1000

20.7.d. Operator's Good Faith

Good faith percentage shall not include a history of violations in the amount. Good faith percentage shall be rounded to the nearest dollar amount.

0 Operator failed to take appropriate remedial action. Violation has been modified to a cessation order.

1-2 Operator took prompt, but insufficient remedial action to fully abate the violation within the required abatement period. Abatement period was extended for just cause. Remedial action was completed prior to the end of the extended abatement period.

3-4 Operator took prompt remedial action and worked diligently to abate the violation. Conditions beyond the operator's control prevented full abatement and required that the abatement period be extended for just cause. Abatement of the violation was accomplished before the end of the extended abatement period.

5-6 Operator initiated remedial action immediately and expended all reasonable efforts to abate the violation. Violation was abated before the end of the original abatement period.

7-8 Operator was already taking remedial action at the time the violation was noted, and expended exemplary effort in abating the violation before the end of the original abatement period.

Rating	0	1	2	3	4
%	0%	5%	10%	20%	20%

Rating	5	6	7	8
%	25%	30%	35%	40%

(e) Determination of Penalty Amount

Seriousness of Violations $_____

Operator Negligence +
$_____

Subtotal $_____

Less Good Faith % -
$_____

Sub Total		$_____
History of Violations	+	$_____
Total		$_____

20.8. When an Individual Civil Penalty May be Assessed:

20.8.a. Except as provided in subdivision 20.8.b of this subsection, the Secretary may assess an individual civil penalty against any corporate director, officer or agent of a corporate permittee who knowingly and willfully authorized, ordered, or carried out a violation, failure or refusal.

20.8.b. The Secretary shall not assess an individual civil penalty in situations resulting from a permit violation by a corporate permittee until a cessation order has been issued by the Secretary to the corporate permittee for the violation and the cessation order has remained unabated for thirty (30) days.

20.9. Amount of Individual Civil Penalty.

20.9.a. In determining the amount of an individual civil penalty assessed under subsection 20.8 of this rule, the Secretary shall consider the criteria specified in subsection (c) of section 17 of the Act.

20.9.b. The penalty shall not exceed $5,000 for each violation. Each day of a continuing violation may be deemed a separate violation and the Secretary may assess a separate individual civil penalty for each day the violation, failure or refusal continues, from the date of service of the underlying notice of violation, cessation order or other order incorporated in a final decision issued by the Secretary until abatement or compliance is achieved.

20.10. Procedure for Assessment for Individual Civil Penalty.

20.10.a. The Secretary shall serve on each individual to be assessed an individual civil penalty a notice of proposed individual civil penalty assessment, including a narrative explanation of the reasons for the penalty, the amount to be assessed, and a copy of an underlying notice of violation and cessation order.

20.10.b. The notice of proposed individual civil penalty assessment shall become a final order of the Secretary thirty (30) days after service upon the individual unless:

20.10.b.1. The individual files within thirty (30) days of service of the notice of proposed individual civil penalty assessment a petition for review with the Surface Mine Board; or

20.10.b.2. The Secretary and the individual or responsible corporate permittee agree within thirty (30) days of service of the notice of proposed individual civil penalty assessment to a schedule or plan for the abatement or correction of the violation, failure, or refusal.

20.10.c. For purposes of this subsection, service is sufficient if it would satisfy state requirements for service of a summons and complaint.

20.11. Payment of Penalty.

20.11.a. If a notice of proposed individual civil penalty assessment becomes a final order in the absence of a petition for review or abatement agreement, the penalty shall be due upon issuance of the final order.

20.11.b. If an individual named in a notice of proposed individual civil penalty assessment files a petition for review in accordance with paragraph 20.10.b.1 of this section, the penalty shall be due upon issuance of a final administrative order affirming, increasing, or decreasing the proposed penalty.

20.11.c. Where the Secretary and the corporate permittee or individual have agreed in writing on a plan for the abatement of or compliance with the unabated order, an individual named in a notice of proposed individual civil penalty assessment may postpone payment until receiving either a final order from the Secretary

stating that the penalty is due on the date of such final order, or written notice that abatement or compliance is satisfactory and the penalty has been withdrawn.

20.12. Fees and Costs of Administrative Proceedings.

20.12.a. Request for Fees. Any person may on request be awarded by the appropriate board or court a sum equal to costs and expenses including attorneys' fees and expert witness fees as determined to have been reasonably incurred. Such request must be filed within forty-five (45) days of date of entry of judgment.

The request shall include an affidavit setting forth costs and expenses and an itemized statement of attorneys' fees. The request shall be served upon all parties who shall have thirty (30) days to answer the request. Cost and expenses including attorneys' fees may be awarded to:

20.12.a.1. Any participating party against the violator upon a finding that there is a violation of the Act, the regulations or the permit has occurred, and there is a determination that the party made a significant contribution to the full and fair determination of the issues;

20.12.a.2. To any participating party other than the violator or his representative from the Department of Environmental Protection upon a determination that the party made a significant contribution to a full and fair determination of the issues;

20.12.a.3. To a violator from the Department of Environmental Protection when the violator demonstrates that the Department of Environmental Protection issues cessation order, a show cause order or notice of violation in bad faith and for the purpose of harassing or embarrassing the violator, provided that no award shall be made under this subsection if the Department of Environmental Protection prevails upon the issue of a violation;

20.12.a.4. To a violator from any participating party other than the Department of Environmental Protection where such participating parties initiated or participated in the magistrate proceeding in bad faith and for the purpose of harassing or embarrassing the violator; and

20.12.a.5. To the Department of Environmental Protection from any participating party where the Department of Environmental Protection demonstrates that any such party participating in such proceeding in bad faith and for the purpose of harassing or embarrassing the Department of Environmental Protection. An award may also include attorneys' fees and expert witness fees expended in obtaining an award of costs, expenses and attorneys' fees. Decisions on such awards may be appealed as other cases under the Act.

§38-2-21. Surface Mine Board.

21.1. Open Meetings.

21.1.a. General. All meetings of the Surface Mine Board, pursuant to the provisions of the Act shall be open to the public.

21.1.b. Public Notice. The time, and place of all regularly scheduled meetings and the time, place and purpose of all special meetings shall be made available to the public and the news media by publishing a notice containing at least the above information in a newspaper of general circulation in the county where the site or environmental concern exists, or if the matter under consideration is of general interest to the people of the State in a newspaper of general circulation in the State.

21.1.c. Emergency Meetings. In the event of any emergency requiring immediate official action such efforts to notify the public shall be taken as circumstances allow.

21.2. Appeals to the Surface Mine Board.

21.2.a. Site Visits. The board may visit the site of the activity or proposed activity which is the subject of the hearing and take such additional evidence as it deems necessary provided that all parties and interveners be given

notice of the visit and are given an opportunity to accompany the Board.

21.2.b. Final Orders. On all appeals to the Board, the Board shall issue a final decision thirty (30) days after the hearing or within thirty (30) days after the testimony presented at the hearing has been transcribed and checked for accuracy.

21.2.c. Burden of Proof. The burden of proof shall be on the party seeking to reverse the decision of the Secretary.

21.3. Ex parte Communication.

21.3.a. Prohibition. Ex parte contacts between representatives of the parties appearing before the Board and members or representatives of the Board shall be prohibited.

§38-2-22. Coal Refuse.

22.1. Applicability - Any surface coal mining operation which involves the construction, operation, enlargement, modification, removal and/or abandonment of a coal refuse site shall be subject to the special provisions of this section in addition to other applicable permitting requirements, performance standards, and enforcement provisions of this rule, the Act, and other State and Federal laws and regulations.

22.2. Certification - For purposes of permitting, the applicant shall submit a separate set of maps, plans, design data, and specifications for the refuse disposal facility, in addition to those contained in the permit application.

The disposal facility shall be designed using current, prudent engineering practices. A qualified registered professional engineer, experienced in the design of similar earth and refuse structures, shall certify the design of the disposal facility. The disposal facility shall be designed to attain a minimum long-term static safety factor of 1.5 and a seismic factor of safety of 1.2. The stability of all foundations and abutments must be maintained during all phases of construction.

22.3. Permit Requirements - General - In addition to the other permitting requirements of the Act, this rule and the requirements of 30 CFR 77.214 and 30 CFR 77.215, each permit application which involves a coal refuse site shall contain the following materials:

22.3.a. Narrative. A general narrative and discussion of the project to include at a minimum a discussion of existing site conditions, the design life of the facility, quantity and type of coal refuse to be placed on the site, subsidence potential method of operation to include clearing and grubbing, topsoil stockpiling, construction of surface and subsurface drainage facilities, phases of construction, method and location of coal refuse placement or removal, coal refuse placement during inclement weather, routine inspection and maintenance, procedure to be followed in the event the site is abandoned prior to the planned design life, and a sequence for construction of drainage facilities, critical construction phases, reclamation and final abandonment procedures. In addition, include a description of the duties, responsibilities and lines of communication of those persons responsible for the design and construction of the coal refuse disposal site. All data, graphs, curves, etc., which provide the basis for hydrologic and hydraulic design of coal refuse embankments and impoundments shall accompany other design data, plans, and specifications, submitted as part of the permit application.

22.3.b. Plan View. A plan view of the site showing detailed contours, limits of the coal refuse disposal site, all drainage facilities, location of springs, seeps, mine drainage and/or openings, location of the subdrain system, project stationing, location of cross sections, location of borings, test pits and instrumentation and other pertinent data required for project control.

22.3.c. Cross Sections. Cross sections of the coal refuse disposal site transversely and longitudinally showing original ground, finished elevations, final configuration of refuse material, subdrains, diversion details, spillways, and other pertinent features of the site. Cross section shall be of sufficient accuracy and detail so as to

provide a basis for stability computations at critical locations.

22.3.d. Sediment Control Plan. A sediment control plan designed in accordance with subsection 5.4 of this rule.

22.3.e. Diversions. Each application shall contain plans and specifications for a diversion channel above the coal refuse site to direct surface water runoff from the contributing watershed around the facility. Such diversion channel shall be designed in accordance with subsection 5.3 of this rule, except as follows:

22.3.e.1. Design storm. All diversion ditches and stream channel diversions shall be designed to carry the peak runoff from a one-hundred (100) year frequency, twenty-four (24) hour duration rainfall.

22.3.e.2. A freeboard equal to or greater than $1+.025vd^{1/3}$ shall be added to the design flow depth to obtain the total depth of the diversion ditch.

22.3.e.3. Each diversion ditch must be designed to carry the peak flow with freeboard from the contributing watershed area.

22.3.e.4. Diversions shall be designed, constructed, and maintained in a manner which prevents additional contributions of suspended solids to stream flow and to runoff outside the permit area to the fullest extent possible.

22.3.e.5. Excess excavated material not required for construction or maintenance of the diversion ditch must be properly disposed of in the permit area.

22.3.e.6. Topsoil removed from the channel excavation shall either be redistributed on another part of the permit area or stockpiled for a later use.

22.3.e.7. All diversion systems shall exit safely beyond the toe of the embankment in a natural drainway capable of carrying the design flow without excessive erosion.

22.3.e.8. All stream channel diversions must be designed to carry the design flow around the disturbed area. The diversions must outlet into the original channel or a natural channel of equal cross section.

22.3.e.9. Diversions in refuse must be lined with soil or a suitable substitute unless other erosion protection is provided.

22.3.e.10. Permanent diversion systems designed to convey water under a coal refuse embankment by means of a pipe or conduit are unacceptable. However, diversion by means of a pipe or conduit may be permitted during active operation, provided that (1) height or storage limits for impoundments are not exceeded, (2) the pipe or conduit is used in conjunction with surface ditches to meet applicable design storm requirements, and (3) the design of the pipe or conduit accounts for durability and design life, load limits, joint sealing, trash rack protection, and maintenance requirements throughout the operational life of the structure.

22.3.f. Design and Specifications for Hydraulic Structures. Such structures shall be designed to safely control excessive erosion by using energy dissipaters and/or channel protection, as necessary, based upon design flow velocity. Seepage control devices shall be used to prevent undercutting of nonflexible linings. The potential for landslides or slope failures shall be considered in the location of all hydraulic structures. Channels shall not be located on or near an existing landslide. No surface runoff or slurry may be diverted into underground mines unless approved by the Secretary in accordance with subdivision 14.5.e of this rule.

22.3.g. Computations. The application shall include all design data and calculation results. If a computer analysis is used, only the input data and results used specifically in the design need be submitted. If graphical flood routing techniques are used, all charts and graphs shall be included. Adequate cross sections and profiles shall be given for all hydraulic structures.

22.3.h. All coal refuse impoundments must be analyzed and/or designed in accordance with this subsection. Non-impounding coal refuse embankments must be designed in accordance with this subsection unless any proposed modifications to the design standards of this subsection are justified through appropriate stability analysis. The following structural analysis and/or design data of coal refuse embankments and impoundments shall be presented in graphical or tabular form:

22.3.h.1. A sufficient subsurface investigation shall be performed by a registered professional engineer or engineering geologist. The number, location, and depth of borings, test pits, and/or trenches shall be reasonable for the size, purpose, soils present, and foundation type of the structure. The investigation shall consider depth of soil to bedrock, field classification of soils, character of bedrock, in situ testing, soil sampling, determination of groundwater flow and location of seeps and springs, and a soil profile for critical locations in the structure, hydraulic structures and other pertinent locations which may affect the safety of the structure. The number, depth, and location of boreholes shall be based on the quantity of material to be impounded and subsurface conditions. A geologic study shall also be conducted for impounding structures to evaluate landslides into the impoundment, bedrock discontinuities such as soft seams, joints, joint systems, bedding planes, and fault zones which may adversely affect the structure's performance. Past and future mining to include height of seam, depth and cover rock of the seam, and previous subsidence problems shall be considered where subsidence may affect the safety of the structure.

22.3.h.2. Laboratory tests shall be conducted on all foundation and embankment materials to include soil classification through hydrometer analysis, density, water content, compaction tests, shear strength, consolidation, and permeability unless the scope, characteristics, or design concept of the site make one or more of these requirements unnecessary.

22.3.i. Safety Factors. A description including plans, design data, specifications, and computations of how safety conditions will be achieved. The disposal facility shall be designed, constructed, and maintained to attain a minimum long-term safety factor of 1.5; provided further that a coal refuse site which has the capability to impound water shall also attain a seismic safety factor of at least 1.2.

22.3.j. Liquefaction. Describe the potential for liquefaction and provide safeguards against the development of this condition.

22.3.k. Instrumentation. A description of installation of instrumentation such as piezometers, settlement markers, slope indicators, and similar monitoring devices shall be included in the plan to monitor present hazardous conditions, construction conditions, and to verify design assumptions. A plan for monitoring these devices shall also be provided.

22.3.l. Stability Analysis. All stability analyses shall be done using standard engineering techniques. The submittal shall include cross sections at critical locations in the facility showing the materials profile, location of critical potential failure surfaces and their factors of safety, estimated or measured phreatic surfaces for construction and/or long term seepage conditions, and a tabulated listing of strength parameters used. If a computer analysis is used, only the input data and results used specifically in the design shall be submitted.

22.3.m. Underdrains. If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the application shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the disposal facility and ensure stability. Diversions and underdrains shall be designed as follows:

22.3.m.1. Runoff from the areas above the refuse pile and runoff from the surface of the refuse pile shall be diverted into stabilized diversion channels designed in accordance with subdivision 22.3.e of this subsection and subsection 5.3 of this rule to safely pass the runoff from a one hundred (100) year, twenty-four (24)

hour precipitation event. Runoff diverted from undisturbed areas need not be commingled with runoff from the surface of the refuse pile. Uncontrolled surface drainage may not be diverted over the outslope of the refuse piles.

22.3.m.2. Underdrains shall consist of durable rock or pipe, and be designed and constructed using current, prudent engineering practices. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall and from seeps and springs in the foundation of the disposal area away from the site, and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil material, and which is free of coal, clay or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

22.3.n. Site Preparation. Procedures for clearing and grubbing.

22.3.o. Excess Material. Procedures for disposal of excess material resulting from clearing, grubbing, and other site preparation activities.

22.3.p. Compaction Requirements. Procedures for spreading and compaction of refuse material during placement. The material shall be compacted in layers not exceeding two (2) feet in thickness and shall not have any slope exceeding two horizontal to one vertical, except that the Secretary may approve construction of a refuse pile in compacted layers exceeding two (2) feet in thickness, where engineering data substantiates that both a minimum static safety factor of 1.5 and a minimum seismic safety factor of 1.2 will be attained; provided, that the operator shall submit plans for the Secretary's approval, and shall also provide documentation showing prior approval by MSHA pursuant to Federal regulations at 30 CFR 77.215(h) for the alternate construction, without which documentation the plans will not be approved.

22.3.q. Sealing Abandoned Openings. Plans in accordance with 30 CFR 75.1711 for sealing abandoned openings and covering the seal with four feet of an impermeable non-toxic material. Such plans shall consider prevention of water buildup behind the seals, toxicity of the refuse and mine strata, gradient of the opening, hydrologic balance and passage of any acid water to a treatment facility. If a mine seal is in the impoundment area of an impounding coal refuse disposal site, the seal shall be designed to safely withstand full hydrostatic head with a factor of safety of at least 1.5 against blowout. Higher factors of safety may be required where dictated by the consequences of failure. Calculations and cross sections used in the analyses shall be submitted.

22.3.r. Extinguishment of Burning Areas. Plans approved by MSHA for the extinguishment of burning areas which contain, at a minimum, method of extinguishment, safety measures for equipment operators and persons working or living in the vicinity of the site, and a provision that only those persons authorized by the operator, shall be involved in the extinguishing operation.

22.3.s. Underground Disposal. Plans for underground refuse disposal shall be submitted to and approved by the Secretary and the Mine Safety and Health Administration. All plans must include:

22.3.s.1. Method of disposal including a description of the source of the transport medium;

22.3.s.2. Maps of mines where coal refuse materials are to be disposed with a description of the percent of mine void to be filled;

22.3.s.3. Description of location of active workings including plans, specifications, and methods of constructing underground retaining walls;

22.3.s.4. Potential areas of breakout in active mine workings and on the surface of the

ground;

22.3.s.5. Effects of subsidence on the plan;

22.3.s.6. The effects on the hydrologic regime including the location and description of permanent monitoring wells or monitoring stations;

22.3.s.7. Gradient of the mine from the backfill area;

22.3.s.8. Description of the stratum underlying the mined coal;

22.3.s.9. Source and quality of the refuse;

22.3.s.10. The method of treatment of water if released to surface streams;

22.3.s.11. A contingency plan formulated to alleviate or correct any hazardous conditions which may result from a blowout; and

22.3.s.12. A description of the surface area to be supported by the refuse backfill, the anticipated surface effects following backfilling, and the method for dewatering the backfill.

22.3.t. Abandonment Plan. An abandonment plan which addresses the following requirements and include a schedule for their implementation:

22.3.t.1. No refuse embankment or impoundment may be abandoned until approved by the Secretary.

22.3.t.2. The final top elevation of the refuse embankment must be higher than, and sloped into, the diversion ditch. Maximum slope of the top of the embankment to the diversion ditch shall be five (5) percent unless otherwise approved by the Secretary.

22.3.t.3. All pipes under refuse areas left as non-impounding fills shall be sealed with concrete at the upstream end prior to abandonment.

22.3.t.4. At abandonment all fine refuse in the impoundment pool shall be covered with a minimum three foot layer of coarse refuse or other fill material prior to topsoiling unless otherwise approved by the Secretary.

22.3.t.5. At abandonment all coal refuse shall be covered with a minimum of four (4) feet of the best available non-toxic and non-combustible material in a manner that does not impede flow from sub-drainage systems. The Secretary may allow less than four (4) feet of cover material where it can be demonstrated on the basis of physical and chemical analyses of the growth medium that the vegetation requirements of section 9 of this rule will be met.

22.3.t.6. A certificate of approval for completion of construction shall be issued upon completion of the above requirements.

22.4. Permit Requirements - Impounding Structures. In addition to the requirements of the Act and this rule coal refuse disposal sites which have the capability of impounding water shall be subject to the special requirements of this subsection and may be subject to other State and Federal laws and rules and regulations, depending on their embankment size and holding capacity.

22.4.a. Dam Control Act. A coal refuse site which is constructed in such a manner that it: (1) Rises twenty-five (25) feet or more above the natural bed of a stream or watercourse as measured from the downstream toe of the embankment and which does or can impound fifteen (15) acre-feet or more of water, or; (2) Rises six (6) feet or more above the natural bed of a stream or watercourse as measured from the downstream toe of the embankment and which does or can impound fifty (50) acre-feet or more of water is by definition a dam and is thereby subject to the provisions of the West Virginia Dam Control Act set forth in W.Va. Code §22-14 et seq.

22.4.b. Mine Safety and Health

Administration (MSHA) Impoundments. A coal refuse site which is constructed in such a manner that it can impound water, sediment, or slurry to an elevation of: (1) Five (5) feet or more above the upstream toe of the structure and can have a storage volume of twenty (20) acres/feet or more, or; (2) Twenty (20) feet or more above the upstream toe of the structure, or; (3) Presents a hazard to coal miners as determined by the District Manager of the Federal Mine Safety and Health Administration, shall be subject to the requirements of 30 CFR 77.215 and 77.216 of the Federal Mine Safety and Health Administration Regulations.

22.4.c. Small Impoundments. Coal refuse sites which result in impoundments which are not subject to the Dam Control Act or the Federal Mine Health and Safety Act shall be designed, constructed, and maintained subject to the requirements of this subsection and subsections 5.4 and 22.5 j.6. of this rule.

22.4.d. Hazard Potential. The hazard potential of coal refuse sites which have the capability of impounding water shall be determined by the applicant based on the potential loss of life that would result due to a failure and the classification determined on the basis of the following criteria:

22.4.d.1. Class A. Impoundments located in rural or agricultural areas where failure may damage farm buildings, agricultural land, or secondary highways. Failure of the structure would cause only loss of the structure and loss of property use such as related roads, but with little additional damage to adjacent property. Any impoundment exceeding twenty-five (25) feet in height measured at the downstream toe or two-hundred (200) acre-feet storage volume or having a watershed exceeding five hundred (500) acres shall not be a Class A structure.

22.4.d.2. Class B. Impoundments located in predominantly rural agricultural areas where failure may damage isolated homes, primary highways or minor railroads or cause interruption of relatively important public utilities. Failure of the structure may cause great damage to property and project operations.

22.4.d.3. Class C. Impoundments located where failure may cause loss of life, serious damage to homes, industrial and commercial buildings, important public utilities, primary highways, or main railroads. This classification must be used if failure would cause possible loss of human life.

22.4.e. Emergency Planning. For a Class C structure or if a dangerous condition exists, notification and action procedures shall be formulated by the operator or owner, for public protection and remedial action in the event of an emergency. All emergency procedures must be submitted and become part of the approved plan. If adequate emergency procedures cannot, for whatever reason, be formulated by the owner or operator, then he must so notify the Secretary in writing. The Secretary may then notify the Office of Emergency Services and request that emergency procedures be developed for the coal refuse site.

22.4.f. Design Storm Specifications. All refuse impoundments and dams shall be designed to meet the following design storm criteria based upon hazard classification.

22.4.f.1. Class A impoundments shall be designed for a minimum of P_{100} + 0.12(PMP-P_{100}) inches of rainfall in six (6) hours.

22.4.f.2. Class B impoundments shall be designed for a minimum of P_{100} + 0.40(PMP-P_{100}) inches of rainfall in six (6) hours.

22.4.f.3. Class C impoundments shall be designed for a probable maximum precipitation (PMP) of a six (6) hour or greater event plus three feet of freeboard.

22.4.g. Primary and Emergency Spillway Design. All impoundments meeting the size or other criteria of 30 CFR 77.216(a) must be designed and constructed to safely pass the probable maximum precipitation of a six (6) hour storm event. All impoundments of a lesser size must be capable of passing through a spillway or

outlet works or a combination thereof, that portion of the design storm that cannot be safely stored in the impoundment and to draw down the stored portion of the design storm within the specified terms in accordance with the following:

22.4.g.1. Class A impoundments must be designed with an open channel spillway unless otherwise approved by the Secretary, Ninety (90) percent of the stored portion of the design storm must be discharged or removed within ten (10) days after the storm event.

22.4.g.2. Class B impoundments shall be designed with either an open channel spillway only, or with an emergency spillway and a principal spillway together. Ninety (90) percent of the stored portion of the design storm shall be discharged or removed within ten days after the storm event.

22.4.g.3. Class C dams may be designed in one of three ways:

22.4.g.3.A. An impoundment designed without discharge structures shall be capable of storing a minimum of two (2) six (6) hour duration probable maximum storms. Water shall be removed from the impoundment to its lowest practical level within ten (10) days after the storm event by pumping or by other means if storm water reduces the storage capacity to one probable maximum storm or less.

22.4.g.3.B. An impoundment designed with a decant or principal spillway only shall be capable of storing at least one (1) six (6) hour duration probable maximum storm. Ninety (90) percent of the stored portion of the storm shall be discharged or removed within ten (10) days after the storm event.

22.4.g.3.C. An impoundment designed with either an open channel spillway only, or with an emergency spillway and principal spillway together shall be capable of discharging that portion of the six (6) hour duration probable maximum storm that cannot be safely stored in the impoundment. Ninety (90) percent of the stored portion of the storm shall be discharged or removed within ten (10) days after the storm event.

22.4.g.4. A single open channel spillway may be used only if it is:

22.4.g.4.A. Of non-erodable construction and designed to carry sustained flows; or

22.4.g.4.B. Earth or grass-lined and designed to carry short term, infrequent flows at non-erosive velocities where sustained flows are not expected.

22.4.h. Open Channel Spillways. All open channel spillways must comply with the design standards of this section and the following additional standards:

22.4.h.1. Any open channel spillway designed for less than one hundred (100) percent probable maximum precipitation shall be provided with freeboard above the maximum water surface as determined by the equation $1+.025vd^{1/3}$.

22.4.h.2. All open channel spillways shall be constructed of non-erodable material where sustained flows are expected, or may be of earth or grass lined construction where short term infrequent flows at nonerosive velocities, are expected.

22.4.h.3. Excess excavated material not needed to construct and maintain the spillway channel must be properly disposed of in the permit area.

22.4.h.4. Topsoil removed from channel excavation shall either be redistributed on another part of the permit area or stockpiled for future use.

22.4.i. Pipe Spillways. All pipe spillways must comply with the requirements of this section and the following additional requirements:

22.4.i.1. The pipe spillway inlet must be protected by a designed trash rack.

22.4.i.2. All riser-type spillways must

be designed to prevent vortexing.

22.4.i.3. A skimming device is required where floating pollutants exist or are anticipated.

22.4.i.4. An adequate foundation and bedding shall be designed for all pipes and risers.

22.4.i.5. All pipe spillways shall be designed to provide seepage control along the conduit.

22.4.i.6. The pipe spillway shall be of sufficient strength to withstand the maximum load of the fill above it.

22.4.i.7. All pipe spillways shall be constructed of suitable material to resist deterioration for the design life of the facility.

22.4.i.8. The outlet of all pipes, where blockage by animals can occur, must be protected by an animal guard.

22.5. Performance Standards. The following performance standards shall be met for all coal refuse disposal sites.

22.5.a. Controlled Placement. All coal refuse sites shall be placed in new or existing disposal areas within a permit area designated for this purpose. Coal mine refuse shall be placed in a controlled manner to:

22.5.a.1. Minimize adverse effects of leachate and surface-water runoff on surface and ground water quality and quantity;

22.5.a.2. Ensure mass stability and prevent mass movement during and after all phases of construction and be constructed and maintained in such a manner so as to attain a minimum long-term safety factor of 1.5 provided that structures which have the capacity to impound water shall also attain a seismic safety factor of 1.2;

22.5.a.3. Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use;

22.5.a.4. Not create a public hazard; and

22.5.a.5. Prevent combustion.

22.5.b. Extraneous Refuse. Coal mine refuse material from activities located outside a permit area may be disposed of in the permit area only if approved by the Secretary. Approval shall be based upon a showing that such disposal will be in accordance with the standards of this section.

22.5.c. Slope Protection. Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.

22.5.d. Site Development. Clearing and grubbing shall be performed in the disposal area prior to placement of refuse material. Topsoil shall be removed, segregated, and stored or redistributed in accordance with subsection 14.3 of this rule. If approved by the Secretary, organic material may be used as mulch, or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

22.5.e. Final Configuration. The final configuration of the refuse pile shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the refuse pile if required for stability, control or erosion, conservation of soil moisture, or facilitation of the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50 percent).

22.5.f. Impoundment Within Fill Areas. No permanent impoundments shall be allowed on the completed refuse pile. Small depressions may be allowed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation, and if they are not

incompatible with stability of the refuse pile.

22.5.g. Topsoiling. Following final grading of the refuse pile, the coal mine refuse shall be covered with a minimum of four (4) feet of the best available, nontoxic and noncombustible material, in a manner that does not impede drainage from the underdrains. The Secretary may allow less than four (4) feet of cover material based on physical and chemical analyses which show that the revegetation requirements of section 9 of this rule will be met.

22.5.h. Notification of Hazardous Conditions. If any examination or inspection discloses that a potential hazard exists, the Secretary shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Secretary shall be notified immediately. The Secretary shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

22.5.i. Disposal in Underground Workings. Coal mine refuse may be disposed of in underground mine workings in accordance with the provisions of subdivision 22.3.s of this section.

22.5.j. Construction Specifications. New and existing impounding structures constructed of coal mine refuse or intended to impound coal mine refuse shall meet the following requirements:

22.5.j.1. Coal mine refuse shall not be used for construction of an embankment which impounds water unless it has been demonstrated to the Secretary that the stability of such a structure conforms to the requirements of this section and the use of coal mine refuse will not have a detrimental effect on downstream water quality or the environment due to acid seepage through the impounding structure. The stability of the structure and the potential impact of acid mine seepage through the impounding structure shall be discussed in detail in the design plan.

22.5.j.2. If an impounding structure constructed of coal mine refuse or intended to impound coal mine refuse meets the criteria of subdivision 22.4.c of this subsection, the combination of principal and emergency spillways shall be designed and constructed in accordance with subdivisions 22.4.g and 22.4.h of this subsection.

22.5.j.3. Spillways and outlet works shall be designed to provide adequate protection against erosion and corrosion. Inlets shall be protected against blockage.

22.5.j.4. Runoff from areas above the disposal facility or runoff from surface of the facility that may cause instability or erosion of the impounding structure shall be diverted into stabilized diversion channels designed to safely pass the runoff from a one hundred (100) year, twenty-four (24) hour precipitation event.

22.5.j.5. Impounding structures constructed of or impounding coal mine refuse shall be designed so that at least ninety (90) percent of the water stored during the design precipitation event can be removed within a ten (10) day period.

22.5.j.6. No coal refuse impoundments shall remain as permanent impoundments. Upon completion of reclamation, such structures shall not be capable of storing or impounding water.

22.5.j.7. Slope protection shall be provided to protect against erosion and sudden drawdown. Embankment faces shall be vegetated or otherwise stabilized in accordance with approved procedures.

22.5.k. Drainage and Sediment Control. Drainage control measures shall meet the requirements of section 5 of this rule. After grade release, discharges from the permit area shall not lower the water quality of receiving streams.

22.5.l. Removal of Abandoned Coal Refuse Piles. Where coal refuse is to be removed from an abandoned coal refuse disposal area under a reclamation contract issued pursuant to

subsection (d) section 28 of the Act and subsection 3.14 of this rule, the following standards shall be met:

22.5.l.1. Removal of refuse shall be complete when possible and shall be accomplished in successive horizontal lifts with a maximum elevation difference between working benches of twelve (12) feet or may be removed down a slope from the top to the toe provided that the slope is no steeper than 2H:1V. No refuse may be removed from the toe of the original embankment until the final removal process.

22.5.l.2. At all times during removal operations, care shall be exercised to protect the operating personnel, the public, and to insure long-term stability in accordance with the approved plan.

22.5.l.3. Where partial removal is approved, the final graded slopes of the remaining refuse shall be no steeper than 2H:1V and have at least one bench for every fifty (50) feet of change in elevation.

22.5.l.4. Should burning areas be encountered, the fires shall be extinguished in accordance with subdivision 22.5.m of this subsection, and removal of refuse shall be done in a safe manner. The final graded slopes of the coal refuse pile shall result in a stable configuration having a static safety factor of 1.5 as demonstrated by a stability analysis.

22.5.l.5. The total disturbed area shall be regraded in such a manner as to be compatible with the natural surroundings and shall be revegetated in accordance with section 9 of this rule. Such regrading and revegetation shall occur as contemporaneously as practicable with removal operations as reflected in the reclamation plan.

22.5.l.6. All remaining refuse materials disturbed by the operation shall be covered with a minimum of four feet of cover of non-toxic and non-combustible material sufficient to establish adequate vegetation except that a lesser cover may be used based on chemical and physical analysis in accordance with subdivision 9.2.k of this rule..

22.5.l.7. Regrading drainage control shall be provided in accordance with the approved reclamation plan.

22.5.m. Burning Refuse Piles. Where burning or burned refuse is encountered in the construction of a new structure or the reconstruction or removal of an existing structure, the following standards shall be met:

22.5.m.1. Coal mine refuse fires shall be extinguished by the person who conducts the surface mining activities, in accordance with a plan approved by the Mine Safety and Health Administration. The plan shall contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, shall be involved in the extinguishing operations.

22.5.m.2. No burning or burned coal mine refuse shall be removed from a permitted disposal area without a removal plan approved by the Secretary. Consideration shall be given to potential hazards to persons working or living in the vicinity of the structure.

22.6. Inspections. A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, shall inspect the refuse pile during construction. The professional engineer or specialist shall be experienced in the construction of similar earth and refuse structures. Inspection reports shall be retained for review at or near the site.

22.6.a. Non-impounding Structures. Inspections of non-impounding refuse piles shall be made at least quarterly throughout construction and during critical construction periods, which shall include at a minimum:

22.6.a.1. Foundation preparation including the removal of all organic material and topsoil;

22.6.a.2. Placement of underdrains

and protective filter systems;

22.6.a.3. Installation of final surface drainage systems; and

22.6.a.4. The final graded and revegetated facility.

22.6.b. Unscheduled Inspections. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of coal mine refuse materials. More frequent inspections shall be conducted if a potential danger or harm exists to the public health and safety or the environment. Inspections shall continue until the refuse pile has been finally graded and revegetated or until a later time if required by the Secretary.

22.6.c. Reporting Requirements. The following reporting requirements shall be met:

22.6.c.1. The qualified registered professional engineer shall provide a certified report to the Secretary promptly after each inspection, that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan, the Act, and this rule. The report shall include any appearances of instability, structural weakness, and other hazardous conditions; and

22.6.c.2. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with coal mine refuse. If the underdrain system is constructed in phases, each phase shall be certified separately. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site.

22.7. Impounding Structures. Inspection of impounding refuse piles shall be made by a qualified registered engineer or other qualified professional specialist under the direction of the professional engineer. The professional engineer or specialist shall be experienced in the construction of impoundments.

22.7.a. Inspection Frequencies. Inspection shall be made regularly but not less than quarterly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the bond. Inspections will be made during placement and compaction of coal refuse material and during critical construction periods.

22.7.b. Reporting Requirements. The qualified professional registered engineer shall promptly, after each inspection, provide to the Secretary a certified report that the impoundment has been constructed and maintained as designed and in accordance with the approved plan and this rule. The report shall include discussions of any appearances of any instability, structural weakness, or other hazardous condition, depth and elevation of any impounded waters existing storage capacity, and existing or required monitoring procedures and instrumentation, and any aspects of the structure affecting stability.

22.7.c. Examinations. Examination of impoundments meeting or exceeding the size specification or other criteria set forth in the Federal Mine Safety and Health Administration regulations at 30 CFR 77.216 shall, in addition to meeting the inspection requirements of subdivisions 22.7.a and 22.7.b of this subsection, comply with the MSHA requirements of 30 CFR 77.216-3.

Other impoundments shall be examined at least quarterly by a qualified person designated by the operator for appearances of structural weaknesses and other hazardous conditions.

22.7.d. Filing of Reports. A copy of each inspection and examination report shall be retained at or near the mine site.

§38-2-23. Special Authorization for Coal Extraction as an Incidental Part of Development of Land for Commercial, Residential, Industrial, or Civic Use.

23.1. Applicant Information. All information provided by an applicant in for a special authorization to engage in surface mining as an incident to the development of land for commercial, residential, industrial, or civic use shall be clear and concise and shall be provided in a format prescribed by the Secretary. In addition to the information requirements of section 28 of the Act, each application for a special authorization shall contain the following information except that submittal of a social security number is at the option of the applicant:

23.1.a. All information required by subsection 3.1 of this rule, except subdivisions 3.1c, 3.1d, 3.1k, 3.1.n, and 3.1.o;

23.1.b. A public notice containing the same information required by subdivision 3.2.b of this rule. The notice shall be published in a newspaper of general circulation in the county in which the operation is located and shall be published once and provide a thirty day comment period. A certification of publication will be made a part of the application;

23.1.c. A statement in accordance with paragraph (9), subsection (a), section 9 of the Act;

23.1.d. A site development plan which includes:

23.1.d.1. Existing site conditions;

23.1.d.2. Permits or approvals as necessary from the appropriate environmental agencies or other agencies;

23.1.d.3. Documentation of the necessity for coal removal as it relates to the proposed development;

23.1.d.4. The availability of all necessary utilities or services required for the development;

23.1.d.5. Evidence of financial commitment necessary for the development and the feasibility of the planned development;

23.1.d.6. A time schedule for site development to include all structures, roads, buildings, etc.;

23.1.d.7. A reasonable estimate of the number of acres of coal that will be removed as a result of the development;

23.1.d.8. The anticipated starting and termination dates of each phase of coal removal and the number of acres of land to be affected;

23.1.d.9. A clear plot of the development versus coal removal area; and

23.1.d.10. Evidence that blasting, if any, is in accordance with the requirement of the state fire marshal.

23.1.e. A description of the results of sampling and analysis procedures issued to develop a representative assay of the physical chemical properties of the material to be disturbed.

23.1.f. A map of the scale, size and color code as described in subdivisions 3.4.a, 3.4.b, and 3.4.c of this rule which contains the following information:

23.1.f.1. All types of information set forth on topographic maps of the U.S. Geological Survey including all manmade features;

23.1.f.2. The area of land to be affected by the operation including any coal storage and topsoil storage areas;

23.1.f.3. The property boundaries of all surface owners within one-hundred feet of any part of the coal removal area;

23.1.f.4. The location of all drainage and sediment control structures to be utilized by the coal removal area;

23.1.f.5. A location map; and

23.1.f.6. A signed, notarized, and dated statement as follows: “The information

contained herein is true and correct to the best of my knowledge and belief."

23.1.g. Insurance and filing fee in accordance with subsection (b) of section 28 of the Act, provided, however, if the coal removed is sold, proceeds will be placed in an escrow account until development is deemed complete by the Secretary.

23.2 Approval of Notice of Intent for coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use.

23.2.a. The Secretary shall act upon an administratively complete application for coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use approval and any written comments within a reasonable period of time after the close of the public comment period.

23.2.b. The Secretary may approve a complete and accurate application filed in accordance with this section if he/she finds, in writing, that the applicant has demonstrated that the coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use described in the application will be conducted in accordance with this section, and other applicable provisions of this rule, the Act, the application and other applicable environmental rules and regulations.

23.2.c. Terms of approval issued by the Secretary shall contain conditions necessary to ensure that the coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use will be conducted in compliance with this rule, the Act, the application and other applicable environmental rules and regulations.

23.2.d. The Secretary shall notify the applicant, the appropriate local government officials, and other commentors on the application, in writing, of his decision on the application. If the application is disapproved, the notice to the applicant shall include a statement of the reason for disapproval. Public notice of the decision on each application shall be posted by the Secretary at the nearest Department of Environmental Protection office in the vicinity of the proposed coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use.

23.2.e. Any person having an interest which is or may be adversely affected by a decision of the Secretary pursuant to subdivision 23.2.d of this subsection shall have the opportunity for administrative and judicial review.

23.2.f. The Secretary shall not approve the coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use for any reason other than:

23.2.f.1. Coal removal is incidental or secondary to the preparation of land for commercial, residential, industrial, or civic use; and

23.2.f.2. As an incident to such preparation of land, the coal must be removed.

23.2.g. The Secretary shall monitor the operation of each and every coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use approval granted for total compliance with the applicable provisions of the Act, this rule, and the terms and conditions of the approval application.

23.2.h. If the Secretary determines that, or has reason to believe based on information made available to him/her that, coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use operation is not being conducted in accordance with the approved special authorization and/or the accompanying documents, the Secretary is authorized to compel compliance with the conditions of the special authorization and other applicable environmental rules and regulations which could include but are not limited to the enforcement actions provided for in Sections 16 and 17 of the Act. Such information may include, but would not be limited to, weight tickets and the inspection of end-user records.

23.3. Performance Standards.

23.3.a. This subsection establishes minimum performance standards applicable to coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use operations.

23.3.b. Blasting. Blasting is prohibited unless otherwise approved by the state fire marshal.

23.3.c. Drainage. All disturbances created in the coal removal area shall be conducted in such a manner as to prevent or control erosion, siltation, pollution of water, and to minimize disturbance to the prevailing hydrologic balance. Such operations shall be exempt from specific design and construction criteria for sediment control structures only if stabilization to control erosion is achieved through alternative measures.

23.3.d. All toxic or acid-forming materials shall be handled and treated in accordance with the methods set forth in the approved site development plan within thirty (30) days after initial exposure.

23.3.e. All areas disturbed during coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use shall be reclaimed in accordance with the approved site development plan.

23.3.f. Comply with all other applicable environmental rules and regulations

23.4. Expiration. A notice of intent coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use shall be valid only for the time period indicated in the application, which period shall not exceed two (2) years.

23.5. Escrow Release. The escrow account shall be released upon completion of the development. All requests for escrow release shall be accompanied with documentation that the development is completed.

23.6. Notice on Site. All persons conducting coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use shall have on site, a copy of the written approval for such activities issued by the Secretary.

23.7. Public Records. All information submitted to the Department of Environmental Protection as a part of the notice of intent for coal extraction as an incidental part of development of land for commercial, residential, industrial, or civic use, shall be made available for public inspection and copying at the nearest Department of Environmental Protection office; provided, that information submitted to the Secretary pursuant to this subsection which contains trade secrets or privileged commercial or financial information which relates to the competitive rights of the person filing such information or other persons who may be affected, is certified information and shall not be available for public examination.

§38-2-24. Performance Standards Applicable Only to Remining Operations

24.1. Backfilling, Remining, and Grading of Previously Mined Areas.

24.1.a. Remining operations on previously mined areas that contain a pre-existing highwall shall comply with the applicable performance standards of the Act and this rule unless otherwise exempted in accordance with the provisions of this subsection.

24.1.b. The requirement of highwall elimination shall not apply to remining operations where the operator can demonstrate in writing that the volume of all reasonably available spoil located in the vicinity of the remining operation is insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be reduced to the maximum extent technically practical. All spoil generated by the remining operation and any other reasonably available spoil in the vicinity of the operation shall be included in the permit area. For purposes of this paragraph, the term reasonably available spoil means spoil and suitable coal mine waste material generated by the

remining operation or other spoil or suitable coal mine waste material located in the permit area that is accessible and available for use and that when rehandled will not cause a hazard to public safety or significant damage to the environment.

24.1.c. Achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides.

24.1.d. Minimize erosion and water pollution both on and off the site.

24.1.e. Support the approved postmining land use.

24.1.f. Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials.

24.1.g. Disposal of coal processing waste and underground development waste in the mined-out area shall be in accordance with section 22 of this, rule except that a long-term static safety factor of 1.3 shall be achieved.

24.1.h. Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining shall be adequately covered with nontoxic and noncombustible material, or treated, to control the impact on surface and ground water in accordance with subsection 14.5 of this section, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

24.1.i. Cut-and-fill terraces may be allowed where:

24.1.i.1. Needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or

24.1.i.2. Specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land use plan.

24.1.j. Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

24.1.k. Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbance will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

24.1.l. Any highwall remnant left after remining must be demonstrated by the operator to be stable and not pose a hazard to the public health and safety or the environment.

24.2. Revegetation.

24.2.a. All revegetation shall be carried out in a manner that encourages a prompt vegetative cover which, at a minimum, shall be adequate to control erosion and is consistent with the reclamation plan. The ground cover requirements for revegetation set forth in section 9 of this rule may be modified on a case-by-case basis, by the Secretary, except that at a minimum the vegetative ground cover shall be no less than that which existed before remining and shall be adequate to control erosion. Determination of premining ground cover success and productivity shall be made using sampling techniques described in the Handbook.

24.2.b. The responsibility for successful revegetation, as required by the Act, shall be for a period of not less than two growing seasons, as defined by the Secretary, after the last year of augmented seeding, fertilizing, irrigation or other work.

24.3. Water Quality. A coal remining operation which began after February 4, 1987, and on a site which was mined prior to August 3, 1977, may qualify for the water quality exemptions set forth in subsection (p), section 301 of the Federal Clean Water Act, as amended.

24.4. Requirements to Release Bonds. Bond release for remining operations shall be in accordance with all of the requirements set forth in subsection 12.2 of this rule. Provided that there is no evidence of a premature vegetation release.

§38-2-25. Exemption for Coal Extraction Incidental to Extraction of Other Minerals.

25.1. Exemption determination. No later than 90 days after filing of an administratively complete request for exemption, the Secretary shall make a written determination whether, and under what conditions, the persons claiming the exemption are exempt under this part, and shall notify the person making the request and persons submitting comments on the application of the determination and the basis for the determination. The determination of exemption shall be based upon information contained in the request and any other information available to the regulatory authority at that time. If the Secretary fails to provide a determination as specified in this section, extraction may commence pending a determination on the request.

25.2. Contents of request for exemption. An request for exemption shall be made part of a quarrying application and shall include at a minimum:

25.2.a. The names and business address of the requestor to include a street address or route number;

25.2.b. A list of the minerals to be extracted;

25.2.c. Estimates of annual production of coal and the other minerals over the anticipated life of the operation;

25.2.d. A reasonable estimate of the number of acres of coal that will be extracted;

25.2.e. Evidence of publication of a public notice. The notice shall be published in a newspaper of general circulation in the county in which the operation is located and shall be published once and provide a thirty day comment period. The public notice must contain at a minimum:

25.2.e.1. The quarrying number identifying the operation;

25.2.e.2. A clear and accurate location map of a scale and detail found in the West Virginia General Highway Map. The map size will be at a minimum four inches (4") x four inches (4"). Longitude and latitude lines and north arrow will be indicated on the map and such lines will cross at or near the center of the quarrying operation;

25.2.e.3. The names and business address of the requestor to include a street address or route number;

25.2.e.4. A narrative description clearly describing the location of the quarrying operation;

25.2.e.5. The name and address of the Department of Environmental Protection Office where written comments on the request may be submitted;

25.2.f. Geologic cross sections, maps or plans of the quarrying operation determine the following information:

25.2.f.1. The locations (latitude and longitude) and elevations of all bore holes;

25.2.f.2. The nature and depth of the various strata or overburden including geologic formation names and/or geologic members;

25.2.f.3. The nature and thickness of any coal or other mineral to be extracted;

25.2.g. A map of appropriate scale which clearly identifies the coal extraction area versus quarrying area;

25.2.h. A general description of coal extraction and quarrying activities for the operation;

25.2.i. Any other information pertinent to the qualification of the operation as exempt.

25.3. Requirements for exemption.

25.3.a. Activities are exempt from the requirements of the Act if all of the following are satisfied:

25.3.a.1. The cumulative production of coal extracted from the mining area determined annually as described in this paragraph does not exceed 16 2/3 percent of the total cumulative production of coal and other minerals removed during such period for purposes of bona fide sale or reasonable commercial use.

25.3.a.2. Coal is extracted from a geological stratum lying above or immediately below the deepest stratum from which other minerals are extracted for purposes of bona fide sale or reasonable commercial use.

25.3.b. Persons seeking or that have obtained an exemption from the requirements of the Act shall comply with the following:

25.3.b.1. Each other mineral upon which an exemption under this part is based must be a commercially valuable mineral for which a market exists or which is quarried in bona fide anticipation that a market will exist for the mineral in the reasonably foreseeable future, not to exceed twelve months. A legally binding agreement for the future sale of other minerals is sufficient to demonstrate the above standard.

25.3.b.2. If either coal or other minerals are transferred or sold by the operator to a related entity for its use or sale, the transaction must be made for legitimate business purposes.

25.4. Conditions of exemption.

A person conducting activities covered by this part shall:

25.4.a. Maintain on-site the information necessary to verify the exemption including, but not limited to, commercial use and sales information, extraction tonnages, and a copy of the exemption application and the Department's exemption approval;

25.4.b. Notify the Department of Environmental Protection upon the completion of all coal extraction activities.

25.5. Stockpiling of minerals.

25.5.a. Coal extracted and stockpiled may be excluded from the calculation of annual production until the time of its sale, transfer to a related entity or use:

25.5.a.1. Up to an amount equaling a 12-month supply of the coal required for future sale, transfer or use as calculated based upon the average annual sales, transfer and use from the mining area over the two preceding years; or

25.5.a.2. For a mining area where coal has been extracted for a period of less than two years, up to an amount that would represent a 12-month supply of the coal required for future sales, transfer or use as calculated based on the average amount of coal sold, transferred or used each month.

25.5.b. The Department of Environmental Protection shall disallow all or part of an operator's tonnages of stockpiled other minerals for purposes of meeting the requirements of this part if the operator fails to maintain adequate and verifiable records of the mining area of origin, the disposition of stockpiles or if the disposition of the stockpiles indicates the lack of commercial use or market for the minerals.

The Department of Environmental Protection may only allow an operator to utilize tonnages of stockpiled other minerals for purposes of meeting the requirements of this part if:

25.5.b.1. The stockpiling is necessary to meet market conditions or is consistent with generally accepted industry practices; and

25.5.b.2. Except as provided in paragraph b.3. of this section, the stockpiled other minerals do not exceed a 12-month supply of the mineral required for future sales as approved by the regulatory authority on the basis of the exemption application.

25.5.b.3. The Department of Environmental Protection may allow an operator to utilize tonnages of stockpiled other minerals beyond the 12-month limit established in paragraph b.2. of this section if the operator can demonstrate to the Department of Environmental Protection's satisfaction that the additional tonnage is required to meet future business obligations of the operator, such as may be demonstrated by a legally binding agreement for future delivery of the minerals.

25.5.b.4. The Department of Environmental Protection may periodically revise the other mineral stockpile tonnage limits in accordance with the criteria established by paragraphs b.2. and 3. of this section based on additional information available to the Department of Environmental Protection.

25.6. Revocation and enforcement.

25.6.a. The Department of Environmental Protection shall conduct an annual compliance review of the operation requesting exemption.

25.6.b. If the Department of Environmental Protection has reason to believe that a specific operation was not exempt at the end of the previous reporting period, is not exempt, or will be unable to satisfy the exemption criteria at the end of the current reporting period, the Department of Environmental Protection shall notify the operator that the exemption may be revoked and the reason(s) therefore. The exemption will be revoked unless the operator demonstrates to the Department of Environmental Protection within 30 days that the operation in question should continue to be exempt.

25.6.c. If the Department of Environmental Protection finds that an operator has not demonstrated that activities conducted in the operation area qualify for the exemption, the Department of Environmental Protection shall notify the operator.

25.7. Reporting requirements.

25.7.a.1. Following approval by the Department of Environmental Protection of an exemption for an operation, the person receiving the exemption shall file a quarterly production report with the Department of Environmental Protection containing the information specified in paragraph b. of this section.

25.7.a.2. The report shall be filed no later than 30 days after the end of each quarter.

25.7.a.3. The information in the report shall cover:

25.7.a.3.A. Quarterly production of coal and other minerals, and

25.7.a.3.B. The cumulative production of coal and other minerals.

25.7.a.3.C. The number of tons of coal stockpiled;

25.7.a.3.D. The number of tons of other minerals stockpiled by the operator.