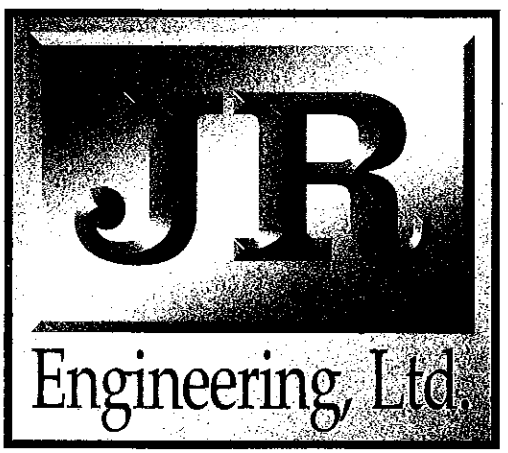
FILE in MDDP's

DESIGN REPORT
FOR
PINE CREEK DETENTION FACILITY NO. 1
MODIFICATIONS



JR Engineering, Ltd.
4935 North 30th Street
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(719) 593-2593 • FAX (719) 528-6613
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DESIGN REPORT
FOR
PINE CREEK DETENTION FACILITY NO. 1
MODIFICATIONS

December 1998

Prepared For:

LP47, LLC
dba LA PLATA INVESTMENTS
7150 Campus Drive, Suite 365
Colorado Springs, CO 80920
(719) 260-7477

Prepared By:

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DESIGN REPORT FOR PINE CREEK DETENTION FACILITY NO. 1 MODIFICATIONS

DRAINAGE REPORT STATEMENT

ENGINEER'S STATEMENT:
The attached drainage report was prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

COLORADO REGISTERED KYLE R. CAMPBELL 29794 PROFESSIONAL ENGINEER

Kyle R. Campbell, Colorado P.E. No. 29794
For and On Behalf of JR Engineering, Ltd.

3-15-99
Date

DEVELOPER'S STATEMENT:
I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: LP47, LLC dba La Plata Investments

By: _____

Title: _____

Address: 7150 Campus Drive, Suite 365

Colorado Springs, CO 80920

CITY OF COLORADO SPRINGS ONLY:
Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

_____
City Engineer

April 5, 1999
Date

Conditions:

DESIGN REPORT FOR
PINE CREEK DETENTION FACILITY NO. 1 MODIFICATIONS

TABLE OF CONTENTS

APPENDICES

DESIGN REPORT FOR
PINE CREEK DETENTION FACILITY NO. 1 MODIFICATIONS

PURPOSE

The purpose of this report is to demonstrate the adequacy of the proposed modifications to existing Pine Creek Detention Facility No. 1.

GENERAL DESCRIPTION

Pine Creek Detention Facility No. 1 is an existing regional detention pond located at the northeast corner of Briargate Parkway and State Highway 83. The pond was constructed to its existing state in the early to mid 1990s. The pond was excavated behind a wide earthen embankment that supports a portion of Briargate Parkway. A 10' high by 12' wide reinforced concrete box culvert constructed through the embankment serves as the outfall for the pond. The pond provides mitigation of peak flow rates in downstream Pine Creek and supports a constructed wetland in its bottom area.

The detention facility was originally proposed in the "Pine Creek Drainage Basin, Drainage Basin Planning Study (Pine Creek DBPS)," prepared by Obering Wurth & Associates, 1988. The criteria for the pond size was subsequently changed by "Amendment No. 1 to the Pine Creek DBPS," prepared by Obering Wurth & Associates, July 1992, due to the addition of a proposed regional detention facility upstream.

The "Design Report for Pine Creek Detention Facility No. 1," prepared by Obering Wurth & Associates, December 1992, provided hydraulic and hydraulic analysis of the now existing facility. The design report looked at two development conditions in the upstream watershed. With the upstream watershed fully developed and other required detention facilities in place, the facility was to discharge a peak flow of 1,835 cfs though the unrestricted box culvert outlet in the 100-year design event. An interim condition with only limited development in the upstream watershed was also considered in the design report. In the interim condition the facility was to

discharge a peak flow of 1,128 cfs through a restricted outlet in the 100-year design event. The existing facility is configured for the interim condition.

The Pine Creek watershed was restudied and the overall drainage plan was revised with "Amendment 2 to the Pine Creek DBPS," prepared by JR Engineering Ltd., October 1998. The revised plan calls for substantially lower peak discharge rates from the Briargate portion of the Pine Creek watershed than the original D.B.P.S. To accomplish the lower discharge rates additional upstream regional detention facilities are required, as well as enlargement of the storage capacity and modifications to the outlet of Detention Facility No. 1.

EXISTING CONDITION

As previously discussed, the pond is currently constructed to provide mitigation of peak flows from a partially developed watershed. The top 6.5 feet of the 10-foot high entrance to the 10'x12' box culvert outlet is blocked by a restrictor plate. The restrictor plate is made up of 6"x6"x1/4" thick galvanized square structural tubing bolted in place across the opening. The 1992 design report contained the following data associated with the interim and the fully developed design conditions.

1992 DESIGN REPORT DATA

	Interim		Fully Developed	
Description	**10-year**	**100-year**	**10-year**	**100-year**
Peak Inflow	860 cfs	2595 cfs	Not Included	2710 cfs
Peak Outflow	507 cfs	1128 cfs	Not Included	1835 cfs
Peak Elevation	6560.1	6574.0	Not Included	6570.3
Peak Storage	18.1 Ac-Ft.	101.25 Ac-Ft	Not Included	76 Ac-Ft.

An estimate of the existing storage capacity in the pond made by JR Engineering from FIMS topography indicates that the existing storage capacity may be somewhat less than the design report called for. However, it should be noted that the FIMS topography lacks detailed elevation data for the pond bottom. JR Engineering assumptions regarding the existing pond bottom may underestimate the pond volume and account for at least part of the discrepancy. A copy of the JR Engineering storage volume estimate is contained in the appendix of this report.

PROPOSED MODIFICATIONS

The proposed modifications to the existing pond includes modifying the outlet and expanding the storage volume . The function of the proposed modifications is to provide more detention of lesser flows and to further lag the peak discharge from the pond in order to allow peak flows from downstream areas to pass ahead of it.

The proposed increase in storage volume will be accomplished via excavation of soil and bedrock at the northwest corner of the existing pond. The expansion grading will impact about 2.2 acres of land. The proposed excavation will add approximately 11.4 ac-ft. of storage volume to the pond below elevation 6574.0. A copy of a spreadsheet used to estimate the volume of the modified pond is contained in the appendix of this report.

A geotechnical report prepared by CTL/Thompson for the original construction of the pond indicates that bedrock will be encountered in the excavation. The report indicates that the expected type of bedrock can normally be excavated with conventional heavy duty construction equipment equipped with rippers or rock teeth

The proposed modifications to the outlet structure include blocking the top 7.5 feet of the 10' high concrete box culvert opening with a restrictor plate. The proposed restrictor plate will be constructed of 6"x6"x1/4" galvanized square structural tubing. Structural tubing that is part of the temporary restrictor plate now in place will be used in the new construction. This material is in good condition. The horizontal location of the restrictor plate will be moved from the wing walls to just inside the entrance of the box culvert. The plate will be remounted with a significant increase in anchorage. The restrictor plate and associated anchors have been designed for the loads imposed if the full 100-year peak discharge to the pond were to pass over the existing emergency spillway (spillway elevation 6575.0, approximate water surface elevation = 6576.7).

A second outlet will be constructed on top of the existing box culvert. This outlet will discharge into the existing box culvert through an opening to be cut in the top of the culvert. The upper outlet is essentially a three-sided box with an open top. The front of the box will be open down to elevation 6567.2. The structure will terminate at elevation 6573.0. Flow will enter the upper

outlet as the water level in the pond exceeds elevation 6567.2. Above elevation 6573.0 flow will enter the outlet from all sides. The outlet will be constructed of reinforced concrete. The outlet structure has been designed for the loads imposed if the full 100-year peak discharge to the pond were to pass over the existing emergency spillway (spillway elevation = 6575.0, approximate water surface elevation = 6576.7). The existing box culvert as modified by this design has also been checked and found to be adequate with this loading condition.

Outlet capacity was calculated assuming submerged orifice flow through the lower outlet and weir flow through the upper outlet. A copy of the spreadsheet used to calculate the outlet capacity is included in the appendix of this report.

The following table is a summary of data associated with the modified pond.

PINE CREEK DETENTION FACILITY NO. 1
ROUTING DATA

	Fully Developed Condition	
Description	**5-year**	**100-year**
Starting Water Surface Elevation	6553.0	6553.0
Peak Water Surface Elevation	6566.2	6573.1
Peak Inflow Rate	1297 cfs	2809 cfs
Peak Outflow Rate	476 cfs	1144 cfs
Starting Volume Stored	0 ac-ft.	0 ac-ft.
Peak Volume Stored	50 ac-ft.	98 ac-ft.
Spillway Crest Elevation	6575.0	6575.0
Total Capacity, Invert to Spillway Crest	112 ac-ft.	112 ac-ft.

HYDROLOGIC CALCULATIONS

The stage , storage , and discharge data associated with the modified pond were entered into the HEC-1 5-year and 100-year models prepared for "Amendment 2 to Pine Creek DBPS." The models were run to simulate routing of storm flows through the proposed modified pond. A copy of the model output is included in the appendix of this report.

EROSION CONTROL PLAN

The City of Colorado Springs Drainage Criteria Manual specifies an erosion control plan and associated cost estimate be submitted with the final drainage report. We respectfully request that the erosion control plan be submitted in conjunction with the overlot grading plan and construction assurances be posted prior to obtaining a grading permit.

FLOODPLAIN STATEMENT

The proposed excavation and grading will occur outside of the limits of the designated 100-year F.E.M.A. floodplain, as shown on Flood Insurance Rate Map Community Panel Number 08041C0508 F, effective date March 17, 1997. A copy of the FIRM is included in the appendix of this report.

PERMITS

The proposed grading will impact a small area of wetland vegetation. An application for a 404 Permit is currently being prepared for the developer by an environmental consultant.

The existing pond was considered "exempt" and thus did not require a permit for construction from the state engineer. The proposed modifications are not expected to change the status of the pond, but plans will be sent to the state engineer for review.

SUMMARY

The analysis performed in the preparation of this report indicates that the modified pond will provide the peak flow mitigation as required by "Amendment 2 to the Pine Creek DBPS." "Amendment 2" modeled a peak 100-year discharge of 1147 cfs from the pond. The current model indicates a peak 100-year discharge of 1144 cfs. The peak 100-year water surface predicted by the model is 6573.1. This provides 1.9 feet of freeboard between the predicted 100-year water surface and the crest of the existing spillway. This freeboard represents a volume of approximately 22 ac-ft.

PREPARED BY:

JR Engineering, Ltd.

Vancel Fossinger

Vancel S. Fossinger, P.E.
Senior Project Engineer

/cw/871610/design rpt.doc

REFERENCES:

1. "Amendment No. 2 to Pine Creek Drainage Basin Planning Study and Master Development Drainage Plan for Pine Creek Subdivision," JR Engineering, Ltd., October 1998.

2. "Pine Creek Drainage Basin Planning Study," Obering Wurth & Associates, October 1988.

3. "Amendment No. 1 to Pine Creek Drainage Basin Planning Study," Obering Wurth & Associates, July 1992.

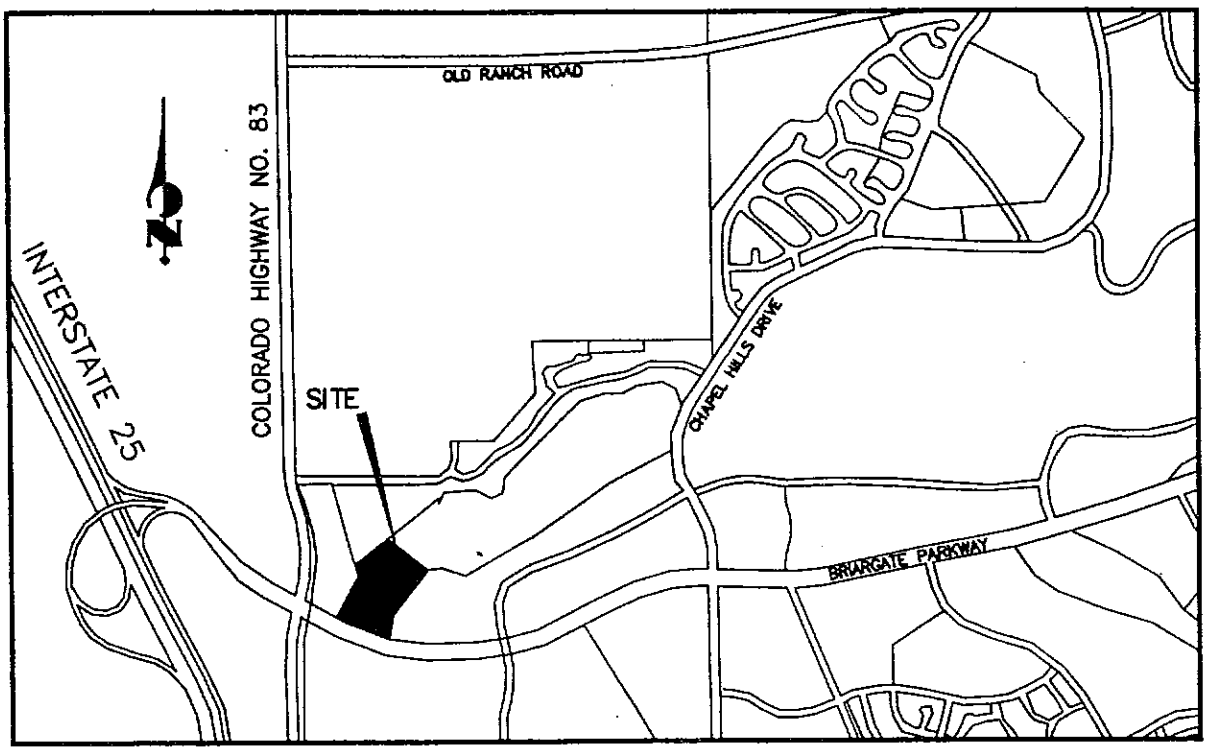
4. "Design Report for Pine Creek Detention Facility No. 1," Obering Wurth & Associates, December 1992.

5. "Geotechnical Investigation, Briargate Parkway Embankment at Pine Creek," CTL/Thompson, Inc., February 1992.

6. "Construction Plans for Detention Facility No. 1," Obering Wurth & Associates, 1992 – 1994.

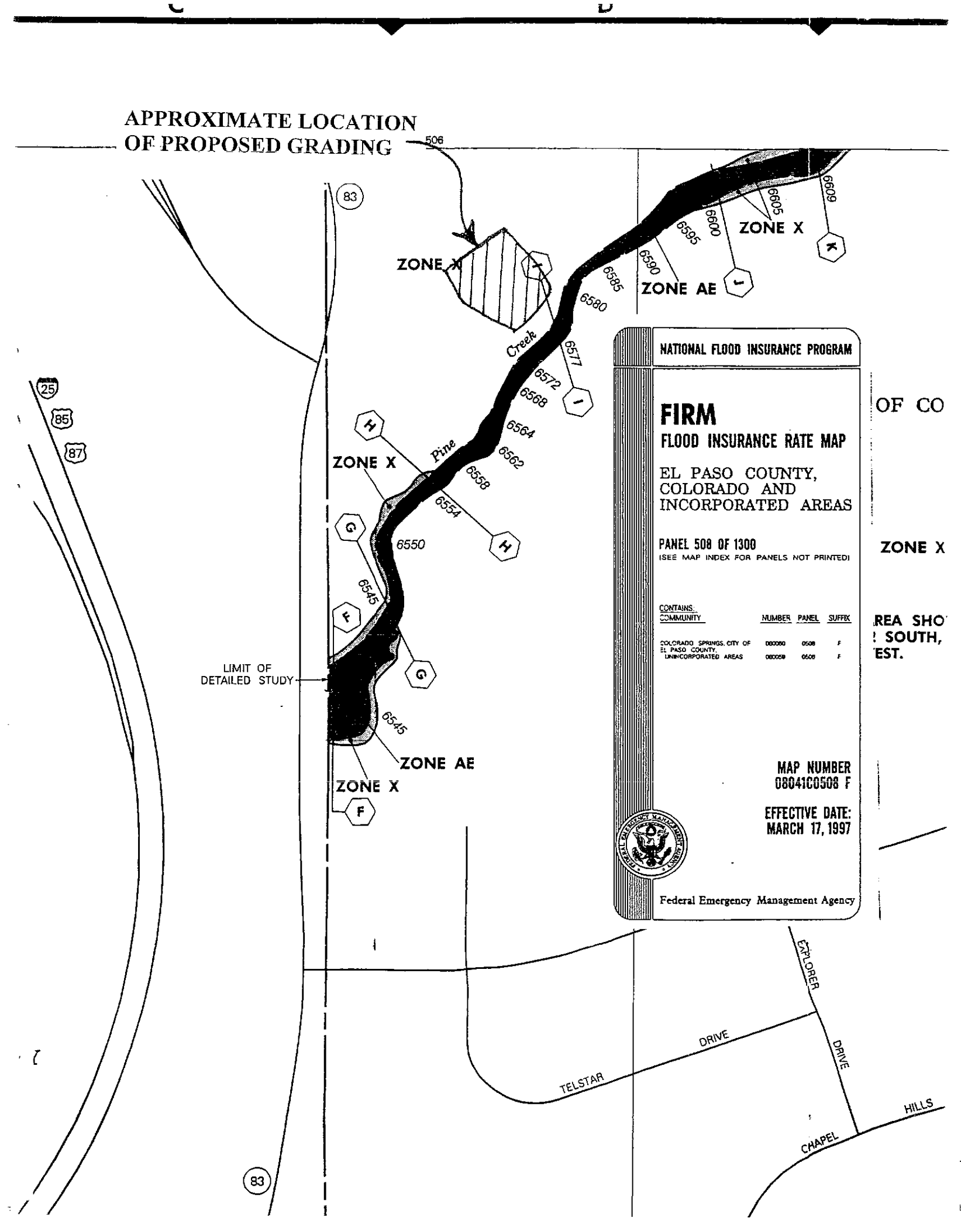
APPENDIX

VICINITY MAP



VICINITY MAP
NTS

F.E.M.A. FLOODPLAIN MAP


APPROXIMATE LOCATION
OF PROPOSED GRADING
506
83
ZONE X
ZONE AE
6609
6605
6600
6595
6590
6585
6580
6577
6572
6568
6564
6562
6558
6554
6550
6545
Creek
Pine
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS
PANEL 508 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
COLORADO SPRINGS, CITY OF
EL PASO COUNTY, UNINCORPORATED AREAS
080060
080059
0508
0508
F
F
MAP NUMBER
08041C0508 F
EFFECTIVE DATE:
MARCH 17, 1997
Federal Emergency Management Agency
LIMIT OF
DETAILED STUDY
25
85
87
EXPLORER
DRIVE
TELSTAR
DRIVE
CHAPEL
HILLS

SPREADSHEETS

- **Existing Storage Volume Estimate**
- **Modified Storage Volume Estimate**
- **Outlet Capacity**

PINE CREEK
DENTION FACILITY No. 1
EXISTING STORAGE VOLUME ESTIMATE
Based on FIMS topography

12/21/98

ELEVATION	EXISTING CONTOUR AREA	INCREMENTAL VOLUME		CUMULATIVE VOLUME	
	(sf)	(cf)	(ac-ft)	(cf)	(ac-ft)
53	0				
54	1340	670	0.02	670	0.02
56	15500	16840	0.39	17510	0.40
58	182016	197516	4.53	215026	4.94
58.7	188170	129565.1	2.97	344591.1	7.91
60	199598	252049.2	5.79	596640.3	13.70
62	212565	412163	9.46	1008803.3	23.16
64	225594	438159	10.06	1446962.3	33.22
66	238773	464367	10.66	1911329.3	43.88
68	252449	491222	11.28	2402551.3	55.15
70	267044	519493	11.93	2922044.3	67.08
72	282517	549561	12.62	3471605.3	79.70
74	299871	582388	13.37	4053993.3	93.07
76	318261	618132	0.00	4672125.3	107.26

PINE CREEK
DETENTION FACILITY No. 1
STORAGE VOLUME ESTIMATE
12/21/1998

ELEVATION	EXISTING CONTOUR AREA	PROPOSED ADDITIONAL CONTOUR AREA	TOTAL PROPOSED CONTOUR AREA	INCREMENTAL VOLUME		CUMULATIVE VOLUME	
	(sf)	(sf)	(sf)	(cf)	(ac-ft)	(cf)	(ac-ft)
53	0						
54	1340	0	1340	670	0.02	670	0.02
56	15500	0	15500	16840	0.39	17510	0.40
58	182016	0	182016	197516	4.53	215026	4.94
58.7	188170	26960	215130	139001.1	3.19	354027.1	8.13
60	199598	28000	227598	287773.2	6.61	641800.3	14.73
62	212565	31500	244065	471663	10.83	1113463	25.56
64	225594	32000	257594	501659	11.52	1615122	37.08
66	238773	32300	271073	528667	12.14	2143789	49.21
68	252449	32900	285349	556422	12.77	2700211	61.99
70	267044	33300	300344	585693	13.45	3285904	75.43
72	282517	33500	316017	616361	14.15	3902265	89.58
74	299871	34100	333971	649988	14.92	4552253	104.51
76	318261	34500	352761	686732	15.77	5238985	120.27

PINE CREEK
DETENTION FACILITY No.1
OUTLET DISCHARGE CAPACITY
PROPOSED MULTIPLE STAGE OUTLET CONFIGURATION

LOWER OUTLET INVERT ELEVATION:	53	LOWER OUTLET SOFFIT ELEVATION:	55.5
UPPER OUTLET INVERT ELEVATION:	67.2	UPPER OUTLET SOFFIT ELEVATION:	76
LOWER OUTLET LENGTH:	12.1		
UPPER OUTLET LENGTH:	12.8		

		LOWER OUTLET								UPPER OUTLET				
WATER SURFACE ELEVATION	NORMAL DEPTH IN BOX (ADJUSTED)	WEIR HEAD ft	WEIR "C"	WEIR LENGTH FT	WEIR FLOW cfs	ORIFICE AREA sf	ORIFICE HEAD FT	ORIFICE "C"	ORIFICE FLOW cfs	WEIR HEAD ft	WEIR "C"	WEIR LENGTH FT	WEIR FLOW cfs	COMBINED FLOW cfs
55.0	1.0	2.00	3.00	11.70	99	0.00	0.0	0.60	0	0.00	0.00	0.00	0	99
56.0	1.4	0.00	3.00	12.10	0	30.25	1.6	0.60	184	0.00	0.00	0.00	0	184
57.0	1.6	0.00	3.00	12.10	0	30.25	2.4	0.60	226	0.00	0.00	0.00	0	226
58.0	1.8	0.00	3.00	12.10	0	30.25	3.2	0.60	261	0.00	0.00	0.00	0	261
59.0	1.9	0.00	3.00	12.10	0	30.25	4.1	0.60	295	0.00	0.00	0.00	0	295
60.0	2.0	0.00	3.00	12.10	0	30.25	5.0	0.60	326	0.00	0.00	0.00	0	326
61.0	2.1	0.00	3.00	12.10	0	30.25	5.9	0.60	354	0.00	0.00	0.00	0	354
62.0	2.2	0.00	3.00	12.10	0	30.25	6.8	0.60	380	0.00	0.00	0.00	0	380
63.0	2.3	0.00	3.00	12.10	0	30.25	7.7	0.60	404	0.00	0.00	0.00	0	404
64.0	2.4	0.00	3.00	12.10	0	30.25	8.6	0.60	427	0.00	0.00	0.00	0	427
65.0	2.5	0.00	3.00	12.10	0	30.25	9.5	0.60	449	0.00	0.00	0.00	0	449
66.0	2.6	0.00	3.00	12.10	0	30.25	10.4	0.60	470	0.00	0.00	0.00	0	470
67.0	2.8	0.00	3.00	12.10	0	30.25	11.2	0.60	487	0.00	0.00	0.00	0	487
68.0	3.1	0.00	3.00	12.10	0	30.25	11.9	0.60	502	0.80	3.24	12.64	29	532
69.0	3.4	0.00	3.00	12.10	0	30.25	12.6	0.60	517	1.80	3.27	12.44	98	615
70.0	3.8	0.00	3.00	12.10	0	30.25	13.2	0.60	529	2.80	3.30	12.24	189	718
71.0	4.3	0.00	3.00	12.10	0	30.25	13.7	0.60	539	3.80	3.33	12.04	297	836
72.0	4.7	0.00	3.00	12.10	0	30.25	14.3	0.60	551	4.80	3.36	11.84	418	969
73.0	5.1	0.00	3.00	12.10	0	30.25	14.9	0.60	562	5.80	3.38	11.64	550	1112
74.0	5.6	0.00	3.00	12.10	0	30.25	15.4	0.60	572	6.80	3.41	11.44	692	1264
75.0	6.1	0.00	3.00	12.10	0	30.25	15.9	0.60	581	7.80	3.44	11.24	842	1423

DISCHARGE THROUGH LOWER OPENING ESTIMATED WITH FORMULA FOR A SUBMERGED ORIFICE (C=.60) WITH THE HEAD ADJUSTED TO ACCOUNT FOR WATER DEPTH IN THE DOWNSTREAM BOX CULVERT

DISCHARGE THROUGH THE UPPER OPENING ESTIMATED WITH THE SHARP CRESTED WEIR FORMULA WITH THE LENGTH ADJUSTED 0.2h FOR END CONTRACTIONS AND C=3.22+0.4(h/p) WHERE P=WEIR HEIGHT ABOVE THE APPROACH CHANNEL BOTTOM (14.2')

FOR STAGES ABOVE EL.=73 CALCULATE FLOW OVER ADDITION WEIR LENGTH (29.3') W/ C=3.22

AT EL. 74 ADDITIONAL FLOW = $3.22*29.3*1^{1.5}$=94cfs TOTAL FLOW=1264+94=1358

AT EL. 75 ADDITIONAL FLOW = $3.22*29.3*2^{1.5}$=267cfs TOTAL FLOW=1423+267=1690

HYDROLOGIC CALCULATIONS

HEC-1 MODEL OUTPUT
FULLY DEVELOPED
5-YEAR STORM

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY   1991              *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  12/21/1998  TIME  17:26:50 *
*                                       *
*****************************************
```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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX          XXX
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::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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   PINE CREEK DRAINAGE BASIN - 24HR, FULL DEVELOPED CONDITION (TYPE IIa5 YEAR)
         2          ID   FILE:PCDBPSD5.DAT
         3          ID   FULLY DEVELOPED CONDITION MODEL MODIFIED PER DESIGN OF MODIFICATIONS TO DF 1
         4          ID   998 REVISION, LAST MODEL REVISION DATE:8/5/98  10-19-98
         5          ID   CN VALUES HAVE BEEN ADJUSTED TO PRODUCE PEAK 100 YEAR FLOW RATES SIMILAR TO
         6          ID   100 YEAR FLOW RATES PRODUCED BY RATIONAL METHOD.
         7          ID   NOTE: THE DIVERSION ROUTINES WERE REMOVED FROM THE MODEL FOR THE 5 YR STORM
         8          ID   NOTE: THE OUTFLOW CURVE FOR THE SUMMER FIELD DETENTION POND WAS MODIFIED
         9          ID   SLIGHTLY TO ALLOW THE 5 YR MODEL TO RUN.
        10          ID   CN VALUES HAVE BEEN ADJUSTED TO PRODUCE PEAK 100 YEAR FLOW RATES SIMILAR TO
        11          ID   100 YEAR FLOW RATES PRODUCED BY RATIONAL METHOD.
        12          ID   ********************************************************************************
        13          ID   BEGIN CALCULATIONS IN THE PINE CREEK NORTH FORK WATERSHED
        14          ID   ********************************************************************************
*** FREE ***
                    *DIAGRAM
        15          IT       3       0       0     300
        16          IO       5

        17          KK  SB-PN1
        18          KM   COMPUTE HYDROGRAPH FOR BASIN PN1
        19          BA    .164
        20          IN      15
        21          PB     2.6
        22          PC    0000   .0005   .0015   .0030   .0045   .0060   .0080   .0100   .0120   .0143
        23          PC   .0165   .0188   .0210   .0233   .0255   .0278   .0320   .0390   .0460   .0530
        24          PC   .0600   .0750   .1000   .4000   .7000   .7250   .7500   .7650   .7800   .7900
        25          PC   .8000   .8100   .8200   .8250   .8300   .8350   .8400   .8450   .8500   .8550
        26          PC   .8600   .8638   .8675   .8713   .8750   .8788   .8825   .8863   .8900   .8938
        27          PC   .8975   .9013   .9050   .9083   .9115   .9148   .9180   .9210   .9240   .9270
        28          PC   .9300   .9325   .9350   .9375   .9400   .9425   .9450   .9475   .9500   .9525
        29          PC   .9550   .9575   .9600   .9625   .9650   .9675   .9700   .9725   .9750   .9775
        30          PC   .9800   .9813   .9825   .9838   .9850   .9863   .9875   .9888   .9900   .9913
        31          PC   .9925   .9938   .9950   .9963   .9975   .9988  1.000
        32          LS       0    80.2
        33          UD    .188

        34          KK  SB-PN2
        35          KM   COMPUTE HYDROGRAPH FOR BASIN PN2
        36          BA    .149
        37          LS       0      79
        38          UD    .192

        39          KK  RT-PN2
        40          KM   ROUTE FLOW FROM PN2 TO AP1
        41          RD    1000     .03    .013            CIRC     4.5

        42          KK     AP1
        43          KM   COMBINE THE FLOW FROM BASIN PN1 TO THE ROUTED FLOW FROM BASIN PN2 AT AP1
        44          HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  45      KK  RT-AP1
  46      KM   ROUTE AP1 TO AP2
  47      RD    2600    .033    .013           CIRC       6

  48      KK  SB-PN3
  49      KM   COMPUTE HYDROGRAPH FOR BASIN PN3
  50      BA    .083
  51      LS       0    85.8
  52      UD    .196

  53      KK     AP2
  54      KM   COMBINE ROUTED FLOW FROM AP1 WITH FLOW FROM BASIN PN3
  55      HC       2

  56      KK  RT-AP2
  57      KM   ROUTE FLOW FROM AP2 TO AP3
  58      RD     800    .025    .013           CIRC       7

  59      KK  SB-PN4
  60      KM   COMPUTE HYDROGRAPH FOR BASIN PN4
  61      BA    .114
  62      LS       0    78.5
  63      UD    .185

  64      KK  RT-PN4
  65      KM   ROUTE FLOW FROM BASIN PN4 TO AP3
  66      RD    1000    .040    .013           CIRC       4

  67      KK  SB-PN5
  68      KM   COMPUTE HYDROGRAPH FOR BASIN PN5
  69      BA    .074
  70      LS       0    86.2
  71      UD    .175

  72      KK     AP3
  73      KM   COMBINE ROUTED FLOW RT-PN4 WITH ROUTED FLOW RT-AP2 AND FLOW FROM BASIN PN5
  74      HC       3

  75      KK  RT-AP3
  76      KM   ROUTE FLOW FROM AP3 TO DETENTION FACILITY "G"
  77      RD    1100    .025   0.013           CIRC     8.5

  78      KK  SB-PN6
  79      KM   COMPUTE HYDROGRAPH FOR BASIN PN6
  80      BA    .146
  81      LS       0    95.0
  82      UD    .127

  83      KK   APDFG
  84      KM   COMBINE ROUTED FLOW FROM AP3 WITH FLOW FROM BASIN PN6 AT REGIONAL DETENTION
  85      KM   FACILITY "G"
  86      HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  87      KK RR-DFFG
  88      KM   ROUTE FLOW THROUGH A REGIONAL DETENTION FACILITY. ASSUME A 48" DIA OUTLET
  89      KM   WITH INVERT AT EL. 59. OUTLET Q ESTIMATED WITH BUREAU OF PUBLIC ROADS
  90      KM   NOMOGRAPH FOR INLET CONTROL OF CULVERTS. VOLUME BASED ON CONCEPTUAL
  91      KM   GRADING PLAN.
  92      KO       3       1     100
  93      RS       1    STOR       0
  94      SV       0      .1     2.8     8.0    14.1    20.9    28.4    36.6    45.5    55.1
  95      SV    65.3    76.3    88.2
  96      SE      59      60      62      64      66      68      70      72      74      76
  97      SE      78      80      82
  98      SQ       0      10      47      93     130     160     180     203     222     240
  99      SQ     262     280     295

 100      KK  RT-DFG
 101      KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM POWERS BLVD.
 102      KM   1800 FEET WEST TO DETENTION FACILITY "F"
 103      RD    1800    .023    .045            TRAP      15       3

 104      KK  SB-PN7
 105      KM   COMPUTE HYDROGRAPH FOR BASIN PN7
 106      BA    .078
 107      LS       0    74.6
 108      UD    .165

 109      KK  SB-PN8
 110      KM   COMPUTE HYDROGRAPH FOR BASIN PN8
 111      BA    .113
 112      LS       0    80.9
 113      UD    .176

 114      KK   APDFF
 115      KM   COMBINE ROUTED FLOW RT-DFG AND FLOW FROM BASINS PN7 AND PN8 AT REGIONAL
 116      KM   DETENTION FACILITY "F"
 117      HC       3

 118      KK  RR-DFF
 119      KM   ROUTE FLOW THRU A REGIONAL DETENTION FACILITY. ASSUME A 48 DIA OUTLET WITH
 120      KM   THE INVERT DEPRESSED 2' BELOW POND INVERT. OUTLET Q ESTIMATED WITH  BUREAU
 121      KM   OF PUBLIC ROADS NOMOGRAPH FOR INLET CONTROL OF CULVERTS
 122      KO       3       1     100
 123      RS       1    STOR       0
 124      SV       0       0     0.1     0.7     1.5     4.4     7.8    11.7    16.1    21.0
 125      SV    26.4
 126      SE      90      92      94      96      98     100     102     104     106     108
 127      SE     110
 128      SQ       0      22      70     112     143     170     190     210     230     250
 129      SQ     265
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  130     KK  RT-DFF
  131     KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM DETENTION
  132     KM   FACILITY "F" AT THE COLLECTOR STREET CROSSING TO AP-4 AT THE WEST SIDE OF
  133     KM   BASINS PN9 AND PN10
  134     RD    1600     .02    .045            TRAP      20       3

  135     KK  SB-PN9
  136     KM   COMPUTE HYDROGRAPH FOR BASIN PN9
  137     BA    .036
  138     LS       0    72.8
  139     UD    .170

  140     KK SB-PN10
  141     KM   COMPUTE HYDROGRAPH FOR BASIN PN10
  142     BA    .043
  143     LS       0    72.7
  144     UD    .141

  145     KK     AP4
  146     KM   COMBINE ROUTED FLOW RT-DFF WITH FLOW FROM BASINS PN9 AND PN10
  147     HC       3

  148     KK  RT-AP4
  149     KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM AP4
  150     KM   TO DETENTION FACILITY "E" AT THE COLLECTOR STREET CROSSING
  151     RD    1400    .032    .045            TRAP      20       3

  152     KK SB-PN11
  153     KM   COMPUTE HYDROGRAPH FOR BASIN PN11
  154     BA   0.079
  155     LS       0    76.7
  156     UD    .189

  157     KK SB-PN12
  158     KM   COMPUTE HYDROGRAPH FOR BASIN PN12
  159     BA   0.039
  160     LS       0    68.2
  161     UD    .129

  162     KK SB-PN13
  163     KM   COMPUTE HYDROGRAPH FOR BASIN PN13
  164     BA   0.127
  165     LS       0      74
  166     UD    .195

  167     KK   APDFE
  168     KM   COMBINE ROUTED FLOW RT-AP4 WITH FLOW FROM BASINS PN11, PN12, AND PN13
  169     KM   AT REGIONAL DETENTION FACILITY "E"
  170     HC       4
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

171       KK  RR-DFE
172       KM   NOTE: THE INPUT POND VOLUME REFLECTS THE DESIGN POND VOLUME ON 7-23-98
173       KM   ROUTE FLOW THRU A DETENTION FACILITY. ASSUME A 54" DIA OUTLET WITH
174       KM   THE INVERT DEPRESSED 2' BELOW POND INVERT (INV EL=84. OUTLET Q ESTIMATED
175       KM   WITH BUREAU OF PUBLIC ROADS NOMOGRAPH FOR INLET CONTROL OF CULVERTS
176       KM   DISCHARGE ABOVE EL 100.3 INCLUDES FLOW OVER EMERGENCY SPILLWAY
177       KM   SCALE 1
178       KO       3       1
179       RS       1    STOR       0
180       SV       0       0    1.25    3.91    6.93   10.31   14.07   18.24   22.83   27.87
181       SE     784     786     788     790     792     794     796     798     800     802
182       SQ       0      25      80     136     173     210     240     263     280    1431

183       KK  RT-DFE
184       KM   ROUTE THE OUTFLOW FROM DETENTION FACILITY "G" IN A STORM DRAIN TO AP-5
185       RD    1800    .025    .013            CIRC     4.5

186       KK SB-PN14
187       KM   COMPUTE HYDROGRAPH FOR BASIN PN14
188       BA    .027
189       LS       0    74.3
190       UD    .157

191       KK RT-PN14
192       KM   ROUTE FLOW FROM BASIN PN14 IN A STORM DRAIN TO AP5
193       RD    1400    .055    .013            CIRC       2

194       KK SB-PN15
195       KM   COMPUTE HYDROGRAPH FOR BASIN PN15
196       BA    .074
197       LS       0    72.7
198       UD    .186

199       KK     AP5
200       KM   COMBINE ROUTED FLOW RT-PN14 TO FLOW FROM BASIN PN15
201       HC       3

202       KK  RT-AP5
203       KM   ROUTE THE FLOW AT AP5 TO AP5A AT THE CONFLUENCE OF THE FLOWS FROM THE
204       KM   NORTH AND SOUTH FORKS OF PINE CREEK
205       RD     400    .025    .013            CIRC       5
206       KM   ********************************************************************************
207       KM   ***** BEGIN CALCULATIONS FOR THE SOUTH FORK OF PINE CREEK WATERSHED ****
208       KM   ********************************************************************************

209       KK  SB-PS1
210       KM   COMPUTE HYDROGRAPH FOR BASIN PS1
211       BA    .150
212       LS       0    78.4
213       UD    .205
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  214     KK  RT-PS1
  215     KM   ROUTE FLOW FROM BASIN PS1 TO REGIONAL DETENTION FACILITY "G"
  216     RD    2100     .03    .013            CIRC     4.5

  217     KK  SB-PS2
  218     KM   COMPUTE HYDROGRAPH FOR BASIN PS2
  219     BA    .154
  220     LS       0    85.2
  221     UD    .188

  222     KK  SB-PS3
  223     KM   COMPUTE HYDROGRAPH FOR BASIN PS3
  224     BA    .162
  225     LS       0    84.8
  226     UD    .205

  227     KK   APDFD
  228     KM   COMBINE ROUTED FLOW RT-PS1 TO FLOW FROM BASINS PS2 AND PS3
  229     HC       3

  230     KK  RR-DFD
  231     KM   ROUTE FLOW THRU A DETENTION FACILITY
  232     KM   ASSUME BOTTOM TO BE 240'WIDE X 590' LONG W 4:1 SIDE SLOPES
  233     KM   ASSUME A 36 DIA OUTLET WITH INVERT AT POND INVERT.
  234     KM   OUTLET Q ESTIMATED WITH ORIFICE EQUATION ASSUMING c=0.60
  235     KM   AND DOWNSTEAM STORM DRAIN IN NON PRESSURE FLOW
  236     KM   2,2,100
  237     RS       1    STOR       0
  238     KO       3       1     100
  239     SV       0     6.8    14.3    22.4    31.1    40.6    50.8    61.8
  240     SE     100     102     104     106     108     110     112     114
  241     SQ       0      18      54      72      87      99     110     120

  242     KK  RT-DFD
  243     KM   ROUTE FLOW FROM DFD TO AP-6 AT POWERS BLVD.
  244     RD    1000    .025    .013            CIRC       3

  245     KK  SB-PS4
  246     KM   COMPUTE HYDROGRAPH FOR BASIN PS4
  247     BA    .054
  248     LS       0    93.2
  249     UD    .134

  250     KK  SB-PS5
  251     KM   COMPUTE HYDROGRAPH FOR BASIN PS5
  252     BA    .066
  253     LS       0    98.0
  254     UD    .135
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

255       KK     AP6
256       KM   COMBINE ROUTED FLOW RT-DFD WITH FLOW FROM BASINS PS4 AND PS5
257       HC       3

258       KK  RT-AP6
259       KM   ROUTE FLOW FROM AP6 TO AP7 AT THE BRIARGATE BLVD./ AUSTIN BLUFFS PKWY.
260       KM   INTERSECTION
261       RD    2800    .025    .013            CIRC     5.5

262       KK  SB-PS6
263       KM   COMPUTE HYDROGRAPH FOR BASIN PS6
264       BA    .075
265       LS       0    86.5
266       UD    .123

267       KK    AP-7
268       KM   COMBINE ROUTED FLOW RT-AP6 TO FLOW FROM BASIN PS6
269       HC       2

270       KK  SB-PS7
271       KM   COMPUTE HYDROGRAPH FOR BASIN PS7
272       BA    .089
273       LS       0    98.0
274       UD    .119

275       KK    AP7A
276       KM   COMBINE FLOW AT AP-7 TO FLOW FROM BASIN PS7
277       HC       2

278       KK RT-AP7A
279       KM   ROUTE FLOW FROM AP7A TO AP8 AT THE BRIARGATE PARKWAY AND UNION BLVD.
280       KM   INTERSECTION
281       RD    2100    .017    .013            CIRC     7.5

282       KK  SB-PS8
283       KM   COMPUTE HYDROGRAPH FOR BASIN PS8
284       BA    .122
285       LS       0    86.0
286       UD    .127

287       KK     AP8
288       KM   COMBINE ROUTED FLOW RT-AP7 TO FLOW FROM BASIN PS8 AT AP8
289       HC       2

290       KK  SB-PS9
291       KM   COMPUTE HYDROGRAPH FOR BASIN PS9
292       BA    .128
293       LS       0    95.3
294       UD    .130
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

295       KK     AP9
296       KM   COMBINE FLOW AT AP-8 TO FLOW FROM BASIN PS9 AT AP9
297       HC       2

298       KK SB-PS10
299       KM   COMPUTE HYDROGRAPH FOR BASIN PS10
300       BA    .038
301       LS       0    72.9
302       UD    .160

303       KK   APDFC
304       KM   COMBINE FLOW AT AP-9 TO FLOW FROM SB-PS10 IN REGIONAL DETENTION FACILITY "C"
305       KM   THIS IS THE TOTAL INFLOW TO DETENTION FACILITY "C"
306       HC       2

307       KK  RR-DFC
308       KM   ROUTE FLOW THRU A DETENTION FACILITY.  ASSUME A 48 DIA OUTLET WITH THE
309       KM   INVERT AT EL 62.  OUTLET Q ESTIMATED WITH BUREAU OF PUBLIC ROADS NOMOGRAPH
310       KM   FOR INLET CONTROL OF CULVERTS, SCALE 1.
311       KO       3       1     100
312       RS       1    STOR       0
313       SV       0    2.73    9.72   18.56   28.03   38.15   48.95   60.45   72.75   85.85
314       SV   99.66
315       SE      62      64      66      68      70      72      74      76      78      80
316       SE      82
317       SQ       0      23      70     110     140     168     190     215     232     245
318       SQ     258

319       KK  RT-DFC
320       KM   ROUTE OUTFLOW FROM POND "C" WEST DOWN A STORM DRAIN IN BRIARGATE PKWY.
321       KM   TO AP10 AT DETENTION FACILITY "B"
322       RD    2400    .035    .013            CIRC       4

323       KK SB-PS11
324       KM   COMPUTE HYDROGRAPH FOR BASIN PS11
325       BA    .056
326       LS       0    80.3
327       UD    .172

328       KK    AP10
329       KM   COMBINE ROUTED FLOW RT-DFC TO FLOW FROM SB-PS11
330       HC       2

331       KK SB-PS12
332       KM   COMPUTE HYDROGRAPH FOR BASIN PS12
333       BA    .153
334       LS       0    69.0
335       UD    .233
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

336       KK   APDFB
337       KM   COMBINE FLOW AT AP10 TO FLOW FROM BASIN PS12
338       HC      2

339       KK  RR-DFB
340       KM   ROUTE FLOW THROUGH REGIONAL DETENTION POND "B"
341       KM   THIS VOLUME REFLECTS THE DESIGN VOLUME PER PRELIMINARY PLANS ON 7-23-98
342       KM   WITH 54" DIA OUTLET SET AT INVERT ELEV. 70.2. OUTLET Q ESTIMATED WITH
343       KM   BUREAU OF PUBLIC ROADS NOMO GRAPH FOR INLET CONTROL OF CONCRETE PIPE
344       KM   DISCHARGE ABOVE 87.6 INCLUDES FLOW OVER 80' LONG EMERGENCY SPILLWAY
345       KM   SCALE 1
346       KO      3       1
347       RS      1    STOR       0
348       SV      0    0.06    1.17    3.30    5.82    8.73   12.07   15.85   20.07   23.60
349       SV  24.76   29.96
350       SE   71.2    72.0      74      76      78      80      82      84      86    87.6
351       SE     88      90
352       SQ      0      22      73     130     169     202     236     260     285     301
353       SQ    371    1222

354       KK  RT-DFB
355       KM   ROUTE FLOW 1000 LF NORTHWEST IN A STORM DRAIN FROM DETENTION FACILITY "B"
356       KM   TO AP-11
357       RD    1000    .021    .013            CIRC     4.5

358       KK SB-PS13
359       KM   COMPUTE HYDROGRAPH FOR BASIN PS13
360       BA    .065
361       LS      0    74.1
362       UD    .149

363       KK    AP11
364       KM   COMBINE ROUTED FLOW RT-DFB TO FLOW FROM BASIN PS13 AT AP11
365       HC      2

366       KK RT-AP11
367       KM   ROUTE FLOW 600 LF NORTHWEST IN A STORM DRAIN FROM AP11 TO AP5A (THE
368       KM   CONFLUENCE OF FLOWS FROM THE NORTH AND SOUTH FORKS OF PINE CREEK)
369       RD     600    .021    .013            CIRC       5

370       KK    AP5A
371       KM   COMBINE ROUTED FLOW AP5 (FLOW FROM THE NORTH FORK OF PINE CREEK) TO ROUTED
372       KM   FLOW RT-AP11 (FLOW FROM THE SOUTH FORK OF PINE CREEK)
373       HC      2

374       KK RT-AP5A
375       KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL 1300 FEET DOWN THE CHANNEL FROM
376       KM   AP5A NEAR THE HISTORIC CONFLUENCE OF PINE CREEK TO AP12 AT THE CONFLUENCE
377       KM   OF THE MAIN CHANNEL AND THE LEXINGTON DRIVE STORM DRAIN OUTFALL. USE AN
378       KM   APPROXIMATE AVERAGE CHANNEL SECTION AND SLOPE FOR ROUTING.
379       RD    1300    .023    .045            TRAP      50       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

380       KK  SB-PM1
381       KM   COMPUTE HYDROGRAPH FOR BASIN PM1
382       BA    .054
383       LS       0    78.5
384       UD    .203

385       KK  RT-PM1
386       KM   ROUTE THE FLOW FROM BASIN PM1 1200 LF NORTH IN THE LEXINGTON DR. S.D. TO
387       KM   PINE CREEK MAIN CHANNEL.
388       RD    1200     .08    .013            CIR     3.5

389       KK  SB-PM2
390       KM   COMPUTE HYDROGRAPH FOR BASIN PM2, AN AREA OF THE GOLF COURSE
391       BA    .154
392       LS       0    66.0
393       UD    .310

394       KK  SB-PM3
395       KM   COMPUTE HYDROGRAPH FOR BASIN PM3
396       BA    .067
397       LS       0    73.5
398       UD    .248

399       KK    AP12
400       KM   COMBINE ROUTED FLOW RT-PM1 WITH THE ROUTED FLOW IN PINE CREEK MAIN CHANNEL
401       KM   AND THE FLOW FROM BASINS PM2 AND PM3
402       HC       4

403       KK RT-AP12
404       KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM AP12 NEAR THE
405       KM   OUTFALL OF LEXINGTON DRIVE STORM DRAIN TO THE CROSSING AT CHAPEL HILLS DRIVE
406       KM   USE AN APPROXIMATE AVERAGE CHANNEL SECTION AND SLOPE FOR ROUTING.
407       RD    1600    .018    .045           TRAP      30       2

408       KK  SB-PM4
409       KM   COMPUTE HYDROGRAPH FOR BASIN PM4
410       BA    .111
411       LS       0    71.9
412       UD    .170

413       KK    AP13
414       KM   COMBINE FLOW FROM BASIN PM4 TO THE ROUTED FLOW RT-AP12 IN PINE CREEK MAIN
415       KM   CHANNEL ON THE EAST SIDE OF THE CHAPEL HILLS DRIVE CROSSING
416       HC       2
417       KM   ********************************************************************************
418       KM   ********BEGIN SOUTH CHAPEL HILLS DRIVE STORM DRAIN WATERSHED*****************
419       KM   ********************************************************************************

420       KK  SB-CS1
421       KM   COMPUTE HYDROGRAPH FOR BASIN CS1
422       BA    .053
423       LS       0    73.6
424       UD    .181
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

425       KK  RT-CS1
426       KM   ROUTE FLOW 1300 LF WEST IN DYNAMIC DR.  ASSUME BULK OF FLOW IS ON THE SURFACE
427       RD    1300    .021    .013            TRAP      32     .01

428       KK  SB-CS2
429       KM   COMPUTE HYDROGRAPH FOR BASIN CS1
430       BA    .070
431       LS       0    98.0
432       UD    .101

433       KKRR-DFCS2
434       KM   ROUTE FLOW THRU AN ASSUMED DETENTION FACILITY TO REFLECT DETENTION OF 1.6cfs
435       KM   /ACRE FROM THE LI/O PROPERTY AS ASSUMED IN THE MDDP FOR BRIARGATE BUSINESS
436       KM   CAMPUS. BECAUSE THE DISCHARGE CONFIGURATION IS UNKNOWN AT THIS TIME ASSUME
437       KM   THAT THE PEAK DISCHARGE RATE MAY BE DISCHARGED AS SOON AS IT IS AVAILABLE AT
438       KM   THE POND TO REFLECT POTENTIAL FREE DISCHARGE FROM A PORTION OF THE SUBBASIN
439       KM   DISCHARGE REDUCTION ASSUMED AT 1.6 cfS x 37ac=60 cfs
440       RS       1    STOR       0
441       SV       0    .001       6      10
442       SE     100     102     104     106
443       SQ       0     194     194     194

444       KK    AP14
445       KM   COMBINE ROUTED FLOW RT-CS1 TO CONTROLED FLOW FROM BASIN CS2 AT THE
446       KM   INTERSECTION OF CHAPEL HILLS DR. AND DYNAMIC DR.
447       HC       2

448       KK RT-AP14
449       KM   ROUTE FLOW 1100 LF NORTH IN THE CHAPEL HILLS DR. S.D. TO BRIARGATE PKWY.
450       KM   NOTE: THE CALCULATED 100 YEAR FLOW IS IN EXCESS OF THE FULL PIPE CAPACITY
451       KM   OF THE STORM DRAIN BETWEEN DYNAMIC DRIVE AND BRIARGATE PARKWAY. SOME OF
452       KM   THE FLOW MAY BE ON THE SURFACE IN CHAPEL HILLS DRIVE.
453       RD    1100     .02    .013            CIR       4

454       KK  SB-CS3
455       KM   COMPUTE HYDROGRAPH FOR BASIN CH3
456       BA    .053
457       LS       0    84.8
458       UD    .177

459       KKRR-DFCS3
460       KM   ROUTE FLOW THRU AN ASSUMED DETENTION FACILITY TO REFLECT DETENTION REDUCING
461       KM   THE PEAK 100YR FLOW RATE FROM THE 9 ACRES OF THE BASIN THAT ARE DESIGNATED
462       KM   AS LI/O USE AS ASSUMED IN MDDP FOR BRIARGATE BUSINESS CAMPUS.
463       KM   BECAUSE THE DISCHARGE CONFIGURATION IS UNKNOWN AT THIS TIME ASSUME
464       KM   THAT THE PEAK DISCHARGE RATE MAY BE DISCHARGED AS SOON AS IT IS AVAILABLE
465       KM   AT THE POND TO REFLECT FREE DISCHARGE FROM A PORTION OF THE SUB BASIN.
466       KM   DISCHARGE REDUCTION ASSUMED AT 1.6 cfS x 9=14 cfs
467       RS       1    STOR       0
468       SV       0    .001       6      10
469       SE     100     102     104     106
470       SQ       0     123     123     123
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

471       KK   AP15
472       KM   COMBINE ROUTED FLOW RT-AP14 WITH CONTROLLED FLOW FROM BASIN CS3 AT THE
473       KM   INTERSECTION OF CHAPEL HILLS DR. AND BRIARGATE PARKWAY. NOTE A SMALL PORTION
474       KM   OF BASIN CS3 IS LOCATED DOWNSTEAM OF THIS POINT. FOR THIS MODELING PURPOSE
475       KM   THIS IS CONSIDERED INSIGNIFICANT.
476       HC     2

477       KK RT-AP15
478       KM   ROUTE FLOW 1400 LF NORTH IN THE CHAPEL HILLS DR. S.D.
479       KM   NOTE: THE CALCULATED 100 YEAR FLOW IS IN EXCESS OF THE FULL PIPE CAPACITY
480       KM   OF THE STORM DRAIN BETWEEN BRIARGATE PARKWAY AND PINE CREEK. SOME OF
481       KM   THE FLOW MAY BE ON THE SURFACE IN CHAPEL HILLS DRIVE. A SMALL PORTION OF
482       KM   THE SURFACE FLOW MAY BE DIVERTED DOWN BRIARGATE PARKWAY, BUT FOR THE PURPOSE
483       KM   OF THIS ANALYSIS ALL OF THE FLOW FROM THE CHAPEL HILLS DRIVE/BRIARGATE PKY.
484       KM   INTERSECTION IS ASSUMED TO REACH PINE CREEK AT CHAPEL HILLS DRIVE.
485       RD    1400    .045    .013            CIR     4.5

486       KK  SB-CS4
487       KM   COMPUTE HYDROGRAPH FOR BASIN CS4
488       BA    .053
489       LS      0    95.5
490       UD    .101

491       KK RR-DFVC
492       KM   ROUTE FLOW THRU THE PROPOSED VILLAGE CENTER DETENTION FACILITY
493       KM   POND GRADING PER THE PRELIMINARY GRADING SHOWN IN THE MDDP FOR VILLAGE
494       KM   CENTER. DISCHARGE ASSUMES USE OF THE EXISTING 18" DIAMETER STUB.
495       KM   WITH THE INVERT SET AT ELEVATION 73. BUREAU OF PUBLIC ROADS NOMOGRAPH
496       KM   USED TO ESTIMATE OUTFLOW RATES ASSUMING INLET CONTROL.
497       RS      1    STOR      0
498       SV    000    .032    1.67    3.23    5.00    7.00
499       SE     73      74      76      78      80      82
500       SQ      0       3      13      17      20      22

501       KK   AP16
502       KM   COMBINE ROUTED FLOW RT-AP15 WITH THE DISCHARGE FROM THE VILLAGE CENTER POND
503       HC     2

504       KK RT-AP16
505       KM   ROUTE THE FLOW IN THE CHAPEL HILLS DRIVE STORM DRAIN FROM AP16 TO AP19 IN
506       KM   PINE CREEK MAIN CHANNEL ON THE DOWNSTREAM SIDE OF THE CHAPEL HILLS DRIVE
507       KM   CROSSING
508       RD    300     .03    .013            CIR     4.5
509       KM   ********************************************************************************
510       KM   ****BEGIN CALCULATION OF THE NORTH CHAPEL HILLS DR. STORM DRAIN WATERSHED***
511       KM   ********************************************************************************

512       KK  SB-CN1
513       KM   COMPUTE RUNOFF FROM BASIN CN1 THE WATERSHED CONTRIBUTING TO THE PARK SITE AT
514       KM   CHAPEL HILLS DRIVE POND (REGIONAL DETENTION FACILITY "A").
515       BA    .145
516       LS      0    76.8
517       UD    .190
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

518       KK  RR-DFA
519       KM   ROUTE THE FLOW FROM CN1 THROUGH THE PROPOSED DETENTION POND AT THE PARK
520       KM   SITE AT CHAPEL HILLS DRIVE. STAGE STORAGE CURVE PER THE 12/22/97 GRADING PLAN
521       KM   DISCHARGE CURVE REFLECTS 12" DIAMETER OUTLET PIPE CONTROL FOR NORMAL DISCHARG
522       KM   AND A 100' LONG EMERGENGY SPILLWAY SET AT ELEVATION 6805.5
523       KO       3       1     100
524       RS       1    STOR       0
525       SV       0     .01     .22     .99    1.95    2.80    4.25    5.31    6.51   11.64
526       SV   15.36
527       SQ    2.35    2.54    3.00    3.73    4.35    4.75    5.36    5.50    8.39    9.01
528       SQ     279
529       SE  6796.6  6797.0  6798.0  6800.0  6802.0  6803.5 6803.51    6804  6804.1  6805.5
530       SE  6806.5

531       KK  RT-DFA
532       KM   ROUTE OUTFLOW FROM  REGIONAL DETENTION POND "A" DOWN THE CHAPEL HILLS STORM
533       KM   DRAIN FROM LEXINGTON DRIVE TO TREELAKE DRIVE
534       RD     930     .04    .013            CIRC     1.5

535       KK  SB-CN2
536       KM   COMPUTE RUNOFF FROM BASIN CN2
537       BA    .078
538       LS       0    75.5
539       UD    .214

540       KK    AP17
541       KM   COMBINE ROUTED FLOW RT-DFA AND FLOW FROM BASIN CN2 AT THE INTERSECTION OF
542       KM   CHAPEL HILLS DRIVE AND TREELAKE DRIVE
543       HC       2

544       KK RT-AP17
545       KM   ROUTE FLOW AT AP17 DOWN THE CHAPEL HILLS DRIVE STORM DRAIN TO MULLIGAN DR.
546       RD    1400     .05    .013            CIRC     3.5

547       KK  SB-CN3
548       KM   COMPUTE RUNOFF FROM BASIN CN3
549       BA    .043
550       LS       0    80.0
551       UD    .157

552       KK    AP18
553       KM   COMBINE ROUTED FLOW RT-AP17 TO FLOW FROM BASIN CN3 AT INTERSECTION OF CHAPEL
554       KM   HILLS DR. AND MULLIGAN DR.
555       HC       2

556       KK RT-AP18
557       KM   ROUTE FLOW AT AP18 DOWN THE CHAPEL HILLS DRIVE STORM DRAIN TO AP19 IN THE
558       KM   PINE CREEK MAIN CHANNEL ON THE DOWNSTREAM SIDE OF THE CHAPEL HILLS DRIVE
559       KM   CROSSING. NOTE A SMALL PORTION OF BASIN CHN3 IS LOCATED SOUTH OF AP18. THIS
560       KM   IS CONSIDERED INSIGNIFICANT FOR THE PURPOSE OF THIS ANALYSIS.
561       RD     600     .04    .013            CIRC     3.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

562       KK   AP19
563       KM   COMBINE ROUTED FLOW RT-AP18 FROM THE NORTH CHAPEL HILLS DR. STORM DRAIN
564       KM   WITH THE ROUTED FLOW RT-AP16 FROM THE SOUTH CHAPEL HILLS DRIVE STORM DRAIN
565       KM   AND THE FLOW IN PINE CREEK MAIN CHANNEL (AP13) AT THE WEST SIDE OF THE CHAPEL
566       KM   HILLS DRIVE CROSSING. FLOW THAT IS TAKEN INTO THE PINE CREEK CHANNEL FORM THE
567       KM   STREET AT THIS POINT HAS BEEN ACCOUNTED FOR IN BASINS CN3 AND CS3. THIS WAS
568       KM   DONE TO REDUCE THE COMPLEXITY OF THE MODEL.
569       HC      3

570       KK RT-AP19
571       KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL FROM AP19 AT THE CHAPEL HILLS DRIVE
572       KM   CROSSING TO AP20 AT REGIONAL DETENTION FACILITY 1 AT BRIARGATE PARKWAY AND
573       KM   HIGHWAY 83. USE AVERAGE SLOPES AND APPROXIMATE CROSS SECTIONS FOR ROUTING.
574       RD    750    .035    .045          TRAP     30      2
575       RD   1000    .025    .045          TRAP    120      2
576       RD   1400    .026    .045          TRAP     60      2

577       KK  SB-PM5
578       KM   COMPUTE HYDROGRAPH FOR BASIN PM5
579       BA    .183
580       LS      0    70.0
581       UD    .185

582       KK   AP20
583       KM   COMBINE FLOW FROM BASIN PM6 WITH THE ROUTED FLOW IN PINE CREEK
584       HC      2

585       KK  SB-PM6
586       KM   COMPUTE HYDROGRAPH FOR PM6 THE AREA BETWEEN CHAPEL HILLS DR. AND DETENTION
587       KM   FACILITY 1 BOUNDED BY THE GOLF COURSE AND BRIARGATE PARKWAY. NOTE:THE MDDP
588       KM   FOR BRIARGATE BUSINESS CAMPUS REQUIRES DETENTION IN THIS SUBBASIN. FOR THE
589       KM   PURPOSE OF THIS ANALYSIS NO DETENTION IS ASSUMED TO ALLOW THE DEVELOPER THE
590       KM   OPTION OF CONSTRUCTING LARGER CONVEYANCE FACILITIES TO DETENTION FACILITY
591       KM   No. 1 AND ALLOWING FREE DISCHARGE FROM THE BASIN.
592       BA    .088
593       LS      0      98
594       UD    .110

595       KK   AP21
596       KM   COMBINE FLOW FROM PM6 WITH THE FLOW IN PINE CREEK AT AP21 FOR THE TOTAL FLOW
597       KM   IN PINE CREEK CHANNEL AS IT ENTERS DETENTION FACILITY No 1
598       HC      2

599       KK  SB-PM7
600       KM   COMPUTE HYDROGRAPH FOR BASIN PM7 THE AREA NORTH OF DETENTION FACILITY 1
601       KM   NOTE: THE MDDP FOR THE BRIARGATE BUSINESS CAMPUS REQUIRES DETENTION IN
602       KM   THE NON RESIDENTIAL PORTIONS OF THIS AREA. FOR THE PURPOSE OF THIS ANALYSIS
603       KM   FREE DISCHARGE FROM THE BASIN IS ASSUMED. THE RESIDENTIAL PORTION OF THE
604       KM   BASIN LOCATED IN OUTSIDE THE CITY LIMITS IS ASSUMED TO BE FULLY DEVELOPED
605       KM   AS 1 DU PER ACRE RESIDENTIAL.
606       BA    .138
607       LS      0    76.3
608       UD    .353
609       KM   ******************************************************************************
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

610       KM   ****BEGIN CALCULATIONS FOR THE FOCUS ON THE FAMILY STORM DRAIN WATERSHED****
611       KM   ********************************************************************************

612       KK   SB-F1
613       KM   COMPUTE HYDROGRAPH FOR BASIN F1
614       BA    .119
615       LS       0    78.3
616       UD    .208

617       KK  RT-F1P
618       KM   ROUTE FLOW IN THE STORM DRAIN 1300 LF WEST FROM THE SAG PT. IN LEXINGTON
619       KM   DRIVE TO SUMMER FIELD POND
620       RD    1300    .036    .013            CIRC       3

621       KK   SB-F2
622       KM   COMPUTE HYDROGRAPH FOR BASIN F2
623       BA    .039
624       LS       0      74
625       UD    .171

626       KK AP-DFSF
627       KM   COMBINE ROUTED FLOW RT-F1P WITH FLOW FROM F2 AT THE SUMMER
628       KM   FIELD POND. THIS IS THE TOTAL FLOW TO THE POND
629       HC       2

630       KK RR-DFSF
631       KM   ROUTE THE FLOW AT AP-DFSF THROUGH THE SUMMER FIELD DETENTION BASIN.
632       KM   THE INFLOW/OUTFLOW S.D. FOR THIS FACILITY IS BURIED BELOW THE POND BOTTOM.
633       KM   THE POND FILLS WHEN THE CAPACITY OF THE DOWNSTREAM REACH OF S.D. IS
634       KM   EXCEEDED. THIS CONFIGURATION PRESENTS A COMPLEX HYDRAULIC PROBLEM. IT IS
635       KM   ASSUMED THAT UNTIL INFLOW >120cfs FLOW WILL PASS THROUGH THE STORM DRAIN.
636       KM   WHEN INFLOW > 120cfs BACKWATER WILL FORM AT THE OUTLET AND THE LID ON THE
637       KM   UPSTREAM MANHOLE WILL LIKELY BE LIFTED OFF AND SOME FLOW WILL ENTER THE POND
638       KM   FROM THAT POINT. WHEN INFLOW>120cfs IT IS ASSUMED THAT THE HEAD LOSS AT
639       KM   THE OUTLET WILL BE APPOXIMATELY 1*VELOCITY HEAD FOR THE PURPOSE OF
640       KM   CALCULATING THE DISCHARGE CURVE.
641       KM   NOTE: THE OUTFLOW CURVE WAS MODIFIED IN THIS MODEL TO ALLOW THE 5 YEAR
642       KM   STORM TO RUN. AT ELEV. 92 SQ OF 80 WAS SUBSTITUTED FOR 120. THIS CHANGE
643       KM   IS CONSIDERED INSIGNIFICANT AT THE 5 YEAR Q
644       KO       3       1     100
645       RS       1    STOR       0
646       SV       0    0.57    4.63    6.87   10.32
647       SE      92      94      96      98     100
648       SQ      80     126     131     137     144

649       KK RT-DFSF
650       KM   ROUTE OUTFLOW FROM THE DETENTION BASIN IN A 48" S.D. TO RESEARCH PKWY.
651       RD     800    .018    .013            CIRC       4

652       KK   SB-F3
653       KM   COMPUTE HYDROGRAPH FOR BASIN F3
654       BA    .114
655       LS       0    77.0
656       UD    .215
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

657       KK    AP22
658       KM    COMBINE ROUTED FLOW RT-DTSF TO FLOW FROM BASIN F3 AT THE INTERSECTION OF
659       KM    RESEARCH PARKWAY AND SUMMERSET DRIVE.
660       HC       2

661       KKRT-AP22P
662       KM    ROUTE THE S.D.FLOW FROM THE BRIARGATE PKWY/ SUMMERSET INTERSECTION TO THE
663       KM    INTERSECTION OF RESEARCH PKWY. AND CHAPEL HILLS DR.
664       RD    2100     .02    .013            CIRC       5

665       KK    SB-F4
666       KM    COMPUTE HYDROGRAPH FOR BASIN F4
667       BA    .038
668       LS       0    83.0
669       UD    .197

670       KK RR-DFF4
671       KM    ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
672       KM    RATE OF 1.6 CFS/ACRE FROM THE 11.5 AC THAT WILL BE DEVELOPED AS LI/O
673       KM    DISCHARGE REDUCTION PER ACRE IS DETERMINED PER THE RATE AND AREA INCLUDED
674       KM    IN THE MDDP FOR BRIARGATE BUSINESS CAMPUS
675       KM    THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
676       KM    THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE SITE WILL LIKELY
677       KM    FREE DISCHARGE TO THE ADJACENT STREET
678       KM    DISCHARGE REDUCTION = LI/O AREA (acres)11.5 x 1.6 cfs = 18.4 cfs
679       RS       1    STOR       0
680       SV       0    .001       6      10
681       SE     100     102     104     106
682       SQ       0    70.6    70.6    70.6

683       KK    AP23
684       KM    COMBINE ROUTED FLOW RT-AP22P TO FLOW FROM BASIN F4 AT THE INTERSECTION OF
685       KM    RESEARCH PARKWAY AND CHAPEL HILLS DR.
686       HC       2

687       KKRT-AP23P
688       KM    ROUTE THE FLOW IN THE STORM DRAIN FROM THE RESEARCH PKWY/CHAPEL HILLS DR.
689       KM    INTERSECTION TO THE INTERSECTION OF EXPLORER DRIVE AND THE FOCUS ON THE
690       KM    FAMILY S.D.
691       RD    2100    .044    .013            CIRC       4

692       KK    SB-F5
693       KM    COMPUTE HYDROGRAPH FOR BASIN F5
694       BA    .064
695       LS       0    95.5
696       UD    .121

697       KK RR-DFF5
698       KM    ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
699       KM    RATE BASED ON APPROXIMATELY 35% OF THE DIFFERENCE BETWEEN THE DEVELOPED
700       KM    AND HISTORIC PEAK 100 YR FLOW RATE PER THE ORIGINAL DBPS CRITERIA FOR LI/O
701       KM    LAND USE. HISTORIC 100 YR PEAK ESTIMATED AT 1.5 CFS/AC. FULLY DEVELOPED 100
702       KM     YR PEAK ESTIMATED AT 5.6 CFS/AC. ESTIMATED REQUIRED DETENTION =
703       KM    (5.6-1.5)*.35*35AC=50cfs   TOTAL Qin=225cfs
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

704       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
705       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN DISCHARGES
706       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN
707       RS       1    STOR       0
708       SV       0    .001       6      10
709       SE     100     102     104     106
710       SQ       0     175     175     175

711       KK    AP24
712       KM   COMBINE THE ROUTED FLOW IN THE S.D.(RTAP102) TO FLOW FROM FF1
713       HC       2

714       KKRT-AP24P
715       KM   ROUTE THE FLOW IN THE FOCUS STORM DRAIN FROM AP24 AT THE INTERSECTION OF
716       KM   EXPLORER DRIVE AND THE FOCUS S.D. TO AP25 AT THE INTERSECTION OF EXPLORER
717       KM   DRIVE & BRIARGATE PKWY
718       RD     800    .011    .013            CIRC     5.5

719       KK   SB-F6
720       KM   COMPUTE HYDROGRAPH FOR BASIN F6
721       BA    .038
722       LS       0    98.0
723       UD    .106

724       KK RR-DFF6
725       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
726       KM   RATE BASED ON APPROXIMATELY 35% OF THE DIFFERENCE BETWEEN THE DEVELOPED
727       KM   AND HISTORIC PEAK 100 YR FLOW RATE. HISTORIC ESTIMATED AT 1.5 CFS/AC.
728       KM   FULLY DEVELOPED ESTIMATED AT 6.0 CFS/AC. ESTIMATED REQUIRED DETENTION =
729       KM   (6.0-1.5)*.35*21.5AC=34cfs   TOTAL Qin=138cfs
730       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
731       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN DISCHARGES
732       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN
733       RS       1    STOR       0
734       SV       0    .001       6      10
735       SE     100     102     104     106
736       SQ       0     104     104     104

737       KK   SB-F7
738       KM   COMPUTE HYDROGRAPH FOR BASIN F7
739       BA    .052
740       LS       0    93.0
741       UD    .137

742       KK RR-DFF7
743       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
744       KM   RATE BASED ON APPROXIMATELY 35% OF THE DIFFERENCE BETWEEN THE DEVELOPED
745       KM   AND HISTORIC PEAK 100 YR FLOW RATE. HISTORIC ESTIMATED AT 1.5 CFS/AC.
746       KM   FULLY DEVELOPED ESTIMATED AT 5.2 CFS/AC. ESTIMATED REQUIRED DETENTION =
747       KM   (5.2-1.5)*.35*29AC=38cfs   TOTAL Qin=170cfs
748       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
749       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN DISCHARGES
750       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN
751       RS       1    STOR       0
752       SV       0    .001       6      10
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

753       SE      100     102     104     106
754       SQ        0     132     132     132

755       KK    AP25
756       KM    COMBINE ROUTED FLOW RT-AP25P TO CONTROLLED FLOW FROM BASINS F6 AND F7
757       KM    AT THE INTERSECTION OF EXPLORER DR AND BRIARGATE PKWY.
758       HC        3

759       KKRT-AP25P
760       KM    ROUTE THE FLOW IN THE S.D.FROM THE INTERSECTION OF EXPLORE DR. & BRIARGATE
761       KM    PARKWAY TO DETENTION FACILITY 1 AT BRIARGATE PKWY & HIGHWAY 83
762       RD     1250    .011    .013            CIRC     5.5

763       KK  SB-PM8
764       KM    COMPUTE HYDROGRAPH FOR BASIN PM8 THE PORTION OF BRIARGATE PARKWAY BETWEEN
765       KM    EXPLORER DR. AND HIGHWAY 83
766       BA     .014
767       LS        0      98
768       UD     .100

769       KK AP-DF#1
770       KM    ADD THE FLOW FROM THE FOCUS ON THE FAMILY STORM DRAIN, BASINS PM7 AND PM8,
771       KM    AND FLOW IN PINE CREEK FOR THE TOTAL INFLOW TO DETENTION FACILITY 1
772       KO        1       1
773       HC        4

774       KK RR-DF#1
775       KM    ROUTE FLOW THRU DETENTION FACILITY NO.1. VOLUME MODIFIED TO REFLECT PROPOSED
776       KM    ENLARGEMENT. PROPOSED ENLARGEMENT IS TO ADD A MINIMUM OF 0.7 ACRES OF SURFACE
777       KM    AREA TO EACH OF THE CONTOURS AT OR ABOVE ELEVATION 58. OUTLET MODELED
778       KM    ASSUMING THE TOP 7.5' OF THE ENTRANCE TO THE 10'R X 12'S HIGH BOX CULVERT IS
779       KM    BLOCKED AND A NEW 12' WIDE OPENING IS CREATED W/ INVERT AT 67.2
780       KM    OUTFLOW CURVE CALCULATED WITH A SPREADSHEET TREATING THE LOWER OPENING AS
781       KM    A SUBMERGED ORIFICE WITH C=.60, h=POND DEPTH - NORMAL DEPTH IN THE OUTFALL
782       KM    AND THE UPPER OPENING TO ELEVATION 73.0 TREATED AS A SHARP CRESTED WEIR WITH
783       KM    A FULL LENGTH OF 12.8' (THE SKEW LENGTH) ADJUSTED 0.2h FOR END CONTRACTIONS
784       KM    AND C=3.22+0.40(h/P) WHERE P=14.2. ABOVE ELEVATION 73.0 THE TOP OUTLET
785       KM    STRUCTURE IS ASSUMED TO TERMINATE WITHOUT A TOP AND THUS ADDITIONAL FLOW CAN
786       KM    OVER TOP THE SIDES AND BACK OF THE ASSUMED 3 SIDED  STRUCTURE
787       KO        1       1
788       RS        1    STOR       0
789       SV      .02    0.20    0.40    4.94   14.73   25.56   37.08   49.21   61.99   75.43
790       SV    89.58   97.00  104.50  112.38  120.27
791       SE     54.0    55.0    56.0    58.0    60.0    62.0    64.0    66.0    68.0    70.0
792       SE     72.0    73.0    74.0    75.0    76.0
793       SQ        0      99     184     261     326     380     427     470     532     718
794       SQ      969    1112    1358    1690    2200

795       KK RT-AP26
796       KM    ROUTE THE COMBINED FLOW FROM AP26 AT BRIARGATE PARKWAY DOWN PINE CREEK TO
797       KM    THE INTERSECTION OF PINE CREEK AND HIGHWAY 83. USE AVERAGE
798       KM    APPROXIMATE SECTION AND SLOPE FOR ROUTING
799       RD     1450    .019    .045            TRAP      40       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

800       KK  SB-PM9
801       KM   COMPUTE HYDROGRAPH FOR BASIN PM9
802       BA    .068
803       LS      0      93
804       UD    .120

805       KK    AP27
806       KM   COMBINE THE FLOW FROM BASIN PM9 AND THE ROUTED FLOW IN PINE CREEK (RT-AP26) A
807       KM   AT THE UPSTREAM SIDE  OF HIGHWAY 83.
808       HC      2

809       KK SB-PM10
810       KM   COMPUTE HYDROGRAPH FOR BASIN PM10
811       BA    .048
812       LS      0      98
813       UD    .092

814       KKRRDFPM10
815       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
816       KM   RATE TO THE APPROXIMATE PEAK FLOW RATE DISCHARGE GOAL FROM THE BASIN
817       KM   AS SHOWN IN THE FINAL DRAINAGE REPORT FOR BRIARGATE BUSINESS CAMPUS
818       KM   FILING 13 AS APPROVED OCT 31, 1996
819       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
820       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN MAY DISCHARGE
821       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN.
822       KM   DISCHARGE FROM THE BASIN PER THE FINAL DRAINAGE REPORT=140 cfs
823       RS      1    STOR      0
824       SV      0     001      .6     1.5
825       SE    100     102     104     106
826       SQ      0     140     140     140

827       KK RT-PM10
828       KM   ROUTE THE FLOW IN THE S.D.FROM THE LOW POINT IN TELESTAR DR. TO THE EXISTING
829       KM   OUTFALL TO PINE CREEK JUST UPSTREAM OF HIGHWAY 83.
830       RD   1000    .025    .013           CIRC     4.0

831       KK SB-PM11
832       KM   COMPUTE HYDROGRAPH FOR BASIN PM11
833       BA    .041
834       LS      0      98
835       UD    .096

836       KK    AP28
837       KM   COMBINE THE FLOW FROM BASIN PM11 WITH THE FLOW IN  PINE CREEK AT AP27,
838       KM   AND THE ROUTED FLOW FROM BASIN PM10. FLOW IS COMBINED IN PINE CREEK AT
839       KM   THE UPSTREAM SIDE OF THE BOX CULVERT UNDER HIGHWAY 83. THIS REPRESENTS THE
840       KM   TOTAL FLOW TO PINE CREEK FROM THE BRIARGATE AREA
841       KO      3       1
842       HC      3
843       ZZ
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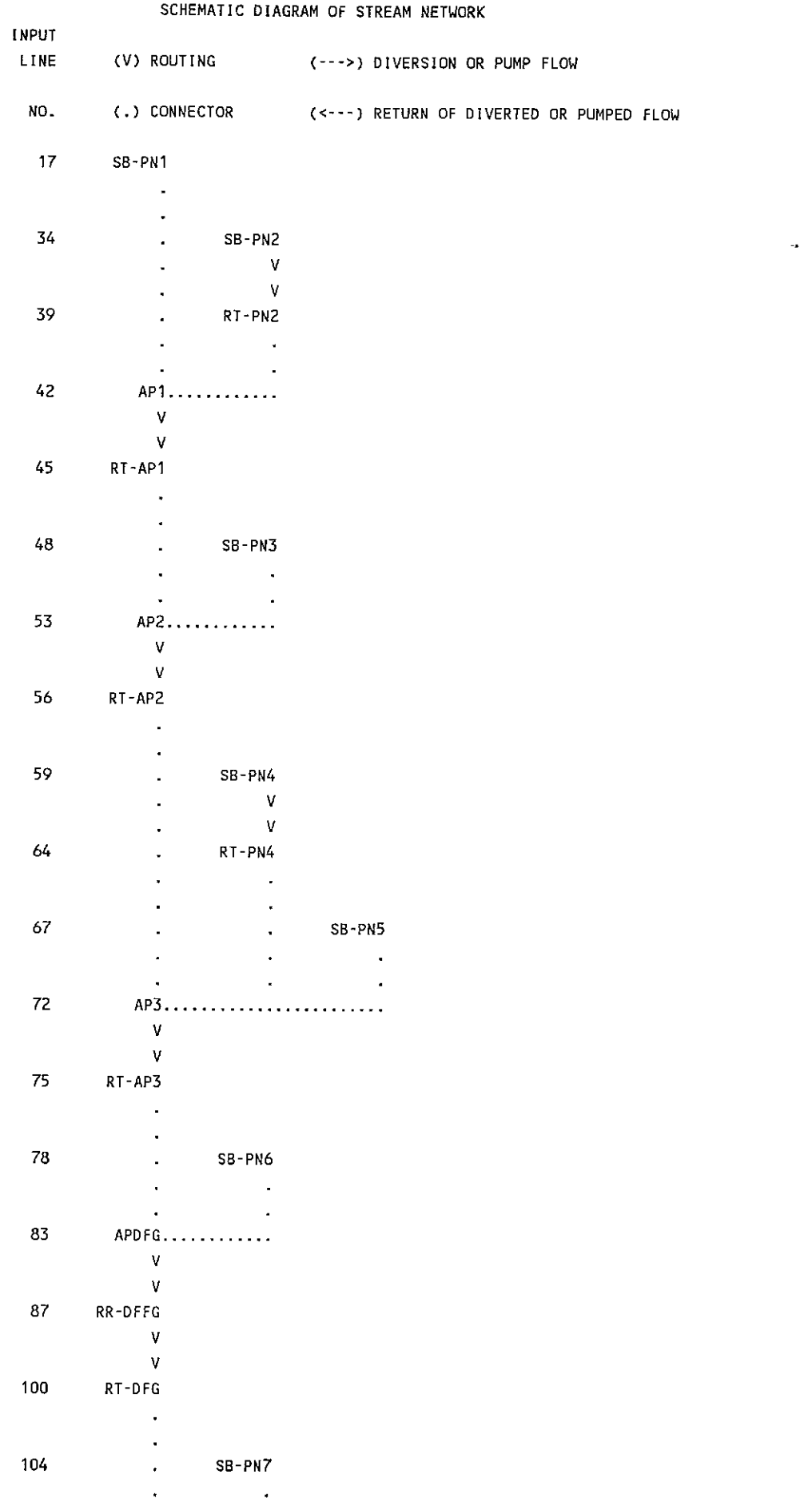
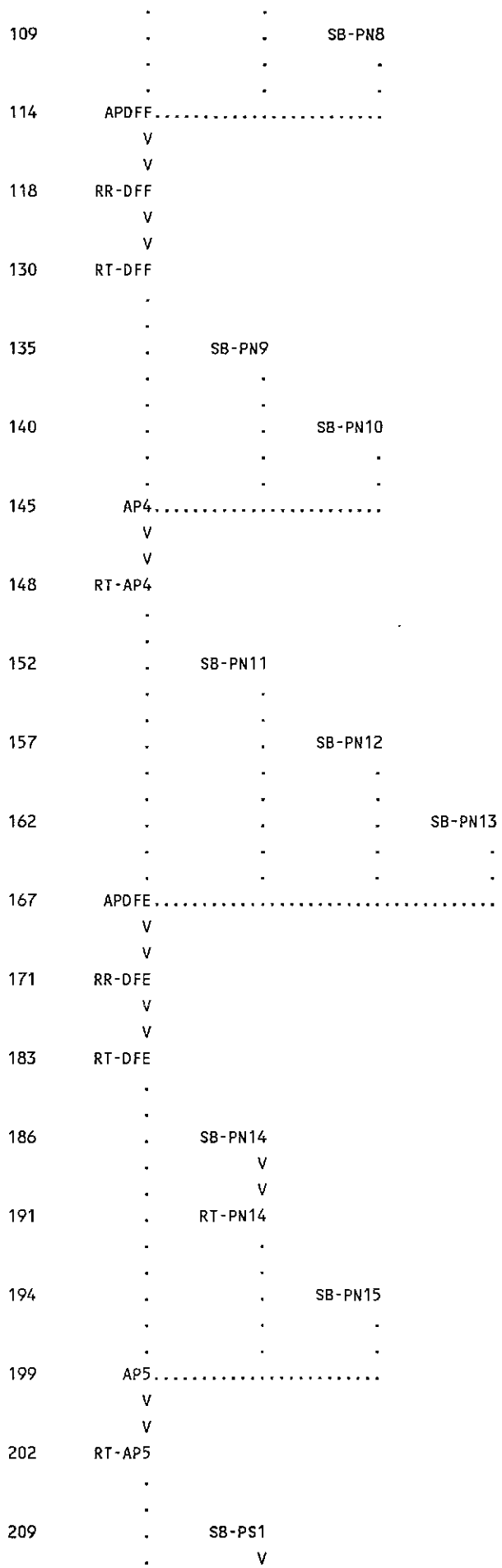
SCHEMATIC DIAGRAM OF STREAM NETWORK

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130 RT-DFF
135 SB-PN9
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145 AP4
148 RT-AP4
152 SB-PN11
157 SB-PN12
162 SB-PN13
167 APDFE
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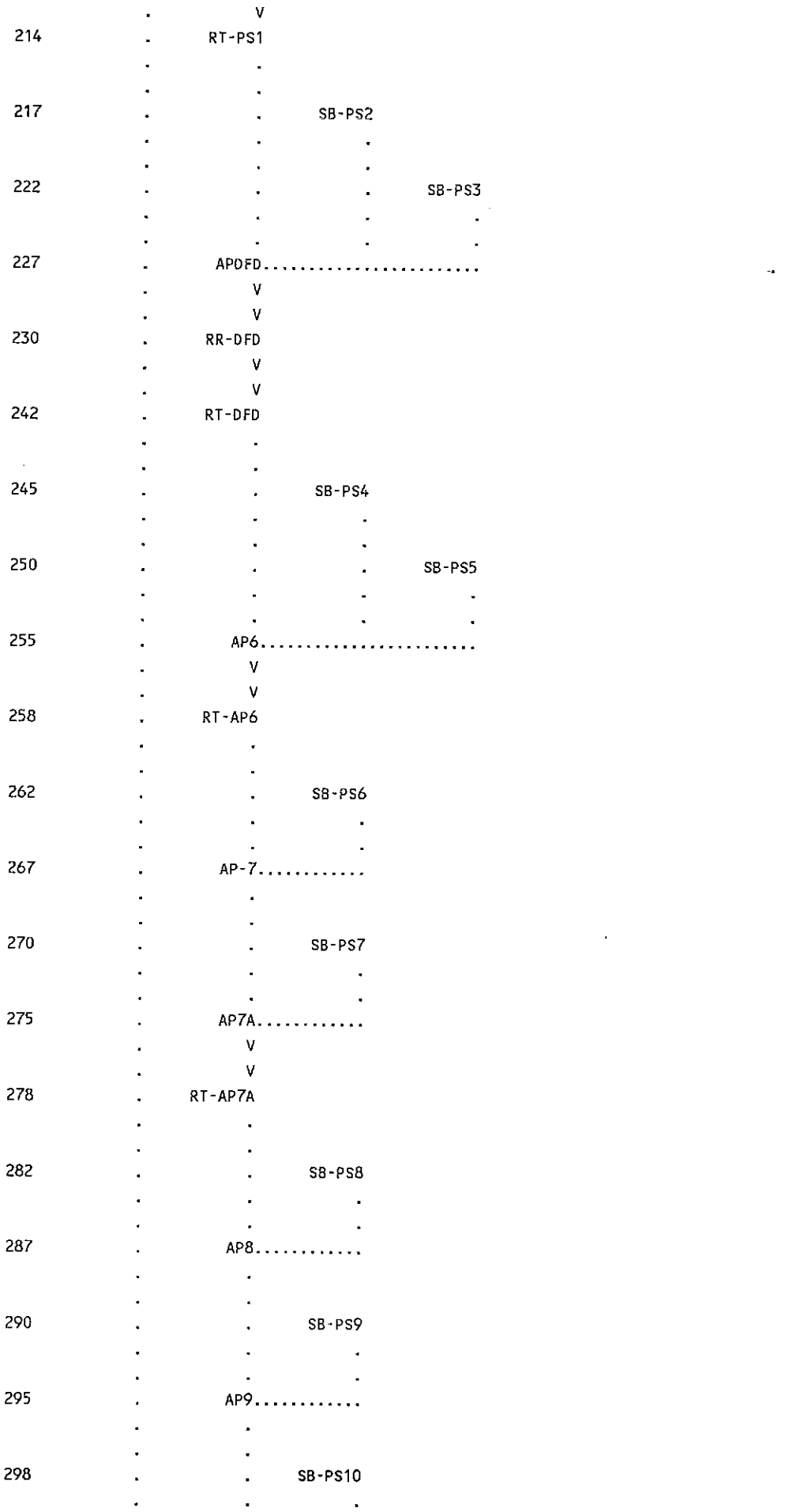
191 RT-PN14
194 SB-PN15
199 AP5
202 RT-AP5
209 SB-PS1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250
SB-PS5
255
AP6
258
RT-AP6
262
SB-PS6
267
AP-7
270
SB-PS7
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AP9
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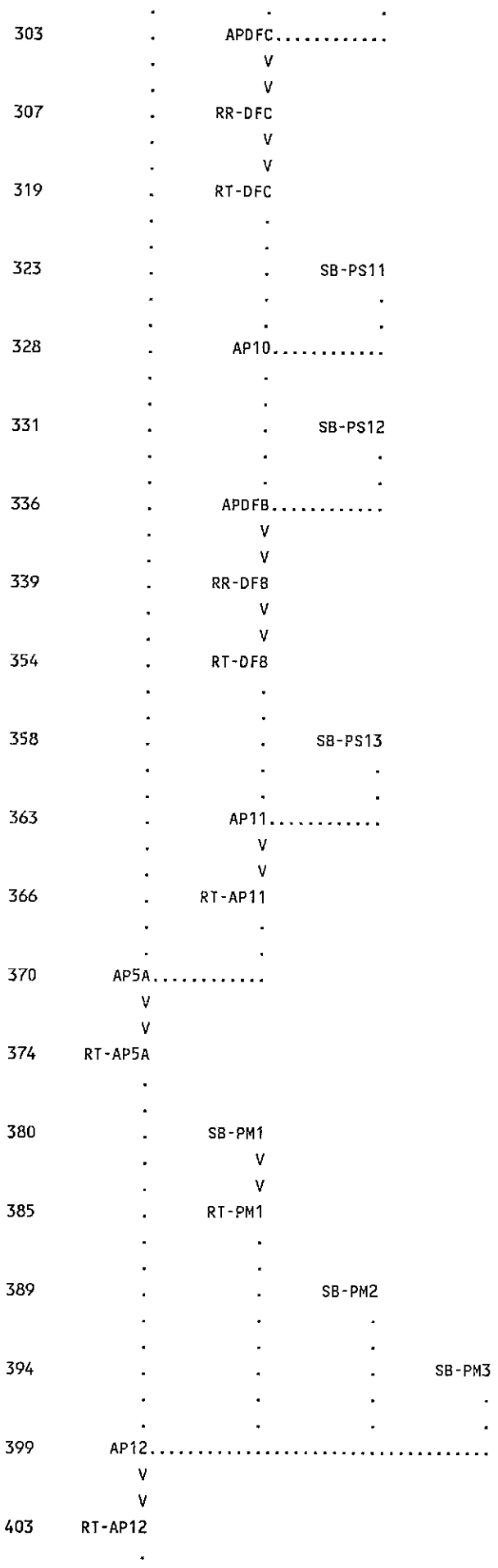
SB-PS10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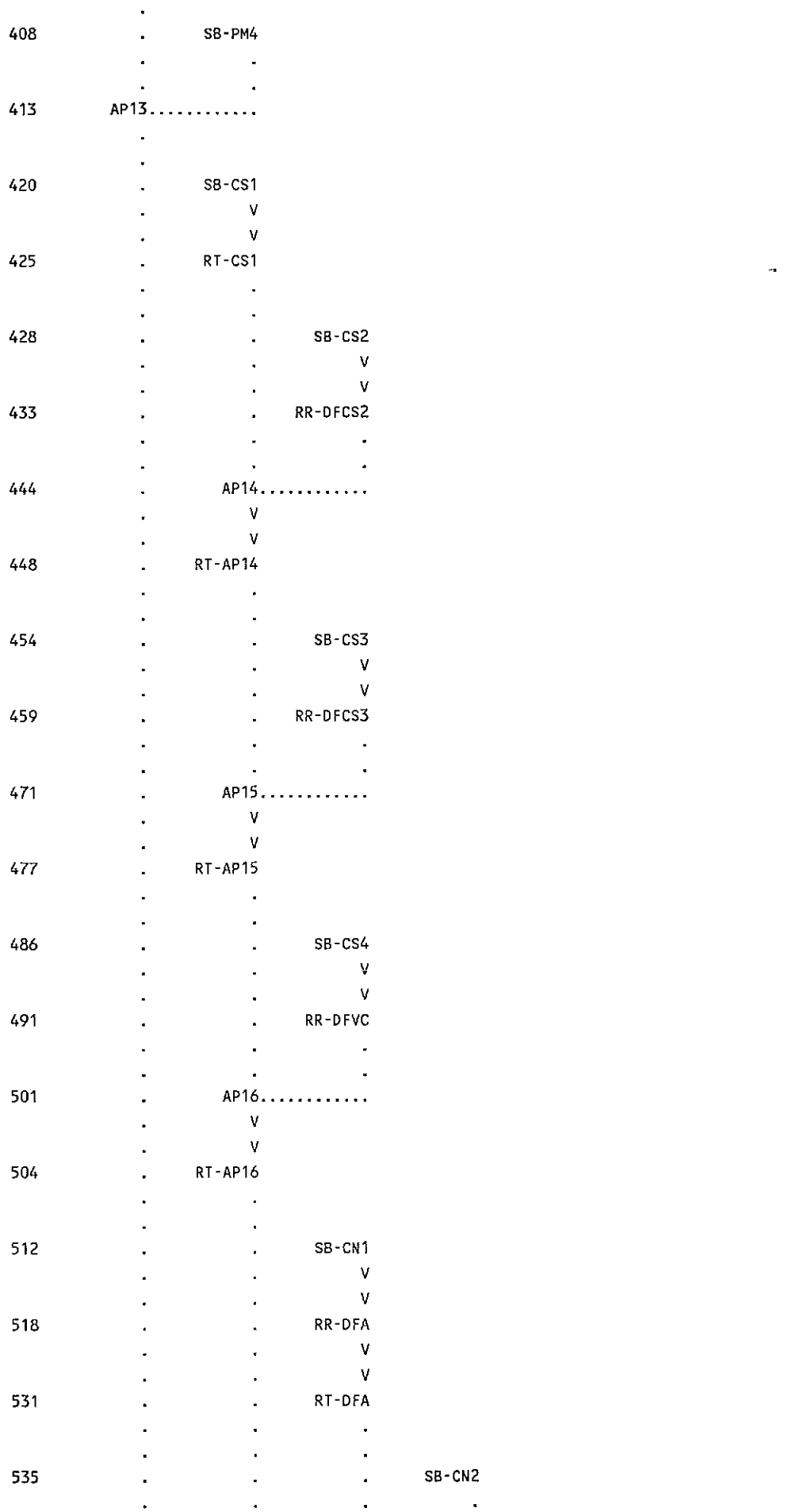
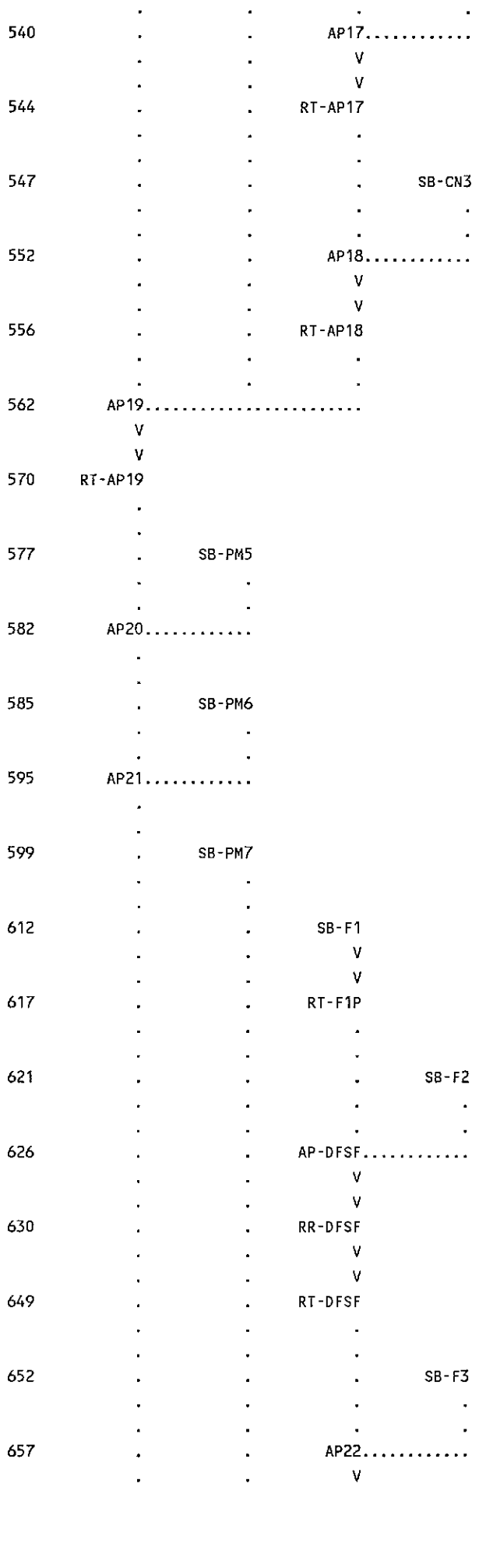
363 AP11
366 RT-AP11
370 AP5A
374 RT-AP5A
380 SB-PM1
385 RT-PM1
389 SB-PM2
394 SB-PM3
399 AP12
403 RT-AP12


408 SB-PM4
413 AP13
420 SB-CS1
425 RT-CS1
428 SB-CS2
433 RR-DFCS2
444 AP14
448 RT-AP14
454 SB-CS3
459 RR-DFCS3
471 AP15
477 RT-AP15
486 SB-CS4
491 RR-DFVC
501 AP16
504 RT-AP16
512 SB-CN1
518 RR-DFA
531 RT-DFA
535 SB-CN2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AP17
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RT-AP17
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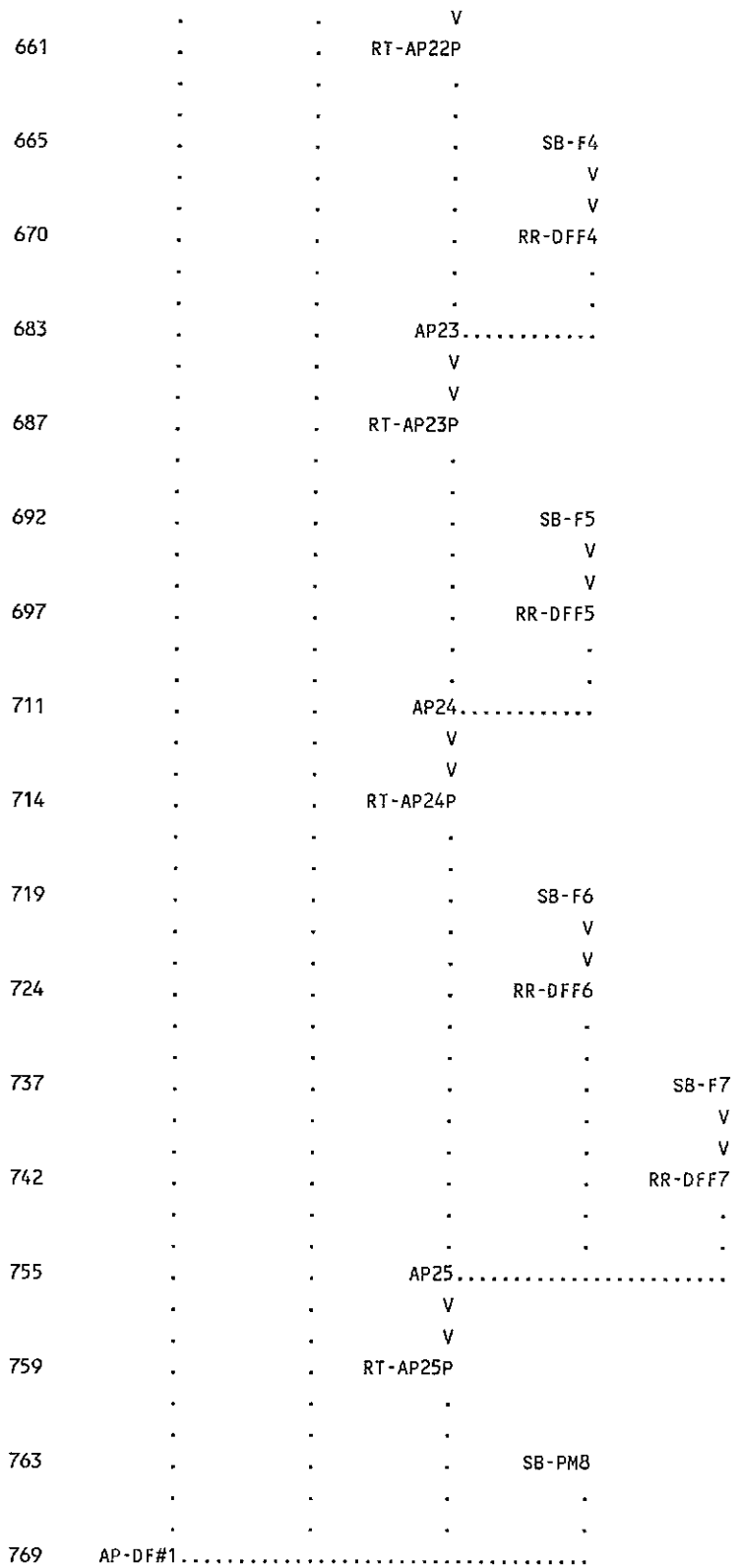
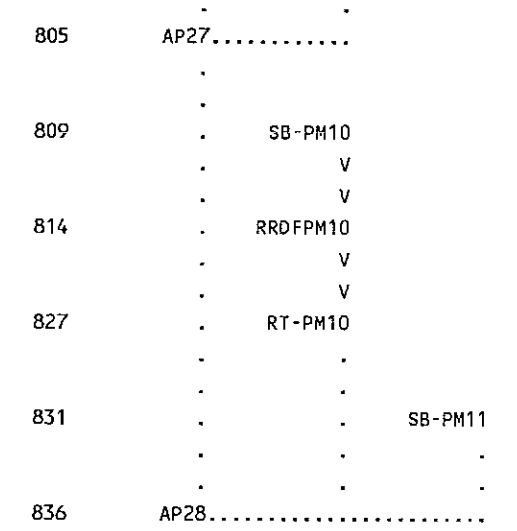
SB-CN3
552
AP18
556
RT-AP18
562
AP19
570
RT-AP19
577
SB-PM5
582
AP20
585
SB-PM6
595
AP21
599
SB-PM7
612
SB-F1
617
RT-F1P
621
SB-F2
626
AP-DFSF
630
RR-DFSF
649
RT-DFSF
652
SB-F3
657
AP22


661
RT-AP22P
665
SB-F4
670
RR-DFF4
683
AP23
687
RT-AP23P
692
SB-F5
697
RR-DFF5
711
AP24
714
RT-AP24P
719
SB-F6
724
RR-DFF6
737
SB-F7
742
RR-DFF7
755
AP25
759
RT-AP25P
763
SB-PM8
769
AP-DF#1
774
RR-DF#1
795
RT-AP26
800
SB-PM9



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  12/21/1998  TIME  17:26:50 *
*                                       *
*****************************************
```


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


PINE CREEK DRAINAGE BASIN - 24HR, FULL DEVELOPED CONDITION (TYPE IIa5 YEAR)
FILE:PCDBPS05.DAT
FULLY DEVELOPED CONDITION MODEL MODIFIED PER DESIGN OF MODIFICATIONS TO DF 1
998 REVISION, LAST MODEL REVISION DATE:8/5/98 10-19-98
CN VALUES HAVE BEEN ADJUSTED TO PRODUCE PEAK 100 YEAR FLOW RATES SIMILAR TO
100 YEAR FLOW RATES PRODUCED BY RATIONAL METHOD.
NOTE: THE DIVERSION ROUTINES WERE REMOVED FROM THE MODEL FOR THE 5 YR STORM
NOTE: THE OUTFLOW CURVE FOR THE SUMMER FIELD DETENTION POND WAS MODIFIED
SLIGHTLY TO ALLOW THE 5 YR MODEL TO RUN.
CN VALUES HAVE BEEN ADJUSTED TO PRODUCE PEAK 100 YEAR FLOW RATES SIMILAR TO
100 YEAR FLOW RATES PRODUCED BY RATIONAL METHOD.

****

BEGIN CALCULATIONS IN THE PINE CREEK NORTH FORK WATERSHED

****

16 IO OUTPUT CONTROL VARIABLES

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

IT HYDROGRAPH TIME DATA

NMIN		3	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		1457	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.05 HOURS
TOTAL TIME BASE 14.95 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

*** ***

****
* *
87 KK * RR-DFFG *
* *
****

92 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	100.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

93 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	STOR	TYPE OF INITIAL CONDITION
RSVRIC	0.00	INITIAL CONDITION
X	0.00	WORKING R AND D COEFFICIENT

94 SV	STORAGE	0.0	0.1	2.8	8.0	14.1	20.9	28.4	36.6	45.5	55.1
		65.3	76.3	88.2							
96 SE	ELEVATION	59.00	60.00	62.00	64.00	66.00	68.00	70.00	72.00	74.00	76.00
		78.00	80.00	82.00							
98 SQ	DISCHARGE	0.	10.	47.	93.	130.	160.	180.	203.	222.	240.
		262.	280.	295.							

***

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

HYDROGRAPH AT STATION RR-DFFG

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR
165.	6.45	(CFS)	87.	38.	38.	38.
		(INCHES)	1.104	1.222	1.222	1.222
		(AC-FT)	43.	48.	48.	48.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	14.95-HR
23.	6.45	9.	4.	4.	4.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	14.95-HR
68.53	6.45	63.96	61.30	61.30	61.30

CUMULATIVE AREA = 0.73 SQ MI

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          *           *
118 KK    *   RR-DFF  *
          *           *
          *************

122 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          3  PRINT CONTROL
                    IPLOT          1  PLOT CONTROL
                    QSCAL        100.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

123 RS        STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC       0.00  INITIAL CONDITION
                        X       0.00 WORKING R AND D COEFFICIENT

124 SV         STORAGE       0.0      0.0      0.1      0.7      1.5      4.4      7.8     11.7     16.1     21.0
                            26.4

126 SE       ELEVATION     90.00    92.00    94.00    96.00    98.00   100.00   102.00   104.00   106.00   108.00
                          110.00

128 SQ       DISCHARGE        0.      22.      70.     112.     143.     170.     190.     210.     230.     250.
                            265.

                                                    ***

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

                    HYDROGRAPH AT STATION   RR-DFF

PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                  6-HR       24-HR       72-HR     14.95-HR
    170.     7.00       (CFS)      103.         46.         46.          46.
                     (INCHES)     1.037       1.147       1.147        1.147
                      (AC-FT)       51.         56.         56.          56.

PEAK STORAGE TIME                          MAXIMUM AVERAGE STORAGE
 (AC-FT)     (HR)                  6-HR       24-HR       72-HR     14.95-HR
      4.     7.00                    2.          1.          1.           1.

PEAK STAGE   TIME                          MAXIMUM AVERAGE STAGE
  (FEET)     (HR)                  6-HR       24-HR       72-HR     14.95-HR
  100.03     7.00                 96.07       92.83       92.83        92.83

                    CUMULATIVE AREA =    0.92 SQ MI

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

          *************
          *           *
171 KK    *   RR-DFE  *
          *           *
          *************
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178 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           1  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

179 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        0.00  INITIAL CONDITION
                          X        0.00 WORKING R AND D COEFFICIENT

180 SV            STORAGE         0.0       0.0       1.3       3.9       6.9      10.3      14.1      18.2      22.8      27.9

181 SE          ELEVATION      784.00    786.00    788.00    790.00    792.00    794.00    796.00    798.00    800.00    802.00

182 SQ          DISCHARGE          0.       25.       80.      136.      173.      210.      240.      263.      280.     1431.

                                                                ***

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

                           HYDROGRAPH AT STATION    RR-DFE

'EAK FLOW       TIME                             MAXIMUM AVERAGE FLOW
  (CFS)         (HR)                     6-HR        24-HR        72-HR     14.95-HR
   177.         7.70         (CFS)       122.          55.          55.          55.
                          (INCHES)      0.913        1.019        1.019        1.019
                           (AC-FT)        61.          68.          68.          68.

PEAK STORAGE    TIME                             MAXIMUM AVERAGE STORAGE
 (AC-FT)        (HR)                     6-HR        24-HR        72-HR     14.95-HR
      7.        7.70                       4.           2.           2.           2.

'EAK STAGE      TIME                             MAXIMUM AVERAGE STAGE
  (FEET)        (HR)                     6-HR        24-HR        72-HR     14.95-HR
  792.24        7.70                   789.81       786.77       786.77       786.77

                          CUMULATIVE AREA =     1.25 SQ MI

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

             **************
             *            *
:30 KK       *   RR-DFD   *
             *            *
             **************

.38 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           1  PLOT CONTROL
```

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                    QSCAL        100.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

237 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC       0.00  INITIAL CONDITION
                         X        0.00 WORKING R AND D COEFFICIENT

239 SV            STORAGE        0.0       6.8      14.3      22.4      31.1      40.6      50.8      61.8

240 SE          ELEVATION      100.00    102.00    104.00    106.00    108.00    110.00    112.00    114.00

241 SQ          DISCHARGE         0.        18.       54.       72.       87.       99.      110.      120.

                                                          ***

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

                      HYDROGRAPH AT STATION   RR-DFD

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                6-HR       24-HR      72-HR     14.95-HR
     57.       6.70       (CFS)     38.        18.        18.        18.
                          (INCHES)  0.758      0.919      0.919      0.919
                          (AC-FT)    19.        23.        23.        23.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                6-HR       24-HR      72-HR     14.95-HR
     16.       6.70                11.         6.         6.         6.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                6-HR       24-HR      72-HR     14.95-HR
   104.36      6.70              103.13     101.62     101.62     101.62

                      CUMULATIVE AREA =    0.47 SQ MI



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


          **************
          *            *
 07 KK    *    RR-DFC  *
          *            *
          **************

 11 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL        100.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

 12 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
```

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                    RSVRIC        0.00  INITIAL CONDITION
                         X        0.00 WORKING R AND D COEFFICIENT

313 SV          STORAGE        0.0       2.7       9.7      18.6      28.0      38.2      49.0      60.5      72.8      85.8
                              99.7

315 SE          ELEVATION     62.00     64.00     66.00     68.00     70.00     72.00     74.00     76.00     78.00     80.00
                              82.00

317 SQ          DISCHARGE      0.       23.       70.      110.      140.      168.      190.      215.      232.      245.
                             258.

                                                          ***

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

                        HYDROGRAPH AT STATION   RR-DFC

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR     14.95-HR
    153.       6.55          (CFS)      119.          59.          59.          59.
                             (INCHES)  1.061        1.310        1.310        1.310
                             (AC-FT)    59.          73.          73.          73.

PEAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                    6-HR        24-HR        72-HR     14.95-HR
     33.       6.55                     22.          10.          10.          10.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                    6-HR        24-HR        72-HR     14.95-HR
    70.96      6.55                   68.71       65.40        65.40        65.40

                        CUMULATIVE AREA =    1.04 SQ MI


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


              **************
              *            *
339 KK        *    RR-DFB  *
              *            *
              **************

346 KO            OUTPUT CONTROL VARIABLES
                       IPRNT          3  PRINT CONTROL
                       IPLOT          1  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

347 RS            STORAGE ROUTING
                       NSTPS          1  NUMBER OF SUBREACHES
                        ITYP       STOR  TYPE OF INITIAL CONDITION
                       RSVRIC       0.00  INITIAL CONDITION
                            X       0.00 WORKING R AND D COEFFICIENT

348 SV            STORAGE        0.0       0.1       1.2       3.3       5.8       8.7      12.1      15.9      20.1      23.6
```

```
                                24.8      30.0

350 SE          ELEVATION      71.20     72.00     74.00     76.00     78.00     80.00     82.00     84.00     86.00     87.60
                               88.00     90.00

352 SQ          DISCHARGE       0.       22.       73.      130.      169.      202.      236.      260.      285.      301.
                              371.     1222.

                                                          ***

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

                        HYDROGRAPH AT STATION   RR-DFB

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR      14.95-HR
   159.       7.15        (CFS)      128.          64.          64.          64.
                          (INCHES)  0.958        1.182        1.182        1.182
                          (AC-FT)    64.          79.          79.          79.

EAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
 (AC-FT)      (HR)                  6-HR        24-HR        72-HR      14.95-HR
     5.       7.15                   4.           2.           2.           2.

PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                  6-HR        24-HR        72-HR      14.95-HR
   77.49      7.15                 76.12       73.63        73.63        73.63

                        CUMULATIVE AREA =    1.25 SQ MI

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

          **************
          *            *
518 KK    *    RR-DFA  *
          *            *
          **************

523 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL        100. HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

524 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC       0.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

525 SV            STORAGE        0.0       0.0       0.2       1.0       2.0       2.8       4.3       5.3       6.5      11.6
                                15.4

527 SQ          DISCHARGE        2.        3.        3.        4.        4.        5.        5.        6.        8.        9.
                               279.
```

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529 SE          ELEVATION     6796.60   6797.00   6798.00   6800.00   6802.00   6803.50   6803.51   6804.00   6804.10   6805.50
                              6806.50

                                                        ***

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

                        HYDROGRAPH AT STATION   RR-DFA

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR          24-HR          72-HR        14.95-HR
     5.       8.10          (CFS)      5.             4.             4.             4.
                            (INCHES)   0.321          0.619          0.619          0.619
                            (AC-FT)    2.             5.             5.             5.

EAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR          24-HR          72-HR        14.95-HR
     4.       8.15                     3.             2.             2.             2.

PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                  6-HR          24-HR          72-HR        14.95-HR
  6803.51     7.65                6803.48        6800.68        6800.68        6800.68

                        CUMULATIVE AREA =    0.14 SQ MI



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


          **************
          *            *
630 KK    *   RR-DFSF  *
          *            *
          **************

644 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL        100.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

645 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC       0.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

646 SV            STORAGE        0.0       0.6       4.6       6.9      10.3

647 SE          ELEVATION       92.00     94.00     96.00     98.00    100.00

648 SQ          DISCHARGE        80.      126.      131.      137.      144.

                                                        ***

     ***             ***             ***             ***             ***
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HYDROGRAPH AT STATION RR-DFSF

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR
92.	6.20	(CFS)	80.	80.	80.	80.
		(INCHES)	4.724	11.746	11.746	11.746
		(AC-FT)	40.	99.	99.	99.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	14.95-HR
0.	6.20	0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	14.95-HR
92.50	6.20	92.01	92.00	92.00	92.00

CUMULATIVE AREA = 0.16 SQ MI

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          **************
          *            *
769 KK    *   AP-DF#1  *
          *            *
          **************
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772 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

773 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

***

****

HYDROGRAPH AT STATION AP-DF#1
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		0000	1	107.	*	1		0345	76	83.	*	1		0730	151	509.	*	1		1115	226	258.
1		0003	2	107.	*	1		0348	77	83.	*	1		0733	152	508.	*	1		1118	227	256.
1		0006	3	107.	*	1		0351	78	84.	*	1		0736	153	507.	*	1		1121	228	254.
1		0009	4	107.	*	1		0354	79	84.	*	1		0739	154	506.	*	1		1124	229	252.
1		0012	5	107.	*	1		0357	80	84.	*	1		0742	155	505.	*	1		1127	230	250.
1		0015	6	107.	*	1		0400	81	84.	*	1		0745	156	504.	*	1		1130	231	248.
1		0018	7	107.	*	1		0403	82	84.	*	1		0748	157	504.	*	1		1133	232	246.
1		0021	8	107.	*	1		0406	83	85.	*	1		0751	158	503.	*	1		1136	233	244.
1		0024	9	106.	*	1		0409	84	85.	*	1		0754	159	503.	*	1		1139	234	242.
1		0027	10	105.	*	1		0412	85	86.	*	1		0757	160	502.	*	1		1142	235	241.

1	0030	11	104.	*	1	0415	86	86.	*	1	0800	161	501.	*	1	1145	236	239.
1	0033	12	103.	*	1	0418	87	86.	*	1	0803	162	500.	*	1	1148	237	237.
1	0036	13	100.	*	1	0421	88	87.	*	1	0806	163	497.	*	1	1151	238	236.
1	0039	14	95.	*	1	0424	89	87.	*	1	0809	164	493.	*	1	1154	239	234.
1	0042	15	91.	*	1	0427	90	87.	*	1	0812	165	488.	*	1	1157	240	233.
1	0045	16	88.	*	1	0430	91	88.	*	1	0815	166	482.	*	1	1200	241	232.
1	0048	17	86.	*	1	0433	92	88.	*	1	0818	167	477.	*	1	1203	242	230.
1	0051	18	84.	*	1	0436	93	88.	*	1	0821	168	472.	*	1	1206	243	229.
1	0054	19	84.	*	1	0439	94	89.	*	1	0824	169	468.	*	1	1209	244	228.
1	0057	20	83.	*	1	0442	95	89.	*	1	0827	170	465.	*	1	1212	245	226.
1	0100	21	83.	*	1	0445	96	89.	*	1	0830	171	461.	*	1	1215	246	225.
1	0103	22	83.	*	1	0448	97	89.	*	1	0833	172	458.	*	1	1218	247	224.
1	0106	23	83.	*	1	0451	98	90.	*	1	0836	173	456.	*	1	1221	248	223.
1	0109	24	82.	*	1	0454	99	90.	*	1	0839	174	453.	*	1	1224	249	222.
1	0112	25	82.	*	1	0457	100	90.	*	1	0842	175	451.	*	1	1227	250	220.
1	0115	26	82.	*	1	0500	101	90.	*	1	0845	176	449.	*	1	1230	251	219.
1	0118	27	82.	*	1	0503	102	91.	*	1	0848	177	446.	*	1	1233	252	217.
1	0121	28	82.	*	1	0506	103	93.	*	1	0851	178	444.	*	1	1236	253	216.
1	0124	29	82.	*	1	0509	104	95.	*	1	0854	179	442.	*	1	1239	254	214.
1	0127	30	82.	*	1	0512	105	97.	*	1	0857	180	439.	*	1	1242	255	213.
1	0130	31	82.	*	1	0515	106	99.	*	1	0900	181	437.	*	1	1245	256	211.
1	0133	32	82.	*	1	0518	107	101.	*	1	0903	182	434.	*	1	1248	257	210.
1	0136	33	82.	*	1	0521	108	105.	*	1	0906	183	431.	*	1	1251	258	208.
1	0139	34	82.	*	1	0524	109	109.	*	1	0909	184	428.	*	1	1254	259	207.
1	0142	35	82.	*	1	0527	110	113.	*	1	0912	185	425.	*	1	1257	260	206.
1	0145	36	82.	*	1	0530	111	116.	*	1	0915	186	422.	*	1	1300	261	205.
1	0148	37	82.	*	1	0533	112	140.	*	1	0918	187	419.	*	1	1303	262	203.
1	0151	38	82.	*	1	0536	113	214.	*	1	0921	188	415.	*	1	1306	263	202.
1	0154	39	82.	*	1	0539	114	322.	*	1	0924	189	412.	*	1	1309	264	201.
1	0157	40	82.	*	1	0542	115	448.	*	1	0927	190	409.	*	1	1312	265	200.
1	0200	41	82.	*	1	0545	116	578.	*	1	0930	191	405.	*	1	1315	266	198.
1	0203	42	82.	*	1	0548	117	680.	*	1	0933	192	402.	*	1	1318	267	197.
1	0206	43	82.	*	1	0551	118	772.	*	1	0936	193	398.	*	1	1321	268	196.
1	0209	44	82.	*	1	0554	119	868.	*	1	0939	194	394.	*	1	1324	269	195.
1	0212	45	82.	*	1	0557	120	977.	*	1	0942	195	389.	*	1	1327	270	194.
1	0215	46	82.	*	1	0600	121	1115.	*	1	0945	196	384.	*	1	1330	271	192.
1	0218	47	82.	*	1	0603	122	1256.	*	1	0948	197	378.	*	1	1333	272	191.
1	0221	48	82.	*	1	0606	123	1297.	*	1	0951	198	373.	*	1	1336	273	190.
1	0224	49	82.	*	1	0609	124	1248.	*	1	0954	199	369.	*	1	1339	274	189.
1	0227	50	82.	*	1	0612	125	1158.	*	1	0957	200	364.	*	1	1342	275	188.
1	0230	51	82.	*	1	0615	126	1055.	*	1	1000	201	359.	*	1	1345	276	187.
1	0233	52	82.	*	1	0618	127	956.	*	1	1003	202	354.	*	1	1348	277	186.
1	0236	53	82.	*	1	0621	128	867.	*	1	1006	203	349.	*	1	1351	278	186.
1	0239	54	82.	*	1	0624	129	791.	*	1	1009	204	344.	*	1	1354	279	185.
1	0242	55	83.	*	1	0627	130	732.	*	1	1012	205	339.	*	1	1357	280	184.
1	0245	56	83.	*	1	0630	131	690.	*	1	1015	206	334.	*	1	1400	281	183.
1	0248	57	83.	*	1	0633	132	659.	*	1	1018	207	329.	*	1	1403	282	183.
1	0251	58	83.	*	1	0636	133	635.	*	1	1021	208	325.	*	1	1406	283	182.
1	0254	59	83.	*	1	0639	134	614.	*	1	1024	209	320.	*	1	1409	284	181.
1	0257	60	83.	*	1	0642	135	596.	*	1	1027	210	316.	*	1	1412	285	180.
1	0300	61	83.	*	1	0645	136	582.	*	1	1030	211	312.	*	1	1415	286	180.
1	0303	62	83.	*	1	0648	137	570.	*	1	1033	212	307.	*	1	1418	287	179.
1	0306	63	83.	*	1	0651	138	561.	*	1	1036	213	302.	*	1	1421	288	178.
1	0309	64	83.	*	1	0654	139	554.	*	1	1039	214	297.	*	1	1424	289	177.
1	0312	65	83.	*	1	0657	140	549.	*	1	1042	215	293.	*	1	1427	290	176.
1	0315	66	83.	*	1	0700	141	545.	*	1	1045	216	288.	*	1	1430	291	176.
1	0318	67	83.	*	1	0703	142	542.	*	1	1048	217	285.	*	1	1433	292	175.
1	0321	68	83.	*	1	0706	143	539.	*	1	1051	218	281.	*	1	1436	293	175.
1	0324	69	83.	*	1	0709	144	534.	*	1	1054	219	277.	*	1	1439	294	174.
1	0327	70	83.	*	1	0712	145	529.	*	1	1057	220	274.	*	1	1442	295	173.

1	0330	71	83.	*	1	0715	146	524.	*	1	1100	221	271.	*	1	1445	296	173.
1	0333	72	83.	*	1	0718	147	520.	*	1	1103	222	268.	*	1	1448	297	172.
1	0336	73	83.	*	1	0721	148	516.	*	1	1106	223	265.	*	1	1451	298	172.
1	0339	74	83.	*	1	0724	149	514.	*	1	1109	224	263.	*	1	1454	299	171.
1	0342	75	83.	*	1	0727	150	511.	*	1	1112	225	260.	*	1	1457	300	171.
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1297.	6.10	(CFS)	487.	274.	274.	274.
		(INCHES)	1.024	1.435	1.435	1.435
		(AC-FT)	242.	339.	339.	339.

CUMULATIVE AREA = 4.43 SQ MI

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          *            *
774 KK    *   RR-DF#1  *
          *            *
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787 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

788 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	STOR	TYPE OF INITIAL CONDITION
RSVRIC	0.00	INITIAL CONDITION
X	0.00	WORKING R AND D COEFFICIENT

789 SV	STORAGE	0.0	0.2	0.4	4.9	14.7	25.6	37.1	49.2	62.0	75.4
		89.6	97.0	104.5	112.4	120.3					
791 SE	ELEVATION	54.00	55.00	56.00	58.00	60.00	62.00	64.00	66.00	68.00	70.00
		72.00	73.00	74.00	75.00	76.00					
793 SQ	DISCHARGE	0.	99.	184.	261.	326.	380.	427.	470.	532.	718.
		969.	1112.	1358.	1690.	2200.					

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** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 99.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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HYDROGRAPH AT STATION RR-DF#1

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.0	54.0	1		0500	101	90.	0.2	54.9	1		1000	201	453.	44.3	65.2
1		0003	2	108.	0.2	55.1	1		0503	102	91.	0.2	54.9	1		1003	202	451.	43.9	65.1
1		0006	3	107.	0.2	55.1	1		0506	103	92.	0.2	54.9	1		1006	203	450.	43.5	65.1
1		0009	4	107.	0.2	55.1	1		0509	104	94.	0.2	54.9	1		1009	204	448.	43.1	65.0
1		0012	5	107.	0.2	55.1	1		0512	105	96.	0.2	55.0	1		1012	205	447.	42.7	64.9
1		0015	6	107.	0.2	55.1	1		0515	106	98.	0.2	55.0	1		1015	206	445.	42.2	64.8
1		0018	7	107.	0.2	55.1	1		0518	107	100.	0.2	55.0	1		1018	207	444.	41.7	64.8
1		0021	8	107.	0.2	55.1	1		0521	108	103.	0.2	55.0	1		1021	208	442.	41.3	64.7
1		0024	9	106.	0.2	55.1	1		0524	109	107.	0.2	55.1	1		1024	209	440.	40.8	64.6
1		0027	10	105.	0.2	55.1	1		0527	110	110.	0.2	55.1	1		1027	210	438.	40.3	64.5
1		0030	11	104.	0.2	55.1	1		0530	111	114.	0.2	55.2	1		1030	211	437.	39.8	64.4
1		0033	12	103.	0.2	55.1	1		0533	112	127.	0.3	55.3	1		1033	212	435.	39.2	64.4
1		0036	13	101.	0.2	55.0	1		0536	113	174.	0.4	55.9	1		1036	213	433.	38.7	64.3
1		0039	14	98.	0.2	55.0	1		0539	114	190.	0.7	56.1	1		1039	214	431.	38.2	64.2
1		0042	15	93.	0.2	54.9	1		0542	115	203.	1.5	56.5	1		1042	215	429.	37.6	64.1
1		0045	16	89.	0.2	54.9	1		0545	116	224.	2.8	57.0	1		1045	216	427.	37.0	64.0
1		0048	17	87.	0.2	54.9	1		0548	117	251.	4.4	57.7	1		1048	217	425.	36.5	63.9
1		0051	18	85.	0.2	54.9	1		0551	118	270.	6.3	58.3	1		1051	218	422.	35.9	63.8
1		0054	19	84.	0.2	54.8	1		0554	119	285.	8.5	58.7	1		1054	219	420.	35.3	63.7
1		0057	20	83.	0.2	54.8	1		0557	120	302.	11.1	59.3	1		1057	220	417.	34.7	63.6
1		0100	21	83.	0.2	54.8	1		0600	121	322.	14.2	59.9	1		1100	221	415.	34.1	63.5
1		0103	22	83.	0.2	54.8	1		0603	122	341.	17.7	60.5	1		1103	222	412.	33.5	63.4
1		0106	23	83.	0.2	54.8	1		0606	123	360.	21.5	61.3	1		1106	223	410.	32.9	63.3
1		0109	24	83.	0.2	54.8	1		0609	124	378.	25.3	61.9	1		1109	224	408.	32.3	63.2
1		0112	25	82.	0.2	54.8	1		0612	125	393.	28.6	62.5	1		1112	225	405.	31.7	63.1
1		0115	26	82.	0.2	54.8	1		0615	126	404.	31.6	63.0	1		1115	226	403.	31.1	63.0
1		0118	27	82.	0.2	54.8	1		0618	127	415.	34.0	63.5	1		1118	227	400.	30.5	62.9
1		0121	28	82.	0.2	54.8	1		0621	128	423.	36.1	63.8	1		1121	228	398.	29.9	62.8
1		0124	29	82.	0.2	54.8	1		0624	129	429.	37.7	64.1	1		1124	229	395.	29.3	62.7
1		0127	30	82.	0.2	54.8	1		0627	130	434.	39.1	64.3	1		1127	230	393.	28.7	62.6
1		0130	31	82.	0.2	54.8	1		0630	131	438.	40.2	64.5	1		1130	231	391.	28.2	62.5
1		0133	32	82.	0.2	54.8	1		0633	132	442.	41.2	64.7	1		1133	232	388.	27.6	62.3
1		0136	33	82.	0.2	54.8	1		0636	133	445.	42.0	64.8	1		1136	233	386.	27.0	62.2
1		0139	34	82.	0.2	54.8	1		0639	134	447.	42.8	64.9	1		1139	234	383.	26.4	62.1
1		0142	35	82.	0.2	54.8	1		0642	135	449.	43.4	65.0	1		1142	235	381.	25.8	62.0
1		0145	36	82.	0.2	54.8	1		0645	136	452.	44.0	65.1	1		1145	236	378.	25.2	61.9
1		0148	37	82.	0.2	54.8	1		0648	137	453.	44.5	65.2	1		1148	237	376.	24.7	61.8
1		0151	38	82.	0.2	54.8	1		0651	138	455.	45.0	65.3	1		1151	238	373.	24.1	61.7
1		0154	39	82.	0.2	54.8	1		0654	139	456.	45.4	65.4	1		1154	239	370.	23.5	61.6
1		0157	40	82.	0.2	54.8	1		0657	140	458.	45.8	65.4	1		1157	240	367.	23.0	61.5
1		0200	41	82.	0.2	54.8	1		0700	141	459.	46.1	65.5	1		1200	241	364.	22.4	61.4
1		0203	42	82.	0.2	54.8	1		0703	142	460.	46.5	65.6	1		1203	242	362.	21.9	61.3
1		0206	43	82.	0.2	54.8	1		0706	143	462.	46.8	65.6	1		1206	243	359.	21.3	61.2
1		0209	44	82.	0.2	54.8	1		0709	144	463.	47.1	65.7	1		1209	244	356.	20.8	61.1
1		0212	45	82.	0.2	54.8	1		0712	145	464.	47.4	65.7	1		1212	245	354.	20.3	61.0
1		0215	46	82.	0.2	54.8	1		0715	146	465.	47.7	65.7	1		1215	246	351.	19.8	60.9
1		0218	47	82.	0.2	54.8	1		0718	147	465.	47.9	65.8	1		1218	247	348.	19.2	60.8
1		0221	48	82.	0.2	54.8	1		0721	148	466.	48.1	65.8	1		1221	248	346.	18.7	60.7
1		0224	49	82.	0.2	54.8	1		0724	149	467.	48.3	65.9	1		1224	249	343.	18.2	60.6
1		0227	50	82.	0.2	54.8	1		0727	150	467.	48.5	65.9	1		1227	250	341.	17.7	60.6
1		0230	51	82.	0.2	54.8	1		0730	151	468.	48.7	65.9	1		1230	251	338.	17.2	60.5
1		0233	52	82.	0.2	54.8	1		0733	152	469.	48.8	65.9	1		1233	252	336.	16.7	60.4
1		0236	53	82.	0.2	54.8	1		0736	153	469.	49.0	66.0	1		1236	253	334.	16.2	60.3
1		0239	54	82.	0.2	54.8	1		0739	154	470.	49.2	66.0	1		1239	254	331.	15.8	60.2
1		0242	55	82.	0.2	54.8	1		0742	155	470.	49.3	66.0	1		1242	255	329.	15.3	60.1
1		0245	56	83.	0.2	54.8	1		0745	156	471.	49.4	66.0	1		1245	256	326.	14.8	60.0

1	0248	57	83.	0.2	54.8	* 1	0748	157	472.	49.6	66.1	* 1	1248	257	323.	14.3	59.9
1	0251	58	83.	0.2	54.8	* 1	0751	158	472.	49.7	66.1	* 1	1251	258	320.	13.9	59.8
1	0254	59	83.	0.2	54.8	* 1	0754	159	473.	49.8	66.1	* 1	1254	259	317.	13.4	59.7
1	0257	60	83.	0.2	54.8	* 1	0757	160	474.	50.0	66.1	* 1	1257	260	314.	12.9	59.6
1	0300	61	83.	0.2	54.8	* 1	0800	161	474.	50.1	66.1	* 1	1300	261	311.	12.5	59.5
1	0303	62	83.	0.2	54.8	* 1	0803	162	475.	50.2	66.2	* 1	1303	262	308.	12.1	59.5
1	0306	63	83.	0.2	54.8	* 1	0806	163	475.	50.3	66.2	* 1	1306	263	305.	11.6	59.4
1	0309	64	83.	0.2	54.8	* 1	0809	164	476.	50.4	66.2	* 1	1309	264	303.	11.2	59.3
1	0312	65	83.	0.2	54.8	* 1	0812	165	476.	50.4	66.2	* 1	1312	265	300.	10.8	59.2
1	0315	66	83.	0.2	54.8	* 1	0815	166	476.	50.5	66.2	* 1	1315	266	297.	10.4	59.1
1	0318	67	83.	0.2	54.8	* 1	0818	167	476.	50.5	66.2	* 1	1318	267	294.	10.0	59.0
1	0321	68	83.	0.2	54.8	* 1	0821	168	476.	50.5	66.2	* 1	1321	268	292.	9.6	58.9
1	0324	69	83.	0.2	54.8	* 1	0824	169	476.	50.4	66.2	* 1	1324	269	289.	9.2	58.9
1	0327	70	83.	0.2	54.8	* 1	0827	170	476.	50.4	66.2	* 1	1327	270	287.	8.8	58.8
1	0330	71	83.	0.2	54.8	* 1	0830	171	476.	50.3	66.2	* 1	1330	271	284.	8.4	58.7
1	0333	72	83.	0.2	54.8	* 1	0833	172	475.	50.3	66.2	* 1	1333	272	282.	8.0	58.6
1	0336	73	83.	0.2	54.8	* 1	0836	173	475.	50.2	66.2	* 1	1336	273	279.	7.7	58.6
1	0339	74	83.	0.2	54.8	* 1	0839	174	474.	50.1	66.1	* 1	1339	274	277.	7.3	58.5
1	0342	75	83.	0.2	54.8	* 1	0842	175	474.	50.0	66.1	* 1	1342	275	274.	6.9	58.4
1	0345	76	83.	0.2	54.8	* 1	0845	176	474.	49.9	66.1	* 1	1345	276	272.	6.6	58.3
1	0348	77	83.	0.2	54.8	* 1	0848	177	473.	49.8	66.1	* 1	1348	277	270.	6.2	58.3
1	0351	78	83.	0.2	54.8	* 1	0851	178	472.	49.7	66.1	* 1	1351	278	267.	5.9	58.2
1	0354	79	84.	0.2	54.8	* 1	0854	179	472.	49.6	66.1	* 1	1354	279	265.	5.6	58.1
1	0357	80	84.	0.2	54.8	* 1	0857	180	471.	49.5	66.0	* 1	1357	280	263.	5.2	58.1
1	0400	81	84.	0.2	54.8	* 1	0900	181	471.	49.3	66.0	* 1	1400	281	261.	4.9	58.0
1	0403	82	84.	0.2	54.9	* 1	0903	182	470.	49.2	66.0	* 1	1403	282	255.	4.6	57.9
1	0406	83	85.	0.2	54.9	* 1	0906	183	469.	49.0	66.0	* 1	1406	283	250.	4.3	57.7
1	0409	84	85.	0.2	54.9	* 1	0909	184	469.	48.9	65.9	* 1	1409	284	246.	4.0	57.6
1	0412	85	85.	0.2	54.9	* 1	0912	185	468.	48.7	65.9	* 1	1412	285	241.	3.8	57.5
1	0415	86	86.	0.2	54.9	* 1	0915	186	468.	48.5	65.9	* 1	1415	286	237.	3.5	57.4
1	0418	87	86.	0.2	54.9	* 1	0918	187	467.	48.3	65.9	* 1	1418	287	233.	3.3	57.3
1	0421	88	87.	0.2	54.9	* 1	0921	188	466.	48.1	65.8	* 1	1421	288	230.	3.1	57.2
1	0424	89	87.	0.2	54.9	* 1	0924	189	465.	47.9	65.8	* 1	1424	289	226.	2.9	57.1
1	0427	90	87.	0.2	54.9	* 1	0927	190	465.	47.7	65.7	* 1	1427	290	223.	2.7	57.0
1	0430	91	88.	0.2	54.9	* 1	0930	191	464.	47.4	65.7	* 1	1430	291	220.	2.5	56.9
1	0433	92	88.	0.2	54.9	* 1	0933	192	463.	47.2	65.7	* 1	1433	292	217.	2.3	56.8
1	0436	93	88.	0.2	54.9	* 1	0936	193	462.	46.9	65.6	* 1	1436	293	214.	2.2	56.8
1	0439	94	88.	0.2	54.9	* 1	0939	194	461.	46.7	65.6	* 1	1439	294	211.	2.0	56.7
1	0442	95	89.	0.2	54.9	* 1	0942	195	460.	46.4	65.5	* 1	1442	295	209.	1.8	56.6
1	0445	96	89.	0.2	54.9	* 1	0945	196	459.	46.1	65.5	* 1	1445	296	206.	1.7	56.6
1	0448	97	89.	0.2	54.9	* 1	0948	197	458.	45.8	65.4	* 1	1448	297	204.	1.6	56.5
1	0451	98	89.	0.2	54.9	* 1	0951	198	457.	45.4	65.4	* 1	1451	298	202.	1.4	56.5
1	0454	99	90.	0.2	54.9	* 1	0954	199	455.	45.1	65.3	* 1	1454	299	200.	1.3	56.4
1	0457	100	90.	0.2	54.9	* 1	0957	200	454.	44.7	65.3	* 1	1457	300	198.	1.2	56.4
						*						*					

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
476.	8.30	(CFS)	443.	273.	273.	273.
		(INCHES)	0.930	1.430	1.430	1.430
		(AC-FT)	220.	337.	337.	337.

EAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	14.95-HR
50.	8.30	42.	19.	19.	19.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	14.95-HR
66.20	8.30	64.76	59.69	59.69	59.69

CUMULATIVE AREA = 4.43 SQ MI

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          *            *
836 KK    *      AP28  *
          *            *
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841 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

842 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AP28

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
620.	6.05	(CFS)	466.	287.	287.	287.
		(INCHES)	0.946	1.449	1.449	1.449
		(AC-FT)	231.	354.	354.	354.

CUMULATIVE AREA = 4.58 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	SB-PN1	143.	6.10	15.	7.	7.	0.16		
HYDROGRAPH AT	SB-PN2	120.	6.10	13.	6.	6.	0.15		
ROUTED TO	RT-PN2	119.	6.10	13.	6.	6.	0.15		
2 COMBINED AT	AP1	262.	6.10	28.	13.	13.	0.31		
ROUTED TO	RT-AP1	259.	6.10	28.	13.	13.	0.31		
HYDROGRAPH AT	SB-PN3	97.	6.10	11.	5.	5.	0.08		
2 COMBINED AT	AP2	356.	6.10	39.	17.	17.	0.40		
ROUTED TO	RT-AP2	353.	6.10	39.	17.	17.	0.40		
HYDROGRAPH AT	SB-PN4	90.	6.10	10.	4.	4.	0.11		
ROUTED TO	RT-PN4	90.	6.10	10.	4.	4.	0.11		
HYDROGRAPH AT	SB-PN5	92.	6.05	10.	4.	4.	0.07		
3 COMBINED AT	AP3	532.	6.10	59.	26.	26.	0.58		
ROUTED TO	RT-AP3	528.	6.10	59.	26.	26.	0.58		
HYDROGRAPH AT	SB-PN6	283.	6.00	30.	13.	13.	0.15		
2 COMBINED AT	APDFG	770.	6.05	88.	39.	39.	0.73		
ROUTED TO	RR-DFFG	165.	6.45	87.	38.	38.	0.73	68.53	6.45
ROUTED TO	RT-DFG	165.	6.50	87.	38.	38.	0.73		
HYDROGRAPH AT	SB-PN7	50.	6.10	5.	2.	2.	0.08		
HYDROGRAPH AT	SB-PN8	104.	6.05	11.	5.	5.	0.11		
3 COMBINED AT	APDFF	269.	6.10	103.	46.	46.	0.92		
ROUTED TO	RR-DFF	170.	7.00	103.	46.	46.	0.92	100.03	7.00
ROUTED TO	RT-DFF	170.	7.05	103.	46.	46.	0.92		
HYDROGRAPH AT	SB-PN9	20.	6.10	2.	1.	1.	0.04		
HYDROGRAPH AT	SB-PN10	26.	6.05	2.	1.	1.	0.04		
3 COMBINED AT	AP4	180.	6.15	107.	48.	48.	1.00		
ROUTED TO	RT-AP4	179.	6.20	107.	48.	48.	1.00		

HYDROGRAPH AT	SB-PN11	55.	6.10	6.	3.	3.	0.08		
HYDROGRAPH AT	SB-PN12	17.	6.05	2.	1.	1.	0.04		
HYDROGRAPH AT	SB-PN13	73.	6.10	8.	4.	4.	0.13		
4 COMBINED AT	APDFE	307.	6.15	123.	55.	55.	1.25		
ROUTED TO	RR-DFE	177.	7.70	122.	55.	55.	1.25	792.24	7.70
ROUTED TO	RT-DFE	177.	7.70	122.	55.	55.	1.25		
HYDROGRAPH AT	SB-PN14	17.	6.05	2.	1.	1.	0.03		
ROUTED TO	RT-PN14	17.	6.10	2.	1.	1.	0.03		
HYDROGRAPH AT	SB-PN15	39.	6.10	4.	2.	2.	0.07		
3 COMBINED AT	AP5	181.	7.70	128.	58.	58.	1.35		
ROUTED TO	RT-AP5	181.	7.70	128.	58.	58.	1.35		
HYDROGRAPH AT	SB-PS1	113.	6.10	13.	6.	6.	0.15		
ROUTED TO	RT-PS1	111.	6.10	13.	6.	6.	0.15		
HYDROGRAPH AT	SB-PS2	177.	6.05	19.	8.	8.	0.15		
HYDROGRAPH AT	SB-PS3	178.	6.10	20.	9.	9.	0.16		
3 COMBINED AT	APDFD	464.	6.10	52.	23.	23.	0.47		
ROUTED TO	RR-DFD	57.	6.70	38.	18.	18.	0.47	104.36	6.70
ROUTED TO	RT-DFD	57.	6.75	38.	18.	18.	0.47		
HYDROGRAPH AT	SB-PS4	97.	6.00	10.	4.	4.	0.05		
HYDROGRAPH AT	SB-PS5	138.	6.00	15.	7.	7.	0.07		
3 COMBINED AT	AP6	247.	6.00	62.	30.	30.	0.59		
ROUTED TO	RT-AP6	246.	6.05	62.	30.	30.	0.59		
HYDROGRAPH AT	SB-PS6	103.	6.05	10.	4.	4.	0.08		
2 COMBINED AT	AP-7	349.	6.05	72.	34.	34.	0.66		
HYDROGRAPH AT	SB-PS7	188.	6.00	21.	9.	9.	0.09		
2 COMBINED AT	AP7A	532.	6.00	92.	43.	43.	0.75		
ROUTED TO	RT-AP7A	529.	6.05	92.	43.	43.	0.75		
HYDROGRAPH AT	SB-PS8	163.	6.05	16.	7.	7.	0.12		
2 COMBINED AT	AP8	692.	6.05	108.	50.	50.	0.87		
HYDROGRAPH AT	SB-PS9	250.	6.00	27.	12.	12.	0.13		

2 COMBINED AT	AP9	935.	6.00	135.	61.	61.	1.00		
HYDROGRAPH AT	SB-PS10	22.	6.10	2.	1.	1.	0.04		
2 COMBINED AT	APDFC	956.	6.05	137.	62.	62.	1.04		
ROUTED TO	RR-DFC	153.	6.55	119.	59.	59.	1.04	70.96	6.55
ROUTED TO	RT-DFC	153.	6.55	118.	59.	59.	1.04		
HYDROGRAPH AT	SB-PS11	51.	6.05	5.	2.	2.	0.06		
2 COMBINED AT	AP10	181.	6.15	123.	61.	61.	1.09		
HYDROGRAPH AT	SB-PS12	52.	6.15	7.	3.	3.	0.15		
2 COMBINED AT	APDFB	233.	6.15	130.	64.	64.	1.25		
ROUTED TO	RR-DFB	159.	7.15	128.	64.	64.	1.25	77.49	7.15
ROUTED TO	RT-DFB	159.	7.15	128.	64.	64.	1.25		
HYDROGRAPH AT	SB-PS13	42.	6.05	4.	2.	2.	0.06		
2 COMBINED AT	AP11	162.	7.05	132.	65.	65.	1.31		
ROUTED TO	RT-AP11	162.	7.05	132.	65.	65.	1.31		
2 COMBINED AT	AP5A	342.	7.15	260.	123.	123.	2.66		
ROUTED TO	RT-AP5A	342.	7.20	260.	123.	123.	2.66		
HYDROGRAPH AT	SB-PM1	41.	6.10	5.	2.	2.	0.05		
ROUTED TO	RT-PM1	41.	6.10	5.	2.	2.	0.05		
HYDROGRAPH AT	SB-PM2	31.	6.25	5.	2.	2.	0.15		
HYDROGRAPH AT	SB-PM3	32.	6.15	4.	2.	2.	0.07		
4 COMBINED AT	AP12	408.	6.25	273.	129.	129.	2.93		
ROUTED TO	RT-AP12	407.	6.30	273.	129.	129.	2.93		
HYDROGRAPH AT	SB-PM4	57.	6.10	6.	3.	3.	0.11		
2 COMBINED AT	AP13	437.	6.25	279.	131.	131.	3.04		
HYDROGRAPH AT	SB-CS1	30.	6.10	3.	1.	1.	0.05		
ROUTED TO	RT-CS1	30.	6.15	3.	1.	1.	0.05		
HYDROGRAPH AT	SB-CS2	149.	6.00	16.	7.	7.	0.07		
ROUTED TO	RR-DFCS2	149.	6.00	16.	7.	7.	0.07	101.53	6.00
2 COMBINED AT	AP14	167.	6.00	20.	9.	9.	0.12		
ROUTED TO	RT-AP14	165.	6.00	20.	9.	9.	0.12		

HYDROGRAPH AT	SB-CS3	61.	6.05	6.	3.	3.	0.05		
ROUTED TO	RR-DFCS3	61.	6.05	6.	3.	3.	0.05	100.99	6.05
2 COMBINED AT	AP15	223.	6.05	26.	11.	11.	0.18		
ROUTED TO	RT-AP15	223.	6.05	26.	11.	11.	0.18		
HYDROGRAPH AT	SB-CS4	107.	6.00	11.	5.	5.	0.05		
ROUTED TO	RR-DFVC	17.	6.25	11.	5.	5.	0.05	78.27	6.25
2 COMBINED AT	AP16	239.	6.05	37.	16.	16.	0.23		
ROUTED TO	RT-AP16	239.	6.05	37.	16.	16.	0.23		
HYDROGRAPH AT	SB-CN1	102.	6.10	11.	5.	5.	0.14		
ROUTED TO	RR-DFA	5.	8.10	5.	4.	4.	0.14	6803.51	7.65
ROUTED TO	RT-DFA	5.	8.15	5.	4.	4.	0.14		
HYDROGRAPH AT	SB-CN2	47.	6.10	5.	2.	2.	0.08		
2 COMBINED AT	AP17	51.	6.10	10.	6.	6.	0.22		
ROUTED TO	RT-AP17	51.	6.15	10.	6.	6.	0.22		
HYDROGRAPH AT	SB-CN3	40.	6.05	4.	2.	2.	0.04		
2 COMBINED AT	AP18	88.	6.10	14.	8.	8.	0.27		
ROUTED TO	RT-AP18	87.	6.10	14.	8.	8.	0.27		
3 COMBINED AT	AP19	656.	6.15	324.	156.	156.	3.54		
ROUTED TO	RT-AP19	651.	6.20	324.	155.	155.	3.54		
HYDROGRAPH AT	SB-PM5	78.	6.10	9.	4.	4.	0.18		
2 COMBINED AT	AP20	712.	6.20	332.	159.	159.	3.72		
HYDROGRAPH AT	SB-PM6	186.	6.00	21.	9.	9.	0.09		
2 COMBINED AT	AP21	797.	6.15	350.	168.	168.	3.81		
HYDROGRAPH AT	SB-PM7	66.	6.25	10.	5.	5.	0.14		
HYDROGRAPH AT	SB-F1	89.	6.10	10.	4.	4.	0.12		
ROUTED TO	RT-F1P	87.	6.10	10.	4.	4.	0.12		
HYDROGRAPH AT	SB-F2	24.	6.10	2.	1.	1.	0.04		
2 COMBINED AT	AP-DFSF	110.	6.10	12.	6.	6.	0.16		
ROUTED TO	RR-DFSF	92.	6.20	80.	80.	80.	0.16	92.50	6.20
ROUTED TO	RT-DFSF	91.	6.20	80.	80.	80.	0.16		

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6770E+02 EXCESS=0.0000E+00 OUTFLOW=0.6772E+02 BASIN STORAGE=-.1088E-01 PERCENT ERROR= 0.0

RT-PN14	MANE	1.30	17.18	364.89	0.67	3.00	17.04	366.00	0.67

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.9711E+00 EXCESS=0.0000E+00 OUTFLOW=0.9699E+00 BASIN STORAGE=0.1459E-02 PERCENT ERROR= 0.0

RT-AP5	MANE	0.27	180.98	462.49	0.99	3.00	180.98	462.00	0.99

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7107E+02 EXCESS=0.0000E+00 OUTFLOW=0.7107E+02 BASIN STORAGE=-.1741E-02 PERCENT ERROR= 0.0

RT-PS1	MANE	1.53	111.98	367.87	0.87	3.00	110.60	366.00	0.87

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6943E+01 EXCESS=0.0000E+00 OUTFLOW=0.6934E+01 BASIN STORAGE=0.1102E-01 PERCENT ERROR= 0.0

RT-DFD	MANE	0.95	57.22	403.82	0.92	3.00	57.21	405.00	0.92

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2285E+02 EXCESS=0.0000E+00 OUTFLOW=0.2282E+02 BASIN STORAGE=0.2601E-01 PERCENT ERROR= 0.0

RT-AP6	MANE	1.83	247.07	362.52	1.17	3.00	246.37	363.00	1.17

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3655E+02 EXCESS=0.0000E+00 OUTFLOW=0.3648E+02 BASIN STORAGE=0.7723E-01 PERCENT ERROR= 0.0

RT-AP7A	MANE	1.32	531.27	361.41	1.33	3.00	529.25	363.00	1.33

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5316E+02 EXCESS=0.0000E+00 OUTFLOW=0.5309E+02 BASIN STORAGE=0.7515E-01 PERCENT ERROR= 0.0

RT-DFC	MANE	1.57	153.45	393.68	1.31	3.00	153.43	393.00	1.31

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7252E+02 EXCESS=0.0000E+00 OUTFLOW=0.7241E+02 BASIN STORAGE=0.1130E+00 PERCENT ERROR= 0.0

RT-DFB	MANE	0.79	159.14	430.27	1.18	3.00	159.13	429.00	1.18

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7864E+02 EXCESS=0.0000E+00 OUTFLOW=0.7858E+02 BASIN STORAGE=0.6222E-01 PERCENT ERROR= 0.0

RT-AP11	MANE	0.46	162.47	423.60	1.16	3.00	162.46	423.00	1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.8088E+02 EXCESS=0.0000E+00 OUTFLOW=0.8085E+02 BASIN STORAGE=0.3747E-01 PERCENT ERROR= 0.0

RT-AP5A	MANE	3.00	341.92	432.00	1.07	3.00	341.92	432.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1521E+03 EXCESS=0.0000E+00 OUTFLOW=0.1518E+03 BASIN STORAGE=0.2915E+00 PERCENT ERROR= 0.0

RT-PM1	MANE	0.73	41.14	366.73	0.87	3.00	40.89	366.00	0.87

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2514E+01 EXCESS=0.0000E+00 OUTFLOW=0.2513E+01 BASIN STORAGE=0.4881E-02 PERCENT ERROR= -0.1

RT-AP12	MANE	1.35	408.19	376.65	1.02	3.00	407.21	378.00	1.02

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1594E+03 EXCESS=0.0000E+00 OUTFLOW=0.1591E+03 BASIN STORAGE=0.3607E+00 PERCENT ERROR= 0.0

RT-CS1	MANE	1.50	30.16	367.50	0.64	3.00	29.97	369.00	0.64

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1819E+01 EXCESS=0.0000E+00 OUTFLOW=0.1814E+01 BASIN STORAGE=0.1499E-01 PERCENT ERROR= -0.5

RT-AP14	MANE	0.61	166.33	360.81	1.62	3.00	165.44	360.00	1.62

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1064E+02 EXCESS=0.0000E+00 OUTFLOW=0.1064E+02 BASIN STORAGE=0.1312E-01 PERCENT ERROR= -0.1

RT-AP15	MANE	0.57	222.89	362.24	1.51	3.00	222.66	363.00	1.51

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1415E+02 EXCESS=0.0000E+00 OUTFLOW=0.1414E+02 BASIN STORAGE=0.1698E-01 PERCENT ERROR= -0.1

RT-AP16	MANE	0.13	238.73	363.01	1.64	3.00	238.72	363.00	1.65

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2009E+02 EXCESS=0.0000E+00 OUTFLOW=0.2009E+02 BASIN STORAGE=0.4950E-02 PERCENT ERROR= 0.0

RT-DFA	MANE	1.21	5.12	491.17	0.62	3.00	5.12	492.00	0.62

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4794E+01 EXCESS=0.0000E+00 OUTFLOW=0.4790E+01 BASIN STORAGE=0.3757E-02 PERCENT ERROR= 0.0

RT-AP17	MANE	1.00	51.07	367.43	0.66	3.00	50.50	369.00	0.66

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7808E+01 EXCESS=0.0000E+00 OUTFLOW=0.7801E+01 BASIN STORAGE=0.6603E-02 PERCENT ERROR= 0.0

RT-AP18	MANE	0.42	87.62	366.30	0.70	3.00	87.34	366.00	0.70

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.9992E+01 EXCESS=0.0000E+00 OUTFLOW=0.9989E+01 BASIN STORAGE=0.3667E-02 PERCENT ERROR= 0.0

RT-AP19	MANE	1.95	651.34	372.45	1.02	3.00	650.95	372.00	1.02

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1927E+03 EXCESS=0.0000E+00 OUTFLOW=0.1923E+03 BASIN STORAGE=0.4095E+00 PERCENT ERROR= 0.0

RT-F1P	MANE	0.98	88.15	366.75	0.86	3.00	86.90	366.00	0.86

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5475E+01 EXCESS=0.0000E+00 OUTFLOW=0.5471E+01 BASIN STORAGE=0.5551E-02 PERCENT ERROR= 0.0

RT-DFSF	MANE	0.45	91.34	373.05	11.74	3.00	90.80	372.00	11.75

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.9901E+02 EXCESS=0.0000E+00 OUTFLOW=0.9901E+02 BASIN STORAGE=-.6495E-09 PERCENT ERROR= 0.0

RT-AP22P	MANE	1.53	159.79	369.99	7.15	3.00	158.71	372.00	7.16

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1039E+03 EXCESS=0.0000E+00 OUTFLOW=0.1039E+03 BASIN STORAGE=0.3607E-02 PERCENT ERROR= 0.0

RT-AP23P	MANE	1.12	193.03	369.58	6.41	3.00	193.01	369.00	6.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1061E+03 EXCESS=0.0000E+00 OUTFLOW=0.1061E+03 BASIN STORAGE=0.3787E-02 PERCENT ERROR= 0.0

RT-AP24P	MANE	0.67	296.41	363.82	5.68	3.00	294.97	363.00	5.68

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1133E+03 EXCESS=0.0000E+00 OUTFLOW=0.1133E+03 BASIN STORAGE=0.3872E-02 PERCENT ERROR= 0.0

RT-AP25P	MANE	0.97	459.13	362.99	4.98	3.00	459.12	363.00	4.98

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1233E+03 EXCESS=0.0000E+00 OUTFLOW=0.1233E+03 BASIN STORAGE=0.9228E-02 PERCENT ERROR= 0.0

RT-AP26	MANE	3.00	476.12	501.00	1.42	3.00	476.12	501.00	1.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3379E+03 EXCESS=0.0000E+00 OUTFLOW=0.3366E+03 BASIN STORAGE=0.1509E+01 PERCENT ERROR= -0.1

RT-PM10	MANE	0.82	98.84	361.40	2.36	3.00	98.36	360.00	2.36

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6049E+01 EXCESS=0.0000E+00 OUTFLOW=0.6047E+01 BASIN STORAGE=0.3163E-02 PERCENT ERROR= 0.0

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

HEC-1 MODEL OUTPUT
FULLY DEVELOPED
100-YEAR STORM

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  12/21/1998  TIME  17:19:31 *
*                                       *
*****************************************
```


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


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

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::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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   PINE CREEK DRAINAGE BASIN - 24HR, FULL DEVELOPED CONDITION (TYPE IIa100 YEAR)
        2       ID   FILE:PCDBPSD.DAT
        3       ID   FULLY DEVELOPED CONDITION MODEL MODIFIED PER DESIGN OF MODIFICATIONS TO DF 1
        4       ID   998 REVISION, LAST MODEL REVISION DATE:8/5/98  10-19-98
        5       ID   CN VALUES HAVE BEEN ADJUSTED TO PRODUCE PEAK 100 YEAR FLOW RATES SIMILAR TO
        6       ID   100 YEAR FLOW RATES PRODUCED BY RATIONAL METHOD.
        7       ID   ********************************************************************************
        8       ID   BEGIN CALCULATIONS IN THE PINE CREEK NORTH FORK WATERSHED
        9       ID   ********************************************************************************
*** FREE ***
                *DIAGRAM
       10       IT       3       0       0     300
       11       IO       5

       12       KK  SB-PN1
       13       KM   COMPUTE HYDROGRAPH FOR BASIN PN1
       14       BA    .164
       15       IN      15
       16       PB     4.4
       17       PC    0000   .0005   .0015   .0030   .0045   .0060   .0080   .0100   .0120   .0143
       18       PC   .0165   .0188   .0210   .0233   .0255   .0278   .0320   .0390   .0460   .0530
       19       PC   .0600   .0750   .1000   .4000   .7000   .7250   .7500   .7650   .7800   .7900
       20       PC   .8000   .8100   .8200   .8250   .8300   .8350   .8400   .8450   .8500   .8550
       21       PC   .8600   .8638   .8675   .8713   .8750   .8788   .8825   .8863   .8900   .8938
       22       PC   .8975   .9013   .9050   .9083   .9115   .9148   .9180   .9210   .9240   .9270
       23       PC   .9300   .9325   .9350   .9375   .9400   .9425   .9450   .9475   .9500   .9525
       24       PC   .9550   .9575   .9600   .9625   .9650   .9675   .9700   .9725   .9750   .9775
       25       PC   .9800   .9813   .9825   .9838   .9850   .9863   .9875   .9888   .9900   .9913
       26       PC   .9925   .9938   .9950   .9963   .9975   .9988  1.000
       27       LS       0    80.2
       28       UD    .188

       29       KK  SB-PN2
       30       KM   COMPUTE HYDROGRAPH FOR BASIN PN2
       31       BA    .149
       32       LS       0      79
       33       UD    .192

       34       KK  RT-PN2
       35       KM   ROUTE FLOW FROM PN2 TO AP1
       36       RD    1000     .03    .013           CIRC     4.5

       37       KK     AP1
       38       KM   COMBINE THE FLOW FROM BASIN PN1 TO THE ROUTED FLOW FROM BASIN PN2 AT AP1
       39       HC       2

       40       KK  RT-AP1
       41       KM   ROUTE AP1 TO AP2
       42       RD    2600    .033    .013           CIRC       6
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 43       KK  SB-PN3
 44       KM   COMPUTE HYDROGRAPH FOR BASIN PN3
 45       BA    .083
 46       LS       0    85.8
 47       UD    .196

 48       KK     AP2
 49       KM   COMBINE ROUTED FLOW FROM AP1 WITH FLOW FROM BASIN PN3
 50       HC       2

 51       KK  RT-AP2
 52       KM   ROUTE FLOW FROM AP2 TO AP3
 53       RD     800    .025    .013            CIRC       7

 54       KK  SB-PN4
 55       KM   COMPUTE HYDROGRAPH FOR BASIN PN4
 56       BA    .114
 57       LS       0    78.5
 58       UD    .185

 59       KK  RT-PN4
 60       KM   ROUTE FLOW FROM BASIN PN4 TO AP3
 61       RD    1000    .040    .013            CIRC       4

 62       KK  SB-PN5
 63       KM   COMPUTE HYDROGRAPH FOR BASIN PN5
 64       BA    .074
 65       LS       0    86.2
 66       UD    .175

 67       KK     AP3
 68       KM   COMBINE ROUTED FLOW RT-PN4 WITH ROUTED FLOW RT-AP2 AND FLOW FROM BASIN PN5
 69       HC       3

 70       KK  RT-AP3
 71       KM   ROUTE FLOW FROM AP3 TO DETENTION FACILITY "G"
 72       RD    1100    .025   0.013            CIRC     8.5

 73       KK  SB-PN6
 74       KM   COMPUTE HYDROGRAPH FOR BASIN PN6
 75       BA    .146
 76       LS       0    95.0
 77       UD    .127

 78       KK   APDFG
 79       KM   COMBINE ROUTED FLOW FROM AP3 WITH FLOW FROM BASIN PN6 AT REGIONAL DETENTION
 80       KM   FACILITY "G"
 81       HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  82      KK RR-DFFG
  83      KM   ROUTE FLOW THROUGH A REGIONAL DETENTION FACILITY. ASSUME A 48" DIA OUTLET
  84      KM   WITH INVERT AT EL. 59. OUTLET Q ESTIMATED WITH BUREAU OF PUBLIC ROADS
  85      KM   NOMOGRAPH FOR INLET CONTROL OF CULVERTS. VOLUME BASED ON CONCEPTUAL
  86      KM   GRADING PLAN.
  87      KO       3       1
  88      RS       1    STOR       0
  89      SV       0      .1     2.8     8.0    14.1    20.9    28.4    36.6    45.5    55.1
  90      SV    65.3    76.3    88.2
  91      SE      59      60      62      64      66      68      70      72      74      76
  92      SE      78      80      82
  93      SQ       0      10      47      93     130     160     180     203     222     240
  94      SQ     262     280     295

  95      KK  RT-DFG
  96      KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM POWERS BLVD.
  97      KM   1800 FEET WEST TO DETENTION FACILITY "F"
  98      RD    1800    .023    .045            TRAP      15       3

  99      KK  SB-PN7
 100      KM   COMPUTE HYDROGRAPH FOR BASIN PN7
 101      BA    .078
 102      LS       0    74.6
 103      UD    .165

 104      KK  SB-PN8
 105      KM   COMPUTE HYDROGRAPH FOR BASIN PN8
 106      BA    .113
 107      LS       0    80.9
 108      UD    .176

 109      KK   APDFF
 110      KM   COMBINE ROUTED FLOW RT-DFG AND FLOW FROM BASINS PN7 AND PN8 AT REGIONAL
 111      KM   DETENTION FACILITY "F"
 112      HC       3

 113      KK  RR-DFF
 114      KM   ROUTE FLOW THRU A REGIONAL DETENTION FACILITY. ASSUME A 48 DIA OUTLET WITH
 115      KM   THE INVERT DEPRESSED 2' BELOW POND INVERT. OUTLET Q ESTIMATED WITH  BUREAU
 116      KM   OF PUBLIC ROADS NOMOGRAPH FOR INLET CONTROL OF CULVERTS
 117      KO       3       1
 118      RS       1    STOR       0
 119      SV       0       0     0.1     0.7     1.5     4.4     7.8    11.7    16.1    21.0
 120      SV    26.4
 121      SE      90      92      94      96      98     100     102     104     106     108
 122      SE     110
 123      SQ       0      22      70     112     143     170     190     210     230     250
 124      SQ     265
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  125     KK  RT-DFF
  126     KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM DETENTION
  127     KM   FACILITY "F" AT THE COLLECTOR STREET CROSSING TO AP-4 AT THE WEST SIDE OF
  128     KM   BASINS PN9 AND PN10
  129     RD    1600     .02    .045           TRAP      20       3

  130     KK  SB-PN9
  131     KM   COMPUTE HYDROGRAPH FOR BASIN PN9
  132     BA    .036
  133     LS       0    72.8
  134     UD    .170

  135     KK SB-PN10
  136     KM   COMPUTE HYDROGRAPH FOR BASIN PN10
  137     BA    .043
  138     LS       0    72.7
  139     UD    .141

  140     KK     AP4
  141     KM   COMBINE ROUTED FLOW RT-DFF WITH FLOW FROM BASINS PN9 AND PN10
  142     HC       3

  143     KK  RT-AP4
  144     KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM AP4
  145     KM   TO DETENTION FACILITY "E" AT THE COLLECTOR STREET CROSSING
  146     RD    1400    .032    .045           TRAP      20       3

  147     KK SB-PN11
  148     KM   COMPUTE HYDROGRAPH FOR BASIN PN11
  149     BA   0.079
  150     LS       0    76.7
  151     UD    .189

  152     KK SB-PN12
  153     KM   COMPUTE HYDROGRAPH FOR BASIN PN12
  154     BA   0.039
  155     LS       0    68.2
  156     UD    .129

  157     KK SB-PN13
  158     KM   COMPUTE HYDROGRAPH FOR BASIN PN13
  159     BA   0.127
  160     LS       0      74
  161     UD    .195

  162     KK   APOFE
  163     KM   COMBINE ROUTED FLOW RT-AP4 WITH FLOW FROM BASINS PN11, PN12, AND PN13
  164     KM   AT REGIONAL DETENTION FACILITY "E"
  165     HC       4
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

166       KK  RR-DFE
167       KM   NOTE: THE INPUT POND VOLUME REFLECTS THE DESIGN POND VOLUME ON 7-23-98
168       KM   ROUTE FLOW THRU A DETENTION FACILITY. ASSUME A 54" DIA OUTLET WITH
169       KM   THE INVERT DEPRESSED 2' BELOW POND INVERT (INV EL=84. OUTLET Q ESTIMATED
170       KM   WITH BUREAU OF PUBLIC ROADS NOMOGRAPH FOR INLET CONTROL OF CULVERTS
171       KM   DISCHARGE ABOVE EL 100.3 INCLUDES FLOW OVER EMERGENCY SPILLWAY
172       KM   SCALE 1
173       KO       3       1
174       RS       1    STOR       0
175       SV       0       0    1.25    3.91    6.93   10.31   14.07   18.24   22.83   27.87
176       SE     784     786     788     790     792     794     796     798     800     802
177       SQ       0      25      80     136     173     210     240     263     280    1431

178       KK  RT-DFE
179       KM   ROUTE THE OUTFLOW FROM DETENTION FACILITY "E" IN A STORM DRAIN TO AP-5
180       RD    1800    .025    .013            CIRC     4.5

181       KK SB-PN14
182       KM   COMPUTE HYDROGRAPH FOR BASIN PN14
183       BA    .027
184       LS       0    74.3
185       UD    .157

186       KK RT-PN14
187       KM   ROUTE FLOW FROM BASIN PN14 IN A STORM DRAIN TO AP5
188       RD    1400    .055    .013            CIRC       2

189       KK SB-PN15
190       KM   COMPUTE HYDROGRAPH FOR BASIN PN15
191       BA    .074
192       LS       0    72.7
193       UD    .186

194       KK     AP5
195       KM   COMBINE ROUTED FLOW RT-PN14 TO FLOW FROM BASIN PN15
196       HC       3

197       KK  RT-AP5
198       KM   ROUTE THE FLOW AT AP5 TO AP5A AT THE CONFLUENCE OF THE FLOWS FROM THE
199       KM   NORTH AND SOUTH FORKS OF PINE CREEK
200       RD     400    .025    .013            CIRC       5
201       KM   ************************************************************************
202       KM   ***** BEGIN CALCULATIONS FOR THE SOUTH FORK OF PINE CREEK WATERSHED ****
203       KM   ************************************************************************

204       KK  SB-PS1
205       KM   COMPUTE HYDROGRAPH FOR BASIN PS1
206       BA    .150
207       LS       0    78.4
208       UD    .205
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  209     KK  RT-PS1
  210     KM   ROUTE FLOW FROM BASIN PS1 TO REGIONAL DETENTION FACILITY "G"
  211     RD    2100     .03    .013           CIRC     4.5

  212     KK  SB-PS2
  213     KM   COMPUTE HYDROGRAPH FOR BASIN PS2
  214     BA    .154
  215     LS       0    85.2
  216     UD    .188

  217     KK  S8-PS3
  218     KM   COMPUTE HYDROGRAPH FOR BASIN PS3
  219     BA    .162
  220     LS       0    84.8
  221     UD    .205

  222     KK   APDFD
  223     KM   COMBINE ROUTED FLOW RT-PS1 TO FLOW FROM BASINS PS2 AND PS3
  224     HC       3

  225     KK  RR-DFD
  226     KM   ROUTE FLOW THRU A DETENTION FACILITY
  227     KM   ASSUME BOTTOM TO BE 240'WIDE X 590' LONG W 4:1 SIDE SLOPES
  228     KM   ASSUME A 36 DIA OUTLET WITH INVERT AT POND INVERT.
  229     KM   OUTLET Q ESTIMATED WITH ORIFICE EQUATION ASSUMING c=0.60
  230     KM   AND DOWNSTEAM STORM DRAIN IN NON PRESSURE FLOW
  231     RS       1    STOR       0
  232     KO       3       1
  233     SV       0     6.8    14.3    22.4    31.1    40.6    50.8    61.8
  234     SE     100     102     104     106     108     110     112     114
  235     SQ       0      18      54      72      87      99     110     120

  236     KK  RT-DFD
  237     KM   ROUTE FLOW FROM DFD TO AP-6 AT POWERS BLVD.
  238     RD    1000    .025    .013           CIRC       3

  239     KK  SB-PS4
  240     KM   COMPUTE HYDROGRAPH FOR BASIN PS4
  241     BA    .054
  242     LS       0    93.2
  243     UD    .134

  244     KK  SB-PS5
  245     KM   COMPUTE HYDROGRAPH FOR BASIN PS5
  246     BA    .066
  247     LS       0    98.0
  248     UD    .135

  249     KK     AP6
  250     KM   COMBINE ROUTED FLOW RT-DFD WITH FLOW FROM BASINS PS4 AND PS5
  251     HC       3
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

252       KK  RT-AP6
253       KM   ROUTE FLOW FROM AP6 TO AP7 AT THE BRIARGATE BLVD./ AUSTIN BLUFFS PKWY.
254       KM   INTERSECTION
255       RD    2800    .025    .013           CIRC     5.5

256       KK  S8-PS6
257       KM   COMPUTE HYDROGRAPH FOR BASIN PS6
258       BA    .075
259       LS       0    86.5
260       UD    .123

261       KK    AP-7
262       KM   COMBINE ROUTED FLOW RT-AP6 TO FLOW FROM BASIN PS6
263       HC       2

264       KK  SB-PS7
265       KM   COMPUTE HYDROGRAPH FOR BASIN PS7
266       BA    .089
267       LS       0    98.0
268       UD    .119

269       KK    AP7A
270       KM   COMBINE FLOW AT AP-7 TO FLOW FROM BASIN PS7
271       HC       2

272       KK RT-AP7A
273       KM   ROUTE FLOW FROM AP7A TO AP8 AT THE BRIARGATE PARKWAY AND UNION BLVD.
274       KM   INTERSECTION
275       RD    2100    .017    .013           CIRC     7.5

276       KK  SB-PS8
277       KM   COMPUTE HYDROGRAPH FOR BASIN PS8
278       BA    .122
279       LS       0    86.0
280       UD    .127

281       KK    AP8
282       KM   COMBINE ROUTED FLOW RT-AP7 TO FLOW FROM BASIN PS8 AT AP8
283       HC       2

284       KK  SB-PS9
285       KM   COMPUTE HYDROGRAPH FOR BASIN PS9
286       BA    .128
287       LS       0    95.3
288       UD    .130

289       KK    AP9
290       KM   COMBINE FLOW AT AP-8 TO FLOW FROM BASIN PS9 AT AP9
291       HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

292       KK SB-PS10
293       KM   COMPUTE HYDROGRAPH FOR BASIN PS10
294       BA    .038
295       LS       0    72.9
296       UD    .160

297       KK   APDFC
298       KM   COMBINE FLOW AT AP-9 TO FLOW FROM SB-PS10 IN REGIONAL DETENTION FACILITY "C"
299       KM   THIS IS THE TOTAL INFLOW TO DETENTION FACILITY "C"
300       HC       2

301       KK  RR-DFC
302       KM   ROUTE FLOW THRU A DETENTION FACILITY.  ASSUME A 48 DIA OUTLET WITH THE
303       KM   INVERT AT EL 62.  OUTLET Q ESTIMATED WITH BUREAU OF PUBLIC ROADS NOMOGRAPH
304       KM   FOR INLET CONTROL OF CULVERTS, SCALE 1.
305       KO       3       1
306       RS       1    STOR       0
307       SV       0    2.73    9.72   18.56   28.03   38.15   48.95   60.45   72.75   85.85
308       SV   99.66
309       SE      62      64      66      68      70      72      74      76      78      80
310       SE      82
311       SQ       0      23      70     110     140     168     190     215     232     245
312       SQ     258

313       KK  RT-DFC
314       KM   ROUTE OUTFLOW FROM POND "C" WEST DOWN A STORM DRAIN IN BRIARGATE PKWY.
315       KM   TO AP10 AT DETENTION FACILITY "B"
316       RD    2400    .035    .013            CIRC       4

317       KK SB-PS11
318       KM   COMPUTE HYDROGRAPH FOR BASIN PS11
319       BA    .056
320       LS       0    80.3
321       UD    .172

322       KK    AP10
323       KM   COMBINE ROUTED FLOW RT-DFC TO FLOW FROM SB-PS11
324       HC       2

325       KK SB-PS12
326       KM   COMPUTE HYDROGRAPH FOR BASIN PS12
327       BA    .153
328       LS       0    69.0
329       UD    .233

330       KK   APDFB
331       KM   COMBINE FLOW AT AP10 TO FLOW FROM BASIN PS12
332       HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

333       KK  RR-DFB
334       KM   ROUTE FLOW THROUGH REGIONAL DETENTION POND "B"
335       KM   THIS VOLUME REFLECTS THE DESIGN VOLUME PER PRELIMINARY PLANS ON 7-23-98
336       KM   WITH 54" DIA OUTLET SET AT INVERT ELEV. 70.2. OUTLET Q ESTIMATED WITH
337       KM   BUREAU OF PUBLIC ROADS NOMO GRAPH FOR INLET CONTROL OF CONCRETE PIPE
338       KM   DISCHARGE ABOVE 87.6 INCLUDES FLOW OVER 80' LONG EMERGENCY SPILLWAY
339       KM   SCALE 1
340       KO       3       1
341       RS       1    STOR       0
342       SV       0    0.06    1.17    3.30    5.82    8.73   12.07   15.85   20.07   23.60
343       SV   24.76   29.96
344       SE    71.2    72.0      74      76      78      80      82      84      86    87.6
345       SE      88      90
346       SQ       0      22      73     130     169     202     236     260     285     301
347       SQ     371    1222

348       KK  RT-DFB
349       KM   ROUTE FLOW 1000 LF NORTHWEST IN A STORM DRAIN FROM DETENTION FACILITY "B"
350       KM   TO AP-11
351       RD    1000    .021    .013            CIRC     4.5

352       KK SB-PS13
353       KM   COMPUTE HYDROGRAPH FOR BASIN PS13
354       BA    .065
355       LS       0    74.1
356       UD    .149

357       KK    AP11
358       KM   COMBINE ROUTED FLOW RT-DFB TO FLOW FROM BASIN PS13 AT AP11
359       HC       2

360       KK RT-AP11
361       KM   ROUTE FLOW 600 LF NORTHWEST IN A STORM DRAIN FROM AP11 TO AP5A (THE
362       KM   CONFLUENCE OF FLOWS FROM THE NORTH AND SOUTH FORKS OF PINE CREEK)
363       RD     600    .021    .013            CIRC       5

364       KK    AP5A
365       KM   COMBINE ROUTED FLOW AP5 (FLOW FROM THE NORTH FORK OF PINE CREEK) TO ROUTED
366       KM   FLOW RT-AP11 (FLOW FROM THE SOUTH FORK OF PINE CREEK)
367       HC       2

368       KK RT-AP5A
369       KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL 1300 FEET DOWN THE CHANNEL FROM
370       KM   AP5A NEAR THE HISTORIC CONFLUENCE OF PINE CREEK TO AP12 AT THE CONFLUENCE
371       KM   OF THE MAIN CHANNEL AND THE LEXINGTON DRIVE STORM DRAIN OUTFALL. USE AN
372       KM   APPROXIMATE AVERAGE CHANNEL SECTION AND SLOPE FOR ROUTING.
373       RD    1300    .023    .045            TRAP      50       2

374       KK  SB-PM1
375       KM   COMPUTE HYDROGRAPH FOR BASIN PM1
376       BA    .054
377       LS       0    78.5
378       UD    .203
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

379       KK  RT-PM1
380       KM   ROUTE THE FLOW FROM BASIN PM1 1200 LF NORTH IN THE LEXINGTON DR. S.D. TO
381       KM   PINE CREEK MAIN CHANNEL.
382       RD    1200     .08    .013            CIR     3.5

383       KK  SB-PM2
384       KM   COMPUTE HYDROGRAPH FOR BASIN PM2, AN AREA OF THE GOLF COURSE
385       BA    .154
386       LS       0    66.0
387       UD    .310

388       KK  SB-PM3
389       KM   COMPUTE HYDROGRAPH FOR BASIN PM3
390       BA    .067
391       LS       0    73.5
392       UD    .248

393       KK    AP12
394       KM   COMBINE ROUTED FLOW RT-PM1 WITH THE ROUTED FLOW IN PINE CREEK MAIN CHANNEL
395       KM   AND THE FLOW FROM BASINS PM2 AND PM3
396       HC       4

397       KK RT-AP12
398       KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL DOWN THE CHANNEL FROM AP12 NEAR THE
399       KM   OUTFALL OF LEXINGTON DRIVE STORM DRAIN TO THE CROSSING AT CHAPEL HILLS DRIVE
400       KM   USE AN APPROXIMATE AVERAGE CHANNEL SECTION AND SLOPE FOR ROUTING.
401       RD    1600    .018    .045            TRAP      30       2

402       KK  SB-PM4
403       KM   COMPUTE HYDROGRAPH FOR BASIN PM4
404       BA    .111
405       LS       0    71.9
406       UD    .170

407       KK    AP13
408       KM   COMBINE FLOW FROM BASIN PM4 TO THE ROUTED FLOW RT-AP12 IN PINE CREEK MAIN
409       KM   CHANNEL ON THE EAST SIDE OF THE CHAPEL HILLS DRIVE CROSSING
410       HC       2
411       KM   ********************************************************************************
412       KM   ********BEGIN SOUTH CHAPEL HILLS DRIVE STORM DRAIN WATERSHED*****************
413       KM   ********************************************************************************

414       KK  SB-CS1
415       KM   COMPUTE HYDROGRAPH FOR BASIN CS1
416       BA    .053
417       LS       0    73.6
418       UD    .181

419       KK  RT-CS1
420       KM   ROUTE FLOW 1300 LF WEST IN DYNAMIC DR.  ASSUME BULK OF FLOW IS ON THE SURFACE
421       RD    1300    .021    .013            TRAP      32     .01
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

422       KK  SB-CS2
423       KM   COMPUTE HYDROGRAPH FOR BASIN CS1
424       BA    .070
425       LS      0    98.0
426       UD    .101

427       KKRR-DFCS2
428       KM   ROUTE FLOW THRU AN ASSUMED DETENTION FACILITY TO REFLECT DETENTION OF 1.6cfs
429       KM   /ACRE FROM THE LI/O PROPERTY AS ASSUMED IN THE MDDP FOR BRIARGATE BUSINESS
430       KM   CAMPUS. BECAUSE THE DISCHARGE CONFIGURATION IS UNKNOWN AT THIS TIME ASSUME
431       KM   THAT THE PEAK DISCHARGE RATE MAY BE DISCHARGED AS SOON AS IT IS AVAILABLE AT
432       KM   THE POND TO REFLECT POTENTIAL FREE DISCHARGE FROM A PORTION OF THE SUBBASIN
433       KM   DISCHARGE REDUCTION ASSUMED AT 1.6 cfS x 37ac=60 cfs
434       RS      1    STOR       0
435       SV      0    .001       6      10
436       SE    100     102     104     106
437       SQ      0     194     194     194

438       KK    AP14
439       KM   COMBINE ROUTED FLOW RT-CS1 TO CONTROLED FLOW FROM BASIN CS2 AT THE
440       KM   INTERSECTION OF CHAPEL HILLS DR. AND DYNAMIC DR.
441       HC      2

442       KK RT-AP14
443       KM   ROUTE FLOW 1100 LF NORTH IN THE CHAPEL HILLS DR. S.D. TO BRIARGATE PKWY.
444       KM   NOTE: THE CALCULATED 100 YEAR FLOW IS IN EXCESS OF THE FULL PIPE CAPACITY
445       KM   OF THE STORM DRAIN BETWEEN DYNAMIC DRIVE AND BRIARGATE PARKWAY. SOME OF
446       KM   THE FLOW MAY BE ON THE SURFACE IN CHAPEL HILLS DRIVE.
447       RD    1100     .02    .013            CIR       4

448       KK  SB-CS3
449       KM   COMPUTE HYDROGRAPH FOR BASIN CH3
450       BA    .053
451       LS      0    84.8
452       UD    .177

453       KKRR-DFCS3
454       KM   ROUTE FLOW THRU AN ASSUMED DETENTION FACILITY TO REFLECT DETENTION REDUCING
455       KM   THE PEAK 100YR FLOW RATE FROM THE 9 ACRES OF THE BASIN THAT ARE DESIGNATED
456       KM   AS LI/O USE AS ASSUMED IN MDDP FOR BRIARGATE BUSINESS CAMPUS.
457       KM   BECAUSE THE DISCHARGE CONFIGURATION IS UNKNOWN AT THIS TIME ASSUME
458       KM   THAT THE PEAK DISCHARGE RATE MAY BE DISCHARGED AS SOON AS IT IS AVAILABLE
459       KM   AT THE POND TO REFLECT FREE DISCHARGE FROM A PORTION OF THE SUB BASIN.
460       KM   DISCHARGE REDUCTION ASSUMED AT 1.6 cfS x 9=14 cfs
461       RS      1    STOR       0
462       SV      0    .001       6      10
463       SE    100     102     104     106
464       SQ      0     123     123     123
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

465       KK    AP15
466       KM    COMBINE ROUTED FLOW RT-AP14 WITH CONTROLLED FLOW FROM BASIN CS3 AT THE
467       KM    INTERSECTION OF CHAPEL HILLS DR. AND BRIARGATE PARKWAY. NOTE A SMALL PORTION
468       KM    OF BASIN CS3 IS LOCATED DOWNSTEAM OF THIS POINT. FOR THIS MODELING PURPOSE
469       KM    THIS IS CONSIDERED INSIGNIFICANT.
470       HC       2

471       KK RT-AP15
472       KM    ROUTE FLOW 1400 LF NORTH IN THE CHAPEL HILLS DR. S.D.
473       KM    NOTE: THE CALCULATED 100 YEAR FLOW IS IN EXCESS OF THE FULL PIPE CAPACITY
474       KM    OF THE STORM DRAIN BETWEEN BRIARGATE PARKWAY AND PINE CREEK. SOME OF
475       KM    THE FLOW MAY BE ON THE SURFACE IN CHAPEL HILLS DRIVE. A SMALL PORTION OF
476       KM    THE SURFACE FLOW MAY BE DIVERTED DOWN BRIARGATE PARKWAY, BUT FOR THE PURPOSE
477       KM    OF THIS ANALYSIS ALL OF THE FLOW FROM THE CHAPEL HILLS DRIVE/BRIARGATE PKY.
478       KM    INTERSECTION IS ASSUMED TO REACH PINE CREEK AT CHAPEL HILLS DRIVE.
479       RD     1400    .045    .013             CIR     4.5

480       KK  SB-CS4
481       KM    COMPUTE HYDROGRAPH FOR BASIN CS4
482       BA     .053
483       LS        0    95.5
484       UD     .101

485       KK RR-DFVC
486       KM    ROUTE FLOW THRU THE PROPOSED VILLAGE CENTER DETENTION FACILITY
487       KM    POND GRADING PER THE PRELIMINARY GRADING SHOWN IN THE MDDP FOR VILLAGE
488       KM    CENTER. DISCHARGE ASSUMES USE OF THE EXISTING 18" DIAMETER STUB.
489       KM    WITH THE INVERT SET AT ELEVATION 73. BUREAU OF PUBLIC ROADS NOMOGRAPH
490       KM    USED TO ESTIMATE OUTFLOW RATES ASSUMING INLET CONTROL.
491       RS        1    STOR       0
492       SV      000    .032    1.67    3.23    5.00    7.00
493       SE       73      74      76      78      80      82
494       SQ        0       3      13      17      20      22

495       KK    AP16
496       KM    COMBINE ROUTED FLOW RT-AP15 WITH THE DISCHARGE FROM THE VILLAGE CENTER POND
497       HC       2

498       KK RT-AP16
499       KM    ROUTE THE FLOW IN THE CHAPEL HILLS DRIVE STORM DRAIN FROM AP16 TO AP19 IN
500       KM    PINE CREEK MAIN CHANNEL ON THE DOWNSTREAM SIDE OF THE CHAPEL HILLS DRIVE
501       KM    CROSSING
502       RD      300     .03    .013             CIR     4.5
503       KM    ********************************************************************************
504       KM    ****BEGIN CALCULATION OF THE NORTH CHAPEL HILLS DR. STORM DRAIN WATERSHED***
505       KM    ********************************************************************************

506       KK  SB-CN1
507       KM    COMPUTE RUNOFF FROM BASIN CN1 THE WATERSHED CONTRIBUTING TO THE PARK SITE AT
508       KM    CHAPEL HILLS DRIVE POND (REGIONAL DETENTION FACILITY "A").
509       BA     .145
510       LS        0    76.8
511       UD     .190
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

512       KK  RR-DFA
513       KM   ROUTE THE FLOW FROM CN1 THROUGH THE PROPOSED DETENTION POND AT THE PARK
514       KM   SITE AT CHAPEL HILLS DRIVE. STAGE STORAGE CURVE PER THE 12/22/97 GRADING PLAN
515       KM   DISCHARGE CURVE REFLECTS 12" DIAMETER OUTLET PIPE CONTROL FOR NORMAL DISCHARG
516       KM   AND A 100' LONG EMERGENGY SPILLWAY SET AT ELEVATION 6805.5
517       KO       3       1
518       RS       1    STOR       0
519       SV       0     .01     .22     .99    1.95    2.80    4.25    5.31    6.51   11.64
520       SV   15.36
521       SQ    2.35    2.54    3.00    3.73    4.35    4.75    5.36    5.50    8.39    9.01
522       SQ     279
523       SE  6796.6  6797.0  6798.0  6800.0  6802.0  6803.5 6803.51    6804  6804.1  6805.5
524       SE  6806.5

525       KK  RT-DFA
526       KM   ROUTE OUTFLOW FROM  REGIONAL DETENTION POND "A" DOWN THE CHAPEL HILLS STORM
527       KM   DRAIN FROM LEXINGTON DRIVE TO TREELAKE DRIVE
528       RD     930     .04    .013            CIRC     1.5

529       KK  SB-CN2
530       KM   COMPUTE RUNOFF FROM BASIN CN2
531       BA    .078
532       LS       0    75.5
533       UD    .214

534       KK    AP17
535       KM   COMBINE ROUTED FLOW RT-DFA AND FLOW FROM BASIN CN2 AT THE INTERSECTION OF
536       KM   CHAPEL HILLS DRIVE AND TREELAKE DRIVE
537       HC       2

538       KK RT-AP17
539       KM   ROUTE FLOW AT AP17 DOWN THE CHAPEL HILLS DRIVE STORM DRAIN TO MULLIGAN DR.
540       RD    1400     .05    .013            CIRC     3.5

541       KK  SB-CN3
542       KM   COMPUTE RUNOFF FROM BASIN CN3
543       BA    .043
544       LS       0    80.0
545       UD    .157

546       KK    AP18
547       KM   COMBINE ROUTED FLOW RT-AP17 TO FLOW FROM BASIN CN3 AT INTERSECTION OF CHAPEL
548       KM   HILLS DR. AND MULLIGAN DR.
549       HC       2

550       KK RT-AP18
551       KM   ROUTE FLOW AT AP18 DOWN THE CHAPEL HILLS DRIVE STORM DRAIN TO AP19 IN THE
552       KM   PINE CREEK MAIN CHANNEL ON THE DOWNSTREAM SIDE OF THE CHAPEL HILLS DRIVE
553       KM   CROSSING. NOTE A SMALL PORTION OF BASIN CHN3 IS LOCATED SOUTH OF AP18. THIS
554       KM   IS CONSIDERED INSIGNIFICANT FOR THE PURPOSE OF THIS ANALYSIS.
555       RD     600     .04    .013            CIRC     3.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

556       KK   AP19
557       KM   COMBINE ROUTED FLOW RT-AP18 FROM THE NORTH CHAPEL HILLS DR. STORM DRAIN
558       KM   WITH THE ROUTED FLOW RT-AP16 FROM THE SOUTH CHAPEL HILLS DRIVE STORM DRAIN
559       KM   AND THE FLOW IN PINE CREEK MAIN CHANNEL (AP13) AT THE WEST SIDE OF THE CHAPEL
560       KM   HILLS DRIVE CROSSING. FLOW THAT IS TAKEN INTO THE PINE CREEK CHANNEL FORM THE
561       KM   STREET AT THIS POINT HAS BEEN ACCOUNTED FOR IN BASINS CN3 AND CS3. THIS WAS
562       KM   DONE TO REDUCE THE COMPLEXITY OF THE MODEL.
563       HC      3

564       KK RT-AP19
565       KM   ROUTE THE FLOW IN PINE CREEK MAIN CHANNEL FROM AP19 AT THE CHAPEL HILLS DRIVE
566       KM   CROSSING TO AP20 AT REGIONAL DETENTION FACILITY 1 AT BRIARGATE PARKWAY AND
567       KM   HIGHWAY 83. USE AVERAGE SLOPES AND APPROXIMATE CROSS SECTIONS FOR ROUTING.
568       RD    750   .035   .045          TRAP     30      2
569       RD   1000   .025   .045          TRAP    120      2
570       RD   1400   .026   .045          TRAP     60      2

571       KK  SB-PM5
572       KM   COMPUTE HYDROGRAPH FOR BASIN PM5
573       BA    .183
574       LS       0   70.0
575       UD    .185

576       KK   AP20
577       KM   COMBINE FLOW FROM BASIN PM6 WITH THE ROUTED FLOW IN PINE CREEK
578       HC      2

579       KK  SB-PM6
580       KM   COMPUTE HYDROGRAPH FOR PM6 THE AREA BETWEEN CHAPEL HILLS DR. AND DETENTION
581       KM   FACILITY 1 BOUNDED BY THE GOLF COURSE AND BRIARGATE PARKWAY. NOTE:THE MDDP
582       KM   FOR BRIARGATE BUSINESS CAMPUS REQUIRES DETENTION IN THIS SUBBASIN. FOR THE
583       KM   PURPOSE OF THIS ANALYSIS NO DETENTION IS ASSUMED TO ALLOW THE DEVELOPER THE
584       KM   OPTION OF CONSTRUCTING LARGER CONVEYANCE FACILITIES TO DETENTION FACILITY
585       KM   No. 1 AND ALLOWING FREE DISCHARGE FROM THE BASIN.
586       BA    .088
587       LS       0     98
588       UD    .110

589       KK   AP21
590       KM   COMBINE FLOW FROM PM6 WITH THE FLOW IN PINE CREEK AT AP21 FOR THE TOTAL FLOW
591       KM   IN PINE CREEK CHANNEL AS IT ENTERS DETENTION FACILITY No 1
592       HC      2

593       KK  SB-PM7
594       KM   COMPUTE HYDROGRAPH FOR BASIN PM7 THE AREA NORTH OF DETENTION FACILITY 1
595       KM   NOTE: THE MDDP FOR THE BRIARGATE BUSINESS CAMPUS REQUIRES DETENTION IN
596       KM   THE NON RESIDENTIAL PORTIONS OF THIS AREA. FOR THE PURPOSE OF THIS ANALYSIS
597       KM   FREE DISCHARGE FROM THE BASIN IS ASSUMED. THE RESIDENTIAL PORTION OF THE
598       KM   BASIN LOCATED IN OUTSIDE THE CITY LIMITS IS ASSUMED TO BE FULLY DEVELOPED
599       KM   AS 1 DU PER ACRE RESIDENTIAL.
600       BA    .138
601       LS       0   76.3
602       UD    .353
603       KM   ********************************************************************************
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 604      KM   ****BEGIN CALCULATIONS FOR THE FOCUS ON THE FAMILY STORM DRAIN WATERSHED****
 605      KM   ********************************************************************************

 606      KK   SB-F1
 607      KM   COMPUTE HYDROGRAPH FOR BASIN F1
 608      BA    .119
 609      LS       0    78.3
 610      UD    .208

 611      KK     F1P
 612      KM   DIVERT FLOW IN EXCESS OF THE DOWNSTREAM STORM DRAIN CAPACITY ASSUMING
 613      KM   FULL PIPE FLOW IN 36" DIA @3.44% FROM THE SAG POINT IN LEXINGTON DRIVE.
 614      KM   FULL FLOW CAPACITY= 123cfs
 615      DT     F1S
 616      DI     123     150     200     250
 617      DQ       0      27      77     127

 618      KK  RT-F1P
 619      KM   ROUTE FLOW IN THE STORM DRAIN 1300 LF WEST FROM THE SAG PT. IN LEXINGTON
 620      KM   DRIVE TO SUMMER FIELD POND
 621      RD    1300    .036    .013           CIRC       3

 622      KK   SB-F2
 623      KM   COMPUTE HYDROGRAPH FOR BASIN F2
 624      BA    .039
 625      LS       0      74
 626      UD    .171

 627      KK  SB-F1S
 628      KM   RETRIEVE FLOW THAT WILL NOT FIT IN THE STORM DRAIN AT LEXINGTON DRIVE
 629      DR     F1S

 630      KK  RT-F1S
 631      KM   ROUTE THE EXCESS FLOW THAT IS ON THE SURFACE OF LEXINGTON DRIVE AT THE SAG
 632      KM   POINT OVERLAND IN A GRASS LINED SWALE TO THE SUMMERFIELD DETENTION BASIN
 633      RD    1300    .037    .040           TRAP      15       6

 634      KK AP-DFSF
 635      KM   COMBINE ROUTED FLOWS RT-F1S AND RT-F1P WITH FLOW FROM F2 AT THE SUMMER
 636      KM   FIELD POND. THIS IS THE TOTAL FLOW TO THE POND
 637      HC       3

 638      KK RR-DFSF
 639      KM   ROUTE THE FLOW AT AP-DFSF THROUGH THE SUMMER FIELD DETENTION BASIN.
 640      KM   THE INFLOW/OUTFLOW S.D. FOR THIS FACILITY IS BURIED BELOW THE POND BOTTOM.
 641      KM   THE POND FILLS WHEN THE CAPACITY OF THE DOWNSTREAM REACH OF S.D. IS
 642      KM   EXCEEDED. THIS CONFIGURATION PRESENTS A COMPLEX HYDRAULIC PROBLEM. IT IS
 643      KM   ASSUMED THAT UNTIL INFLOW >120cfs FLOW WILL PASS THROUGH THE STORM DRAIN.
 644      KM   WHEN INFLOW > 120cfs BACKWATER WILL FORM AT THE OUTLET AND THE LID ON THE
 645      KM   UPSTREAM MANHOLE WILL LIKELY BE LIFTED OFF AND SOME FLOW WILL ENTER THE POND
 646      KM   FROM THAT POINT. WHEN INFLOW>120cfs IT IS ASSUMED THAT THE HEAD LOSS AT
 647      KM   THE OUTLET WILL BE APPOXIMATELY 1*VELOCITY HEAD FOR THE PURPOSE OF
 648      KM   CALCULATING THE DISCHARGE CURVE.
 649      KO       3       1
 650      RS       1    STOR       0
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

651       SV       0    0.57    4.63    6.87   10.32
652       SE      92      94      96      98     100
653       SQ     120     126     131     137     144

654       KK RT-DFSF
655       KM   ROUTE OUTFLOW FROM THE DETENTION BASIN IN A 48" S.D. TO RESEARCH PKWY.
656       RD     800    .018    .013            CIRC       4

657       KK   SB-F3
658       KM   COMPUTE HYDROGRAPH FOR BASIN F3
659       BA    .114
660       LS       0    77.0
661       UD    .215

662       KK    AP22
663       KM   COMBINE ROUTED FLOW RT-DTSF TO FLOW FROM BASIN F3 AT THE INTERSECTION OF
664       KM   RESEARCH PARKWAY AND SUMMERSET DRIVE.
665       HC       2

666       KK   AP22P
667       KM   DIVERT FLOW IN EXCESS OF THE DOWNSTREAM STORM DRAIN CAPACITY AT THE
668       KM   INTERSECTION OF RESEARCH PARKWAY AND SUMMERSET DRIVE. CONTROLLING
669       KM   DOWNSTREAM STORM DRAIN IS A 60" DIA RCP @ S=1%, FULL FLOW CAPACITY= 260cfs
670       KM   THE DIVERTED FLOW IS ASSUMED TO RUN DOWN SUMMERSET DR. SOUTH OF RESEARCH
671       KM   PARKWAY AND EVENTUALLY TO COTTONWOOD CREEK.
672       DT   AP22S
673       DI     260     261     280     300     320     340     360     380
674       DQ       0       1      20      40      60      80     100     120

675       KKRT-AP22P
676       KM   ROUTE THE S.D.FLOW FROM THE BRIARGATE PKWY/ SUMMERSET INTERSECTION TO THE
677       KM   INTERSECTION OF RESEARCH PKWY. AND CHAPEL HILLS DR.
678       RD    2100     .02    .013            CIRC       5

679       KK   SB-F4
680       KM   COMPUTE HYDROGRAPH FOR BASIN F4
681       BA    .038
682       LS       0    83.0
683       UD    .197

684       KK RR-DFF4
685       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
686       KM   RATE OF 1.6 CFS/ACRE FROM THE 11.5 AC THAT WILL BE DEVELOPED AS LI/O
687       KM   DISCHARGE REDUCTION PER ACRE IS DETERMINED PER THE RATE AND AREA INCLUDED
688       KM   IN THE MDDP FOR BRIARGATE BUSINESS CAMPUS
689       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
690       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE SITE WILL LIKELY
691       KM   FREE DISCHARGE TO THE ADJACENT STREET
692       KM   DISCHARGE REDUCTION = LI/O AREA (acres)11.5 x 1.6 cfs = 18.4 cfs
693       RS       1    STOR       0
694       SV       0    .001       6      10
695       SE     100     102     104     106
696       SQ       0    70.6    70.6    70.6
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

697       KK   AP23
698       KM   COMBINE ROUTED FLOW RT-AP22P TO FLOW FROM BASIN F4 AT THE INTERSECTION OF
699       KM   RESEARCH PARKWAY AND CHAPEL HILLS DR.
700       HC     2

701       KK   AP23P
702       KM   DIVERT FLOW IN EXCESS OF THE DOWNSTREAM STORM DRAIN CAPACITY AT THE
703       KM   FIRST MANHOLE (MH8) DOWNSTREAM OF THE INTERSECTION OF RESEARCH PARKWAY AND
704       KM   CHAPEL HILLS DRIVE. THE MANHOLE IS LOCATED JUST UPSTREAM OF A PIPE SIZE
705       KM   REDUCTION FROM 54" TO 48" DIA.. IT IS ASSUMED THAT THE MH LID WILL BE PUSHED
706       KM   OFF BY THE HIGH HGL ABOVE THE TRANSITION AT THE ESTIMATED 100 YEAR PEAK
707       KM   FLOW RATE. DOWNSTREAM PIPE CAPACITY IS ESTIMATED AT 298 cfs BASED ON
708       KM   FULL PIPE CONVEYANCE CAPACITY OF 48" DIA RCP, SLOPE = 4.3%
709       DT   AP23S
710       DI    298    300    325    350    375    400    425    450    470
711       DQ      0      2     27     52     77    102    127    152    172

712       KKRT-AP23P
713       KM   ROUTE THE FLOW IN THE STORM DRAIN FROM THE RESEARCH PKWY/CHAPEL HILLS DR.
714       KM   INTERSECTION TO THE INTERSECTION OF EXPLORER DRIVE AND THE FOCUS ON THE
715       KM   FAMILY S.D.
716       RD   2100   .044   .013          CIRC     4

717       KK   AP23S
718       KM   RETRIEVE THE DIVERTED FLOW AT MH8 JUST DOWNSTREAM OF THE INTERSECTION OF
719       KM   RESEARCH PARKWAY AND CHAPEL HILLS DRIVE. THIS IS SURFACE FLOW.
720       DR   AP23S

721       KKRT-AP23S
722       KM   ROUTE THE SURFACE FLOW AT MH8 ACCROSS THE FOCUS SITE TO EXPLORER DRIVE
723       KM   ASSUME FLOW WILL BE SHALLOW AND WIDE THROUGH THE PARKING LOTS
724       RD   1550   .042   .015          TRAP     75    .01

725       KK   SB-F5
726       KM   COMPUTE HYDROGRAPH FOR BASIN F5
727       BA   .064
728       LS     0   95.5
729       UD   .121

730       KK RR-DFF5
731       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
732       KM   RATE BASED ON APPROXIMATELY 35% OF THE DIFFERENCE BETWEEN THE DEVELOPED
733       KM   AND HISTORIC PEAK 100 YR FLOW RATE PER THE ORIGINAL DBPS CRITERIA FOR LI/O
734       KM   LAND USE. HISTORIC 100 YR PEAK ESTIMATED AT 1.5 CFS/AC. FULLY DEVELOPED 100
735       KM    YR PEAK ESTIMATED AT 5.6 CFS/AC. ESTIMATED REQUIRED DETENTION =
736       KM   (5.6-1.5)*.35*35AC=50cfs   TOTAL Qin=225cfs
737       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
738       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN DISCHARGES
739       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN
740       RS     1   STOR     0
741       SV     0   .001     6     10
742       SE   100    102   104    106
743       SQ     0    175   175    175
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

744       KK   AP24
745       KM   COMBINE THE ROUTED FLOW IN THE S.D.(RTAP102) TO FLOW FROM FF1 AND THE SURFACE
746       KM   FLOW THAT WAS DIVERTED THROUGH THE FOCUS SITE FROM MH8(RP102A) AT THE
747       KM   INTERSECTION OF EXPLORER DRIVE AND THE FOCUS ON THE FAMILY STORM DRAIN.
748       HC     3

749       KK   AP24P
750       KM   DIVERT FLOW IN EXCESS OF THE DOWNSTREAM STORM DRAIN CAPACITY AT THE
751       KM   INTERSECTION OF EXPLORER DRIVE AND TELSTAR DRIVE. DOWNSTREAM
752       KM   STORM DRAIN IS A 66" DIA RCP @ S=1.1%, FULL FLOW CAPACITY= 350cfs
753       KM   ASSUME THIS DIVERTED FLOW WILL GO WEST DOWN TELSTAR DRIVE
754       DT   AP24S
755       DI    350    351    370    390    410    430    450    470    490
756       DQ      0      1     20     40     60     80    100    120    140

757       KKRT-AP24P
758       KM   ROUTE THE FLOW IN THE FOCUS STORM DRAIN FROM AP24 AT THE INTERSECTION OF
759       KM   EXPLORER DRIVE AND THE FOCUS S.D. TO AP25 AT THE INTERSECTION OF EXPLORER
760       KM   DRIVE & BRIARGATE PKWY
761       RD    800   .011   .013          CIRC    5.5

762       KK   SB-F6
763       KM   COMPUTE HYDROGRAPH FOR BASIN F6
764       BA   .038
765       LS     0   98.0
766       UD   .106

767       KK RR-DFF6
768       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
769       KM   RATE BASED ON APPROXIMATELY 35% OF THE DIFFERENCE BETWEEN THE DEVELOPED
770       KM   AND HISTORIC PEAK 100 YR FLOW RATE. HISTORIC ESTIMATED AT 1.5 CFS/AC.
771       KM   FULLY DEVELOPED ESTIMATED AT 6.0 CFS/AC. ESTIMATED REQUIRED DETENTION =
772       KM   (6.0-1.5)*.35*21.5AC=34cfs   TOTAL Qin=138cfs
773       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
774       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN DISCHARGES
775       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN
776       RS     1   STOR      0
777       SV     0   .001      6     10
778       SE   100    102    104    106
779       SQ     0    104    104    104

780       KK   SB-F7
781       KM   COMPUTE HYDROGRAPH FOR BASIN F7
782       BA   .052
783       LS     0   93.0
784       UD   .137

785       KK RR-DFF7
786       KM   ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
787       KM   RATE BASED ON APPROXIMATELY 35% OF THE DIFFERENCE BETWEEN THE DEVELOPED
788       KM   AND HISTORIC PEAK 100 YR FLOW RATE. HISTORIC ESTIMATED AT 1.5 CFS/AC.
789       KM   FULLY DEVELOPED ESTIMATED AT 5.2 CFS/AC. ESTIMATED REQUIRED DETENTION =
790       KM   (5.2-1.5)*.35*29AC=38cfs   TOTAL Qin=170cfs
791       KM   THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
```

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

792       KM   THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN DISCHARGES
793       KM   DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN
794       RS       1    STOR       0
795       SV       0    .001       6      10
796       SE     100     102     104     106
797       SQ       0     132     132     132

798       KK    AP25
799       KM   COMBINE ROUTED FLOW RT-AP25P TO CONTROLLED FLOW FROM BASINS F6 AND F7
800       KM   AT THE INTERSECTION OF EXPLORER DR AND BRIARGATE PKWY.
801       HC       3

802       KK   AP25P
803       KM   DIVERT FLOW IN EXCESS OF THE DOWNSTREAM STORM DRAIN CAPACITY AT THE
804       KM   INTERSECTION OF EXPLORER DR. AND BRIARGATE PARKWAY. CONTROL APPEARS TO
805       KM   BE DOWNSTREAM 54" DIA S.D. @ 5.5% SLOPE, FULL PIPE CAPACITY=461cfs
806       KM   DIVERTED FLOW IS ASSUMED TO FLOW DOWM BRIARGATE PARKWAY TO THE SUMP
807       KM   ADJACENT TO FACILITY #1
808       DT   AP25S
809       DI     461     464     475     500     525     550     575     600     625
810       DQ       0       1      14      39      64      89     114     139     164

811       KKRT-AP25P
812       KM   ROUTE THE FLOW IN THE S.D.FROM THE INTERSECTION OF EXPLORER DR. & BRIARGATE
813       KM   PARKWAY TO DETENTION FACILITY 1 AT BRIARGATE PKWY & HIGHWAY 83
814       RD    1250    .011    .013            CIRC     5.5

815       KK  SB-PM8
816       KM   COMPUTE HYDROGRAPH FOR BASIN PM8 THE PORTION OF BRIARGATE PARKWAY BETWEEN
817       KM   EXPLORER DR. AND HIGHWAY 83
818       BA    .014
819       LS       0      98
820       UD    .100

821       KK AP-DF#1
822       KM   ADD THE FLOW FROM THE FOCUS ON THE FAMILY STORM DRAIN, BASINS PM7 AND PM8,
823       KM   AND FLOW IN PINE CREEK FOR THE TOTAL INFLOW TO DETENTION FACILITY 1
824       KO       1       1
825       HC       4

826       KK RR-DF#1
827       KM   ROUTE FLOW THRU DETENTION FACILITY NO.1. VOLUME MODIFIED TO REFLECT PROPOSED
828       KM   ENLARGEMENT. PROPOSED ENLARGEMENT IS TO ADD A MINIMUM OF 0.7 ACRES OF SURFACE
829       KM   AREA TO EACH OF THE CONTOURS AT OR ABOVE ELEVATION 58. OUTLET MODELED
830       KM   ASSUMING THE TOP 7.5' OF THE ENTRANCE TO THE 10'R X 12'S HIGH BOX CULVERT IS
831       KM   BLOCKED AND A NEW 12' WIDE OPENING IS CREATED W/ INVERT AT 67.2
832       KM   OUTFLOW CURVE CALCULATED WITH A SPREADSHEET TREATING THE LOWER OPENING AS
833       KM   A SUBMERGED ORIFICE WITH C=.60, h=POND DEPTH - NORMAL DEPTH IN THE OUTFALL
834       KM   AND THE UPPER OPENING TO ELEVATION 73.0 TREATED AS A SHARP CRESTED WEIR WITH
835       KM   A FULL LENGTH OF 12.8' (THE SKEW LENGTH) ADJUSTED 0.2h FOR END CONTRACTIONS
836       KM   AND C=3.22+0.40(h/P) WHERE P=14.2. ABOVE ELEVATION 73.0 THE TOP OUTLET
837       KM   STRUCTURE IS ASSUMED TO TERMINATE WITHOUT A TOP AND THUS ADDITIONAL FLOW CAN
838       KM   OVER TOP THE SIDES AND BACK OF THE ASSUMED 3 SIDED  STRUCTURE
839       KO       1       1
840       RS       1    STOR       0
```

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

841       SV    .02   0.20   0.40   4.94  14.73  25.56  37.08  49.21  61.99  75.43
842       SV  89.58  97.00 104.50 112.38 120.27
843       SE   54.0   55.0   56.0   58.0   60.0   62.0   64.0   66.0   68.0   70.0
844       SE   72.0   73.0   74.0   75.0   76.0
845       SQ      0     99    184    261    326    380    427    470    532    718
846       SQ    969   1112   1358   1690   2200

847       KK  AP25S
848       KM  RETRIEVE THE DIVERTED FLOW AT THE INTERSECTION OF BRIARGATE PARKWAY AND
849       KM  EXPLORER DRIVE. THIS IS FLOW IN THE STREET.
850       DR  AP25S

851       KKRT-AP25S
852       KM  ROUTE THE SURFACE FLOW IN BRIARGATE PARKWAY DOWN BRIARGATE PARKWAY TO PINE
853       KM  CREEK. ASSUME THIS FLOW ENTERS THE CHANNEL AT THE OUTLET FROM DETENTION
854       KM  FACILITY #1.
855       RD   1400   .043   .015          TRAP     75    .01

856       KK   AP26
857       KM  COMBINE ROUTED FLOW RT-AP25S TO THE OUTFLOW FROM DF#1 AT THE INTERSECTION OF
858       KM  BRIARGATE PKWY. AND PINE CREEK
859       HC      2

860       KK RT-AP26
861       KM  ROUTE THE COMBINED FLOW FROM AP26 AT BRIARGATE PARKWAY DOWN PINE CREEK TO
862       KM  THE INTERSECTION OF PINE CREEK AND HIGHWAY 83. USE AVERAGE
863       KM  APPROXIMATE SECTION AND SLOPE FOR ROUTING
864       RD   1450   .019   .045          TRAP     40      2

865       KK  SB-PM9
866       KM  COMPUTE HYDROGRAPH FOR BASIN PM9
867       BA   .068
868       LS      0     93
869       UD   .120

870       KK   AP27
871       KM  COMBINE THE FLOW FROM BASIN PM9 AND THE ROUTED FLOW IN PINE CREEK (RT-AP26) A
872       KM  AT THE UPSTREAM SIDE  OF HIGHWAY 83.
873       HC      2

874       KK SB-PM10
875       KM  COMPUTE HYDROGRAPH FOR BASIN PM10
876       BA   .048
877       LS      0     98
878       UD   .092

879       KKRRDFPM10
880       KM  ROUTE FLOW THRU A POND ROUTING ROUTINE TO REFLECT REDUCTION IN PEAK FLOW
881       KM  RATE TO THE APPROXIMATE PEAK FLOW RATE DISCHARGE GOAL FROM THE BASIN
882       KM  AS SHOWN IN THE FINAL DRAINAGE REPORT FOR BRIARGATE BUSINESS CAMPUS
883       KM  FILING 13 AS APPROVED OCT 31, 1996
884       KM  THE ROUTING ROUTINE ONLY REGULATES THE PEAK DISCHARGE AND DOES NOT LAG
885       KM  THE DISCHARGE. THIS IS APPROPRIATE AS A PORTION OF THE BASIN MAY DISCHARGE
886       KM  DIRECTLY TO THE ADJACENT STREET AND STORM DRAIN.
887       KM  DISCHARGE FROM THE BASIN PER THE FINAL DRAINAGE REPORT=140 cfs
```

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

888       RS       1    STOR       0
889       SV       0     001      .6     1.5
890       SE     100     102     104     106
891       SQ       0     140     140     140

892       KK RT-PM10
893       KM   ROUTE THE FLOW IN THE S.D.FROM THE LOW POINT IN TELESTAR DR. TO THE EXISTING
894       KM   OUTFALL TO PINE CREEK JUST UPSTREAM OF HIGHWAY 83.
895       RD    1000    .025    .013            CIRC     4.0

896       KK SB-PM11
897       KM   COMPUTE HYDROGRAPH FOR BASIN PM11
898       BA    .041
899       LS       0      98
900       UD    .096

901       KK   AP24S
902       KM   RETRIEVE THE FLOW THAT WAS IN EXCESS OF THE STORM DRAIN CAPACITY AT THE
903       KM   INTERSECTION OF EXPLORER DRIVE AND TELSTAR DRIVE.(AP24S)
904       DR   AP24S

905       KKRT-AP24S
906       KM   ROUTE THE RETRIEVED FLOW FROM AP24 DOWN TELSTAR DRIVE TO THE SUMP THEN
907       KM   ACROSS BBC FILING 19 TO AP28 IN PINE CREEK.
908       RD    2200     .05    .015            TRAP      40      01

909       KK    AP28
910       KM   COMBINE THE FLOW FROM BASIN PM11 WITH THE ROUTED SURFACE FLOW FROM THE
911       KM   INTERSECTION OF TELSTAR DR. AND EXPLORER DRIVE (RT-AP24S), THE FLOW IN
912       KM   PINE CREEK AT AP27, AND THE ROUTED FLOW FROM BASIN PM10.
913       KM   FLOW IS COMBINED IN PINE CREEK AT THE UPSTREAM SIDE OF THE BOX CULVERT
914       KM   UNDER HIGHWAY 83. THIS REPRESENTS THE TOTAL FLOW TO PINE CREEK FROM THE
915       KM   BRIARGATE AREA
916       KO       3       1
917       HC       4
918       ZZ
```
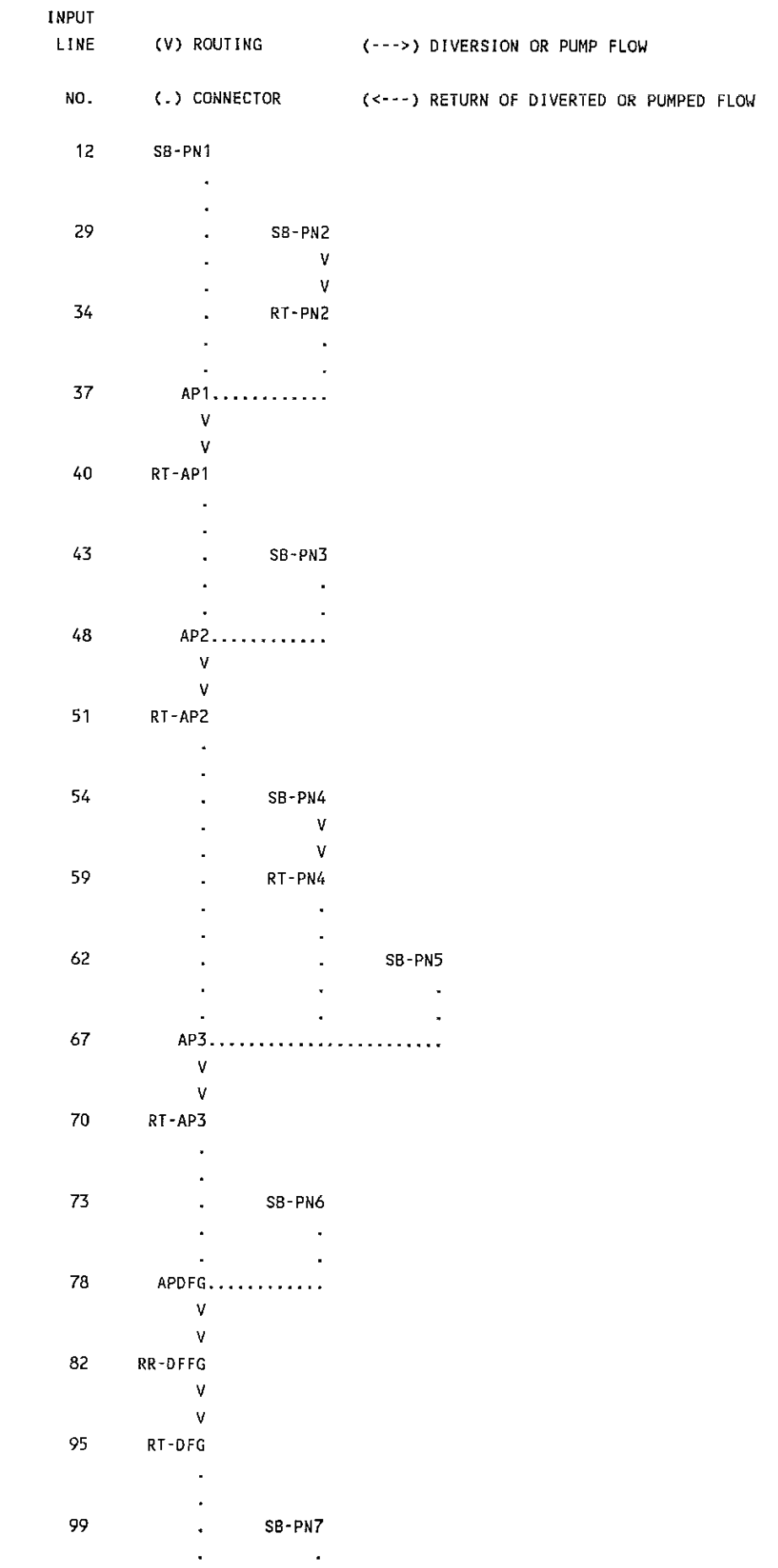
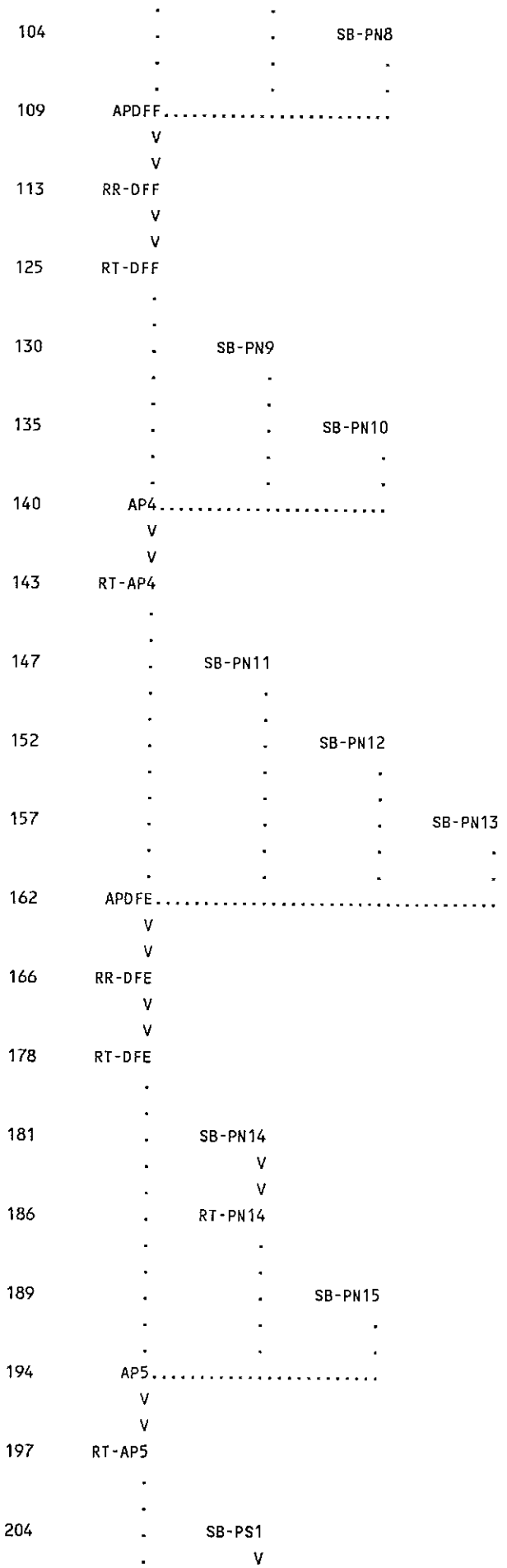

SCHEMATIC DIAGRAM OF STREAM NETWORK

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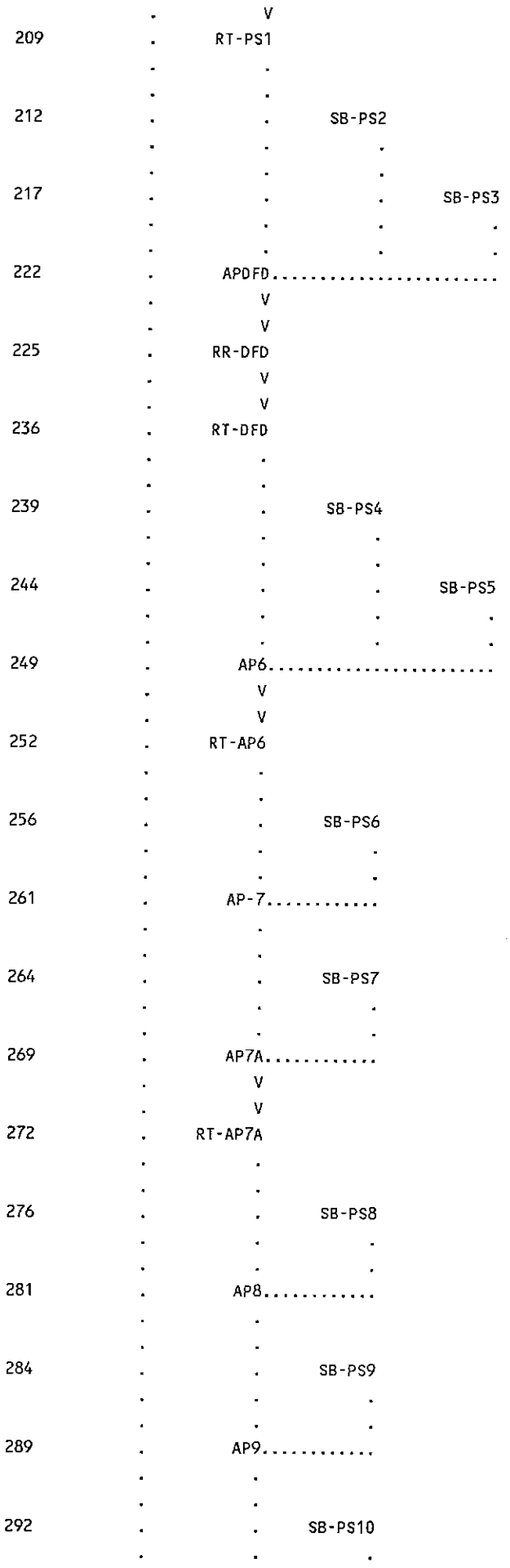
109
APDFF
113
RR-DFF
125
RT-DFF
130
SB-PN9
135
SB-PN10
140
AP4
143
RT-AP4
147
SB-PN11
152
SB-PN12
157
SB-PN13
162
APDFE
166
RR-DFE
178
RT-DFE
181
SB-PN14
186
RT-PN14
189
SB-PN15
194
AP5
197
RT-AP5
204
SB-PS1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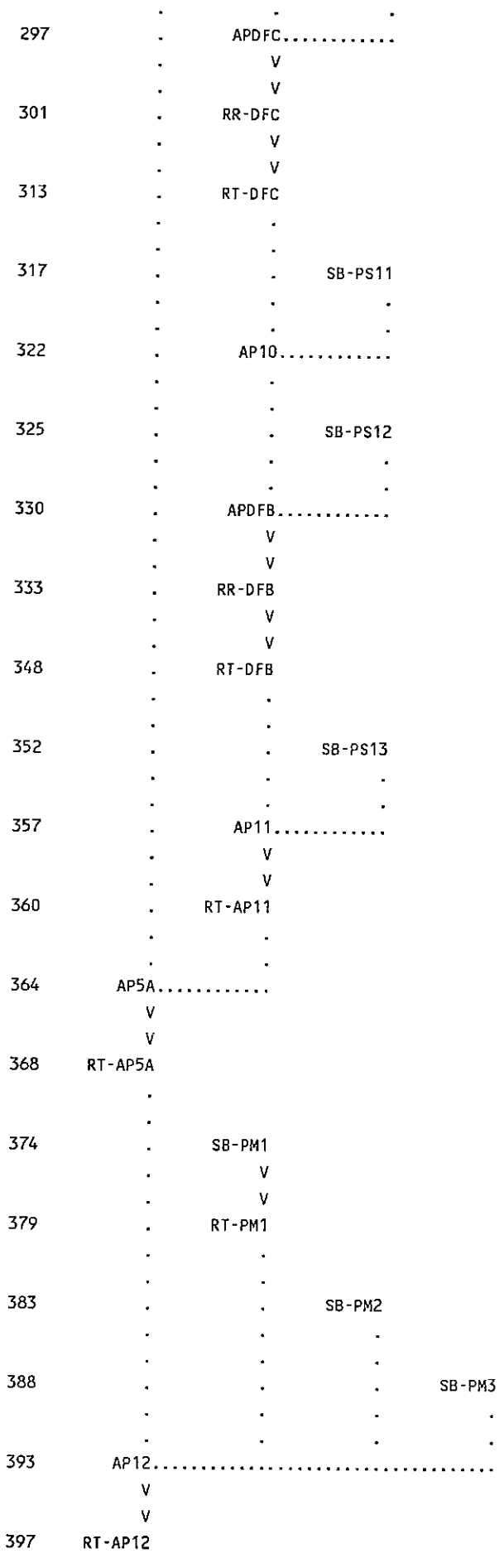
212 SB-PS2
217 SB-PS3
222 APDFD
V
V
225 RR-DFD
V
V
236 RT-DFD
239 SB-PS4
244 SB-PS5
249 AP6
V
V
252 RT-AP6
256 SB-PS6
261 AP-7
264 SB-PS7
269 AP7A
V
V
272 RT-AP7A
276 SB-PS8
281 AP8
284 SB-PS9
289 AP9
292 SB-PS10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301
RR-DFC
313
RT-DFC
317
SB-PS11
322
AP10
325
SB-PS12
330
APDFB
333
RR-DFB
348
RT-DFB
352
SB-PS13
357
AP11
360
RT-AP11
364
AP5A
368
RT-AP5A
374
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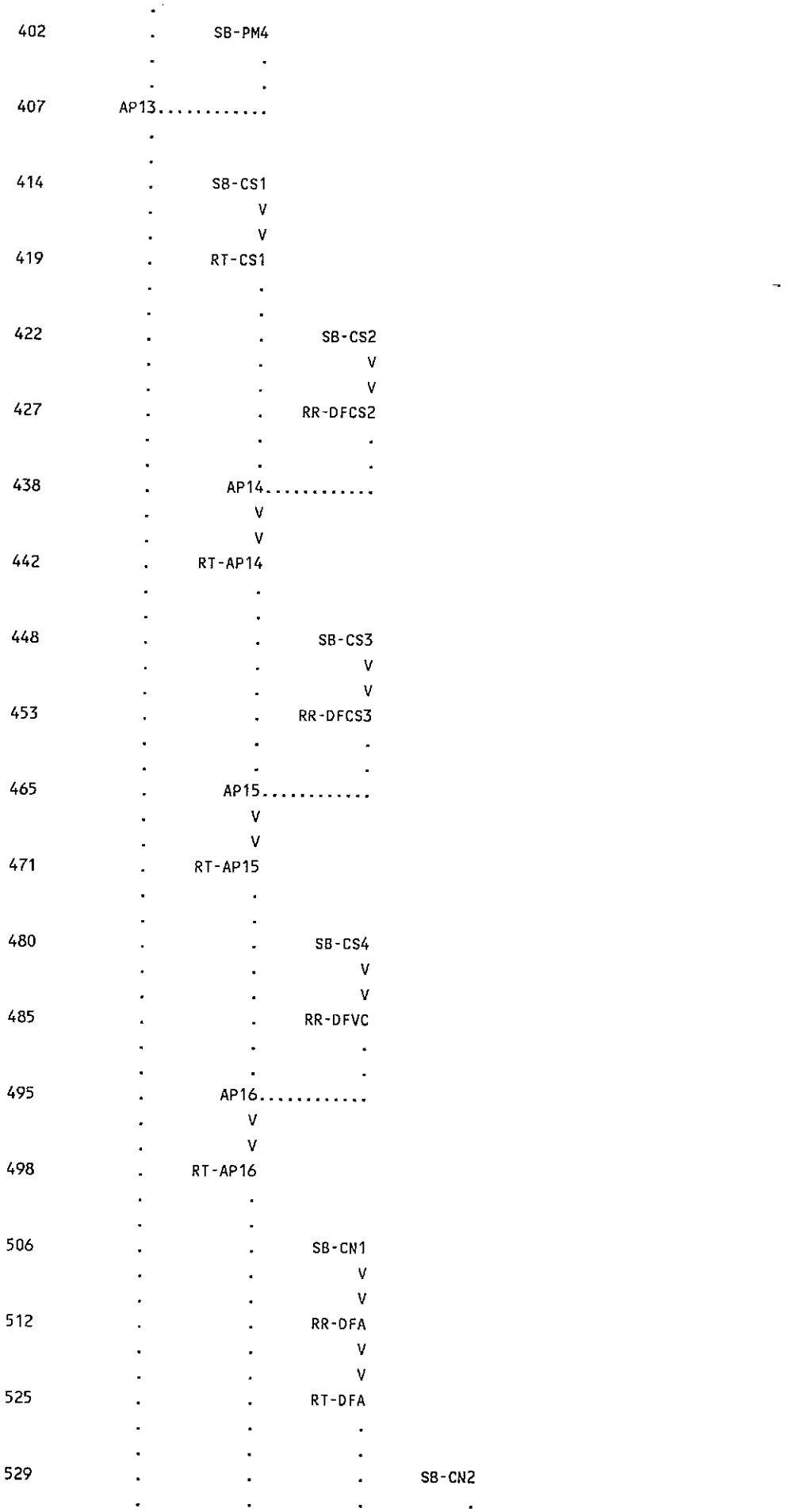
379
RT-PM1
383
SB-PM2
388
SB-PM3
393
AP12
397
RT-AP12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AP13
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SB-CS1
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RT-CS1
422
SB-CS2
427
RR-DFCS2
438
AP14
442
RT-AP14
448
SB-CS3
453
RR-DFCS3
465
AP15
471
RT-AP15
480
SB-CS4
485
RR-DFVC
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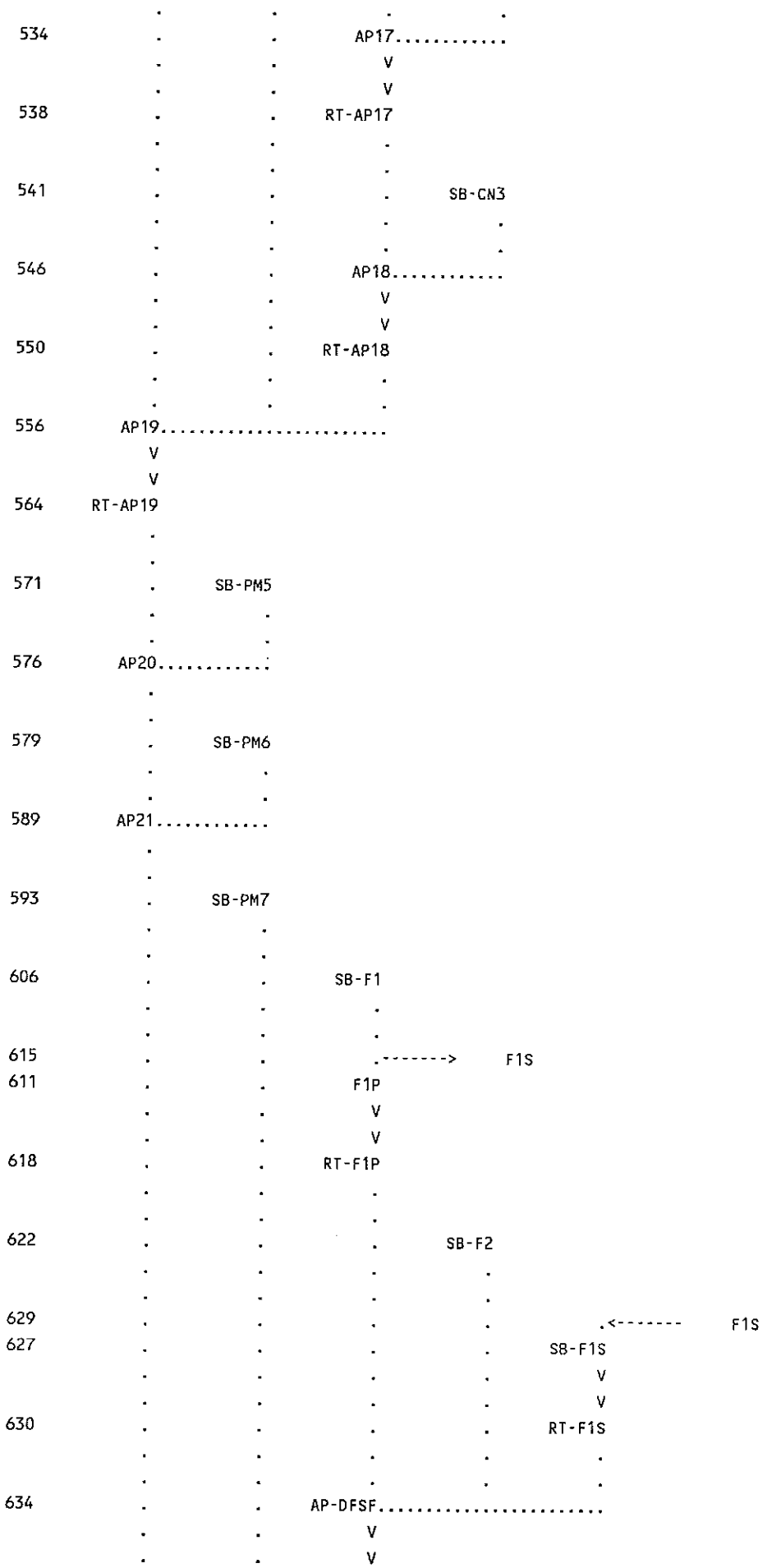
RR-DFA
525
RT-DFA
529
SB-CN2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AP18
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AP19
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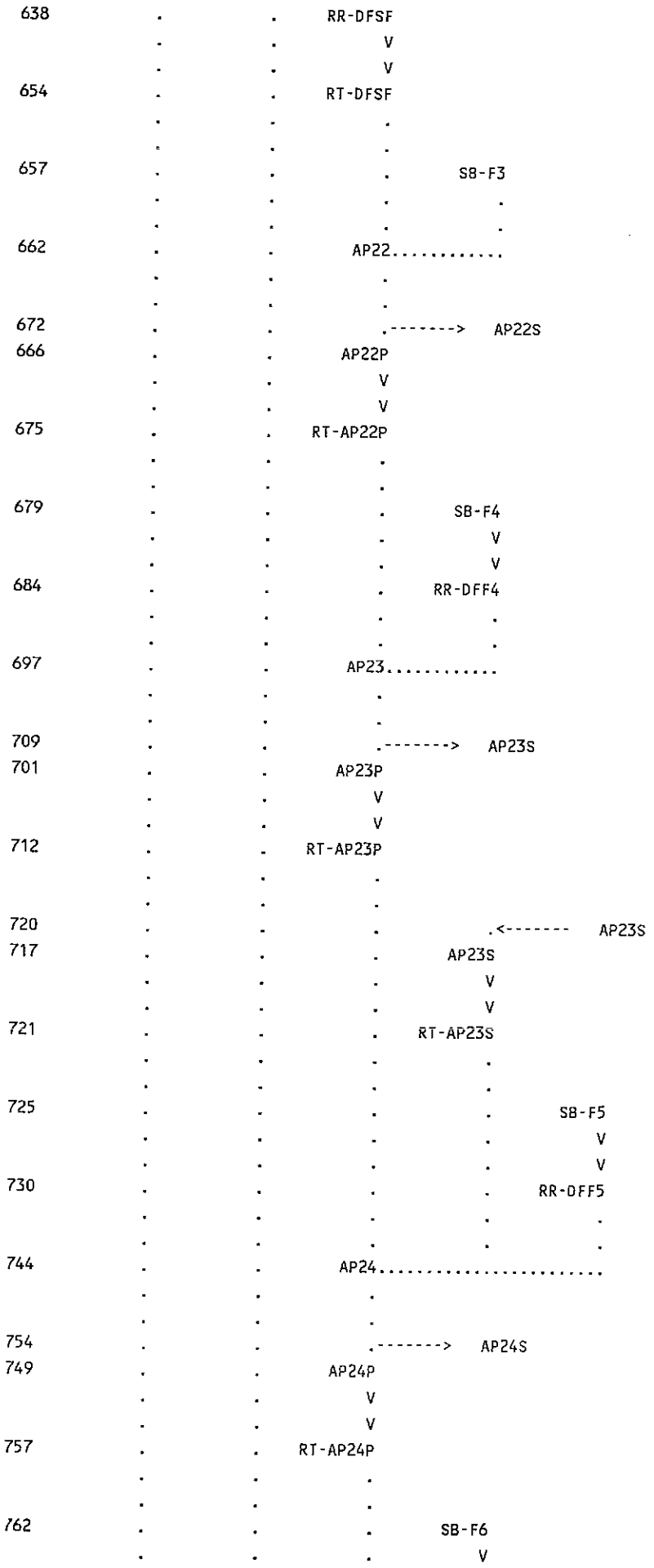
SB-PM5
576
AP20
579
SB-PM6
589
AP21
593
SB-PM7
606
SB-F1
615
F1S
611
F1P
618
RT-F1P
622
SB-F2
629
F1S
627
SB-F1S
630
RT-F1S
634
AP-DFSF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RT-DFSF
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S8-F3
662
AP22
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AP22S
666
AP22P
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SB-F4
684
RR-DFF4
697
AP23
709
AP23S
701
AP23P
712
RT-AP23P
720
AP23S
717
AP23S
721
RT-AP23S
725
S8-F5
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AP24P
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RT-AP24P
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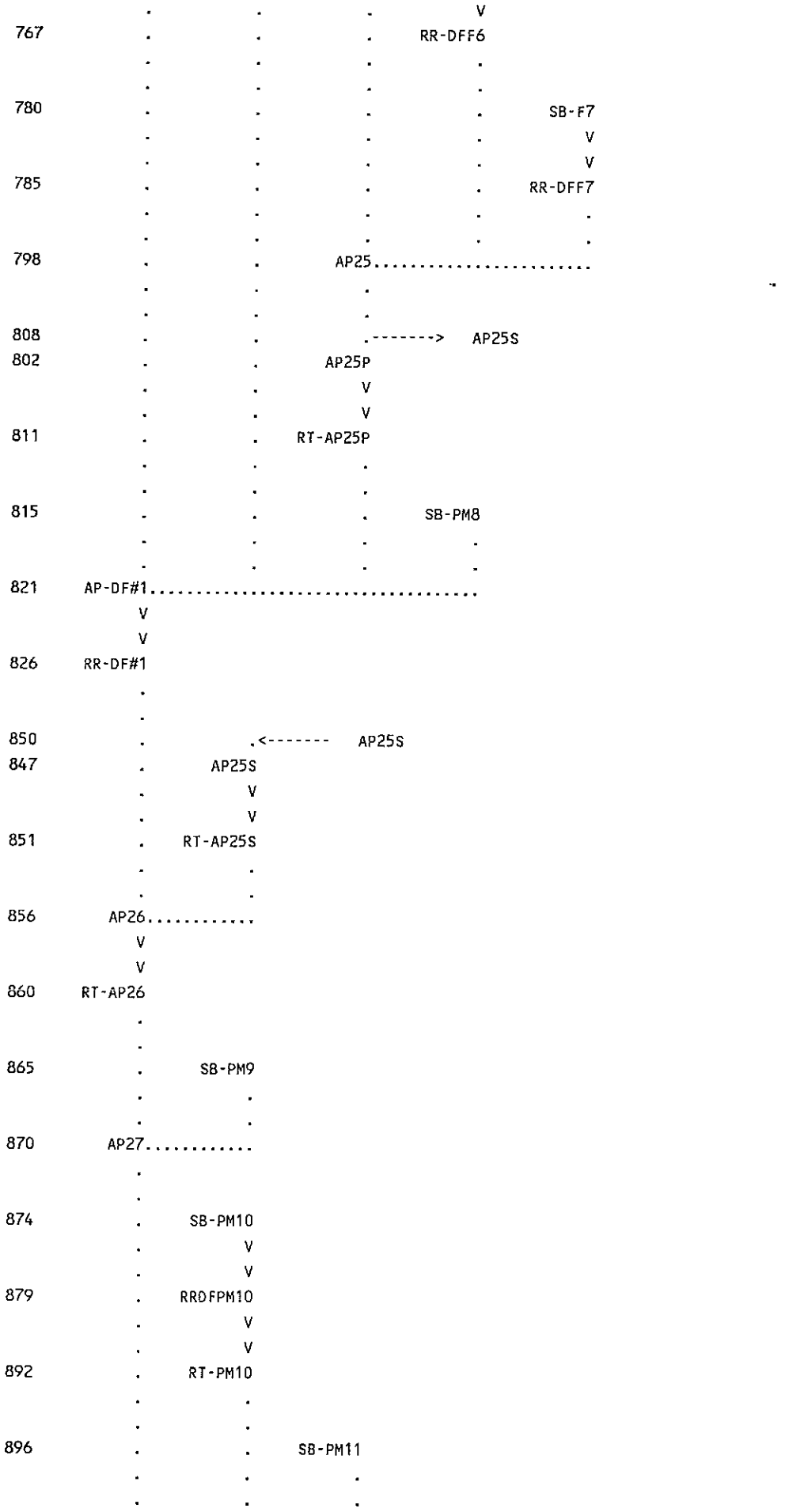
SB-F6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AP25
808
AP25S
802
AP25P
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815
SB-PM8
821
AP-DF#1
826
RR-DF#1
850
AP25S
847
AP25S
851
RT-AP25S
856
AP26
860
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AP27
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SB-PM10
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RRDFPM10
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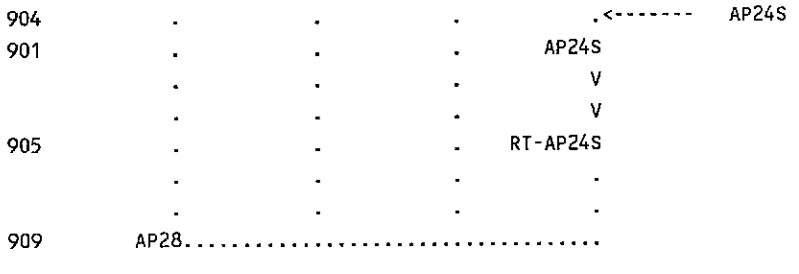
RT-PM10
896
SB-PM11



(**) RUNOFF ALSO COMPUTED AT THIS LOCATION

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 ****************************************                                 ***************************************
*                                        *                                *                                     *
*   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  12/21/1998  TIME  17:19:31  *                                *          (916) 756-1104             *
*                                        *                                *                                     *
 ****************************************                                 ***************************************

                    PINE CREEK DRAINAGE BASIN - 24HR, FULL DEVELOPED CONDITION (TYPE IIa100 YEAR)
                    FILE:PCDBPSD.DAT
                    FULLY DEVELOPED CONDITION MODEL MODIFIED PER DESIGN OF MODIFICATIONS TO DF 1
                    998 REVISION, LAST MODEL REVISION DATE:8/5/98  10-19-98
                    CN VALUES HAVE BEEN ADJUSTED TO PRODUCE PEAK 100 YEAR FLOW RATES SIMILAR TO
                    100 YEAR FLOW RATES PRODUCED BY RATIONAL METHOD.
                    ****************************************************************************
                    BEGIN CALCULATIONS IN THE PINE CREEK NORTH FORK WATERSHED
                    ****************************************************************************

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

    IT        HYDROGRAPH TIME DATA
                     NMIN          3  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       1457  ENDING TIME
                    ICENT         19  CENTURY MARK

                COMPUTATION INTERVAL    0.05 HOURS
                     TOTAL TIME BASE   14.95 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

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

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 82 KK     *   RR-DFFG  *
           *            *
           **************

 87 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

 88 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC       0.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

 89 SV            STORAGE        0.0        0.1        2.8        8.0       14.1       20.9       28.4       36.6       45.5       55.1
                                65.3       76.3       88.2

 91 SE            ELEVATION     59.00      60.00      62.00      64.00      66.00      68.00      70.00      72.00      74.00      76.00
                                78.00      80.00      82.00

 93 SQ            DISCHARGE      0.         10.        47.        93.       130.       160.       180.       203.       222.       240.
                               262.       280.       295.

                                                                  ***

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

                        HYDROGRAPH AT STATION  RR-DFFG

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR         24-HR         72-HR       14.95-HR
    250.       6.55          (CFS)    183.          85.           85.           85.
                             (INCHES) 2.332        2.699         2.699         2.699
                             (AC-FT)   91.         105.          105.          105.

 PEAK STORAGE  TIME                              MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                  6-HR         24-HR         72-HR       14.95-HR
     60.       6.55                   33.          14.           14.           14.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR         24-HR         72-HR       14.95-HR
    76.93      6.55                 70.70        64.43         64.43         64.43

                        CUMULATIVE AREA =    0.73 SQ MI

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

           **************
           *            *
113 KK     *    RR-DFF  *
           *            *
           **************
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117 KO         OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           1  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

118 RS         STORAGE ROUTING
                     NSTPS           1  NUMBER OF SUBREACHES
                      ITYP        STOR  TYPE OF INITIAL CONDITION
                    RSVRIC        0.00  INITIAL CONDITION
                         X        0.00 WORKING R AND D COEFFICIENT

119 SV          STORAGE        0.0      0.0      0.1      0.7      1.5      4.4      7.8     11.7     16.1     21.0
                              26.4

121 SE        ELEVATION      90.00    92.00    94.00    96.00    98.00   100.00   102.00   104.00   106.00   108.00
                            110.00

123 SQ        DISCHARGE         0.      22.      70.     112.     143.     170.     190.     210.     230.     250.
                              265.

                                                  ***

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

                    HYDROGRAPH AT STATION   RR-DFF

PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR     14.95-HR
   239.       8.05       (CFS)       217.        103.        103.         103.
                       (INCHES)     2.187       2.596       2.596        2.596
                        (AC-FT)      107.        128.        128.         128.

:AK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                   6-HR       24-HR       72-HR     14.95-HR
      18.     8.05                    13.          5.          5.           5.

PEAK STAGE    TIME                         MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                   6-HR       24-HR       72-HR     14.95-HR
  106.85      8.05                 104.67       96.88       96.88        96.88

                    CUMULATIVE AREA =     0.92 SQ MI



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


          **************
          *            *
166 KK    *   RR-DFE   *
          *            *
          **************

173 KO         OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           1  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
```

HYDROGRAPH ROUTING DATA

174 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	STOR	TYPE OF INITIAL CONDITION
RSVRIC	0.00	INITIAL CONDITION
X	0.00	WORKING R AND D COEFFICIENT

175 SV	STORAGE	0.0	0.0	1.3	3.9	6.9	10.3	14.1	18.2	22.8	27.9
176 SE	ELEVATION	784.00	786.00	788.00	790.00	792.00	794.00	796.00	798.00	800.00	802.00
177 SQ	DISCHARGE	0.	25.	80.	136.	173.	210.	240.	263.	280.	1431.

***

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

HYDROGRAPH AT STATION RR-DFE

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR
265.	8.10	(CFS)	253.	129.	129.	129.
		(INCHES)	1.889	2.395	2.395	2.395
		(AC-FT)	125.	159.	159.	159.

EAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	14.95-HR
19.	8.10	17.	8.	8.	8.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	14.95-HR
798.27	8.10	797.20	790.61	790.61	790.62

CUMULATIVE AREA = 1.25 SQ MI

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* *
225 KK * RR-DFD *
* *
****

232 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

231 RS STORAGE ROUTING

```
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC       0.00  INITIAL CONDITION
                        X       0.00 WORKING R AND D COEFFICIENT

233 SV          STORAGE         0.0       6.8      14.3      22.4      31.1      40.6      50.8      61.8

234 SE          ELEVATION     100.00    102.00    104.00    106.00    108.00    110.00    112.00    114.00

235 SQ          DISCHARGE       0.        18.       54.       72.       87.       99.       110.      120.

                                                              ***

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

                    HYDROGRAPH AT STATION   RR-DFD

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR        24-HR       72-HR     14.95-HR
    99.       6.80        (CFS)     85.          44.         44.         44.
                          (INCHES)  1.689        2.201       2.201       2.201
                          (AC-FT)   42.          55.         55.         55.

EAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                 6-HR        24-HR       72-HR     14.95-HR
    41.       6.80                 31.          15.         15.         15.

PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                 6-HR        24-HR       72-HR     14.95-HR
  109.99      6.80               107.83       103.95      103.95      103.95

                    CUMULATIVE AREA =    0.47 SQ MI

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


          **************
          *            *
301 KK    *    RR-DFC  *
          *            *
          **************

305 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

306 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC       0.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

307 SV          STORAGE         0.0       2.7       9.7       18.6      28.0      38.2      49.0      60.5      72.8      85.8
                               99.7
```

309 SE	ELEVATION	62.00	64.00	66.00	68.00	70.00	72.00	74.00	76.00	78.00	80.00
		82.00									
311 SQ	DISCHARGE	0.	23.	70.	110.	140.	168.	190.	215.	232.	245.
		258.									

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

HYDROGRAPH AT STATION RR-DFC

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR
227.	6.70	(CFS)	203.	113.	113.	113.
		(INCHES)	1.819	2.514	2.514	2.514
		(AC-FT)	101.	139.	139.	139.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	14.95-HR
69.	6.70	56.	29.	29.	29.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	14.95-HR
77.44	6.70	75.12	69.08	69.08	69.08

CUMULATIVE AREA = 1.04 SQ MI

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          *            *
333 KK    *   RR-DFB   *
          *            *
          **************

340 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          3  PRINT CONTROL
                    IPLOT          1  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

341 RS        STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC       0.00  INITIAL CONDITION
                        X       0.00  WORKING R AND D COEFFICIENT
```

342 SV	STORAGE	0.0	0.1	1.2	3.3	5.8	8.7	12.1	15.9	20.1	23.6
		24.8	30.0								
344 SE	ELEVATION	71.20	72.00	74.00	76.00	78.00	80.00	82.00	84.00	86.00	87.60
		88.00	90.00								

```
346 SQ          DISCHARGE        0.      22.      73.     130.     169.     202.     236.     260.     285.     301.
                                371.    1222.

                                                  ***

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

                        HYDROGRAPH AT STATION   RR-DFB

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      14.95-HR
    247.       7.25          (CFS)      226.         125.         125.         125.
                             (INCHES)  1.685        2.327        2.327        2.327
                             (AC-FT)    112.         155.         155.         155.

PEAK STORAGE   TIME                                MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                    6-HR        24-HR        72-HR      14.95-HR
     14.       7.25                     11.          6.           6.           6.

 PEAK STAGE    TIME                                MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                    6-HR        24-HR        72-HR      14.95-HR
    82.91      7.25                   81.49       76.71        76.71        76.71

                        CUMULATIVE AREA =    1.25 SQ MI


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


            **************
            *            *
512 KK      *    RR-DFA  *
            *            *
            **************

517 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

 18 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC       0.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

 19 SV            STORAGE        0.0      0.0      0.2      1.0      2.0      2.8      4.3      5.3      6.5     11.6
                                15.4

 21 SQ          DISCHARGE         2.       3.       3.       4.       4.       5.       5.       6.       8.       9.
                                279.

 23 SE          ELEVATION    6796.60  6797.00  6798.00  6800.00  6802.00  6803.50  6803.51  6804.00  6804.10  6805.50
                             6806.50

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HYDROGRAPH AT STATION RR-DFA

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR
9.	8.20	(CFS)	9.	6.	6.	6.
		(INCHES)	0.573	1.001	1.001	1.001
		(AC-FT)	4.	8.	8.	8.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	14.95-HR
11.	8.30	11.	6.	6.	6.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	14.95-HR
6805.44	8.30	6805.31	6801.83	6801.83	6801.83

CUMULATIVE AREA = 0.14 SQ MI

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          *            *
638 KK    *   RR-DFSF  *
          *            *
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649 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

650 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	STOR	TYPE OF INITIAL CONDITION
RSVRIC	0.00	INITIAL CONDITION
X	0.00	WORKING R AND D COEFFICIENT

651 SV	STORAGE	0.0	0.6	4.6	6.9	10.3
652 SE	ELEVATION	92.00	94.00	96.00	98.00	100.00
653 SQ	DISCHARGE	120.	126.	131.	137.	144.

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HYDROGRAPH AT STATION RR-DFSF

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR

130.	6.35	(CFS)	121.	121.	121.	121.
		(INCHES)	7.136	17.669	17.669	17.669
		(AC-FT)	60.	149.	149.	149.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	14.95-HR
4.	6.35	0.	0.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	14.95-HR
95.57	6.35	92.44	92.18	92.18	92.18

CUMULATIVE AREA = 0.16 SQ MI

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          *            *
821 KK    *   AP-DF#1  *
          *            *
          **************
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824 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

825 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AP-DF#1
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		0000	1	147.	*	1		0345	76	126.	*	1		0730	151	823.	*	1		1115	226	642.
1		0003	2	147.	*	1		0348	77	127.	*	1		0733	152	817.	*	1		1118	227	641.
1		0006	3	147.	*	1		0351	78	127.	*	1		0736	153	817.	*	1		1121	228	638.
1		0009	4	147.	*	1		0354	79	128.	*	1		0739	154	813.	*	1		1124	229	636.
1		0012	5	147.	*	1		0357	80	128.	*	1		0742	155	814.	*	1		1127	230	633.
1		0015	6	147.	*	1		0400	81	129.	*	1		0745	156	810.	*	1		1130	231	632.
1		0018	7	146.	*	1		0403	82	130.	*	1		0748	157	812.	*	1		1133	232	629.
1		0021	8	145.	*	1		0406	83	131.	*	1		0751	158	809.	*	1		1136	233	627.
1		0024	9	144.	*	1		0409	84	132.	*	1		0754	159	811.	*	1		1139	234	624.
1		0027	10	143.	*	1		0412	85	134.	*	1		0757	160	809.	*	1		1142	235	622.
1		0030	11	141.	*	1		0415	86	135.	*	1		0800	161	810.	*	1		1145	236	620.
1		0033	12	137.	*	1		0418	87	136.	*	1		0803	162	807.	*	1		1148	237	618.
1		0036	13	133.	*	1		0421	88	137.	*	1		0806	163	805.	*	1		1151	238	615.
1		0039	14	129.	*	1		0424	89	138.	*	1		0809	164	795.	*	1		1154	239	614.
1		0042	15	126.	*	1		0427	90	139.	*	1		0812	165	787.	*	1		1157	240	611.

1	0045	16	125.	*	1	0430	91	139.	*	1	0815	166	776.	*	1	1200	241	609.
1	0048	17	124.	*	1	0433	92	140.	*	1	0818	167	767.	*	1	1203	242	606.
1	0051	18	123.	*	1	0436	93	141.	*	1	0821	168	758.	*	1	1206	243	604.
1	0054	19	123.	*	1	0439	94	141.	*	1	0824	169	752.	*	1	1209	244	601.
1	0057	20	123.	*	1	0442	95	142.	*	1	0827	170	745.	*	1	1212	245	599.
1	0100	21	123.	*	1	0445	96	143.	*	1	0830	171	742.	*	1	1215	246	596.
1	0103	22	122.	*	1	0448	97	143.	*	1	0833	172	737.	*	1	1218	247	595.
1	0106	23	122.	*	1	0451	98	144.	*	1	0836	173	736.	*	1	1221	248	592.
1	0109	24	122.	*	1	0454	99	145.	*	1	0839	174	733.	*	1	1224	249	589.
1	0112	25	122.	*	1	0457	100	146.	*	1	0842	175	732.	*	1	1227	250	586.
1	0115	26	122.	*	1	0500	101	147.	*	1	0845	176	730.	*	1	1230	251	583.
1	0118	27	122.	*	1	0503	102	149.	*	1	0848	177	729.	*	1	1233	252	579.
1	0121	28	122.	*	1	0506	103	153.	*	1	0851	178	727.	*	1	1236	253	576.
1	0124	29	122.	*	1	0509	104	158.	*	1	0854	179	727.	*	1	1239	254	572.
1	0127	30	122.	*	1	0512	105	164.	*	1	0857	180	725.	*	1	1242	255	568.
1	0130	31	122.	*	1	0515	106	169.	*	1	0900	181	725.	*	1	1245	256	564.
1	0133	32	122.	*	1	0518	107	174.	*	1	0903	182	723.	*	1	1248	257	560.
1	0136	33	122.	*	1	0521	108	181.	*	1	0906	183	723.	*	1	1251	258	555.
1	0139	34	122.	*	1	0524	109	189.	*	1	0909	184	721.	*	1	1254	259	551.
1	0142	35	122.	*	1	0527	110	198.	*	1	0912	185	721.	*	1	1257	260	546.
1	0145	36	122.	*	1	0530	111	205.	*	1	0915	186	719.	*	1	1300	261	542.
1	0148	37	122.	*	1	0533	112	250.	*	1	0918	187	719.	*	1	1303	262	536.
1	0151	38	123.	*	1	0536	113	404.	*	1	0921	188	717.	*	1	1306	263	531.
1	0154	39	123.	*	1	0539	114	645.	*	1	0924	189	716.	*	1	1309	264	525.
1	0157	40	123.	*	1	0542	115	916.	*	1	0927	190	714.	*	1	1312	265	520.
1	0200	41	123.	*	1	0545	116	1118.	*	1	0930	191	713.	*	1	1315	266	514.
1	0203	42	123.	*	1	0548	117	1284.	*	1	0933	192	711.	*	1	1318	267	509.
1	0206	43	123.	*	1	0551	118	1488.	*	1	0936	193	711.	*	1	1321	268	503.
1	0209	44	123.	*	1	0554	119	1767.	*	1	0939	194	709.	*	1	1324	269	498.
1	0212	45	123.	*	1	0557	120	2098.	*	1	0942	195	708.	*	1	1327	270	492.
1	0215	46	123.	*	1	0600	121	2426.	*	1	0945	196	706.	*	1	1330	271	487.
1	0218	47	123.	*	1	0603	122	2689.	*	1	0948	197	706.	*	1	1333	272	480.
1	0221	48	123.	*	1	0606	123	2809.	*	1	0951	198	704.	*	1	1336	273	474.
1	0224	49	124.	*	1	0609	124	2790.	*	1	0954	199	703.	*	1	1339	274	468.
1	0227	50	124.	*	1	0612	125	2673.	*	1	0957	200	701.	*	1	1342	275	463.
1	0230	51	124.	*	1	0615	126	2471.	*	1	1000	201	700.	*	1	1345	276	457.
1	0233	52	124.	*	1	0618	127	2180.	*	1	1003	202	698.	*	1	1348	277	453.
1	0236	53	124.	*	1	0621	128	1867.	*	1	1006	203	696.	*	1	1351	278	448.
1	0239	54	124.	*	1	0624	129	1652.	*	1	1009	204	692.	*	1	1354	279	444.
1	0242	55	124.	*	1	0627	130	1489.	*	1	1012	205	689.	*	1	1357	280	439.
1	0245	56	124.	*	1	0630	131	1362.	*	1	1015	206	685.	*	1	1400	281	435.
1	0248	57	124.	*	1	0633	132	1270.	*	1	1018	207	682.	*	1	1403	282	430.
1	0251	58	124.	*	1	0636	133	1197.	*	1	1021	208	678.	*	1	1406	283	427.
1	0254	59	124.	*	1	0639	134	1133.	*	1	1024	209	676.	*	1	1409	284	422.
1	0257	60	125.	*	1	0642	135	1084.	*	1	1027	210	672.	*	1	1412	285	419.
1	0300	61	125.	*	1	0645	136	1039.	*	1	1030	211	670.	*	1	1415	286	414.
1	0303	62	125.	*	1	0648	137	1005.	*	1	1033	212	667.	*	1	1418	287	410.
1	0306	63	125.	*	1	0651	138	973.	*	1	1036	213	665.	*	1	1421	288	405.
1	0309	64	125.	*	1	0654	139	952.	*	1	1039	214	663.	*	1	1424	289	401.
1	0312	65	125.	*	1	0657	140	932.	*	1	1042	215	662.	*	1	1427	290	396.
1	0315	66	125.	*	1	0700	141	920.	*	1	1045	216	659.	*	1	1430	291	393.
1	0318	67	125.	*	1	0703	142	906.	*	1	1048	217	658.	*	1	1433	292	389.
1	0321	68	125.	*	1	0706	143	898.	*	1	1051	218	656.	*	1	1436	293	386.
1	0324	69	125.	*	1	0709	144	883.	*	1	1054	219	655.	*	1	1439	294	383.
1	0327	70	126.	*	1	0712	145	872.	*	1	1057	220	653.	*	1	1442	295	381.
1	0330	71	126.	*	1	0715	146	859.	*	1	1100	221	651.	*	1	1445	296	378.
1	0333	72	126.	*	1	0718	147	849.	*	1	1103	222	649.	*	1	1448	297	376.
1	0336	73	126.	*	1	0721	148	838.	*	1	1106	223	648.	*	1	1451	298	373.
1	0339	74	126.	*	1	0724	149	833.	*	1	1109	224	645.	*	1	1454	299	372.
1	0342	75	126.	*	1	0727	150	824.	*	1	1112	225	645.	*	1	1457	300	370.

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

 PEAK FLOW     TIME                               MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                     6-HR         24-HR        72-HR     14.95-HR
    2809.      6.10         (CFS)        927.          536.         536.         536.
                          (INCHES)      1.948         2.805        2.805        2.805
                           (AC-FT)       460.          662.         662.         662.

                           CUMULATIVE AREA =     4.43 SQ MI


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

            **************
            *            *
826 KK      *   RR-DF#1  *
            *            *
            **************

839 KO          OUTPUT CONTROL VARIABLES
                      IPRNT            1  PRINT CONTROL
                      IPLOT            1  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

840 RS          STORAGE ROUTING
                      NSTPS            1  NUMBER OF SUBREACHES
                       ITYP         STOR  TYPE OF INITIAL CONDITION
                     RSVRIC         0.00  INITIAL CONDITION
                          X         0.00 WORKING R AND D COEFFICIENT

341 SV            STORAGE          0.0        0.2        0.4        4.9       14.7       25.6       37.1       49.2       62.0       75.4
                                  89.6       97.0      104.5      112.4      120.3

843 SE          ELEVATION        54.00      55.00      56.00      58.00      60.00      62.00      64.00      66.00      68.00      70.00
                                 72.00      73.00      74.00      75.00      76.00

845 SQ          DISCHARGE           0.        99.       184.       261.       326.       380.       427.       470.       532.       718.
                                  969.      1112.      1358.      1690.      2200.

                                                                 ***

:* WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN         0. TO        99.
               THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
               THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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

                                                   HYDROGRAPH AT STATION  RR-DF#1

**************************************************************************************************************************************
                                           *                                           *
)A MON HRMN ORD   OUTFLOW  STORAGE    STAGE * DA MON HRMN ORD   OUTFLOW  STORAGE    STAGE * DA MON HRMN ORD   OUTFLOW  STORAGE    STAGE
                                           *                                           *
 1     0000   1       0.      0.0     54.0 *  1     0500 101     146.      0.3     55.6 *  1     1000 201     725.     75.8     70.1
```

1	0003	2	145.	0.3	55.5	*	1	0503	102	148.	0.3	55.6	*	1	1003	202	723.	75.7	70.0
1	0006	3	147.	0.3	55.6	*	1	0506	103	151.	0.3	55.6	*	1	1006	203	721.	75.6	70.0
1	0009	4	147.	0.3	55.6	*	1	0509	104	155.	0.3	55.7	*	1	1009	204	719.	75.5	70.0
1	0012	5	147.	0.3	55.6	*	1	0512	105	161.	0.3	55.7	*	1	1012	205	718.	75.4	70.0
1	0015	6	147.	0.3	55.6	*	1	0515	106	166.	0.4	55.8	*	1	1015	206	716.	75.3	70.0
1	0018	7	147.	0.3	55.6	*	1	0518	107	171.	0.4	55.8	*	1	1018	207	714.	75.1	70.0
1	0021	8	146.	0.3	55.6	*	1	0521	108	177.	0.4	55.9	*	1	1021	208	712.	75.0	69.9
1	0024	9	145.	0.3	55.5	*	1	0524	109	184.	0.4	56.0	*	1	1024	209	710.	74.9	69.9
1	0027	10	144.	0.3	55.5	*	1	0527	110	185.	0.4	56.0	*	1	1027	210	708.	74.7	69.9
1	0030	11	142.	0.3	55.5	*	1	0530	111	186.	0.5	56.0	*	1	1030	211	706.	74.6	69.9
1	0033	12	139.	0.3	55.5	*	1	0533	112	189.	0.7	56.1	*	1	1033	212	704.	74.4	69.8
1	0036	13	135.	0.3	55.4	*	1	0536	113	198.	1.2	56.4	*	1	1036	213	702.	74.3	69.8
1	0039	14	131.	0.3	55.4	*	1	0539	114	220.	2.5	56.9	*	1	1039	214	700.	74.1	69.8
1	0042	15	128.	0.3	55.3	*	1	0542	115	258.	4.8	57.9	*	1	1042	215	698.	74.0	69.8
1	0045	16	126.	0.3	55.3	*	1	0545	116	280.	7.9	58.6	*	1	1045	216	696.	73.8	69.8
1	0048	17	124.	0.3	55.3	*	1	0548	117	305.	11.6	59.4	*	1	1048	217	694.	73.7	69.7
1	0051	18	124.	0.3	55.3	*	1	0551	118	332.	16.0	60.2	*	1	1051	218	692.	73.5	69.7
1	0054	19	123.	0.3	55.3	*	1	0554	119	359.	21.3	61.2	*	1	1054	219	690.	73.4	69.7
1	0057	20	123.	0.3	55.3	*	1	0557	120	389.	27.8	62.4	*	1	1057	220	688.	73.2	69.7
1	0100	21	123.	0.3	55.3	*	1	0600	121	420.	35.4	63.7	*	1	1100	221	686.	73.1	69.7
1	0103	22	122.	0.3	55.3	*	1	0603	122	452.	44.2	65.2	*	1	1103	222	684.	72.9	69.6
1	0106	23	122.	0.3	55.3	*	1	0606	123	491.	53.6	66.7	*	1	1106	223	682.	72.8	69.6
1	0109	24	122.	0.3	55.3	*	1	0609	124	546.	63.0	68.2	*	1	1109	224	680.	72.7	69.6
1	0112	25	122.	0.3	55.3	*	1	0612	125	668.	71.8	69.5	*	1	1112	225	678.	72.5	69.6
1	0115	26	122.	0.3	55.3	*	1	0615	126	789.	79.4	70.6	*	1	1115	226	676.	72.4	69.5
1	0118	27	122.	0.3	55.3	*	1	0618	127	898.	85.6	71.4	*	1	1118	227	674.	72.2	69.5
1	0121	28	122.	0.3	55.3	*	1	0621	128	978.	90.0	72.1	*	1	1121	228	672.	72.1	69.5
1	0124	29	122.	0.3	55.3	*	1	0624	129	1038.	93.1	72.5	*	1	1124	229	670.	72.0	69.5
1	0127	30	122.	0.3	55.3	*	1	0627	130	1079.	95.3	72.8	*	1	1127	230	668.	71.8	69.5
1	0130	31	122.	0.3	55.3	*	1	0630	131	1105.	96.6	73.0	*	1	1130	231	666.	71.7	69.4
1	0133	32	122.	0.3	55.3	*	1	0633	132	1127.	97.5	73.1	*	1	1133	232	664.	71.5	69.4
1	0136	33	122.	0.3	55.3	*	1	0636	133	1141.	97.9	73.1	*	1	1136	233	662.	71.4	69.4
1	0139	34	122.	0.3	55.3	*	1	0639	134	1144.	98.0	73.1	*	1	1139	234	660.	71.2	69.4
1	0142	35	122.	0.3	55.3	*	1	0642	135	1139.	97.8	73.1	*	1	1142	235	658.	71.1	69.4
1	0145	36	122.	0.3	55.3	*	1	0645	136	1129.	97.5	73.1	*	1	1145	236	656.	70.9	69.3
1	0148	37	122.	0.3	55.3	*	1	0648	137	1116.	97.1	73.0	*	1	1148	237	654.	70.8	69.3
1	0151	38	122.	0.3	55.3	*	1	0651	138	1105.	96.6	72.9	*	1	1151	238	652.	70.7	69.3
1	0154	39	123.	0.3	55.3	*	1	0654	139	1094.	96.1	72.9	*	1	1154	239	650.	70.5	69.3
1	0157	40	123.	0.3	55.3	*	1	0657	140	1082.	95.4	72.8	*	1	1157	240	648.	70.4	69.2
1	0200	41	123.	0.3	55.3	*	1	0700	141	1070.	94.8	72.7	*	1	1200	241	646.	70.2	69.2
1	0203	42	123.	0.3	55.3	*	1	0703	142	1058.	94.2	72.6	*	1	1203	242	643.	70.0	69.2
1	0206	43	123.	0.3	55.3	*	1	0706	143	1046.	93.6	72.5	*	1	1206	243	641.	69.9	69.2
1	0209	44	123.	0.3	55.3	*	1	0709	144	1034.	93.0	72.5	*	1	1209	244	639.	69.7	69.2
1	0212	45	123.	0.3	55.3	*	1	0712	145	1022.	92.3	72.4	*	1	1212	245	637.	69.6	69.1
1	0215	46	123.	0.3	55.3	*	1	0715	146	1010.	91.7	72.3	*	1	1215	246	635.	69.4	69.1
1	0218	47	123.	0.3	55.3	*	1	0718	147	998.	91.1	72.2	*	1	1218	247	633.	69.3	69.1
1	0221	48	123.	0.3	55.3	*	1	0721	148	986.	90.5	72.1	*	1	1221	248	630.	69.1	69.1
1	0224	49	123.	0.3	55.3	*	1	0724	149	975.	89.9	72.0	*	1	1224	249	628.	68.9	69.0
1	0227	50	124.	0.3	55.3	*	1	0727	150	964.	89.3	72.0	*	1	1227	250	626.	68.8	69.0
1	0230	51	124.	0.3	55.3	*	1	0730	151	954.	88.7	71.9	*	1	1230	251	624.	68.6	69.0
1	0233	52	124.	0.3	55.3	*	1	0733	152	945.	88.2	71.8	*	1	1233	252	621.	68.4	69.0
1	0236	53	124.	0.3	55.3	*	1	0736	153	936.	87.7	71.7	*	1	1236	253	619.	68.3	68.9
1	0239	54	124.	0.3	55.3	*	1	0739	154	927.	87.2	71.7	*	1	1239	254	616.	68.1	68.9
1	0242	55	124.	0.3	55.3	*	1	0742	155	919.	86.8	71.6	*	1	1242	255	614.	67.9	68.9
1	0245	56	124.	0.3	55.3	*	1	0745	156	911.	86.3	71.5	*	1	1245	256	611.	67.7	68.9
1	0248	57	124.	0.3	55.3	*	1	0748	157	904.	85.9	71.5	*	1	1248	257	608.	67.5	68.8
1	0251	58	124.	0.3	55.3	*	1	0751	158	898.	85.6	71.4	*	1	1251	258	606.	67.3	68.8
1	0254	59	124.	0.3	55.3	*	1	0754	159	892.	85.2	71.4	*	1	1254	259	603.	67.1	68.8
1	0257	60	124.	0.3	55.3	*	1	0757	160	886.	84.9	71.3	*	1	1257	260	600.	66.9	68.7
1	0300	61	125.	0.3	55.3	*	1	0800	161	880.	84.6	71.3	*	1	1300	261	597.	66.7	68.7

1	0303	62	125.	0.3	55.3	*	1	0803	162	875.	84.3	71.3	*	1	1303	262	593.	66.4	68.7
1	0306	63	125.	0.3	55.3	*	1	0806	163	870.	84.0	71.2	*	1	1306	263	590.	66.2	68.6
1	0309	64	125.	0.3	55.3	*	1	0809	164	865.	83.7	71.2	*	1	1309	264	587.	65.9	68.6
1	0312	65	125.	0.3	55.3	*	1	0812	165	860.	83.4	71.1	*	1	1312	265	583.	65.7	68.5
1	0315	66	125.	0.3	55.3	*	1	0815	166	855.	83.1	71.1	*	1	1315	266	579.	65.4	68.5
1	0318	67	125.	0.3	55.3	*	1	0818	167	849.	82.8	71.0	*	1	1318	267	576.	65.1	68.5
1	0321	68	125.	0.3	55.3	*	1	0821	168	843.	82.5	71.0	*	1	1321	268	572.	64.9	68.4
1	0324	69	125.	0.3	55.3	*	1	0824	169	836.	82.1	70.9	*	1	1324	269	568.	64.6	68.4
1	0327	70	125.	0.3	55.3	*	1	0827	170	830.	81.8	70.9	*	1	1327	270	564.	64.3	68.3
1	0330	71	126.	0.3	55.3	*	1	0830	171	824.	81.4	70.8	*	1	1330	271	560.	64.0	68.3
1	0333	72	126.	0.3	55.3	*	1	0833	172	818.	81.1	70.8	*	1	1333	272	555.	63.7	68.3
1	0336	73	126.	0.3	55.3	*	1	0836	173	812.	80.8	70.8	*	1	1336	273	551.	63.4	68.2
1	0339	74	126.	0.3	55.3	*	1	0839	174	807.	80.4	70.7	*	1	1339	274	547.	63.1	68.2
1	0342	75	126.	0.3	55.3	*	1	0842	175	802.	80.1	70.7	*	1	1342	275	542.	62.7	68.1
1	0345	76	126.	0.3	55.3	*	1	0845	176	797.	79.9	70.6	*	1	1345	276	538.	62.4	68.1
1	0348	77	126.	0.3	55.3	*	1	0848	177	792.	79.6	70.6	*	1	1348	277	533.	62.1	68.0
1	0351	78	127.	0.3	55.3	*	1	0851	178	787.	79.3	70.6	*	1	1351	278	531.	61.7	68.0
1	0354	79	127.	0.3	55.3	*	1	0854	179	783.	79.1	70.5	*	1	1354	279	529.	61.4	67.9
1	0357	80	128.	0.3	55.3	*	1	0857	180	779.	78.9	70.5	*	1	1357	280	527.	61.0	67.8
1	0400	81	129.	0.3	55.3	*	1	0900	181	775.	78.7	70.5	*	1	1400	281	525.	60.6	67.8
1	0403	82	129.	0.3	55.4	*	1	0903	182	772.	78.5	70.4	*	1	1403	282	524.	60.3	67.7
1	0406	83	130.	0.3	55.4	*	1	0906	183	768.	78.3	70.4	*	1	1406	283	522.	59.9	67.7
1	0409	84	132.	0.3	55.4	*	1	0909	184	765.	78.1	70.4	*	1	1409	284	520.	59.5	67.6
1	0412	85	133.	0.3	55.4	*	1	0912	185	762.	77.9	70.3	*	1	1412	285	518.	59.1	67.5
1	0415	86	134.	0.3	55.4	*	1	0915	186	759.	77.7	70.3	*	1	1415	286	516.	58.7	67.5
1	0418	87	136.	0.3	55.4	*	1	0918	187	756.	77.6	70.3	*	1	1418	287	514.	58.2	67.4
1	0421	88	137.	0.3	55.4	*	1	0921	188	753.	77.4	70.3	*	1	1421	288	512.	57.8	67.3
1	0424	89	137.	0.3	55.5	*	1	0924	189	751.	77.3	70.3	*	1	1424	289	510.	57.4	67.3
1	0427	90	138.	0.3	55.5	*	1	0927	190	748.	77.1	70.2	*	1	1427	290	507.	56.9	67.2
1	0430	91	139.	0.3	55.5	*	1	0930	191	746.	77.0	70.2	*	1	1430	291	505.	56.4	67.1
1	0433	92	140.	0.3	55.5	*	1	0933	192	743.	76.9	70.2	*	1	1433	292	503.	56.0	67.1
1	0436	93	140.	0.3	55.5	*	1	0936	193	741.	76.7	70.2	*	1	1436	293	501.	55.5	67.0
1	0439	94	141.	0.3	55.5	*	1	0939	194	739.	76.6	70.2	*	1	1439	294	498.	55.0	66.9
1	0442	95	142.	0.3	55.5	*	1	0942	195	737.	76.5	70.1	*	1	1442	295	496.	54.6	66.8
1	0445	96	142.	0.3	55.5	*	1	0945	196	735.	76.4	70.1	*	1	1445	296	494.	54.1	66.8
1	0448	97	143.	0.3	55.5	*	1	0948	197	733.	76.3	70.1	*	1	1448	297	491.	53.6	66.7
1	0451	98	144.	0.3	55.5	*	1	0951	198	731.	76.1	70.1	*	1	1451	298	489.	53.1	66.6
1	0454	99	145.	0.3	55.5	*	1	0954	199	729.	76.0	70.1	*	1	1454	299	487.	52.6	66.5
1	0457	100	145.	0.3	55.5	*	1	0957	200	727.	75.9	70.1	*	1	1457	300	484.	52.2	66.5
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1144.	6.65	(CFS)	813.	494.	494.	494.
		(INCHES)	1.707	2.584	2.584	2.584
		(AC-FT)	403.	610.	610.	610.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	14.95-HR
98.	6.65	80.	45.	45.	45.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	14.95-HR
73.13	6.65	70.70	64.14	64.14	64.14

CUMULATIVE AREA = 4.43 SQ MI

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          *            *
909 KK    *      AP28  *
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916 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	1	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

917 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AP28

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	14.95-HR
1187.	6.30	(CFS)	866.	527.	527.	527.
		(INCHES)	1.757	2.664	2.664	2.664
		(AC-FT)	429.	651.	651.	651.

CUMULATIVE AREA = 4.58 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	SB-PN1	355.	6.05	39.	17.	17.	0.16		
HYDROGRAPH AT	SB-PN2	306.	6.05	34.	15.	15.	0.15		
ROUTED TO	RT-PN2	305.	6.10	34.	15.	15.	0.15		
2 COMBINED AT	AP1	657.	6.05	72.	32.	32.	0.31		
ROUTED TO	RT-AP1	656.	6.10	72.	31.	31.	0.31		
HYDROGRAPH AT	SB-PN3	213.	6.05	24.	10.	10.	0.08		
2 COMBINED AT	AP2	866.	6.10	96.	42.	42.	0.40		
ROUTED TO	RT-AP2	864.	6.10	96.	42.	42.	0.40		
HYDROGRAPH AT	SB-PN4	234.	6.05	25.	11.	11.	0.11		
ROUTED TO	RT-PN4	231.	6.10	25.	11.	11.	0.11		
HYDROGRAPH AT	SB-PN5	199.	6.05	22.	9.	9.	0.07		
3 COMBINED AT	AP3	1285.	6.10	143.	62.	62.	0.58		
ROUTED TO	RT-AP3	1283.	6.10	143.	62.	62.	0.58		
HYDROGRAPH AT	SB-PN6	507.	6.00	55.	24.	24.	0.15		
2 COMBINED AT	APDFG	1747.	6.05	198.	86.	86.	0.73		
ROUTED TO	RR-DFFG	250.	6.55	183.	85.	85.	0.73	76.93	6.55
ROUTED TO	RT-DFG	250.	6.60	183.	85.	85.	0.73		
HYDROGRAPH AT	SB-PN7	144.	6.05	15.	7.	7.	0.08		
HYDROGRAPH AT	SB-PN8	257.	6.05	27.	12.	12.	0.11		
3 COMBINED AT	APDFF	578.	6.10	224.	103.	103.	0.92		
ROUTED TO	RR-DFF	239.	8.05	217.	103.	103.	0.92	106.85	8.05
ROUTED TO	RT-DFF	239.	8.10	217.	103.	103.	0.92		
HYDROGRAPH AT	SB-PN9	61.	6.05	6.	3.	3.	0.04		
HYDROGRAPH AT	SB-PN10	78.	6.05	8.	3.	3.	0.04		
3 COMBINED AT	AP4	309.	6.10	229.	109.	109.	1.00		
ROUTED TO	RT-AP4	307.	6.10	229.	109.	109.	1.00		

HYDROGRAPH AT	SB-PN11	150.	6.10	16.	7.	7.	0.08		
HYDROGRAPH AT	SB-PN12	60.	6.05	6.	2.	2.	0.04		
HYDROGRAPH AT	SB-PN13	215.	6.10	23.	10.	10.	0.13		
4 COMBINED AT	APDFE	724.	6.10	272.	129.	129.	1.25		
ROUTED TO	RR-DFE	265.	8.10	253.	129.	129.	1.25	798.27	8.10
ROUTED TO	RT-DFE	265.	8.10	253.	129.	129.	1.25		
HYDROGRAPH AT	SB-PN14	50.	6.05	5.	2.	2.	0.03		
ROUTED TO	RT-PN14	49.	6.05	5.	2.	2.	0.03		
HYDROGRAPH AT	SB-PN15	120.	6.10	13.	6.	6.	0.07		
3 COMBINED AT	AP5	368.	6.15	267.	137.	137.	1.35		
ROUTED TO	RT-AP5	368.	6.15	267.	137.	137.	1.35		
HYDROGRAPH AT	SB-PS1	296.	6.10	33.	14.	14.	0.15		
ROUTED TO	RT-PS1	294.	6.10	33.	14.	14.	0.15		
HYDROGRAPH AT	SB-PS2	394.	6.05	43.	19.	19.	0.15		
HYDROGRAPH AT	SB-PS3	397.	6.05	45.	19.	19.	0.16		
3 COMBINED AT	APDFD	1073.	6.10	121.	53.	53.	0.47		
ROUTED TO	RR-DFD	99.	6.80	85.	44.	44.	0.47	109.99	6.80
ROUTED TO	RT-DFD	99.	6.80	85.	44.	44.	0.47		
HYDROGRAPH AT	SB-PS4	181.	6.00	19.	8.	8.	0.05		
HYDROGRAPH AT	SB-PS5	237.	6.00	27.	12.	12.	0.07		
3 COMBINED AT	AP6	470.	6.00	126.	65.	65.	0.59		
ROUTED TO	RT-AP6	468.	6.05	126.	64.	64.	0.59		
HYDROGRAPH AT	SB-PS6	218.	6.00	22.	10.	10.	0.08		
2 COMBINED AT	AP-7	681.	6.05	148.	74.	74.	0.66		
HYDROGRAPH AT	SB-PS7	321.	6.00	36.	16.	16.	0.09		
2 COMBINED AT	AP7A	998.	6.00	183.	90.	90.	0.75		
ROUTED TO	RT-AP7A	989.	6.05	183.	90.	90.	0.75		
HYDROGRAPH AT	SB-PS8	348.	6.00	35.	15.	15.	0.12		
2 COMBINED AT	AP8	1332.	6.00	218.	105.	105.	0.87		
HYDROGRAPH AT	SB-PS9	446.	6.00	49.	21.	21.	0.13		

2 COMBINED AT	AP9	1778.	6.00	267.	126.	126.	1.00		
HYDROGRAPH AT	SB-PS10	66.	6.05	7.	3.	3.	0.04		
2 COMBINED AT	APDFC	1840.	6.00	273.	129.	129.	1.04		
ROUTED TO	RR-DFC	227.	6.70	203.	113.	113.	1.04	77.44	6.70
ROUTED TO	RT-DFC	227.	6.70	203.	112.	112.	1.04		
HYDROGRAPH AT	SB-PS11	126.	6.05	13.	6.	6.	0.06		
2 COMBINED AT	AP10	317.	6.10	214.	118.	118.	1.09		
HYDROGRAPH AT	SB-PS12	189.	6.10	23.	10.	10.	0.15		
2 COMBINED AT	APDFB	506.	6.10	237.	128.	128.	1.25		
ROUTED TO	RR-DFB	247.	7.25	226.	125.	125.	1.25	82.91	7.25
ROUTED TO	RT-DFB	247.	7.25	226.	125.	125.	1.25		
HYDROGRAPH AT	SB-PS13	122.	6.05	12.	5.	5.	0.06		
2 COMBINED AT	AP11	289.	6.10	235.	130.	130.	1.31		
ROUTED TO	RT-AP11	288.	6.10	235.	130.	130.	1.31		
2 COMBINED AT	AP5A	654.	6.10	502.	267.	267.	2.66		
ROUTED TO	RT-AP5A	652.	6.15	502.	266.	266.	2.66		
HYDROGRAPH AT	SB-PM1	107.	6.10	12.	5.	5.	0.05		
ROUTED TO	RT-PM1	107.	6.10	12.	5.	5.	0.05		
HYDROGRAPH AT	SB-PM2	139.	6.20	20.	9.	9.	0.15		
HYDROGRAPH AT	SB-PM3	99.	6.15	12.	5.	5.	0.07		
4 COMBINED AT	AP12	985.	6.15	542.	285.	285.	2.93		
ROUTED TO	RT-AP12	975.	6.20	542.	285.	285.	2.93		
HYDROGRAPH AT	SB-PM4	180.	6.05	19.	8.	8.	0.11		
2 COMBINED AT	AP13	1115.	6.15	559.	293.	293.	3.04		
HYDROGRAPH AT	SB-CS1	90.	6.05	10.	4.	4.	0.05		
ROUTED TO	RT-CS1	90.	6.10	10.	4.	4.	0.05		
HYDROGRAPH AT	SB-CS2	254.	6.00	29.	13.	13.	0.07		
ROUTED TO	RR-DFCS2	194.	5.70	29.	13.	13.	0.07	102.48	6.10
2 COMBINED AT	AP14	284.	6.10	38.	17.	17.	0.12		
ROUTED TO	RT-AP14	284.	6.10	38.	17.	17.	0.12		

HYDROGRAPH AT	SB-CS3	137.	6.05	15.	6.	6.	0.05		
ROUTED TO	RR-DFCS3	123.	6.00	15.	6.	6.	0.05	102.04	6.10
2 COMBINED AT	AP15	407.	6.10	53.	23.	23.	0.18		
ROUTED TO	RT-AP15	406.	6.10	53.	23.	23.	0.18		
HYDROGRAPH AT	SB-CS4	188.	6.00	20.	9.	9.	0.05		
ROUTED TO	RR-DFVC	22.	6.35	18.	9.	9.	0.05	81.86	6.35
2 COMBINED AT	AP16	427.	6.10	70.	32.	32.	0.23		
ROUTED TO	RT-AP16	427.	6.10	70.	32.	32.	0.23		
HYDROGRAPH AT	SB-CN1	275.	6.10	30.	13.	13.	0.14		
ROUTED TO	RR-DFA	9.	8.20	9.	6.	6.	0.14	6805.44	8.30
ROUTED TO	RT-DFA	9.	8.30	9.	6.	6.	0.14		
HYDROGRAPH AT	SB-CN2	136.	6.10	15.	7.	7.	0.08		
2 COMBINED AT	AP17	142.	6.10	24.	13.	13.	0.22		
ROUTED TO	RT-AP17	140.	6.10	24.	13.	13.	0.22		
HYDROGRAPH AT	SB-CN3	98.	6.05	10.	4.	4.	0.04		
2 COMBINED AT	AP18	232.	6.10	34.	17.	17.	0.27		
ROUTED TO	RT-AP18	232.	6.10	34.	17.	17.	0.27		
3 COMBINED AT	AP19	1753.	6.15	652.	342.	342.	3.54		
ROUTED TO	RT-AP19	1739.	6.15	652.	342.	342.	3.54		
HYDROGRAPH AT	SB-PM5	265.	6.10	28.	13.	13.	0.18		
2 COMBINED AT	AP20	1978.	6.15	680.	354.	354.	3.72		
HYDROGRAPH AT	SB-PM6	319.	6.00	36.	16.	16.	0.09		
2 COMBINED AT	AP21	2149.	6.10	708.	370.	370.	3.81		
HYDROGRAPH AT	SB-PM7	191.	6.20	28.	12.	12.	0.14		
HYDROGRAPH AT	SB-F1	233.	6.10	26.	11.	11.	0.12		
DIVERSION TO	F1S	110.	5.90	5.	2.	2.	0.12		
HYDROGRAPH AT	F1P	123.	5.90	21.	10.	10.	0.12		
ROUTED TO	RT-F1P	123.	6.00	21.	10.	10.	0.12		
HYDROGRAPH AT	SB-F2	69.	6.05	7.	3.	3.	0.04		
HYDROGRAPH AT	SB-F1S	110.	6.10	5.	2.	2.	0.00		

ROUTED TO	RT-F1S	109.	6.15	5.	2.	2.	0.00		
3 COMBINED AT	AP-DFSF	296.	6.10	33.	15.	15.	0.16		
ROUTED TO	RR-DFSF	130.	6.35	121.	121.	121.	0.16	95.57	6.35
ROUTED TO	RT-DFSF	130.	6.35	121.	121.	121.	0.16		
HYDROGRAPH AT	SB-F3	210.	6.10	24.	10.	10.	0.11		
2 COMBINED AT	AP22	337.	6.10	145.	131.	131.	0.27		
DIVERSION TO	AP22S	77.	5.95	3.	1.	1.	0.27		
HYDROGRAPH AT	AP22P	260.	5.95	142.	130.	130.	0.27		
ROUTED TO	RT-AP22P	260.	6.00	142.	130.	130.	0.27		
HYDROGRAPH AT	SB-F4	89.	6.05	10.	4.	4.	0.04		
ROUTED TO	RR-DFF4	71.	5.95	10.	4.	4.	0.04	102.08	6.20
2 COMBINED AT	AP23	331.	6.00	152.	134.	134.	0.31		
DIVERSION TO	AP23S	33.	5.95	2.	1.	1.	0.31		
HYDROGRAPH AT	AP23P	298.	5.95	150.	133.	133.	0.31		
ROUTED TO	RT-AP23P	298.	6.00	150.	133.	133.	0.31		
HYDROGRAPH AT	AP23S	33.	6.00	2.	1.	1.	0.00		
ROUTED TO	RT-AP23S	36.	6.05	2.	1.	1.	0.00		
HYDROGRAPH AT	SB-F5	225.	6.00	25.	11.	11.	0.06		
ROUTED TO	RR-DFF5	175.	5.75	25.	11.	11.	0.06	102.32	6.10
3 COMBINED AT	AP24	509.	6.05	177.	145.	145.	0.37		
DIVERSION TO	AP24S	159.	5.80	10.	4.	4.	0.37		
HYDROGRAPH AT	AP24P	350.	5.80	167.	141.	141.	0.37		
ROUTED TO	RT-AP24P	350.	5.85	167.	141.	141.	0.37		
HYDROGRAPH AT	SB-F6	138.	6.00	16.	7.	7.	0.04		
ROUTED TO	RR-DFF6	104.	5.70	16.	7.	7.	0.04	102.27	6.10
HYDROGRAPH AT	SB-F7	173.	6.00	19.	8.	8.	0.05		
ROUTED TO	RR-DFF7	132.	5.80	19.	8.	8.	0.05	102.24	6.10
3 COMBINED AT	AP25	586.	5.85	201.	156.	156.	0.46		
DIVERSION TO	AP25S	125.	5.70	11.	5.	5.	0.46		
HYDROGRAPH AT	AP25P	461.	5.70	189.	151.	151.	0.46		

ROUTED TO	RT-AP25P	461.	5.75	189.	151.	151.	0.46		
HYDROGRAPH AT	SB-PM8	51.	6.00	6.	3.	3.	0.01		
4 COMBINED AT	AP-DF#1	2809.	6.10	927.	536.	536.	4.43		
ROUTED TO	RR-DF#1	1144.	6.65	813.	494.	494.	4.43	73.13	6.65
HYDROGRAPH AT	AP25S	125.	5.85	11.	5.	5.	0.00		
ROUTED TO	RT-AP25S	126.	5.85	11.	5.	5.	0.00		
2 COMBINED AT	AP26	1144.	6.65	816.	498.	498.	4.43		
ROUTED TO	RT-AP26	1142.	6.70	816.	496.	496.	4.43		
HYDROGRAPH AT	SB-PM9	230.	6.00	24.	11.	11.	0.07		
2 COMBINED AT	AP27	1158.	6.65	828.	507.	507.	4.49		
HYDROGRAPH AT	SB-PM10	175.	6.00	20.	9.	9.	0.05		
ROUTED TO	RRDFPM10	140.	5.80	20.	9.	9.	0.05	106.31	6.05
ROUTED TO	RT-PM10	140.	5.85	20.	9.	9.	0.05		
HYDROGRAPH AT	SB-PM11	149.	6.00	17.	7.	7.	0.04		
HYDROGRAPH AT	AP24S	159.	6.05	10.	4.	4.	0.00		
ROUTED TO	RT-AP24S	158.	6.10	10.	4.	4.	0.00		
4 COMBINED AT	AP28	1187.	6.30	866.	527.	527.	4.58		

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
RT-PN2	MANE	0.60	305.91	363.89	2.28	3.00	305.05	366.00	2.28

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1812E+02 EXCESS=0.0000E+00 OUTFLOW=0.1811E+02 BASIN STORAGE=0.9474E-02 PERCENT ERROR= 0.0

RT-AP1	MANE	1.24	658.65	364.95	2.33	3.00	655.90	366.00	2.33

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3896E+02 EXCESS=0.0000E+00 OUTFLOW=0.3892E+02 BASIN STORAGE=0.4165E-01 PERCENT ERROR= 0.0

RT-AP2	MANE	0.39	863.87	365.94	2.44	3.00	863.86	366.00	2.45

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5165E+02 EXCESS=0.0000E+00 OUTFLOW=0.5163E+02 BASIN STORAGE=0.1718E-01 PERCENT ERROR= 0.0

RT-PN4	MANE	0.57	233.36	363.74	2.24	3.00	231.29	366.00	2.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1362E+02 EXCESS=0.0000E+00 OUTFLOW=0.1361E+02 BASIN STORAGE=0.6878E-02 PERCENT ERROR= 0.0

RT-AP3	MANE	0.49	1282.79	366.16	2.46	3.00	1282.62	366.00	2.47

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7679E+02 EXCESS=0.0000E+00 OUTFLOW=0.7676E+02 BASIN STORAGE=0.3147E-01 PERCENT ERROR= 0.0

RT-DFG	MANE	3.00	250.28	396.00	2.69	3.00	250.28	396.00	2.69

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1051E+03 EXCESS=0.0000E+00 OUTFLOW=0.1048E+03 BASIN STORAGE=0.3794E+00 PERCENT ERROR= 0.0

RT-DFF	MANE	3.00	238.54	486.00	2.59	3.00	238.54	486.00	2.59

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1276E+03 EXCESS=0.0000E+00 OUTFLOW=0.1275E+03 BASIN STORAGE=0.1190E+00 PERCENT ERROR= 0.0

RT-AP4	MANE	1.35	308.77	367.20	2.53	3.00	306.89	366.00	2.53

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1350E+03 EXCESS=0.0000E+00 OUTFLOW=0.1349E+03 BASIN STORAGE=0.1055E+00 PERCENT ERROR= 0.0

RT-DFE	MANE	1.17	265.26	487.11	2.39	3.00	265.26	486.00	2.39

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1591E+03 EXCESS=0.0000E+00 OUTFLOW=0.1590E+03 BASIN STORAGE=0.5028E-01 PERCENT ERROR= 0.0

RT-PN14	MANE	1.05	49.82	363.76	1.91	3.00	49.19	363.00	1.91

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2750E+01 EXCESS=0.0000E+00 OUTFLOW=0.2748E+01 BASIN STORAGE=0.2765E-02 PERCENT ERROR= 0.0

RT-AP5	MANE	0.24	367.94	366.60	2.35	3.00	367.91	369.00	2.35

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1688E+03 EXCESS=0.0000E+00 OUTFLOW=0.1687E+03 BASIN STORAGE=0.1227E-01 PERCENT ERROR= 0.0

RT-PS1	MANE	1.26	294.79	365.55	2.23	3.00	294.37	366.00	2.23

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1785E+02 EXCESS=0.0000E+00 OUTFLOW=0.1783E+02 BASIN STORAGE=0.1984E-01 PERCENT ERROR= 0.0

RT-DFD	MANE	0.85	98.97	408.74	2.20	3.00	98.96	408.00	2.20

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.5470E+02 EXCESS=0.0000E+00 OUTFLOW=0.5465E+02 BASIN STORAGE=0.5548E-01 PERCENT ERROR= 0.0

RT-AP6	MANE	1.61	469.72	362.31	2.54	3.00	467.96	363.00	2.54

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7973E+02 EXCESS=0.0000E+00 OUTFLOW=0.7957E+02 BASIN STORAGE=0.1580E+00 PERCENT ERROR= 0.0

RT-AP7A	MANE	1.16	995.92	361.71	2.77	3.00	989.30	363.00	2.77

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1111E+03 EXCESS=0.0000E+00 OUTFLOW=0.1109E+03 BASIN STORAGE=0.1485E+00 PERCENT ERROR= 0.0

RT-DFC	MANE	1.46	227.20	401.82	2.51	3.00	227.19	402.00	2.51

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1393E+03 EXCESS=0.0000E+00 OUTFLOW=0.1390E+03 BASIN STORAGE=0.2911E+00 PERCENT ERROR= 0.0

RT-DFB	MANE	0.72	246.94	435.86	2.32	3.00	246.94	435.00	2.32

ONTINUITY SUMMARY (AC-FT) - INFLOW=0.1548E+03 EXCESS=0.0000E+00 OUTFLOW=0.1546E+03 BASIN STORAGE=0.1657E+00 PERCENT ERROR= 0.0

RT-AP11	MANE	0.41	288.73	366.31	2.30	3.00	288.12	366.00	2.30

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1612E+03 EXCESS=0.0000E+00 OUTFLOW=0.1611E+03 BASIN STORAGE=0.9914E-01 PERCENT ERROR= 0.0

RT-AP5A	MANE	1.65	653.30	369.60	2.32	3.00	652.11	369.00	2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3298E+03 EXCESS=0.0000E+00 OUTFLOW=0.3288E+03 BASIN STORAGE=0.9628E+00 PERCENT ERROR= 0.0

RT-PM1	MANE	0.50	107.12	366.09	2.24	3.00	107.08	366.00	2.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6448E+01 EXCESS=0.0000E+00 OUTFLOW=0.6446E+01 BASIN STORAGE=0.7579E-02 PERCENT ERROR= -0.1

RT-AP12	MANE	1.65	979.76	371.25	2.25	3.00	974.98	372.00	2.25

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3527E+03 EXCESS=0.0000E+00 OUTFLOW=0.3516E+03 BASIN STORAGE=0.1159E+01 PERCENT ERROR= 0.0

RT-CS1	MANE	1.65	90.51	366.30	1.85	3.00	90.31	366.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5244E+01 EXCESS=0.0000E+00 OUTFLOW=0.5233E+01 BASIN STORAGE=0.2491E-01 PERCENT ERROR= -0.3

RT-AP14	MANE	0.50	284.03	366.35	3.18	3.00	283.67	366.00	3.20

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2089E+02 EXCESS=0.0000E+00 OUTFLOW=0.2089E+02 BASIN STORAGE=0.2081E-01 PERCENT ERROR= -0.1

RT-AP15	MANE	0.45	406.34	366.25	3.08	3.00	405.99	366.00	3.08

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2891E+02 EXCESS=0.0000E+00 OUTFLOW=0.2890E+02 BASIN STORAGE=0.2341E-01 PERCENT ERROR= -0.1

RT-AP16	MANE	0.11	427.19	366.16	3.25	3.00	427.05	366.00	3.25

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3973E+02 EXCESS=0.0000E+00 OUTFLOW=0.3973E+02 BASIN STORAGE=0.7924E-02 PERCENT ERROR= 0.0

RT-DFA	MANE	1.11	8.98	499.60	1.00	3.00	8.98	498.00	1.00

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7739E+01 EXCESS=0.0000E+00 OUTFLOW=0.7729E+01 BASIN STORAGE=0.9996E-02 PERCENT ERROR= 0.0

RT-AP17	MANE	0.82	141.10	367.03	1.35	3.00	140.17	366.00	1.35

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1605E+02 EXCESS=0.0000E+00 OUTFLOW=0.1603E+02 BASIN STORAGE=0.1607E-01 PERCENT ERROR= 0.0

RT-AP18	MANE	0.35	231.68	365.86	1.51	3.00	231.64	366.00	1.51

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2146E+02 EXCESS=0.0000E+00 OUTFLOW=0.2145E+02 BASIN STORAGE=0.8548E-02 PERCENT ERROR= 0.0

RT-AP19	MANE	1.97	1748.21	370.93	2.23	3.00	1739.33	369.00	2.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4230E+03 EXCESS=0.0000E+00 OUTFLOW=0.4220E+03 BASIN STORAGE=0.1201E+01 PERCENT ERROR= 0.0

RT-F1P	MANE	0.92	123.10	355.43	1.86	3.00	123.01	360.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1179E+02 EXCESS=0.0000E+00 OUTFLOW=0.1178E+02 BASIN STORAGE=0.1000E-01 PERCENT ERROR= 0.0

RT-F1S	MANE	0.75	108.57	369.00	-1.00	3.00	108.57	369.00	-1.00
RT-DFSF	MANE	0.62	129.92	382.04	17.66	3.00	129.91	381.00	17.67

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1489E+03 EXCESS=0.0000E+00 OUTFLOW=0.1489E+03 BASIN STORAGE=0.0000E+00 PERCENT ERROR= 0.0

RT-AP22P	MANE	1.35	260.35	359.10	11.05	3.00	260.20	360.00	11.06

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1605E+03 EXCESS=0.0000E+00 OUTFLOW=0.1605E+03 BASIN STORAGE=0.7076E-02 PERCENT ERROR= 0.0

RT-AP23P	MANE	1.03	298.61	358.10	9.96	3.00	298.01	360.00	9.96

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1648E+03 EXCESS=0.0000E+00 OUTFLOW=0.1648E+03 BASIN STORAGE=0.7177E-02 PERCENT ERROR= 0.0

RT-AP23S	MANE	0.30	43.63	361.50	-1.00	3.00	36.44	363.00	-1.00
RT-AP24P	MANE	0.64	350.05	349.53	8.72	3.00	350.00	351.00	8.72

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1740E+03 EXCESS=0.0000E+00 OUTFLOW=0.1740E+03 BASIN STORAGE=0.7306E-02 PERCENT ERROR= 0.0

RT-AP25P	MANE	0.96	461.40	344.51	7.55	3.00	461.12	345.00	7.55

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1870E+03 EXCESS=0.0000E+00 OUTFLOW=0.1870E+03 BASIN STORAGE=0.1510E-01 PERCENT ERROR= 0.0

RT-AP25S	MANE	0.60	126.10	351.00	-1.00	3.00	126.10	351.00	-1.00
RT-AP26	MANE	2.40	1143.50	401.29	2.60	3.00	1142.23	402.00	2.60

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6159E+03 EXCESS=0.0000E+00 OUTFLOW=0.6135E+03 BASIN STORAGE=0.2668E+01 PERCENT ERROR= 0.0

RT-PM10	MANE	0.76	140.52	349.41	4.15	3.00	140.10	351.00	4.15

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1063E+02 EXCESS=0.0000E+00 OUTFLOW=0.1063E+02 BASIN STORAGE=0.4832E-02 PERCENT ERROR= 0.0

RT-AP24S	MANE	0.90	158.95	365.40	-1.00	3.00	158.39	366.00	-1.00

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

DRAINAGE MAP

Copy Of Map From
"Amendment 2 To Pine Creek
Drainage Basin Planning Study"