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Skunk Creek 3 Tributaries
Floodplain Delineation Study
(Addendum to the Skunk Creek Floodplain Delineation Study)

Technical Data Notebook
Hydrologic Analysis

August 1998

Prepared by
Hydrology Branch, Engineering Division

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1.0 INTRODUCTION

The Hydraulics Branch of the Flood Control District of Maricopa County is redelineating 3 tributaries in three of the sub-basins within the hydrologic model as developed by the Flood Insurance Study (Ref 1). As such they have asked the Hydrology Branch of the Flood Control District of Maricopa County to redelineate two of the sub-basins(S-6 and S-10) into smaller sub-areas and produce a hydrologic model of the resultant area. Figure 1 shows the redelineated sub-basins with the original surrounding sub-basins as a backdrop. This work will lead to a finer floodplain detail for the sub-basins and tributaries in question.

1.0.1 Purpose of Study

This addendum to the original report developed by the FCD has reproduced as much as possible the assumptions and methodology followed by the Flood Insurance Study. The purpose is to redelineate a portion of the study and obtain flows for 3 tributaries within sub-basins S-6 and S-10. Flows from sub-basin S-12 have already been provided in the original Flood Insurance Study but will also be provided within this addendum.

1.1 HYDROLOGIC MODEL DEVELOPMENT AND ASSUMPTIONS

Sub-basins in the addendum were delineated using the 7-1/2 minute quadrangle maps as done in the original work. Sub-basins were drawn out by hand and presented to the FCD's Geographic Information Systems Branch for digitizing. Once digitized the soil and landuse coverages for the area were placed on the sub-basin boundaries and reports summarizing the landuse and soil types for each sub-basin were produced.

The FCD's DDMS was used to compute Green-Ampt parameters for input into the HEC-1 model. Because a portion of the sub-basins lie within the boundaries of the Tonto National Forest, where the soil survey does not cover, the assumptions used to obtain soil areas within the national forest as estimated by the FIS were reproduced in this addendum.. Landuse default conditions were modified to match the assumptions as previously supplied by the FIS. Appendix A contains sub-basin reports for each of the new sub-basins. Figure 2 in Appendix D shows the flow paths in each of the sub-basins.

Hydrograph routing was performed using the Muskingum Method. The assumptions used to obtain the routing parameters in the previous work were used for this work. Table 1 lists the hydrograph routing parameters for this addendum study. Figure 3 in Appendix E shows the HEC-1 schematic for the addendum.

1.2 REFERENCES

Montgomery Watson, Skunk Creek Floodplain Delineation Study, Hydrologic Analysis. June, 1997.

1.2 FINAL RESULTS

A comparison of the sub-basin peak flows and unit flows for each basin are shown in Table 2.

Table 2.
Sub-basin Peak Flows and Unit Flows, 100-yr, 24-hr

Skunk Creek Addendum			Original Skunk Creek FIS			% Difference in Unit Q between Addendum and Original
Sub-basin	Q(cfs)	Unit Q(cfs/sq.mi.)	Sub-basin	Q(cfs)	Unit Q(cfs/sq.mi)	
S-6A	347	1652	—	—	—	+16
S-6B	622	1636	S-6	1339	1424	+15
S-6C	549	1614	—	—	—	+13
S-10A	1605	1407	—	—	—	+8
S-10B	964	1460	S-10	2350	1305	+12

The difference in unit flows may be attributed to the decreased lag time for the smaller basins. This has the effect of producing a greater amount of water during a time period. Removing the areal reduction in each of the models did lower the percentage difference in unit flow for each of the comparisons but not by a significant amount. The 6 hour storm was modeled for this watershed and the flows were lower than what was produced from the 24 hour storm. The HEC-1 model for the 6 hour storm is located in Appendix C.

Table 3 shows a comparison between similar concentration points from each of the two models. Each of the concentration points shown is within Skunk Creek. There are negligible differences between flows from each of the models when they are compared on a macro scale.

Warnings for instability in routing reach RS-10B in the 100-yr, 24-hr model are due to the short length of the routing reach. Decreasing the computation time interval to correct for this routing causes most of the other routings to have the same error. It was decided to leave this routing as is since it is very short and would not have much attenuation in flow or difference in time in moving the water downstream.

Table 3
Comparison of Similar Concentration Points, 100-yr, 24-hr

Skunk Creek Addendum			Original Skunk Creek FIS			% Difference in Q
Concentration Point	Contributing Area	Q(cfs)	Concentration Point	Contributing Area	Q(cfs)	
CS-6C	8	7704	S6C	8	7840	-2
F-10A	12	9611	S10C	12	9741	-1
S24C	64	26605	S24C	64	26544	<1

1.3 REFERENCES

Montgomery Watson, Skunk Creek Floodplain Delineation Study, Hydrologic Analysis. June, 1997.

FROM EARLIER ? VERSION OF THIS REPORT

Skunk Creek and 3 Tributaries Delineation
Basin Boundaries

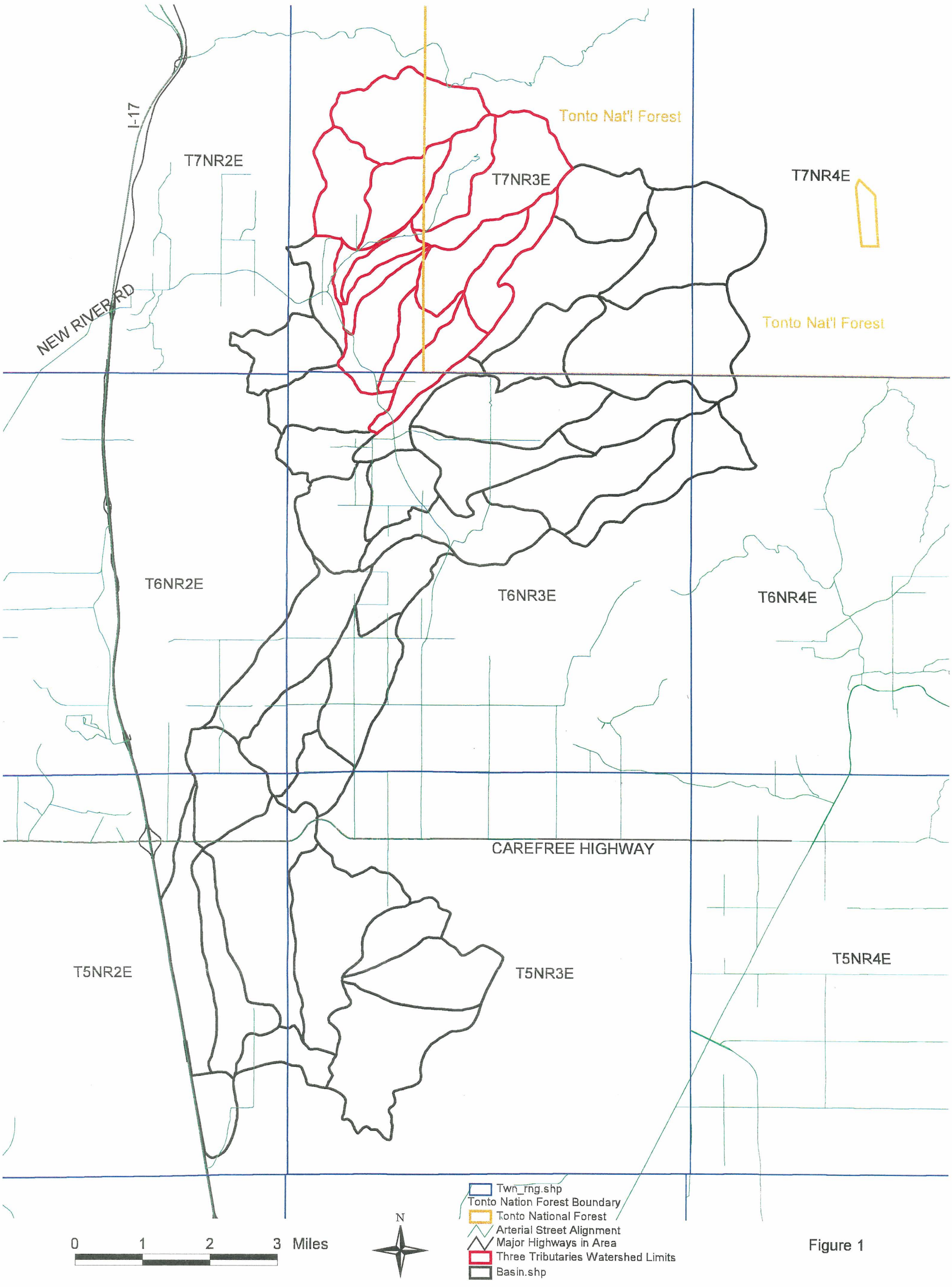

Figure 1

Table 1
Hydrograph Routing Parameters

From	To	Model Length(ft)	Slope	n value	Velocity(ft/s)	Vm/V	Celerity, Vm(ft/s)	Travel Time(min)	K	X	NSTPS
S3	S-6A	5750	0.009	0.045	4.9	1.33	6.5	15	0.25	0.3	3
S5	S-6B	9775	0.013	0.045	5.9	1.33	7.8	20	0.35	0.3	4
S-6B	S-6C	2875	0.01	0.04	5.7	1.67	9.5	5	0.08	0.25	1
S-6C	S-10A	6325	0.01	0.04	5.7	1.67	9.5	11	0.18	0.25	2
S9	S-10B	9200	0.015	0.04	6.2	1.67	10.3	15	0.25	0.3	3
S-10B	S-10A	920	0.015	0.04	6.2	1.67	10.3	2	0.02	0.3	1
S-10B	S-13	3228	0.009	0.04	5.0	1.67	8.45	10	0.09	0.25	1

Appendix A

LOSS PARAMETERS FOR SUBBASIN: S-6A

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
2	9.000	6.7	0.41	0
10	30.000	22.4	0.94	0
12	23.000	17.2	0.01	0
13	23.000	17.2	0.01	0
98	4.000	3.0	0.37	0
110	42.000	31.3	0.13	0
122	3.000	2.2	0.33	0

TOTAL = 134.000 Acres XKSAT = 0.10 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 7.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
13.000	Desert	9.7	DRY	31	0	0.23	0.03	Low	0.04
	OPEN		DRY	10	0	0.10	0.02	Min	
	V.L.D.R		NORMAL	30	5	0.30	0.05	Low	
120.000	L.D.R.	89.6	DRY	31	5	0.23	0.03	Low	0.05
1.000	INSTITU	0.7	DRY	31	0	0.23	0.03	Low	0.08
	M.F.R.		NORMAL	50	45	0.25	0.05	Low	
	Ind		NORMAL	60	55	0.15	0.03	Min	
	Comm		NORMAL	75	80	0.10	0.02	Min	
	Park		NORMAL	90	0	0.20	0.10	Hi	
	RowCrop		NORMAL	85	0	0.50	0.10	Hi	

134.00 = Total Area Avg. = 31 4% 0.230

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 4
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 4

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S-6A	0.209	1.70	0.95	0.03	141.2	0.23	0.35	7.00	0.12	4	20

LOSS PARAMETERS FOR SUBBASIN: S-6B

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
2	5.000	2.0	0.41	0
8	12.000	4.9	0.96	0
10	38.000	15.4	0.94	0
12	54.000	22.0	0.01	0
41	87.000	35.4	0.17	0
66	19.000	7.7	0.23	0
95	31.000	12.6	0.04	0

TOTAL = 246.000 Acres XKSAT = 0.11 %Rock = 0

DTHETA

Dry = 0.36 PSIF = 6.80
Normal = 0.17
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
137.000	Desert	55.7	DRY	31	0	0.23	0.03	Low	0.04
	OPEN		DRY	10	0	0.10	0.02	Min	
	V.L.D.R		NORMAL	30	5	0.30	0.05	Low	
108.000	L.D.R.	43.9	DRY	31	5	0.23	0.03	Low	0.05
	M.D.R.		NORMAL	50	30	0.25	0.05	Low	
1.000	INSTITU	0.4	DRY	31	0	0.23	0.03	Low	0.08
	Ind		NORMAL	60	55	0.15	0.03	Min	
	Comm		NORMAL	75	80	0.10	0.02	Min	
	Park		NORMAL	90	0	0.20	0.10	Hi	
	RowCrop		NORMAL	85	0	0.50	0.10	Hi	
246.00 = Total Area			Avg. =	31	2%	0.230			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.36

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 2
ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 2

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S-6B	0.384	1.60	0.95	0.03	125.0	0.23	0.36	6.80	0.14	2	20

LOSS PARAMETERS FOR SUBBASIN: S-6C

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
3	9.000	4.1	0.58	0
10	3.000	1.4	0.94	0
12	12.000	5.5	0.01	0
13	47.000	21.5	0.01	0
22	2.000	0.9	0.04	0
41	41.000	18.7	0.17	0
66	72.000	32.9	0.23	0
98	25.000	11.4	0.37	0
110	8.000	3.7	0.13	0

TOTAL = 219.000 Acres XKSAT = 0.10 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 7.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
210.000	Desert	95.9	DRY	31	0	0.23	0.03	Low	0.04
	OPEN		DRY	10	0	0.10	0.02	Min	
	V.L.D.R		NORMAL	30	5	0.30	0.05	Low	
9.000	L.D.R.	4.1	DRY	31	5	0.23	0.03	Low	0.07
	M.D.R.		NORMAL	50	30	0.25	0.05	Low	
	M.F.R.		NORMAL	50	45	0.25	0.05	Low	
	Ind		NORMAL	60	55	0.15	0.03	Min	
	Comm		NORMAL	75	80	0.10	0.02	Min	
	Park		NORMAL	90	0	0.20	0.10	Hi	
	RowCrop		NORMAL	85	0	0.50	0.10	Hi	

219.00 = Total Area Avg. = 31 0% 0.230

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S-6C	0.342	1.98	1.04	0.03	181.8	0.23	0.35	7.00	0.12	0	21

LOSS PARAMETERS FOR SUBBASIN: S-10A

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
3	100.000	13.7	0.58	0
13	58.000	7.9	0.01	0
41	65.000	8.9	0.17	0
66	233.000	31.9	0.23	0
93	4.000	0.5	0.33	0
95	122.000	16.7	0.04	0
96	2.000	0.3	0.07	0
98	24.000	3.3	0.37	0
109	41.000	5.6	0.35	35
110	32.000	4.4	0.13	0
120	50.000	6.8	0.06	0

TOTAL = 731.000 Acres XKSAT = 0.14 %Rock = 2

DTHETA

Dry = 0.39 PSIF = 6.20
Normal = 0.23
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
700.000	Desert	95.5	DRY	27	0	0.17	0.03	Low	0.04
	OPEN		DRY	10	0	0.10	0.02	Min	
	V.L.D.R		NORMAL	30	5	0.30	0.05	Low	
33.000	L.D.R.	4.5	DRY	27	5	0.17	0.03	Low	0.05
	M.D.R.		NORMAL	50	30	0.25	0.05	Low	
	M.F.R.		NORMAL	50	45	0.25	0.05	Low	
	Ind		NORMAL	60	55	0.15	0.03	Min	
	Comm		NORMAL	75	80	0.10	0.02	Min	
	Park		NORMAL	90	0	0.20	0.10	Hi	
	RowCrop		NORMAL	85	0	0.50	0.10	Hi	
733.00 = Total Area			Avg. =	27	0%	0.170			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.17

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 2
% EFFECTIVE IMP. = 2

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S-10A	1.142	2.65	1.23	0.03	156.6	0.17	0.39	6.20	0.17	2	26

LOSS PARAMETERS FOR SUBBASIN: S-10B

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
6	21.000	5.0	0.62	0
66	222.000	52.6	0.23	0
93	95.000	22.5	0.33	0
95	45.000	10.7	0.04	0
96	30.000	7.1	0.07	0
120	9.000	2.1	0.06	0

TOTAL = 422.000 Acres XKSAT = 0.19 %Rock = 0

DTHETA

Dry = 0.38 PSIF = 5.40
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
370.000	Desert	87.7	DRY	27	0	0.17	0.03	Low	0.04
	OPEN		DRY	10	0	0.10	0.02	Min	
	V.L.D.R		NORMAL	30	5	0.30	0.05	Low	
52.000	L.D.R.	12.3	DRY	27	5	0.17	0.03	Low	0.05
	M.D.R.		NORMAL	50	30	0.25	0.05	Low	
	M.F.R.		NORMAL	50	45	0.25	0.05	Low	
	Ind		NORMAL	60	55	0.15	0.03	Min	
	Comm		NORMAL	75	80	0.10	0.02	Min	
	Park		NORMAL	90	0	0.20	0.10	Hi	
	RowCrop		NORMAL	85	0	0.50	0.10	Hi	
422.00 = Total Area			Avg. =	27	1%	0.170			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.38

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.23

IMPERVIOUS AREA: URBAN @ 100 % effective = 1
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 1

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S-10B	0.659	1.98	1.04	0.03	151.5	0.17	0.38	5.40	0.23	1	22

Summary of MCUHP2 Subbasin Input Parameters

SUBBASIN	AREA sq.miles	IA ins.	DTHETA	PSIF	XKSAT adj.	RTIMP %	LAG mins.
S-10A	1.142	0.170	0.390	6.20	0.170	2	25.9
S-10B	0.659	0.170	0.380	5.40	0.230	1	21.9
S-6A	0.209	0.230	0.350	7.00	0.120	4	20.2
S-6B	0.384	0.230	0.360	6.80	0.140	2	20.2
S-6C	0.342	0.230	0.350	7.00	0.120	0	21.2

LOSS PARAMETERS FOR SUBBASIN: S1

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
8	0.053	2.5	0.96	0
72	1.031	49.6	0.09	30
96	0.021	1.0	0.07	0
40	0.811	39.0	0.17	0
93	0.002	0.1	0.33	0
104	0.027	1.3	0.14	60
41	0.135	6.5	0.17	0

TOTAL = 2.080 Sq.Miles XKSAT = 0.13 %Rock = 16

DTHETA

Dry = 0.38 PSIF = 6.40
Normal = 0.21
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
1.398	VACANT	67.3	DRY	18	0	0.22	0.04	Low	0.04
0.680	FOREST	32.7	DRY	18	0	0.22	0.04	Low	0.04
2.078 = Total Area				Avg. =	18	0%	0.220		

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.38

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 16
% EFFECTIVE IMP. = 6

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S1	2.080	2.48	0.93	0.04	535.5	0.22	0.38	6.40	0.14	6	24

LOSS PARAMETERS FOR SUBBASIN: S2

oil Survey Used Aguila/Carefree

XKSAT

ap Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
72	0.265	22.6	0.09	30
96	0.046	3.9	0.07	0
40	0.309	26.3	0.17	0
8	0.055	4.7	0.96	0
93	0.014	1.2	0.33	0
66	0.080	6.8	0.23	0
41	0.121	10.3	0.17	0
95	0.076	6.5	0.04	0
26	0.142	12.1	0.01	0
68	0.018	1.5	0.63	0
110	0.026	2.2	0.13	0
10	0.012	1.0	0.94	0
13	0.009	0.8	0.01	0
12	0.001	0.1	0.01	0

TOTAL = 1.174 Sq.Miles XKSAT = 0.10 %Rock = 7

DTHETA

ry = 0.35 PSIF = 7.00
Normal = 0.15
et = 0.00

AND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.115	LDR	9.8	DRY	22	5	0.18	0.04	Low	0.05
1.059	VACANT	90.2	DRY	22	0	0.18	0.04	Low	0.04
1.174 = Total Area			Avg. =	22	0%	0.180			

ERCENT OF SUBBASIN
DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

UBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.11

MPERVIOUS AREA:
URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 7
% EFFECTIVE IMP. = 7

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S2	1.174	2.22	1.09	0.04	384.2	0.18	0.35	7.00	0.11	7	23

LOSS PARAMETERS FOR SUBBASIN: S3

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
41	0.224	21.7	0.17	0
95	0.043	4.2	0.04	0
66	0.620	60.2	0.23	0
72	0.107	10.4	0.09	30
96	0.022	2.1	0.07	0
68	0.007	0.7	0.63	0
12	0.007	0.7	0.01	0

TOTAL = 1.030 Sq.Miles XKSAT = 0.17 %Rock = 3

DTHETA

Dry = 0.39 PSIF = 5.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.114	LDR	11.1	DRY	23	5	0.17	0.04	Low	0.05
0.722	VACANT	70.1	DRY	23	0	0.17	0.04	Low	0.04
0.194	FOREST	18.8	DRY	23	0	0.17	0.04	Low	0.05

1.030 = Total Area Avg. = 23 1% 0.170

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 1
ROCK OUTCROP @ 100 % effective = 3
% EFFECTIVE IMP. = 4

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S3	1.030	2.27	1.08	0.04	331.3	0.17	0.39	5.70	0.19	4	24

LOSS PARAMETERS FOR SUBBASIN: S4

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
66	0.017	1.8	0.23	0
95	0.020	2.1	0.04	0
40	0.933	96.2	0.17	0

TOTAL = 0.970 Sq.Miles XKSAT = 0.17 %Rock = 0

DTHETA

Dry = 0.39 PSIF = 5.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.040	VACANT	4.1	DRY	20	0	0.20	0.04	Low	0.06
0.930	FOREST	95.9	DRY	20	0	0.20	0.04	Low	0.04

0.970 = Total Area Avg. = 20 0% 0.200

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S4	0.970	2.31	1.10	0.04	588.7	0.20	0.39	5.70	0.19	0	24

LOSS PARAMETERS FOR SUBBASIN: S5

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
95	0.004	0.2	0.04	0
8	0.005	0.3	0.96	0
41	0.005	0.3	0.17	0
40	1.836	99.2	0.17	0

TOTAL = 1.850 Sq.Miles XKSAT = 0.17 %Rock = 0

DTHETA

Dry = 0.39 PSIF = 5.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.016	VACANT	0.9	DRY	17	0	0.23	0.04	Low	0.07
1.837	FOREST	99.1	DRY	17	0	0.23	0.04	Low	0.04
1.853 = Total Area				Avg. = 17	0%	0.230			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.18

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S5	1.850	2.91	1.77	0.04	618.6	0.23	0.39	5.70	0.18	0	34

LOSS PARAMETERS FOR SUBBASIN: S7

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
26	0.042	6.1	0.01	0
49	0.023	3.4	0.06	0
110	0.175	25.6	0.13	0
52	0.112	16.4	0.16	20
13	0.088	12.9	0.01	0
98	0.099	14.5	0.37	0
22	0.082	12.0	0.04	0
3	0.020	2.9	0.58	0
45	0.042	6.1	0.03	0
TOTAL =	0.683 Sq.Miles		XKSAT = 0.08	%Rock = 3

DTHETA

Dry = 0.32 PSIF = 7.60
Normal = 0.15
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.189	LDR	27.7	DRY	25	5	0.15	0.03	Low	0.05
0.494	VACANT	72.3	DRY	25	0	0.15	0.03	Low	0.05
0.683 = Total Area			Avg. =	25	1%	0.150			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.32

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 1
ROCK OUTCROP @ 100 % effective = 3
% EFFECTIVE IMP. = 4

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S7	0.683	2.14	1.25	0.03	136.4	0.15	0.32	7.60	0.09	4	26

LOSS PARAMETERS FOR SUBBASIN: S8

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
52	0.014	1.2	0.16	20
45	0.309	27.6	0.03	0
22	0.027	2.4	0.04	0
109	0.705	62.9	0.35	35
98	0.006	0.5	0.37	0
3	0.060	5.4	0.58	0

TOTAL = 1.121 Sq.Miles XKSAT = 0.17 %Rock = 22

DTHETA

Dry = 0.39
Normal = 0.25
Wet = 0.00

PSIF = 5.70

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
1.121	VACANT	100.	DRY	23	0	0.17	0.03	Low	0.04
1.121 = Total Area			Avg. =	23	0%	0.170			

PERCENT OF SUBBASIN

DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA:

URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 22

% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S8	1.121	1.94	1.01	0.03	207.2	0.17	0.39	5.70	0.19	0	23

LOSS PARAMETERS FOR SUBBASIN: S9

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
95	0.009	0.9	0.04	0
66	0.027	2.6	0.23	0
40	0.985	96.5	0.17	0

TOTAL = 1.021 Sq.Miles XKSAT = 0.17 %Rock = 0

DTHETA

Dry = 0.39 PSIF = 5.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.043	VACANT	4.2	DRY	20	0	0.20	0.04	Low	0.06
0.978	FOREST	95.8	DRY	20	0	0.20	0.04	Low	0.04
1.021 = Total Area			Avg. =	20	0%	0.200			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S9	1.021	2.31	0.91	0.04	329.0	0.20	0.39	5.70	0.19	0	28

LOSS PARAMETERS FOR SUBBASIN: S11

Soil Survey Used Aguila/Carefree

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
40	0.920	100.	0.17	0
TOTAL =	0.920 Sq.Miles	XKSAT = 0.17	%Rock = 0	

DTHETA

Dry = 0.39 PSIF = 5.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.920	FOREST	100.	DRY	20	0	0.20	0.04	Low	0.04
0.920 = Total Area			Avg. =	20	0%	0.200			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.39

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S11	0.920	2.70	1.28	0.04	438.1	0.20	0.39	5.70	0.19	0	27

LOSS PARAMETERS FOR SUBBASIN: S12

il Survey Used Aguila/Carefree

SAT

p Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
95	0.425	46.7	0.04	0
56	0.383	42.1	0.23	0
26	0.076	8.4	0.01	0
52	0.002	0.2	0.16	20
68	0.020	2.2	0.63	0
3	0.004	0.4	0.58	0

OTAL = 0.910 Sq.Miles XKSAT = 0.08 %Rock = 0

DTHETA

Dry = 0.32 PSIF = 7.60
Normal = 0.15
Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.506	FOREST	55.4	DRY	25	0	0.15	0.03	Low	0.05
0.214	VACANT	23.4	DRY	25	0	0.15	0.03	Low	0.05
0.193	LDR	21.1	DRY	25	5	0.15	0.03	Low	0.05

0.913 = Total Area Avg. = 25 1% 0.150

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.32

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 1
ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 1

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
S12	0.910	2.76	1.30	0.03	123.2	0.15	0.32	7.60	0.09	1	29

LOSS PARAMETERS FOR SUBBASIN: S13

oil Survey Used Aguila/Carefree

XKSAT

ap Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
109	0.660	51.9	0.35	35
98	0.060	4.7	0.37	0
14	0.234	18.4	0.03	0
110	0.126	9.9	0.13	0
68	0.075	5.9	0.63	0
3	0.054	4.2	0.58	0
13	0.019	1.5	0.01	0
56	0.033	2.6	0.23	0
52	0.009	0.7	0.16	20
96	0.002	0.2	0.07	0

OTAL = 1.272 Sq.Miles XKSAT = 0.20 %Rock = 18

DTHETA

Dry = 0.37 PSIF = 5.30
ormal = 0.25
et = 0.00

AND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.203	LDR	16.0	DRY	25	5	0.22	0.04	Low	0.05
0.031	MEDCOM	2.4	DRY	25	60	0.22	0.04	Low	0.06
1.038	VACANT	81.6	DRY	25	0	0.22	0.04	Low	0.04
1.272 = Total Area			Avg. =	25	2%	0.220			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

UBBASIN DTHETA WEIGHTED BY LAND USE = 0.37

UBBASIN XKSAT ADJUSTED FOR VEG. = 0.23

MPERVIOUS AREA: URBAN @ 100 % effective = 2
ROCK OUTCROP @ 100 % effective = 18
% EFFECTIVE IMP. = 20

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
13	1.272	2.67	1.16	0.04	425.1	0.22	0.37	5.30	0.23	20	25

Appendix B

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1****************************************
****************************************
 *                                      *                                                                    *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                                    *
U.S. ARMY CORPS OF ENGINEERS     *
 *               JUL   1997             *                                                                    *
HYDROLOGIC ENGINEERING CENTER    *
 *            VERSION 4.1               *                                                                    *
609 SECOND STREET          *
 *                                      *                                                                    *
DAVIS, CALIFORNIA 95616       *
 *  RUN DATE   08OCT98  TIME  08:10:08  *                                                                    *
(916) 756-1104            *
 *                                      *                                                                    *
*
 ****************************************
****************************************
```

24
NR

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,

DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION

KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                                    HEC-1 INPUT
PAGE  1

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

             1          ID    FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
             2          ID
             3          ID    SKUNK CREEK FOODPLAIN DELINEATION STUDY
             4          ID    CAP AQUEDUCT THROUGH TOWN OF NEW RIVER
             5          ID
             6          ID    100-YEAR 24-HOUR FLOOD HYDROLOGY
             7          ID
             8          ID                METHODS OF STUDY:
             9          ID    - FCD STORM PATTERNS
            10          ID    - FCD PHOENIX AREA S-GRAPHS
            11          ID    - GREEN-AMPT LOSSES
            12          ID    - MUSKINGUM STREAM ROUTING
            13          ID    - FCD DDMS PROGRAM (VER 1.1, AUG 1995) USED TO COMPUTE PARAMETERS
            14          ID
            15          ID    INPUT FILE NAME - SC100Y24.DAT
            16          ID
            17          ID    MONTGOMERY WATSON
```

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            18          ID    MARCH 1996
            19          ID
            20          ID
*************************************************************************
            21          ID   *MODIFIED BY FLOOD CONTROL DISTRICT BY DOING: SPLIT BASIN S6 UP INTO
3 NEW *
            22          ID   *BASINS, S-6A, S-6B, AND S-6C. ALSO SPLIT BASIN S10 INTO S-10A AND S-
10B.  *
            23          ID   *ADDED THE NEW ROUTINGS FOR THESE SPLIT BASINS USING THE ASSUMPTIONS
OF    *
            24          ID   *MONTGOMERY WATSON.
*
            25          ID   *BASINS S-11, S-12 AND S-13 ADDED TO MODEL ON 10/8/98 BECAUSE
FLOODPLAIN  *
            26          ID   *DELINEATION WILL ALSO INCLUDE WASH IN BASIN S-12
            27          ID
*************************************************************************
            28          ID
            29          ID   DDM MCUHP2 SKUNK CREEK FOODPLAIN DELINEATION STUDY
                        *DIAGRAM
            30          IT       5 05JAN96    0000     300
            31          IN      15
            32          IO       5
                        *  THE FOLLOWING JD CARDS DESCRIBE A PRECIP DEPTH/AREA CURVE FOR HEC-1.
                        *  THE JD CARD DATA IS DERIVED FROM DARF DATA GIVEN IN THE MARICOPA COUNTY
                        *  DRAINAGE DESIGN MANUAL (TBL 2.2).  USING THE JD CARDS HEC-1 APPLIES THE
                        *  CORRECT DARF TO POINT RAINFALL VALUES FOR EACH CONCENTRATION POINT.
            33          JD   4.602    .001
                        * THE FOLLOWING PC RECORD USED A 24-HOUR SCS TYPE II RAINFALL
            34          PC    .000    .002    .005    .008    .011    .014    .017    .020    .023
.026
            35          PC    .029    .032    .035    .038    .041    .044    .048    .052    .056
.060
            36          PC    .064    .068    .072    .076    .080    .085    .090    .095    .100
.105
            37          PC    .110    .115    .120    .126    .135    .142    .150    .158    .166
.175
            38          PC    .184    .195    .208    .224    .243    .266    .318    .479    .678
.716
            39          PC    .743    .764    .781    .795    .808    .818    .828    .837    .844
.851
            40          PC    .858    .865    .871    .877    .883    .889    .895    .900    .905
.910
            41          PC    .915    .919    .923    .927    .931    .935    .939    .943    .947
.951
            42          PC    .954    .957    .960    .963    .966    .969    .972    .975    .978
.981
            43          PC    .984    .987    .990    .993    .996    .999   1.000
            44          JD   4.574       1
            45          JD   4.464       5
            46          JD   4.326      10
            47          JD   4.188      20
            48          JD   4.142      30
            49          JD   4.050      40
1                                                   HEC-1 INPUT
PAGE  2

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

            50          JD   4.004      50
            51          JD   3.949      65
                        * DDM   ***** Updated *****

            52          KK      S1
            53          KM   BASIN S1
            54          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
            55          KM    L=      2.5  Lca=       .9   S=  535.5  Kn= .040  LAG=  24.0
            56          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
            57          BA    2.08
            58          LG     .22     .38    6.40     .14    6.00
```

```
          59          UI    292.    975.   1892.   2662.   2623.   1696.   1381.   1093.    796.
657.
          60          UI    486.    358.    293.    224.    156.    143.     92.     56.     56.
56.
          61          UI     56.     56.      0.      0.      0.      0.      0.      0.      0.
0.
          62          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                      * DDM   ***** Preserved *****

          63          KK     S1R
          64          KM    ROUTE S1 THROUGH S2
          65          RM       4    0.31    0.35
                      * DDM   ***** Updated *****

          66          KK      S2
          67          KM   BASIN S2
          68          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          69          KM    L=      2.2  Lca=      1.1   S=  384.2  Kn= .036  LAG=  23.4
          70          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
          71          BA    1.17
          72          LG     .18     .35    7.00     .11    7.00
          73          UI    169.    592.   1118.   1615.   1407.    953.    770.    600.    436.
362.
          74          UI    251.    198.    152.    120.     83.     83.     33.     32.     32.
32.
          75          UI     32.      0.      0.      0.      0.      0.      0.      0.      0.
0.
          76          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                      * DDM   ***** Preserved *****

          77          KK     S2C
          78          KM    COMBINE S1+S2
          79          HC       2
                      * DDM   ***** Updated *****

          80          KK      S3
          81          KM   BASIN S3
          82          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          83          KM    L=      2.3  Lca=      1.1   S=  331.3  Kn= .035  LAG=  23.5
          84          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
          85          BA    1.03
          86          LG     .17     .39    5.70     .19    4.00
          87          UI    148.    513.    974.   1398.   1248.    837.    677.    529.    385.
320.
          88          UI    222.    174.    135.    108.     72.     72.     32.     28.     28.
28.
          89          UI     28.      0.      0.      0.      0.      0.      0.      0.      0.
0.
          90          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                      * DDM   ***** Preserved *****
1                                                   HEC-1 INPUT
PAGE  3

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


          91          KK     S3C
          92          KM    COMBINE S3+S2C (SUBAREAS S1-S3)
          93          HC       2
                      * DDM   ***** Preserved *****

          94          KK     S3R
          95          KM    ROUTE S3C THROUGH S6A, APPROXIMATELY 5,000 FEET TO THE SOUTH
          96          KM    (RM RECORDS WILL HAVE TO BE CHANGED STILL)
          97          RM       3    0.25    0.30
                      * DDM   ***** Preserved *****
```

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          98          KK    S-6A
          99          KM   BASIN S-6A
         100          KM    BASIN ADDED TO MODEL ON 7/30/98. THIS BASIN IN A SUB-WATERSHED OF S-
6.
         101          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         102          KM    L=       1.7  Lca=        .9   S=  141.2  Kn= .030  LAG=  20.2
         103          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
         104          BA     .21
         105          LG     .23     .35    7.00     .12    4.00
         106          UI     39.    153.    274.    330.    286.    190.    124.     79.     53.
33.
         107          UI     24.      9.      8.      8.      0.      0.      0.      0.      0.
0.
         108          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

         109          KK   CPS6A
         110          KM   COMBINE FLOWS IN SKUNK CREEK APPROXIMATELY 5,000 FEET SOUTH OF
COMBINATION
         111          KM   POINT S3C.
         112          HC       2
                      * DDM   ***** Updated *****

         113          KK      S4
         114          KM   BASIN S4
         115          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         116          KM    L=       2.3  Lca=       1.1   S=  588.7  Kn= .040  LAG=  24.4
         117          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
         118          BA     .97
         119          LG     .20     .39    5.70     .19     .00
         120          UI    134.    437.    853.   1188.   1253.    794.    648.    517.    381.
309.
         121          UI    241.    170.    144.    103.     80.     66.     53.     26.     26.
26.
         122          UI     26.     26.      0.      0.      0.      0.      0.      0.      0.
0.
         123          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                      * DDM   ***** Updated *****

         124          KK      S5
         125          KM   BASIN S5
         126          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         127          KM    L=       2.9  Lca=       1.8   S=  618.6  Kn= .043  LAG=  34.0
         128          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
         129          BA    1.85
         130          LG     .23     .39    5.70     .18     .00
         131          UI    183.    333.    782.   1176.   1442.   2021.   1475.   1109.    962.
830.
         132          UI    702.    564.    461.    409.    335.    259.    220.    201.    142.
140.
         133          UI     93.     90.     90.     49.     35.     35.     35.     35.     35.
35.
         134          UI     35.      0.      0.      0.      0.      0.      0.      0.      0.
0.
         135          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                      * DDM   ***** Preserved *****
1                                                   HEC-1 INPUT
PAGE  4

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

         136          KK     S5C
         137          KM    COMBINE S4+S5
         138          HC       2
                      * DDM   ***** Preserved *****

         139          KK     S5R
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          140          KM    ROUTE S5C THROUGH S6B TO A POINT JUST OUTSIDE OF SKUNK CREEK. THIS
POINT IS
          141          KM   APPROXIMATELY 8,500 FEET SOUTHWEST OF CONCENTRATION POINT S5C.
          142          KM    (ROUTING WILL HAVE TO BE CHANGED
          143          RM       4    0.35    0.30
                       * DDM   ***** Preserved *****

          144          KK    S-6B
          145          KM   BASIN S-6B
          146          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          147          KM    L=      1.6  Lca=       .9   S=  125.0  Kn= .030  LAG=  20.2
          148          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
          149          BA     .38
          150          LG     .23     .36    6.80     .14    2.00
          151          UI     73.    281.    504.    606.    526.    350.    228.    146.     97.
60.
          152          UI     44.     17.     16.     16.      0.      0.      0.      0.      0.
0.
          153          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                       *

          154          KK   CPS6B
          155          KM    COMBINE FLOWS FROM SUBBASINS S-4, S-5 AND S-6B JUST OUTSIDE OF SKUNK
CREEK
          156          KM    APPROXIMATELY 8,500 FEET SOUTHWEST OF CONCENTRATION POINT S5C.
          157          HC       2
                       *

          158          KK  CS6A-B
          159          KM   COMBINE FLOWS FROM CONCENTRATION POINT CPS6B AND CONCENTRATION POINT
CPS6A
          160          KM   IN SKUNK CREEK. FROM HERE THEY WILL BE ROUTED TO SUBBASIN S-6C
          161          HC       2
                       *
                       * DDM   ***** Preserved *****

          162          KK  S6AB-R
          163          KM    ROUTE FLOWS IN SKUNK CREEK TO SUBBASIN S-6C. ROUTING DISTANCE IS
APPROXIMATE
          164          KM    2,500 FEET TO THE SOUTH
          165          KM   (RM RECORDS WILL HAVE TO BE CHANGED)
          166          RM       1    0.08    0.25
                       * DDM   ***** Preserved *****

          167          KK    S-6C
          168          KM   BASIN S-6C
          169          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          170          KM    L=      2.0  Lca=      1.0   S=  181.8  Kn= .030  LAG=  21.2
          171          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
          172          BA     .34
          173          LG     .23     .35    7.00     .12     .00
          174          UI     57.    226.    409.    510.    475.    332.    221.    144.     96.
64.
          175          UI     40.     27.     13.     13.     13.      0.      0.      0.      0.
0.
          176          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                       *
1                                                HEC-1 INPUT
PAGE  5

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


          177          KK   CS-6C
          178          KM   COMBINE FLOWS FROM ALL THE S-6 SUBBASINS IN SKUNK CREEK. THIS IS
APPROXIMATEY
          179          KM   WHERE NEW RIVER ROAD CROSSES SKUNK CREEK.
          180          HC       2
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                        *

          181           KK   RS-6C
          182           KM   ROUTE CONCENTRATION POINT CS-6C TO THE SOUTH IN SKUNK, THROUGH
SUBBASIN S-10A
          183           KM   ROUTING DISTANCE IS APPROXIMATELY 5,500 FEET TO THE SOUTH.
          184           KM   (RM RECORDS WILL HAVE TO BE CHANGED)
          185           RM       2     .18     .25
                        * DDM   ***** Preserved *****

          186           KK   S-10A
          187           KM   BASIN S-10A
          188           KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          189           KM    L=      2.7  Lca=      1.2   S=  156.6  Kn= .030  LAG=  25.9
          190           KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
          191           BA    1.14
          192           LG     .17     .39    6.20     .17    2.00
          193           UI    148.    445.    903.   1260.   1417.   1306.    970.    696.    497.
351.
          194           UI    254.    178.    125.    102.     46.     36.     36.     36.     36.
0.
          195           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
          196           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                        *

          197           KK  C-S10a
          198           KM    COMBINE FLOWS FROM ROUTED FLOW RS-6C AND SUBBASIN S-10A. POINT IS IN
SKUNK
          199           KM   CREEK, 5,500 FEET SOUTH OF WHERE NEW RIVER ROAD CROSSES SKUNK CREEK.
          200           HC       2
                        * DDM   ***** Updated *****

          201           KK      S7
          202           KM   BASIN S7
          203           KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          204           KM    L=      2.1  Lca=      1.3   S=  136.4  Kn= .031  LAG=  25.5
          205           KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
          206           BA     .68
          207           LG     .15     .32    7.60     .09    4.00
          208           UI     90.    278.    556.    774.    863.    777.    571.    406.    288.
202.
          209           UI    149.    100.     69.     59.     22.     22.     22.     22.      0.
0.
          210           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                        * DDM   ***** Updated *****

          211           KK      S8
          212           KM   BASIN S8
          213           KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          214           KM    L=      1.9  Lca=      1.0   S=  207.2  Kn= .034  LAG=  22.9
          215           KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
          216           BA    1.12
          217           LG     .17     .39    5.70     .19     .00
          218           UI    165.    611.   1147.   1509.   1531.   1190.    814.    554.    375.
268.
          219           UI    173.    113.     77.     40.     40.     40.      0.      0.      0.
0.
          220           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
                        * DDM   ***** Preserved *****
1                                                   HEC-1 INPUT
PAGE  6

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

          221           KK     S8C
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222          KM    COMBINE S7+S8
223          HC       2
             * DDM   ***** Preserved *****

224          KK    S8CR
225          KM    ROUTE S8C THROUGH S10A
226          RM       2    0.14    0.25
             *

227          KK  CP10Aa
228          KM   COMBINE FLOWS FROM SUBBASINS S-7 AND S-8 WITH FLOWS FROM SUBBASIN S-
10A AND
229          KM   THE ROUTED FLOWS THAT CAME DOWN FROM THE NORTH IN SKUNK CREEK
230          KM   THE POINT IS IN SKUNK CREEK
231          HC       2
             * DDM   ***** Updated *****

232          KK      S9
233          KM   BASIN S9
234          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
235          KM    L=      2.3  Lca=       .9   S=  329.0  Kn= .044  LAG=  27.9
236          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
237          BA    1.02
238          LG     .20     .39    5.70     .19     .00
239          UI    123.    321.    680.    925.   1329.    913.    702.    590.    484.
372.
240          UI    299.    254.    185.    149.    126.     94.     76.     60.     60.
27.
241          UI     24.     24.     24.     24.     24.      0.      0.      0.      0.
0.
242          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             * DDM   ***** Preserved *****

243          KK     S9R
244          KM    ROUTE S9 THROUGH S10B. ROUTING LENGTH IS APPROXIMATELY 8000 FEET
245          KM    DID NOT CHANGE THESE PARAMETERS FROM ORIGINAL SUPPLIED BY
CONSULTANTS
246          RM       3    0.25    0.30
             * DDM   ***** Preserved *****

247          KK   S-10B
248          KM   BASIN S-10B
249          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
250          KM    L=      2.0  Lca=      1.0   S=  151.5  Kn= .030  LAG=  21.9
251          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
252          BA     .66
253          LG     .17     .38    5.40     .23    1.00
254          UI    101.    403.    740.    943.    916.    664.    447.    300.    199.
133.
255          UI     88.     68.     25.     25.     25.     25.      0.      0.      0.
0.
256          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             *

257          KK  C-S10B
258          KM   COMBINE THE FLOW COMING SOUTH FROM SUBBASIN S-9 AND THE FLOW FROM
SUBBASIN
259          KM   S-10B. THIS POINT IS LOCATED AT THE NEW RIVER ROAD, APPROXIMATELY 800
FEET
260          KM   EAST OF SKUNK CREEK
261          HC       2
             *
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          LINE
ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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262          KK  RS-10B
263          KM   ROUTE THE FLOW FROM THE POINT C-S10B TO SKUNK CREEK, WHERE IT WILL BE
264          KM   COMBINED WITH THE OTHER FLOWS AND ROUTED TO SUBBASIN S-13
265          KM   FLOW LENGTH IS APPROXIMATELY 800 FEET
266          KM   (THE RM CARDS WILL HAVE TO BE EXAMINED FOR RESONABLENESS)
267          RM       1     .02     .30
             *

268          KK   F-10A
269          KM   THE FINAL CONCENTRATION POINT FOR THE 3 TRIBUTARY STUDY
270          KM   THIS POINT IS IN SKUNK CREEK
271          HC       2
             * DDM   ***** Preserved *****

272          KK    S10R
273          KM    ROUTE S10C THROUGH S13
274          RM       1    0.09    0.25
             * DDM   ***** Updated *****

275          KK     S13
276          KM   BASIN S13
277          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
278          KM    L=      2.7  Lca=      1.2   S=  425.1  Kn= .035  LAG=  24.5
279          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
280          BA    1.27
281          LG     .22     .37    5.30     .23   20.00
282          UI    175.    567.   1109.   1541.   1652.   1043.    851.    680.    503.
406.
283          UI    318.    227.    191.    134.    108.     86.     73.     34.     34.
34.
284          UI     34.     34.      0.      0.      0.      0.      0.      0.      0.
0.
285          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             * DDM   ***** Updated *****

286          KK     S11
287          KM   BASIN S11
288          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
289          KM    L=      2.7  Lca=      1.3   S=  438.1  Kn= .037  LAG=  26.9
290          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
291          BA     .92
292          LG     .20     .39    5.70     .19     .00
293          UI    115.    317.    664.    896.   1241.    783.    631.    523.    422.
315.
294          UI    265.    210.    154.    129.     98.     84.     56.     56.     36.
22.
295          UI     22.     22.     22.     22.      0.      0.      0.      0.      0.
0.
296          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             * DDM   ***** Preserved *****

297          KK    S11R
298          KM    ROUTE S11 THROUGH S12
299          RM       3    0.24    0.30
             * DDM   ***** Updated *****
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          LINE
ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


300          KK     S12
301          KM   BASIN S12
302          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
303          KM    L=      2.8  Lca=      1.3   S=  123.2  Kn= .031  LAG=  29.1
304          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
305          BA     .91
306          LG     .15     .32    7.60     .09    1.00
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307          UI    105.    257.    558.    811.    971.    995.    868.    652.    482.
359.
308          UI    262.    195.    146.    109.     72.     67.     26.     26.     26.
26.
309          UI     26.      0.      0.      0.      0.      0.      0.      0.      0.
0.
310          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             * DDM   ***** Preserved *****

311          KK    S12C
312          KM    COMBINE S11R+S12 (SUBAREAS S11 AND S12)
313          HC       2
             * DDM   ***** Preserved *****

314          KK    S13C
315          KM    COMBINE S10R+S13+S12       (SUBAREAS S1-S13)
316          HC       3
             * DDM   ***** Preserved *****

317          KK   S13CR
318          KM    ROUTE S13C THROUGH S14
319          RM       2    0.15    0.25
320          ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    52          S1
                 V
                 V
    63         S1R
                 .
                 .
    66           .          S2
                 .           .
                 .           .
    77         S2C............
                 .
                 .
    80           .          S3
                 .           .
                 .           .
    91         S3C............
                 V
                 V
    94         S3R
                 .
                 .
    98           .        S-6A
                 .           .
                 .           .
   109       CPS6A............
                 .
                 .
   113           .          S4
                 .           .
                 .           .
   124           .           .          S5
                 .           .           .
                 .           .           .
   136           .         S5C............
                 .           V
                 .           V
   139           .         S5R
                 .           .
                 .           .
   144           .           .        S-6B
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                .           .           .
                .           .           .
154             .       CPS6B............
                .           .
                .           .
158       CS6A-B............
              V
              V
162       S6AB-R
                .
                .
167             .        S-6C
                .           .
                .           .
177        CS-6C............
              V
              V
181        RS-6C
                .
                .
186             .       S-10A
                .           .
                .           .
197       C-S10a............
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                .
201             .          S7
                .           .
                .           .
211             .           .          S8
                .           .           .
                .           .           .
221             .         S8C............
                .           V
                .           V
224             .        S8CR
                .           .
                .           .
227       CP10Aa............
                .
                .
232             .          S9
                .           V
                .           V
243             .         S9R
                .           .
                .           .
247             .           .       S-10B
                .           .           .
                .           .           .
257             .      C-S10B............
                .           V
                .           V
262             .      RS-10B
                .           .
                .           .
268        F-10A............
              V
              V
272         S10R
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275             .         S13
                .           .
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286             .           .         S11
                .           .           V
                .           .           V
297             .           .        S11R
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300          .          .          .        S12
             .          .          .          .
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311          .          .       S12C...........
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314       S13C......................
             V
             V
317      S13CR
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(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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1****************************************
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 *                                      *                                                    *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                    *
U.S. ARMY CORPS OF ENGINEERS     *
 *                JUL   1997             *                                                    *
HYDROLOGIC ENGINEERING CENTER    *
 *             VERSION 4.1               *                                                    *
609 SECOND STREET          *
 *                                      *                                                    *
DAVIS, CALIFORNIA 95616       *
 *  RUN DATE   08OCT98  TIME  08:10:08   *                                                    *
(916) 756-1104            *
 *                                      *                                                    *
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SKUNK CREEK FOODPLAIN DELINEATION STUDY
CAP AQUEDUCT THROUGH TOWN OF NEW RIVER

100-YEAR 24-HOUR FLOOD HYDROLOGY

METHODS OF STUDY:
- FCD STORM PATTERNS
- FCD PHOENIX AREA S-GRAPHS
- GREEN-AMPT LOSSES
- MUSKINGUM STREAM ROUTING
- FCD DDMS PROGRAM (VER 1.1, AUG 1995) USED TO COMPUTE PARAMETERS

INPUT FILE NAME - SC100Y24.DAT

MONTGOMERY WATSON
MARCH 1996

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***************************************************************************
*MODIFIED BY FLOOD CONTROL DISTRICT BY DOING: SPLIT BASIN S6 UP INTO 3
NEW *
*BASINS, S-6A, S-6B, AND S-6C. ALSO SPLIT BASIN S10 INTO S-10A AND S-
10B.  *
*ADDED THE NEW ROUTINGS FOR THESE SPLIT BASINS USING THE ASSUMPTIONS OF
*
*MONTGOMERY WATSON.
*
*BASINS S-11, S-12 AND S-13 ADDED TO MODEL ON 10/8/98 BECAUSE FLOODPLAIN
*
*DELINEATION WILL ALSO INCLUDE WASH IN BASIN S-12
***************************************************************************
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DDM MCUHP2 SKUNK CREEK FOODPLAIN DELINEATION STUDY

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

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      5JAN96  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      6JAN96  ENDING DATE
                     NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

 33 JD          INDEX STORM NO. 1
                       STRM        4.60  PRECIPITATION DEPTH
                       TRDA         .00  TRANSPOSITION DRAINAGE AREA

 34 PI            PRECIPITATION PATTERN
                      .00       .00       .00       .00       .00       .00       .00       .00
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                      .00       .00       .00       .00       .00       .00       .00       .00
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   44 JD          INDEX STORM NO. 2
                    STRM        4.57  PRECIPITATION DEPTH
                    TRDA        1.00  TRANSPOSITION DRAINAGE AREA

    0 PI            PRECIPITATION PATTERN
                     .00   .00   .00   .00   .00   .00   .00   .00
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                     .01   .01   .01   .01   .01   .02   .02   .02
 .05   .05
                     .05   .07   .07   .07   .01   .01   .01   .01
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  45 JD          INDEX STORM NO. 3
                      STRM        4.46  PRECIPITATION DEPTH
                      TRDA        5.00  TRANSPOSITION DRAINAGE AREA

   0 PI            PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00
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                    .01       .01       .01       .01       .01       .02       .02       .02
.05       .05
                    .05       .07       .07       .07       .01       .01       .01       .01
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   46 JD          INDEX STORM NO. 4
                        STRM       4.33  PRECIPITATION DEPTH
                        TRDA      10.00  TRANSPOSITION DRAINAGE AREA

    0 PI           PRECIPITATION PATTERN
                        .00      .00      .00      .00      .00      .00      .00      .00
  .00      .00
                        .00      .00      .00      .00      .00      .00      .00      .00
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                        .01      .01      .01      .01      .01      .02      .02      .02
  .05      .05
                        .05      .07      .07      .07      .01      .01      .01      .01
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   47 JD          INDEX STORM NO. 5
                        STRM       4.19  PRECIPITATION DEPTH
                        TRDA      20.00  TRANSPOSITION DRAINAGE AREA
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     0 PI            PRECIPITATION PATTERN
                        .00     .00     .00     .00     .00     .00     .00     .00
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                        .00     .00     .00     .00     .00     .00     .00     .00
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  .01     .01
                        .01     .01     .01     .01     .01     .02     .02     .02
  .05     .05
                        .05     .07     .07     .07     .01     .01     .01     .01
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    48 JD          INDEX STORM NO. 6
                        STRM        4.14  PRECIPITATION DEPTH
                        TRDA       30.00  TRANSPOSITION DRAINAGE AREA

     0 PI            PRECIPITATION PATTERN
                        .00     .00     .00     .00     .00     .00     .00     .00
  .00     .00
                        .00     .00     .00     .00     .00     .00     .00     .00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.01	.01	.01	.01
.01	.01	.01	.01	.01	.02	.02	.02	.05	.05
.05	.07	.07	.07	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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 49 JD        INDEX STORM NO. 7
                 STRM        4.05  PRECIPITATION DEPTH
                 TRDA       40.00  TRANSPOSITION DRAINAGE AREA

  0 PI         PRECIPITATION PATTERN
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.01	.01	.01	.01
.01	.01	.01	.01	.01	.02	.02	.02	.05	.05
.05	.07	.07	.07	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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50 JD INDEX STORM NO. 8

STRM 4.00 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.01	.01	.01	.01
.01	.01	.01	.01	.01	.02	.02	.02	.05	.05
.05	.07	.07	.07	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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51 JD INDEX STORM NO. 9

STRM 3.95 PRECIPITATION DEPTH

TRDA 65.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.01	.01	.01	.01
.01	.01	.01	.01	.01	.02	.02	.02	.05	.05
.05	.07	.07	.07	.01	.01	.01	.01	.01	.01

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WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH RS-10B.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH RS-10B.
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REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

***** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH RS-10B.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO

1

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

MAXIMUM STAGE	TIME OF MAX STAGE	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA
+									
+		HYDROGRAPH AT	S1	2911.	12.17	389.	102.	98.	2.08
+		ROUTED TO	S1R	2737.	12.50	388.	102.	98.	2.08
+		HYDROGRAPH AT	S2	1738.	12.17	240.	63.	61.	1.17
+		2 COMBINED AT	S2C	3760.	12.33	619.	162.	156.	3.25
		HYDROGRAPH AT							

+		S3	1415.	12.17	179.	46.	45.	1.03
	2 COMBINED AT							
+		S3C	4899.	12.25	788.	206.	198.	4.28
	ROUTED TO							
+		S3R	4710.	12.50	788.	206.	198.	4.28
	HYDROGRAPH AT							
+		S-6A	347.	12.08	40.	10.	10.	.21
	2 COMBINED AT							
+		CPS6A	4818.	12.50	826.	215.	208.	4.49
	HYDROGRAPH AT							
+		S4	1295.	12.17	161.	40.	39.	.97
	HYDROGRAPH AT							
+		S5	2007.	12.25	307.	77.	74.	1.85
	2 COMBINED AT							
+		S5C	3169.	12.25	461.	115.	111.	2.82
	ROUTED TO							
+		S5R	2980.	12.58	461.	115.	111.	2.82
	HYDROGRAPH AT							
+		S-6B	622.	12.08	70.	18.	17.	.38
	2 COMBINED AT							
+		CPS6B	3110.	12.58	527.	132.	127.	3.20
	2 COMBINED AT							
+		CS6A-B	7678.	12.50	1305.	335.	323.	7.69
	ROUTED TO							
+		S6AB-R	7589.	12.58	1305.	335.	323.	7.69
	HYDROGRAPH AT							
+		S-6C	549.	12.08	64.	16.	15.	.34
	2 COMBINED AT							
+		CS-6C	7704.	12.58	1361.	349.	336.	8.03
	ROUTED TO							
+		RS-6C	7487.	12.75	1361.	349.	336.	8.03
	HYDROGRAPH AT							
+		S-10A	1605.	12.17	198.	50.	48.	1.14
	2 COMBINED AT							
+		C-S10a	7727.	12.75	1531.	392.	378.	9.17
	HYDROGRAPH AT							
+		S7	1061.	12.17	146.	37.	36.	.68
	HYDROGRAPH AT							
+		S8	1650.	12.17	186.	47.	45.	1.12
	2 COMBINED AT							
+		S8C	2685.	12.17	327.	83.	80.	1.80
	ROUTED TO							
+		S8CR	2567.	12.33	327.	83.	80.	1.80
	2 COMBINED AT							
+		CP10Aa	8525.	12.67	1813.	464.	447.	10.97
	HYDROGRAPH AT							
+		S9	1254.	12.17	169.	42.	41.	1.02

	ROUTED TO						
+		S9R	1130.	12.42	169.	42.	41.	1.02
	HYDROGRAPH AT						
+		S-10B	964.	12.17	106.	27.	26.	.66
	2 COMBINED AT						
+		C-S10B	1798.	12.25	272.	68.	66.	1.68
	ROUTED TO						
+		RS-10B	1787.	12.25	272.	68.	66.	1.68
	2 COMBINED AT						
+		F-10A	9611.	12.50	2041.	521.	502.	12.65
	ROUTED TO						
+		S10R	9561.	12.67	2041.	521.	502.	12.65
	HYDROGRAPH AT						
+		S13	1734.	12.17	249.	71.	69.	1.27
	HYDROGRAPH AT						
+		S11	1161.	12.17	153.	38.	37.	.92
	ROUTED TO						
+		S11R	1104.	12.42	153.	38.	37.	.92
	HYDROGRAPH AT						
+		S12	1307.	12.25	190.	48.	46.	.91
	2 COMBINED AT						
+		S12C	2246.	12.33	338.	85.	82.	1.83
	3 COMBINED AT						
+		S13C	11757.	12.50	2536.	653.	629.	15.75
	ROUTED TO						
+		S13CR	11617.	12.67	2536.	653.	629.	15.75

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

Appendix C

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1****************************************
****************************************
 *                                      *                                                    *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF
ENGINEERS      *
 *              JUL   1997              *                                                    *    HYDROLOGIC
ENGINEERING CENTER    *
 *            VERSION 4.1               *                                                    *          609 SECOND
STREET          *
 *                                      *                                                    *       DAVIS, CALIFORNIA
95616       *
 *  RUN DATE   08OCT98  TIME  08:58:08  *                                                    *           (916) 756-
1104            *
 *                                      *                                                    *
*
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X      X  XXXXXXX   XXXXX           X
X      X  X        X     X         XX
X      X  X        X                X
XXXXXXX   XXXX     X        XXXXX   X
X      X  X        X                X
X      X  X        X     X          X
X      X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE
1

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

  1           ID    FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
  2           ID
  3           ID    SKUNK CREEK FOODPLAIN DELINEATION STUDY
  4           ID    CAP AQUEDUCT THROUGH TOWN OF NEW RIVER
  5           ID
  6           ID    100-YEAR 6-HOUR FLOOD HYDROLOGY
  7           ID
  8           ID                METHODS OF STUDY:
  9           ID    - FCD STORM PATTERNS
 10           ID    - FCD PHOENIX AREA S-GRAPHS
 11           ID    - GREEN-AMPT LOSSES
 12           ID    - MUSKINGUM STREAM ROUTING
 13           ID    - FCD DDMS PROGRAM (VER 1.1, AUG 1995) USED TO COMPUTE PARAMETERS
 14           ID
 15           ID    INPUT FILE NAME - new6h.dat
 16           ID
 17           ID    MONTGOMERY WATSON
 18           ID    MARCH 1996
 19           ID
 20           ID    MODIFIED BY FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ON 8/10/98 FOR THE
 21           ID    THREE TRIBUTARIES FLOOD DELINEATION.
 22           ID    BASINS S11, S12 AND S-13 ADDED TO MODEL ON 10/8/98 BECAUSE WASH IN BASIN
 23           ID    S12 WILL BE DELINEATED ALSO
 24           ID
 25           ID   DDM MCUHP2 SKUNK CREEK FOODPLAIN DELINEATION STUDY
              *DIAGRAM
 26           IT       5 05JAN96    0000     300
 27           IN      15
 28           IO       5
              *  THE FOLLOWING JD CARDS DESCRIBE A PRECIP DEPTH/AREA CURVE FOR HEC-1.
              *  THE JD CARD DATA IS DERIVED FROM DARF DATA GIVEN IN THE MARICOPA COUNTY
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                 *  DRAINAGE DESIGN MANUAL (TBL 2.2).  USING THE JD CARDS HEC-1 APPLIES THE
                 *  CORRECT DARF TO POINT RAINFALL VALUES FOR EACH CONCENTRATION POINT.
 29              JD     3.4     0.01
 30              PC    .000     .008     .016     .025     .033     .041     .050     .058     .066     .074
 31              PC    .087     .099     .118     .138     .216     .377     .834     .911     .931     .950
 32              PC    .962     .972     .983     .991    1.000
 33              JD    3.37     0.50
 34              JD     3.3     2.80
 35              PC    .000     .009     .016     .025     .034     .042     .051     .059     .067     .076
 36              PC    .087     .100     .120     .163     .252     .451     .694     .837     .900     .938
 37              PC    .950     .963     .975     .988    1.000
 38              JD    3.16     16.0
 39              PC    .000     .015     .020     .030     .048     .063     .076     .090     .105     .119
 40              PC    .135     .152     .175     .222     .304     .472     .670     .796     .868     .912
 41              PC    .946     .960     .973     .987    1.000
 42              JD     2.8     90.0
 43              PC    .000     .021     .035     .051     .071     .087     .105     .125     .143     .160
 44              PC    .179     .201     .232     .281     .364     .500     .658     .773     .841     .888
 45              PC    .927     .945     .964     .982    1.000
                 * DDM    ***** Updated *****
1                                          HEC-1 INPUT                                                    PAGE
2

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


 46              KK      S1
 47              KM    BASIN S1
 48              KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 49              KM     L=       2.5  Lca=        .9   S=  535.5  Kn= .040  LAG=  24.0
 50              KM     PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
 51              BA     2.08
 52              LG      .22      .38     6.40      .14     6.00
 53              UI     292.     975.    1892.    2662.    2623.    1696.    1381.    1093.     796.     657.
 54              UI     486.     358.     293.     224.     156.     143.      92.      56.      56.      56.
 55              UI      56.      56.       0.       0.       0.       0.       0.       0.       0.       0.
 56              UI       0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                 * DDM    ***** Preserved *****

 57              KK      S1R
 58              KM     ROUTE S1 THROUGH S2
 59              RM        4     0.31     0.35
                 * DDM    ***** Updated *****

 60              KK      S2
 61              KM    BASIN S2
 62              KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 63              KM     L=       2.2  Lca=       1.1   S=  384.2  Kn= .036  LAG=  23.4
 64              KM     PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
 65              BA     1.17
 66              LG      .18      .35     7.00      .11     7.00
 67              UI     169.     592.    1118.    1615.    1407.     953.     770.     600.     436.     362.
 68              UI     251.     198.     152.     120.      83.      83.      33.      32.      32.      32.
 69              UI      32.       0.       0.       0.       0.       0.       0.       0.       0.       0.
 70              UI       0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                 * DDM    ***** Preserved *****

 71              KK      S2C
 72              KM     COMBINE S1+S2
 73              HC        2
                 * DDM    ***** Updated *****

 74              KK      S3
 75              KM    BASIN S3
 76              KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 77              KM     L=       2.3  Lca=       1.1   S=  331.3  Kn= .035  LAG=  23.5
 78              KM     PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
 79              BA     1.03
 80              LG      .17      .39     5.70      .19     4.00
 81              UI     148.     513.     974.    1398.    1248.     837.     677.     529.     385.     320.
 82              UI     222.     174.     135.     108.      72.      72.      32.      28.      28.      28.
 83              UI      28.       0.       0.       0.       0.       0.       0.       0.       0.       0.
 84              UI       0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                 * DDM    ***** Preserved *****
1                                          HEC-1 INPUT                                                    PAGE
3

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


 85              KK      S3C
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 86          KM     COMBINE S3+S2C (SUBAREAS S1-S3)
 87          HC        2
             * DDM    ***** Preserved *****

 88          KK      S3R
 89          KM     ROUTE S3C THROUGH S6A, APPROXIMATELY 5,000 FEET TO THE SOUTH
 90          KM     (RM RECORDS WILL HAVE TO BE CHANGED STILL)
 91          RM        3    0.27    0.30
             * DDM    ***** Preserved *****

 92          KK     S-6A
 93          KM    BASIN S-6A
 94          KM     BASIN ADDED TO MODEL ON 7/30/98. THIS BASIN IN A SUB-WATERSHED OF S-6.
 95          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 96          KM     L=       1.7  Lca=        .9   S=  141.2  Kn= .030  LAG=  20.2
 97          KM     DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
 98          BA      .21
 99          LG      .23      .35    7.00     .12    4.00
100          UI      39.     153.    274.    330.    286.    190.    124.     79.     53.     33.
101          UI      24.       9.      8.      8.      0.      0.      0.      0.      0.      0.
102          UI       0.       0.      0.      0.      0.      0.      0.      0.      0.      0.

103          KK    CPS6A
104          KM    COMBINE FLOWS IN SKUNK CREEK APPROXIMATELY 5,000 FEET SOUTH OF COMBINATION
105          KM    POINT S3C.
106          HC        2
             * DDM    ***** Updated *****

107          KK       S4
108          KM    BASIN S4
109          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
110          KM     L=       2.3  Lca=       1.1   S=  588.7  Kn= .040  LAG=  24.4
111          KM     PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
112          BA      .97
113          LG      .20      .39    5.70     .19     .00
114          UI     134.     437.    853.   1188.   1253.    794.    648.    517.    381.    309.
115          UI     241.     170.    144.    103.     80.     66.     53.     26.     26.     26.
116          UI      26.      26.      0.      0.      0.      0.      0.      0.      0.      0.
117          UI       0.       0.      0.      0.      0.      0.      0.      0.      0.      0.
             * DDM    ***** Updated *****

118          KK       S5
119          KM    BASIN S5
120          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
121          KM     L=       2.9  Lca=       1.8   S=  618.6  Kn= .043  LAG=  34.0
122          KM     PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
123          BA     1.85
124          LG      .23      .39    5.70     .18     .00
125          UI     183.     333.    782.   1176.   1442.   2021.   1475.   1109.    962.    830.
126          UI     702.     564.    461.    409.    335.    259.    220.    201.    142.    140.
127          UI      93.      90.     90.     49.     35.     35.     35.     35.     35.     35.
128          UI      35.       0.      0.      0.      0.      0.      0.      0.      0.      0.
129          UI       0.       0.      0.      0.      0.      0.      0.      0.      0.      0.
             * DDM    ***** Preserved *****
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

130          KK      S5C
131          KM     COMBINE S4+S5
132          HC        2
             * DDM    ***** Preserved *****

133          KK      S5R
134          KM     ROUTE S5C THROUGH S6B TO A POINT JUST OUTSIDE OF SKUNK CREEK. THIS POINT IS
135          KM    APPROXIMATELY 8,500 FEET SOUTHWEST OF CONCENTRATION POINT S5C.
136          KM     (ROUTING WILL HAVE TO BE CHANGED
137          RM        5    0.38    0.30
             * DDM    ***** Preserved *****

138          KK     S-6B
139          KM    BASIN S-6B
140          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
141          KM     L=       1.6  Lca=        .9   S=  125.0  Kn= .030  LAG=  20.2
142          KM     DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
143          BA      .38
144          LG      .23      .36    6.80     .14    2.00
145          UI      73.     281.    504.    606.    526.    350.    228.    146.     97.     60.
146          UI      44.      17.     16.     16.      0.      0.      0.      0.      0.      0.
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147          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *

148          KK   CPS6B
149          KM    COMBINE FLOWS FROM SUBBASINS S-4, S-5 AND S-6B JUST OUTSIDE OF SKUNK CREEK
150          KM    APPROXIMATELY 8,500 FEET SOUTHWEST OF CONCENTRATION POINT S5C.
151          HC       2
             *

152          KK  CS6A-B
153          KM   COMBINE FLOWS FROM CONCENTRATION POINT CPS6B AND CONCENTRATION POINT CPS6A
154          KM   IN SKUNK CREEK. FROM HERE THEY WILL BE ROUTED TO SUBBASIN S-6C
155          HC       2
             *
             * DDM   ***** Preserved *****

156          KK  S6AB-R
157          KM    ROUTE FLOWS IN SKUNK CREEK TO SUBBASIN S-6C. ROUTING DISTANCE IS APPROXIMATE
158          KM    2,500 FEET TO THE SOUTH
159          KM   (RM RECORDS WILL HAVE TO BE CHANGED)
160          RM       1    0.09    0.25
             * DDM   ***** Preserved *****

161          KK    S-6C
162          KM   BASIN S-6C
163          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
164          KM    L=      2.0  Lca=      1.0   S=  181.8  Kn= .030  LAG=  21.2
165          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
166          BA     .34
167          LG     .23     .35    7.00     .12     .00
168          UI     57.    226.    409.    510.    475.    332.    221.    144.     96.     64.
169          UI     40.     27.     13.     13.     13.      0.      0.      0.      0.      0.
170          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
1                                                HEC-1 INPUT                                                PAGE
5

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

171          KK   CS-6C
172          KM   COMBINE FLOWS FROM ALL THE S-6 SUBBASINS IN SKUNK CREEK. THIS IS APPROXIMATEY
173          KM   WHERE NEW RIVER ROAD CROSSES SKUNK CREEK.
174          HC       2
             *

175          KK   RS-6C
176          KM   ROUTE CONCENTRATION POINT CS-6C TO THE SOUTH IN SKUNK, THROUGH SUBBASIN S-10A
177          KM   ROUTING DISTANCE IS APPROXIMATELY 5,500 FEET TO THE SOUTH.
178          KM   (RM RECORDS WILL HAVE TO BE CHANGED)
179          RM       2     .20     .25
             * DDM   ***** Preserved *****

180          KK   S-10A
181          KM   BASIN S-10A
182          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
183          KM    L=      2.7  Lca=      1.2   S=  156.6  Kn= .030  LAG=  25.9
184          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
185          BA    1.14
186          LG     .17     .39    6.20     .17    2.00
187          UI    148.    445.    903.   1260.   1417.   1306.    970.    696.    497.    351.
188          UI    254.    178.    125.    102.     46.     36.     36.     36.     36.      0.
189          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
190          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *

191          KK  C-S10a
192          KM    COMBINE FLOWS FROM ROUTED FLOW RS-6C AND SUBBASIN S-10A. POINT IS IN SKUNK
193          KM   CREEK, 5,500 FEET SOUTH OF WHERE NEW RIVER ROAD CROSSES SKUNK CREEK.
194          HC       2
             * DDM   ***** Updated *****

195          KK      S7
196          KM   BASIN S7
197          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
198          KM    L=      2.1  Lca=      1.3   S=  136.4  Kn= .031  LAG=  25.5
199          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
200          BA     .68
201          LG     .15     .32    7.60     .09    4.00
202          UI     90.    278.    556.    774.    863.    777.    571.    406.    288.    202.
203          UI    149.    100.     69.     59.     22.     22.     22.     22.      0.      0.
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 204          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              * DDM   ***** Updated *****

 205          KK      S8
 206          KM   BASIN S8
 207          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 208          KM    L=      1.9  Lca=      1.0   S=  207.2  Kn= .034  LAG=  22.9
 209          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
 210          BA    1.12
 211          LG     .17     .39    5.70     .19     .00
 212          UI    165.    611.   1147.   1509.   1531.   1190.    814.    554.    375.    268.
 213          UI    173.    113.     77.     40.     40.     40.      0.      0.      0.      0.
 214          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              * DDM   ***** Preserved *****
1                                          HEC-1 INPUT                                          PAGE
6

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

 215          KK     S8C
 216          KM    COMBINE S7+S8
 217          HC       2
              * DDM   ***** Preserved *****

 218          KK    S8CR
 219          KM    ROUTE S8C THROUGH S10A
 220          RM       2    0.14    0.25
              *

 221          KK  CP10Aa
 222          KM   COMBINE FLOWS FROM SUBBASINS S-7 AND S-8 WITH FLOWS FROM SUBBASIN S-10A AND
 223          KM   THE ROUTED FLOWS THAT CAME DOWN FROM THE NORTH IN SKUNK CREEK
 224          KM   THE POINT IS IN SKUNK CREEK
 225          HC       2
              * DDM   ***** Updated *****

 226          KK      S9
 227          KM   BASIN S9
 228          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 229          KM    L=      2.3  Lca=       .9   S=  329.0  Kn= .044  LAG=  27.9
 230          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
 231          BA    1.02
 232          LG     .20     .39    5.70     .19     .00
 233          UI    123.    321.    680.    925.   1329.    913.    702.    590.    484.    372.
 234          UI    299.    254.    185.    149.    126.     94.     76.     60.     60.     27.
 235          UI     24.     24.     24.     24.     24.      0.      0.      0.      0.      0.
 236          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              * DDM   ***** Preserved *****

 237          KK     S9R
 238          KM    ROUTE S9 THROUGH S10B. ROUTING LENGTH IS APPROXIMATELY 8000 FEET
 239          KM    DID NOT CHANGE THESE PARAMETERS FROM ORIGINAL SUPPLIED BY CONSULTANTS
 240          RM       3    0.24    0.30
              * DDM   ***** Preserved *****

 241          KK   S-10B
 242          KM   BASIN S-10B
 243          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 244          KM    L=      2.0  Lca=      1.0   S=  151.5  Kn= .030  LAG=  21.9
 245          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
 246          BA     .66
 247          LG     .17     .38    5.40     .23    1.00
 248          UI    101.    403.    740.    943.    916.    664.    447.    300.    199.    133.
 249          UI     88.     68.     25.     25.     25.     25.      0.      0.      0.      0.
 250          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *

 251          KK  C-S10B
 252          KM   COMBINE THE FLOW COMING SOUTH FROM SUBBASIN S-9 AND THE FLOW FROM SUBBASIN
 253          KM   S-10B. THIS POINT IS LOCATED AT THE NEW RIVER ROAD, APPROXIMATELY 800 FEET
 254          KM   EAST OF SKUNK CREEK
 255          HC       2
              *
1                                          HEC-1 INPUT                                          PAGE
7

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

 256          KK  RS-10B
```

```
257          KM   ROUTE THE FLOW FROM THE POINT C-S10B TO SKUNK CREEK, WHERE IT WILL BE
258          KM   COMBINED WITH THE OTHER FLOWS AND ROUTED TO SUBBASIN S-13
259          KM   FLOW LENGTH IS APPROXIMATELY 800 FEET
260          KM   (THE RM CARDS WILL HAVE TO BE EXAMINED FOR RESONABLENESS)
261          RM       1     .02     .30
             *

262          KK   F-10A
263          KM   THE FINAL CONCENTRATION POINT FOR THE 3 TRIBUTARY STUDY
264          KM   THIS POINT IS IN SKUNK CREEK
265          HC       2
             * DDM   ***** Preserved *****

266          KK    S10R
267          KM    ROUTE S10C THROUGH S13
268          RM       1    0.09    0.25
             * DDM   ***** Updated *****

269          KK     S13
270          KM   BASIN S13
271          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
272          KM    L=      2.7  Lca=      1.2   S=  425.1  Kn= .035  LAG=  24.5
273          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
274          BA    1.27
275          LG     .22     .37    5.30     .23   20.00
276          UI    175.    567.   1109.   1541.   1652.   1043.    851.    680.    503.    406.
277          UI    318.    227.    191.    134.    108.     86.     73.     34.     34.     34.
278          UI     34.     34.      0.      0.      0.      0.      0.      0.      0.      0.
279          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             * DDM   ***** Updated *****

280          KK     S11
281          KM   BASIN S11
282          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
283          KM    L=      2.7  Lca=      1.3   S=  438.1  Kn= .037  LAG=  26.9
284          KM    PHOENIX MOUNTAIN S-GRAPH WAS USED FOR THIS BASIN
285          BA     .92
286          LG     .20     .39    5.70     .19     .00
287          UI    115.    317.    664.    896.   1241.    783.    631.    523.    422.    315.
288          UI    265.    210.    154.    129.     98.     84.     56.     56.     36.     22.
289          UI     22.     22.     22.     22.      0.      0.      0.      0.      0.      0.
290          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             * DDM   ***** Preserved *****

291          KK    S11R
292          KM    ROUTE S11 THROUGH S12
293          RM       3    0.24    0.30
             * DDM   ***** Updated *****
```



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

294          KK     S12
295          KM   BASIN S12
296          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
297          KM    L=      2.8  Lca=      1.3   S=  123.2  Kn= .031  LAG=  29.1
298          KM    DESERT/RANGELAND S-GRAPH WAS USED FOR THE BASIN
299          BA     .91
300          LG     .15     .32    7.60     .09    1.00
301          UI    105.    257.    558.    811.    971.    995.    868.    652.    482.    359.
302          UI    262.    195.    146.    109.     72.     67.     26.     26.     26.     26.
303          UI     26.      0.      0.      0.      0.      0.      0.      0.      0.      0.
304          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             * DDM   ***** Preserved *****

305          KK    S12C
306          KM    COMBINE S11R+S12 (SUBAREAS S11 AND S12)
307          HC       2
             * DDM   ***** Preserved *****

308          KK    S13C
309          KM    COMBINE S10R+S13+S12C       (SUBAREAS S1-S13)
310          HC       3
             * DDM   ***** Preserved *****

311          KK   S13CR
312          KM    ROUTE S13C THROUGH S14
313          RM       2    0.15    0.25
314          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

   46          S1
                V
                V
   57         S1R
                .
                .
   60           .          S2
                .           .
                .           .
   71         S2C............
                .
                .
   74           .          S3
                .           .
                .           .
   85         S3C............
                V
                V
   88         S3R
                .
                .
   92           .        S-6A
                .           .
                .           .
  103       CPS6A............
                .
                .
  107           .          S4
                .           .
                .           .
  118           .           .          S5
                .           .           .
                .           .           .
  130           .         S5C............
                .           V
                .           V
  133           .         S5R
                .           .
                .           .
  138           .           .        S-6B
                .           .           .
                .           .           .
  148           .       CPS6B............
                .           .
                .           .
  152      CS6A-B............
                V
                V
  156      S6AB-R
                .
                .
  161           .        S-6C
                .           .
                .           .
  171       CS-6C............
                V
                V
  175       RS-6C
                .
                .
  180           .       S-10A
                .           .
                .           .
  191      C-S10a............
                .
                .
  195           .          S7
                .           .
                .           .
  205           .           .          S8
                .           .           .
                .           .           .
  215           .         S8C............
                .           V
```

```
                 .          V
   218           .       S8CR
                 .          .
                 .          .
   221      CP10Aa...........
                 .
                 .
   226           .         S9
                 .          V
                 .          V
   237           .        S9R
                 .          .
                 .          .
   241           .          .       S-10B
                 .          .          .
                 .          .          .
   251           .      C-S10B...........
                 .          V
                 .          V
   256           .      RS-10B
                 .          .
                 .          .
   262       F-10A...........
                V
                V
   266        S10R
                .
                .
   269           .        S13
                 .          .
                 .          .
   280           .          .         S11
                 .          .           V
                 .          .           V
   291           .          .       S11R
                 .          .          .
                 .          .          .
   294           .          .          .         S12
                 .          .          .           .
                 .          .          .           .
   305           .          .       S12C...........
                 .          .          .
                 .          .          .
   308        S13C........................
                V
                V
   311       S13CR

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
****************************************
 *                                      *                                                    *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF
ENGINEERS     *
 *              JUL   1997              *                                                    *    HYDROLOGIC
ENGINEERING CENTER    *
 *            VERSION 4.1               *                                                    *          609 SECOND
STREET          *
 *                                      *                                                    *       DAVIS, CALIFORNIA
95616       *
 *  RUN DATE   08OCT98  TIME  08:58:08  *                                                    *           (916) 756-
1104            *
 *                                      *                                                    *
*
 ****************************************
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```

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SKUNK CREEK FOODPLAIN DELINEATION STUDY
CAP AQUEDUCT THROUGH TOWN OF NEW RIVER

100-YEAR 6-HOUR FLOOD HYDROLOGY

METHODS OF STUDY:
- FCD STORM PATTERNS

```
                    - FCD PHOENIX AREA S-GRAPHS
                    - GREEN-AMPT LOSSES
                    - MUSKINGUM STREAM ROUTING
                    - FCD DDMS PROGRAM (VER 1.1, AUG 1995) USED TO COMPUTE PARAMETERS

                    INPUT FILE NAME - new6h.dat

                    MONTGOMERY WATSON
                    MARCH 1996

                    MODIFIED BY FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ON 8/10/98 FOR THE
                    THREE TRIBUTARIES FLOOD DELINEATION.
                    BASINS S11, S12 AND S-13 ADDED TO MODEL ON 10/8/98 BECAUSE WASH IN BASIN
                    S12 WILL BE DELINEATED ALSO

                   DDM MCUHP2 SKUNK CREEK FOODPLAIN DELINEATION STUDY

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

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      5JAN96  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      6JAN96  ENDING DATE
                     NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT

 29 JD          INDEX STORM NO. 1
                       STRM        3.40  PRECIPITATION DEPTH
                       TRDA         .01  TRANSPOSITION DRAINAGE AREA

 30 PI            PRECIPITATION PATTERN
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
                      .03       .03       .05       .05       .05       .15       .15       .15       .03       .03
                      .03       .01       .01       .01       .01       .01       .01       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00

 33 JD          INDEX STORM NO. 2
                       STRM        3.37  PRECIPITATION DEPTH
                       TRDA         .50  TRANSPOSITION DRAINAGE AREA

  0 PI            PRECIPITATION PATTERN
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
                      .03       .03       .05       .05       .05       .15       .15       .15       .03       .03
                      .03       .01       .01       .01       .01       .01       .01       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00

 34 JD          INDEX STORM NO. 3
                       STRM        3.30  PRECIPITATION DEPTH
                       TRDA        2.80  TRANSPOSITION DRAINAGE AREA

 35 PI            PRECIPITATION PATTERN
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
                      .03       .03       .07       .07       .07       .08       .08       .08       .05       .05
```

```
                    .05       .02       .02       .02       .01       .01       .01       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00

  38 JD          INDEX STORM NO. 4
                       STRM        3.16  PRECIPITATION DEPTH
                       TRDA       16.00  TRANSPOSITION DRAINAGE AREA

  39 PI            PRECIPITATION PATTERN
                    .01       .01       .00       .00       .00       .00       .00       .00       .00       .01
                    .01       .01       .00       .01       .00       .00       .00       .00       .00       .00
                    .00       .00       .01       .00       .00       .00       .00       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
                    .03       .03       .06       .06       .06       .07       .07       .07       .04       .04
                    .04       .02       .02       .02       .01       .01       .01       .01       .01       .01
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00

  42 JD          INDEX STORM NO. 5
                       STRM        2.80  PRECIPITATION DEPTH
                       TRDA       90.00  TRANSPOSITION DRAINAGE AREA

  43 PI            PRECIPITATION PATTERN
                    .01       .01       .01       .00       .00       .00       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
                    .03       .03       .05       .05       .05       .05       .05       .05       .04       .04
                    .04       .02       .02       .02       .02       .02       .02       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH  RS-10B.
       REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH  RS-10B.
       REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH  RS-10B.
       REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH  RS-10B.
       REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH  RS-10B.
       REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
1
                                                  RUNOFF SUMMARY
                                          FLOW IN CUBIC FEET PER SECOND
                                        TIME IN HOURS,  AREA IN SQUARE MILES

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

          HYDROGRAPH AT
+                            S1        2744.    4.17        402.        101.         97.       2.08

          ROUTED TO
+                           S1R        2645.    4.50        402.        101.         97.       2.08

          HYDROGRAPH AT
+                            S2        1932.    4.17        254.         64.         61.       1.17

          2 COMBINED AT
+                           S2C        3508.    4.50        628.        157.        151.       3.25

          HYDROGRAPH AT
+                            S3        1614.    4.17        195.         49.         47.       1.03

          2 COMBINED AT
+                           S3C        4342.    4.42        783.        196.        189.       4.28

          ROUTED TO
+                           S3R        4241.    4.67        782.        196.        189.       4.28

          HYDROGRAPH AT
+                          S-6A         481.    4.17         45.         11.         11.        .21

          2 COMBINED AT
+                         CPS6A        4323.    4.67        818.        205.        197.       4.49

          HYDROGRAPH AT
+                            S4        1477.    4.17        176.         44.         42.        .97
```

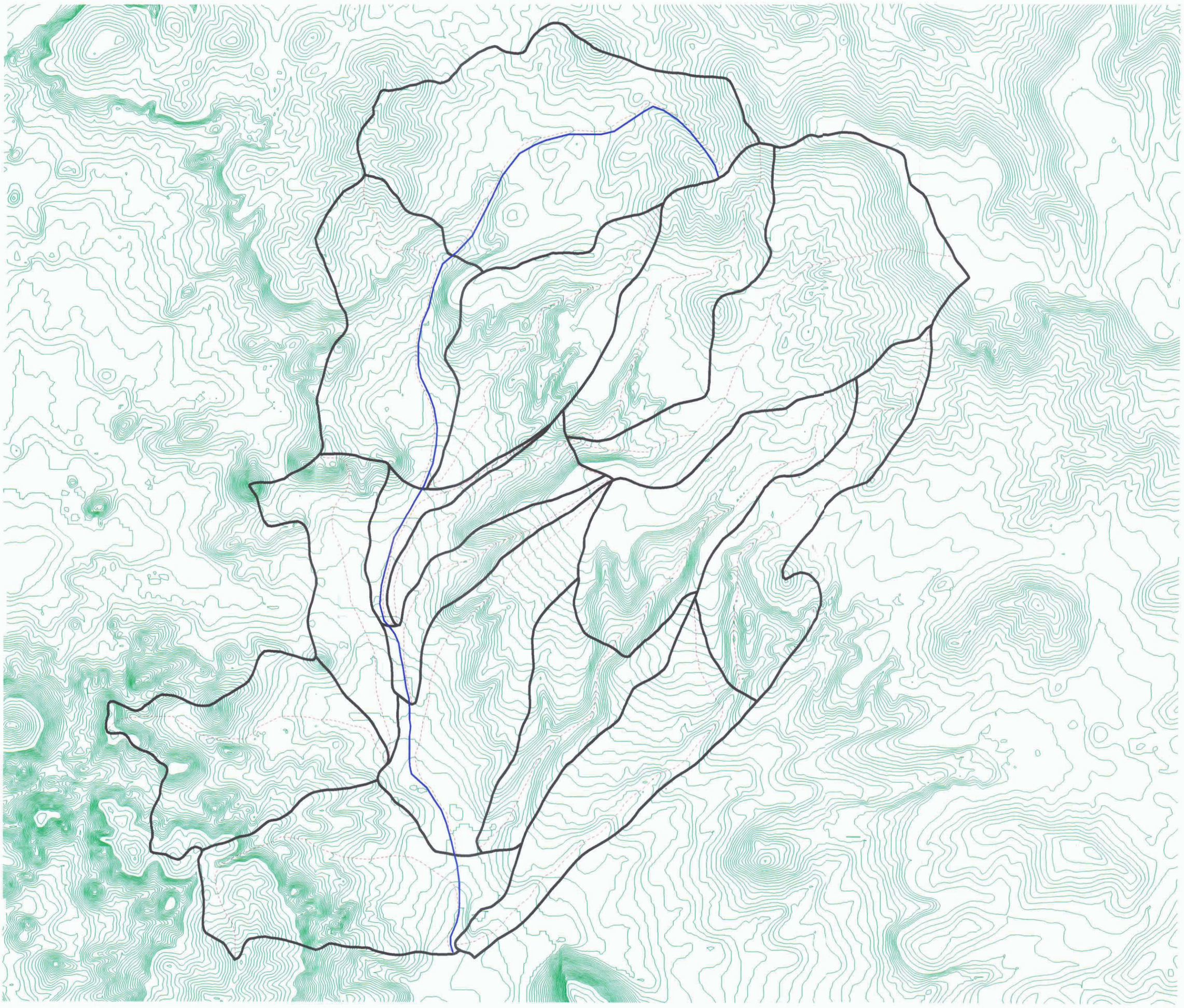
+	HYDROGRAPH AT	S5	1985.	4.33	318.	80.	77.	1.95
+	2 COMBINED AT	S5C	2801.	4.33	463.	116.	111.	2.82
+	ROUTED TO	S5R	2686.	4.67	463.	116.	111.	2.82
+	HYDROGRAPH AT	S-6B	865.	4.17	79.	20.	19.	.38
+	2 COMBINED AT	CPS6B	2828.	4.67	525.	131.	126.	3.20
+	2 COMBINED AT	CS6A-B	6532.	4.67	1254.	314.	302.	7.69
+	ROUTED TO	S6AB-R	6463.	4.75	1254.	314.	302.	7.69
+	HYDROGRAPH AT	S-6C	758.	4.17	72.	18.	17.	.34
+	2 COMBINED AT	CS-6C	6564.	4.75	1306.	327.	315.	8.03
+	ROUTED TO	RS-6C	6404.	4.92	1306.	327.	315.	8.03
+	HYDROGRAPH AT	S-10A	1778.	4.25	214.	53.	51.	1.14
+	2 COMBINED AT	C-S10a	6600.	4.92	1461.	366.	352.	9.17
+	HYDROGRAPH AT	S7	1322.	4.25	156.	39.	38.	.68
+	HYDROGRAPH AT	S8	1830.	4.17	202.	51.	49.	1.12
+	2 COMBINED AT	S8C	2652.	4.25	342.	86.	82.	1.80
+	ROUTED TO	S8CR	2576.	4.33	342.	86.	82.	1.80
+	2 COMBINED AT	CP10Aa	7330.	4.83	1722.	431.	415.	10.97
+	HYDROGRAPH AT	S9	1426.	4.25	184.	46.	44.	1.02
+	ROUTED TO	S9R	1346.	4.50	184.	46.	44.	1.02
+	HYDROGRAPH AT	S-10B	1249.	4.17	122.	30.	29.	.66
+	2 COMBINED AT	C-S10B	1820.	4.33	285.	71.	69.	1.68
+	ROUTED TO	RS-10B	1824.	4.42	285.	71.	69.	1.68
+	2 COMBINED AT	F-10A	8113.	4.75	1920.	481.	463.	12.65
+	ROUTED TO	S10R	8072.	4.83	1920.	481.	463.	12.65
+	HYDROGRAPH AT	S13	1876.	4.17	263.	66.	63.	1.27
+	HYDROGRAPH AT	S11	1344.	4.25	168.	42.	40.	.92
+	ROUTED TO	S11R	1264.	4.50	168.	42.	40.	.92

	HYDROGRAPH AT						
+	S12	1509.	4.25	202.	51.	49.	.91
	2 COMBINED AT						
+	S12C	2255.	4.42	352.	88.	85.	1.83
	3 COMBINED AT						
+	S13C	9588.	4.67	2368.	594.	572.	15.75
	ROUTED TO						
+	S13CR	9534.	4.83	2368.	594.	572.	15.75

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

Appendix D

Flow Paths for
Skunk Creek 3 Tributaries
Floodplain Delineation Study



Skunk Creek Alignment
Tc13.shp
Tc8.shp
Tc7.shp
Tc3.shp
Tc2.shp
Tc1.shp
Tc4.shp
Tc5.shp
Tc9.shp
Tc11.shp
Tc12new.shp
Tc6b.shp
Tc6c.shp
Tc6a.shp
Tc10b.shp
Tc10a.shp
Figure2basins.shp
Daisymtn.shp

N

0 2000 4000 6000 8000 10000 Feet

Appendix E

HEC-1 SCHEMATIC
of
CONTRIBUTING WATERSHED

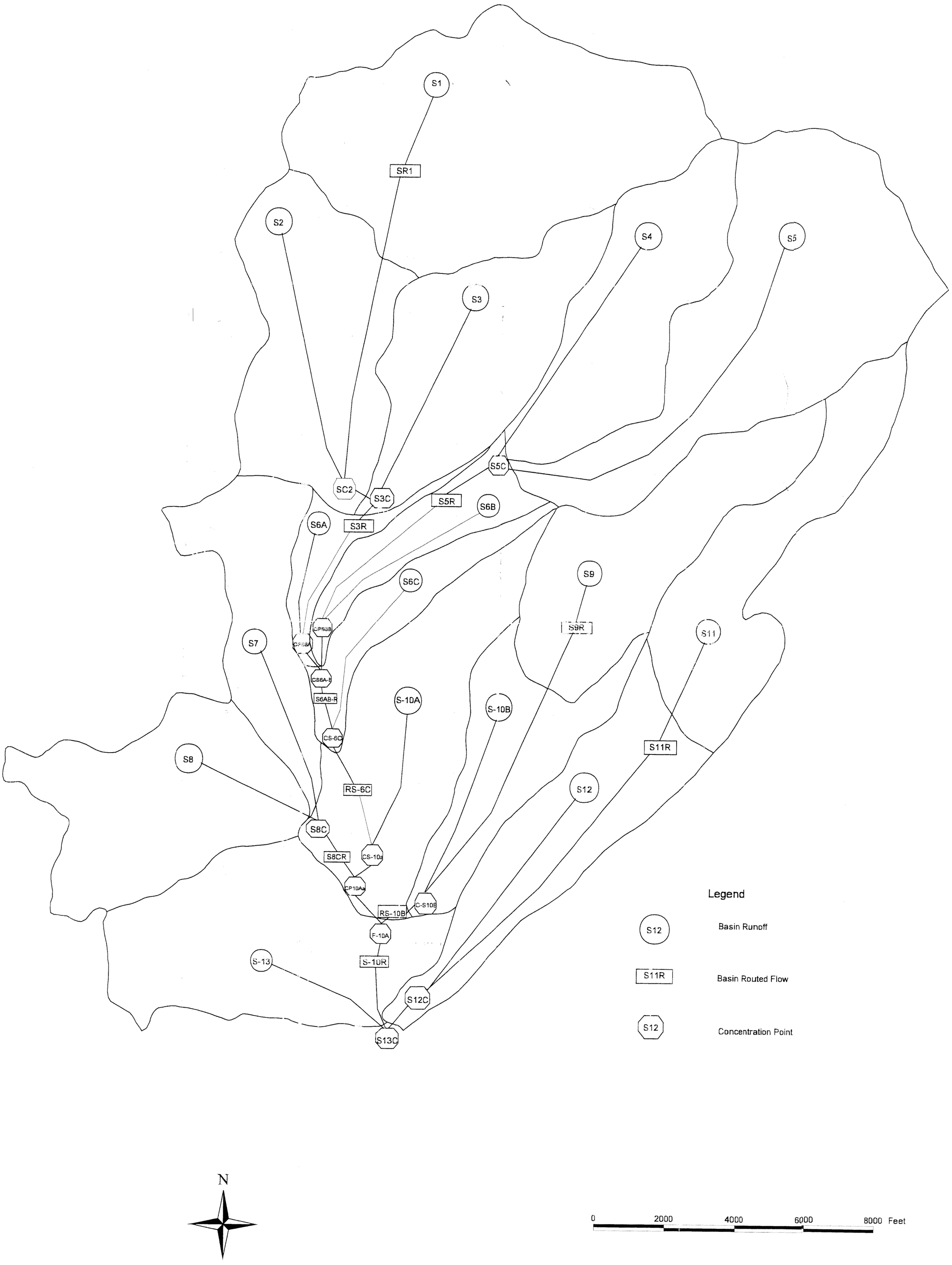


Figure 3