

**SUN CITY AREA HYDROLOGIC STUDY**

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**Prepared by**

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**DRAFT**

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## 1.0 INTRODUCTION

### 1.1 General Description

The Sun City Area had undergone a period of urbanization with several drainage structures constructed to minimize flooding problems. The Flood Control District of Maricopa County is at present maintaining some 13 structures, 9 of which drain to the Agua Fria River. However a large part of the watershed drains to New River through a well planned major channel along the north side of the rail road and Grand Avenue. A major portion of the watershed south of Grand Avenue drains to New River through a channel along Olive Avenue.

### 1.2 Purpose

In view of the lack of hydrology for the area, the District decided to conduct this study in order to have some estimate of peak flows especially at major storm water concentration points. There is lack of information on what are the design capacity of the drainage structures already in place. It is anticipated that the peak flow estimates can be useful for planning and design of storm drainage systems in the area.

### 1.3 Location

The study area is located in northwest Metropolitan Phoenix as shown in Fig. 1. It is bounded on the west by Youngstown and the Agua Fria River, on the north and east by the City of Peoria and New River, and on the south by the City of Peoria. The total watershed area is about 16 sq. miles with about 0.7 sq. miles offsite watershed north of Beardsley Road. Figure 1a shows local streets and drainage features in relation to the study area.

### 1.4 Agencies

The study is conducted in coordination with Maricopa County Department of Transportation which took over the projects upon completion by Del Webb corporation. The District took over the responsibility for the operation and maintenance of the drainage system.

## 2.0 REVIEW OF HYDROLOGY STUDIES

### 2.1 Beardsley Channel

The District conducted a hydrological study entitled "Beardsley Channel Extension Design Hydrology" in December 1990. The objective was to "develop a 100 year peak discharge for the Beardsley channel at 111<sup>th</sup> Avenue. It included a watershed area of 4.75 sq. miles with a 100yr-6hr storm of 3.2" The estimated peak flow from the HEC-1 model is 1423 cfs or a unit peak discharge of only 300 cfs/sq. mile which reflects the existing

# PROJECT LOCATION MAP

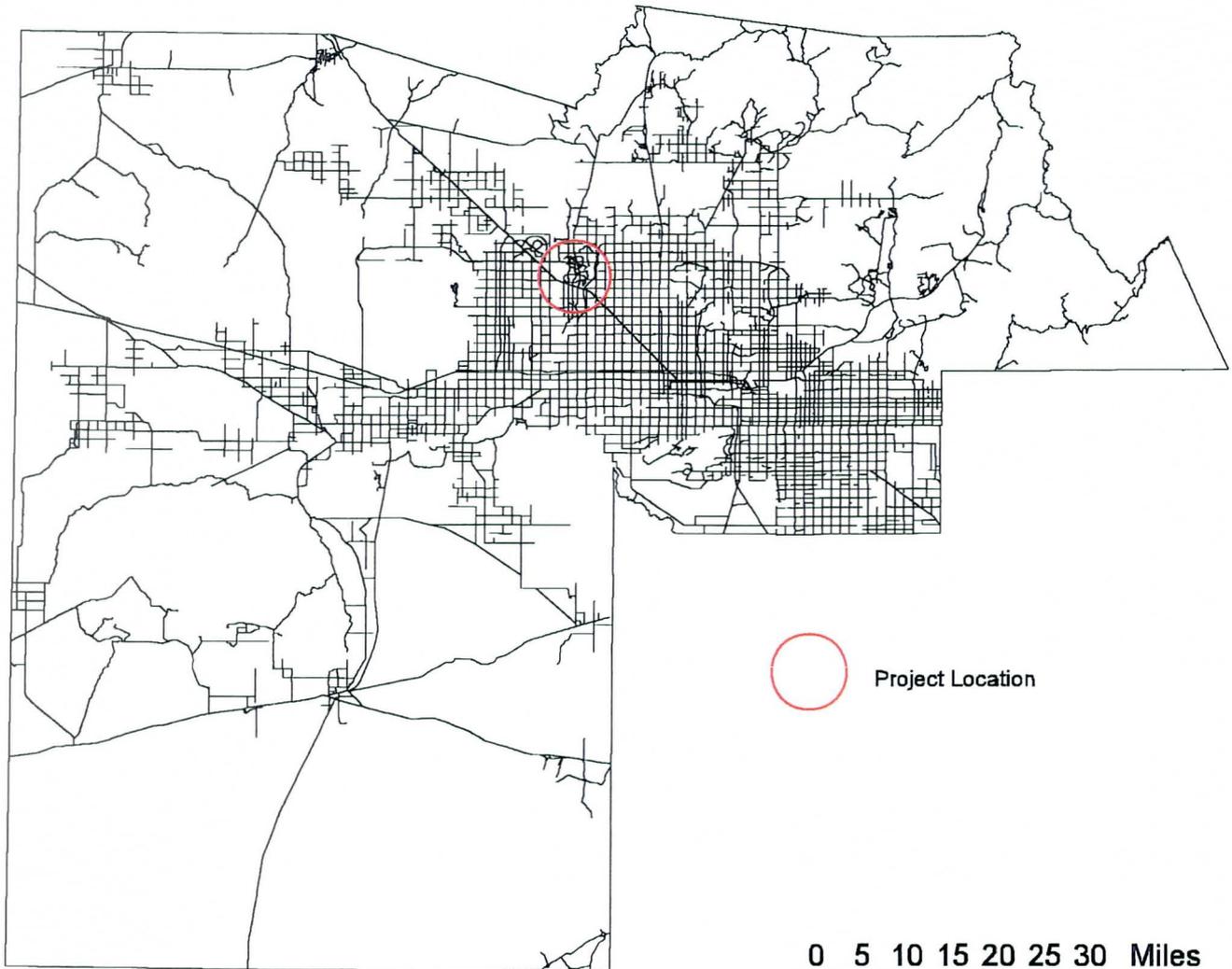
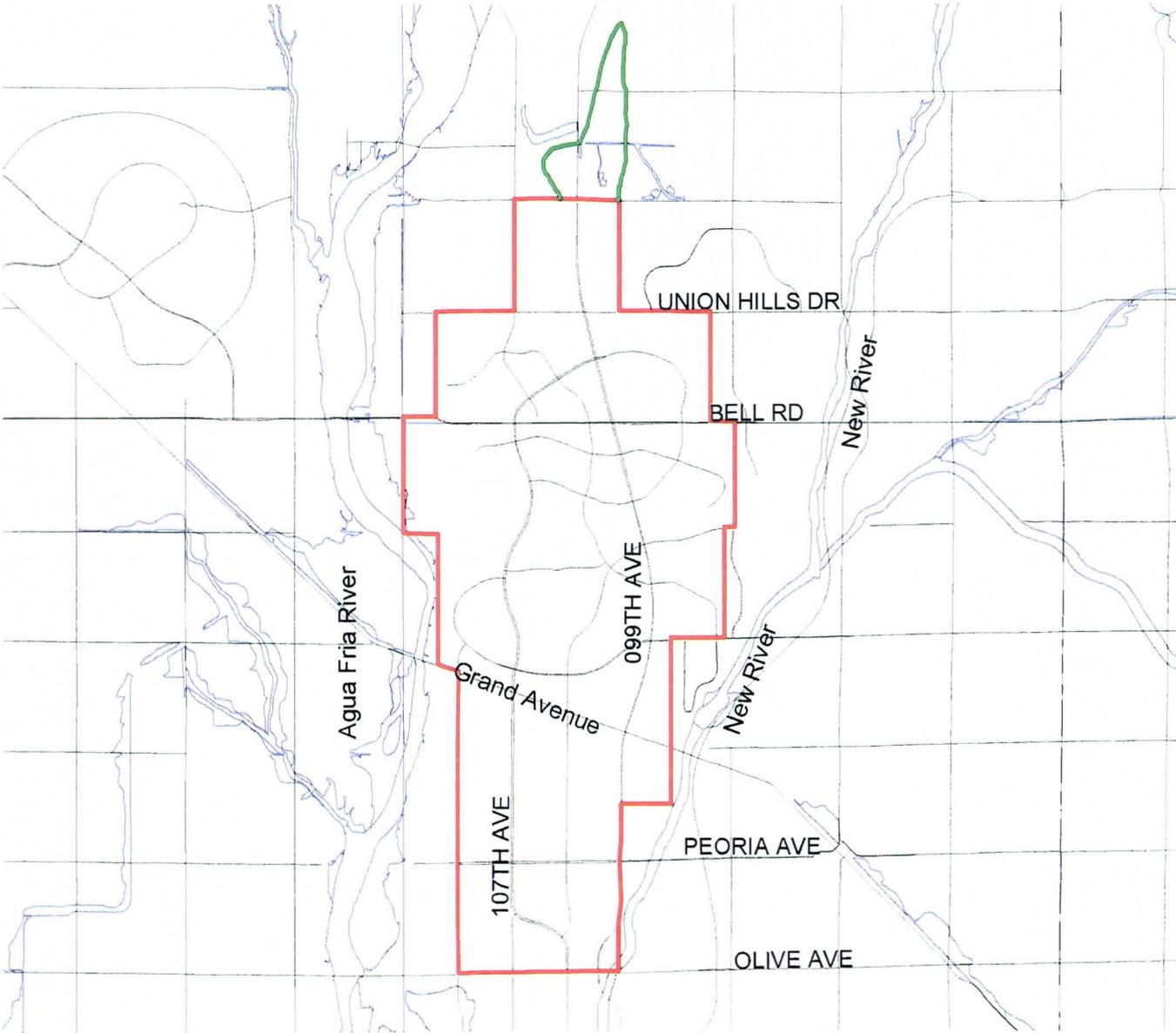


Figure 1

# Project Vicinity Map



0 0.5 1 1.5 2 2.5 Miles



Sun City Boundary Outlined in Red  
Offsite Watershed Boundary Outlined in Green

Fig. 1a

condition at the time of the study. Sub-basin A with concentration point at the intersection of 99<sup>th</sup> Ave and Beardsley Rd has an area of 2.53 sq. miles. This is greater than the sub-basin delineated in another hydrological report which excluded the recent subdivision project north of Beardsley Road on the assumption of 100% retention of the 100yr-2hr storm..

## 2.2 Drainage Report for Ventana Lakes

The Ventana Lakes development is located north of Beardsley Road between 99<sup>th</sup> Avenue and 111<sup>th</sup> Ave. An undated drainage report prepared by Collar, Williams & white Engineering, Inc for the Adams Groups shows Sub-basin 6 which has a concentration point at 99<sup>th</sup> Avenue and Beardsley Road as having a drainage area equal to 416 acres (0.65 sq. miles). The 100yr peak Q is 271 cfs and therefore the unit peak Q is 417 cfs/sq. mile.

## 2.3 Hydrology Update for 91<sup>st</sup> Avenue Drain

The District conducted a hydrological study for the 91<sup>st</sup> Avenue watershed north of Greenway Road and east of the Sun City project area. The western boundary more or less corresponds to the eastern boundary of Sun City. The study covers 9.7 sq. miles with minimal storm runoff contribution from the Sun City area. Along Union Hills Drive the bleed off runoff from Westbrook Village West drains towards 91<sup>st</sup> Avenue.

## 2.4 99<sup>th</sup> Avenue Road Improvement Project

A report entitled "Preliminary Drainage Report for Intersection Improvements of 99<sup>th</sup> Avenue, Bell Road to Thunderbird Road" was prepared by Hendrich, Eberhart & Associates, Inc for MCDOT in August 1995. The study included the hydrology and hydraulics of the 99<sup>th</sup> Avenue drainage system. The HEC-1 model centers on 99<sup>th</sup> Avenue from Beardsley road to Thunderbird Road. The watershed area is 4.4 sq. miles which is divided into 8 subareas with concentration points located in 6 intersections along 99<sup>th</sup> Avenue where there is a proposed MCDOT road improvement project.

The report shows that the contributing watershed to the existing culvert at 99<sup>th</sup> Avenue and Beardsley Road intersection is 350 acres. However, the Parkridge I & II subdivision which is approximately 100 acres provided for retention of the 100yr-2hr storm. Thus, it was assumed that only the net contributing area of 250 acres will affect the existing culvert at the intersection of 99<sup>th</sup> Avenue and Beardsley road. Using the result of the previous FCD study for the Beardsley Channel hydrology and a rough assumption of doubling the cfs/acre, it was assumed that the Beardsley channel will "divert the runoff up to and including the 50year storm to Agua Fria River and out of the 99<sup>th</sup> Avenue watershed.

Another related report entitled "Final Geometric Concept and Drainage Report-Appendix" was prepared by Post, Buckley, Schuh & Jernigan, Inc. dated December 1995. This was an addendum to the 99<sup>th</sup> Avenue Intersection Improvement Project Report. The

report primarily deals with cost estimates of selected alternatives and a HEC-2 run for the 99<sup>th</sup> Avenue drainage channel.

Appendix K shows the HEC-1 model that was developed for 99<sup>th</sup> Avenue along with the schematic watershed flow diagram.

### 3.0 ASSESSMENT OF EXISTING DRAINAGE STRUCTURES

#### 3.1 Del Webb Boulevard Channel

A triangular channel located between the left and right lane of 99<sup>th</sup> Avenue begins a few hundred feet south of Beardsley Road and ends at intersection of Del Webb Boulevard and 99<sup>th</sup> Avenue. The existing 5 barrel 48" culvert pipe was reported to have a capacity to divert 500cfs into the Del Webb trapezoidal channel before overtopping. The channel is located between the right and left lanes of Del Webb Boulevard. A split flow analysis shows the following results:

HW Elev(ft)	INFLOW	CULVERT FLOW	OVERTOPPING FLOW	OVERFLOW DEPTH (FT)
1209.8	503	503	0	0.0
1210.7	700	594	105	0.9
1210.9	800	612	184	1.1
1211.1	900	630	270	1.3

The 5-barrel culvert makes a 90 degrees turn and outlets into the Del Webb Boulevard channel. It was assumed the flow rate of 500 cfs at the intersection represents a 10 year storm event.

#### 3.2 99<sup>th</sup> Avenue Channel

The main 99<sup>th</sup> Avenue channel extends from Bell Road through Thunderbird Road continuing to Grand Avenue and southeasterly to New River. It was built in 1970-1971 as part of the roadway project of MCDOT. The channel has 2 to 3 feet bottom width and 4.5 to 5.5 side slopes. Depth varies from 4 to 5 feet and bed slope from 0.0020 to 0.0030 ft/ft. Channel capacity on the portion north of Thunderbird Rd is about 850 cfs and then about 1210 cfs on the portion south which has bottom width of 7.0 ft and side slope of 3.5 to 4.1. A long box culvert is being constructed across Thunderbird Road to facilitate left and right turns at the intersection. According to Mike Smith of MCDOT it was designed to handle 2-5 years storm runoff.

Based on analyses of existing features included in Hendrich, Eberhart & Associates, Inc. report the capacity of existing drainage structures is not adequate to discharge the 100yr flows. Table 1 shows the channels capacity at 2 locations. Table 2 shows existing culvert

data. Appendix L shows design details as reported in the Hendrick, Eberhart & Associates report. As stated in the report the "existing channel and culvert system is incapable of containing the 5-year storm runoff at Thunderbird Road."

Table 1- Existing Channel Capacities

Cross Section Location	W/1' of Freeboard	W/0' of Freeboard	W/One Lane Open
Burns Dr., 130' d.s. of CL	455	845	1045
T-bird Rd. 125' d.s. of CL	500	1210	1425

Table 2 - Existing Culvert Data

CULVERT LOCATION	EXISTING CAPACITY	LENGTH (FT)	CULVERT SIZE
Hutton Dr	500	102	2 - 10' x 4'
Burns Dr	720	58	2 - 10' x 4'
Greenway Rd.	700	80	2 - 10' x 4'
Boswell Blvd.	630	58	2 - 10' x 4'
Cameo Dr	700	47	2 - 10' x 4'
Thunderbird Rd	720	58	2 - 10' x 4'

The consultant concluded that "the drainage facilities for 99<sup>th</sup> Avenue Bell Road to Grand Avenue is very inadequate".

### 3.3 Mountain View Road Channel

A small rectangular channel runs between the left and right lane of Mountain View Road starting south of Peoria Avenue. Designated as the Mountain View Road Channel it receives most of the storm runoff south of Grand Avenue. It conveys flow to a trapezoidal channel along Olive Avenue and then to a box culvert diagonally crossing the intersection of 99<sup>th</sup> Avenue and Olive Avenue and finally discharges into New River. The channel starts with a shallow rectangular cross-section gradually becoming larger as it approaches 103<sup>rd</sup> Avenue. Just downstream of a box culvert having 9' x 4' dimensions (crossing 103<sup>rd</sup> Avenue), the channel has a bottom width of 10', side slopes of 2:1 and 5 to 6 foot depth.

### 3.4 Other Drainage Channels

Several other channels are being maintained by FCD. The biggest one runs north of Grand Avenue, parallel to the railroad from Del Webb Blvd to Agua Fria. A box culvert about midway between 107<sup>th</sup> and 111<sup>th</sup> Avenue collects most of the runoff from the north. Other channels of relatively small sizes collect runoff from smaller watersheds for direct

discharge into Agua Fria River. These channels are located on the western boundary of the project area north watershed.

Table 3 shows listing of drainage structures that are currently maintained by the District. Figure 2 shows the location of the FCD maintained drainage channels. Appendix A shows rough AutoCad drawings of the structures based on field measurements using a tape.

#### 4.0 HEC-1 MODEL FORMULATION

##### 4.1 Data Collection

###### 4.1.1 Topographic Maps

The project area is covered by USGS Quad sheets Calderwood Butte and El Mirage dated 1957. The Calderwood Butte sheet was photorevised in 1981 with 10 foot contour intervals based on National Geodetic Vertical Datum of 1929. It already includes the development north of Greenway Road. The El Mirage sheet has 5 foot contour interval with datum mean sea level. The southeast lowest contour elevation at intersection of 99<sup>th</sup> Ave and Olive Ave is 1100' and the northeast highest contour elevation is 1300'.

The eastern part of the area is covered by recent topographic mapping by Kinney Aerial Mapping, Inc. using an aerial photo flown on April 16, 1991. This is part of the ACDC Area Drainage Master Study contract. The maps have 1"=400' scale and contour interval of 2 feet.

###### 4.1.2 Rainfall Data

The 100yr-6hr storm and the 100yr-24hr storm are taken from NOAA Atlas isopluvial maps as included in the FCDMC Drainage Design Manual Vol. 1. For the project area the 100yr-6hr rainfall is 3.12" and is assumed uniform over the whole area for purposes of the modeling. The 100yr-24hr rainfall is 3.8" and has been reduced in each of the models by areal reduction. Program MCUHP1 was used to generate the rainfall distributions for each of the storms. Program "PREFRE" was used in the 99<sup>th</sup> Ave drainage study.

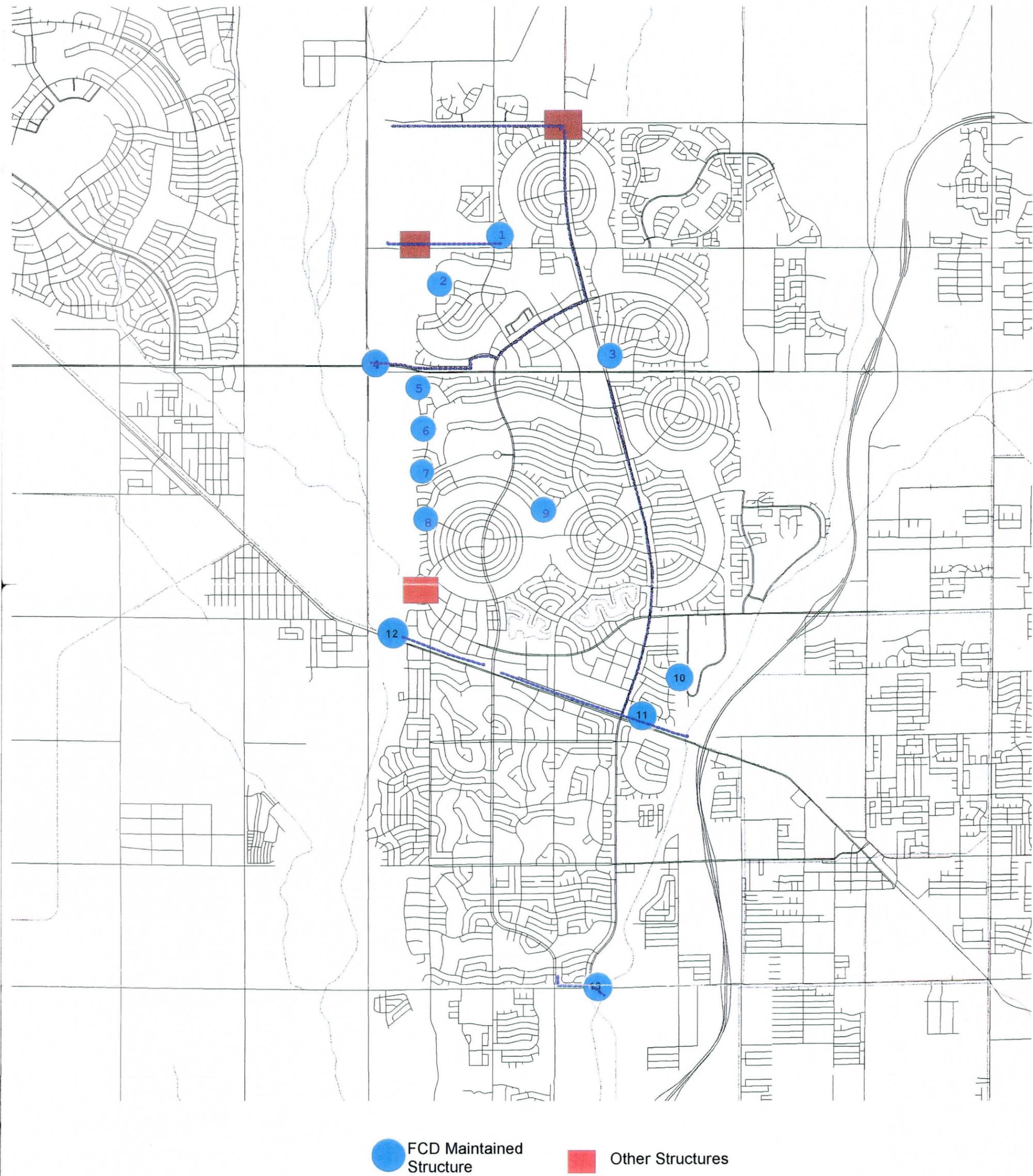
###### 4.1.3 Soils and Lands Use

The area is covered in Soil Survey of Maricopa County, Central County part as published by the U.S. Soil Conservation Service. Soils data for the county have already been stored in the FCD GIS system. In addition, land use information is also stored and therefore it is a matter of retrieval. Steve Bruffy of the GIS Group prepared the Soils and Land Use data for the project area. Fig. 3 shows the soils type distribution and Figure 4, the land use types based on MAG standard land use classification.

**Table 3- Drainage Channels Being Maintained by Flood Control District in Sun City**

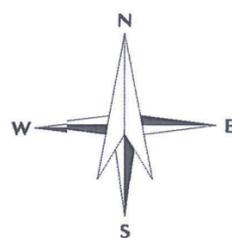
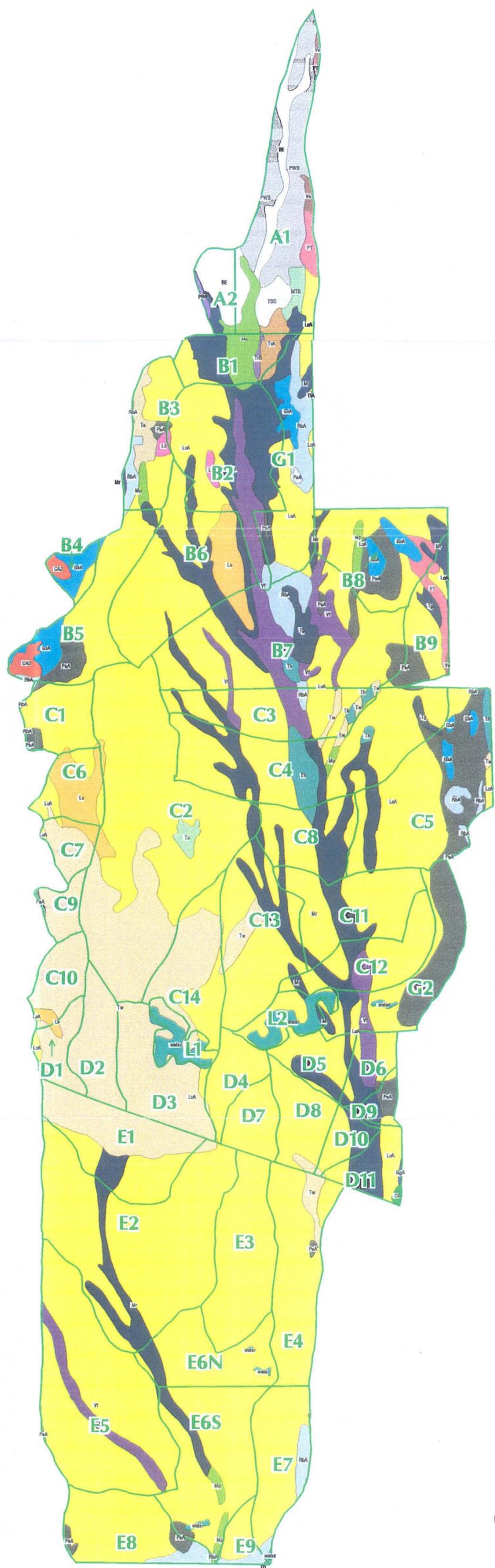
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- 1 Begins west of Kiva Dr. on Carob and flows into the intersection of 107th. Ave. and Union Hills Dr. A small trapezoidal channel of bottom width 15' , side slope of 2:1, and depth of 2'. It drains into the centerline of 107th Ave & Union Hills Dr.
  - 2 . Begins north of Acacia on Willowbrook and enters into the Aqua Fria River
  3. Parallels Bell Rd. north of the post office from 98th. Ave. to 99th. Ave .There are two side drains which enter the main drain. They begin on Wrangler Dr. at Appaloosa Dr. and Foothills Dr.
  4. Begins at Del Webb Blvd. north of Bell Rd. and the Safeway/Osco shopping center, it then turns south toward Bell Rd. and then goes west paralleling Bell Rd. toward the Aqua Fria River. at 115th. Ave. Thent it goes south paralleling a trailer court.
  5. Begins at 111th. Ave. and Crestbrook then flows into the Aqua Fria River.
  6. Begins at the intersection of 111th. Ave. and Summerset then enters the golf course.
  7. Begins at the end of Gulf Hills Dr. north of Edgewood then flows into the golf course.
  8. Begins at the intersection of Waikiki Dr and Aqua Fria, paralleling the Sun City Water Company entrance. The drain flows into the Aqua Fria River. Begins west of the intersection of Maede and White Mountain, then flows into the golf course.
  - 10 The west end starts at Lake Forest Dr. between Forrester and Emberwood, then travels east outside the Sun City boundary wall, then goes south and ends at the end of the lined section.
  - 11 Parallels Grand Ave. north of the railroad track from the New River to 103rd. Ave.
  - 12 Parallels Grand Ave. north of the railroad track beginning at Del Webb west to the Aqua Fria River.
  - 13 Parallels the north side of Olive Ave. from 99th. Ave. to 103rd. Ave.
- 

\*Scanned from Sun City Area Map provided by Duke Yager, 7/9/97



**FIGURE 2 – LOCATION MAP OF FCD MAINTAINED DRAINAGE CHANNELS**  
 (ID number shown in circle are described in Table 3)

# Soil Types in the Sun City Study Area



	BE		RbA
	CA2		TD
	Cb		TSC
	GgA		Te
	GxA		TfA
	Lb		Tg
	LcA		Th
	Le		TrA
	MTB		TrB
	Mp		Tu
	Mr		Tw
	PRB		Ve
	PT		Vf
	PWB		Vh
	PeA		water
	PsA		

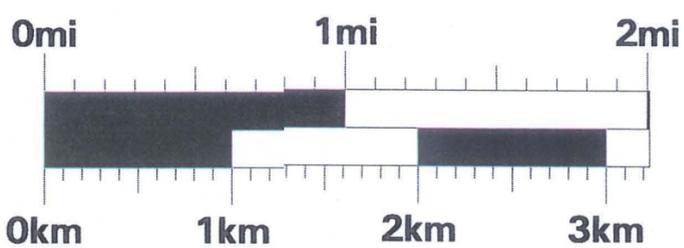
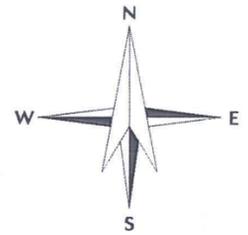
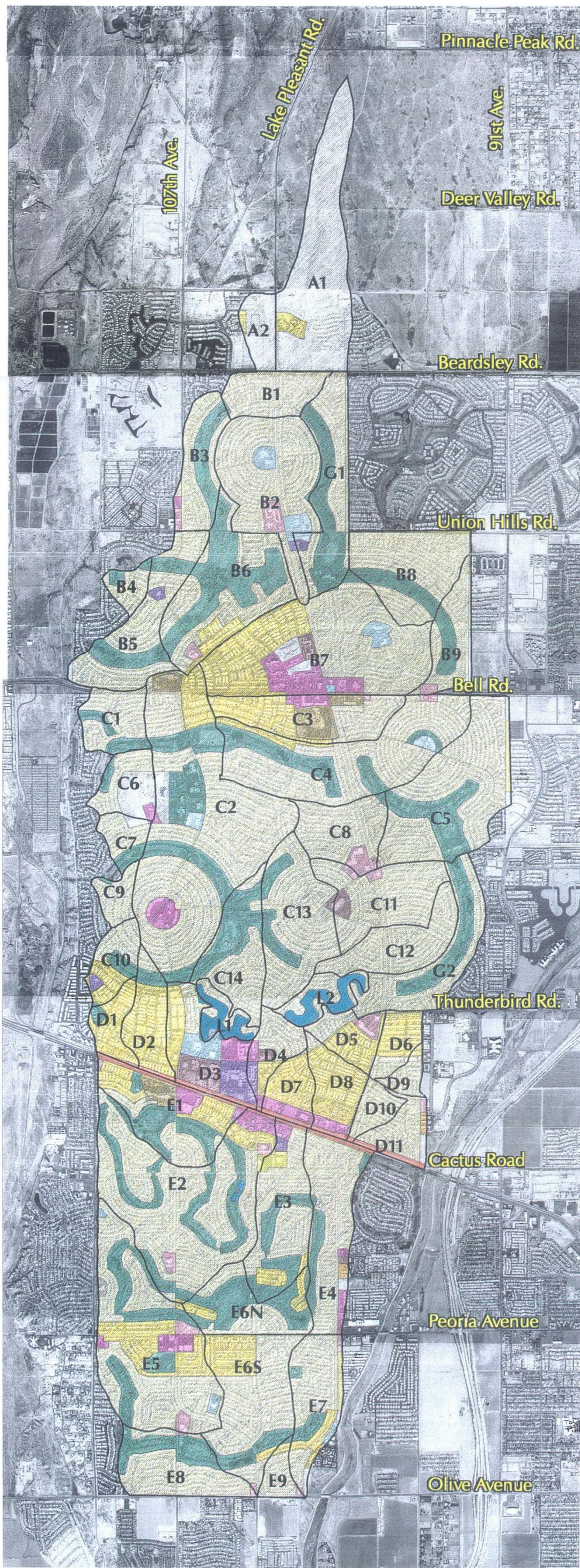


FIGURE 3 – SOILS TYPE IN SUN CITY AREA

# Landuse Types in the Sun City Study Area



- Agriculture
- Community Retail Center
- High Density Residential
- Hotel, Motel or Resort
- Institutional
- Large Lot Residential
- Medium Density Residential
- Neighborhood Retail Center
- Office
- Public Facility
- Recreational Open Space
- Rural
- Small Lot Residential
- Transportation
- Vacant
- Water

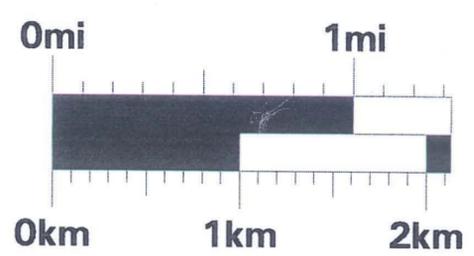


FIGURE 4 – LAND USE TYPES IN SUN CITY AREA

Fig. 4

Table 4 - Lookup Table for Land use Parameters

Land Use	M.Condition	%Veg.Cover	RTIMP(%)	Initial Abs	Roughness	
Vacant	DRY	10	5	0.1	0.02	Min
S.L.R	NORMAL	30	10	0.3	0.05	Low
Public	NORMAL	50	15	0.3	0.05	Low
M.D.R.	NORMAL	50	30	0.25	0.05	Low
H.D.R.	NORMAL	50	45	0.25	0.05	Low
Office	NORMAL	50	45	0.25	0.05	Low
Transportation	NORMAL	60	70	0.15	0.03	Min
Commercial	NORMAL	75	80	0.1	0.02	Min
Recreational	NORMAL	90	5	0.2	0.1	Hi

The above table was a result of slight modification of the default land use table in the DDMS taking into consideration the land use classification used in the sub-basin delineation.

#### 4.1.4 Field Observations

Several field trips to the area were made to observe soils and land use type especially for undeveloped or open areas. The area north of Beardsley Road has been undergoing urbanization lately and therefore adjustment of percent impervious data was made. Most of the golf courses were not designed to store runoff.

#### 4.2 Watershed Boundary

As a result of several inspection trips to the area it was decided to subdivide the Sun City area into a watershed north of Grand Avenue and a watershed south of Grand Avenue. The railroad is elevated and it is assumed that there is a small probability of water from the north overtopping the railroad. The open drainage channels on the north side of the railroad were inspected for flow diversion through underground pipes, but there is no sufficient evidence of active pipe flow southward.

Figure 5 shows the sub-basin delineation in the north watershed and Figure 6 shows the sub-basin delineation in the south watershed. Also shown are the major flow routing systems that have been identified.

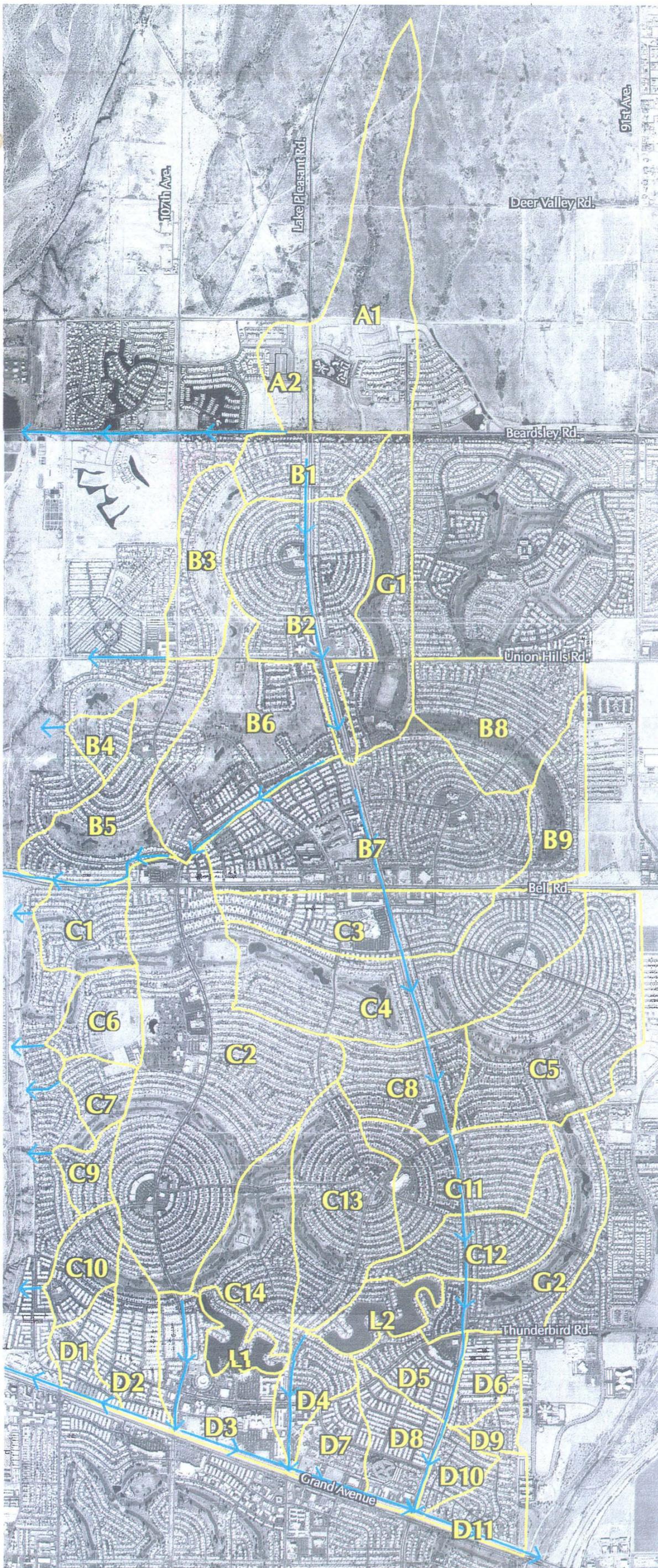
The east boundary was taken as the Sun City boundary with the City of Peoria. This is the western watershed boundary of a previous hydrological study conducted by the District in coordination with the City of Peoria for the 91<sup>st</sup> Avenue watershed north of Greenway Road. The western boundary of the project southern portion is approximately taken as the boundary with the Town of Youngtown along 111<sup>th</sup> Avenue.

#### 4.3 Sub-basin Delineation

Basically the sub-basins were delineated using the available topographic maps. The actual boundaries were confirmed through several field visits in the area. Figures 5 and 6

# Sun City Area Hydrological Study

## North Half



— Basins  
— Flowpaths

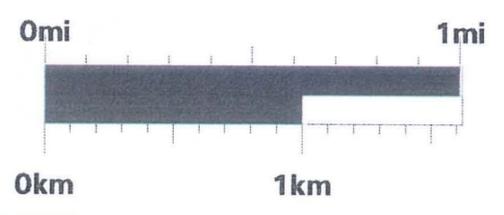


FIGURE 5 – SUB-BASIN DELINEATION OF NORTH WATERSHED

Fig. 5

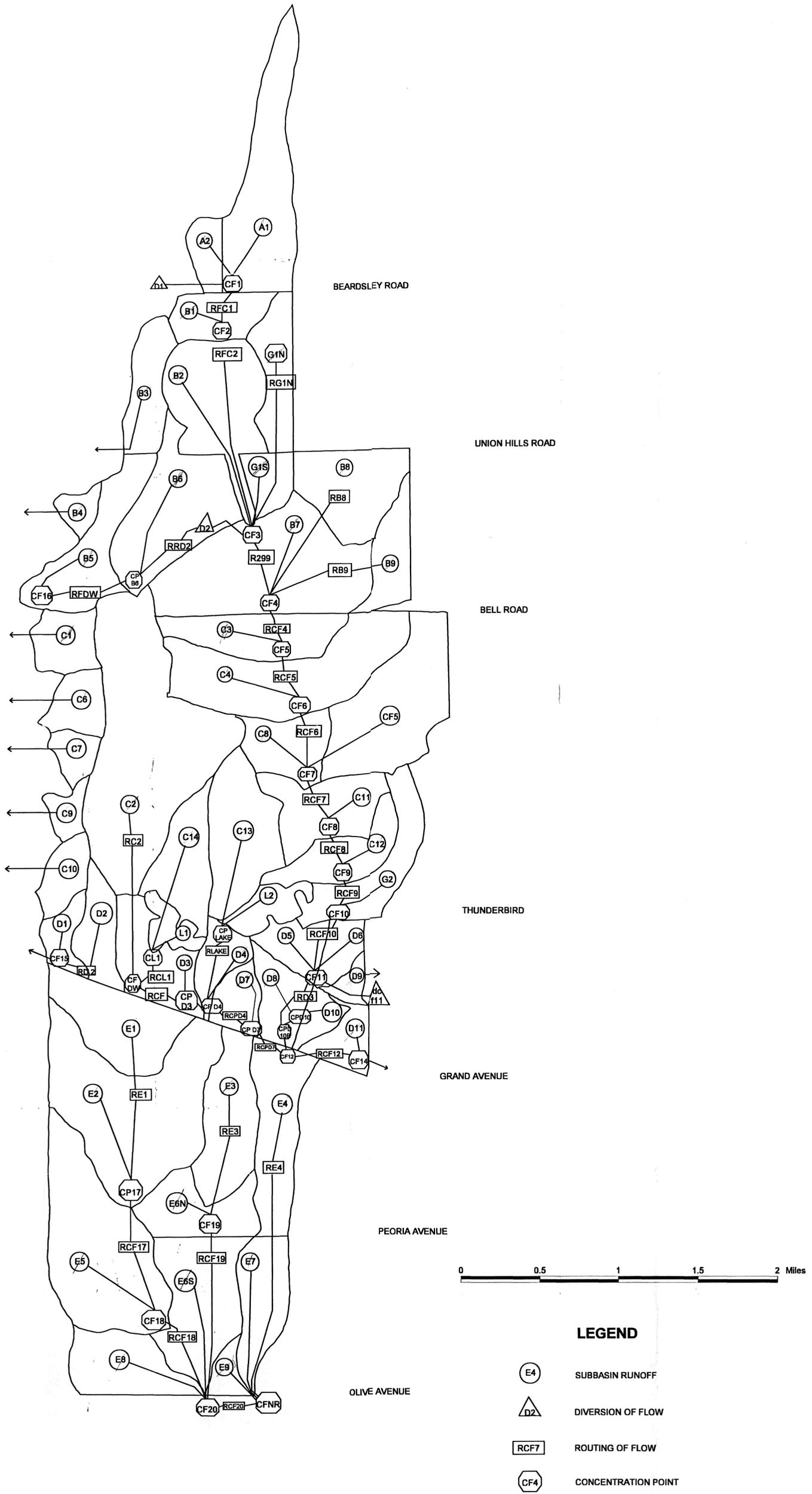
# Sun City Area Hydrological Study

## South Half



FIGURE 6 – SUB-BASIN DELINEATION OF SOUTH WATERSHED

# SCHEMATIC DIAGRAM OF SUN CITY AREA



show the sub-basin delineation. These are also the basis for estimating the soils and land use loss parameters.

The 99<sup>th</sup> Avenue HEC-1 model as previously reported was slightly modified to combine some of the golf course with the surrounding areas. As much as possible the location of identified concentration points are maintained to match the MCDOT proposed culvert locations along 99<sup>th</sup> Avenue.

Most of the major streets in the area are lower than the general individual lot elevation and were thus assumed to convey most of the storm runoff. As used in the previous hydrological study by Hendrich, Eberhart & Associates, Inc. the 99<sup>th</sup> Avenue drainage channel is a major runoff collector of the northern watershed.

#### 4.4 Green and Ampt Parameters

As recommended in the FCD Drainage Design Manual Volume I – Hydrology, the rainfall loss parameters were based on Green and Ampt estimates. The Drainage Design Menu System (DDMS) was used to determine the loss parameters with the input of soil types and land use for each delineated sub-basin. Appendix C summarizes the soil and landuse breakdowns for each of the subbasins.

#### 4.5 HEC-1 Model

Using the DDMS as developed by FCD the various data for each sub-basin were entered into the input table. The required parameters are subsequently displayed and checked for accuracy. After entering all the required data for the sub-basins the MCUHP1 Option was run within the DDMS.

As mentioned previously the study area was divided into a north portion and a south portion. Each portion was modeled using the 100yr-6hr storm and the 100yr-24hr storm. Therefore there are 4 models for the study area. Each 100yr-6hr model used the single storm assumption using a rainfall depth of 3.12". This point rainfall was reduced for each model based upon the area of the contributing watershed. The 100yr-24hr models used a point rainfall of 3.8". Areal reduction was applied to each model up to the size of the entire contributing watershed for that model.

The necessary routing reaches, combination or concentration points, and diversions points were added into the HEC-1 data file as created using DDMS.

Three diversion points were identified. Flow from Sub-basins A1 and A2 collects at intersection of Beardsley Rd. and 99<sup>th</sup> Avenue. The Beardsley channel along the south side of Beardsley Road could divert as much as the 50yr peak flow into Agua Fria River. At the intersection of Del Webb Boulevard and 99<sup>th</sup> Avenue flow is diverted into Del Webb channel which is also located in the road median through 5-36" concrete pipe culverts. The last diversion point is a box culvert some 50 feet upstream of 99<sup>th</sup> Ave intersection with Grand Avenue.

Appendix D contains a schematic diagram of the sub-basins and their routing paths as reflected in the HEC-1 output file.

## 5. HEC-1 MODEL RESULTS

### 5.1 Model Output

Appendices E through H show the HEC-1 model output files for each of the modeled areas and storm duration. With several smaller sub-basins draining directly to Agua Fria River on the western boundary, the original model resulted in an error for "too many hydrographs" which cannot be combined further. This did not affect the peak discharge estimates. However, for the sake of eliminating confusion and having a clean output, several "fake" combination points were added. This effectively eliminated the error statements.

### 5.2 Peak Discharge

Appendix I shows the sub-basin peak discharge and concentration point peak discharge. The unit peak discharge are also shown for purposes of checking on the reliability of results as compared with normally expected unit peak discharge of nearby hydrologic studies.

### 5.3 Channel Routing Results

The normal depth method was used to route flow through sub-basins and assumed drainage channels. Cross-sections of existing channels are used in the model with the leftmost and rightmost points slightly elevated in an attempt to eliminate warning messages in the output concerning routed outflows. All of the warnings occurred in the north area models (100yr-24hr and 100yr-6hr) for the 99<sup>th</sup> Avenue channel below basin C8 and the channel carrying flows along Grand Avenue. This occurs because the channels do not have enough capacity to contain the flows generated by the contributing drainage areas. Table 5 shows flows at various points within the major channels and the corresponding full capacity flow as calculated by Flowmaster for Windows.

Table 5.  
HEC-1 Model Flow and Flowmaster Full Capacity Flow

Concentration Point or Basin Flow	100yr-24hr Flow	100yr-6hr Flow	Full Capacity Flow
CF3	860	720	610
CF5	1679	1172	1916
B3	165	103	162
CDP7	1699	1528	1257
CF12	4336	3784	1257
CF15	283	220	1108
CPB6	1065	944	1132
CF18	964	1069	926
CF20	1762	1982	807

As is indicated by the following table most of the major channels within the Sun City development are not properly designed to convey either the 100yr-24hr flow or the 100yr-6hr flow.

#### 5.4 Retention/Detention

Most of the Golf Courses in the area are not designed to retain storm runoff. Based on field observations they are generally elevated above the street elevation. Some of them have small retention facilities but may not be effective for the 50yr or 100yr storm events.

Two big lakes are identified as L1 and L2 in the model, named View Point Lake and Dawn Lake, respectively. The total water surface area is about 63 acres. In the model the surrounding areas are included for the sub-basin area. No additional retention capacities are incorporated in the model with the assumption that these 2 lakes are full at the start of each 100yr storm.

## 6. CONCLUSIONS AND RECOMMENDATIONS

Field observation of the various drainage structures being maintained by the Flood Control District of Maricopa County was made to determine the cross-sectional area of existing channels. They are found to be fairly uniform with not much trace of a recent flood mark. The watershed area includes several golf courses which are not designed to retain storm water runoff. Some, however have small retention capacities but certainly not adequate for the 50yr or 100yr floods

At the intersection of 99<sup>th</sup> Avenue and Beardsley Rd, the 100yr-24hr peak flow is 522 cfs. As reported by Hendrich, Eberhart, Inc "the Beardsley Road channel will divert the runoff up to and including the 50 year storm to the Agua Fria River and out of the 99<sup>th</sup> Ave. watershed." The peak discharge of the 3-42" pipe culverts with 4.5 ft headwater is roughly estimated to be 225 cfs only.

At the intersection of 99<sup>th</sup> Avenue and Del Webb Blvd, the 100yr-24hr peak flow is 860 cfs from a watershed area of 1.6 sq. miles. The 5-barrel 48" pipe culverts has a capacity of only 500 cfs which is only roughly equivalent to the 10year flow. Thus, about 240 cfs will be moving down southward through the 99<sup>th</sup> Ave.

At the intersection of 99<sup>th</sup> Ave and Grand Ave the 100yr-24hr peak flow is 4336 cfs from a total catchment area of 7.92 sq. miles. The present channel will have some amount of overbank flow and some of it may even overtop the railroad.

At the intersection of 99<sup>th</sup> Ave and Olive Rd. the 100yr-24hr peak flow is 1762 cfs from a total catchment area of 3.66 sq. miles. Overbank flow may be adequate to convey this flow to the existing culvert located diagonally across Olive Rd. and 99<sup>th</sup> Avenue.

The HEC-1 model for the 100yr-24hr storm produced individual sub-basin runoff that is higher than that produced by the 100yr-6hr storm. There are cases for combined flows and routed flows being higher as produced by the 6hr storm. This could be attributed to the intensity of the rainfall and areal reduction for areas in the lower part of the watershed.

It is concluded that floods higher than the 50 year return period would create some flooding problems in some sections along the 99<sup>th</sup> Avenue. Therefore, it is recommended that in planning for additional flood control measures in the Sun City area some of the existing golf courses could be modified to increase their retention capacities. Another alternative would be to increase upstream diversion to either New River or Agua Fria River to relieve pressure on downstream conveyance channels.

## 7. REFERENCES

Collar, Williams & White Engineering, Inc.. Drainage Report for Ventana Lakes prepared for The Adams Group. Undated Report

FCD, 1990. Hydrological Analysis of Beardsley Channel extension Project, December 1990.

FCD, 1994. Hydrological Update of the 91<sup>st</sup> Avenue Drain prepared for the City of Peoria, Oct. 1994.

FCD, 1995. Drainage Design Manual for Maricopa County, Arizona – Volume 1 Hydrology, Revision dated January 1995.

Hendrich, Eberhart & Associates Inc. 1995. Preliminary Drainage Report for Intersection Improvements, 99<sup>th</sup> Avenue, Bell Road to Thunderbird Road prepared for MCDOT, August 1990.

Post,Buckley, Schuh & Jernigan, Inc. 1995. Final Geometric Concept and Drainage Report Appendix prepared for MCDOT, December 1995.

Appendix A

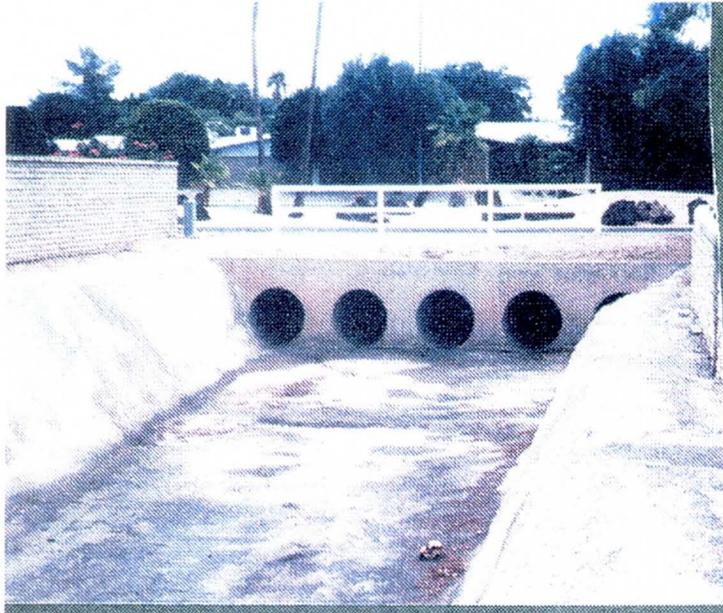
APPENDIX A – PICTURES OF EXISTING MAJOR DRAINAGE STRUCTURES



Drainage Channel on East Side of Del Webb Blvd at Right Angle To Channel Along RR



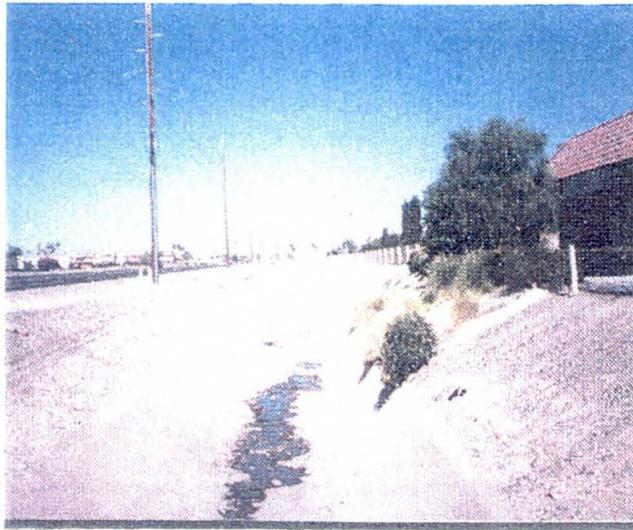
Confluence of 99<sup>th</sup> Av. Drainage Channel And Channel Along North side of RailRoad



**Culverts Crossing Del Webb Boulevard North of  
Intersection with Bell Rd. (Outlet to Agua Fria)**



**Del Webb Channel Along North Side of Bell Rd.  
Looking towards Agua Fria**



Drainage Channel Along North Side of Olive Ave. Looking Westward



Box Culvert Diagonally Crossing Olive Ave at Intersection With 99th Ave. (Outlet to New River)



**Culverts at Intersection of 99<sup>th</sup> Ave. and  
Beardsley Rd. (Outlet to Agua Fria)**

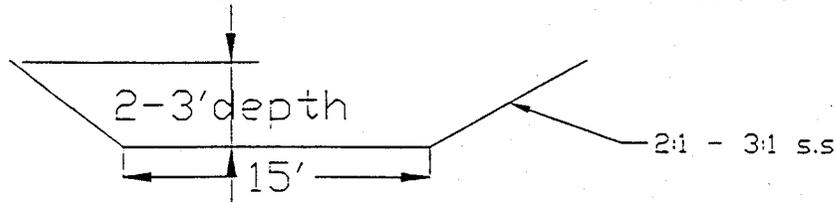


**Beardsley Channel Along South Side of  
Beardsley Rd. (Looking towards Agua Fria)**

Appendix B

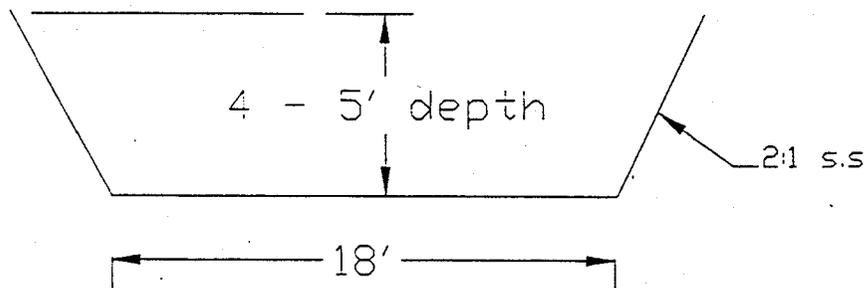
**APPENDIX B - CROSS-SECTION PLOT OF EXISTING FCD MAINTAINED STRUCTURES (Drawings not to scale)**

FCD STRUCT. 01  
Located at 107th x Union Hills Rd Intersection

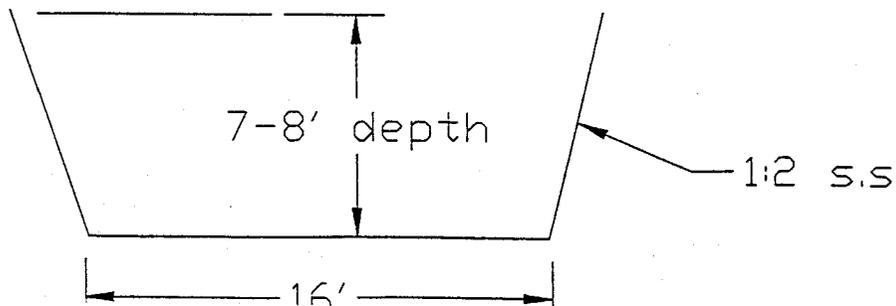


Channel drains to a trapezoidal channel along side side of Union Hills Dr. to Agua Fria

FCD STRUC. 03  
Parallels Bell Rd North of Post Office fr. 98th to 99th Av

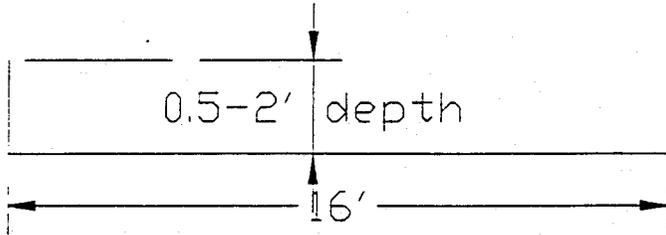


FCD STRUC. 04  
Begins Del Webb Blvd n. of Esco Drug, s. to Bell Rd & Westward to Agua Fria parallel to Bell Rd.



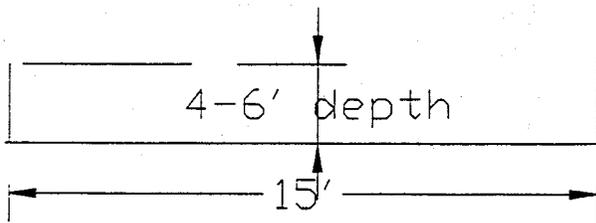
FCD STRUC. 05

Begins at 111th Ave and Crestbrook then flows to Agua Fria pan.



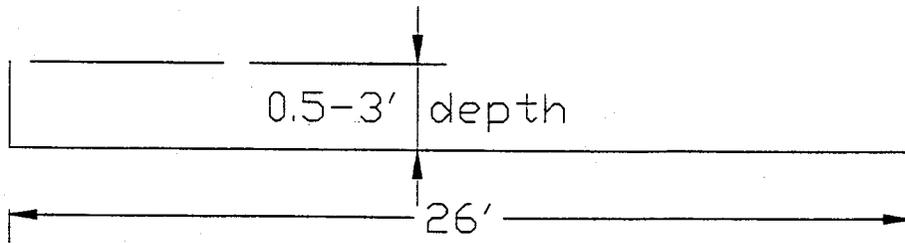
FCD STRUC. 06

Begins at intersection 111th Ave & Smmerset then flows into golf course



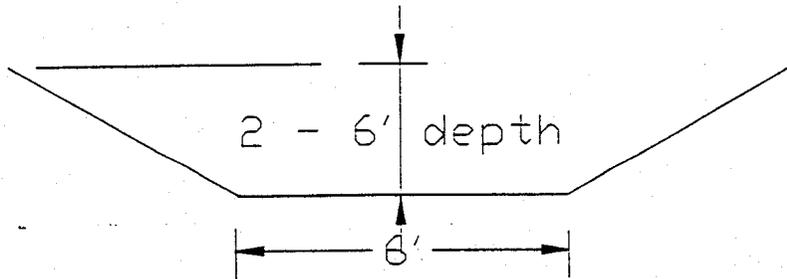
FCD STRUC. 07

Begins end of Gulf Hills Dr. n. of Edgewood then flows into golf course



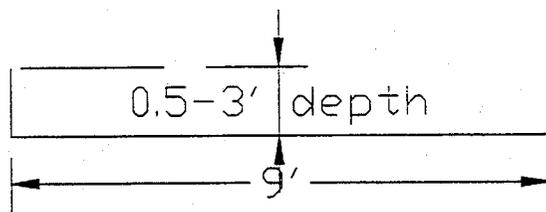
FCD STRUC. 08

Begins at intersection Waikiki & Agua Fria, paralleling the Sun City Water Company entrance. Drains into Agua Fria



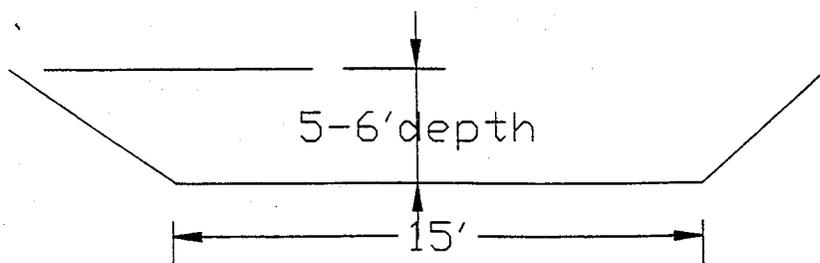
FCD STRUC. 09

Begins west of intersection of Meads & White Mountain, then flows into the golf course



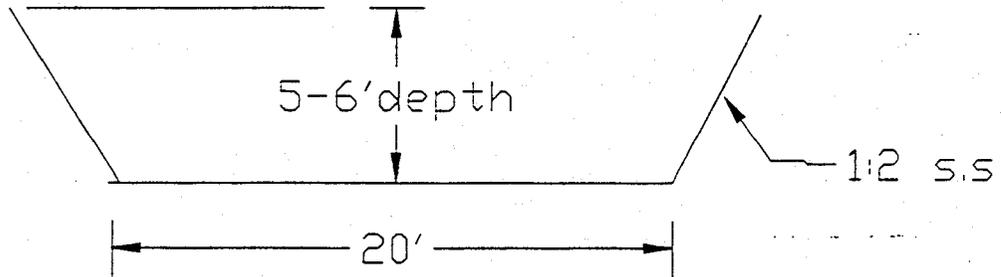
FCD STRUC. 10

West end starts at Lake Forest DR. between Forrester & Emberwood, then travels east outside Sun City boundary then goes south, finally to N.R.



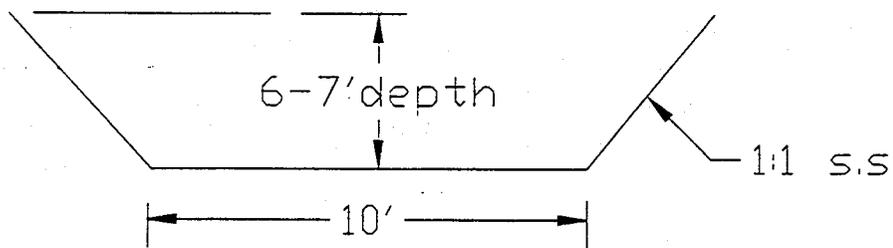
FCD STRUC. 11

Parallels Grand Ave n. of railroad track from New River to 103rd Avenue



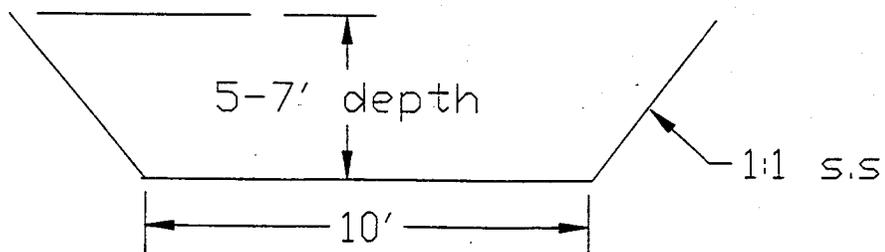
FCD STRUC. 12

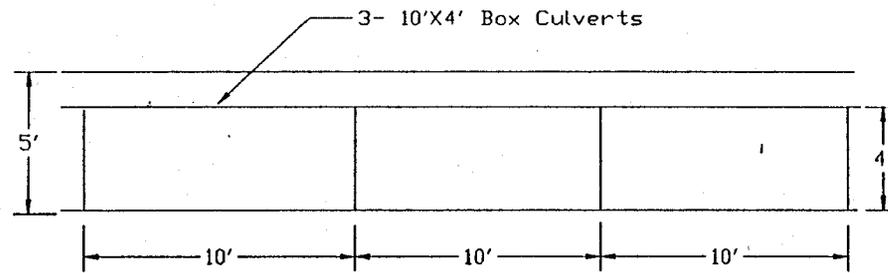
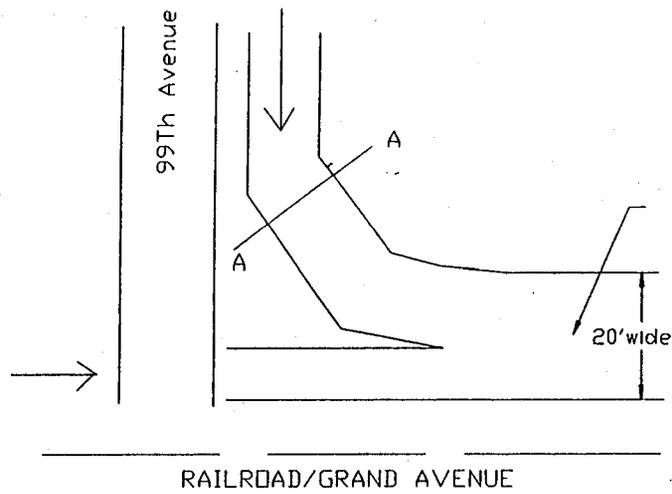
Parallels Grand Ave. n. of railroad track beginning at Del Webb Blvd. west to Agua Fria River.



FCD STRUC. 13

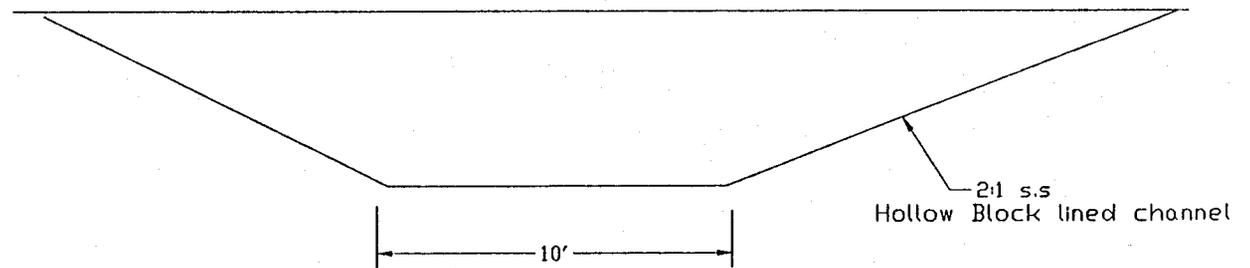
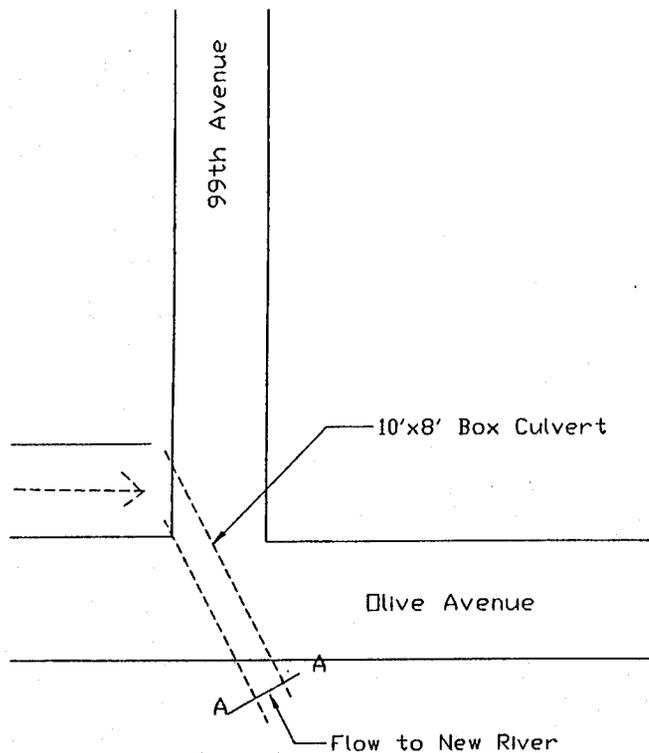
Parallels the north side of Olive Ave. from 99th Ave to 103rd Ave





Section A-A Showing Box Culverts

Fig. \_ Plan View and Section of Structure at 99th Ave x Railroad Crossing



Section A-A Showing Outlet channel to New River

Fig. Plan View and Section of Structure at Olive Ave & 99th Avenue

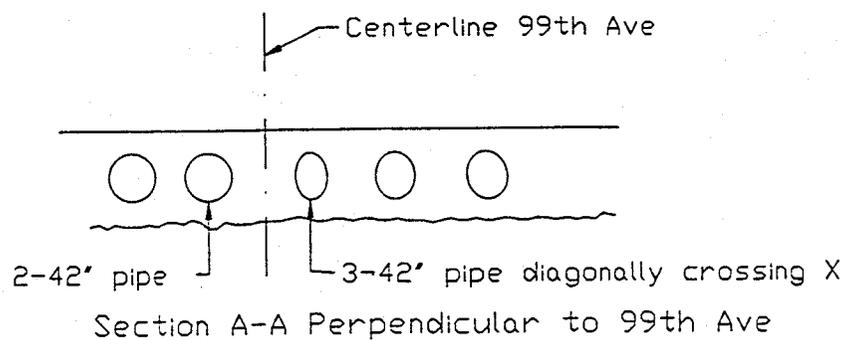
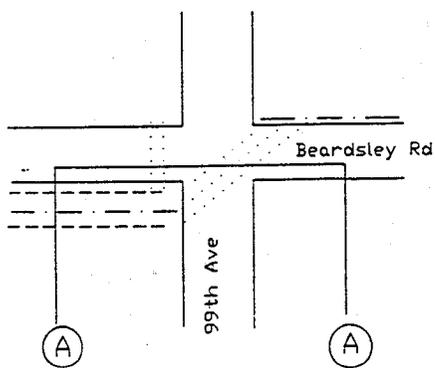
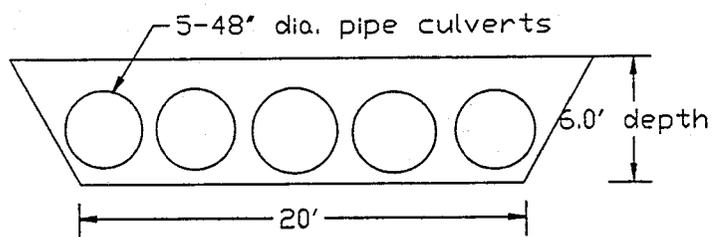
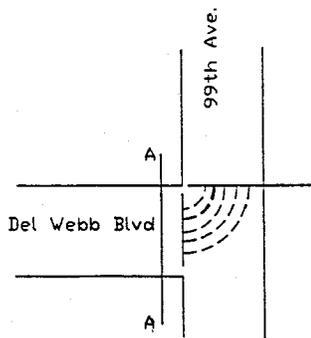


Fig. - CULVERTS AT 99TH AVE AND BEARDSLEY RD INTERSECTION



Section A-A Showing Pipe Culverts Outlet

Fig. - CULVERTS AT DEL WEBB BLVD. CROSSING 99TH AVENUE

Appendix C

**North Area 100yr-24hr  
Soil, Landuse and Clark Parameters**

Summary of MCUHP1 Input Parameters

=====

Input File: NORTH100.M1I

Output File: NORTH100.M1O

SUBBASIN	AREA sq.miles	IA ins.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Tc	R
A1	0.515	0.110	0.350	4.65	0.270	6.0	0.59	0.50
A2	0.089	0.110	0.360	5.30	0.200	6.0	0.46	0.38
B1	0.166	0.300	0.190	6.60	0.150	29.0	0.35	0.15
B2	0.443	0.300	0.150	7.60	0.120	28.0	0.82	0.54
B3	0.194	0.170	0.310	4.25	0.450	24.0	0.59	0.50
B4	0.059	0.140	0.330	4.70	0.320	26.0	0.20	0.13
B5	0.314	0.290	0.250	4.70	0.340	25.0	0.84	0.69
B6	0.463	0.210	0.230	6.20	0.190	19.0	0.64	0.39
G1N	0.280	0.100	0.250	6.00	0.200	10.0	0.91	0.70
G1S	0.120	0.050	0.250	6.00	0.100	2.0	0.38	0.24
B7	0.730	0.260	0.160	7.30	0.120	34.0	0.41	0.14
B8	0.326	0.290	0.250	5.00	0.290	30.0	0.65	0.34
B9	0.164	0.280	0.250	5.10	0.280	33.0	0.70	0.64
C1	0.147	0.150	0.250	4.80	0.310	25.0	0.31	0.16
C2	1.043	0.260	0.250	6.00	0.190	37.0	0.95	0.59
C3	0.272	0.290	0.170	6.80	0.140	21.0	0.51	0.34
C4	0.583	0.080	0.250	6.00	0.190	32.0	0.51	0.25
C5	0.527	0.290	0.250	5.00	0.290	33.0	0.89	0.60
C6	0.132	0.210	0.220	7.60	0.090	20.0	0.38	0.24
C7	0.078	0.270	0.160	8.80	0.060	23.0	0.34	0.22
C8	0.205	0.300	0.350	6.60	0.150	35.0	0.39	0.25
C9	0.064	0.300	0.150	8.80	0.060	29.0	0.30	0.20
C10	0.115	0.200	0.150	8.80	0.070	22.0	0.37	0.22
C11	0.283	0.120	0.250	5.60	0.220	31.0	0.37	0.19
C12	0.210	0.100	0.390	6.20	0.170	30.0	0.34	0.21
C13	0.361	0.130	0.250	5.80	0.210	27.0	0.49	0.32
C14	0.243	0.300	0.150	7.00	0.140	22.0	0.53	0.38
L1	0.080	0.220	0.250	4.55	0.340	53.0	0.61	0.42
L2	0.106	0.200	0.260	3.74	0.550	55.0	1.14	0.92
G2	0.267	0.300	0.250	4.90	0.330	23.0	0.64	0.56
D1	0.089	0.290	0.150	8.40	0.090	28.0	0.53	0.44
D2	0.154	0.300	0.150	8.80	0.060	43.0	0.53	0.43
D3	0.247	0.270	0.150	8.40	0.080	31.0	0.75	0.58
D4	0.116	0.300	0.310	4.80	0.320	26.0	0.46	0.36
D5	0.118	0.300	0.250	5.80	0.200	28.0	0.40	0.25
D6	0.092	0.300	0.150	8.40	0.070	16.0	0.50	0.41
D7	0.111	0.300	0.270	4.80	0.300	44.0	0.39	0.24
D8	0.155	0.300	0.250	5.00	0.290	30.0	0.55	0.43
D9	0.047	0.290	0.250	6.00	0.180	33.0	0.46	0.38
D10	0.068	0.300	0.210	6.40	0.160	31.0	0.48	0.38
D11	0.117	0.300	0.190	6.60	0.150	38.0	0.53	0.31

LOSS PARAMETERS FOR SUBBASIN: A1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
BE	0.102	19.8	0.24	0
LCA	0.022	4.3	0.25	0
MTB	0.023	4.5	0.15	0
MP	0.031	6.0	0.25	0
MR	0.011	2.1	0.05	0
PT	0.025	4.9	0.40	0
PWB	0.239	46.4	0.38	0
TSC	0.035	6.8	0.14	0
TRA	0.014	2.7	0.11	0
VE	0.013	2.5	0.25	0
TOTAL =	0.515 Sq.Miles		XKSAT = 0.27	%Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.65  
 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
0.494	Vacant	95.9	DRY	10	5	0.10	0.02	Min	0.02
0.000	S.L.R	0.0	NORMAL	30	10	0.30	0.05	Low	
0.021	M.D.R	4.1	NORMAL	30	30	0.30	0.05	Low	0.06
0.515 = Total Area			Avg. =	11	6%	0.110			

PERCENT OF SUBBASIN  
 DRY = 96.0 %  
 NORMAL = 4.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.27

IMPERVIOUS AREA: URBAN @ 100 % effective = 6  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 6

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
A1	0.515	1.890	0.025	30.0	0.11	0.35	4.65	0.27	6

LOSS PARAMETERS FOR SUBBASIN: A2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
BE	0.066	74.2	0.24	0
MP	0.004	4.5	0.25	0
MR	0.012	13.5	0.05	0
PRB	0.007	7.9	0.28	0

TOTAL = 0.089 Sq.Miles XKSAT = 0.20 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 5.30  
 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
0.083	Vacant	93.3	DRY	10	5	0.10	0.02	Min	0.03
0.001	S.L.R	1.1	NORMAL	30	10	0.30	0.05	Low	0.08
0.005	M.D.R	5.6	NORMAL	50	30	0.30	0.05	Low	0.07

0.089 = Total Area Avg. = 12 6% 0.110

PERCENT OF SUBBASIN  
 DRY = 93.0 %  
 NORMAL = 7.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.36

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.20

IMPERVIOUS AREA: URBAN @ 100 % effective = 6  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 6

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
A2	0.089	0.530	0.031	9.0	0.11	0.36	5.30	0.20	6

LOSS PARAMETERS FOR SUBBASIN: B1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.027	16.3	0.25	0
MP	0.049	29.5	0.25	0
MR	0.060	36.1	0.05	0
TRA	0.023	13.9	0.11	0
TRB	0.007	4.2	0.13	0

TOTAL = 0.166 Sq.Miles XKSAT = 0.12 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 6.60  
 Normal = 0.19  
 Wet = 0.00

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.002	Vacant	1.2	DRY	10	5	0.10	0.02	Min	0.04
0.162	M.D.R	97.6	NORMAL	30	30	0.30	0.05	Low	0.05
0.002	S.L.R	1.2	NORMAL	30	10	0.30	0.05	Low	0.08

0.166 = Total Area Avg. = 30 29% 0.300

PERCENT OF SUBBASIN

DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.19

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.15

IMPERVIOUS AREA: URBAN @ 100 % effective = 29  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 29

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B1	0.166	0.380	0.052	24.0	0.30	0.19	6.60	0.15	29

LOSS PARAMETERS FOR SUBBASIN: B2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.002	0.5	0.23	0
LB	0.011	2.5	0.40	0
LCA	0.178	40.2	0.25	0
LE	0.002	0.5	0.04	0
MP	0.003	0.7	0.25	0
MR	0.159	35.9	0.05	0
PEA	0.001	0.2	0.37	0
RBA	0.006	1.4	0.26	0
VF	0.081	18.3	0.01	0

TOTAL = 0.443 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
0.001	S.L.R	0.2	NORMAL	30	10	0.30	0.05	Low	0.08
0.374	M.D.R	84.4	NORMAL	50	30	0.30	0.05	Low	0.05
0.060	Public	13.5	NORMAL	50	15	0.30	0.05	Low	0.06
0.008	Institut	1.8	NORMAL	30	15	0.30	0.05	Low	0.07

0.443 = Total Area Avg. = 50 28% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B2	0.443	1.170	0.046	15.0	0.30	0.15	7.60	0.12	28



LOSS PARAMETERS FOR SUBBASIN: B4

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CA2	0.013	22.0	0.38	0
LCA	0.011	18.6	0.25	0
GXA	0.035	59.3	0.23	0

TOTAL = 0.059 Sq.Miles XKSAT = 0.26 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.70  
 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
0.046	M.D.R	78.0	DRY	30	30	0.10	0.02	Min	0.03
0.013	Recreati	22.0	NORMAL	30	10	0.30	0.05	Low	0.07

0.059 = Total Area Avg. = 30 26% 0.140

PERCENT OF SUBBASIN  
 DRY = 78.0 %  
 NORMAL = 22.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.33

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.32

IMPERVIOUS AREA: URBAN @ 100 % effective = 26  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 26

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B4	0.059	0.340	0.037	59.0	0.14	0.33	4.70	0.32	26

LOSS PARAMETERS FOR SUBBASIN: B3

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LB	0.008	3.1	0.40	0
LCA	0.099	38.2	0.25	0
MP	0.011	4.2	0.25	0
MR	0.005	1.9	0.05	0
PEA	0.006	2.3	0.37	0
RBA	0.022	8.5	0.26	0
TE	0.043	16.6	0.25	0

TOTAL = 0.194 Sq.Miles XKSAT = 0.35 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.25  
 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
0.123	M.D.R	63.4	DRY	30	30	0.10	0.02	Min	0.03
0.010	S.L.R	5.2	NORMAL	30	10	0.30	0.05	Low	0.07
0.061	Public	31.4	NORMAL	50	15	0.30	0.05	Low	0.06

0.194 = Total Area Avg. = 37 24% 0.170

PERCENT OF SUBBASIN DRY = 63.0 %  
 NORMAL = 37.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.31

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.45

IMPERVIOUS AREA: URBAN @ 100 % effective = 24  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 24

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B3	0.194	0.950	0.036	19.0	0.17	0.31	4.25	0.45	24

LOSS PARAMETERS FOR SUBBASIN: B5  
 =====

Soil Survey Used Central County

XKSAT  
 =====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CA2	0.025	8.0	0.38	0
GXA	0.040	12.7	0.23	0
LCA	0.202	64.3	0.25	0
MR	0.007	2.2	0.05	0
PEA	0.036	11.5	0.37	0
RBA	0.004	1.3	0.26	0

TOTAL = 0.314 Sq.Miles XKSAT = 0.26 %Rock = 0

DTHETA  
 =====

Dry = 0.35 PSIF = 4.70  
 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
0.003	Vacant	1.0	DRY	10	5	0.10	0.02	Min	0.04
0.232	M.D.R	73.9	NORMAL	30	30	0.30	0.05	Low	0.05
0.006	Public	1.9	NORMAL	50	15	0.30	0.05	Low	0.07
0.073	Recreati	23.2	NORMAL	50	10	0.25	0.05	Low	0.06

0.314 = Total Area Avg. = 36 25% 0.290

PERCENT OF SUBBASIN DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.34

IMPERVIOUS AREA: URBAN @ 100 % effective = 25  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 25

INPUT VALUES FOR MCUHP1 PROGRAM  
 -----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B5	0.314	1.210	0.049	21.0	0.29	0.25	4.70	0.34	25

LOSS PARAMETERS FOR SUBBASIN: B6

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.304	65.7	0.25	0
LE	0.069	14.9	0.04	0
MR	0.086	18.6	0.05	0
VF	0.004	0.9	0.01	0

TOTAL = 0.463 Sq.Miles XKSAT = 0.14 %Rock = 0

DTHETA

=====

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

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.207	M.D.R	44.7	NORMAL	30	30	0.10	0.02	Min	0.03
0.048	S.L.R	10.4	NORMAL	30	10	0.30	0.05	Low	0.06
0.208	Recreati	44.9	NORMAL	50	10	0.30	0.05	Low	0.05

0.463 = Total Area Avg. = 40 19% 0.210

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.23

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 19  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 19

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B6	0.463	1.140	0.036	18.0	0.21	0.23	6.20	0.19	19

LOSS PARAMETERS FOR SUBBASIN: B7

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.349	47.8	0.25	0
LE	0.017	2.3	0.04	0
MR	0.066	9.0	0.05	0
PEA	0.034	4.7	0.37	0
RBA	0.054	7.4	0.26	0
TG	0.043	5.9	0.04	0
TH	0.014	1.9	0.04	0
TW	0.002	0.3	0.05	0
VF	0.151	20.7	0.01	0

TOTAL = 0.730 Sq.Miles XKSAT = 0.09 %Rock = 0

DTHETA

=====

Dry = 0.33 PSIF = 7.30  
 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
0.025	Vacant	3.4	DRY	10	5	0.10	0.02	Min	0.03
0.359	M.D.R	49.2	NORMAL	30	30	0.30	0.05	Low	0.05
0.026	Public	3.6	NORMAL	50	15	0.30	0.05	Low	0.06
0.208	S.L.R.	28.5	NORMAL	50	30	0.25	0.05	Low	0.05
0.014	Office	1.9	NORMAL	50	45	0.25	0.05	Low	0.07
0.090	Transpor	12.3	NORMAL	60	70	0.15	0.03	Min	0.03
0.008	Comm	1.1	NORMAL	75	80	0.10	0.02	Min	0.04

0.730 = Total Area Avg. = 38 34% 0.260

PERCENT OF SUBBASIN  
 DRY = 3.0 %  
 NORMAL = 97.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.16

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 34  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 34

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
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B7

0.730 0.800 0.040 32.0 0.26 0.16 7.30 0.12 34

LOSS PARAMETERS FOR SUBBASIN: B8  
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Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.040	12.3	0.23	0
LCA	0.162	49.7	0.25	0
MP	0.016	4.9	0.25	0
MR	0.024	7.4	0.05	0
PT	0.018	5.5	0.40	0
PEA	0.061	18.7	0.37	0
VF	0.005	1.5	0.01	0

TOTAL = 0.326 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA  
=====

Dry = 0.36 PSIF = 5.00  
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
0.001	Vacant	0.3	DRY	10	5	0.10	0.02	Min	0.04
0.265	M.D.R	81.3	NORMAL	30	30	0.30	0.05	Low	0.05
0.005	Public	1.5	NORMAL	50	15	0.30	0.05	Low	0.07
0.055	M.D.R.	16.9	NORMAL	50	30	0.25	0.05	Low	0.06

0.326 = Total Area Avg. = 34 30% 0.290

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 30  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM  
-----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B8	0.326	0.720	0.048	14.0	0.29	0.25	5.00	0.29	30

LOSS PARAMETERS FOR SUBBASIN: B9

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.079	48.2	0.25	0
MR	0.014	8.5	0.05	0
PT	0.028	17.1	0.40	0
PEA	0.028	17.1	0.37	0
TG	0.013	7.9	0.04	0
TW	0.000	0.0	0.05	0
VE	0.002	1.2	0.25	0

TOTAL = 0.164 Sq.Miles XKSAT = 0.22 %Rock = 0

DTHETA

=====

Dry = 0.36 PSIF = 5.10  
 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
0.005	Vacant	3.0	DRY	10	5	0.10	0.02	Min	0.04
0.112	M.D.R	68.3	NORMAL	30	30	0.30	0.05	Low	0.05
0.001	Public	0.6	NORMAL	50	15	0.30	0.05	Low	0.08
0.007	M.D.R.	4.3	NORMAL	50	30	0.25	0.05	Low	0.07
0.039	Office	23.8	NORMAL	50	45	0.25	0.05	Low	0.06

0.164 = Total Area Avg. = 34 33% 0.280

PERCENT OF SUBBASIN  
 DRY = 3.0 %  
 NORMAL = 97.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.28

IMPERVIOUS AREA: URBAN @ 100 % effective = 33  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 33

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B9	0.164	0.910	0.052	20.0	0.28	0.25	5.10	0.28	33

LOSS PARAMETERS FOR SUBBASIN: C1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CA2	0.000	0.0	0.38	0
LCA	0.130	88.4	0.25	0
LE	0.002	1.4	0.04	0
PEA	0.013	8.8	0.37	0
RBA	0.002	1.4	0.26	0

TOTAL = 0.147 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.111	M.D.R	75.5	NORMAL	30	30	0.10	0.02	Min	0.03
0.036	Recreati	24.5	NORMAL	30	10	0.30	0.05	Low	0.06

0.147 = Total Area Avg. = 30 25% 0.150

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.31

IMPERVIOUS AREA: URBAN @ 100 % effective = 25  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 25

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C1	0.147	0.450	0.034	22.0	0.15	0.25	4.80	0.31	25

LOSS PARAMETERS FOR SUBBASIN: C10

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.002	1.7	0.25	0
LE	0.007	6.1	0.04	0
TW	0.106	92.2	0.05	0

TOTAL = 0.115 Sq.Miles XKSAT = 0.05 %Rock = 0

DTHETA

Dry = 0.27 PSIF = 8.80  
 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
0.051	M.D.R	44.0	NORMAL	30	30	0.10	0.02	Min	0.03
0.006	S.L.R	5.2	NORMAL	30	10	0.30	0.05	Low	0.07
0.040	Public	34.5	NORMAL	50	20	0.30	0.05	Low	0.06
0.019	Recreati	16.4	NORMAL	50	10	0.25	0.05	Low	0.07

0.116 = Total Area Avg. = 41 22% 0.200

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.07

IMPERVIOUS AREA: URBAN @ 100 % effective = 22  
 ROCK OUTCROP @ 100 % effective = 0  
 % EFFECTIVE IMP. = 22

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C10	0.115	0.450	0.042	18.0	0.20	0.15	8.80	0.07	22

LOSS PARAMETERS FOR SUBBASIN: C11

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.228	80.6	0.25	0
MR	0.055	19.4	0.05	0
-----				
TOTAL =	0.283 Sq.Miles		XKSAT = 0.18	%Rock = 0

DTHETA

Dry =	0.38	PSIF =	5.60
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
0.256	M.D.R	90.5	NORMAL	30	30	0.10	0.02	Min	0.03
0.014	Office	4.9	NORMAL	30	10	0.30	0.05	Low	0.07
0.013	Commerci	4.6	NORMAL	50	80	0.30	0.05	Low	0.07
0.283 = Total Area			Avg. =	30	31%	0.120			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.22

IMPERVIOUS AREA:	URBAN @	100 % effective =	31
	ROCK OUTCROP @	100 % effective =	0
	% EFFECTIVE IMP. = 31		

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C11	0.283	0.680	0.028	19.0	0.12	0.25	5.60	0.22	31

LOSS PARAMETERS FOR SUBBASIN: C12

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.152	72.4	0.25	0
MR	0.037	17.6	0.05	0
VF	0.021	10.0	0.01	0
-----				
TOTAL =	0.210 Sq.Miles		XKSAT = 0.14	%Rock = 0

DTHETA

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

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.210	M.D.R	100.	DRY	30	30	0.10	0.02	Min	0.05
0.210 = Total Area			Avg. =	30	30%	0.100			

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 = 30
	ROCK OUTCROP @	100 % effective = 0
	-----	
	% EFFECTIVE IMP. = 30	

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C12	0.210	0.720	0.027	25.0	0.10	0.39	6.20	0.17	30

LOSS PARAMETERS FOR SUBBASIN: C13

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.256	70.9	0.25	0
MR	0.066	18.3	0.05	0
TW	0.039	10.8	0.05	0

TOTAL = 0.361 Sq.Miles XKSAT = 0.16 %Rock = 0

DTHETA

=====

Dry = 0.39 PSIF = 5.80  
 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
0.301	M.D.R	83.6	NORMAL	30	30	0.10	0.02	Min	0.03
0.004	Office	1.1	NORMAL	30	45	0.30	0.05	Low	0.07
0.055	Recreati	15.3	NORMAL	60	10	0.30	0.05	Low	0.06

0.360 = Total Area Avg. = 36 27% 0.130

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.21

IMPERVIOUS AREA: URBAN @ 100 % effective = 27  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 27

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C13	0.361	1.100	0.029	21.0	0.13	0.25	5.80	0.21	27

LOSS PARAMETERS FOR SUBBASIN: C14

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.103	42.4	0.25	0
TW	0.140	57.6	0.05	0
W	0.000	0.0	0.00	0

TOTAL = 0.243 Sq.Miles XKSAT = 0.10 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 7.00  
 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
0.140	M.D.R	57.9	NORMAL	30	30	0.30	0.02	Min	0.06
0.102	Recreati	42.1	NORMAL	60	10	0.30	0.05	Low	0.06

0.242 = Total Area Avg. = 45 22% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 22  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 22

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C14	0.243	0.910	0.036	18.0	0.30	0.15	7.00	0.14	22

LOSS PARAMETERS FOR SUBBASIN: C2

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.695	66.6	0.25	0
LE	0.016	1.5	0.04	0
MR	0.012	1.2	0.05	0
TU	0.020	1.9	0.25	0
TW	0.300	28.8	0.05	0

TOTAL = 1.043 Sq.Miles XKSAT = 0.15 %Rock = 0

DTHETA

Dry = 0.40 PSIF = 6.00  
 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
0.026	Vacant	2.5	DRY	10	5	0.10	0.02	Min	0.03
0.693	M.D.R	66.4	NORMAL	30	30	0.30	0.05	Low	0.06
0.010	Public	1.0	NORMAL	50	15	0.30	0.05	Low	0.07
0.057	S.L.R	5.5	NORMAL	30	10	0.25	0.05	Low	0.06
0.054	Office	5.2	NORMAL	50	45	0.25	0.05	Low	0.06
0.203	Transpor	19.5	NORMAL	60	70	0.15	0.03	Min	0.03

1.043 = Total Area Avg. = 33 37% 0.260

PERCENT OF SUBBASIN  
 DRY = 2.0 %  
 NORMAL = 98.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 37  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 37

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C2	1.043	2.010	0.037	20.0	0.26	0.25	6.00	0.19	37

LOSS PARAMETERS FOR SUBBASIN: C3

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.174	64.0	0.25	0
MR	0.020	7.4	0.05	0
RBA	0.006	2.2	0.26	0
TH	0.015	5.5	0.04	0
TW	0.018	6.6	0.05	0
VF	0.039	14.3	0.01	0

TOTAL = 0.272 Sq.Miles XKSAT = 0.11 %Rock = 0

DTHETA

=====

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

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.087	M.D.R	32.0	NORMAL	30	30	0.30	0.02	Min	0.05
0.102	S.L.R	37.5	NORMAL	30	10	0.30	0.05	Low	0.06
0.021	Public	7.7	NORMAL	50	15	0.30	0.05	Low	0.06
0.062	Hotel	22.8	NORMAL	50	30	0.25	0.05	Low	0.06

0.272 = Total Area Avg. = 36 21% 0.290

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.17

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 21  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 21

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C3	0.272	0.910	0.042	25.0	0.29	0.17	6.80	0.14	21

LOSS PARAMETERS FOR SUBBASIN: C4

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.396	67.9	0.25	0
MP	0.007	1.2	0.25	0
MR	0.104	17.8	0.05	0
PEA	0.006	1.0	0.37	0
TG	0.011	1.9	0.04	0
TH	0.054	9.3	0.04	0
TW	0.005	0.9	0.05	0
VF	0.000	0.0	0.01	0

TOTAL = 0.583 Sq.Miles XKSAT = 0.15 %Rock = 0

DTHETA

Dry = 0.40 PSIF = 6.00  
 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
0.415	M.D.R	71.2	NORMAL	30	30	0.00	0.02	Min	0.05
0.009	Public	1.5	NORMAL	30	10	0.30	0.05	Low	0.07
0.028	S.L.R	4.8	NORMAL	50	15	0.30	0.05	Low	0.06
0.005	M.D.R.	0.9	NORMAL	50	30	0.25	0.05	Low	0.07
0.126	Office	21.6	NORMAL	50	45	0.25	0.05	Low	0.05

0.583 = Total Area Avg. = 35 32% 0.080

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

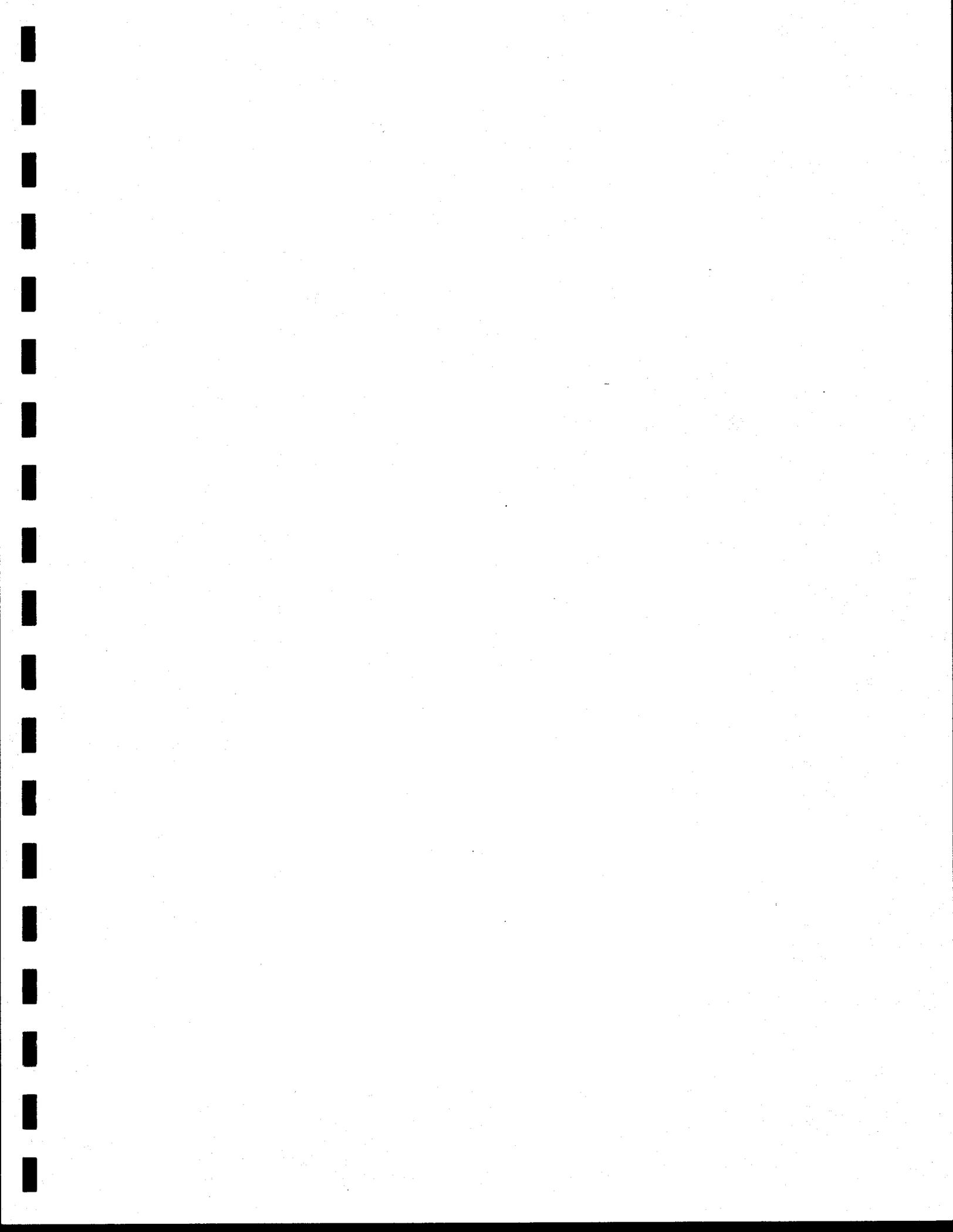
SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 32  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 32

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C4	0.583	1.060	0.030	19.0	0.08	0.25	6.00	0.19	32



LOSS PARAMETERS FOR SUBBASIN: C5

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.021	4.0	0.23	0
LCA	0.283	53.7	0.25	0
MR	0.035	6.6	0.05	0
PEA	0.147	27.9	0.37	0
RBA	0.023	4.4	0.26	0
TG	0.001	0.2	0.04	0
TH	0.014	2.7	0.04	0
TW	0.003	0.6	0.05	0

TOTAL = 0.527 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA

Dry = 0.36 PSIF = 5.00  
 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
0.006	Vacant	1.1	DRY	10	5	0.10	0.02	Min	0.04
0.396	M.D.R	75.1	NORMAL	30	30	0.30	0.05	Low	0.05
0.012	Rereatio	2.3	NORMAL	50	15	0.30	0.05	Low	0.07
0.001	Commerci	0.2	NORMAL	50	30	0.25	0.05	Low	0.08
0.112	Office	21.3	NORMAL	50	45	0.25	0.05	Low	0.05

0.527 = Total Area Avg. = 34 33% 0.290

PERCENT OF SUBBASIN DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

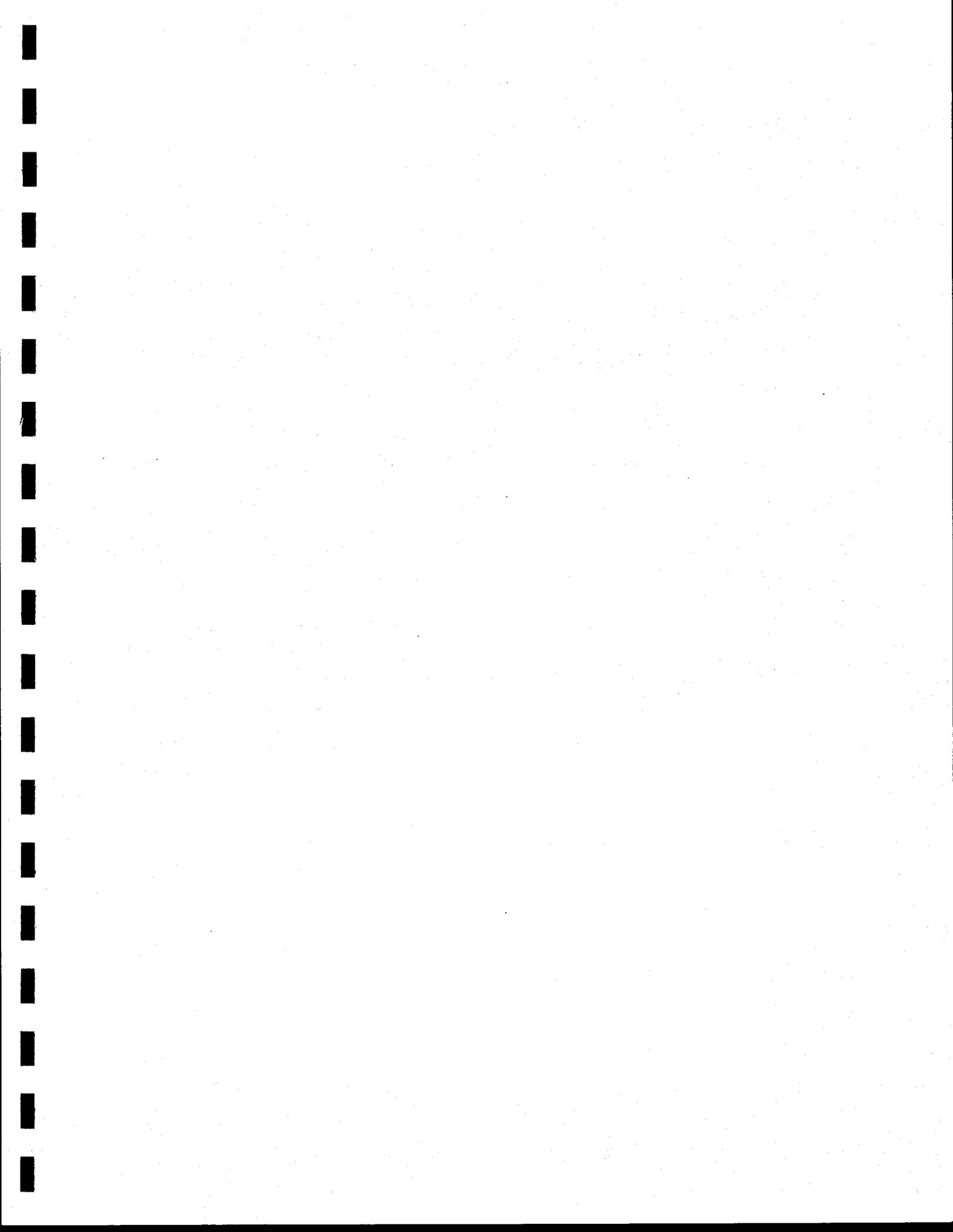
SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 33  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 33

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C5	0.527	1.360	0.045	18.0	0.29	0.25	5.00	0.29	33



LOSS PARAMETERS FOR SUBBASIN: C6  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.046	34.8	0.25	0
LE	0.084	63.6	0.04	0
TW	0.002	1.5	0.05	0

TOTAL = 0.132 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
0.056	Vacant	42.4	DRY	10	5	0.10	0.02	Min	0.03
0.059	M.D.R	44.7	NORMAL	30	30	0.30	0.05	Low	0.06
0.006	Commerci	4.5	NORMAL	50	80	0.30	0.05	Low	0.07
0.011	Recreati	8.3	NORMAL	50	15	0.25	0.05	Low	0.07

0.132 = Total Area Avg. = 22 20% 0.210

PERCENT OF SUBBASIN  
DRY = 42.0 %  
NORMAL = 58.0 %  
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.22

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 20  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 20

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C6	0.132	0.530	0.043	23.0	0.21	0.22	7.60	0.09	20

LOSS PARAMETERS FOR SUBBASIN: C7

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.003	3.8	0.25	0
LE	0.014	17.9	0.04	0
TW	0.061	78.2	0.05	0

TOTAL = 0.078 Sq.Miles XKSAT = 0.05 %Rock = 0

DTHETA

=====

Dry = 0.27 PSIF = 8.80  
 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
0.007	Vacant	9.0	DRY	10	5	0.10	0.02	Min	0.04
0.054	M.D.R.	69.2	NORMAL	30	30	0.30	0.05	Low	0.06
0.000	Public	0.0	NORMAL	50	15	0.30	0.05	Low	
0.017	Recrea	21.8	NORMAL	60	10	0.25	0.05	Low	0.07

0.078 = Total Area Avg. = 35 23% 0.270

PERCENT OF SUBBASIN  
 DRY = 9.0 %  
 NORMAL = 91.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.16

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.06

IMPERVIOUS AREA: URBAN @ 100 % effective = 23  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 23

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C7	0.078	0.380	0.054	26.0	0.27	0.16	8.80	0.06	23

LOSS PARAMETERS FOR SUBBASIN: C8  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.117	57.1	0.25	0
MR	0.083	40.5	0.05	0
TH	0.005	2.4	0.04	0

TOTAL = 0.205 Sq.Miles XKSAT = 0.12 %Rock = 0

DTHETA  
=====

Dry = 0.37 PSIF = 6.60  
Normal = 0.19  
Wet = 0.00

LAND USE  
=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.178	M.D.R	86.8	DRY	30	30	0.30	0.02	Min	0.05
0.023	Commeric	11.2	NORMAL	30	80	0.30	0.05	Low	0.06
0.004	Recreati	2.0	NORMAL	50	10	0.30	0.05	Low	0.07

0.205 = Total Area Avg. = 31 35% 0.300

PERCENT OF SUBBASIN  
DRY = 87.0 %  
NORMAL = 13.0 %  
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.15

IMPERVIOUS AREA: URBAN @ 100 % effective = 35  
ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 35

INPUT VALUES FOR MCUHP1 PROGRAM  
-----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C8	0.205	0.720	0.030	21.0	0.30	0.35	6.60	0.15	35

LOSS PARAMETERS FOR SUBBASIN: C9

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
PEA	0.002	3.1	0.37	0
TW	0.062	96.9	0.05	0
-----				
TOTAL =	0.064 Sq.Miles		XKSAT = 0.05	%Rock = 0

DTHETA

=====

Dry =	0.27	PSIF = 8.80
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
0.063	M.D.R	96.9	NORMAL	30	30	0.30	0.05	Low	0.06
0.002	Recreati	3.1	NORMAL	30	10	0.30	0.05	Low	0.08
-----									
0.065 = Total Area			Avg. =	30	29%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.06

IMPERVIOUS AREA: URBAN @ 100 % effective = 29  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 29

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C9	0.064	0.340	0.058	32.0	0.30	0.15	8.80	0.06	29

LOSS PARAMETERS FOR SUBBASIN: D1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.006	6.7	0.25	0
LE	0.004	4.5	0.04	0
TW	0.079	88.8	0.05	0

TOTAL = 0.089 Sq.Miles XKSAT = 0.06 %Rock = 0

DTHETA

=====

Dry = 0.29 PSIF = 8.40  
 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
0.000	Vacant	0.0	DRY	10	5	0.10	0.02	Min	
0.078	M.D.R	87.6	NORMAL	50	30	0.30	0.05	Low	0.06
0.002	Public	2.2	NORMAL	50	15	0.30	0.05	Low	0.08
0.009	Recreati	10.1	NORMAL	60	10	0.25	0.05	Low	0.07

0.089 = Total Area Avg. = 51 28% 0.290

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D1	0.089	0.530	0.056	15.0	0.29	0.15	8.40	0.09	28

LOSS PARAMETERS FOR SUBBASIN: D10

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.042	61.8	0.25	0
MR	0.025	36.8	0.05	0
TW	0.001	1.5	0.05	0
-----				
TOTAL =	0.068 Sq.Miles		XKSAT = 0.13	%Rock = 0

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
0.067	M.D.R	98.5	NORMAL	30	30	0.30	0.02	Min	0.06
0.001	tRANSPOR	1.5	NORMAL	20	70	0.30	0.05	Low	0.08
-----									
0.068 = Total Area			Avg. =	30	31%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.21

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.16

IMPERVIOUS AREA:	URBAN @	100 % effective =	31
	ROCK OUTCROP @	100 % effective =	0
		% EFFECTIVE IMP. =	31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D10	0.068	0.420	0.031	5.0	0.30	0.21	6.40	0.16	31

LOSS PARAMETERS FOR SUBBASIN: D11

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CB	0.005	4.3	0.40	0
GGA	0.002	1.7	0.25	0
LCA	0.057	48.7	0.25	0
MR	0.053	45.3	0.05	0
TD	0.000	0.0	1.20	0
TW	0.000	0.0	0.05	0

TOTAL = 0.117 Sq.Miles XKSAT = 0.12 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 6.60  
 Normal = 0.19  
 Wet = 0.00

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.086	M.D.R	73.5	NORMAL	30	30	0.30	0.02	Min	0.06
0.005	H.D.R	4.3	NORMAL	30	45	0.30	0.05	Low	0.07
0.015	Transpor	12.8	NORMAL	20	70	0.30	0.05	Low	0.07
0.003	Commeric	2.6	NORMAL	20	80	0.25	0.05	Low	0.08
0.008	Office	6.8	NORMAL	50	45	0.25	0.05	Low	0.07

0.117 = Total Area Avg. = 31 38% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.19

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.15

IMPERVIOUS AREA: URBAN @ 100 % effective = 38  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 38

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D11	0.117	0.420	0.036	5.0	0.30	0.19	6.60	0.15	38

LOSS PARAMETERS FOR SUBBASIN: D2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
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TW	0.154	100.	0.05	0
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TOTAL = 0.154 Sq.Miles XKSAT = 0.05 %Rock = 0

DTHETA

=====

Dry = 0.27 PSIF = 8.80  
 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
0.012	M.D.R	7.8	NORMAL	30	30	0.30	0.02	Min	0.05
0.123	H.D.R	79.9	NORMAL	30	45	0.30	0.05	Low	0.05
0.005	Transpor	3.2	NORMAL	20	70	0.30	0.05	Low	0.07
0.014	M.D.R.	9.1	NORMAL	50	30	0.25	0.05	Low	0.07

0.154 = Total Area Avg. = 32 43% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.06

IMPERVIOUS AREA: URBAN @ 100 % effective = 43  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 43

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D2	0.154	0.760	0.051	22.0	0.30	0.15	8.80	0.06	43

LOSS PARAMETERS FOR SUBBASIN: D3

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.007	2.8	0.25	0
TW	0.235	95.1	0.05	0
W	0.005	2.0	0.00	0

TOTAL = 0.247 Sq.Miles XKSAT = 0.06 %Rock = 0

DTHETA

Dry = 0.29 PSIF = 8.40  
 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
0.030	M.D.R	12.1	NORMAL	30	30	0.30	0.02	Min	0.05
0.075	S.L.R	30.4	NORMAL	30	10	0.30	0.05	Low	0.06
0.050	Public	20.2	NORMAL	30	45	0.30	0.05	Low	0.06
0.048	Commeric	19.4	NORMAL	50	30	0.25	0.05	Low	0.06
0.014	Office	5.7	NORMAL	50	45	0.25	0.05	Low	0.07
0.023	Transpor	9.3	NORMAL	60	70	0.15	0.03	Min	0.03
0.002	Comm	0.8	NORMAL	75	80	0.10	0.02	Min	0.04
0.005	Recreati	2.0	NORMAL	90	5	0.20	0.10	Hi	0.14

0.247 = Total Area Avg. = 38 31% 0.270

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.08

IMPERVIOUS AREA: URBAN @ 100 % effective = 31  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D3	0.247	0.980	0.045	13.0	0.27	0.15	8.40	0.08	31

LOSS PARAMETERS FOR SUBBASIN: D4

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Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
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LCA	0.115	99.1	0.25	0
TW	0.001	0.9	0.05	0

TOTAL = 0.116 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.068	M.D.R	58.6	DRY	30	30	0.30	0.02	Min	0.05
0.020	S.L.R	17.2	NORMAL	30	10	0.30	0.05	Low	0.06
0.017	Public	14.7	NORMAL	50	15	0.30	0.05	Low	0.07
0.001	Transpor	0.9	NORMAL	20	70	0.25	0.05	Low	0.08
0.010	Office	8.6	NORMAL	50	45	0.25	0.05	Low	0.07

0.116 = Total Area Avg. = 35 26% 0.300

PERCENT OF SUBBASIN  
 DRY = 59.0 %  
 NORMAL = 41.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.31

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.32

IMPERVIOUS AREA: URBAN @ 100 % effective = 26  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 26

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D4	0.116	0.610	0.040	18.0	0.30	0.31	4.80	0.32	26

LOSS PARAMETERS FOR SUBBASIN: D5  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.084	71.2	0.25	0
MR	0.034	28.8	0.05	0
-----				
TOTAL =	0.118 Sq.Miles		XKSAT = 0.16	%Rock = 0

DTHETA  
=====

Dry =	0.39	PSIF = 5.80
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
0.036	M.D.R	30.5	NORMAL	30	30	0.30	0.02	Min	0.05
0.062	S.L.R	52.5	NORMAL	30	10	0.30	0.05	Low	0.06
0.019	Commerci	16.1	NORMAL	20	80	0.30	0.05	Low	0.07
0.001	M.D.R.	0.8	NORMAL	50	30	0.25	0.05	Low	0.08
-----									
0.118 = Total Area			Avg. =	30	28%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.20

IMPERVIOUS AREA:  
 URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0  
 -----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D5	0.118	0.490	0.046	22.0	0.30	0.25	5.80	0.20	28

LOSS PARAMETERS FOR SUBBASIN: D6

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.039	42.4	0.25	0
MR	0.023	25.0	0.05	0
PEA	0.002	2.2	0.37	0
VF	0.028	30.4	0.01	0

TOTAL = 0.092 Sq.Miles XKSAT = 0.06 %Rock = 0

DTHETA

=====

Dry = 0.29 PSIF = 8.40  
 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
0.027	M.D.R	29.3	NORMAL	30	30	0.30	0.02	Min	0.05
0.064	S.L.R	69.6	NORMAL	30	10	0.30	0.05	Low	0.06
0.001	Office	1.1	NORMAL	50	45	0.30	0.05	Low	0.08

0.092 = Total Area Avg. = 30 16% 0.300

PERCENT OF SUBBASIN

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.07

IMPERVIOUS AREA:

URBAN @ 100 % effective = 16  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 16

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D6	0.092	0.530	0.048	13.0	0.30	0.15	8.40	0.07	16

LOSS PARAMETERS FOR SUBBASIN: D7  
 =====

Soil Survey Used Central County

XKSAT  
 =====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.111	100.	0.25	0
TOTAL = 0.111 Sq.Miles XKSAT = 0.25 %Rock = 0				

DTHETA  
 =====

Dry =	0.35	PSIF = 4.80
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
0.023	Commerci	20.9	DRY	10	80	0.30	0.02	Min	0.03
0.077	M.D.R	70.0	NORMAL	30	30	0.30	0.05	Low	0.06
0.009	Transpor	8.2	NORMAL	20	70	0.30	0.05	Low	0.07
0.001	S.L.R.	0.9	NORMAL	50	10	0.25	0.05	Low	0.08
0.110 = Total Area			Avg. =	28	44%	0.300			

PERCENT OF SUBBASIN	DRY = 21.0 %
	NORMAL = 79.0 %
	WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.27

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.30

IMPERVIOUS AREA:	URBAN @ 100 % effective = 44
	ROCK OUTCROP @ 100 % effective = 0
	% EFFECTIVE IMP. = 44

INPUT VALUES FOR MCUHP1 PROGRAM  
 -----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D7	0.111	0.450	0.049	22.0	0.30	0.27	4.80	0.30	44

LOSS PARAMETERS FOR SUBBASIN: D8

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
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LCA	0.147	94.8	0.25	0
TW	0.008	5.2	0.05	0

TOTAL = 0.155 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA

=====

Dry = 0.36 PSIF = 5.00  
 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
0.011	S.L.R	7.1	NORMAL	30	10	0.30	0.02	Min	0.05
0.122	M.D.R	78.7	NORMAL	30	30	0.30	0.05	Low	0.05
0.007	tRANSPOR	4.5	NORMAL	20	70	0.30	0.05	Low	0.07
0.015	M.D.R.	9.7	NORMAL	50	30	0.25	0.05	Low	0.07

0.155 = Total Area Avg. = 32 30% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 30  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D8	0.155	0.720	0.051	22.0	0.30	0.25	5.00	0.29	30

LOSS PARAMETERS FOR SUBBASIN: D9

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.008	17.0	0.25	0
MR	0.019	40.4	0.05	0
PEA	0.020	42.6	0.37	0

TOTAL = 0.047 Sq.Miles XKSAT = 0.15 %Rock = 0

DTHETA

Dry = 0.40 PSIF = 6.00  
 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
0.001	Vacant	2.1	DRY	10	5	0.10	0.02	Min	0.04
0.041	M.D.R	87.2	NORMAL	30	30	0.30	0.05	Low	0.06
0.004	TRANSPOR	8.5	NORMAL	20	70	0.30	0.05	Low	0.07
0.001	M.D.R.	2.1	NORMAL	50	30	0.25	0.05	Low	0.08

0.047 = Total Area Avg. = 29 33% 0.290

PERCENT OF SUBBASIN  
 DRY = 2.0 %  
 NORMAL = 98.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.18

IMPERVIOUS AREA: URBAN @ 100 % effective = 33  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 33

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D9	0.047	0.340	0.059	12.0	0.29	0.25	6.00	0.18	33

LOSS PARAMETERS FOR SUBBASIN: G1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.027	8.7	0.23	0
LCA	0.131	42.3	0.25	0
MR	0.060	19.4	0.05	0
PEA	0.003	1.0	0.37	0
PSA	0.003	1.0	0.25	0
RBA	0.074	23.9	0.26	0
TFA	0.001	0.3	0.37	0
TRA	0.004	1.3	0.11	0
VF	0.007	2.3	0.01	0

TOTAL = 0.310 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
0.001	Vacant	0.3	DRY	10	5	0.10	0.02	Min	0.04
0.159	M.D.R	51.3	NORMAL	30	30	0.30	0.05	Low	0.05
0.005	Public	1.6	NORMAL	30	45	0.30	0.05	Low	0.07
0.004	iNSTITUT	1.3	NORMAL	50	30	0.25	0.05	Low	0.07
0.141	Office	45.5	NORMAL	50	45	0.25	0.05	Low	0.05

0.310 = Total Area Avg. = 38 37% 0.280

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.22

IMPERVIOUS AREA: URBAN @ 100 % effective = 37  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 37

LOSS PARAMETERS FOR SUBBASIN: G2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.085	31.8	0.25	0
MR	0.022	8.2	0.05	0
PEA	0.142	53.2	0.37	0
VF	0.012	4.5	0.01	0
W	0.006	2.2	0.00	0

TOTAL = 0.267 Sq.Miles XKSAT = 0.24 %Rock = 0

DTHETA

=====

Dry =	0.35	PSIF =	4.90
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
0.170	M.D.R	63.7	NORMAL	30	30	0.30	0.02	Min	0.05
0.097	Recreati	36.3	NORMAL	60	10	0.30	0.05	Low	0.06

0.267 = Total Area Avg. = 43 23% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.33

IMPERVIOUS AREA: URBAN @ 100 % effective = 23  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 23

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
G2	0.267	1.210	0.035	21.0	0.30	0.25	4.90	0.33	23

LOSS PARAMETERS FOR SUBBASIN: L1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.008	10.0	0.25	0
TW	0.029	36.2	0.05	0
W	0.043	53.8	0.00	0

TOTAL = 0.080 Sq.Miles XKSAT = 0.29 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.55  
 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
0.033	M.D.R	41.2	NORMAL	30	30	0.10	0.02	Min	0.03
0.003	Public	3.8	NORMAL	30	45	0.30	0.05	Low	0.08
0.044	Water	55.0	NORMAL	20	70	0.30	0.05	Low	0.06

0.080 = Total Area Avg. = 27 53% 0.220

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.34

IMPERVIOUS AREA: URBAN @ 100 % effective = 53  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 53

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
L1	0.080	0.380	0.046	5.0	0.22	0.25	4.55	0.34	53

LOSS PARAMETERS FOR SUBBASIN: L2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.049	46.2	0.25	0
MR	0.005	4.7	0.05	0
W	0.052	49.1	0.00	0

TOTAL = 0.106 Sq.Miles XKSAT = 0.46 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 3.74  
 Normal = 0.26  
 Wet = 0.00

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.054	M.D.R	50.9	NORMAL	30	30	0.10	0.02	Min	0.05
0.052	Water	49.1	NORMAL	20	80	0.30	0.05	Low	0.06

0.106 = Total Area Avg. = 28 55% 0.200

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.26

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.55

IMPERVIOUS AREA: URBAN @ 100 % effective = 55  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 55

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
L2	0.106	0.530	0.042	2.0	0.20	0.26	3.74	0.55	55

**North Area 100yr-6hr  
Soil, Landuse and Clark Parameters**

Summary of MCUHP1 Input Parameters

=====

Input File: NORTH6.M1I  
 Output File: NORTH6.M1O

SUBBASIN	AREA sq.miles	IA ins.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Tc	R
A1	0.515	0.110	0.350	4.65	0.270	6.0	0.71	0.62
A2	0.089	0.110	0.360	5.30	0.200	6.0	0.58	0.48
B1	0.166	0.300	0.190	6.60	0.150	29.0	0.44	0.19
B2	0.443	0.300	0.150	7.60	0.120	28.0	0.90	0.60
B3	0.194	0.170	0.310	4.25	0.450	24.0	0.73	0.63
B4	0.059	0.140	0.330	4.70	0.320	26.0	0.27	0.18
B5	0.314	0.290	0.250	4.70	0.340	25.0	0.95	0.79
B6	0.463	0.210	0.230	6.20	0.190	19.0	0.74	0.46
G1N	0.280	0.100	0.250	6.00	0.200	10.0	1.01	0.78
G1S	0.120	0.050	0.250	6.00	0.100	2.0	0.47	0.30
B7	0.730	0.260	0.160	7.30	0.120	34.0	0.50	0.17
B8	0.326	0.290	0.250	5.00	0.290	30.0	0.75	0.39
B9	0.164	0.280	0.250	5.10	0.280	33.0	0.80	0.75
C1	0.147	0.150	0.250	4.80	0.310	25.0	0.41	0.22
C2	1.043	0.260	0.250	6.00	0.190	37.0	1.02	0.65
C3	0.272	0.290	0.170	6.80	0.140	21.0	0.62	0.42
C4	0.583	0.080	0.250	6.00	0.190	32.0	0.61	0.31
C5	0.527	0.290	0.250	5.00	0.290	33.0	0.99	0.68
C6	0.132	0.210	0.220	7.60	0.090	20.0	0.47	0.31
C7	0.078	0.270	0.160	8.80	0.060	23.0	0.42	0.28
C8	0.205	0.300	0.350	6.60	0.150	35.0	0.48	0.31
C9	0.064	0.300	0.150	8.80	0.060	29.0	0.39	0.26
C10	0.115	0.200	0.150	8.80	0.070	22.0	0.45	0.28
C11	0.283	0.120	0.250	5.60	0.220	31.0	0.46	0.24
C12	0.210	0.100	0.390	6.20	0.170	30.0	0.43	0.27
C13	0.361	0.130	0.250	5.80	0.210	27.0	0.60	0.41
C14	0.243	0.300	0.150	7.00	0.140	22.0	0.63	0.46
L1	0.080	0.220	0.250	4.55	0.340	53.0	0.70	0.49
L2	0.106	0.200	0.260	3.74	0.550	55.0	1.23	1.01
G2	0.267	0.300	0.250	4.90	0.330	23.0	0.75	0.67
D1	0.089	0.290	0.150	8.40	0.090	28.0	0.63	0.53
D2	0.154	0.300	0.150	8.80	0.060	43.0	0.62	0.51
D3	0.247	0.270	0.150	8.40	0.080	31.0	0.82	0.65
D4	0.116	0.300	0.310	4.80	0.320	26.0	0.59	0.47
D5	0.118	0.300	0.250	5.80	0.200	28.0	0.49	0.32
D6	0.092	0.300	0.150	8.40	0.070	16.0	0.60	0.50
D7	0.111	0.300	0.270	4.80	0.300	44.0	0.49	0.31
D8	0.155	0.300	0.250	5.00	0.290	30.0	0.67	0.52
D9	0.047	0.290	0.250	6.00	0.180	33.0	0.57	0.47
D10	0.068	0.300	0.210	6.40	0.160	31.0	0.59	0.47
D11	0.117	0.300	0.190	6.60	0.150	38.0	0.63	0.38

LOSS PARAMETERS FOR SUBBASIN: A1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
BE	0.102	19.8	0.24	0
LCA	0.022	4.3	0.25	0
MTB	0.023	4.5	0.15	0
MP	0.031	6.0	0.25	0
MR	0.011	2.1	0.05	0
PT	0.025	4.9	0.40	0
PWB	0.239	46.4	0.38	0
TSC	0.035	6.8	0.14	0
TRA	0.014	2.7	0.11	0
VE	0.013	2.5	0.25	0

TOTAL = 0.515 Sq.Miles XKSAT = 0.27 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.65  
 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
0.494	Vacant	95.9	DRY	10	5	0.10	0.02	Min	0.02
0.000	S.L.R	0.0	NORMAL	30	10	0.30	0.05	Low	
0.021	M.D.R	4.1	NORMAL	30	30	0.30	0.05	Low	0.06

0.515 = Total Area Avg. = 11 6% 0.110

PERCENT OF SUBBASIN DRY = 96.0 %  
 NORMAL = 4.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.27

IMPERVIOUS AREA: URBAN @ 100 % effective = 6  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 6

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
A1	0.515	1.890	0.025	30.0	0.11	0.35	4.65	0.27	6

LOSS PARAMETERS FOR SUBBASIN: A2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
BE	0.066	74.2	0.24	0
MP	0.004	4.5	0.25	0
MR	0.012	13.5	0.05	0
PRB	0.007	7.9	0.28	0

TOTAL = 0.089 Sq.Miles XKSAT = 0.20 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 5.30  
 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
0.083	Vacant	93.3	DRY	10	5	0.10	0.02	Min	0.03
0.001	S.L.R	1.1	NORMAL	30	10	0.30	0.05	Low	0.08
0.005	M.D.R	5.6	NORMAL	50	30	0.30	0.05	Low	0.07

0.089 = Total Area Avg. = 12 6% 0.110

PERCENT OF SUBBASIN  
 DRY = 93.0 %  
 NORMAL = 7.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.36

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.20

IMPERVIOUS AREA: URBAN @ 100 % effective = 6  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 6

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
A2	0.089	0.530	0.031	9.0	0.11	0.36	5.30	0.20	6

LOSS PARAMETERS FOR SUBBASIN: B1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.027	16.3	0.25	0
MP	0.049	29.5	0.25	0
MR	0.060	36.1	0.05	0
TRA	0.023	13.9	0.11	0
TRB	0.007	4.2	0.13	0

TOTAL = 0.166 Sq.Miles XKSAT = 0.12 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 6.60  
 Normal = 0.19  
 Wet = 0.00

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.002	Vacant	1.2	DRY	10	5	0.10	0.02	Min	0.04
0.162	M.D.R	97.6	NORMAL	30	30	0.30	0.05	Low	0.05
0.002	S.L.R	1.2	NORMAL	30	10	0.30	0.05	Low	0.08

0.166 = Total Area Avg. = 30 29% 0.300

PERCENT OF SUBBASIN  
 DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.19

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.15

IMPERVIOUS AREA: URBAN @ 100 % effective = 29  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 29

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B1	0.166	0.380	0.052	24.0	0.30	0.19	6.60	0.15	29

LOSS PARAMETERS FOR SUBBASIN: B2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.002	0.5	0.23	0
LB	0.011	2.5	0.40	0
LCA	0.178	40.2	0.25	0
LE	0.002	0.5	0.04	0
MP	0.003	0.7	0.25	0
MR	0.159	35.9	0.05	0
PEA	0.001	0.2	0.37	0
RBA	0.006	1.4	0.26	0
VF	0.081	18.3	0.01	0

TOTAL = 0.443 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
0.001	S.L.R	0.2	NORMAL	30	10	0.30	0.05	Low	0.08
0.374	M.D.R	84.4	NORMAL	50	30	0.30	0.05	Low	0.05
0.060	Public	13.5	NORMAL	50	15	0.30	0.05	Low	0.06
0.008	Institut	1.8	NORMAL	30	15	0.30	0.05	Low	0.07

0.443 = Total Area Avg. = 50 28% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B2	0.443	1.170	0.046	15.0	0.30	0.15	7.60	0.12	28

LOSS PARAMETERS FOR SUBBASIN: B4  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CA2	0.013	22.0	0.38	0
LCA	0.011	18.6	0.25	0
GXA	0.035	59.3	0.23	0

TOTAL = 0.059 Sq.Miles XKSAT = 0.26 %Rock = 0

DTHETA  
=====

Dry = 0.35 PSIF = 4.70  
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
0.046	M.D.R	78.0	DRY	30	30	0.10	0.02	Min	0.03
0.013	Recreati	22.0	NORMAL	30	10	0.30	0.05	Low	0.07

0.059 = Total Area Avg. = 30 26% 0.140

PERCENT OF SUBBASIN  
DRY = 78.0 %  
NORMAL = 22.0 %  
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.33

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.32

IMPERVIOUS AREA: URBAN @ 100 % effective = 26  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 26

INPUT VALUES FOR MCUHP1 PROGRAM  
-----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B4	0.059	0.340	0.037	59.0	0.14	0.33	4.70	0.32	26

LOSS PARAMETERS FOR SUBBASIN: B3

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LB	0.008	3.1	0.40	0
LCA	0.099	38.2	0.25	0
MP	0.011	4.2	0.25	0
MR	0.005	1.9	0.05	0
PEA	0.006	2.3	0.37	0
RBA	0.022	8.5	0.26	0
TE	0.043	16.6	0.25	0

TOTAL = 0.194 Sq.Miles XKSAT = 0.35 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.25  
 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
0.123	M.D.R	63.4	DRY	30	30	0.10	0.02	Min	0.03
0.010	S.L.R	5.2	NORMAL	30	10	0.30	0.05	Low	0.07
0.061	Public	31.4	NORMAL	50	15	0.30	0.05	Low	0.06

0.194 = Total Area Avg. = 37 24% 0.170

PERCENT OF SUBBASIN DRY = 63.0 %  
 NORMAL = 37.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.31

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.45

IMPERVIOUS AREA: URBAN @ 100 % effective = 24  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 24

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B3	0.194	0.950	0.036	19.0	0.17	0.31	4.25	0.45	24

LOSS PARAMETERS FOR SUBBASIN: B5

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CA2	0.025	8.0	0.38	0
GXA	0.040	12.7	0.23	0
LCA	0.202	64.3	0.25	0
MR	0.007	2.2	0.05	0
PEA	0.036	11.5	0.37	0
RBA	0.004	1.3	0.26	0

TOTAL = 0.314 Sq.Miles XKSAT = 0.26 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.70  
 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
0.003	Vacant	1.0	DRY	10	5	0.10	0.02	Min	0.04
0.232	M.D.R	73.9	NORMAL	30	30	0.30	0.05	Low	0.05
0.006	Public	1.9	NORMAL	50	15	0.30	0.05	Low	0.07
0.073	Recreati	23.2	NORMAL	50	10	0.25	0.05	Low	0.06

0.314 = Total Area Avg. = 36 25% 0.290

PERCENT OF SUBBASIN DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.34

IMPERVIOUS AREA: URBAN @ 100 % effective = 25  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 25

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B5	0.314	1.210	0.049	21.0	0.29	0.25	4.70	0.34	25

LOSS PARAMETERS FOR SUBBASIN: B6

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.304	65.7	0.25	0
LE	0.069	14.9	0.04	0
MR	0.086	18.6	0.05	0
VF	0.004	0.9	0.01	0

TOTAL = 0.463 Sq.Miles XKSAT = 0.14 %Rock = 0

DTHETA

=====

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

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.207	M.D.R	44.7	NORMAL	30	30	0.10	0.02	Min	0.03
0.048	S.L.R	10.4	NORMAL	30	10	0.30	0.05	Low	0.06
0.208	Recreati	44.9	NORMAL	50	10	0.30	0.05	Low	0.05

0.463 = Total Area Avg. = 40 19% 0.210

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.23

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 19  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 19

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B6	0.463	1.140	0.036	18.0	0.21	0.23	6.20	0.19	19

LOSS PARAMETERS FOR SUBBASIN: B7

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.349	47.8	0.25	0
LE	0.017	2.3	0.04	0
MR	0.066	9.0	0.05	0
PEA	0.034	4.7	0.37	0
RBA	0.054	7.4	0.26	0
TG	0.043	5.9	0.04	0
TH	0.014	1.9	0.04	0
TW	0.002	0.3	0.05	0
VF	0.151	20.7	0.01	0

TOTAL = 0.730 Sq.Miles XKSAT = 0.09 %Rock = 0

DTHETA

=====

Dry = 0.33 PSIF = 7.30  
 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
0.025	Vacant	3.4	DRY	10	5	0.10	0.02	Min	0.03
0.359	M.D.R	49.2	NORMAL	30	30	0.30	0.05	Low	0.05
0.026	Public	3.6	NORMAL	50	15	0.30	0.05	Low	0.06
0.208	S.L.R.	28.5	NORMAL	50	30	0.25	0.05	Low	0.05
0.014	Office	1.9	NORMAL	50	45	0.25	0.05	Low	0.07
0.090	Transpor	12.3	NORMAL	60	70	0.15	0.03	Min	0.03
0.008	Comm	1.1	NORMAL	75	80	0.10	0.02	Min	0.04

0.730 = Total Area Avg. = 38 34% 0.260

PERCENT OF SUBBASIN

DRY = 3.0 %  
 NORMAL = 97.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.16

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 34  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 34

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B7	0.730	0.800	0.040	32.0	0.26	0.16	7.30	0.12	34

LOSS PARAMETERS FOR SUBBASIN: B8

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.040	12.3	0.23	0
LCA	0.162	49.7	0.25	0
MP	0.016	4.9	0.25	0
MR	0.024	7.4	0.05	0
PT	0.018	5.5	0.40	0
PEA	0.061	18.7	0.37	0
VF	0.005	1.5	0.01	0

TOTAL = 0.326 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA

=====

Dry = 0.36 PSIF = 5.00  
 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
0.001	Vacant	0.3	DRY	10	5	0.10	0.02	Min	0.04
0.265	M.D.R	81.3	NORMAL	30	30	0.30	0.05	Low	0.05
0.005	Public	1.5	NORMAL	50	15	0.30	0.05	Low	0.07
0.055	M.D.R.	16.9	NORMAL	50	30	0.25	0.05	Low	0.06

0.326 = Total Area Avg. = 34 30% 0.290

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 30  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B8	0.326	0.720	0.048	14.0	0.29	0.25	5.00	0.29	30

LOSS PARAMETERS FOR SUBBASIN: B9  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.079	48.2	0.25	0
MR	0.014	8.5	0.05	0
PT	0.028	17.1	0.40	0
PEA	0.028	17.1	0.37	0
TG	0.013	7.9	0.04	0
TW	0.000	0.0	0.05	0
VE	0.002	1.2	0.25	0

TOTAL = 0.164 Sq.Miles XKSAT = 0.22 %Rock = 0

DTHETA  
=====

Dry = 0.36 PSIF = 5.10  
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
0.005	Vacant	3.0	DRY	10	5	0.10	0.02	Min	0.04
0.112	M.D.R	68.3	NORMAL	30	30	0.30	0.05	Low	0.05
0.001	Public	0.6	NORMAL	50	15	0.30	0.05	Low	0.08
0.007	M.D.R.	4.3	NORMAL	50	30	0.25	0.05	Low	0.07
0.039	Office	23.8	NORMAL	50	45	0.25	0.05	Low	0.06

0.164 = Total Area Avg. = 34 33% 0.280

PERCENT OF SUBBASIN  
DRY = 3.0 %  
NORMAL = 97.0 %  
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.28

IMPERVIOUS AREA: URBAN @ 100 % effective = 33  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 33

INPUT VALUES FOR MCUHP1 PROGRAM  
-----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
B9	0.164	0.910	0.052	20.0	0.28	0.25	5.10	0.28	33

LOSS PARAMETERS FOR SUBBASIN: C1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CA2	0.000	0.0	0.38	0
LCA	0.130	88.4	0.25	0
LE	0.002	1.4	0.04	0
PEA	0.013	8.8	0.37	0
RBA	0.002	1.4	0.26	0

TOTAL = 0.147 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.111	M.D.R	75.5	NORMAL	30	30	0.10	0.02	Min	0.03
0.036	Recreati	24.5	NORMAL	30	10	0.30	0.05	Low	0.06
0.147 = Total Area			Avg. =	30	25%	0.150			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.31

IMPERVIOUS AREA: URBAN @ 100 % effective = 25  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 25

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C1	0.147	0.450	0.034	22.0	0.15	0.25	4.80	0.31	25

LOSS PARAMETERS FOR SUBBASIN: C10

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.002	1.7	0.25	0
LE	0.007	6.1	0.04	0
TW	0.106	92.2	0.05	0

TOTAL = 0.115 Sq.Miles XKSAT = 0.05 %Rock = 0

DTHETA

=====

Dry = 0.27 PSIF = 8.80  
 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
0.051	M.D.R	44.0	NORMAL	30	30	0.10	0.02	Min	0.03
0.006	S.L.R	5.2	NORMAL	30	10	0.30	0.05	Low	0.07
0.040	Public	34.5	NORMAL	50	20	0.30	0.05	Low	0.06
0.019	Recreati	16.4	NORMAL	50	10	0.25	0.05	Low	0.07

0.116 = Total Area Avg. = 41 22% 0.200

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.07

IMPERVIOUS AREA: URBAN @ 100 % effective = 22  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 22

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C10	0.115	0.450	0.042	18.0	0.20	0.15	8.80	0.07	22

LOSS PARAMETERS FOR SUBBASIN: C11

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.228	80.6	0.25	0
MR	0.055	19.4	0.05	0
TOTAL = 0.283 Sq.Miles XKSAT = 0.18 %Rock = 0				

DTHETA

Dry =	0.38	PSIF =	5.60
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
0.256	M.D.R	90.5	NORMAL	30	30	0.10	0.02	Min	0.03
0.014	Office	4.9	NORMAL	30	10	0.30	0.05	Low	0.07
0.013	Commerci	4.6	NORMAL	50	80	0.30	0.05	Low	0.07
0.283 = Total Area			Avg. =	30	31%	0.120			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.22

IMPERVIOUS AREA:  
 URBAN @ 100 % effective = 31  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C11	0.283	0.680	0.028	19.0	0.12	0.25	5.60	0.22	31

LOSS PARAMETERS FOR SUBBASIN: C12

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.152	72.4	0.25	0
MR	0.037	17.6	0.05	0
VF	0.021	10.0	0.01	0

TOTAL = 0.210 Sq.Miles XKSAT = 0.14 %Rock = 0

DTHETA

=====

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

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.210	M.D.R	100.	DRY	30	30	0.10	0.02	Min	0.05
0.210 = Total Area			Avg. =	30	30%	0.100			

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 = 30  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C12	0.210	0.720	0.027	25.0	0.10	0.39	6.20	0.17	30

LOSS PARAMETERS FOR SUBBASIN: C13

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.256	70.9	0.25	0
MR	0.066	18.3	0.05	0
TW	0.039	10.8	0.05	0

TOTAL = 0.361 Sq.Miles XKSAT = 0.16 %Rock = 0

DTHETA

=====

Dry = 0.39 PSIF = 5.80  
 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
0.301	M.D.R	83.6	NORMAL	30	30	0.10	0.02	Min	0.03
0.004	Office	1.1	NORMAL	30	45	0.30	0.05	Low	0.07
0.055	Recreati	15.3	NORMAL	60	10	0.30	0.05	Low	0.06
0.360 = Total Area			Avg. = 36		27%	0.130			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.21

IMPERVIOUS AREA: URBAN @ 100 % effective = 27  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 27

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C13	0.361	1.100	0.029	21.0	0.13	0.25	5.80	0.21	27

LOSS PARAMETERS FOR SUBBASIN: C14

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.103	42.4	0.25	0
TW	0.140	57.6	0.05	0
W	0.000	0.0	0.00	0

TOTAL = 0.243 Sq.Miles XKSAT = 0.10 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 7.00  
 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
0.140	M.D.R	57.9	NORMAL	30	30	0.30	0.02	Min	0.06
0.102	Recreati	42.1	NORMAL	60	10	0.30	0.05	Low	0.06

0.242 = Total Area Avg. = 45 22% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 22  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 22

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C14	0.243	0.910	0.036	18.0	0.30	0.15	7.00	0.14	22

LOSS PARAMETERS FOR SUBBASIN: C2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.695	66.6	0.25	0
LE	0.016	1.5	0.04	0
MR	0.012	1.2	0.05	0
TU	0.020	1.9	0.25	0
TW	0.300	28.8	0.05	0

TOTAL = 1.043 Sq.Miles XKSAT = 0.15 %Rock = 0

DTHETA

=====

Dry = 0.40 PSIF = 6.00  
 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
0.026	Vacant	2.5	DRY	10	5	0.10	0.02	Min	0.03
0.693	M.D.R	66.4	NORMAL	30	30	0.30	0.05	Low	0.06
0.010	Public	1.0	NORMAL	50	15	0.30	0.05	Low	0.07
0.057	S.L.R	5.5	NORMAL	30	10	0.25	0.05	Low	0.06
0.054	Office	5.2	NORMAL	50	45	0.25	0.05	Low	0.06
0.203	Transpor	19.5	NORMAL	60	70	0.15	0.03	Min	0.03

1.043 = Total Area Avg. = 33 37% 0.260

PERCENT OF SUBBASIN  
 DRY = 2.0 %  
 NORMAL = 98.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 37  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 37

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C2	1.043	2.010	0.037	20.0	0.26	0.25	6.00	0.19	37

LOSS PARAMETERS FOR SUBBASIN: C3

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.174	64.0	0.25	0
MR	0.020	7.4	0.05	0
REA	0.006	2.2	0.26	0
TH	0.015	5.5	0.04	0
TW	0.018	6.6	0.05	0
VF	0.039	14.3	0.01	0

TOTAL = 0.272 Sq.Miles XKSAT = 0.11 %Rock = 0

DTHETA

=====

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

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.087	M.D.R	32.0	NORMAL	30	30	0.30	0.02	Min	0.05
0.102	S.L.R	37.5	NORMAL	30	10	0.30	0.05	Low	0.06
0.021	Public	7.7	NORMAL	50	15	0.30	0.05	Low	0.06
0.062	Hotel	22.8	NORMAL	50	30	0.25	0.05	Low	0.06

0.272 = Total Area Avg. = 36 21% 0.290

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.17

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 21  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 21

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C3	0.272	0.910	0.042	25.0	0.29	0.17	6.80	0.14	21

LOSS PARAMETERS FOR SUBBASIN: C4

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.396	67.9	0.25	0
MP	0.007	1.2	0.25	0
MR	0.104	17.8	0.05	0
PEA	0.006	1.0	0.37	0
TG	0.011	1.9	0.04	0
TH	0.054	9.3	0.04	0
TW	0.005	0.9	0.05	0
VF	0.000	0.0	0.01	0

TOTAL = 0.583 Sq.Miles XKSAT = 0.15 %Rock = 0

DTHETA

=====

Dry = 0.40 PSIF = 6.00  
 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
0.415	M.D.R	71.2	NORMAL	30	30	0.00	0.02	Min	0.05
0.009	Public	1.5	NORMAL	30	10	0.30	0.05	Low	0.07
0.028	S.L.R	4.8	NORMAL	50	15	0.30	0.05	Low	0.06
0.005	M.D.R.	0.9	NORMAL	50	30	0.25	0.05	Low	0.07
0.126	Office	21.6	NORMAL	50	45	0.25	0.05	Low	0.05

0.583 = Total Area Avg. = 35 32% 0.080

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.19

IMPERVIOUS AREA: URBAN @ 100 % effective = 32  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 32

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C4	0.583	1.060	0.030	19.0	0.08	0.25	6.00	0.19	32

LOSS PARAMETERS FOR SUBBASIN: C5

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.021	4.0	0.23	0
LCA	0.283	53.7	0.25	0
MR	0.035	6.6	0.05	0
PEA	0.147	27.9	0.37	0
RBA	0.023	4.4	0.26	0
TG	0.001	0.2	0.04	0
TH	0.014	2.7	0.04	0
TW	0.003	0.6	0.05	0

TOTAL = 0.527 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA

Dry = 0.36 PSIF = 5.00  
 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
0.006	Vacant	1.1	DRY	10	5	0.10	0.02	Min	0.04
0.396	M.D.R	75.1	NORMAL	30	30	0.30	0.05	Low	0.05
0.012	Rereatio	2.3	NORMAL	50	15	0.30	0.05	Low	0.07
0.001	Commerci	0.2	NORMAL	50	30	0.25	0.05	Low	0.08
0.112	Office	21.3	NORMAL	50	45	0.25	0.05	Low	0.05

0.527 = Total Area Avg. = 34 33% 0.290

PERCENT OF SUBBASIN  
 DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 33  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 33

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C5	0.527	1.360	0.045	18.0	0.29	0.25	5.00	0.29	33

LOSS PARAMETERS FOR SUBBASIN: C6  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.046	34.8	0.25	0
LE	0.084	63.6	0.04	0
TW	0.002	1.5	0.05	0

TOTAL = 0.132 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
0.056	Vacant	42.4	DRY	10	5	0.10	0.02	Min	0.03
0.059	M.D.R	44.7	NORMAL	30	30	0.30	0.05	Low	0.06
0.006	Commerci	4.5	NORMAL	50	80	0.30	0.05	Low	0.07
0.011	Recreati	8.3	NORMAL	50	15	0.25	0.05	Low	0.07

0.132 = Total Area Avg. = 22 20% 0.210

PERCENT OF SUBBASIN  
DRY = 42.0 %  
NORMAL = 58.0 %  
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.22

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 20  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 20

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C6	0.132	0.530	0.043	23.0	0.21	0.22	7.60	0.09	20

LOSS PARAMETERS FOR SUBBASIN: C7

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.003	3.8	0.25	0
LE	0.014	17.9	0.04	0
TW	0.061	78.2	0.05	0

TOTAL = 0.078 Sq.Miles XKSAT = 0.05 %Rock = 0

DTHETA

=====

Dry = 0.27 PSIF = 8.80  
 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
0.007	Vacant	9.0	DRY	10	5	0.10	0.02	Min	0.04
0.054	M.D.R.	69.2	NORMAL	30	30	0.30	0.05	Low	0.06
0.000	Public	0.0	NORMAL	50	15	0.30	0.05	Low	
0.017	Recrea	21.8	NORMAL	60	10	0.25	0.05	Low	0.07

0.078 = Total Area Avg. = 35 23% 0.270

PERCENT OF SUBBASIN  
 DRY = 9.0 %  
 NORMAL = 91.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.16

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.06

IMPERVIOUS AREA: URBAN @ 100 % effective = 23  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 23

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C7	0.078	0.380	0.054	26.0	0.27	0.16	8.80	0.06	23

LOSS PARAMETERS FOR SUBBASIN: C8  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.117	57.1	0.25	0
MR	0.083	40.5	0.05	0
TH	0.005	2.4	0.04	0

TOTAL = 0.205 Sq.Miles XKSAT = 0.12 %Rock = 0

DTHETA  
=====

Dry = 0.37 PSIF = 6.60  
Normal = 0.19  
Wet = 0.00

LAND USE  
=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.178	M.D.R	86.8	DRY	30	30	0.30	0.02	Min	0.05
0.023	Commeric	11.2	NORMAL	30	80	0.30	0.05	Low	0.06
0.004	Recreati	2.0	NORMAL	50	10	0.30	0.05	Low	0.07

0.205 = Total Area Avg. = 31 35% 0.300

PERCENT OF SUBBASIN DRY = 87.0 %  
NORMAL = 13.0 %  
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.35

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.15

IMPERVIOUS AREA: URBAN @ 100 % effective = 35  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 35

INPUT VALUES FOR MCUHP1 PROGRAM  
-----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
C8	0.205	0.720	0.030	21.0	0.30	0.35	6.60	0.15	35



LOSS PARAMETERS FOR SUBBASIN: D1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.006	6.7	0.25	0
LE	0.004	4.5	0.04	0
TW	0.079	88.8	0.05	0

TOTAL = 0.089 Sq.Miles XKSAT = 0.06 %Rock = 0

DTHETA

Dry = 0.29 PSIF = 8.40  
 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
0.000	Vacant	0.0	DRY	10	5	0.10	0.02	Min	
0.078	M.D.R	87.6	NORMAL	50	30	0.30	0.05	Low	0.06
0.002	Public	2.2	NORMAL	50	15	0.30	0.05	Low	0.08
0.009	Recreati	10.1	NORMAL	60	10	0.25	0.05	Low	0.07

0.089 = Total Area Avg. = 51 28% 0.290

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D1	0.089	0.530	0.056	15.0	0.29	0.15	8.40	0.09	28

LOSS PARAMETERS FOR SUBBASIN: D10

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.042	61.8	0.25	0
MR	0.025	36.8	0.05	0
TW	0.001	1.5	0.05	0

TOTAL = 0.068 Sq.Miles XKSAT = 0.13 %Rock = 0

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
0.067	M.D.R	98.5	NORMAL	30	30	0.30	0.02	Min	0.06
0.001	TRANSPOR	1.5	NORMAL	20	70	0.30	0.05	Low	0.08

0.068 = Total Area Avg. = 30 31% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.21

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.16

IMPERVIOUS AREA: URBAN @ 100 % effective = 31  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D10	0.068	0.420	0.031	5.0	0.30	0.21	6.40	0.16	31

LOSS PARAMETERS FOR SUBBASIN: D11

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
CB	0.005	4.3	0.40	0
GGA	0.002	1.7	0.25	0
LCA	0.057	48.7	0.25	0
MR	0.053	45.3	0.05	0
TD	0.000	0.0	1.20	0
TW	0.000	0.0	0.05	0

TOTAL = 0.117 Sq.Miles XKSAT = 0.12 %Rock = 0

DTHETA

Dry = 0.37 PSIF = 6.60  
 Normal = 0.19  
 Wet = 0.00

LAND USE

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.086	M.D.R	73.5	NORMAL	30	30	0.30	0.02	Min	0.06
0.005	H.D.R	4.3	NORMAL	30	45	0.30	0.05	Low	0.07
0.015	Transpor	12.8	NORMAL	20	70	0.30	0.05	Low	0.07
0.003	Commeric	2.6	NORMAL	20	80	0.25	0.05	Low	0.08
0.008	Office	6.8	NORMAL	50	45	0.25	0.05	Low	0.07

0.117 = Total Area Avg. = 31 38% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.19

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.15

IMPERVIOUS AREA: URBAN @ 100 % effective = 38  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 38

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D11	0.117	0.420	0.036	5.0	0.30	0.19	6.60	0.15	38

LOSS PARAMETERS FOR SUBBASIN: D2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
TW	0.154	100.	0.05	0
TOTAL = 0.154 Sq.Miles XKSAT = 0.05 %Rock = 0				

DTHETA

=====

Dry =	0.27	PSIF =	8.80
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
0.012	M.D.R	7.8	NORMAL	30	30	0.30	0.02	Min	0.05
0.123	H.D.R	79.9	NORMAL	30	45	0.30	0.05	Low	0.05
0.005	Transpor	3.2	NORMAL	20	70	0.30	0.05	Low	0.07
0.014	M.D.R.	9.1	NORMAL	50	30	0.25	0.05	Low	0.07
0.154 = Total Area			Avg. =	32	43%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.06

IMPERVIOUS AREA: URBAN @ 100 % effective = 43  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 43

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D2	0.154	0.760	0.051	22.0	0.30	0.15	8.80	0.06	43

LOSS PARAMETERS FOR SUBBASIN: D3

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.007	2.8	0.25	0
TW	0.235	95.1	0.05	0
W	0.005	2.0	0.00	0

TOTAL = 0.247 Sq.Miles XKSAT = 0.06 %Rock = 0

DTHETA

=====

Dry = 0.29 PSIF = 8.40  
 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
0.030	M.D.R	12.1	NORMAL	30	30	0.30	0.02	Min	0.05
0.075	S.L.R	30.4	NORMAL	30	10	0.30	0.05	Low	0.06
0.050	Public	20.2	NORMAL	30	45	0.30	0.05	Low	0.06
0.048	Commeric	19.4	NORMAL	50	30	0.25	0.05	Low	0.06
0.014	Office	5.7	NORMAL	50	45	0.25	0.05	Low	0.07
0.023	Transpor	9.3	NORMAL	60	70	0.15	0.03	Min	0.03
0.002	Comm	0.8	NORMAL	75	80	0.10	0.02	Min	0.04
0.005	Recreati	2.0	NORMAL	90	5	0.20	0.10	Hi	0.14

0.247 = Total Area Avg. = 38 31% 0.270

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.08

IMPERVIOUS AREA: URBAN @ 100 % effective = 31  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D3	0.247	0.980	0.045	13.0	0.27	0.15	8.40	0.08	31

LOSS PARAMETERS FOR SUBBASIN: D4  
 =====

Soil Survey Used Central County

XKSAT  
 =====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.115	99.1	0.25	0
TW	0.001	0.9	0.05	0
-----				
TOTAL =	0.116 Sq.Miles	XKSAT = 0.25	%Rock = 0	

DTHETA  
 =====

Dry = 0.35 PSIF = 4.80  
 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
0.068	M.D.R	58.6	DRY	30	30	0.30	0.02	Min	0.05
0.020	S.L.R	17.2	NORMAL	30	10	0.30	0.05	Low	0.06
0.017	Public	14.7	NORMAL	50	15	0.30	0.05	Low	0.07
0.001	Transpor	0.9	NORMAL	20	70	0.25	0.05	Low	0.08
0.010	Office	8.6	NORMAL	50	45	0.25	0.05	Low	0.07
-----									
0.116 = Total Area			Avg. =	35	26%	0.300			

PERCENT OF SUBBASIN  
 DRY = 59.0 %  
 NORMAL = 41.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.31

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.32

IMPERVIOUS AREA: URBAN @ 100 % effective = 26  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 26

INPUT VALUES FOR MCUHP1 PROGRAM  
 -----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D4	0.116	0.610	0.040	18.0	0.30	0.31	4.80	0.32	26

LOSS PARAMETERS FOR SUBBASIN: D5

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.084	71.2	0.25	0
MR	0.034	28.8	0.05	0
-----				
TOTAL =	0.118 Sq.Miles		XKSAT = 0.16	%Rock = 0

DTHETA

Dry =	0.39	PSIF = 5.80
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
0.036	M.D.R	30.5	NORMAL	30	30	0.30	0.02	Min	0.05
0.062	S.L.R	52.5	NORMAL	30	10	0.30	0.05	Low	0.06
0.019	Commerci	16.1	NORMAL	20	80	0.30	0.05	Low	0.07
0.001	M.D.R.	0.8	NORMAL	50	30	0.25	0.05	Low	0.08
-----									
0.118 = Total Area			Avg. =	30	28%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.20

IMPERVIOUS AREA:	URBAN @	100 % effective = 28
	ROCK OUTCROP @	100 % effective = 0
	-----	
	% EFFECTIVE IMP. = 28	

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D5	0.118	0.490	0.046	22.0	0.30	0.25	5.80	0.20	28

LOSS PARAMETERS FOR SUBBASIN: D6  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.039	42.4	0.25	0
MR	0.023	25.0	0.05	0
PEA	0.002	2.2	0.37	0
VF	0.028	30.4	0.01	0

TOTAL = 0.092 Sq.Miles XKSAT = 0.06 %Rock = 0

DTHETA  
=====

Dry = 0.29 PSIF = 8.40  
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
0.027	M.D.R	29.3	NORMAL	30	30	0.30	0.02	Min	0.05
0.064	S.L.R	69.6	NORMAL	30	10	0.30	0.05	Low	0.06
0.001	Office	1.1	NORMAL	50	45	0.30	0.05	Low	0.08

0.092 = Total Area Avg. = 30 16% 0.300

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.07

IMPERVIOUS AREA: URBAN @ 100 % effective = 16  
ROCK OUTCROP @ 100 % effective = 0

-----  
% EFFECTIVE IMP. = 16

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D6	0.092	0.530	0.048	13.0	0.30	0.15	8.40	0.07	16

LOSS PARAMETERS FOR SUBBASIN: D7  
=====

Soil Survey Used Central County

XKSAT  
=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.111	100.	0.25	0
TOTAL = 0.111 Sq.Miles XKSAT = 0.25 %Rock = 0				

DTHETA  
=====

Dry = 0.35 PSIF = 4.80  
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
0.023	Commerci	20.9	DRY	10	80	0.30	0.02	Min	0.03
0.077	M.D.R	70.0	NORMAL	30	30	0.30	0.05	Low	0.06
0.009	Transpor	8.2	NORMAL	20	70	0.30	0.05	Low	0.07
0.001	S.L.R.	0.9	NORMAL	50	10	0.25	0.05	Low	0.08
0.110 = Total Area			Avg. =	28	44%	0.300			

PERCENT OF SUBBASIN  
 DRY = 21.0 %  
 NORMAL = 79.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.27

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.30

IMPERVIOUS AREA: URBAN @ 100 % effective = 44  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 44

INPUT VALUES FOR MCUHP1 PROGRAM  
-----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D7	0.111	0.450	0.049	22.0	0.30	0.27	4.80	0.30	44

LOSS PARAMETERS FOR SUBBASIN: D8  
 =====

Soil Survey Used Central County

XKSAT  
 =====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.147	94.8	0.25	0
TW	0.008	5.2	0.05	0
-----				
TOTAL =	0.155 Sq.Miles		XKSAT = 0.23	%Rock = 0

DTHETA  
 =====

Dry = 0.36 PSIF = 5.00  
 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
0.011	S.L.R	7.1	NORMAL	30	10	0.30	0.02	Min	0.05
0.122	M.D.R	78.7	NORMAL	30	30	0.30	0.05	Low	0.05
0.007	tRANSPOR	4.5	NORMAL	20	70	0.30	0.05	Low	0.07
0.015	M.D.R.	9.7	NORMAL	50	30	0.25	0.05	Low	0.07
-----									
0.155 = Total Area			Avg. =	32	30%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 30  
 ROCK OUTCROP @ 100 % effective = 0  
 -----  
 % EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM  
 -----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D8	0.155	0.720	0.051	22.0	0.30	0.25	5.00	0.29	30

LOSS PARAMETERS FOR SUBBASIN: D9

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.008	17.0	0.25	0
MR	0.019	40.4	0.05	0
PEA	0.020	42.6	0.37	0

TOTAL = 0.047 Sq.Miles XKSAT = 0.15 %Rock = 0

DTHETA

Dry = 0.40 PSIF = 6.00  
 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
0.001	Vacant	2.1	DRY	10	5	0.10	0.02	Min	0.04
0.041	M.D.R	87.2	NORMAL	30	30	0.30	0.05	Low	0.06
0.004	TRANSPOR	8.5	NORMAL	20	70	0.30	0.05	Low	0.07
0.001	M.D.R.	2.1	NORMAL	50	30	0.25	0.05	Low	0.08

0.047 = Total Area Avg. = 29 33% 0.290

PERCENT OF SUBBASIN  
 DRY = 2.0 %  
 NORMAL = 98.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.18

IMPERVIOUS AREA: URBAN @ 100 % effective = 33  
 ROCK OUTCROP @ 100 % effective = 0  
 % EFFECTIVE IMP. = 33

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
D9	0.047	0.340	0.059	12.0	0.29	0.25	6.00	0.18	33

LOSS PARAMETERS FOR SUBBASIN: G1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
GXA	0.027	8.7	0.23	0
LCA	0.131	42.3	0.25	0
MR	0.060	19.4	0.05	0
PEA	0.003	1.0	0.37	0
PSA	0.003	1.0	0.25	0
RBA	0.074	23.9	0.26	0
TFA	0.001	0.3	0.37	0
TRA	0.004	1.3	0.11	0
VF	0.007	2.3	0.01	0

TOTAL = 0.310 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
0.001	Vacant	0.3	DRY	10	5	0.10	0.02	Min	0.04
0.159	M.D.R	51.3	NORMAL	30	30	0.30	0.05	Low	0.05
0.005	Public	1.6	NORMAL	30	45	0.30	0.05	Low	0.07
0.004	iNSTITUT	1.3	NORMAL	50	30	0.25	0.05	Low	0.07
0.141	Office	45.5	NORMAL	50	45	0.25	0.05	Low	0.05

0.310 = Total Area Avg. = 38 37% 0.280

PERCENT OF SUBBASIN

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.22

IMPERVIOUS AREA:

URBAN @ 100 % effective = 37  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 37

LOSS PARAMETERS FOR SUBBASIN: G2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.085	31.8	0.25	0
MR	0.022	8.2	0.05	0
PEA	0.142	53.2	0.37	0
VF	0.012	4.5	0.01	0
W	0.006	2.2	0.00	0

TOTAL = 0.267 Sq.Miles XKSAT = 0.24 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.90  
 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
0.170	M.D.R	63.7	NORMAL	30	30	0.30	0.02	Min	0.05
0.097	Recreati	36.3	NORMAL	60	10	0.30	0.05	Low	0.06
0.267 = Total Area			Avg. = 43		23%	0.300			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.33

IMPERVIOUS AREA: URBAN @ 100 % effective = 23  
 ROCK OUTCROP @ 100 % effective = 0  
 -----  
 % EFFECTIVE IMP. = 23

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
G2	0.267	1.210	0.035	21.0	0.30	0.25	4.90	0.33	23

LOSS PARAMETERS FOR SUBBASIN: L1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.008	10.0	0.25	0
TW	0.029	36.2	0.05	0
W	0.043	53.8	0.00	0

TOTAL = 0.080 Sq.Miles XKSAT = 0.29 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.55  
 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
0.033	M.D.R	41.2	NORMAL	30	30	0.10	0.02	Min	0.03
0.003	Public	3.8	NORMAL	30	45	0.30	0.05	Low	0.08
0.044	Water	55.0	NORMAL	20	70	0.30	0.05	Low	0.06

0.080 = Total Area Avg. = 27 53% 0.220

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.34

IMPERVIOUS AREA: URBAN @ 100 % effective = 53  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 53

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
L1	0.080	0.380	0.046	5.0	0.22	0.25	4.55	0.34	53

LOSS PARAMETERS FOR SUBBASIN: L2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.049	46.2	0.25	0
MR	0.005	4.7	0.05	0
W	0.052	49.1	0.00	0

TOTAL = 0.106 Sq.Miles XKSAT = 0.46 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 3.74  
 Normal = 0.26  
 Wet = 0.00

LAND USE

=====

AREA Sq.Miles	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
0.054	M.D.R	50.9	NORMAL	30	30	0.10	0.02	Min	0.05
0.052	Water	49.1	NORMAL	20	80	0.30	0.05	Low	0.06

0.106 = Total Area Avg. = 28 55% 0.200

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.26

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.55

IMPERVIOUS AREA: URBAN @ 100 % effective = 55  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 55

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
L2	0.106	0.530	0.042	2.0	0.20	0.26	3.74	0.55	55

South Area 100yr-24hr  
Soil, Landuse and Clark Parameters

Summary of MCUHP1 Input Parameters

Input File: SOUTH6.M1I  
Output File: SOUTH6.M1O

SUBBASIN	AREA sq.miles	IA ins.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Tc	R
E1	0.332	0.250	0.150	7.30	0.120	49.0	0.73	0.81
E2	0.800	0.260	0.250	5.20	0.300	28.0	1.19	0.74
E3	0.321	0.150	0.250	4.80	0.340	27.0	0.61	0.47
E4	0.333	0.270	0.250	5.10	0.300	31.0	1.24	1.05
E5	0.677	0.250	0.250	5.60	0.240	39.0	0.98	0.68
E6N	0.238	0.220	0.250	5.10	0.310	18.0	0.47	0.19
E6S	0.403	0.160	0.250	5.00	0.290	24.0	0.87	0.56
E7	0.239	0.270	0.250	4.80	0.320	30.0	0.65	0.53
E8	0.262	0.300	0.320	4.70	0.350	24.0	0.73	0.52
E9	0.058	0.130	0.250	4.80	0.310	28.0	0.31	0.23

LOSS PARAMETERS FOR SUBBASIN: E1

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.114	34.3	0.25	0
MR	0.027	8.1	0.05	0
TW	0.191	57.5	0.05	0

TOTAL = 0.332 Sq.Miles XKSAT = 0.09 %Rock = 0

DTHETA

=====

Dry = 0.33 PSIF = 7.30  
 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
0.074	M.D.R	22.3	NORMAL	30	30	0.30	0.02	Min	0.05
0.031	Hotel	9.3	NORMAL	30	30	0.30	0.05	Low	0.06
0.081	H.D.R	24.4	NORMAL	30	45	0.30	0.05	Low	0.06
0.022	Transpor	6.6	NORMAL	20	70	0.25	0.05	Low	0.06
0.027	Office	8.1	NORMAL	50	45	0.25	0.05	Low	0.06
0.097	Transpor	29.2	NORMAL	60	70	0.15	0.03	Min	0.03

0.332 = Total Area Avg. = 37 49% 0.250

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA: URBAN @ 100 % effective = 49  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 49

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E1	0.332	1.890	0.036	30.0	0.25	0.15	7.30	0.12	49

LOSS PARAMETERS FOR SUBBASIN: E2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.716	89.5	0.25	0
MR	0.077	9.6	0.05	0
TW	0.007	0.9	0.05	0

TOTAL = 0.800 Sq.Miles XKSAT = 0.21 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 5.20  
 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
0.004	Water	0.5	NORMAL	10	80	0.10	0.02	Min	0.04
0.542	M.D.R	67.7	NORMAL	30	30	0.30	0.05	Low	0.05
0.001	Transpor	0.1	NORMAL	20	70	0.30	0.05	Low	0.08
0.036	M.D.R.	4.5	NORMAL	50	30	0.25	0.05	Low	0.06
0.001	Office	0.1	NORMAL	50	45	0.25	0.05	Low	0.08
0.004	Transpor	0.5	NORMAL	60	70	0.15	0.03	Min	0.04
0.039	Comm	4.9	NORMAL	75	80	0.10	0.02	Min	0.03
0.174	Recreati	21.7	NORMAL	90	5	0.20	0.10	Hi	0.10

0.801 = Total Area Avg. = 49 28% 0.260

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.30

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E2	0.800	1.590	0.050	16.0	0.26	0.25	5.20	0.30	28

LOSS PARAMETERS FOR SUBBASIN: E3

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Soil Survey Used Central County

XKSAT

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Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
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LCA	0.321	100.	0.25	0
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TOTAL = 0.321 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.180	M.D.R	56.1	NORMAL	30	30	0.10	0.02	Min	0.03
0.006	Institui	1.9	NORMAL	30	30	0.30	0.05	Low	0.07
0.038	Public	11.8	NORMAL	50	30	0.30	0.05	Low	0.06
0.005	Transpor	1.6	NORMAL	20	70	0.25	0.05	Low	0.07
0.009	Commerci	2.8	NORMAL	20	70	0.25	0.05	Low	0.07
0.083	Recreati	25.9	NORMAL	60	10	0.15	0.03	Min	0.03

0.321 = Total Area Avg. = 42 27% 0.150

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.34

IMPERVIOUS AREA: URBAN @ 100 % effective = 27  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 27

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E3	0.321	1.170	0.029	20.0	0.15	0.25	4.80	0.34	27

LOSS PARAMETERS FOR SUBBASIN: E4

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.304	91.3	0.25	0
PEA	0.003	0.9	0.37	0
TW	0.026	7.8	0.05	0

TOTAL = 0.333 Sq.Miles XKSAT = 0.22 %Rock = 0

DTHETA

Dry = 0.36 PSIF = 5.10  
 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
0.004	Vacant	1.2	DRY	10	10	0.10	0.02	Min	0.04
0.250	M.D.R	75.1	NORMAL	30	30	0.30	0.05	Low	0.05
0.006	H.D.R	1.8	NORMAL	30	45	0.30	0.05	Low	0.07
0.003	Office	0.9	NORMAL	20	45	0.25	0.05	Low	0.08
0.001	Office	0.3	NORMAL	50	45	0.25	0.05	Low	0.08
0.013	Transpor	3.9	NORMAL	60	70	0.15	0.03	Min	0.03
0.014	Comm	4.2	NORMAL	75	80	0.10	0.02	Min	0.03
0.042	Recreati	12.6	NORMAL	90	5	0.20	0.10	Hi	0.11

0.333 = Total Area Avg. = 41 31% 0.270

PERCENT OF SUBBASIN DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.30

IMPERVIOUS AREA: URBAN @ 100 % effective = 31  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E4	0.333	1.250	0.051	10.0	0.27	0.25	5.10	0.30	31

LOSS PARAMETERS FOR SUBBASIN: E5

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.603	89.1	0.25	0
MR	0.001	0.1	0.05	0
PEA	0.001	0.1	0.37	0
VF	0.072	10.6	0.01	0

TOTAL = 0.677 Sq.Miles XKSAT = 0.18 %Rock = 0

DTHETA

=====

Dry = 0.38 PSIF = 5.60  
 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
0.006	Vacant	0.9	DRY	10	5	0.10	0.02	Min	0.04
0.349	M.D.R	51.6	NORMAL	30	30	0.30	0.05	Low	0.05
0.009	Public	1.3	NORMAL	30	45	0.30	0.05	Low	0.07
0.126	L.D.R	18.6	NORMAL	50	30	0.25	0.05	Low	0.05
0.048	Office	7.1	NORMAL	50	45	0.25	0.05	Low	0.06
0.139	Transpor	20.5	NORMAL	60	70	0.15	0.03	Min	0.03

0.677 = Total Area Avg. = 38 39% 0.250

PERCENT OF SUBBASIN DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.24

IMPERVIOUS AREA: URBAN @ 100 % effective = 39  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 39

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E5	0.677	1.670	0.039	16.0	0.25	0.25	5.60	0.24	39

LOSS PARAMETERS FOR SUBBASIN: E6N

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.213	89.5	0.25	0
MR	0.021	8.8	0.05	0
W	0.004	1.7	0.00	0

TOTAL = 0.238 Sq.Miles XKSAT = 0.22 %Rock = 0

DTHETA

Dry = 0.36 PSIF = 5.10  
 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
0.093	M.D.R	39.1	NORMAL	30	30	0.10	0.02	Min	0.03
0.030	S.L.R	12.6	NORMAL	30	10	0.30	0.05	Low	0.06
0.115	Recreati	48.3	NORMAL	60	10	0.30	0.05	Low	0.05

0.238 = Total Area Avg. = 46 18% 0.220

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.31

IMPERVIOUS AREA: URBAN @ 100 % effective = 18  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 18

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E6N	0.238	0.450	0.040	16.0	0.22	0.25	5.10	0.31	18

LOSS PARAMETERS FOR SUBBASIN: E6S  
 =====

Soil Survey Used Central County

XKSAT  
 =====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.342	84.9	0.25	0
MP	0.019	4.7	0.25	0
MR	0.031	7.7	0.05	0
PEA	0.007	1.7	0.37	0
W	0.004	1.0	0.00	0

TOTAL = 0.403 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA  
 =====

Dry = 0.36 PSIF = 5.00  
 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
0.272	M.D.R	67.5	NORMAL	30	30	0.10	0.02	Min	0.03
0.085	S.L.R	21.1	NORMAL	30	10	0.30	0.05	Low	0.06
0.002	Public	0.5	NORMAL	20	45	0.30	0.05	Low	0.08
0.044	Recreati	10.9	NORMAL	60	10	0.25	0.05	Low	0.06

0.403 = Total Area Avg. = 34 24% 0.160

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 24  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 24

INPUT VALUES FOR MCUHP1 PROGRAM  
 -----

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E6S	0.403	1.060	0.032	8.0	0.16	0.25	5.00	0.29	24

LOSS PARAMETERS FOR SUBBASIN: E7

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Soil Survey Used Central County

XKSAT

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Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.206	86.2	0.25	0
RBA	0.032	13.4	0.26	0
W	0.001	0.4	0.00	0

TOTAL = 0.239 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.007	Vacant	2.9	DRY	10	5	0.10	0.02	Min	0.04
0.158	M.D.R	66.1	NORMAL	30	30	0.30	0.05	Low	0.05
0.005	Public	2.1	NORMAL	20	30	0.30	0.05	Low	0.07
0.040	S.L.R	16.7	NORMAL	50	10	0.25	0.05	Low	0.06
0.004	Office	1.7	NORMAL	50	45	0.25	0.05	Low	0.07
0.025	Transpor	10.5	NORMAL	60	70	0.15	0.03	Min	0.03

0.239 = Total Area Avg. = 35 30% 0.270

PERCENT OF SUBBASIN

DRY = 3.0 %  
 NORMAL = 97.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.32

IMPERVIOUS AREA:

URBAN @ 100 % effective = 30  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E7	0.239	1.020	0.047	30.0	0.27	0.25	4.80	0.32	30

LOSS PARAMETERS FOR SUBBASIN: E8

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.219	83.6	0.25	0
MP	0.001	0.4	0.25	0
PEA	0.018	6.9	0.37	0
RBA	0.024	9.2	0.26	0

TOTAL = 0.262 Sq.Miles XKSAT = 0.26 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.70  
 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
0.176	M.D.R	67.2	DRY	30	30	0.30	0.02	Min	0.05
0.003	Commeric	1.1	NORMAL	20	80	0.30	0.05	Low	0.08
0.083	Recreati	31.7	NORMAL	60	10	0.30	0.05	Low	0.06

0.262 = Total Area Avg. = 41 24% 0.300

PERCENT OF SUBBASIN  
 DRY = 67.0 %  
 NORMAL = 33.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.32

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.35

IMPERVIOUS AREA: URBAN @ 100 % effective = 24  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 24

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E8	0.262	0.910	0.034	12.0	0.30	0.32	4.70	0.35	24

LOSS PARAMETERS FOR SUBBASIN: E9

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.046	79.3	0.25	0
MP	0.001	1.7	0.25	0
RBA	0.011	19.0	0.26	0

TOTAL = 0.058 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.048	M.D.R	82.8	NORMAL	30	30	0.10	0.02	Min	0.03
0.005	S.L.R	8.6	NORMAL	30	10	0.30	0.05	Low	0.07
0.003	Public	5.2	NORMAL	20	45	0.30	0.05	Low	0.08
0.002	Recreati	3.4	NORMAL	60	10	0.25	0.05	Low	0.08

0.058 = Total Area Avg. = 31 28% 0.130

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.31

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E9	0.058	0.380	0.035	32.0	0.13	0.25	4.80	0.31	28

South Area 100yr-6hr  
Soil, Landuse and Clark Parameters

Summary of MCUHP1 Input Parameters

=====

Input File: SOUTH100.M1I  
 Output File: SOUTH100.M1O

SUBBASIN	AREA sq.miles	IA ins.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Tc	R
E1	0.332	0.250	0.150	7.30	0.120	49.0	0.70	0.77
E2	0.800	0.260	0.250	5.20	0.300	28.0	1.18	0.73
E3	0.321	0.150	0.250	4.80	0.340	27.0	0.54	0.41
E4	0.333	0.270	0.250	5.10	0.300	31.0	1.23	1.04
E5	0.677	0.250	0.250	5.60	0.240	39.0	0.96	0.66
E6N	0.238	0.220	0.250	5.10	0.310	18.0	0.40	0.16
E6S	0.403	0.160	0.250	5.00	0.290	24.0	0.83	0.53
E7	0.239	0.270	0.250	4.80	0.320	30.0	0.59	0.47
E8	0.262	0.300	0.320	4.70	0.350	24.0	0.67	0.47
E9	0.058	0.130	0.250	4.80	0.310	28.0	0.25	0.18

LOSS PARAMETERS FOR SUBBASIN: E1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.114	34.3	0.25	0
MR	0.027	8.1	0.05	0
TW	0.191	57.5	0.05	0
-----				
TOTAL =	0.332 Sq.Miles		XKSAT = 0.09	%Rock = 0

DTHETA

Dry =	0.33	PSIF =	7.30
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
0.074	M.D.R	22.3	NORMAL	30	30	0.30	0.02	Min	0.05
0.031	Hotel	9.3	NORMAL	30	30	0.30	0.05	Low	0.06
0.081	H.D.R	24.4	NORMAL	30	45	0.30	0.05	Low	0.06
0.022	Transpor	6.6	NORMAL	20	70	0.25	0.05	Low	0.06
0.027	Office	8.1	NORMAL	50	45	0.25	0.05	Low	0.06
0.097	Transpor	29.2	NORMAL	60	70	0.15	0.03	Min	0.03
-----									
0.332 = Total Area			Avg. =	37	49%	0.250			

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.12

IMPERVIOUS AREA:  
 URBAN @ 100 % effective = 49  
 ROCK OUTCROP @ 100 % effective = 0  
 -----  
 % EFFECTIVE IMP. = 49

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E1	0.332	1.890	0.036	30.0	0.25	0.15	7.30	0.12	49

LOSS PARAMETERS FOR SUBBASIN: E2

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.716	89.5	0.25	0
MR	0.077	9.6	0.05	0
TW	0.007	0.9	0.05	0

TOTAL = 0.800 Sq.Miles XKSAT = 0.21 %Rock = 0

DTHETA

=====

Dry = 0.37 PSIF = 5.20  
 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
0.004	Water	0.5	NORMAL	10	80	0.10	0.02	Min	0.04
0.542	M.D.R	67.7	NORMAL	30	30	0.30	0.05	Low	0.05
0.001	Transpor	0.1	NORMAL	20	70	0.30	0.05	Low	0.08
0.036	M.D.R.	4.5	NORMAL	50	30	0.25	0.05	Low	0.06
0.001	Office	0.1	NORMAL	50	45	0.25	0.05	Low	0.08
0.004	Transpor	0.5	NORMAL	60	70	0.15	0.03	Min	0.04
0.039	Comm	4.9	NORMAL	75	80	0.10	0.02	Min	0.03
0.174	Recreati	21.7	NORMAL	90	5	0.20	0.10	Hi	0.10

0.801 = Total Area Avg. = 49 28% 0.260

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.30

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E2	0.800	1.590	0.050	16.0	0.26	0.25	5.20	0.30	28

LOSS PARAMETERS FOR SUBBASIN: E3

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.321	100.	0.25	0
TOTAL = 0.321 Sq.Miles XKSAT = 0.25 %Rock = 0				

DTHETA

=====

Dry =	0.35	PSIF = 4.80
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
0.180	M.D.R	56.1	NORMAL	30	30	0.10	0.02	Min	0.03
0.006	Institui	1.9	NORMAL	30	30	0.30	0.05	Low	0.07
0.038	Public	11.8	NORMAL	50	30	0.30	0.05	Low	0.06
0.005	Transpor	1.6	NORMAL	20	70	0.25	0.05	Low	0.07
0.009	Commerci	2.8	NORMAL	20	70	0.25	0.05	Low	0.07
0.083	Recreati	25.9	NORMAL	60	10	0.15	0.03	Min	0.03

0.321 = Total Area Avg. = 42 27% 0.150

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.34

IMPERVIOUS AREA: URBAN @ 100 % effective = 27  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 27

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E3	0.321	1.170	0.029	20.0	0.15	0.25	4.80	0.34	27

LOSS PARAMETERS FOR SUBBASIN: E4

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.304	91.3	0.25	0
PEA	0.003	0.9	0.37	0
TW	0.026	7.8	0.05	0

TOTAL = 0.333 Sq.Miles XKSAT = 0.22 %Rock = 0

DTHETA

=====

Dry = 0.36 PSIF = 5.10  
 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
0.004	Vacant	1.2	DRY	10	10	0.10	0.02	Min	0.04
0.250	M.D.R	75.1	NORMAL	30	30	0.30	0.05	Low	0.05
0.006	H.D.R	1.8	NORMAL	30	45	0.30	0.05	Low	0.07
0.003	Office	0.9	NORMAL	20	45	0.25	0.05	Low	0.08
0.001	Office	0.3	NORMAL	50	45	0.25	0.05	Low	0.08
0.013	Transpor	3.9	NORMAL	60	70	0.15	0.03	Min	0.03
0.014	Comm	4.2	NORMAL	75	80	0.10	0.02	Min	0.03
0.042	Recreati	12.6	NORMAL	90	5	0.20	0.10	Hi	0.11

0.333 = Total Area Avg. = 41 31% 0.270

PERCENT OF SUBBASIN  
 DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.30

IMPERVIOUS AREA: URBAN @ 100 % effective = 31  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 31

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E4	0.333	1.250	0.051	10.0	0.27	0.25	5.10	0.30	31

LOSS PARAMETERS FOR SUBBASIN: E5

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.603	89.1	0.25	0
MR	0.001	0.1	0.05	0
PEA	0.001	0.1	0.37	0
VF	0.072	10.6	0.01	0

TOTAL = 0.677 Sq.Miles XKSAT = 0.18 %Rock = 0

DTHETA

=====

Dry = 0.38 PSIF = 5.60  
 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
0.006	Vacant	0.9	DRY	10	5	0.10	0.02	Min	0.04
0.349	M.D.R	51.6	NORMAL	30	30	0.30	0.05	Low	0.05
0.009	Public	1.3	NORMAL	30	45	0.30	0.05	Low	0.07
0.126	L.D.R	18.6	NORMAL	50	30	0.25	0.05	Low	0.05
0.048	Office	7.1	NORMAL	50	45	0.25	0.05	Low	0.06
0.139	Transpor	20.5	NORMAL	60	70	0.15	0.03	Min	0.03

0.677 = Total Area Avg. = 38 39% 0.250

PERCENT OF SUBBASIN  
 DRY = 1.0 %  
 NORMAL = 99.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.24

IMPERVIOUS AREA: URBAN @ 100 % effective = 39  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 39

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E5	0.677	1.670	0.039	16.0	0.25	0.25	5.60	0.24	39

LOSS PARAMETERS FOR SUBBASIN: E6N

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.213	89.5	0.25	0
MR	0.021	8.8	0.05	0
W	0.004	1.7	0.00	0

TOTAL = 0.238 Sq.Miles XKSAT = 0.22 %Rock = 0

DTHETA

=====

Dry = 0.36 PSIF = 5.10  
 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
0.093	M.D.R	39.1	NORMAL	30	30	0.10	0.02	Min	0.03
0.030	S.L.R	12.6	NORMAL	30	10	0.30	0.05	Low	0.06
0.115	Recreati	48.3	NORMAL	60	10	0.30	0.05	Low	0.05

0.238 = Total Area Avg. = 46 18% 0.220

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.31

IMPERVIOUS AREA: URBAN @ 100 % effective = 18  
 ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 18

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E6N	0.238	0.450	0.040	16.0	0.22	0.25	5.10	0.31	18

LOSS PARAMETERS FOR SUBBASIN: E6S

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
----------	------------------	--------	-------	-------------------

LCA	0.342	84.9	0.25	0
MP	0.019	4.7	0.25	0
MR	0.031	7.7	0.05	0
PEA	0.007	1.7	0.37	0
W	0.004	1.0	0.00	0

TOTAL = 0.403 Sq.Miles XKSAT = 0.23 %Rock = 0

DTHETA

=====

Dry = 0.36 PSIF = 5.00  
 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
0.272	M.D.R	67.5	NORMAL	30	30	0.10	0.02	Min	0.03
0.085	S.L.R	21.1	NORMAL	30	10	0.30	0.05	Low	0.06
0.002	Public	0.5	NORMAL	20	45	0.30	0.05	Low	0.08
0.044	Recreati	10.9	NORMAL	60	10	0.25	0.05	Low	0.06

0.403 = Total Area Avg. = 34 24% 0.160

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.29

IMPERVIOUS AREA: URBAN @ 100 % effective = 24  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 24

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E6S	0.403	1.060	0.032	8.0	0.16	0.25	5.00	0.29	24

LOSS PARAMETERS FOR SUBBASIN: E7

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.206	86.2	0.25	0
RBA	0.032	13.4	0.26	0
W	0.001	0.4	0.00	0

TOTAL = 0.239 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.007	Vacant	2.9	DRY	10	5	0.10	0.02	Min	0.04
0.158	M.D.R	66.1	NORMAL	30	30	0.30	0.05	Low	0.05
0.005	Public	2.1	NORMAL	20	30	0.30	0.05	Low	0.07
0.040	S.L.R	16.7	NORMAL	50	10	0.25	0.05	Low	0.06
0.004	Office	1.7	NORMAL	50	45	0.25	0.05	Low	0.07
0.025	Transpor	10.5	NORMAL	60	70	0.15	0.03	Min	0.03

0.239 = Total Area Avg. = 35 30% 0.270

PERCENT OF SUBBASIN  
 DRY = 3.0 %  
 NORMAL = 97.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.32

IMPERVIOUS AREA: URBAN @ 100 % effective = 30  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 30

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E7	0.239	1.020	0.047	30.0	0.27	0.25	4.80	0.32	30

LOSS PARAMETERS FOR SUBBASIN: E8

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.219	83.6	0.25	0
MP	0.001	0.4	0.25	0
PEA	0.018	6.9	0.37	0
RBA	0.024	9.2	0.26	0

TOTAL = 0.262 Sq.Miles XKSAT = 0.26 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.70  
 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
0.176	M.D.R	67.2	DRY	30	30	0.30	0.02	Min	0.05
0.003	Commeric	1.1	NORMAL	20	80	0.30	0.05	Low	0.08
0.083	Recreati	31.7	NORMAL	60	10	0.30	0.05	Low	0.06

0.262 = Total Area Avg. = 41 24% 0.300

PERCENT OF SUBBASIN  
 DRY = 67.0 %  
 NORMAL = 33.0 %  
 WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.32

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.35

IMPERVIOUS AREA: URBAN @ 100 % effective = 24  
 ROCK OUTCROP @ 100 % effective = 0  
 -----  
 % EFFECTIVE IMP. = 24

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E8	0.262	0.910	0.034	12.0	0.30	0.32	4.70	0.35	24

LOSS PARAMETERS FOR SUBBASIN: E9

=====

Soil Survey Used Central County

XKSAT

=====

Map Unit	AREA Sq.Miles	% Area	XKSAT	% Rock Outcrop
LCA	0.046	79.3	0.25	0
MP	0.001	1.7	0.25	0
RBA	0.011	19.0	0.26	0

TOTAL = 0.058 Sq.Miles XKSAT = 0.25 %Rock = 0

DTHETA

=====

Dry = 0.35 PSIF = 4.80  
 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
0.048	M.D.R	82.8	NORMAL	30	30	0.10	0.02	Min	0.03
0.005	S.L.R	8.6	NORMAL	30	10	0.30	0.05	Low	0.07
0.003	Public	5.2	NORMAL	20	45	0.30	0.05	Low	0.08
0.002	Recreati	3.4	NORMAL	60	10	0.25	0.05	Low	0.08

0.058 = Total Area Avg. = 31 28% 0.130

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

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.31

IMPERVIOUS AREA: URBAN @ 100 % effective = 28  
 ROCK OUTCROP @ 100 % effective = 0

-----  
 % EFFECTIVE IMP. = 28

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
E9	0.058	0.380	0.035	32.0	0.13	0.25	4.80	0.31	28

Appendix D

Appendix E

North Area 100yr-24hr Output

```

1*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
ENGINEERS
* JUL 1997
ENGINEERING CENTER
* VERSION 4.1
STREET
*
95616
* RUN DATE 15SEP98 TIME 08:14:40
1104
*
*****
*****

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*
*
* U.S. ARMY CORPS OF
* HYDROLOGIC
*
* 609 SECOND
*
* DAVIS, CALIFORNIA
*
* (916) 756-
*

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X X XXXXXXX XXXX X
X X X X X XX
X X X X X X
XXXXXXX XXXX X XXXXX X
X X X X X X
X X X X X X
X X XXXXXXX XXXX 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 -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

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

HEC-1 INPUT

PAGE

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1	ID SUN CITY HYDROLOGICAL STUDY FILE: NORTH100.DAT
2	ID AREA NORTH OF GRAND AVENUE AND APPROXIMATELY .60 SQUARE MILES ABOVE
3	ID BEARDSLEY ROAD.
4	ID SOILS AND LAND USE GIS DATA GENERATED BY STEVE BRUFFY
5	ID DRAINAGE DESIGN MENU SYSTEM (DDMS) OF FCD WAS USED
6	ID CHANNEL ROUTING REACHES SECTION NEAR 6 INTERSECTIONS ALONG
7	ID 99TH AVENUE WERE EXTRACTED FROM A HECRAS VERSION OF THE HEC-2
8	ID MODEL DEVELOPED BY POST, BUCKLY, SCHUH & JERGENS, INC., DEC. 1995
9	ID MCUHP1 RUN, 100YR-6HR STORM = 3.8, STORM SIZE =9.89 SQUARE MILES
10	ID
11	ID INITIAL SETUP OF MODEL AND HYDROLOGY DONE BY MAX DEVERA IN THE FALL OF 1997
12	ID
13	ID MODEL WAS SPLIT INTO A NORTH AND SOUTH PORTION BY DAVID DEGERNESS TO RID THE
14	ID OUTPUT OF THE HEC-1 ERROR STATING TO COMBINE HYDROGRAPHS MORE OFTEN. THIS
15	ID WILL MAKE THE MODEL EASIER TO READ. THIS WORK WAS COMPLETED IN AUGUST, 1998
16	ID
17	ID DDM MCUHP1 Sun City hydrologic study, 100yr, 24hr event *DIAGRAM
18	IT 5 500
19	IO 5
20	IN 15
21	JD 3.80 0.01
22	PC .000 .002 .005 .008 .011 .014 .017 .020 .023 .026
23	PC .029 .032 .035 .038 .041 .044 .048 .052 .056 .060
24	PC .064 .068 .072 .076 .080 .085 .090 .095 .100 .105
25	PC .110 .115 .120 .126 .133 .140 .147 .155 .163 .172
26	PC .181 .191 .203 .218 .236 .257 .283 .387 .663 .707
27	PC .735 .758 .776 .791 .804 .815 .825 .834 .842 .849
28	PC .856 .863 .869 .875 .881 .887 .893 .898 .903 .908
29	PC .913 .918 .922 .926 .930 .934 .938 .942 .946 .950
30	PC .953 .956 .959 .962 .965 .968 .971 .974 .977 .980
31	PC .983 .986 .989 .992 .995 .998 1.000

```

32      JD  3.788    0.5
33      JD  3.781    1.0
34      JD  3.754    2.0
35      JD  3.731    3.0
36      JD  3.57    10.00
      * DDM ***** Updated *****

37      KK      B3
38      KM  SUB-BASIN B3
39      KM  24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
40      KM  THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
41      KM  L = .95  Kb = .036  Adj. Slope = 19.0
42      BA  .194
43      LG  .170    .310    4.250    .450    24.000
44      UC  .592    .505
45      UA  0      3      5      8      12      20      43      75      90      96
46      UA  100
      *

```

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

```

47      KK      A1
48      KM  SUB-BASIN A1
49      KM  24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
50      KM  THIS BASIN USED RAINFALL REDUCTION FACTOR OF .997
51      KM  L = 1.89  Kb = .025  Adj. Slope = 30.0
52      BA  .515
53      LG  .110    .350    4.650    .270    6.000
54      UC  .592    .502
55      UA  0      5      16     30     65     77     84     90     94     97
56      UA  100

```

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

```

57      KK      A2
58      KM  SUB-BASIN A2
59      KM  24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
60      KM  THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
61      KM  L = .53  Kb = .031  Adj. Slope = 9.0
62      BA  .089
63      LG  .110    .360    5.300    .200    6.000
64      UC  .463    .376
65      UA  0      5      16     30     65     77     84     90     94     97
66      UA  100

```

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

```

67      KK      CF1
68      KM  COMBINE AT BEARDSLEY RD X 99TH AVE
69      HC      2

```

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

```

70      KK      DBC
71      KM  DIVERT 400 CFS INTO BEARDSLEY CHANNEL
72      DT      D1
73      DI      0      200     400     500     700     1000
74      DQ      0      200     400     420     450     500

```

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

```

75      KK      RCF1
76      KM  ROUTE FLOW FROM BREADSLEY ROAD SOUTH TO APPROXIMATELY WILLOW CREEK CIRCLE
77      KM  FLOW IS IN CHANNEL BESIDE 99TH AVENUE
78      RS      1      FLOW      -1
79      RC  .025    .020    .025    1600    .0025
80      RX      0      10     30     40     50     60     80     90
81      RY      2      .5     .3     .1     .1     .3     .5     2

```

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

```

82      KK      B1
83      KM  SUB-BASIN B1
84      KM  24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
85      KM  THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
86      KM  L = .38  Kb = .052  Adj. Slope = 24.0
87      BA  .166
88      LG  .300    .190    6.600    .150    29.000
89      UC  .346    .146
90      UA  0      5      16     30     65     77     84     90     94     97

```

HEC-1 INPUT

PAGE

1  
2

1  
3

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

91 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

92 KK CF2  
 93 KM COMBINE AT WILLOW CREEK RD X 99TH AVE  
 94 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

95 KK RCF2  
 96 KM ROUTE FLOW IN CHANNEL ALONG 99TH AVE TO DEL WEB BLVD  
 97 KM CHANNEL DIMENSIONS CHANGED FROM ORIGINAL BECAUSE OF FIELD VISIT AS OF  
 98 KM 9/10/98  
 99 RS 4 FLOW -1  
 100 RC .025 .020 .025 6400 .0028  
 \* RX 0 2 12 32 33 108 148 150  
 \* RY 8 6 5 .2 .2 5 6 8  
 101 RX 0 20 30 52 55 77 87 107  
 102 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

103 KK B2  
 104 KM SUB-BASIN B2  
 105 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 106 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .997  
 107 KM L = 1.17 Kb = .046 Adj. Slope = 15.0  
 108 BA .443  
 109 LG .300 .150 7.600 .120 28.000  
 110 UC .825 .539  
 111 UA 0 5 16 30 65 77 84 90 94 97  
 112 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

113 KK GIN  
 114 KM SUB-BASIN G1N  
 115 KM 6-HOUR RAINFALL, PATTERN NO. 2.88 WAS USED TO FIND TC & R FOR THIS BASIN  
 116 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .931  
 117 KM L = 1.02 Kb = .050 Adj. Slope = 13.0  
 118 BA .280  
 119 LG .100 .250 6.000 .200 10.000  
 120 UC 1.029 .802  
 121 UA 0 5 16 30 65 77 84 90 94 97  
 122 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

123 KK RGIN  
 124 KM ROUTE FLOW OVERLAND TO APPROXIMATELY LINDGREN AVE  
 125 RS 1 FLOW -1  
 126 RC .04 .04 .04 2400 .0050  
 127 RX 0 20 40 50 60 70 80 100  
 128 RY 2 1 1 1 1 1 1 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

129 KK G1S  
 130 KM SUB-BASIN G1S  
 131 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 132 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 133 KM L = .49 Kb = .050 Adj. Slope = 27.0  
 134 BA .120  
 135 LG .050 .250 6.000 .100 2.000  
 136 UC .379 .239  
 137 UA 0 5 16 30 65 77 84 90 94 97  
 138 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

139 KK CF3  
 140 KM COMBINE AT DELL WEB AV X 99TH AVE  
 141 HC 4  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

142 KK DDWC  
 143 KM DIVERT 500 CFS TO DELL WEB CHANNEL  
 144 DT D2  
 145 DI 0 300 400 503 700 800 900  
 146 DQ 0 300 400 503 594 612 630  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

1  
4

147 KK R299  
 148 KM ROUTE FLOW OVERLAND TO BELL ROAD AND 99TH AVE  
 149 RS 2 FLOW -1  
 150 RC .035 .035 .035 3200 .0049  
 151 RX 0 5 40 70 71 100 145 150  
 152 RY 5 3 3 .1 .1 3 3 5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

153 KK B8  
 154 KM SUB-BASIN B8  
 155 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 156 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 157 KM L = .72 Kb = .048 Adj. Slope = 14.0  
 158 BA .326  
 159 LG .290 .250 5.000 .290 30.000  
 160 UC .654 .336  
 161 UA 0 5 16 30 65 77 84 90 94 97  
 162 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

163 KK RB8  
 164 KM ROUTE FLOW OVERLAND FROM SUBBASIN B8 TO BELL ROAD AND 99TH AVE.  
 165 RS 3 FLOW -1  
 166 RC .04 .04 .04 3600 .0014  
 167 RX 0 20 40 80 120 140 160 180  
 168 RY 2.5 1 1 1 1 1 1 2.5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

169 KK B7  
 170 KM SUB-BASIN B7  
 171 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 172 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .996  
 173 KM L = .80 Kb = .040 Adj. Slope = 32.0  
 174 BA .730  
 175 LG .260 .160 7.300 .120 34.000  
 176 UC .412 .139  
 177 UA 0 5 16 30 65 77 84 90 94 97  
 178 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

179 KK B9  
 180 KM SUB-BASIN B9  
 181 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 182 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 183 KM L = .91 Kb = .052 Adj. Slope = 20.0  
 184 BA .164  
 185 LG .280 .250 5.100 .280 33.000  
 186 UC .696 .643  
 187 UA 0 5 16 30 65 77 84 90 94 97  
 188 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

189 KK RB9  
 190 KM ROUTE FLOW OVERLAND FROM BASIN B9 TO INTERSECTION OF 99TH AVE AND BELL RD  
 191 RS 1 FLOW -1  
 192 RC .035 .035 .035 2600 .0008  
 193 RX 0 20 40 60 80 100 120 140  
 194 RY 3 2 1 1 1 1 2 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

195 KK CF4  
 196 KM COMBINE FLOWS AT BELL RD X 99TH AVE  
 197 HC 4  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

198 KK RCF4  
 199 KM ROUTE FLOW FROM BELL ROAD IN CHANNEL TO APPROXIMATELY PINEAIRE DR(OR HUTTON)  
 200 KM RX AND RY VALUES CHANGED BECAUSE OF FIELD VISIT ON 9/10/98  
 201 RS 1 FLOW -1  
 202 RC .025 .015 .025 1600 .0069  
 \* RX 0 5 45 71 72 105 145 150  
 \* RY 5 3 3 .1 .1 3 3 5  
 203 RX 0 20 30 52 55 77 87 107  
 204 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

205 KK C3  
 206 KM SUB-BASIN C3  
 207 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 208 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 209 KM L = .91 Kb = .042 Adj. Slope = 25.0  
 210 BA .272

HEC-1 INPUT

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

211 LG .290 .170 6.800 .140 21.000  
 212 UC .512 .343  
 213 UA 0 5 16 30 65 77 84 90 94 97  
 214 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

215 KK CF5  
 216 KM COMBINE FLOWS AT HUTTON DR X 99TH AVE  
 217 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

218 KK RCF5  
 219 KM ROUTE FLOWS FROM PINEAIRE DR (OR HUTTON) TO DESERT ROCK (OR BURNS)  
 220 KM RX AND RY CHANGED BECAUSE OF OBSERVATIONS MADE DURING FIELD TRIP ON 9/10/98  
 221 RS 1 FLOW -1  
 222 RC .025 .015 .025 2000 .0055  
 \* RX 0 30 46 71 100 125 155 200  
 \* RY 5.8 6.2 4.3 .1 .1 3.8 4.2 11  
 223 RX 0 20 30 52 55 77 87 107  
 224 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

225 KK C4  
 226 KM SUB-BASIN C4  
 227 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 228 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .997  
 229 KM L = 1.06 Kb = .030 Adj. Slope = 19.0  
 230 BA .583  
 231 LG .080 .250 6.000 .190 32.000  
 232 UC .508 .249  
 233 UA 0 5 16 30 65 77 84 90 94 97  
 234 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

235 KK CF6  
 236 KM COMBINE FLOWS AT BURNS ST X 99TH AVE  
 237 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

238 KK RCF6  
 239 KM ROUTE FLOWS IN CHANNEL DOWN 99TH AVE TO GREENWAY ROAD  
 240 KM RX AND RY CHANGED BECAUSE OF FIELD VISIT ON 9/10/98  
 241 RS 1 FLOW -1  
 242 RC .025 .015 .025 2600 .0045  
 \* RX 0 40 78 100 122 129 155 200  
 \* RY 5.5 5 4.6 .1 .1 4.5 4.8 5.5  
 243 RX 0 20 30 52 55 77 87 107  
 244 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

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

245 KK C8  
 246 KM SUB-BASIN C8  
 247 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 248 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 249 KM L = .72 Kb = .030 Adj. Slope = 21.0  
 250 BA .205  
 251 LG .300 .350 6.600 .150 35.000  
 252 UC .387 .245  
 253 UA 0 5 16 30 65 77 84 90 94 97  
 254 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

255 KK C5  
 256 KM SUB-BASIN C5  
 257 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 258 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .997

259 KM L = 1.36 Kb = .045 Adj. Slope = 18.0  
 260 BA .527  
 261 LG .290 .250 5.000 .290 33.000  
 262 UC .892 .600  
 263 UA 0 5 16 30 65 77 84 90 94 97  
 264 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

265 KK CF7  
 266 KM COMBINE FLOWS AT GREENWAY RD X 99TH AVE  
 267 HC 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

268 KK RCF7  
 269 KM ROUTE FLOWS IN CHANNEL ALONG 99TH AVE. TO BOSWELL BLVD.  
 270 KM RX AND RY CHANGED TO REFLECT FIELD VISIT ON 9/10/98  
 271 RS 1 FLOW -1  
 272 RC .025 .015 .025 1600 .0031  
 \* RX 0 40 75 90 110 120 160 180  
 \* RY 8.0 6.0 5.8 .1 .1 5.7 6.2 7.5  
 273 RX 0 20 30 52 55 77 87 107  
 274 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

275 KK C11  
 276 KM SUB-BASIN C11  
 277 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 278 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 279 KM L = .68 Kb = .028 Adj. Slope = 19.0  
 280 BA .283  
 281 LG .120 .250 5.600 .220 31.000  
 282 UC .371 .186  
 283 UA 0 5 16 30 65 77 84 90 94 97  
 284 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

285 KK CF8  
 286 KM COMBINE FLOWS AT BOSEWELL RD X 99TH AVE  
 287 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

288 KK RCF8  
 289 KM ROUTE FLOWS IN CHANNEL ALONG 99TH AVE TO CAMEO DR.  
 290 KM RX AND RY CHANGED BECAUSE OF FIELD VISIT ON 9/10/98  
 291 RS 1 FLOW -1  
 292 RC .025 .015 .025 1400 .0024  
 \* RX 0 30 42 75 100 120 155 170  
 \* RY 8.0 8.3 5.8 4.7 .1 4.5 5.8 8.2  
 293 RX 0 20 30 52 55 77 87 107  
 294 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

295 KK C12  
 296 KM SUB-BASIN C12  
 297 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 298 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 299 KM L = .72 Kb = .027 Adj. Slope = 25.0  
 300 BA .210  
 301 LG .100 .390 6.200 .170 30.000  
 302 UC .338 .207  
 303 UA 0 5 16 30 65 77 84 90 94 97  
 304 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

305 KK CF9  
 306 KM COMBINE FLOWS AT CAMEO DR X 99TH AVE  
 307 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

308 KK RCF9  
 309 KM ROUTE FLOWS DOWN CHANNEL ALONG 99TH AVE TO THUNDERBIRD AVE.  
 310 KM RX AND RY VALUES CHANGED BECAUSE OF FIELD VISIT ON 9/10/98  
 311 RS 1 FLOW -1  
 312 RC .025 .015 .025 1200 .0022  
 \* RX 0 40 70 90 98 120 140 170  
 \* RY 8.5 5.2 4.3 3.0 3.0 5.0 8.2 8.5  
 313 RX 0 20 30 52 55 77 87 107

314 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

315 KK G2  
 316 KM SUB-BASIN G2  
 317 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 318 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 319 KM L = 1.21 Kb = .035 Adj. Slope = 21.0  
 320 BA .267  
 321 LG .300 .250 4.900 .330 23.000  
 322 UC .642 .559  
 323 UA 0 5 16 30 65 77 84 90 94 97  
 324 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

325 KK CF10  
 326 KM COMBINE AT THUNDERBIRD AVE X 99TH AVE  
 327 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

328 KK RCF10  
 329 KM ROUTE FLOWS IN CHANNEL ALONG 99TH AVE TO EMBERWOOD  
 330 KM RX AND RY CHANGED TO REFLECT FIELD VISIT ON 9/10/98  
 331 RS 1 FLOW -1  
 332 RC .025 .015 .025 2200 .0032  
 \* RX 0 30 40 100 120 155 170 200  
 \* RY 8.7 8.0 6.0 .1 5.5 5.6 7.5 8.8  
 333 RX 0 20 30 52 55 77 87 107  
 334 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

335 KK D5  
 336 KM SUB-BASIN D5  
 337 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 338 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 339 KM L = .49 Kb = .046 Adj. Slope = 22.0  
 340 BA .118  
 341 LG .300 .250 5.800 .200 28.000  
 342 UC .396 .253  
 343 UA 0 5 16 30 65 77 84 90 94 97  
 344 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

345 KK D6  
 346 KM SUB-BASIN D6  
 347 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 348 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 349 KM L = .53 Kb = .048 Adj. Slope = 13.0  
 350 BA .092  
 351 LG .300 .150 8.400 .070 16.000  
 352 UC .504 .406  
 353 UA 0 5 16 30 65 77 84 90 94 97  
 354 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

355 KK CF11  
 356 KM COMBINE FLOW UPSTREAM DIVERT CHANNEL PARALLEL TO EMBERWOOD ST  
 357 HC 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

358 KK DCF11  
 359 KM DIVERT TO CHANNEL EASTWARD TO NEW RIVER  
 360 DT D3  
 361 DI 0 100 200 300 500  
 362 DQ 0 100 200 220 250  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

363 KK RD3  
 364 KM ROUTE FLOW IN CHANNEL ALONG 99TH AVE. TO CHANNEL ON NORTH SIDE OF GRAND AVE  
 365 KM RX AND RY CHANGED BECAUSE OF FIELD VISIT ON 9/10/08  
 366 RS 1 FLOW -1  
 367 RC .020 .015 .020 1920 .0020

1  
9

1  
10

\* RX 0 5 40 68 72 100 145 150  
 \* RY 5 3 3 .2 .2 3 3 5  
 368 RX 0 20 30 52 55 77 87 107  
 369 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*  
 370 KK D8  
 371 KM SUB-BASIN D8  
 372 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 373 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 374 KM L = .72 Kb = .051 Adj. Slope = 22.0  
 375 BA .155  
 376 LG .300 .250 5.000 .290 30.000  
 377 UC .554 .428  
 378 UA 0 5 16 30 65 77 84 90 94 97  
 379 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

380 KK D10  
 381 KM SUB-BASIN D10  
 382 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 383 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF 1.000  
 384 KM L = .42 Kb = .031 Adj. Slope = 5.0  
 385 BA .068  
 386 LG .300 .210 6.400 .160 31.000  
 387 UC .483 .382  
 388 UA 0 5 16 30 65 77 84 90 94 97  
 389 UA 100  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

390 KK CPD10  
 391 KM COMBINE FLOWS FROM SUBBASINS D8 AND D10 AT GRAND AVE  
 392 HC 2  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

393 KK CPD10B  
 394 KM COMBINE THE PREVIOUS CONCENTRATION POINT FLOWS WITH THE FLOW COMING DOWN THE  
 395 KM STREET FROM SUBBASINS D5 AND D6. THIS IS ALSO AT GRAND AVE.  
 396 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

397 KK C2  
 398 KM SUB-BASIN C2  
 399 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 400 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .994  
 401 KM L = 2.01 Kb = .037 Adj. Slope = 20.0  
 402 BA 1.043

HEC-1 INPUT

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

403 LG .260 .250 6.000 .190 37.000  
 404 UC .946 .594  
 405 UA 0 5 16 30 65 77 84 90 94 97  
 406 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

407 KK RC2  
 408 KM THIS IS OVERLAND FLOW. THERE IS A CHANNEL STARTING AT THUNDERBIRD ROAD ON THE  
 409 KM EAST SIDE OF DEL WEB BLVD., BUT BECAUSE IT IS INSIGNIFICANT IN DISTANCE THE  
 410 KM FLOW WILL REMAIN AS OVERLAND  
 411 KM FLOWS TO DEL WEB BLVD SHAPE  
 412 RS 2 FLOW -1  
 413 RC .035 .025 .035 3000 .0023  
 414 RX 0 5 40 68 72 105 145 150  
 415 RY 5 3 3 .2 .2 3 3 5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

416 KK C14  
 417 KM SUB-BASIN C14  
 418 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 419 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 420 KM L = .91 Kb = .036 Adj. Slope = 18.0  
 421 BA .243  
 422 LG .300 .150 7.000 .140 22.000  
 423 UC .529 .379  
 424 UA 0 5 16 30 65 77 84 90 94 97  
 425 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

426 KK L1  
 427 KM SUB-BASIN L1  
 428 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 429 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF 1.000  
 430 KM L = .38 Kb = .046 Adj. Slope = 5.0  
 431 BA .080  
 432 LG .220 .250 4.550 .340 53.000  
 433 UC .613 .418  
 434 UA 0 5 16 30 65 77 84 90 94 97  
 435 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

436 KK CL1  
 437 KM COMBINE FLOW AT MOST SOUTHERN PART OF L1  
 438 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

439 KK RCL1  
 440 KM ROUTE FLOW FROM LAKE TO CHANNEL ON NORTH SIDE OF GRAND AVE.  
 441 KM THIS IS OVERLAND FLOW  
 442 RS 1 FLOW -1  
 443 RC .04 .04 .04 1200 .0042  
 444 RX 0 60 150 250 300 400 500 600  
 445 RY 3 2 2 2 2 2 2 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

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

446 KK CFDW  
 447 KM COMBINE FLOWS NEAR COR. OF DEL WEBB AND BELL RD  
 448 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

449 KK RCF  
 450 KM ROUTE FLOW IN CHANNEL ON NORTH SIDE OF GRAND AVE TO 103RD AVE.  
 451 KM RX AND RY VALUES CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 452 RS 3 FLOW -1  
 453 RC .025 .018 .025 2800 .0018  
 \* RX 0 10 15 20 25 35 40 45  
 \* RY 5 4 .1 .1 .1 4 4.5 5  
 454 RX 0 30 40 42.5 62.5 65 75 105  
 455 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

456 KK D3  
 457 KM SUB-BASIN D3  
 458 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 459 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 460 KM L = .98 Kb = .045 Adj. Slope = 13.0  
 461 BA .247  
 462 LG .270 .150 8.400 .080 31.000  
 463 UC .746 .583  
 464 UA 0 5 16 30 65 77 84 90 94 97  
 465 UA 100  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

466 KK CPD3  
 467 KM COMBINE FLOWS FROM BASIN D3 WITH THOSE FLOWING IN CHANNEL. THIS IS  
 468 KM APPROXIMATELY AT 103RD AVE AND GRAND AVE  
 469 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

470 KK C13  
 471 KM SUB-BASIN C13  
 472 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 473 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 474 KM L = 1.10 Kb = .029 Adj. Slope = 21.0  
 475 BA .361  
 476 LG .130 .250 5.800 .210 27.000  
 477 UC .492 .325  
 478 UA 0 5 16 30 65 77 84 90 94 97  
 479 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

480 KK L2  
 481 KM SUB-BASIN L2  
 482 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN

483 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 484 KM L = .53 Kb = .042 Adj. Slope = 2.0  
 485 BA .106  
 486 LG .200 .260 3.740 .550 55.000  
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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10  
 487 UC 1.138 .923  
 488 UA 0 5 16 30 65 77 84 90 94 97  
 489 UA 100

\*  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

490 KK CPLAKE  
 491 KM COMBINE FLOW FROM BASIN C13 WITH OVERFLOW FROM THE LAKE AT A POINT ON THE  
 492 KM NORTHERN BOUNDARY OF BASIN D4  
 493 HC 2

\*  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

494 KK RLAKE  
 495 KM ROUTE THE PRECEEDING FLOW THROUGH D4 TO THE CHANNEL AT GRAND AVENUE  
 496 KM THIS IS OVERLAND FLOW  
 497 RS 2 FLOW -1  
 498 RC .035 .035 .035 2700 .0023  
 499 RX 0 5 40 68 72 105 145 150  
 500 RY 5 3 3 .2 .2 3 3 5

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

501 KK D4  
 502 KM SUB-BASIN D4  
 503 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 504 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 505 KM L = .61 Kb = .040 Adj. Slope = 18.0  
 506 BA .116  
 507 LG .300 .310 4.800 .320 26.000  
 508 UC .463 .361  
 509 UA 0 5 16 30 65 77 84 90 94 97  
 510 UA 100

\*  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

511 KK CPD4  
 512 KM COMBINE FLOWS  
 513 HC 3

\*  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

514 KK RCPD4  
 515 KM ROUTE FLOWS IN CHANNEL ALONG NORTH SIDE OF GRAND AVE TO BASIN D7  
 516 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 517 RS 3 FLOW -1  
 518 RC .025 .018 .025 1760 .0018  
 \* RX 0 10 15 20 25 35 40 45  
 \* RY 5 4 .1 .1 .1 4 4.5 5  
 519 RX 0 30 40 42.5 62.5 65 75 105  
 520 RY 6 5.5 5 0 0 5 5.5 6

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

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

521 KK D7  
 522 KM SUB-BASIN D7  
 523 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 524 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 525 KM L = .45 Kb = .049 Adj. Slope = 22.0  
 526 BA .111  
 527 LG .300 .270 4.800 .300 44.000  
 528 UC .392 .242  
 529 UA 0 5 16 30 65 77 84 90 94 97  
 530 UA 100

\*  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

531 KK CPD7  
 532 KM COMBINE FLOWS AT SOUTHEAST CORNER OF BASIN D7. THIS IS APPROXIMATELY AT  
 533 KM 100TH AVE.

534 HC 2  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

535 KK RCPD7  
 536 KM ROUTE FLOWS IN CHANNEL TO 99TH AVE AND GRAND  
 537 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 538 RS 3 FLOW -1  
 539 RC .025 .018 .025 1320 .0018  
 \* RX 0 10 15 20 25 35 40 45  
 \* RY 5 4 .1 .1 .1 4 4.5 5  
 540 RX 0 30 40 42.5 62.5 65 75 105  
 541 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

542 KK CF12  
 543 KM COMBINE FLOW AT 99TH AVE AND GRAND AVE.  
 544 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

545 KK RCF12  
 546 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 547 RS 2 FLOW -1  
 548 RC .025 .018 .025 2640 .0023  
 \* RX 0 10 20 23 43 46 56 66  
 \* RY 7 6 5 .1 .1 .5 6 7  
 549 RX 0 30 40 42.5 62.5 65 75 105  
 550 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

551 KK D11  
 552 KM SUB-BASIN D11  
 553 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 554 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 555 KM L = .42 Kb = .036 Adj. Slope = 5.0  
 556 BA .117  
 557 LG .300 .190 6.600 .150 38.000  
 558 UC .533 .313

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LINE	ID	1	2	3	4	5	6	7	8	9	10
559	UA	0	5	16	30	65	77	84	90	94	97
560	UA	100									
	* DDM	***** Preserved *****									

561 KK CF14  
 562 KM COMBINE FLOWS IN CHANNEL AT OUTLET TO NEW RIVER  
 563 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

564	KK	D2									
565	KM	SUB-BASIN D2									
566	KM	24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN									
567	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999									
568	KM	L = .76 Kb = .051 Adj. Slope = 22.0									
569	BA	.154									
570	LG	.300	.150	8.800	.060	43.000					
571	UC	.533	.429								
572	UA	0	5	16	30	65	77	84	90	94	97
573	UA	100									
	* DDM	***** Preserved *****									

574 KK RD2  
 575 KM ROUTE FLOW IN CHANNEL ON NORTH SIDE OF GRAND AVE. TO 111TH AVE.  
 576 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 577 RS 1 FLOW -1  
 578 RC .02 .015 .02 1600 .0025  
 \* RX 0 5 8 12 18 21 23 30  
 \* RY 5 4 4 .1 .1 4 4 5  
 579 RX 0 30 40 46 56 62 72 102  
 580 RY 7 6.5 6 0 0 6 6.5 7  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

581 KK D1  
 582 KM SUB-BASIN D1  
 583 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 584 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 585 KM L = .53 Kb = .056 Adj. Slope = 15.0  
 586 BA .089  
 587 LG .290 .150 8.400 .090 28.000

588 UC .533 .440  
 589 UA 0 5 16 30 65 77 84 90 94 97  
 590 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

591 KK CF15  
 592 KM COMBINE FLOWS IN CHANNEL AT 111TH AVE  
 593 HC 2  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*  
 HEC-1 INPUT

PAGE

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

594 KK RF1  
 595 KM RETRIEVE FLOW FROM 99TH AVE X DEL WEBB CHANNEL  
 596 DR D2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

597 KK RRD2  
 598 KM ROUTE RETRIEVED FLOW ALONG DEL WEBB CHANNEL TO PALMERAS DRIVE  
 599 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 600 RS 4 FLOW -1  
 601 RC .025 .015 .025 4600 .0010  
 \* RX 0 2 35 40 60 88 98 100  
 \* RY 6 5 4 .1 .1 4 5 6  
 602 RX 0 30 40 43.5 59.5 63 73 103  
 603 RY 8 7.5 7 0 0 7 7.5 8  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

604 KK B6  
 605 KM SUB-BASIN B6  
 606 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 607 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .997  
 608 KM L = 1.14 Kb = .036 Adj. Slope = 18.0  
 609 BA .463  
 610 LG .210 .230 6.200 .190 19.000  
 611 UC .642 .389  
 612 UA 0 5 16 30 65 77 84 90 94 97  
 613 UA 100  
 \*

614 KK CPB6  
 615 KM COMBINE FLOWS IN CHANNEL ALONG DEL WEB BLVD AT INTERSECTION OF PALMERAS BLVD  
 616 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

617 KK RFDW  
 618 KM ROUTE FLOW ALONG DEL WEBB CHANNEL PARALLEL TO BELL ROAD  
 619 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT CHANNEL  
 620 RS 4 FLOW -1  
 621 RC .025 .018 .025 4200 .0010  
 \* RX 0 5 10 20 30 40 45 50  
 \* RY 6 5 5 .1 .1 5 5 6  
 622 RX 0 30 40 43.5 59.5 63 73 103  
 623 RY 8 7.5 7 0 0 7 7.5 8  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

624 KK B5  
 625 KM SUB-BASIN B5  
 626 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 627 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 628 KM L = 1.21 Kb = .049 Adj. Slope = 21.0  
 629 BA .314  
 630 LG .290 .250 4.700 .340 25.000  
 631 UC .837 .685  
 632 UA 0 5 16 30 65 77 84 90 94 97  
 633 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

634 KK CF16  
 635 KM COMBINE FLOWS NEAR WEST EDGE OF SUN CITY AT OUTLET TO AGUA FRIA RIVER  
 636 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

1  
16

1  
17

637 KK B4  
 638 KM SUB-BASIN B4  
 639 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 640 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF 1.000  
 641 KM L = .34 Kb = .037 Adj. Slope = 59.0  
 642 BA .059  
 643 LG .140 .330 4.700 .320 26.000  
 644 UC .200 .131  
 645 UA 0 5 16 30 65 77 84 90 94 97  
 646 UA 100

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

647 KK FAKE3  
 648 KM COMBINE HYDROGRAPHS TO GET RID OF ERRORS  
 649 HC 2

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

650 KK FAKE4  
 651 KM COMBINE HYDROGRAPHS TO GET RID OF ERRORS  
 652 HC 2

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

653 KK C1  
 654 KM SUB-BASIN C1  
 655 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 656 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 657 KM L = .45 Kb = .034 Adj. Slope = 22.0  
 658 BA .147  
 659 LG .150 .250 4.800 .310 25.000  
 660 UC .313 .160  
 661 UA 0 5 16 30 65 77 84 90 94 97  
 662 UA 100

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

663 KK C6  
 664 KM SUB-BASIN C6  
 665 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 666 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 667 KM L = .53 Kb = .043 Adj. Slope = 23.0  
 668 BA .132  
 669 LG .210 .220 7.600 .090 20.000  
 670 UC .379 .241  
 671 UA 0 5 16 30 65 77 84 90 94 97  
 672 UA 100

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

673 KK FAKE  
 674 KM COMBINE TO GET RID OF ERROR  
 675 HC 2

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

676 KK C7  
 677 KM SUB-BASIN C7  
 678 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 679 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF 1.000  
 680 KM L = .38 Kb = .054 Adj. Slope = 26.0  
 681 BA .078  
 682 LG .270 .160 8.800 .060 23.000  
 683 UC .342 .222  
 684 UA 0 5 16 30 65 77 84 90 94 97  
 685 UA 100

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

686 KK C9  
 687 KM SUB-BASIN C9  
 688 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 689 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF 1.000  
 690 KM L = .34 Kb = .058 Adj. Slope = 32.0  
 691 BA .064  
 692 LG .300 .150 8.800 .060 29.000  
 693 UC .304 .200  
 694 UA 0 5 16 30 65 77 84 90 94 97  
 695 UA 100

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

1  
18



139

CF3.....

144

-----> D2

142

DDWC

V

V

147

R299

153

B8

V

V

163

RB8

169

B7

179

B9

V

V

189

RB9

195

CF4.....

V

V

198

RCF4

205

C3

215

CF5.....

V

V

218

RCF5

225

C4

235

CF6.....

V

V

238

RCF6

245

C8

255

C5

265

CF7.....

V

V

268

RCF7

275

C11

285

CF8.....

V

V

288

RCF8

295

C12

305

CF9.....

V

V

308

RCF9

315

G2

325	CF10.....			
	V			
	V			
328	RCF10			
	.			
335		D5		
	.	.		
345			D6	
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355	CF11.....			
	.			
360	----->	D3		
358	DCF11			
	V			
	V			
363	RD3			
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370		D8		
	.	.		
380			D10	
	.	.	.	
390		CPD10.....		
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393	CPD10B.....			
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397		C2		
	.	V		
	.	V		
407		RC2		
	.	.		
416			C14	
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426				L1
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436			CL1.....	
	.	.	V	
	.	.	V	
439			RCL1	
	.	.	.	
446		CFDW.....		
	.	V		
	.	V		
449		RCF		
	.	.		
456			D3	
	.	.	.	
466		CPD3.....		
	.	.		
470			C13	
	.	.	.	
480				L2
	.	.	.	.
490			CPLAKE.....	
	.	.	V	
	.	.	V	
494			RLAKE	
	.	.	.	
501				D4
	.	.	.	.
511		CPD4.....		
	.	V		
	.	V		

514  
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RCPD4  
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D7  
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CPD7.....  
V  
V  
RCPD7  
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CF12.....  
V  
V  
RCF12  
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D11  
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CF14.....  
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D2  
V  
V  
RD2  
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D1  
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CF15.....  
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←----- D2  
RF1  
V  
V  
RRD2  
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B6  
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CPB6.....  
V  
V  
RFDW  
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B5  
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CF16.....  
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B4  
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FAKE3.....  
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FAKE4.....  
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C1  
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C6  
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FAKE.....  
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C7  
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C9  
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696 . . . . . C10
. . . . .
706 . . . . . D9
. . . . .
716 . . . . . FAKE6.....

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(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
ENGINEERS *
* JUL 1997 *
ENGINEERING CENTER *
* VERSION 4.1 *
STREET *
* 95616 *
* RUN DATE 15SEP98 TIME 08:14:40 *
1104 *
*
*****
*****

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* U.S. ARMY CORPS OF
* HYDROLOGIC
* 609 SECOND
* DAVIS, CALIFORNIA
* (916) 756-

```

SUN CITY HYDROLOGICAL STUDY FILE: NORTH100.DAT  
 AREA NORTH OF GRAND AVENUE AND APPROXIMATELY .60 SQUARE MILES ABOVE  
 BEARDSLEY ROAD.  
 SOILS AND LAND USE GIS DATA GENERATED BY STEVE BRUFFY  
 DRAINAGE DESIGN MENU SYSTEM (DMS) OF FCD WAS USED  
 CHANNEL ROUTING REACHES SECTION NEAR 6 INTERSECTIONS ALONG  
 99TH AVENUE WERE EXTRACTED FROM A HECRAS VERSION OF THE HEC-2  
 MODEL DEVELOPED BY POST, BUCKLY, SCHUH & JERGENS, INC., DEC. 1995  
 MCUHP1 RUN, 100YR-6HR STORM = 3.8, STORM SIZE =9.89 SQUARE MILES

INITIAL SETUP OF MODEL AND HYDROLOGY DONE BY MAX DEVERA IN THE FALL OF 1997  
 MODEL WAS SPLIT INTO A NORTH AND SOUTH PORTION BY DAVID DEGERNESS TO RID THE  
 OUTPUT OF THE HEC-1 ERROR STATING TO COMBINE HYDROGRAPHS MORE OFTEN. THIS  
 WILL MAKE THE MODEL EASIER TO READ. THIS WORK WAS COMPLETED IN AUGUST, 1998

DDM MCUHP1 Sun City hydrologic study, 100yr, 24hr event

```

19 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      1 0 STARTING DATE
      ITIME      0000 STARTING TIME
      NQ         500 NUMBER OF HYDROGRAPH ORDINATES
      NDDATE     2 0 ENDING DATE
      NDTIME     1735 ENDING TIME
      ICENT      19 CENTURY MARK

```

```

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 41.58 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

```

```

21 JD INDEX STORM NO. 1
      STRM      3.80 PRECIPITATION DEPTH
      TRDA      .01 TRANSPOSITION DRAINAGE AREA

```

```

22 PI PRECIPITATION PATTERN
      .00 .00 .00 .00 .00 .00 .00 .00 .00 .00

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WARNING --- ROUTED OUTFLOW ( 2280.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 1990.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 1714.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 1821.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2515.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 3224.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 3786.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 4108.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 4186.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 4069.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 3825.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 3508.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 3157.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2807.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2490.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2195.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 1910.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 1658.) IS GREATER THAN MAXIMUM OUTFLOW ( 1512.) IN STORAGE-OUTFLOW TABLE  
 WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO  
 WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO

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

TIME OF MAX STAGE	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE
					6-HOUR	24-HOUR	72-HOUR		
	HYDROGRAPH AT	B3	165.	12.42	28.	8.	5.	.19	
	HYDROGRAPH AT	A1	430.	12.25	67.	18.	10.	.51	
	HYDROGRAPH AT	A2	96.	12.17	12.	3.	2.	.09	
	2 COMBINED AT	CF1	522.	12.25	80.	21.	12.	.60	
	DIVERSION TO	D1	423.	12.25	76.	20.	12.	.60	
	HYDROGRAPH AT	DBC	99.	12.25	4.	1.	1.	.60	
	ROUTED TO	RCF1	55.	12.42	4.	1.	1.	.60	
	HYDROGRAPH AT	B1	312.	12.08	31.	9.	5.	.17	
	2 COMBINED AT	CF2	312.	12.08	35.	10.	6.	.77	
	ROUTED TO	RCF2	257.	12.33	35.	10.	6.	.77	
	HYDROGRAPH AT	B2	407.	12.33	86.	25.	15.	.44	

+	HYDROGRAPH AT	GIN	168.	12.50	42.	11.	7.	.28
+	ROUTED TO	RG1N	148.	12.75	42.	11.	7.	.28
+	HYDROGRAPH AT	G1S	183.	12.08	21.	5.	3.	.12
+	4 COMBINED AT	CF3	860.	12.33	181.	51.	30.	1.61
+	DIVERSION TO	D2	623.	12.33	164.	47.	27.	1.61
+	HYDROGRAPH AT	DDWC	237.	12.33	18.	4.	3.	1.61
+	ROUTED TO	R299	180.	12.58	18.	4.	3.	1.61
+	HYDROGRAPH AT	B8	358.	12.25	56.	17.	10.	.33
+	ROUTED TO	RB8	245.	12.75	55.	17.	10.	.33
+	HYDROGRAPH AT	B7	1368.	12.08	148.	44.	26.	.73
+	HYDROGRAPH AT	B9	127.	12.33	29.	9.	5.	.16
+	ROUTED TO	RB9	85.	12.75	28.	9.	5.	.16
+	4 COMBINED AT	CF4	1385.	12.08	243.	72.	42.	2.83
+	ROUTED TO	RCF4	1355.	12.17	243.	72.	42.	2.83
+	HYDROGRAPH AT	C3	334.	12.17	49.	14.	8.	.27
+	2 COMBINED AT	CF5	1679.	12.17	290.	86.	50.	3.11
+	ROUTED TO	RCF5	1675.	12.17	290.	86.	50.	3.11
+	HYDROGRAPH AT	C4	824.	12.17	108.	33.	19.	.58
+	2 COMBINED AT	CF6	2466.	12.17	392.	117.	68.	3.69
+	ROUTED TO	RCF6	2379.	12.25	392.	117.	68.	3.69
+	HYDROGRAPH AT	C8	298.	12.17	38.	12.	7.	.20
+	HYDROGRAPH AT	C5	398.	12.42	92.	28.	16.	.53
+	3 COMBINED AT	CF7	2955.	12.25	514.	154.	89.	4.42
+	ROUTED TO	RCF7	2924.	12.25	514.	154.	89.	4.42
+	HYDROGRAPH AT	C11	466.	12.08	51.	15.	9.	.28
+	2 COMBINED AT	CF8	3256.	12.25	561.	168.	98.	4.70
+	ROUTED TO	RCF8	3176.	12.25	561.	168.	98.	4.70
+	HYDROGRAPH AT							

	C12	336.	12.08	37.	11.	6.	.21
2 COMBINED AT							
	CF9	3412.	12.25	595.	178.	104.	4.91
ROUTED TO							
	RCF9	3380.	12.33	595.	178.	104.	4.91
HYDROGRAPH AT							
	G2	212.	12.25	41.	12.	7.	.27
2 COMBINED AT							
	CF10	3571.	12.33	633.	189.	110.	5.18
ROUTED TO							
	RCF10	3498.	12.33	633.	189.	110.	5.18
HYDROGRAPH AT							
	D5	167.	12.17	21.	6.	4.	.12
HYDROGRAPH AT							
	D6	110.	12.25	18.	5.	3.	.09
3 COMBINED AT							
	CF11	3701.	12.33	668.	200.	116.	5.39
DIVERSION TO							
	D3	730.	12.33	239.	92.	54.	5.39
HYDROGRAPH AT							
	DCF11	2971.	12.33	429.	107.	62.	5.39
ROUTED TO							
	RD3	2914.	12.42	429.	107.	62.	5.39
HYDROGRAPH AT							
	D8	156.	12.25	26.	8.	5.	.16
HYDROGRAPH AT							
	D10	80.	12.17	13.	4.	2.	.07
2 COMBINED AT							
	CPD10	235.	12.25	39.	12.	7.	.22
2 COMBINED AT							
	CPD10B	3093.	12.42	465.	118.	68.	5.61
HYDROGRAPH AT							
	C2	835.	12.42	198.	61.	35.	1.04
ROUTED TO							
	RC2	785.	12.67	198.	61.	35.	1.04
HYDROGRAPH AT							
	C14	286.	12.25	45.	13.	7.	.24
HYDROGRAPH AT							
	L1	86.	12.25	17.	5.	3.	.08
2 COMBINED AT							
	CL1	372.	12.25	61.	18.	10.	.32
ROUTED TO							
	RCL1	319.	12.42	61.	18.	10.	.32
2 COMBINED AT							
	CFDW	1062.	12.58	258.	78.	45.	1.37
ROUTED TO							
	RCF	1056.	12.67	258.	78.	45.	1.37
HYDROGRAPH AT							
	D3	230.	12.33	52.	15.	9.	.25
2 COMBINED AT							
	CPD3	1241.	12.58	309.	93.	54.	1.61
HYDROGRAPH AT							
	C13	444.	12.17	63.	19.	11.	.36
HYDROGRAPH AT							
	L2	62.	12.58	21.	7.	4.	.11

2 COMBINED AT	CPLAKE	479.	12.17	84.	26.	15.	.47
ROUTED TO	RLAKE	404.	12.50	84.	26.	15.	.47
HYDROGRAPH AT	D4	125.	12.17	18.	5.	3.	.12
3 COMBINED AT	CPD4	1672.	12.58	408.	124.	72.	2.20
ROUTED TO	RCPD4	1662.	12.67	408.	124.	72.	2.20
HYDROGRAPH AT	D7	159.	12.17	21.	7.	4.	.11
2 COMBINED AT	CPD7	1699.	12.67	429.	130.	75.	2.31
ROUTED TO	RCPD7	1689.	12.75	429.	130.	75.	2.31
2 COMBINED AT	CF12	4336.	12.42	863.	240.	139.	7.92
ROUTED TO	RCF12	4233.	12.58	863.	240.	139.	7.92
HYDROGRAPH AT	D11	152.	12.17	23.	7.	4.	.12
2 COMBINED AT	CF14	4306.	12.58	884.	246.	143.	8.04
HYDROGRAPH AT	D2	185.	12.25	36.	11.	6.	.15
ROUTED TO	RD2	181.	12.25	36.	11.	6.	.15
HYDROGRAPH AT	D1	101.	12.25	18.	5.	3.	.09
2 COMBINED AT	CF15	283.	12.25	54.	16.	9.	.24
HYDROGRAPH AT	RF1	623.	12.33	164.	47.	27.	1.61
ROUTED TO	RRD2	620.	12.50	164.	47.	27.	1.61
HYDROGRAPH AT	B6	490.	12.25	76.	22.	13.	.46
2 COMBINED AT	CPB6	1065.	12.33	241.	69.	40.	.46
ROUTED TO	RFDW	1044.	12.50	241.	69.	40.	.46
HYDROGRAPH AT	B5	210.	12.33	49.	15.	8.	.31
2 COMBINED AT	CF16	1244.	12.50	289.	83.	48.	.78
HYDROGRAPH AT	B4	109.	12.00	9.	3.	2.	.06
2 COMBINED AT	FAKE3	1253.	12.50	299.	86.	50.	.84
2 COMBINED AT	FAKE4	1497.	12.42	352.	102.	59.	1.08
HYDROGRAPH AT	C1	253.	12.08	24.	7.	4.	.15

+	HYDROGRAPH AT	C6	203.	12.08	25.	7.	4.	.13
+	2 COMBINED AT	FAKE	456.	12.08	49.	14.	8.	.28
+	HYDROGRAPH AT	C7	132.	12.08	17.	5.	3.	.08
+	HYDROGRAPH AT	C9	116.	12.08	14.	4.	2.	.06
+	HYDROGRAPH AT	C10	190.	12.08	24.	7.	4.	.12
+	HYDROGRAPH AT	D9	55.	12.17	9.	3.	2.	.05
+	5 COMBINED AT	FAKE6	942.	12.08	112.	32.	19.	.58

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

Appendix F

North Area 100yr-6hr Output

```

1*****
*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
ENGINEERS *
* JUL 1997
ENGINEERING CENTER *
* VERSION 4.1
STREET *
*
95616 *
* RUN DATE 15SEP98 TIME 08:15:14
1104 *
*
*****
*****

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*
* U.S. ARMY CORPS OF
* HYDROLOGIC
* 609 SECOND
* DAVIS, CALIFORNIA
* (916) 756-
*

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X X XXXXXXX XXXXX X
X X X X X XX
X X X X X X
XXXXXXXX XXXX X XXXXX X
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 -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

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

HEC-1 INPUT

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1 ID SUN CITY HYDROLOGICAL STUDY FILE: NORTH6.DAT
2 ID AREA NORTH OF GRAND AVENUE AND APPROXIMATELY .60 SQUARE MILES ABOVE
3 ID BEARDSLEY ROAD.
4 ID SOILS AND LAND USE GIS DATA GENERATED BY STEVE BRUFFY
5 ID DRAINAGE DESIGN MENU SYSTEM (DDMS) OF FCD WAS USED
6 ID CHANNEL ROUTING REACHES SECTION NEAR 6 INTERSECTIONS ALONG
7 ID 99TH AVENUE WERE EXTRACTED FROM A HECRAS VERSION OF THE HEC-2
8 ID MODEL DEVELOPED BY POST, BUCKLY, SCHUH & JERGENS, INC., DEC. 1995
9 ID MCUHP1 RUN, 100YR-6HR STORM = 3.12, STORM SIZE =9.89 SQUARE MILES
10 ID DDM MCUHP1 Sun City hydrologic study 100yr, 6hr event
11 ID
12 ID INITIAL SETUP OF MODEL AND HYDROLOGY DONE BY MAX DEVERA IN THE FALL OF 1997
13 ID
14 ID MODEL WAS SPLIT INTO A NORTH AND SOUTH PORTION BY DAVID DEGERNESS TO RID THE
15 ID OUTPUT OF THE HEC-1 ERROR STATING TO COMBINE HYDROGRAPHS MORE OFTEN. THIS
16 ID WILL MAKE THE MODEL EASIER TO READ. THIS WORK WAS COMPLETED IN AUGUST, 1998
17 ID
18 *DIAGRAM
IT 5 500
19 IO 5
20 IN 15
* DDM ***** Updated *****

21 KK B3
22 KM SUB-BASIN B3
23 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
24 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
25 KM L = .95 Kb = .036 Adj. Slope = 19.0
26 BA .194
27 IN 15
28 KM RAINFALL DEPTH OF 3.12 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
29 PB 2.934

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30 KM THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.72  
 31 PC .000 .013 .019 .029 .044 .057 .069 .081 .095 .107  
 32 PC .122 .138 .160 .206 .290 .466 .677 .807 .877 .919  
 33 PC .947 .961 .974 .987 1.000  
 34 LG .170 .310 4.250 .450 24.000  
 35 UC .725 .633  
 36 UA 0 5 16 30 65 77 84 90 94 97  
 37 UA 100

\*  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

38 KK A1  
 39 KM SUB-BASIN A1  
 40 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 41 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 42 KM L = 1.89 Kb = .025 Adj. Slope = 30.0  
 43 BA .515  
 44 LG .110 .350 4.650 .270 6.000  
 45 UC .712 .617  
 46 UA 0 5 16 30 65 77 84 90 94 97  
 47 UA 100

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

48 KK A2  
 49 KM SUB-BASIN A2  
 50 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 51 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 52 KM L = .53 Kb = .031 Adj. Slope = 9.0  
 53 BA .089  
 54 LG .110 .360 5.300 .200 6.000  
 55 UC .579 .482  
 56 UA 0 5 16 30 65 77 84 90 94 97  
 57 UA 100

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

58 KK CF1  
 59 KM COMBINE AT BEARDSLEY RD X 99TH AVE  
 60 HC 2

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

61 KK DBC  
 62 KM DIVERT 400 CFS INTO BEARDSLEY CHANNEL  
 63 DT D1  
 64 DI 0 200 400 500 700 1000  
 65 DQ 0 200 400 420 450 500

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

66 KK RCF1  
 67 KM ROUTE FLOW FROM BEARDSLEY ROAD SOUTH TO WILLOW CREEK CIRCLE  
 68 RS 1 FLOW -1  
 69 RC .025 .015 .025 1600 .0025  
 70 RX 0 10 30 40 50 60 80 90  
 71 RY 2 .5 .3 .1 .1 .3 .5 2

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

72 KK B1  
 73 KM SUB-BASIN B1  
 74 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 75 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 76 KM L = .38 Kb = .052 Adj. Slope = 24.0  
 77 BA .166  
 78 LG .300 .190 6.600 .150 29.000  
 79 UC .438 .190  
 80 UA 0 5 16 30 65 77 84 90 94 97  
 81 UA 100

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

82 KK CF2  
 83 KM COMBINE AT WILLOW CREEK RD X 99TH AVE  
 84 HC 2

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

85 KK RCF2  
 86 KM ROUTE FLOW IN CHANNEL ALONG 99TH AVE TO DEL WEB BLVD  
 87 KM CHANNEL DIMENSIONS CHANGED FROM ORIGINAL BECAUSE OF FIELD VISIT ON 9/10/98  
 88 RS 4 FLOW -1  
 89 RC .025 .015 .025 6400 .0028  
 \* RX 0 2 12 32 33 108 148 150  
 \* RY 8 6 5 .2 .2 5 6 8  
 90 RX 0 20 30 52 55 77 87 107  
 91 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

92 KK B2  
 93 KM SUB-BASIN B2  
 94 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 95 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 96 KM L = 1.17 Kb = .046 Adj. Slope = 15.0  
 97 BA .443  
 98 LG .300 .150 7.600 .120 28.000  
 99 UC .904 .597  
 100 UA 0 5 16 30 65 77 84 90 94 97  
 101 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

102 KK GIN  
 103 KM SUB-BASIN G1N  
 104 KM 6-HOUR RAINFALL, PATTERN NO. 2.88 WAS USED TO FIND TC & R FOR THIS BASIN  
 105 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .931  
 106 KM L = 1.02 Kb = .050 Adj. Slope = 13.0  
 107 BA .280  
 108 LG .100 .250 6.000 .200 10.000  
 109 UC 1.029 .802  
 110 UA 0 5 16 30 65 77 84 90 94 97  
 111 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

112 KK RG1N  
 113 KM ROUTE FLOW OVERLAND TO LINDGREN AVE (OR DEL WEB BLVD)  
 114 RS 1 FLOW -1  
 115 RC .04 .04 .04 2400 .0050  
 116 RX 0 20 40 50 60 70 80 100  
 117 RY 2 1 1 1 1 1 1 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

118 KK G1S  
 119 KM SUB-BASIN G1S  
 120 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 121 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 122 KM L = .49 Kb = .050 Adj. Slope = 27.0  
 123 BA .120  
 124 LG .050 .250 6.000 .100 2.000  
 125 UC .467 .300  
 126 UA 0 5 16 30 65 77 84 90 94 97  
 127 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

128 KK CF3  
 129 KM COMBINE AT DELL WEB AV X 99TH AVE  
 130 HC 4  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

131 KK DDWC  
 132 KM DIVERT 500 CFS TO DELL WEB CHANNEL  
 133 DT D2  
 134 DI 0 300 400 503 700 800 900  
 135 DQ 0 300 400 503 594 612 630  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

136 KK R299  
 137 KM ROUTE FLOW SOUTH DOWN 99TH AVE ALIGNMENT TO BELL RD  
 138 KM FLOW IS OVERLAND  
 139 RS 2 FLOW -1  
 140 RC .035 .035 .035 3200 .0049  
 141 RX 0 5 40 70 71 100 145 150  
 142 RY 5 3 3 .1 .1 3 3 5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

143 KK B8

144 KM SUB-BASIN B8  
 145 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 146 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 147 KM L = .72 Kb = .048 Adj. Slope = 14.0  
 148 BA .326  
 149 LG .290 .250 5.000 .290 30.000  
 150 UC .754 .394  
 151 UA 0 5 16 30 65 77 84 90 94 97  
 152 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

153 KK RB8  
 154 KM ROUTE FLOW OVERLAND THROUGH STREETS AND HOUSING TO 99TH AVE AND BELL RD  
 155 RS 3 FLOW -1  
 156 RC .04 .04 .04 3600 .0014  
 157 RX 0 20 40 80 120 140 160 180  
 158 RY 2.5 1 1 1 1 1 1 2.5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

159 KK B7  
 160 KM SUB-BASIN B7  
 161 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 162 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 163 KM L = .80 Kb = .040 Adj. Slope = 32.0  
 164 BA .730  
 165 LG .260 .160 7.300 .120 34.000  
 166 UC .500 .172  
 167 UA 0 5 16 30 65 77 84 90 94 97  
 168 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

169 KK B9  
 170 KM SUB-BASIN B9  
 171 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 172 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 173 KM L = .91 Kb = .052 Adj. Slope = 20.0  
 174 BA .164  
 175 LG .280 .250 5.100 .280 33.000  
 176 UC .796 .746  
 177 UA 0 5 16 30 65 77 84 90 94 97  
 178 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

179 KK RB9  
 180 KM ROUTE FLOW OVERLAND TO 99TH AVE AND BELL ROAD  
 181 RS 1 FLOW -1  
 182 RC .035 .035 .035 2600 .0008  
 183 RX 0 20 40 60 80 100 120 140  
 184 RY 3 2 1 1 1 1 2 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

185 KK CF4  
 186 KM COMBINE FLOWS AT BELL RD X 99TH AVE  
 187 HC 4  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

188 KK RCF4  
 189 KM ROUTE FLOW FROM BELL RD TO PINEAIRE DR (OR IT COULD BE HUTTON) ALONG 99TH AV  
 190 KM RX AND RY VALUES CHANGED BECAUSE OF FIELD VISIT ON 9/10/98  
 191 RS 1 FLOW -1  
 192 RC .025 .015 .025 1600 .0069  
 \* RX 0 5 45 71 72 105 145 150  
 \* RY 5 3 3 .1 .1 3 3 5  
 193 RX 0 20 30 52 55 77 87 107  
 194 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

195 KK C3  
 196 KM SUB-BASIN C3  
 197 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 198 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 199 KM L = .91 Kb = .042 Adj. Slope = 25.0  
 200 BA .272  
 201 LG .290 .170 6.800 .140 21.000  
 202 UC .617 .421  
 203 UA 0 5 16 30 65 77 84 90 94 97  
 204 UA 100

1  
5

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

205 KK CF5  
206 KM COMBINE FLOWS AT HUTTON DR X 99TH AVE  
207 HC 2

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

1  
6

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

208 KK RCF5  
209 KM ROUTE FLOWS FROM PINEAIRE DR SOUTH TO BURNS DR ALONG 99TH AVE  
210 KM RX AND RY CHANGED FROM FIELD VISIT ON 9/10/98  
211 RS 1 FLOW -1  
212 RC .025 .015 .025 2000 .0055  
\* RX 0 30 46 71 100 125 155 200  
\* RY 5.8 6.2 4.3 .1 .1 3.8 4.2 11  
213 RX 0 20 30 52 55 77 87 107  
214 RY 6 5.5 5 0 0 5 5.5 6  
\* DDM \*\*\*\*\* Updated \*\*\*\*\*

215 KK C4  
216 KM SUB-BASIN C4  
217 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
218 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
219 KM L = 1.06 Kb = .030 Adj. Slope = 19.0  
220 BA .583  
221 LG .080 .250 6.000 .190 32.000  
222 UC .613 .306  
223 UA 0 5 16 30 65 77 84 90 94 97  
224 UA 100  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

225 KK CF6  
226 KM COMBINE FLOWS AT BURNS ST X 99TH AVE  
227 HC 2  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

228 KK RCF6  
229 KM ROUTE FLOW ALONG 99TH AVE SOUTH TO GREENWAY RD  
230 KM RX AND RY CHANGED TO REFLECT FIELD VISIT ON 9/10/98  
231 RS 1 FLOW -1  
232 RC .025 .015 .025 2600 .0045  
\* RX 0 40 78 100 122 129 155 200  
\* RY 5.5 5 4.6 .1 4.2 4.5 4.8 5.5  
233 RX 0 20 30 52 55 77 87 107  
234 RY 6 5.5 5 0 0 5 5.5 6  
\* DDM \*\*\*\*\* Updated \*\*\*\*\*

235 KK C8  
236 KM SUB-BASIN C8  
237 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
238 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
239 KM L = .72 Kb = .030 Adj. Slope = 21.0  
240 BA .205  
241 LG .300 .350 6.600 .150 35.000  
242 UC .479 .310  
243 UA 0 5 16 30 65 77 84 90 94 97  
244 UA 100  
\* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

1  
7

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

245 KK C5  
246 KM SUB-BASIN C5  
247 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
248 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
249 KM L = 1.36 Kb = .045 Adj. Slope = 18.0  
250 BA .527  
251 LG .290 .250 5.000 .290 33.000  
252 UC .992 .675  
253 UA 0 5 16 30 65 77 84 90 94 97  
254 UA 100  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

255 KK CF7  
256 KM COMBINE FLOWS AT GREENWAY RD X 99TH AVE

257 HC 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

258 KK RCF7  
 259 KM ROUTE FLOW SOUTH ALONG 99TH AVE TO BOSWELL BLVD  
 260 KM RX AND RY CHANGED TO REFLECT FIELD VISIT ON 9/10/98  
 261 RS 1 FLOW -1  
 262 RC .025 .015 .025 2600 .0031  
 \* RX 0 40 75 90 110 120 160 180  
 \* RY 8.0 6.0 5.8 .1 .1 5.7 6.2 7.5  
 263 RX 0 20 30 52 55 77 87 107  
 264 RY 6 6.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

265 KK C11  
 266 KM SUB-BASIN C11  
 267 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 268 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 269 KM L = .68 Kb = .028 Adj. Slope = 19.0  
 270 BA .283  
 271 LG .120 .250 5.600 .220 31.000  
 272 UC .463 .237  
 273 UA 0 5 16 30 65 77 84 90 94 97  
 274 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

275 KK CF8  
 276 KM COMBINE FLOWS AT BOSWELL RD X 99TH AVE  
 277 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

278 KK RCF8  
 279 KM ROUTE FLOW SOUTH ALONG 99TH AVE ALIGNMENT TO CAMEO DR  
 280 KM RX AND RY CHANGED TO REFLECT FIELD VISIT ON 9/10/98  
 281 RS 1 FLOW -1  
 282 RC .025 .015 .025 1400 .0024  
 \* RX 0 30 42 75 100 120 155 170  
 \* RY 8.0 8.3 5.8 4.7 .1 4.5 5.8 8.2  
 283 RX 0 20 30 52 55 77 87 107  
 284 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

285 KK C12  
 286 KM SUB-BASIN C12  
 287 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 288 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 289 KM L = .72 Kb = .027 Adj. Slope = 25.0  
 290 BA .210  
 291 LG .100 .390 6.200 .170 30.000  
 292 UC .429 .271  
 293 UA 0 5 16 30 65 77 84 90 94 97  
 294 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

295 KK CF9  
 296 KM COMBINE FLOWS AT CAMEO DR X 99TH AVE  
 297 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

298 KK RCF9  
 299 KM ROUTE FLOW SOUTH ALONG 99TH AVE ALIGNMENT TO THUNDERBIRD RD  
 300 KM RX ANDRY VALUES CHANGED TO REFLECT FIELD VISIT OF 9/10/98  
 301 RS 1 FLOW -1  
 302 RC .025 .015 .025 1200 .0025  
 \* RX 0 40 70 90 98 120 140 170  
 \* RY 8.5 5.2 .1 4.3 4.6 5.0 8.2 8.5  
 303 RX 0 20 30 52 55 77 87 107  
 304 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

305 KK G2  
 306 KM SUB-BASIN G2  
 307 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 308 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 309 KM L = 1.21 Kb = .035 Adj. Slope = 21.0  
 310 BA .267  
 311 LG .300 .250 4.900 .330 23.000

312 UC .754 .669  
 313 UA 0 5 16 30 65 77 84 90 94 97  
 314 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*  
  
 315 KK CF10  
 316 KM COMBINE AT THUNDERBIRD AVE X 99TH AVE  
 317 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*  
  
 318 KK RCF10  
 319 KM ROUTE FLOW SOUTH ALONG 99TH AVE ALIGNMENT TO APPROXIMATELY EMBERWOOD  
 320 KM RX AND RY CHANGED TO REFLECT A FIELD VISIT ON 9/10/98  
 321 RS 1 FLOW -1  
 322 RC .025 .015 .025 2200 .0032  
 \* RX 0 30 40 100 120 155 170 200  
 \* RY 8.7 8.0 6.0 .1 5.5 5.6 7.5 8.8  
 323 RX 0 20 30 52 55 77 87 107  
 324 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

325 KK D5  
 326 KM SUB-BASIN D5  
 327 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 328 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 329 KM L = .49 Kb = .046 Adj. Slope = 22.0  
 330 BA .118  
 331 LG .300 .250 5.800 .200 28.000  
 332 UC .492 .321  
 333 UA 0 5 16 30 65 77 84 90 94 97  
 334 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

335 KK D6  
 336 KM SUB-BASIN D6  
 337 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 338 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 339 KM L = .53 Kb = .048 Adj. Slope = 13.0  
 340 BA .092  
 341 LG .300 .150 8.400 .070 16.000  
 342 UC .604 .496  
 343 UA 0 5 16 30 65 77 84 90 94 97  
 344 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

345 KK CF11  
 346 KM COMBINE FLOW UPSTREAM DIVERT CHANNEL PARALLEL TO EMBERWOOD ST  
 347 HC 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

348 KK DCF11  
 349 KM DIVERT TO CHANNEL EASTWARD TO NEW RIVER  
 350 DT D3  
 351 DI 0 100 200 300 500  
 352 DQ 0 100 200 220 250  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

353 KK RD3  
 354 KM ROUTE FLOW SOUTH ALONG 99TH AVE ALIGNMENT TO GRAND AVE  
 355 KM RX AND RY CHANGED TO REFLECT FIELD VISIT ON 9/10/98  
 356 RS 1 FLOW -1  
 357 RC .025 .015 .025 1920 .0026  
 \* RX 0 5 40 68 72 100 145 150  
 \* RY 5 3 3 .2 .2 3 3 5  
 358 RX 0 20 30 52 55 77 87 107  
 359 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

360 KK D8  
 361 KM SUB-BASIN D8  
 362 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 363 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 364 KM L = .72 Kb = .051 Adj. Slope = 22.0  
 365 BA .155  
 366 LG .300 .250 5.000 .290 30.000

HEC-1 INPUT

PAGE

LINE	ID	1	2	3	4	5	6	7	8	9	10
367	UC	.667	.525								
368	UA	0	5	16	30	65	77	84	90	94	97
369	UA	100									
	* DDM	***** Updated *****									
370	KK	D10									
371	KM	SUB-BASIN D10									
372	KM	6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN									
373	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940									
374	KM	L = .42 Kb = .031 Adj. Slope = 5.0									
375	BA	.068									
376	LG	.300	.210	6.400	.160	31.000					
377	UC	.587	.474								
378	UA	0	5	16	30	65	77	84	90	94	97
379	UA	100									
	* DDM	***** Preserved *****									
380	KK	CPD10									
381	KM	COMBINE FLOWS FROM SUBBASINS D8 AND D10 AT 99TH AVE AND GRAND AVE									
382	HC	2									
	* DDM	***** Preserved *****									
383	KK	CPD10B									
384	KM	COMBINE THE PREVIOUS CONCENTRATION POINT FLOWS WITH THE FLOW COMING DOWN THE									
385	KM	STREET FROM SUBBASINS D5 AND D6 AT 99TH AVE AND GRAND AVE									
386	HC	2									
	* DDM	***** Updated *****									
387	KK	C2									
388	KM	SUB-BASIN C2									
389	KM	6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN									
390	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940									
391	KM	L = 2.01 Kb = .037 Adj. Slope = 20.0									
392	BA	1.043									
393	LG	.260	.250	6.000	.190	37.000					
394	UC	1.025	.649								
395	UA	0	5	16	30	65	77	84	90	94	97
396	UA	100									
	* DDM	***** Preserved *****									
397	KK	RC2									
398	KM	THIS IS OVERLAND FLOW. THERE IS A CHANNEL STARTING AT THUNDERBIRD ROAD ON									
399	KM	THE EAST SIDE OF DEL WEB BLVD, BUT BECAUSE IT IS INSIGNIFICANT IN DISTANCE									
400	KM	THE FLOW WILL REMAIN AS OVERLAND									
401	RS	2	FLOW	-1							
402	RC	.035	.025	.035	3000	.0023					
403	RX	0	5	40	68	72	105	145	150		
404	RY	5	3	3	.2	.2	3	3	5		
	* DDM	***** Updated *****									

HEC-1 INPUT

PAGE

LINE	ID	1	2	3	4	5	6	7	8	9	10
405	KK	C14									
406	KM	SUB-BASIN C14									
407	KM	6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN									
408	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940									
409	KM	L = .91 Kb = .036 Adj. Slope = 18.0									
410	BA	.243									
411	LG	.300	.150	7.000	.140	22.000					
412	UC	.629	.459								
413	UA	0	5	16	30	65	77	84	90	94	97
414	UA	100									
	* DDM	***** Updated *****									
415	KK	L1									
416	KM	SUB-BASIN L1									
417	KM	6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN									
418	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940									
419	KM	L = .38 Kb = .046 Adj. Slope = 5.0									
420	BA	.080									
421	LG	.220	.250	4.550	.340	53.000					
422	UC	.704	.488								
423	UA	0	5	16	30	65	77	84	90	94	97
424	UA	100									

1  
11

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

425 KK CL1  
 426 KM COMBINE FLOW AT MOST SOUTHERN PART OF L1  
 427 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

428 KK RCL1  
 429 KM ROUTE COMBINED FLOW SOUTH TO DEL WEB BLVD AND GRAND AVE  
 430 KM THIS IS OVERLAND FLOW  
 431 RS 1 FLOW -1  
 432 RC .04 .04 .04 1200 .0042  
 433 RX 0 60 150 250 300 400 500 600  
 434 RY 3 2 2 2 2 2 2 3  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

435 KK CFDW  
 436 KM COMBINE FLOWS NEAR COR. OF DEL WEBB AND BELL RD  
 437 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

438 KK RCF  
 439 KM ROUTE FLOW EAST IN CHANNEL ON NORTH SIDE OF GRAND AVE TO 103RD AVE  
 440 KM RX AND RY VALUES CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 441 RS 3 FLOW -1  
 442 RC .025 .018 .025 2800 .0018  
 \* RX 0 10 15 20 25 35 40 45  
 \* RY 5 4 .1 .1 .1 4 4.5 5  
 443 RX 0 30 40 42.5 62.5 65 75 105  
 444 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

445 KK D3  
 446 KM SUB-BASIN D3  
 447 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 448 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 449 KM L = .98 Kb = .045 Adj. Slope = 13.0  
 450 BA .247  
 451 LG .270 .150 8.400 .080 31.000  
 452 UC .825 .653  
 453 UA 0 5 16 30 65 77 84 90 94 97  
 454 UA 100  
 \*

455 KK CPD3  
 456 KM COMBINE FLOWS AT CORNER OF GRAND AVE AND 103RD AVE  
 457 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

458 KK C13  
 459 KM SUB-BASIN C13  
 460 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 461 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 462 KM L = 1.10 Kb = .029 Adj. Slope = 21.0  
 463 BA .361  
 464 LG .130 .250 5.800 .210 27.000  
 465 UC .600 .405  
 466 UA 0 5 16 30 65 77 84 90 94 97  
 467 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

468 KK L2  
 469 KM SUB-BASIN L2  
 470 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 471 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 472 KM L = .53 Kb = .042 Adj. Slope = 2.0  
 473 BA .106  
 474 LG .200 .260 3.740 .550 55.000  
 475 UC 1.229 1.006  
 476 UA 0 5 16 30 65 77 84 90 94 97  
 477 UA 100  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

478 KK CPLAKE  
 479 KM COMBINE FLOW FROM BASIN C13 WITH OVERFLOW FROM THE LAKE AT A POINT ON THE  
 480 KM NORTHERN BOUNDARY OF BASIN D4

1  
12

HC 2  
\*  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

1  
13

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

482 KK RLAKE  
483 KM ROUTE FLOW THROUGH SUBBASIN D4 TO THE CHANNEL AT GRAND AVENUE AND 103RD AVE  
484 KM THIS IS OVERLAND FLOW  
485 RS 2 FLOW -1  
486 RC .035 .035 .035 2700 .0023  
487 RX 0 5 40 68 72 105 145 150  
488 RY .5 3 3 .2 .2 3 3 5  
\* DDM \*\*\*\*\* Updated \*\*\*\*\*

489 KK D4  
490 KM SUB-BASIN D4  
491 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
492 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
493 KM L = .61 Kb = .040 Adj. Slope = 18.0  
494 BA .116  
495 LG .300 .310 4.800 .320 26.000  
496 UC .587 .471  
497 UA 0 5 16 30 65 77 84 90 94 97  
498 UA 100  
\*

499 KK CPD4  
500 KM COMBINE FLOWS IN CHANNEL ON NORTH SIDE OF GRAND AVE AT INTERSECTION OF 103RD  
501 KM AVE AND GRAND AVE  
502 HC 3  
\*

503 KK RCPD4  
504 KM ROUTE FLOWS IN CHANNEL ALONG NORTH SIDE OF GRAND AVE TO SOUTHEAST CORNER  
505 KM OF D7. THIS CORNER IS APPROXIMATELY AT INTERSECTION OF 100TH AVE AND GRAND AV  
506 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
507 RS 3 FLOW -1  
508 RC .025 .018 .025 1760 .0018  
\* RX 0 10 15 20 25 35 40 45  
\* RY 5 4 .1 .1 .1 4 4.5 5  
509 RX 0 30 40 42.5 62.5 65 75 105  
510 RY 6 5.5 5 0 0 5 5.5 6  
\* DDM \*\*\*\*\* Updated \*\*\*\*\*

511 KK D7  
512 KM SUB-BASIN D7  
513 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
514 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
515 KM L = .45 Kb = .049 Adj. Slope = 22.0  
516 BA .111  
517 LG .300 .270 4.800 .300 44.000  
518 UC .488 .308  
519 UA 0 5 16 30 65 77 84 90 94 97  
520 UA 100  
\*

HEC-1 INPUT

1  
14

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

521 KK CPD7  
522 KM COMBINE FLOWS IN CHANNEL AT INTERSECTION OF 100TH AVE AND GRAND AVE  
523 HC 2  
\*

524 KK RCPD7  
525 KM ROUTE FLOWS IN CHANNEL TO 99TH AVE AND GRAND  
526 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
527 RS 3 FLOW -1  
528 RC .025 .018 .025 1320 .0018  
\* RX 0 10 15 20 25 35 40 45  
\* RY 5 4 .1 .1 .1 4 4.5 5  
529 RX 0 30 40 42.5 62.5 65 75 105  
530 RY 6 5.5 5 0 0 5 5.5 6  
\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

531 KK CF12

532 KM COMBINE FLOW IN CHANNEL AT INTERSECTION OF 99TH AVE AND GRAND AVE  
 533 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

534 KK RCF12  
 535 KM ROUTE FLOW IN CHANNEL ON NORTH SIDE OF GRAND AVE TO SOUTHEAST CORNER OF  
 536 KM SUBBASIN D11.  
 537 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 538 RS 2 FLOW -1  
 539 RC .025 .018 .025 2640 .0023  
 \* RX 0 10 20 23 43 46 56 66  
 \* RY 7 6 5 .1 .1 .5 6 7  
 540 RX 0 30 40 42.5 62.5 65 75 105  
 541 RY 6 5.5 5 0 0 5 5.5 6  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

542 KK D11  
 543 KM SUB-BASIN D11  
 544 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 545 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 546 KM L = .42 Kb = .036 Adj. Slope = 5.0  
 547 BA .117  
 548 LG .300 .190 6.600 .150 38.000  
 549 UC .633 .378  
 550 UA 0 5 16 30 65 77 84 90 94 97  
 551 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

552 KK CF14  
 553 KM COMBINE FLOWS AT OUTLET TO NEW RIVER  
 554 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

555 KK D2  
 556 KM SUB-BASIN D2  
 557 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 558 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 559 KM L = .76 Kb = .051 Adj. Slope = 22.0  
 560 BA .154  
 561 LG .300 .150 8.800 .060 43.000  
 562 UC .625 .512  
 563 UA 0 5 16 30 65 77 84 90 94 97  
 564 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

565 KK RD2  
 566 KM ROUTE FLOWS IN CHANNEL ON NORTH SIDE OF GRAND AVE TO APPROXIMATELY 111TH AVE  
 567 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 568 RS 1 FLOW -1  
 569 RC .02 .015 .02 1600 .0025  
 \* RX 0 5 8 12 18 21 23 30  
 \* RY 5 4 4 .1 .1 4 4 5  
 570 RX 0 30 40 46 56 62 72 102  
 571 RY 7 6.5 6 0 0 6 6.5 7  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

572 KK D1  
 573 KM SUB-BASIN D1  
 574 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 575 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 576 KM L = .53 Kb = .056 Adj. Slope = 15.0  
 577 BA .089  
 578 LG .290 .150 8.400 .090 28.000  
 579 UC .629 .529  
 580 UA 0 5 16 30 65 77 84 90 94 97  
 581 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

582 KK CF15  
 583 KM COMBINE FLOWS AT CHANNEL OUTLET TO AGUA FRIA RIVER  
 584 HC 2  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

585 KK RF1  
 586 KM RETRIEVE FLOW FROM 99TH AVE X DEL WEBB CHANNEL  
 587 DR D2

1  
15

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

588 KK RRD2  
 589 KM ROUTE RETRIEVED FLOW ALONG DEL WEBB CHANNEL TO INTERSECTION OF DEL WEB BLVD  
 590 KM AND PALMERAS DRIVE  
 591 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 592 RS 4 FLOW -1  
 593 RC .025 .015 .025 4600 .0010  
 \* RX 0 2 35 40 60 88 98 100  
 \* RY 6 5 4 .1 .1 4 5 6  
 HEC-1 INPUT

PAGE

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10  
 594 RX 0 30 40 43.5 59.5 63 73 103  
 595 RY 8 7.5 7 0 0 7 7.5 8  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

596 KK B6  
 597 KM SUB-BASIN B6  
 598 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 599 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 600 KM L = 1.14 Kb = .036 Adj. Slope = 18.0  
 601 BA .463  
 602 LG .210 .230 6.200 .190 19.000  
 603 UC .738 .455  
 604 UA 0 5 16 30 65 77 84 90 94 97  
 605 UA 100  
 \*

606 KK CPB6  
 607 KM COMBINE FLOW IN CHANNEL AT DEL WEB AND PALMERAS DR  
 608 HC 2  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

609 KK RFDW  
 610 KM ROUTE FLOW ALONG DEL CHANNEL PARALLEL TO BELL ROAD  
 611 KM RX AND RY CHANGED TO MORE ACCURATELY DEPICT THE CHANNEL  
 612 RS 4 FLOW -1  
 613 RC .025 .018 .025 4200 .0010  
 \* RX 0 5 10 20 30 40 45 50  
 \* RY 6 5 5 .1 .1 5 5 6  
 614 RX 0 30 40 43.5 59.5 63 73 103  
 615 RY 8 7.5 7 0 0 7 7.5 8  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

616 KK B5  
 617 KM SUB-BASIN B5  
 618 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 619 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 620 KM L = 1.21 Kb = .049 Adj. Slope = 21.0  
 621 BA .314  
 622 LG .290 .250 4.700 .340 25.000  
 623 UC .954 .792  
 624 UA 0 5 16 30 65 77 84 90 94 97  
 625 UA 100  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

626 KK CF16  
 627 KM COMBINE FLOWS NEAR OUTLET TO AGUA FRIA  
 628 HC 2  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

629 KK B4  
 630 KM SUB-BASIN B4  
 631 KM 6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN  
 632 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940  
 633 KM L = .34 Kb = .037 Adj. Slope = 59.0  
 634 BA .059

HEC-1 INPUT

PAGE

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10  
 635 LG .140 .330 4.700 .320 26.000  
 636 UC .267 .181  
 637 UA 0 5 16 30 65 77 84 90 94 97  
 638 UA 100  
 \*  
 \* DDM \*\*\*\*\* Preserved \*\*\*\*\*

1  
16

1  
17

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639      KK      FAKE3
640      KM      COMBINE HYDROGRAPHS TO GET RID OF ERRORS
641      HC      2
        *
        * DDM      ***** Preserved *****

642      KK      FAKE4
643      KM      COMBINE HYDROGRAPHS TO GET RID OF ERRORS
644      HC      2
        *
        * DDM      ***** Updated *****

645      KK      C1
646      KM      SUB-BASIN C1
647      KM      6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
648      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
649      KM      L = .45 Kb = .034 Adj. Slope = 22.0
650      BA      .147
651      LG      .150      .250      4.800      .310      25.000
652      UC      .408      .216
653      UA      0          5          16          30          65          77          84          90          94          97
654      UA      100
        * DDM      ***** Updated *****

655      KK      C6
656      KM      SUB-BASIN C6
657      KM      6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
658      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
659      KM      L = .53 Kb = .043 Adj. Slope = 23.0
660      BA      .132
661      LG      .210      .220      7.600      .090      20.000
662      UC      .471      .306
663      UA      0          5          16          30          65          77          84          90          94          97
664      UA      100

665      KK      FAKE
666      KM      COMBINE TO GET RID OF ERROR
667      HC      2
        * DDM      ***** Updated *****

668      KK      C7
669      KM      SUB-BASIN C7
670      KM      6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
671      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
672      KM      L = .38 Kb = .054 Adj. Slope = 26.0
673      BA      .078
674      LG      .270      .160      8.800      .060      23.000
675      UC      .421      .279

                                HEC-1 INPUT

1
18

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
676      UA      0          5          16          30          65          77          84          90          94          97
677      UA      100
        * DDM      ***** Updated *****

678      KK      C9
679      KM      SUB-BASIN C9
680      KM      6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
681      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
682      KM      L = .34 Kb = .058 Adj. Slope = 32.0
683      BA      .064
684      LG      .300      .150      8.800      .060      29.000
685      UC      .387      .261
686      UA      0          5          16          30          65          77          84          90          94          97
687      UA      100

688      KK      FAKE
689      KM      COMBINE TO GET RID OF ERROR
690      HC      2
        * DDM      ***** Updated *****

691      KK      C10
692      KM      SUB-BASIN C10
693      KM      6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
694      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
695      KM      L = .45 Kb = .042 Adj. Slope = 18.0
696      BA      .115
697      LG      .200      .150      8.800      .070      22.000
698      UC      .454      .279
699      UA      0          5          16          30          65          77          84          90          94          97

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700      UA      100
        *
        * DDM ***** Updated *****

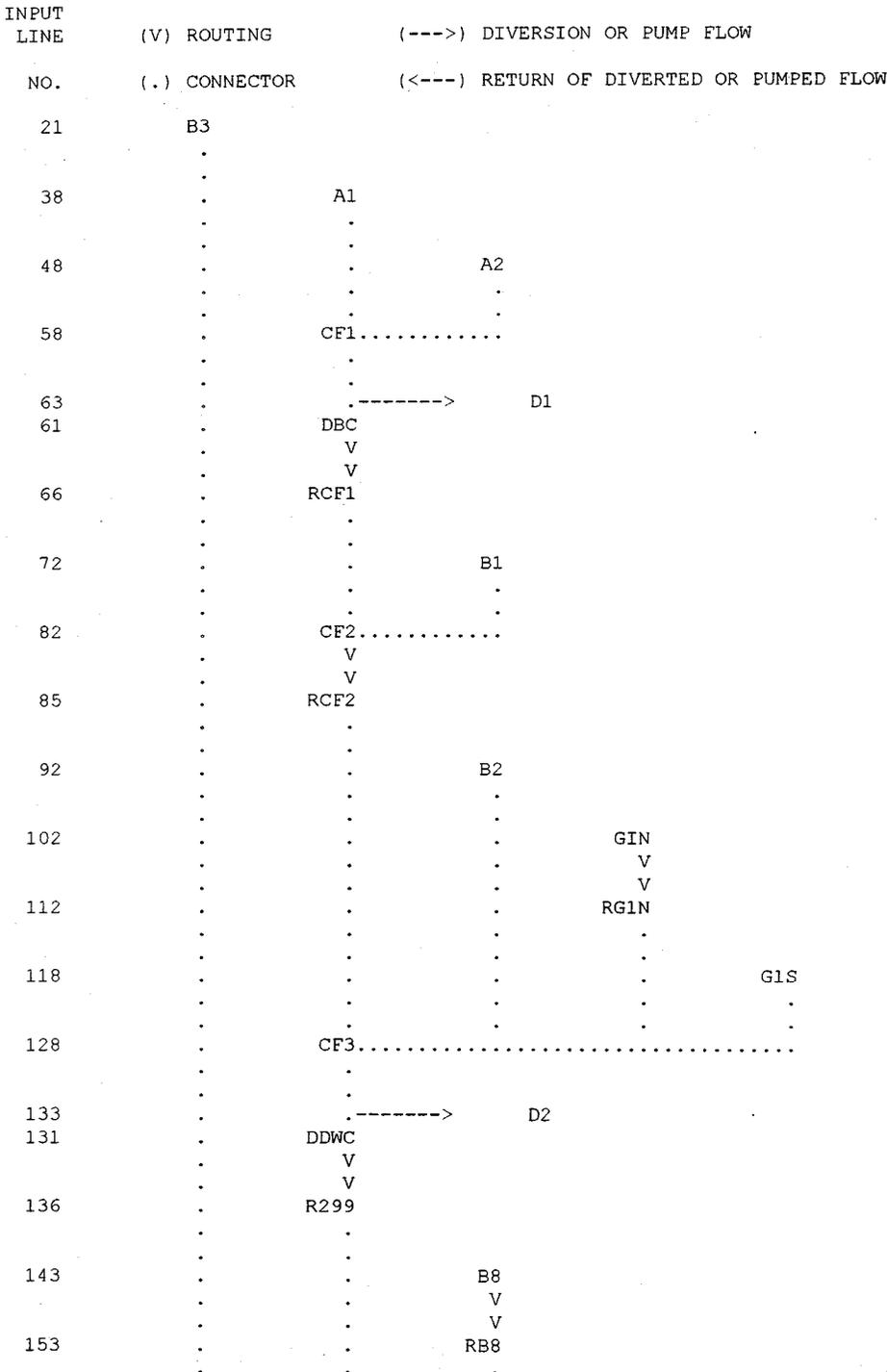
701      KK      D9
702      KM      SUB-BASIN D9
703      KM      6-HOUR RAINFALL, PATTERN NO. 2.72 WAS USED TO FIND TC & R FOR THIS BASIN
704      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .940
705      KM      L = .34 Kb = .059 Adj. Slope = 12.0
706      BA      .047
707      LG      .290      .250      6.000      .180      33.000
708      UC      .567      .475
709      UA      0          5          16          30          65          77          84          90          94          97
710      UA      100
        * DDM ***** Preserved *****

711      KK      FAKE6
712      KM      COMBINE FLOWS JUST TO ELIMINATE THE ERROR CODE
713      HC      4
714      ZZ

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1

SCHEMATIC DIAGRAM OF STREAM NETWORK



159

B7

169

B9

V

V

179

RB9

185

CF4.....

V

V

188

RCF4

195

C3

205

CF5.....

V

V

208

RCF5

215

C4

225

CF6.....

V

V

228

RCF6

235

C8

245

C5

255

CF7.....

V

V

258

RCF7

265

C11

275

CF8.....

V

V

278

RCF8

285

C12

295

CF9.....

V

V

298

RCF9

305

G2

315

CF10.....

V

V

318

RCF10

325

D5

335

D6

345

CF11.....

350  
348  
353  
360  
370  
380  
383  
387  
397  
405  
415  
425  
428  
435  
438  
445  
455  
458  
468  
478  
482  
489  
499  
503  
511  
521  
524  
531

-----> D3  
DCF11  
V  
V  
RD3  
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D8  
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D10  
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CPD10.....  
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CPD10B.....  
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C2  
V  
V  
RC2  
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C14  
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L1  
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CL1.....  
V  
V  
RCL1  
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CFDW.....  
V  
V  
RCF  
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D3  
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CPD3.....  
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C13  
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L2  
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CPLAKE.....  
V  
V  
RLAKE  
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D4  
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CPD4.....  
V  
V  
RCPD4  
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D7  
.  
CPD7.....  
V  
V  
RCPD7  
.  
CF12.....  
V  
V

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534      RCF12
      .
542      .           D11
      .           .
552      .           CF14.....
      .           .
555      .           D2
      .           V
565      .           V
      .           RD2
      .           .
572      .           D1
      .           .
582      .           CF15.....
      .           .
587      .           .<----- D2
585      .           RF1
      .           V
588      .           V
      .           RRD2
      .           .
596      .           .           B6
      .           .           .
606      .           .           CPB6.....
      .           .           V
609      .           .           V
      .           .           RFDW
      .           .           .
616      .           .           B5
      .           .           .
626      .           .           CF16.....
      .           .           .
629      .           .           B4
      .           .           .
639      .           .           FAKE3.....
      .           .           .
642      .           .           FAKE4.....
      .           .           .
645      .           .           C1
      .           .           .
655      .           .           C6
      .           .           .
665      .           .           FAKE.....
      .           .           .
668      .           .           C7
      .           .           .
678      .           .           C9
      .           .           .
688      .           .           FAKE.....
      .           .           .
691      .           .           C10
      .           .           .
701      .           .           D9
      .           .           .
711      .           .           FAKE6.....

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(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****
*****

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\*  
 \* FLOOD HYDROGRAPH PACKAGE (HEC-1) \*  
 ENGINEERS \*  
 \* JUL 1997 \*  
 ENGINEERING CENTER \*  
 \* VERSION 4.1 \*  
 STREET \*  
 \*  
 95616 \*  
 \* RUN DATE 15SEP98 TIME 08:15:14 \*  
 1104 \*  
 \*  
 \*

\*  
 \* U.S. ARMY CORPS OF \*  
 \* HYDROLOGIC \*  
 \* 609 SECOND \*  
 \* DAVIS, CALIFORNIA \*  
 \* (916) 756- \*  
 \*

\*\*\*\*\*  
 \*\*\*\*\*

SUN CITY HYDROLOGICAL STUDY FILE: NORTH6.DAT  
 AREA NORTH OF GRAND AVENUE AND APPROXIMATELY .60 SQUARE MILES ABOVE  
 BEARDSLEY ROAD.  
 SOILS AND LAND USE GIS DATA GENERATED BY STEVE BRUFFY  
 DRAINAGE DESIGN MENU SYSTEM (DDMS) OF FCD WAS USED  
 CHANNEL ROUTING REACHES SECTION NEAR 6 INTERSECTIONS ALONG  
 99TH AVENUE WERE EXTRACTED FROM A HECRAS VERSION OF THE HEC-2  
 MODEL DEVELOPED BY POST, BUCKLY, SCHUH & JERGENS, INC., DEC. 1995  
 MCUHP1 RUN, 100YR-6HR STORM = 3.12, STORM SIZE =9.89 SQUARE MILES  
 DDM MCUHP1 Sun City hydrologic study 100yr, 6hr event

INITIAL SETUP OF MODEL AND HYDROLOGY DONE BY MAX DEVERA IN THE FALL OF 1997  
 MODEL WAS SPLIT INTO A NORTH AND SOUTH PORTION BY DAVID DEGERNESS TO RID THE  
 OUTPUT OF THE HEC-1 ERROR STATING TO COMBINE HYDROGRAPHS MORE OFTEN. THIS  
 WILL MAKE THE MODEL EASIER TO READ. THIS WORK WAS COMPLETED IN AUGUST, 1998

19 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 1 0 STARTING DATE  
 ITIME 0000 STARTING TIME  
 NQ 500 NUMBER OF HYDROGRAPH ORDINATES  
 NDDATE 2 0 ENDING DATE  
 NDTIME 1735 ENDING TIME  
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .08 HOURS  
 TOTAL TIME BASE 41.58 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

WARNING --- ROUTED OUTFLOW ( 2043.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2277.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2408.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2440.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2393.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2294.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2157.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 1998.) IS GREATER THAN MAXIMUM OUTFLOW ( 1997.) IN STORAGE-OUTFLOW TABLE  
 WARNING --- ROUTED OUTFLOW ( 2134.) IS GREATER THAN MAXIMUM OUTFLOW ( 2039.) IN STORAGE-OUTFLOW TABLE







+		CF3	720.	4.50	187.	48.	28.	1.61	
	DIVERSION TO								
+		D2	598.	4.50	176.	45.	26.	1.61	
	HYDROGRAPH AT								
+		DDWC	122.	4.50	11.	3.	2.	1.61	
	ROUTED TO								
+		R299	97.	4.75	11.	3.	2.	1.61	1.89
+									
4.75									
	HYDROGRAPH AT								
+		B8	254.	4.33	55.	14.	8.	.33	
	ROUTED TO								
+		RB8	206.	4.92	54.	14.	8.	.33	2.01
+									
4.92									
	HYDROGRAPH AT								
+		B7	889.	4.17	159.	40.	23.	.73	
	HYDROGRAPH AT								
+		B9	100.	4.50	29.	7.	4.	.16	
	ROUTED TO								
+		RB9	75.	5.00	28.	7.	4.	.16	1.92
+									
5.00									
	4 COMBINED AT								
+		CF4	941.	4.17	245.	64.	37.	2.83	
	ROUTED TO								
+		RCF4	934.	4.25	245.	64.	37.	2.83	3.72
+									
4.25									
	HYDROGRAPH AT								
+		C3	240.	4.33	52.	13.	8.	.27	
	2 COMBINED AT								
+		CF5	1172.	4.25	296.	77.	44.	3.11	
	ROUTED TO								
+		RCF5	1169.	4.25	296.	77.	44.	3.11	4.26
+									
4.25									
	HYDROGRAPH AT								
+		C4	568.	4.25	114.	29.	17.	.58	
	2 COMBINED AT								
+		CF6	1737.	4.25	409.	106.	61.	3.69	
	ROUTED TO								
+		RCF6	1728.	4.33	409.	106.	61.	3.69	5.15
+									
4.33									
	HYDROGRAPH AT								
+		C8	196.	4.25	39.	10.	6.	.20	
	HYDROGRAPH AT								
+		C5	322.	4.58	91.	23.	13.	.53	
	3 COMBINED AT								
+		CF7	2208.	4.33	539.	139.	80.	4.42	
	ROUTED TO								
+		RCF7	2189.	4.42	539.	139.	80.	4.42	5.94
+									
4.42									
	HYDROGRAPH AT								
+		C11	296.	4.17	53.	13.	8.	.28	
	2 COMBINED AT								
+		CF8	2443.	4.33	591.	152.	88.	4.70	



+		CFDW	930.	4.75	267.	68.	39.	1.37	
	ROUTED TO								
+		RCF	930.	4.75	267.	68.	39.	1.37	
+									4.99
4.75									
+	HYDROGRAPH AT	D3	195.	4.50	55.	14.	8.	.25	
+	2 COMBINED AT								
+		CPD3	1109.	4.75	321.	82.	47.	1.61	
+	HYDROGRAPH AT	C13	307.	4.33	65.	16.	10.	.36	
+	HYDROGRAPH AT	L2	55.	4.75	21.	5.	3.	.11	
+	2 COMBINED AT								
+		CPLAKE	351.	4.33	85.	22.	13.	.47	
+	ROUTED TO								
+		RLAKE	323.	4.67	85.	22.	13.	.47	
+									3.19
4.67									
+	HYDROGRAPH AT	D4	79.	4.33	18.	4.	3.	.12	
+	3 COMBINED AT								
+		CPD4	1481.	4.67	423.	108.	63.	2.20	
+	ROUTED TO								
+		RCPD4	1475.	4.83	423.	108.	63.	2.20	
+									6.29
4.83									
+	HYDROGRAPH AT	D7	105.	4.25	22.	5.	3.	.11	
+	2 COMBINED AT								
+		CPD7	1528.	4.75	444.	114.	66.	2.31	
+	ROUTED TO								
+		RCPD7	1526.	4.83	444.	114.	66.	2.31	
+									6.39
4.83									
+	2 COMBINED AT								
+		CF12	3784.	4.58	949.	240.	139.	7.92	
+	ROUTED TO								
+		RCF12	3749.	4.75	949.	240.	139.	7.92	
+									10.15
4.75									
+	HYDROGRAPH AT	D11	111.	4.33	25.	6.	4.	.12	
+	2 COMBINED AT								
+		CF14	3825.	4.75	973.	247.	142.	8.04	
+	HYDROGRAPH AT	D2	143.	4.33	37.	9.	5.	.15	
+	ROUTED TO								
+		RD2	143.	4.42	37.	9.	5.	.15	
+									1.88
4.42									
+	HYDROGRAPH AT	D1	77.	4.42	19.	5.	3.	.09	
+	2 COMBINED AT								
+		CF15	220.	4.42	56.	14.	8.	.24	
+	HYDROGRAPH AT	RF1	598.	4.50	176.	45.	26.	.00	
+	ROUTED TO								
+		RRD2	597.	4.58	175.	45.	26.	.00	

+  
4.58

HYDROGRAPH AT B6 360. 4.42 79. 20. 11. .46

2 COMBINED AT CPB6 944. 4.50 253. 65. 37. .46

ROUTED TO RFDW 939. 4.58 253. 65. 37. .46

+  
+  
4.58

6.94

HYDROGRAPH AT B5 162. 4.58 47. 12. 7. .31

2 COMBINED AT CF16 1101. 4.58 300. 77. 44. .78

HYDROGRAPH AT B4 60. 4.08 9. 2. 1. .06

2 COMBINED AT FAKE3 1123. 4.58 309. 79. 46. .84

2 COMBINED AT FAKE4 1330. 4.58 364. 93. 54. 1.08

HYDROGRAPH AT C1 146. 4.17 24. 6. 3. .15

HYDROGRAPH AT C6 137. 4.17 27. 7. 4. .13

2 COMBINED AT FAKE 283. 4.17 50. 13. 7. .28

HYDROGRAPH AT C7 89. 4.17 17. 4. 2. .08

HYDROGRAPH AT C9 75. 4.17 15. 4. 2. .06

2 COMBINED AT FAKE 164. 4.17 32. 8. 5. .14

HYDROGRAPH AT C10 130. 4.17 25. 6. 4. .12

HYDROGRAPH AT D9 39. 4.33 9. 2. 1. .05

4 COMBINED AT FAKE6 613. 4.17 116. 29. 17. .58

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

Appendix G

South Area 100yr-24hr Output

```

1*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
ENGINEERS
* JUL 1997
ENGINEERING CENTER
* VERSION 4.1
STREET
*
95616
* RUN DATE 15SEP98 TIME 08:15:59
1104
*
*****
*****

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*
*
* U.S. ARMY CORPS OF
*
* HYDROLOGIC
*
* 609 SECOND
*
* DAVIS, CALIFORNIA
*
* (916) 756-
*

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X X XXXXXXX XXXXX X
X X X X X XX
X X X X X
XXXXXXXX XXXX X XXXXX 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 -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

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

HEC-1 INPUT

PAGE

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1	ID SUN CITY HYDROLOGICAL STUDY FILE: SOUTH100.DAT
2	ID AREA SOUTH OF GRAND AVENUE AND NORTH OF OLIVE AVENUE
3	ID THIS IS AN AREA OF APPROXIMATLEY 3.66 SQUARE MILES
4	ID AREAS SPILT INTO A NORTH AND SOUTH HALF TO AVOID THE HEC-1 ERROR STATING
5	ID TO COMBINE HYDROGRAPHS MORE OFTEN. THIS MAKES THE MODEL EASIER TO READ AND
6	ID LESS CONFUSING TO PEOPLE WHO MAY LOOK AT THE MODEL IN THE FUTURE
7	ID SOILS AND LAND USE GIS DATA GENERATED BY STEVE BRUFFY
8	ID DRAINAGE DESIGN MENU SYSTEM (DDMS) OF FCD WAS USED
9	ID CHANNEL ROUTING REACHES SECTION NEAR 6 INTERSECTIONS ALONG
10	ID 99TH AVENUE WERE EXTRACTED FROM A HECRAS VERSION OF THE HEC-2
11	ID MODEL DEVELOPED BY POST, BUCKLY, SCHUH & JERGENS, INC., DEC. 1995
12	ID MCUHP1 RUN, 100YR-24HR STORM = 3.8 INCHES POINT RAIN, STORM SIZE =3.66 MILES
13	ID
14	ID INITIAL MODELING AND HYDROLOGIC SETUP DONE BY MAX DEVERA OF THE FLOOD CONTROL
15	ID DURING THE FALL OF 1997.
16	ID MODIFICATIONS TO THE MODEL SUCH AS ADDING BETTER COMMENTS AND SPLITTING THE
17	ID MODELS INTO A NORTH AND SOUTH PORTION WERE PERFORMED BY DAVID DEGERNESS OF
18	ID THE FLOOD CONTROL DISTRICT IN AUGUST OF 1998
19	ID DDM MCUHP1 Sun City 100YR, 24 HOUR EVENT
	*DIAGRAM
20	IT 5 500
21	IO 5
22	IN 15
23	JD 3.80 0.01
24	PC .000 .002 .005 .008 .011 .014 .017 .020 .023 .026
25	PC .029 .032 .035 .038 .041 .044 .048 .052 .056 .060
26	PC .064 .068 .072 .076 .080 .085 .090 .095 .100 .105
27	PC .110 .115 .120 .126 .133 .140 .147 .155 .163 .172
28	PC .181 .191 .203 .218 .236 .257 .283 .387 .663 .707
29	PC .735 .758 .776 .791 .804 .815 .825 .834 .842 .849
30	PC .856 .863 .869 .875 .881 .887 .893 .898 .903 .908
31	PC .913 .918 .922 .926 .930 .934 .938 .942 .946 .950

32	PC	.953	.956	.959	.962	.965	.968	.971	.974	.977	.980
33	PC	.983	.986	.989	.992	.995	.998	1.000			
34	JD	3.788	0.5								
35	JD	3.781	1.0								
36	JD	3.754	2.0								
37	JD	3.731	3.0								

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

38	KK	E1									
39	KM	SUB-BASIN E1									
40	KM	24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN									
41	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998									
42	KM	L = 1.89 Kb = .036 Adj. Slope = 30.0									
43	BA	.332									
44	LG	.250	.150	7.300	.120	49.000					
45	UC	.696	.772								
46	UA	0	5	16	30	65	77	84	90	94	97
47	UA	100									

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

48	KK	RE1									
49	KM	ROUTE SOUTHWARD THROUGH 107TH AVE (MTN VIEW RD)									
50	RS	3 FLOW -1									
51	RC	.03 .025 .03 5040 .0022									
52	RX	0 1 51 53 67 69 119 120									
53	RY	4 3 3 1 1 3 3 4									

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

54	KK	E2									
55	KM	SUB-BASIN E2									
56	KM	24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN									
57	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .995									
58	KM	L = 1.59 Kb = .050 Adj. Slope = 16.0									
59	BA	.800									
60	LG	.260 .250 5.200 .300 28.000									
61	UC	1.179 .731									
62	UA	0 5 16 30 65 77 84 90 94 97									
63	UA	100									

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

64	KK	CP17									
65	KM	COMBINE FLOWS FROM BASIN E1 WITH E2 AT APPROXIMATELY 107TH AVE AND EL DORADO									
66	KM	DRIVE. THIS IS LESS THAN 1/4 MILE NORTH OF PEORIA AVE.									
67	HC	2									

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

68	KK	RCF17									
69	KM	ROUTE FLOW THROUGH 107TH AVE AND THEN MOUNTAIN VIEW ROAD									
70	RS	4 FLOW -1									
71	RC	.03 .025 .03 5760 .0022									
72	RX	0 1 51 53 67 69 119 120									
73	RY	5 3 2 .5 .5 2 3 4									

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

74	KK	E5									
75	KM	SUB-BASIN E5									
76	KM	24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN									
77	KM	THIS BASIN USED RAINFALL REDUCTION FACTOR OF .996									
78	KM	L = 1.67 Kb = .039 Adj. Slope = 16.0									
79	BA	.677									
80	LG	.250 .250 5.600 .240 39.000									
81	UC	.958 .664									
82	UA	0 5 16 30 65 77 84 90 94 97									
83	UA	100									

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

HEC-1 INPUT

PAGE

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

84	KK	CF18									
----	----	------	--	--	--	--	--	--	--	--	--

1  
2

1  
3

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85 KM COMBINE FLOWS AT MOUNTAIN VIEW ROAD AND ROGERS CIRCLE
86 HC 2
*
* DDM ***** Preserved *****

87 KK RCF18
88 KM ROUTE FLOW IN MOUNTAIN VIEW ROAD TO OLIVE AVE
89 RS 2 FLOW -1
90 RC .03 .025 .03 3360 .0028
91 RX 0 1 51 53 67 69 119 120
92 RY 5 3 2 .5 .5 2 3 5
* DDM ***** Updated *****

93 KK E3
94 KM SUB-BASIN E3
95 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
96 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998
97 KM L = 1.17 Kb = .029 Adj. Slope = 20.0
98 BA .321
99 LG .150 .250 4.800 .340 27.000
100 UC .542 .406
101 UA 0 5 16 30 65 77 84 90 94 97
102 UA 100
*
* DDM ***** Preserved *****

103 KK RE3
104 KM ROUTE FLOW FROM BASIN E3 SOUTH ALONG 103RD AVE TO PEORIA AVE
105 RS 1 FLOW -1
106 RC .03 .025 .03 1000 .003
107 RX 0 1 20 30 45 60 79 80
108 RY 3 2 2 1 1 2 2 3
* DDM ***** Updated *****

109 KK E6N
110 KM SUB-BASIN E6N
111 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
112 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
113 KM L = .45 Kb = .040 Adj. Slope = 16.0
114 BA .238
115 LG .220 .250 5.100 .310 18.000
116 UC .400 .160
117 UA 0 5 16 30 65 77 84 90 94 97
118 UA 100
*
* DDM ***** Preserved *****

119 KK CF19
120 KM COMBINE FLOWS AT INTERSECTION OF 103RD AVE AND PEORIA AVE
121 HC 2
*
* DDM ***** Preserved *****

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HEC-1 INPUT

PAGE

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

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122 KK RCF19
123 KM ROUTE FLOW SOUTH DOWN 103RD AVE AND THEN ON MOUNTAIN VIEW ROAD TO OLIVE AVE
124 RS 3 FLOW -1
125 RC .03 .025 .03 5280 .0034
126 RX 0 1 20 30 45 60 79 80
127 RY 4 3 2 1 1 2 3 4
* DDM ***** Updated *****

128 KK E6S
129 KM SUB-BASIN E6S
130 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
131 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998
132 KM L = 1.06 Kb = .032 Adj. Slope = 8.0
133 BA .403
134 LG .160 .250 5.000 .290 24.000
135 UC .833 .532
136 UA 0 5 16 30 65 77 84 90 94 97
137 UA 100
* DDM ***** Updated *****

138 KK E8
139 KM SUB-BASIN E8
140 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
141 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998

```

142 KM L = .91 Kb = .034 Adj. Slope = 12.0  
 143 BA .262  
 144 LG .300 .320 4.700 .350 24.000  
 145 UC .671 .473  
 146 UA 0 5 16 30 65 77 84 90 94 97  
 147 UA 100

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

148 KK CF20  
 149 KM COMBINE FLOWS AT THE INTERSECTION OF MOUNTAIN VIEW ROAD AND OLIVE AVE  
 150 HC 4

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

151 KK RCF20  
 152 KM ROUTE FLOWS ALONG OLIVE AVE TO INTERSECTION OF 99TH AVE AND OLIVE AVE  
 153 KM THIS FLOW COULD BE IN A CHANNEL  
 154 RS 1 FLOW -1  
 155 RC .03 .025 .03 1520 .0026  
 156 RX 0 11 15 24 34 40 42 44  
 157 RY 7 5 .1 .1 .1 5 5 7

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

158 KK E4  
 159 KM SUB-BASIN E4  
 160 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 161 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .998  
 162 KM L = 1.25 Kb = .051 Adj. Slope = 10.0  
 163 BA .333

HEC-1 INPUT

PAGE

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

164 LG .270 .250 5.100 .300 31.000  
 165 UC 1.229 1.041  
 166 UA 0 5 16 30 65 77 84 90 94 97  
 167 UA 100

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

168 KK RE4  
 169 KM ROUTE FLOW SOUTH DOWN 99TH AVE TO INTERSECTION OF 99TH AVE AND OLIVE AVE  
 170 RS 4 FLOW -1  
 171 RC .03 .025 .03 5600 .0055  
 172 RX 0 1 20 40 60 80 99 100  
 173 RY 3 2 2 1 1 2 2 3

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

174 KK E7  
 175 KM SUB-BASIN E7  
 176 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 177 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999  
 178 KM L = 1.02 Kb = .047 Adj. Slope = 30.0  
 179 BA .239  
 180 LG .270 .250 4.800 .320 30.000  
 181 UC .592 .475  
 182 UA 0 5 16 30 65 77 84 90 94 97  
 183 UA 100

\* DDM \*\*\*\*\* Updated \*\*\*\*\*

184 KK E9  
 185 KM SUB-BASIN E9  
 186 KM 24-HOUR SCS TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN  
 187 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF 1.000  
 188 KM L = .38 Kb = .035 Adj. Slope = 32.0  
 189 BA .058  
 190 LG .130 .250 4.800 .310 28.000  
 191 UC .246 .182  
 192 UA 0 5 16 30 65 77 84 90 94 97  
 193 UA 100

\* DDM \*\*\*\*\* Preserved \*\*\*\*\*

194 KK CFNR  
 195 KM COMBINE FLOWS AT INTERSECTION OF 99TH AVE AND OLIVE AVE. THIS FLOW WILL GO  
 196 KM TO NEW RIVER  
 197 HC 4  
 198 ZZ

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW	
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW	
38	E1		
	V		
	V		
48	RE1		
	.		
54	.	E2	
	.	.	
64	CP17.....		
	V		
	V		
68	RCF17		
	.		
74	.	E5	
	.	.	
84	CF18.....		
	V		
	V		
87	RCF18		
	.		
93	.	E3	
	.	V	
	.	V	
103	.	RE3	
	.	.	
109	.	E6N	
	.	.	
119	.	CF19.....	
	.	V	
	.	V	
122	.	RCF19	
	.	.	
128	.	E6S	
	.	.	
138	.	.	E8
	.	.	.
148	CF20.....		.
	V		.
	V		.
151	RCF20		.
	.		.
158	.	E4	.
	.	V	.
	.	V	.
168	.	RE4	.
	.	.	.
174	.	.	E7
	.	.	.
184	.	.	E9
	.	.	.
194	CFNR.....		.

(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

1\*\*\*\*\*  
\*\*\*\*\*

*	*	*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)	*	* U.S. ARMY CORPS OF
* ENGINEERS	*	* HYDROLOGIC
* JUL 1997	*	
* ENGINEERING CENTER	*	
* VERSION 4.1	*	* 609 SECOND
* STREET	*	







ROUTED TO	RE1	219.	13.00	74.	23.	13.	.33
HYDROGRAPH AT	E2	489.	12.50	132.	40.	23.	.80
2 COMBINED AT	CF17	650.	12.67	205.	62.	36.	1.13
ROUTED TO	RCF17	628.	13.08	205.	62.	36.	1.13
HYDROGRAPH AT	E5	500.	12.42	128.	40.	23.	.68
2 COMBINED AT	CF18	964.	12.92	329.	101.	59.	1.81
ROUTED TO	RCF18	945.	13.08	329.	101.	59.	1.81
HYDROGRAPH AT	E3	325.	12.25	52.	16.	9.	.32
ROUTED TO	RE3	316.	12.25	52.	16.	9.	.32
HYDROGRAPH AT	E6N	376.	12.08	35.	10.	6.	.24
2 COMBINED AT	CF19	630.	12.17	88.	26.	15.	.56
ROUTED TO	RCF19	532.	12.42	88.	26.	15.	.56
HYDROGRAPH AT	E6S	328.	12.33	65.	19.	11.	.40
HYDROGRAPH AT	E8	219.	12.25	39.	12.	7.	.26
4 COMBINED AT	CF20	1520.	12.50	514.	155.	90.	3.03
ROUTED TO	RCF20	1516.	12.58	514.	155.	90.	3.03
HYDROGRAPH AT	E4	165.	12.58	56.	17.	10.	.33
ROUTED TO	RE4	156.	13.08	56.	17.	10.	.33
HYDROGRAPH AT	E7	223.	12.25	40.	12.	7.	.24
HYDROGRAPH AT	E9	98.	12.08	10.	3.	2.	.06
4 COMBINED AT	CFNR	1762.	12.58	614.	186.	108.	3.66

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

Appendix H

South Area 100yr-6hr Output

```

1*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
ENGINEERS
* JUL 1997
ENGINEERING CENTER
* VERSION 4.1
STREET
*
95616
* RUN DATE 15SEP98 TIME 08:16:24
1104
*
*****
*****

```

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*
* U.S. ARMY CORPS OF
* HYDROLOGIC
* 609 SECOND
* DAVIS, CALIFORNIA
* (916) 756-
*

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X X XXXXXXX XXXX X
X X X X X XX
X X X X X
XXXXXXXX XXXX X XXXXX X
X X X X X
X X X X X
X X XXXXXXX XXXX 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 -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

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

HEC-1 INPUT

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1 ID SUN CITY HYDROLOGICAL STUDY FILE: SOUTH6.DAT
2 ID AREA SOUTH OF GRAND AVENUE AND NORTH OF OLIVE AVENUE
3 ID THIS IS AN AREA OF APPROXIMATLEY 3.66 SQUARE MILES
4 ID AREAS SPILT INTO A NORTH AND SOUTH HALF TO AVOID THE HEC-1 ERROR STATING
5 ID TO COMBINE HYDROGRAPHS MORE OFTEN. THIS MAKES THE MODEL EASIER TO READ AND
6 ID LESS CONFUSING TO PEOPLE WHO MAY LOOK AT THE MODEL IN THE FUTURE
7 ID SOILS AND LAND USE GIS DATA GENERATED BY STEVE BRUFFY
8 ID DRAINAGE DESIGN MENU SYSTEM (DDMS) OF FCD WAS USED
9 ID CHANNEL ROUTING REACHES SECTION NEAR 6 INTERSECTIONS ALONG
10 ID 99TH AVENUE WERE EXTRACTED FROM A HECRAS VERSION OF THE HEC-2
11 ID MODEL DEVELOPED BY POST, BUCKLY, SCHUH & JERGENS, INC., DEC. 1995
12 ID MCUHP1 RUN, 100YR-6HR STORM = 3.12 INCHES POINT RAIN, STORM SIZE =3.66 MILES
13 ID DDM MCUHP1 Sun City 100yr, 6hr storm
14 ID
15 ID INITIAL MODELING AND HYDROLOGIC SETUP DONE BY MAX DEVERA OF THE.FLOOD CONTROL
16 ID DURING THE FALL OF 1997.
17 ID MODIFICATIONS TO THE MODEL SUCH AS ADDING BETTER COMMENTS AND SPLITTING THE
18 ID MODELS INTO A NORTH AND SOUTH PORTION WERE PERFORMED BY DAVID DEGERNESS OF
19 ID THE FLOOD CONTROL DISTRICT IN AUGUST OF 1998
*DIAGRAM
20 IT 5 500
21 IO 5
22 IN 15
*
* DDM ***** Updated *****
23 KK E1
24 KM SUB-BASIN E1
25 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN
26 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969
27 KM L = 1.89 Kb = .036 Adj. Slope = 30.0
28 BA .332

```

29 IN 15  
 30 KM RAINFALL DEPTH OF 3.12 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD  
 31 PB 3.023  
 32 KM THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 2.15  
 33 PC .000 .010 .017 .026 .036 .045 .055 .064 .073 .083  
 34 PC .094 .108 .128 .172 .260 .454 .690 .831 .895 .934  
 35 PC .949 .963 .975 .988 1.000  
 36 LG .250 .150 7.300 .120 49.000  
 37 UC .725 .808  
 38 UA 0 5 16 30 65 77 84 90 94 97  
 39 UA 100  
 \*

40 KK RE1  
 41 KM ROUTE SOUTHWARD THROUGH 107TH AVE (MTN VIEW RD)  
 42 RS 3 FLOW -1  
 43 RC .03 .025 .03 5040 .0022  
 44 RX 0 1 51 53 67 69 119 120  
 45 RY 4 3 3 1 1 3 3 4  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

46 KK E2  
 47 KM SUB-BASIN E2  
 48 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 49 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 50 KM L = 1.59 Kb = .050 Adj. Slope = 16.0  
 51 BA .800  
 52 LG .260 .250 5.200 .300 28.000  
 53 UC 1.192 .740  
 54 UA 0 5 16 30 65 77 84 90 94 97  
 55 UA 100  
 \*

56 KK CP17  
 57 KM COMBINE FLOWS FROM BASIN E1 WITH E2 AT APPROXIMATELY 107TH AVE AND EL DORADO  
 58 KM DRIVE. THIS IS LESS THAN 1/4 MILE NORTH OF PEORIA AVE.  
 59 HC 2  
 \*

60 KK RCF17  
 61 KM ROUTE FLOW THROUGH 107TH AVE AND THEN MOUNTAIN VIEW ROAD  
 62 RS 4 FLOW -1  
 63 RC .03 .025 .03 5760 .0022  
 64 RX 0 1 51 53 67 69 119 120  
 65 RY 5 3 2 .5 .5 2 3 4  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

66 KK E5  
 67 KM SUB-BASIN E5  
 68 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 69 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 70 KM L = 1.67 Kb = .039 Adj. Slope = 16.0  
 71 BA .677  
 72 LG .250 .250 5.600 .240 39.000  
 73 UC .975 .677  
 74 UA 0 5 16 30 65 77 84 90 94 97  
 75 UA 100  
 \*

76 KK CF18  
 77 KM COMBINE FLOWS AT MOUNTAIN VIEW ROAD AND ROGERS CIRCLE  
 78 HC 2  
 \*

79 KK RCF18  
 80 KM ROUTE FLOW IN MOUNTAIN VIEW ROAD TO OLIVE AVE  
 81 RS 2 FLOW -1  
 82 RC .03 .025 .03 3360 .0028  
 83 RX 0 1 51 53 67 69 119 120  
 84 RY 5 3 2 .5 .5 2 3 5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

HEC-1 INPUT

PAGE

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

85 KK E3  
 86 KM SUB-BASIN E3  
 87 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 88 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 89 KM L = 1.17 Kb = .029 Adj. Slope = 20.0  
 90 BA .321  
 91 LG .150 .250 4.800 .340 27.000  
 92 UC .613 .465  
 93 UA 0 5 16 30 65 77 84 90 94 97  
 94 UA 100  
 \*

95 KK RE3  
 96 KM ROUTE FLOW FROM BASIN E3 SOUTH ALONG 103RD AVE TO PEORIA AVE  
 97 RS 1 FLOW -1  
 98 RC .03 .025 .03 1000 .003  
 99 RX 0 1 20 30 45 60 79 80  
 100 RY 3 2 2 1 1 2 2 3  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

101 KK E6N  
 102 KM SUB-BASIN E6N  
 103 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 104 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 105 KM L = .45 Kb = .040 Adj. Slope = 16.0  
 106 BA .238  
 107 LG .220 .250 5.100 .310 18.000  
 108 UC .471 .192  
 109 UA 0 5 16 30 65 77 84 90 94 97  
 110 UA 100  
 \*

111 KK CF19  
 112 KM COMBINE FLOWS AT INTERSECTION OF 103RD AVE AND PEORIA AVE  
 113 HC 2  
 \*

114 KK RCF19  
 115 KM ROUTE FLOW SOUTH DOWN 103RD AVE AND THEN ON MOUNTAIN VIEW ROAD TO OLIVE AVE  
 116 RS 3 FLOW -1  
 117 RC .03 .025 .03 5280 .0034  
 118 RX 0 1 20 30 45 60 79 80  
 119 RY 4 3 2 1 1 2 3 4  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

120 KK E6S  
 121 KM SUB-BASIN E6S  
 122 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 123 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 124 KM L = 1.06 Kb = .032 Adj. Slope = 8.0  
 125 BA .403  
 126 LG .160 .250 5.000 .290 24.000  
 127 UC .867 .555  
 128 UA 0 5 16 30 65 77 84 90 94 97  
 HEC-1 INPUT

PAGE

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

129 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

130 KK E8  
 131 KM SUB-BASIN E8  
 132 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 133 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 134 KM L = .91 Kb = .034 Adj. Slope = 12.0  
 135 BA .262  
 136 LG .300 .320 4.700 .350 24.000  
 137 UC .733 .522  
 138 UA 0 5 16 30 65 77 84 90 94 97  
 139 UA 100  
 \*

140 KK CF20  
 141 KM COMBINE FLOWS AT THE INTERSECTION OF MOUNTAIN VIEW ROAD AND OLIVE AVE  
 142 HC 4  
 \*

143 KK RCF20  
 144 KM ROUTE FLOWS ALONG OLIVE AVE TO INTERSECTION OF 99TH AVE AND OLIVE AVE  
 145 KM THIS FLOW COULD BE IN A CHANNEL

146 RS 1 FLOW -1  
 147 RC .03 .025 .03 1520 .0026  
 148 RX 0 11 15 24 34 40 42 44  
 149 RY 7.5 5.5 .1 .1 .1 5 5.5 7.5  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

150 KK E4  
 151 KM SUB-BASIN E4  
 152 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 153 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 154 KM L = 1.25 Kb = .051 Adj. Slope = 10.0  
 155 BA .333  
 156 LG .270 .250 5.100 .300 31.000  
 157 UC 1.242 1.053  
 158 UA 0 5 16 30 65 77 84 90 94 97  
 159 UA 100  
 \*

160 KK RE4  
 161 KM ROUTE FLOW SOUTH DOWN 99TH AVE TO INTERSECTION OF 99TH AVE AND OLIVE AVE  
 162 RS 4 FLOW -1  
 163 RC .03 .025 .03 5600 .0055  
 164 RX 0 1 20 40 60 80 99 100  
 165 RY 3 2 2 1 1 2 2 3  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

166 KK E7  
 167 KM SUB-BASIN E7  
 168 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 169 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 170 KM L = 1.02 Kb = .047 Adj. Slope = 30.0  
 171 BA .239

HEC-1 INPUT

PAGE

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

172 LG .270 .250 4.800 .320 30.000  
 173 UC .650 .527  
 174 UA 0 5 16 30 65 77 84 90 94 97  
 175 UA 100  
 \* DDM \*\*\*\*\* Updated \*\*\*\*\*

176 KK E9  
 177 KM SUB-BASIN E9  
 178 KM 6-HOUR RAINFALL, PATTERN NO. 2.15 WAS USED TO FIND TC & R FOR THIS BASIN  
 179 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .969  
 180 KM L = .38 Kb = .035 Adj. Slope = 32.0  
 181 BA .058  
 182 LG .130 .250 4.800 .310 28.000  
 183 UC .308 .234  
 184 UA 0 5 16 30 65 77 84 90 94 97  
 185 UA 100  
 \*

186 KK CFNR  
 187 KM COMBINE FLOWS AT INTERSECTION OF 99TH AVE AND OLIVE AVE. THIS FLOW WILL GO  
 188 KM TO NEW RIVER  
 189 HC 4  
 190 ZZ

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW  
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

23 E1  
 V  
 V  
 40 RE1  
 .  
 .  
 46 . E2  
 .  
 .  
 56 CPl7.....  
 V  
 V  
 60 RCF17  
 .  
 .





+		RE3	271.	4.42	57.	14.	8.	.32	
+									2.67
4.42									
+	HYDROGRAPH AT	E6N	268.	4.17	38.	10.	6.	.24	
+	2 COMBINED AT	CF19	510.	4.25	95.	24.	14.	.56	
+	ROUTED TO	RCF19	473.	4.50	95.	24.	14.	.56	
+									3.22
4.50									
+	HYDROGRAPH AT	E6S	309.	4.50	72.	18.	10.	.40	
+	HYDROGRAPH AT	E8	188.	4.42	41.	10.	6.	.26	
+	4 COMBINED AT	CF20	1692.	4.75	567.	145.	84.	3.03	
+	ROUTED TO	RCF20	1693.	4.83	567.	145.	84.	3.03	
+									7.08
4.83									
+	HYDROGRAPH AT	E4	175.	4.75	60.	16.	9.	.33	
+	ROUTED TO	RE4	167.	5.17	60.	16.	9.	.33	
+									2.08
5.17									
+	HYDROGRAPH AT	E7	193.	4.42	43.	11.	6.	.24	
+	HYDROGRAPH AT	E9	69.	4.08	11.	3.	2.	.06	
+	4 COMBINED AT	CFNR	1982.	4.83	679.	175.	101.	3.66	

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

Appendix I

Sub-basin Peak Flow and Unit Peak Flow

Sub-basin	Area	100yr-24hr Flow(cfs)	100yr-24hr Unit Flow (cfs/sq.mi)	100yr-6hr Flow(cfs)	100yr-6hr Unit Flow (cfs/sq.mi)
A1	0.51	430	843.1	289	566.7
A2	0.09	96	1066.7	62	688.9
B1	0.17	312	1835.3	190	1117.6
B2	0.44	407	925.0	341	775.0
B3	0.19	165	868.4	103	542.1
B4	0.06	109	1816.7	60	1000.0
B5	0.31	210	677.4	162	522.6
B6	0.46	490	1065.2	360	782.6
B7	0.73	1368	1874.0	889	1217.8
B8	0.33	358	1084.8	254	769.7
B9	0.16	127	793.8	100	625.0
C1	0.15	253	1686.7	146	973.3
C2	1.04	835	802.9	713	685.6
C3	0.27	334	1237.0	240	888.9
C4	0.58	824	1420.7	568	979.3
C5	0.53	398	750.9	322	607.5
C6	0.13	203	1561.5	137	1053.8
C7	0.08	132	1650.0	89	1112.5
C8	0.2	298	1490.0	196	980.0
C9	0.06	116	1933.3	75	1250.0
C10	0.12	190	1583.3	130	1083.3
C11	0.28	466	1664.3	296	1057.1
C12	0.21	336	1600.0	208	990.5
C13	0.36	444	1233.3	307	852.8
C14	0.24	286	1191.7	210	875.0
D1	0.6	101	168.3	77	128.3
D2	1.61	185	114.9	143	88.8
D3	0.25	230	920.0	195	780.0
D4	0.12	125	1041.7	79	658.3
D5	0.12	167	1391.7	109	908.3
D6	0.09	110	1222.2	82	911.1
D7	0.11	159	1445.5	105	954.5
D8	0.16	156	975.0	109	681.3
D9	0.05	55	1100.0	39	780.0
D10	0.07	80	1142.9	57	814.3
D11	0.12	152	1266.7	111	925.0
G1N	0.28	168	600.0	153	546.4
G1S	0.12	183	1525.0	124	1033.3
L1	0.08	86	1075.0	65	812.5
L2	0.11	62	563.6	55	500.0
E1	0.33	267	809.1	276	836.4
E2	0.8	489	611.3	498	622.5
E3	0.32	325	1015.6	273	853.1
E4	0.33	165	500.0	175	530.3
E5	0.68	500	735.3	509	748.5
E6N	0.24	376	1566.7	268	1116.7
E6S	0.4	328	820.0	309	772.5

Sub-basin Peak Flow and Unit Peak Flow

		100yr-24hr	100yr-24hr Unit Flow	100yr-6hr	100yr-6hr Unit Flow
Sub-basin	Area	Flow(cfs)	(cfs/sq.mi)	Flow(cfs)	(cfs/sq.mi)
E7	0.24	223	929.2	193	804.2
E8	0.26	219	842.3	188	723.1
E9	0.06	98	1633.3	69	1150.0
	SUM		56671.3		40677.2
	AVERAGE		1133.4		813.5

Concentration Point Peak Flow and Unit Peak Flow

Concentration Pt	Area	100yr-24hr Flow(cfs)	100yr-24hr Unit Flow (cfs/sq.mi)	100yr-6hr Flow(cfs)	100yr-6hr Unit Flow (cfs/sq.mi)
CF1	0.6	522	870.0	350	583.3
CF2	0.77	312	405.2	190	246.8
CF3	1.61	860	534.2	720	447.2
CF4	2.83	1385	489.4	941	332.5
CF5	3.11	1679	539.9	1172	376.8
CF6	3.69	2466	668.3	1737	470.7
CF7	4.42	2955	668.6	2208	499.5
CF8	4.7	3256	692.8	2443	519.8
CF9	4.91	3412	694.9	2615	532.6
CF10	5.18	3571	689.4	2766	534.0
CF11	5.39	3701	686.6	2913	540.4
CPD10	0.22	235	1068.2	166	754.5
CPD10B	5.61	3093	551.3	2450	436.7
CL1	0.32	372	1162.5	275	859.4
CFDW	1.37	1062	775.2	930	678.8
CPD3	1.61	1241	770.8	1109	688.8
CPLAKE	0.47	479	1019.1	351	746.8
CPD4	2.2	1672	760.0	1481	673.2
CPD7	2.31	1699	735.5	1528	661.5
CF12	7.92	4336	547.5	3784	477.8
CF14	8.04	4306	535.6	3825	475.7
CF15	0.24	283	1179.2	220	916.7
CPB6	0.46	1065	2315.2	944	2052.2
CF16	0.78	1244	1594.9	1101	1411.5
CP17	1.13	650	575.2	703	622.1
CF18	1.81	964	532.6	1069	590.6
CF19	0.56	630	1125.0	510	910.7
CF20	3.03	1520	501.7	1692	558.4
CFNR	3.66	1762	481.4	1982	541.5
		SUM	23170.0		19140.8
		AVERAGE	799.0		660.0

Appendix J

union hills channel: 107th ave to agua f  
Worksheet for Trapezoidal Channel

---

Project Description

Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	union hills channel:107th av to agua fri
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data

Mannings Coefficient	0.015
Channel Slope	0.001000 ft/ft
Depth	2.00 ft
Left Side Slope	2.000000 H : V
Right Side Slope	2.000000 H : V
Bottom Width	15.00 ft

---

---

Results

Discharge	161.96	cfs
Flow Area	38.00	ft <sup>2</sup>
Wetted Perimeter	23.94	ft
Top Width	23.00	ft
Critical Depth	1.44	ft
Critical Slope	0.003188	ft/ft
Velocity	4.26	ft/s
Velocity Head	0.28	ft
Specific Energy	2.28	ft
Froude Number	0.58	

Flow is subcritical.

---

99th ave channel: north of del web blvd  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	99th ave channel just north of del web
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.030
Channel Slope	0.002800 ft/ft
Depth	5.00 ft
Left Side Slope	4.330000 H : V
Right Side Slope	4.330000 H : V
Bottom Width	3.00 ft

---

---

Results		
Discharge	610.48	cfs
Flow Area	123.25	ft <sup>2</sup>
Wetted Perimeter	47.44	ft
Top Width	46.30	ft
Critical Depth	3.82	ft
Critical Slope	0.010621	ft/ft
Velocity	4.95	ft/s
Velocity Head	0.38	ft
Specific Energy	5.38	ft
Froude Number	0.54	
Flow is subcritical.		

---

99th ave channel just south of bell rd  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	99th ave channel just south of bell rd
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.015
Channel Slope	0.006900 ft/ft
Depth	5.00 ft
Left Side Slope	4.330000 H : V
Right Side Slope	4.330000 H : V
Bottom Width	3.00 ft

---

---

Results		
Discharge	1,916.66	cfs
Flow Area	123.25	ft <sup>2</sup>
Wetted Perimeter	47.44	ft
Top Width	46.30	ft
Critical Depth	6.23	ft
Critical Slope	0.002281	ft/ft
Velocity	15.55	ft/s
Velocity Head	3.76	ft
Specific Energy	8.76	ft
Froude Number	1.68	
Flow is supercritical.		

---

channel north of bell rd:98th ave to 99t  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	north of bell rd from 98th to 99th ave
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.015
Channel Slope	0.001000 ft/ft
Depth	4.00 ft
Left Side Slope	2.000000 H : V
Right Side Slope	2.000000 H : V
Bottom Width	18.00 ft

---

---

Results	
Discharge	662.20 cfs
Flow Area	104.00 ft <sup>2</sup>
Wetted Perimeter	35.89 ft
Top Width	34.00 ft
Critical Depth	3.08 ft
Critical Slope	0.002587 ft/ft
Velocity	6.37 ft/s
Velocity Head	0.63 ft
Specific Energy	4.63 ft
Froude Number	0.64
Flow is subcritical.	

---

grand ave channel:103rd ave to new river  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	grand ave channel:103rd ave to new river
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.015
Channel Slope	0.002300 ft/ft
Depth	5.00 ft
Left Side Slope	0.500000 H : V
Right Side Slope	0.500000 H : V
Bottom Width	20.00 ft

---

---

Results		
Discharge	1,257.29	cfs
Flow Area	112.50	ft <sup>2</sup>
Wetted Perimeter	31.18	ft
Top Width	25.00	ft
Critical Depth	4.77	ft
Critical Slope	0.002678	ft/ft
Velocity	11.18	ft/s
Velocity Head	1.94	ft
Specific Energy	6.94	ft
Froude Number	0.93	
Flow is subcritical.		

---

grand ave channel:del web bv to agua fri  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	grand ave channel:del web bd to agua fri
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.015
Channel Slope	0.002500 ft/ft
Depth	6.00 ft
Left Side Slope	1.000000 H : V
Right Side Slope	1.000000 H : V
Bottom Width	10.00 ft

---

---

Results		
Discharge	1,108.49	cfs
Flow Area	96.00	ft <sup>2</sup>
Wetted Perimeter	26.97	ft
Top Width	22.00	ft
Critical Depth	5.91	ft
Critical Slope	0.002639	ft/ft
Velocity	11.55	ft/s
Velocity Head	2.07	ft
Specific Energy	8.07	ft
Froude Number	0.97	
Flow is subcritical.		

---

del web blvd channel  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	del web blvd channel
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.015
Channel Slope	0.001000 ft/ft
Depth	7.00 ft
Left Side Slope	0.500000 H : V
Right Side Slope	0.500000 H : V
Bottom Width	16.00 ft

---

---

Results		
Discharge	1,132.89	cfs
Flow Area	136.50	ft <sup>2</sup>
Wetted Perimeter	31.65	ft
Top Width	23.00	ft
Critical Depth	5.09	ft
Critical Slope	0.002818	ft/ft
Velocity	8.30	ft/s
Velocity Head	1.07	ft
Specific Energy	8.07	ft
Froude Number	0.60	
Flow is subcritical.		

---

mountain view channel d.s. of 103rd ave  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	mountain view channel down of 103rd ave
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.018
Channel Slope	0.002800 ft/ft
Depth	5.00 ft
Left Side Slope	2.000000 H : V
Right Side Slope	2.000000 H : V
Bottom Width	10.00 ft

---

---

Results		
Discharge	926.74	cfs
Flow Area	100.00	ft <sup>2</sup>
Wetted Perimeter	32.36	ft
Top Width	30.00	ft
Critical Depth	4.72	ft
Critical Slope	0.003547	ft/ft
Velocity	9.27	ft/s
Velocity Head	1.33	ft
Specific Energy	6.33	ft
Froude Number	0.89	
Flow is subcritical.		

---

olive rd channel:103rd av to 99th ave  
Worksheet for Trapezoidal Channel

---

Project Description	
Project File	t:\djd\sun city flowmaster\sun city.fm2
Worksheet	olive rd channel:103rd ave to 99th ave
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

---

---

Input Data	
Mannings Coefficient	0.015
Channel Slope	0.002600 ft/ft
Depth	5.00 ft
Left Side Slope	1.000000 H : V
Right Side Slope	1.000000 H : V
Bottom Width	10.00 ft

---

---

Results		
Discharge	806.57	cfs
Flow Area	75.00	ft <sup>2</sup>
Wetted Perimeter	24.14	ft
Top Width	20.00	ft
Critical Depth	4.94	ft
Critical Slope	0.002718	ft/ft
Velocity	10.75	ft/s
Velocity Head	1.80	ft
Specific Energy	6.80	ft
Froude Number	0.98	
Flow is subcritical.		

---

Appendix K

# APPENDIX F - 99<sup>TH</sup> AVENUE HEC-1 MODEL (Modified for various Frequency)

```

*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*
* SEPTEMBER 1990 *
*
* VERSION 4.0 *
*
*
* RUN DATE 11/25/1997 TIME 08:23:24 *
*
*
*****
*****
    
```

```

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

```

X X XXXXXXX XXXXX X
X X X X X XX
X X X X X X
XXXXXX XXXX X XXXXX X
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      MODEL REVISED TO INCLUDE 5, 10, 25, 50, 100YR FLOWS USING
2          ID      JR RECORD-MULTIRATIO OPTION - 9/18/97 FCD
3          ID      99TH AVENUE DRAINAGE STUDY          MCDOT CONTRACT CY 1995-1
4          ID      PROJECT LIMITS: BELL ROAD TO THUNDERBIRD ROAD
5          ID      50 YEAR - 6 HOUR STORM COMPUTED BY CLARK UNIT HYDROGRAPH METHOD
6          ID      RAINFALL LOSSES COMPUTED GY GREEN & AMPT METHOD
7          ID      *****
8          ID      **PRESENT** PRESENT CONDITION = FULLY DEVELOPED CONDITION
9          ID      *****
10         ID      STUDY BY HENDRICH, EBERHART & ASSOC.          TAB 3-29-1995
11         ID      FILENAME = 99-50Y.HC1
12         ID      BASIN 1 DIVERSION "D1" REVISED 6-2-95 TO MODEL ACTUAL FLOW SPLIT
13         ID      CONDITIONS AT DEL WEBB BLVD AND 99TH AS SURVEYED IN THE FIELD.
14         ID      *REVISED 8-8-95,ADJUST DEL WEBB DIVERSION PER HYS MODEL RESULTS.
15         ID      *REVISED 7-3-95 TO EXCLUDE ALL OR PART OF THREE EXISTING GOLF
16         ID      COURSES WHICH LIE WITHIN THE PROJECT WATERSHED LIMITS.
17         ID
18         ID      *DIAGRAM
19         ID      IT      3          300
20         ID      IO      5
21         ID      JR      PREC      .597      .716      .874      1.000      1.122
22         ID      *      FREQ      --5YR      10YR      25YR      50YR      100YR
23         ID
24         ID      KK      1
25         ID      *      KO      1
26         ID      KM      SUB-BASIN 1
27         ID      KM      6-HOUR RAINFALL, PATTERN NO. 2.26 WAS USED TO FIND TC & R FOR THIS BASIN
28         ID      KM      THIS BASIN USED RAINFALL REDUCTION FACTOR OF .964
29         ID      BA      .713
30         ID      IN      15
31         ID      KM      RAINFALL DEPTH OF 2.78 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
32         ID      PB      2.680
33         ID      KM      THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN NO. OF 2.26
34         ID      PC      .000      .011      .017      .026      .038      .047      .058      .067      .077      .087
35         ID      PC      .100      .114      .134      .178      .266      .456      .688      .826      .892      .931
36         ID      PC      .949      .962      .974      .988      1.000
37         ID      LG      .107      .150      7.700      .110      56.000
38         ID      UC      .725      .540
39         ID      UA      0          5          16          30          65          77          84          90          94          97
40         ID      UA      100
41         ID
42         ID      KK      D1
43         ID      KM      DIVERT FLOW FROM SUBBASIN 1
    
```



```

117 KK R7
118 KM ROUTE COMBINED HYDROGRAPHS (1+2+3+4+5+6) THROUGH REACH R7
119 RD 1500 .005 .016 TRAP 2 4

120 KK 7
* KO 1
121 KM SUB-BASIN 7
122 KM 6-HOUR RAINFALL, PATTERN NO. 2.26 WAS USED TO FIND TC & R FOR THIS BASIN
123 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .964
124 BA .200
125 LG .110 .230 6.200 .180 51.000
126 UC .471 .352
127 UA 0 5 16 30 65 77 84 90 94 97
128 UA 100

```

HEC-1 INPUT

PAGE 4

1

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

```

129 KK S6
130 KM COMBINE HYDROGRAPHS (1+2+3+4+5+6,7) @ CAMEO DRIVE
131 HC 2

132 KK R8
133 KM ROUTE COMBINED HYDROGRAPHS (1+2+3+4+5+6+7) THROUGH REACH R8
134 RD 1200 .005 .016 TRAP 2 4

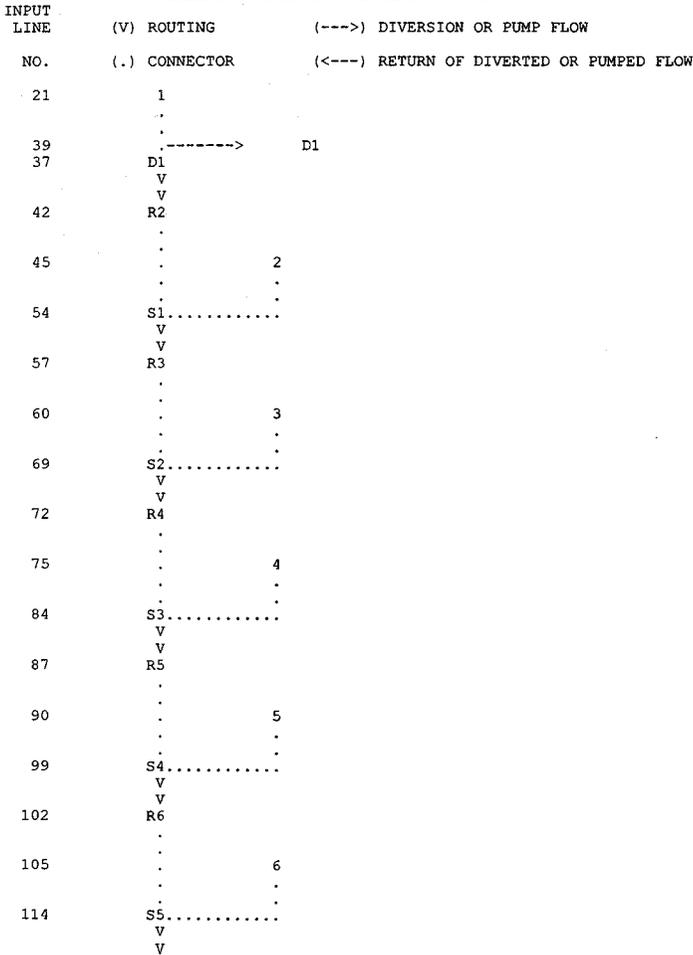
135 KK 8
136 KM SUB-BASIN 8
137 KM 6-HOUR RAINFALL, PATTERN NO. 2.26 WAS USED TO FIND TC & R FOR THIS BASIN
138 KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .964
139 BA .104
140 LG .110 .250 5.600 .210 55.000
141 UC .579 .888
142 UA 0 5 16 30 65 77 84 90 94 97
143 UA 100

144 KK S7
145 KM COMBINE HYDROGRAPHS (1+2+3+4+5+6+7,8) THUNDERBIRD ROAD
146 HC 2
147 ZZ

```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK



```

117      R7
      .
120      .
      .
129      S6.....
      V
      V
132      R8
      .
135      .
      .
144      S7.....

```

(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
*****
*
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*
* SEPTEMBER 1990 *
*
* VERSION 4.0 *
*
*
* RUN DATE 11/25/1997 TIME 08:23:24 *
*
*
*****
*****

```

```

*
* U.S. ARMY CORPS OF ENGINEERS
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* 609 SECOND STREET
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* (916) 756-1104
*
*

```

```

MODEL REVISED TO INCLUDE 5, 10, 25, 50, 100YR FLOWS USING
JR RECORD-MULTIRATIO OPTION - 9/18/97 FCD
99TH AVENUE DRAINAGE STUDY MCDOT CONTRACT CY 1995-1
PROJECT LIMITS: BELL ROAD TO THUNDERBIRD ROAD
50 YEAR - 6 HOUR STORM COMPUTED BY CLARK UNIT HYDROGRAPH METHOD
RAINFALL LOSSES COMPUTED GY GREEN & AMPT METHOD
*****
**PRESENT** PRESENT CONDITION = FULLY DEVELOPED CONDITION
*****
STUDY BY HENDRICH, EBERHART & ASSOC. TAB 3-29-1995
FILENAME = 99-50Y.HC1
BASIN 1 DIVERSION "D1" REVISED 6-2-95 TO MODEL ACTUAL FLOW SPLIT
CONDITIONS AT DEL WEBB BLVD AND 99TH AS SURVEYED IN THE FIELD.
*REVISED 8-8-95,ADJUST DEL WEBB DIVERSION PER HY8 MODEL RESULTS.
*REVISED 7-3-95 TO EXCLUDE ALL OR PART OF THREE EXISTING GOLF
COURSES WHICH LIE WITHIN THE PROJECT WATERSHED LIMITS.

```

```

19 IO      OUTPUT CONTROL VARIABLES
           IPRNT      5  PRINT CONTROL
           IPILOT     0  PLOT CONTROL
           QSCAL      0.  HYDROGRAPH PLOT SCALE

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

           COMPUTATION INTERVAL .05 HOURS
           TOTAL TIME BASE     14.95 HOURS

```

```

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

```

```

JP         MULTI-PLAN OPTION
           NPLAN      1  NUMBER OF PLANS

JR         MULTI-RATIO OPTION
           RATIOS OF PRECIPITATION
           .60      .72      .87      1.00      1.12

```

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS  
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES  
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION				
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5
				.60	.72	.87	1.00	1.12

HYDROGRAPH AT +	1	.71	1	FLOW TIME	343. 4.40	428. 4.40	541. 4.40	630. 4.40	717. 4.40
DIVERSION TO +	D1	.71	1	FLOW TIME	343. 4.40	428. 4.40	521. 4.40	562. 4.40	597. 4.40
HYDROGRAPH AT +	D1	.71	1	FLOW TIME	0. .05	0. .05	20. 4.40	69. 4.40	120. 4.40
ROUTED TO +	R2	.71	1	FLOW TIME	0. .05	0. .05	20. 4.60	68. 4.55	119. 4.50
HYDROGRAPH AT +	2	1.14	1	FLOW TIME	590. 4.30	743. 4.30	947. 4.30	1109. 4.30	1265. 4.30
2 COMBINED AT +	S1	1.85	1	FLOW TIME	590. 4.30	743. 4.30	947. 4.30	1150. 4.40	1355. 4.40
ROUTED TO +	R3	1.85	1	FLOW TIME	589. 4.35	742. 4.35	946. 4.35	1145. 4.40	1354. 4.40
HYDROGRAPH AT +	3	.25	1	FLOW TIME	159. 4.25	193. 4.25	237. 4.25	273. 4.25	308. 4.25
2 COMBINED AT +	S2	2.10	1	FLOW TIME	746. 4.35	932. 4.35	1179. 4.35	1408. 4.40	1649. 4.40
ROUTED TO +	R4	2.10	1	FLOW TIME	745. 4.40	931. 4.40	1178. 4.40	1399. 4.45	1645. 4.40
HYDROGRAPH AT +	4	.69	1	FLOW TIME	331. 4.30	425. 4.30	549. 4.30	648. 4.30	744. 4.30
2 COMBINED AT +	S3	2.79	1	FLOW TIME	1074. 4.35	1354. 4.35	1726. 4.35	2034. 4.40	2381. 4.40
ROUTED TO +	R5	2.79	1	FLOW TIME	1070. 4.40	1351. 4.40	1724. 4.40	2029. 4.45	2375. 4.45
HYDROGRAPH AT +	5	.40	1	FLOW TIME	164. 4.45	207. 4.45	263. 4.45	309. 4.45	353. 4.45
2 COMBINED AT +	S4	3.19	1	FLOW TIME	1233. 4.40	1557. 4.40	1985. 4.40	2338. 4.45	2728. 4.45
ROUTED TO +	R6	3.19	1	FLOW TIME	1230. 4.45	1555. 4.45	1982. 4.45	2334. 4.45	2718. 4.45
HYDROGRAPH AT +	6	.33	1	FLOW TIME	193. 4.20	244. 4.20	311. 4.20	364. 4.20	416. 4.20
2 COMBINED AT +	S5	3.51	1	FLOW TIME	1391. 4.40	1758. 4.40	2246. 4.40	2638. 4.40	3063. 4.45
ROUTED TO +	R7	3.51	1	FLOW TIME	1390. 4.45	1757. 4.45	2242. 4.45	2637. 4.45	3057. 4.45
HYDROGRAPH AT +	7	.20	1	FLOW TIME	102. 4.20	131. 4.20	170. 4.20	200. 4.20	230. 4.20
2 COMBINED AT +	S6	3.71	1	FLOW TIME	1479. 4.45	1872. 4.45	2394. 4.40	2813. 4.45	3260. 4.45
ROUTED TO +	R8	3.71	1	FLOW TIME	1477. 4.45	1871. 4.45	2392. 4.45	2813. 4.45	3255. 4.45
HYDROGRAPH AT +	8	.10	1	FLOW TIME	35. 4.45	45. 4.45	58. 4.45	69. 4.45	79. 4.45
2 COMBINED AT +	S7	3.82	1	FLOW TIME	1512. 4.45	1916. 4.45	2450. 4.45	2882. 4.45	3334. 4.45

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL			
						DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
R2	MANE	.30	.00	413.70	.00	3.00	.00	414.00	.00

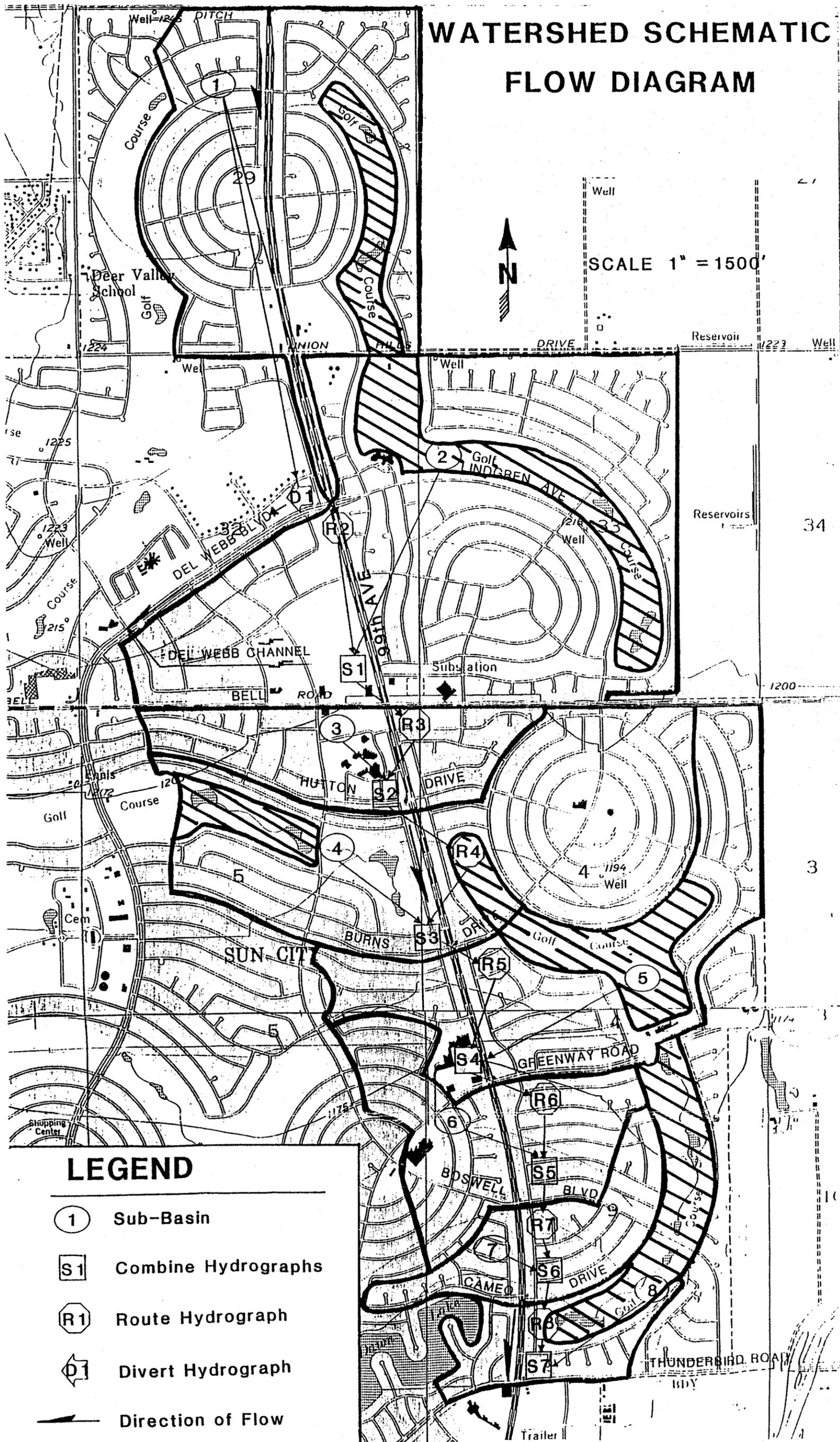
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3029E-07 EXCESS= .0000E+00 OUTFLOW= .3030E-07 BASIN STORAGE= .2221E-05 PERCENT ERROR=\*\*\*\*\*

FOR PLAN = 1 RATIO= .00									
R2	MANE	.75	.00	359.25	.00	3.00	.00	360.00	.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3768E-07 EXCESS= .0000E+00 OUTFLOW= .3768E-07 BASIN STORAGE= .2221E-05 PERCENT ERROR=\*\*\*\*\*

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

# WATERSHED SCHEMATIC FLOW DIAGRAM



## LEGEND

- 1 Sub-Basin
- S1 Combine Hydrographs
- R1 Route Hydrograph
- D1 Divert Hydrograph
- Direction of Flow
- Sub-Basin Boundary
- Area Excluded

APPENDIX G - SCHEMATIC FLOW DIAGRAM OF 99<sup>TH</sup> AVENUE HEC-1 MODEL

Appendix L