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A GUIDE TO SCS RUNOFF PROCEDURES

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LIST OF SYMBOLS

A = Drainage area, square miles

A_{ei} = Effective impervious area, square miles

A_{nei} = Noneffective impervious area, square miles

A_{perv} = Pervious area, square miles

A_{ti} = Total impervious area, square miles

AMC = Antecedent moisture condition

CN = SCS runoff curve number

D = Duration of unit excess rainfall, hours

DWT = Depth to water table, feet

EIA = Effective impervious area

F = Depth of rainfall infiltrated after runoff begins, inches

I = Initial abstraction, inches

K = Hydrograph shape factor

K' = Peak rate factor

L = Watershed time lag, hours

n = Manning's roughness coefficient

P = Total rainfall, inches

P' = Total rainfall adjusted for the pervious area, inches

P_{24} = 2-year 24-hour rainfall depth, inches

Q = Direct runoff, inches

Q_{ei} = Runoff contributed from the effective impervious area, inches

Q_{perv} = Runoff contributed from the pervious area, inches

q_p = Peak discharge, cubic feet per second

R_Q = Proportional change in Q per unit change in CN

R_q = Proportional change in q_p per unit change in CN

S = Watershed storage, inches

s = Slope of energy gradient, feet/foot

s_o = Overland flow slope, feet/foot

t_b = Time base of unit hydrograph, hours

t_c = Time of concentration, hours

t_o = Overland flow travel time, hours

t_p = Time to peak of unit hydrograph, hours

t_r = Recession time of unit hydrograph, hours

TIA = Total impervious area

V = Volume of direct runoff, cubic feet

x_o = Overland flow length, feet

x_w = Hydraulic length of watershed, feet

Y = Average watershed land slope, percent

ABSTRACT

This report contains: (1) discussions of the SCS runoff procedures, including the curve number and the unit hydrograph methods; (2) methods of estimating runoff curve numbers (CN), the time of concentration (t_c), and a peak rate factor (K') for different hydrologic conditions; (3) a method of constructing a triangular unit hydrograph for a peak rate factor; and (4) example problems illustrating the effects of methods used in estimating CN, t_c, and K' on runoff hydrographs.

In estimating CN for urban basins, the effective impervious area (EIA) method should be used. The Agricultural Research Service (ARS) method is recommended for basins where soil storage is affected by water table. The SCS velocity method should be used in estimating the basin t_c. K' can be determined from the proportion of area under the rising limb of the time-area curve or by using the adjustment factor for the swampy and ponding areas.

INTRODUCTION

A. Background

The Soil Conservation Service (SCS) runoff procedures, consisting of the curve number (CN) method and the unit hydrograph method, are commonly used by hydrologists and engineers for hydrologic analyses and designs. These runoff procedures are often recommended by federal, state, and local government agencies, including all of the water management districts in Florida, for use in evaluating the effects of land use changes on runoff volumes and peak discharges.

B. Scope of Report

The first objective of this report is to provide a better understanding of the SCS runoff procedures. The second objective is to develop practical guidelines for estimating soil storage and selecting a peak rate factor for different hydrologic conditions. Specific tasks involved in this report are:

(1) Detailed discussions of the SCS runoff procedures.

(2) Discussion of techniques for estimating CN under different hydrologic conditions.

(3) Derivation of equations for defining the shape of a triangular unit hydrograph for a given peak rate factor.

(4) Development of a practical guideline for estimating the peak rate factor for swampy and depression areas.

(5) Example problems on applications of the SCS runoff procedures.

DISCUSSION OF THE SCS RUNOFF EQUATION

In the early 1950's, the SCS developed a method for estimating volume of direct runoff from storm rainfall and evaluating the effects of land use and treatment changes on volume of direct runoff. The method, which is often referred to as the curve number method, was empirically developed from small agricultural watersheds.

A. Development

In deriving the SCS runoff equation, the ratio of amount of rainfall infiltrated after runoff begins (F) to watershed storage (S) was assumed to be equal to the ratio of actual direct runoff to effective rainfall (total rainfall minus initial abstraction). The assumed relationship in mathematical form is:

$$\frac{F}{S} = \frac{Q}{P-I} \qquad (1)$$

where

F = accumulated infiltration, inches

S = watershed storage, inches

Q = actual direct runoff, inches

P = total rainfall, inches

I = initial abstraction, inches

The amount of rainfall infiltrated after runoff begins can be expressed as:

$$F = (P-I) - Q \qquad (2)$$

By substituting Equation (2) into Equation (1) and solving Q in terms of P, I, and S, Equation (1) becomes:

$$Q = \frac{(P-I)^2}{(P-I)+S} \quad ; \quad P>I \tag{3}$$

The initial abstraction defined by the SCS mainly consists of interception, depression storage, and infiltration occurring prior to runoff. To eliminate the necessity of estimating both parameters I and S in Equation (3), the relation between I and S was developed by analyzing rainfall-runoff data for many small watersheds. The empirical relationship is:

$$I = 0.2S \tag{4}$$

Substituting Equation (4) into Equation (3) yields:

$$Q = \frac{(P-0.2S)^2}{P+0.8S} \tag{5}$$

which is the rainfall-runoff equation used by the SCS for estimating depth of direct runoff from storm rainfall. The equation has one variable P and one parameter S. S is related to CN by:

$$S = \frac{1000}{CN} - 10 \tag{6}$$

CN is a function of hydrologic soil group, land use, land treatment and hydrologic condition. It is dimensionless and has values ranging from 0 to 100.

B. Limitations

The limitations related to the SCS runoff equation are as follows:

1. Since daily rainfall data were used in the development of the equation, the time distribution and duration of storms were not considered. If all other factors are constant, all storms having the same rainfall magnitude but different duration or intensity will produce equal amount of direct runoff volume. In fact, rainfall intensity does have an effect on the hydrologic response of the watershed.
2. The equation tends to overpredict runoff volume for a discontinuous storm, because it does not account for the recovery of soil storage caused by infiltration during periods of no rain.
3. The CN procedure does not work well in areas where large proportion of flow is subsurface, rather than direct runoff (Rallison and Miller, 1983).
4. Since the SCS curve numbers were developed from annual maximum one-day runoff data, the CN procedure is less accurate when dealing with small runoff events.
5. The equation predicts that infiltration rate will approach zero for storms with long duration instead of a constant terminal infiltration rate (Hjelmfelt, 1980).

C. <u>Summary</u>

1. The SCS runoff equation is widely used in estimating direct runoff because of its simplicity, flexibility, and versatility. The only input parameter needed is CN and the hydrologic data used to estimate CN are normally

available in most ungaged watersheds. In addition, the equation can be applied to a wide range of watershed conditions.

2. Since CN is the only parameter required, the accuracy of runoff prediction is entirely dependent on the accuracy of CN.

3. Aron and Lakatos (1976) suggested that the assumption of $I = 0.2S$ is in general too large. According to McCuen (1983), this assumption is not critical to design accuracy. Although further refinement of I is possible, it is not recommended because under typical field conditions very little is known of the magnitudes of interception, infiltration, and surface storage (Rallison and Miller, 1979).

4. To avoid using different rainfall distributions for the same region, the synthetic rainfall distributions developed by the SCS are usually used in practical applications (See Appendix A).

RUNOFF CURVE NUMBERS

Runoff Curve Number (CN) is a parameter used in estimating available soil moisture storage prior to a storm event. It is determined based on the following factors: hydrologic soil group, land use, land treatment, and hydrologic condition.

A. Hydrologic Soil Group Classification

Soils are classified into four hydrologic soil groups (A, B, C, and D) according to their minimum infiltration rate, which is obtained for a bare soil after prolonged wetting. The definitions of the four hydrologic soil groups and a list of soil names associated with their hydrologic classifications are given in Appendix B.

B. Cover Complex Classification

Determination of cover complex classification depends on three factors: land use, treatment, and hydrologic condition. Land use is watershed cover; it includes all agricultural and nonagricultural lands. Land treatment refers mainly to mechanical practices (e.g., contouring or terracing) and management practices (e.g., grazing control, crop rotation or conservation tillage). The hydrologic condition reflects the level of land treatment; it is divided into three classes: poor, fair, and good. A brief description of the selected land uses are given in Appendix C.

C. Estimation of CN

According to Mockus (1964), to the extent possible, curve numbers (CN) were developed from gaged watershed data where soils, crop covers, and hydrologic conditions were known. The watershed data were interpolated and extrapolated to determine the missing CN values. Estimates of CN values for the selected agricultural, suburban, and urban land uses are given in Table 1. By knowing a hydrologic soil-cover complex condition, CN can be estimated from Table 1.

1. Urban CN

A common method of estimating CN for an urbanized basin is to compute the weighted average of CN's for the total impervious area (TIA/A_{ti}) and pervious area (A_{perv}). Another method is to divide the total impervious area into effective and noneffective impervious areas. The effective impervious area (EIA/A_{ei}) comprises those impervious surfaces that are hydraulically connected to the drainage system (e.g., streets with curb and gutter and paved parking lots that drain onto streets). The noneffective impervious area (A_{nei}) consists of those impervious surfaces that drain to pervious surface such as a roof that drains onto a lawn. The second method assumes that rain falling on noneffective impervious area is instantaneously and uniformly distributed over the pervious area. This volume is then added to rain falling on the pervious area prior to computation of

Table 1.—Runoff Curve Numbers for Hydrologic Soil Cover Complexes (AMC II, I = 0.2S) (SCS, 1983)

Land Use Description	Average % impervious[2/]	Curve Numbers for Hydrologic soil group A	B	C	D
FULLY DEVELOPED URBAN AREA[1/] (Vegetation Established)					
Lawns, open spaces, parks, golf courses, cemeteries, etc.					
good condition: grass cover on 75% or more of the area		39	61	74	80
fair condition: grass cover on 50% to 75% of the area		49	69	79	84
poor condition: grass cover on 50% or less of the area		68	79	86	89
Paved parking lots, roofs, driveways, etc.		98	98	98	98
Streets and roads: paved with curbs and storm sewers		98	98	98	98
gravel		76	85	89	91
dirt		72	82	87	89
paved with open ditches		83	89	92	93
Commercial and business areas	85	89	92	94	95
Industrial districts	72	81	88	91	93
Row houses, town houses, and residential with lot sizes 1/8 acre or less	65	77	85	90	92
Residential					
Average lot size					
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acre	12	46	65	77	82
DEVELOPING URBAN AREAS[3/] (No Vegetation Established)					
Newly graded area or bare soil		77	86	91	94

Table 1.--Continued (AMC II, I = 0.2S)

Land Use	Cover: Treatment or Practice	Hydrologic Condition[4/]	Curve Numbers for Hydrologic Soil Group: A	B	C	D
CULTIVATED AGRICULTURAL LAND						
Fallow	Straight row		77	86	91	94
	Conservation tillage	poor	76	85	90	93
	Conservation tillage	good	74	83	88	90
Row crops	Straight row	poor	72	81	88	91
	Straight row	good	67	78	85	89
	Conservation tillage	poor	71	80	87	90
	Conservation tillage	good	64	75	82	85
	Contoured	poor	70	79	84	88
	Contoured	good	65	75	82	86
	Contoured + conservation tillage	poor	69	78	83	87
		good	64	74	81	85
	Contoured + terraces	poor	66	74	80	82
	Contoured + terraces	good	62	71	78	81
	Contoured + terraces + conservation tillage	poor	65	73	79	81
		good	61	70	77	80
Small grain	Straight row	poor	65	76	84	88
	Straight row	good	63	75	83	87
	Conservation tillage	poor	64	75	83	86
	Conservation tillage	good	60	72	80	84
	Contoured	poor	63	74	82	85
	Contoured	good	61	73	81	84
	Contoured + conservation tillage	poor	62	73	81	84
		good	60	72	80	83
	Contoured + terraces	poor	61	72	79	82
	Contoured + terraces	good	59	70	78	81
	Contoured + terraces + conservation tillage	poor	60	71	78	81
		good	58	69	77	80
Close-seeded Legumes or Rotation Meadow[5/]	Straight row	poor	66	77	85	89
	Straight row	good	58	72	81	85
	Contoured	poor	64	75	83	85
	Contoured	good	55	69	78	83
	Contoured & terraces	poor	63	73	80	83
	Contoured & terraces	good	51	67	76	80

Table 1.--Continued (AMC II, I = 0.2S)

Land Use	Cover: Treatment or Practice	Hydrologic Condition[6/]	Curve Numbers for Hydrologic Soil Group: A	B	C	D
NON-CULTIVATED AGRICULTURAL LAND						
Pasture or Range	No mechanical treatment	poor	68	79	86	89
	No mechanical treatment	fair	49	69	79	84
	No mechanical treatment	good	39	61	74	80
	Contoured	poor	47	67	81	88
	Contoured	fair	25	59	75	83
	Contoured	good	6	35	70	79
Meadow		--	30	58	71	78
Forestland--grass or orchards--evergreen or deciduous		poor	55	73	82	86
		fair	44	65	76	82
		good	32	58	72	79
Brush		poor	48	67	77	83
		good	20	48	65	73
Woods		poor	45	66	77	83
		fair	36	60	73	79
		good	25	55	70	77
Farmsteads		--	59	74	82	86

Table 1.--Continued (AMC II, I = 0.2S)

Land Use	Cover Treatment or Practice	Hydrologic Condition[7]	Curve Numbers for Hydrologic Soil Group A	B	C	D
<u>FOREST-RANGE</u>						
Herbaceous		poor		79	86	92
		fair		71	80	89
		good		61	74	84
Oak-Aspen		poor		65	74	
		fair		47	57	
		good		30	41	
Juniper-grass		poor		72	83	
		fair		58	73	
		good		41	61	
Sage-grass		poor		67	80	
		fair		50	63	
		good		35	48	

1/ For land uses with impervious areas, curve numbers are computed assuming that 100% of runoff from impervious areas is directly connected to the drainage system. Pervious areas (lawn) are considered to be equivalent to lawns in good condition and the impervious areas have a CN of 98.

2/ Includes paved streets.

3/ Use for the design of temporary measures during grading and construction.

4/ For conservation tillage poor hydrologic condition, 5 to 20 percent of the surface is covered with residue (less than 750 #/acre row crops or 300 #/acre small grain).

For conservation tillage good hydrologic condition, more than 20 percent of the surface is covered with residue (greater than 750 #/acre row crops or 300 #/acre small grain).

5/ Close-drilled or broadcast.

6/ Poor hydrologic condition has less than 25 percent ground cover density.

Fair hydrologic condition has between 25 and 50 percent ground cover density.

Good hydrologic condition has more than 50 percent ground cover density.

7/ Poor hydrologic condition has less than 30 percent ground cover density.

Fair hydrologic condition has between 30 and 70 percent ground cover density.

Good hydrologic condition has more than 70 percent ground cover density.

runoff from the pervious area. The steps involved in calculating the total runoff are given below:

Step 1. Compute CN and S for the pervious area (A_{perv}).

Step 2. Adjust rain for the pervious area such that:

$$P' = (1+A_{nei}/A_{perv})(P)$$

Step 3. Compute runoff from the pervious area:

$$Q_{perv} = \frac{(P'-0.2S)^2}{P'+0.8S}(A_{perv}/A)$$

Step 4. Compute runoff from the effective impervious area:

$$Q_{ei} = (P)(A_{ei}/A)$$

Step 5. Compute total runoff:

$$Q = Q_{perv} + Q_{ei}$$

Miller (1979) studied the rainfall-runoff characteristics of four urbanized basins in south Florida. His study indicated:

(1) The EIA is an important physical feature in urban basins, and is responsible for runoff from small and medium rainfall events. It produces a linear relation between rainfall and runoff.

(2) There is a breakpoint rainfall, which varies from 1 to 2 inches. When this rainfall is exceeded, runoff will be contributed from the basin area outside the EIA.

(3) A nonlinear relation exists when runoff is produced from the area outside the EIA.

Alley and Veenhuis (1983) concluded that considerable overestimations of runoff volumes and peak flows could be incurred in rainfall-runoff modeling, if TIA rather than EIA is used as a model input. Simulation experiments also show that the TIA method produces higher runoff volume and peak flow for larger rainfall events. However, the TIA method gives lower runoff volume for smaller rainfall events simply because most of runoff is contributed from the EIA.

In the TR-20 computer model, the basin CN is calculated based on TIA. To obtain more realistic estimates of runoff volume and peak flow, the basin CN can be adjusted as follows:

Step 1. Compute total runoff using the steps given earlier.

Step 2. Compute the equivalent S from the following equation (Hope and Schulze, 1981):

$$S = 5[P+2Q-(4Q^2+5PQ)^{0.5}]$$

Step 3. Compute the equivalent CN from the following equation:

$$CN = \frac{1000}{(S+10)}$$

2. Flatwoods CN

The CN values for the flatwoods are greatly affected by the water table and antecedent moisture conditions.

During wet periods, the water table is near ground surface and the flatwoods are often submerged. The flatwoods can become very dry during dry periods when water table normally drops to 3-5 feet below the surface. Estimates of CN values for the pine flatwoods are given in Table 2.

Another way of estimating watershed storage or CN for the flatwoods is to relate watershed storage with water table. Capece (1984) conducted a study on estimation of runoff volumes from flat, high-water table watersheds in south Florida. Among the seven methods investigated, he concluded that the ARS (Agricultural Research Service) method gives the best estimates of runoff volume. This method was developed from the absorption curve of sandy soils in the Taylor Creek area (Speir et.al., 1960). The relationship between watershed storage and water table is given by the following equations:

$$S = 0.60(DWT) \quad , \; 0.0<DWT<0.5 \qquad (7a)$$

$$S = 0.30+1.00(DWT-0.5) \quad , \; 0.5<DWT<1.0 \qquad (7b)$$

$$S = 0.80+1.35(DWT-1.0) \quad , \; 1.0<DWT<2.0 \qquad (7c)$$

$$S = 2.15+1.55(DWT-2.0) \quad , \; 2.0<DWT<3.0 \qquad (7d)$$

where

S = watershed storage, inches

DWT = depth to water table, feet.

The ARS method ignores effects of crop cover, land treatment and hydrologic condition on runoff. The method seems to work well for watersheds where soil storage is significantly affected by fluctuations of water table.

Table 2.--Approximate CN values for Pine Flatwoods and Wetlands.

	Curve Number for		
	Dry Periods	Wet Periods	Design
Wet prairies	70	98	95
Pine flatwoods	60	98	93
River swamp, cypress swamp, lake border swamp	80	98	95
Marsh	90	98	98
Bog swamp, bay head, cypress dome	--	98	77

3. Wetlands CN

It is difficult to assign CN values for wetlands because their CN values vary from one condition to another condition. During wet periods, wetlands are nearly or fully saturated and could be given a CN value of 100. The behavior of wetlands during dry periods is unclear. Certain types of wetlands such as bog swamp, bay head, and cypress dome may have tremendous depression storage depending on water table conditions. Soils in wetlands areas generally consist of organic materials, peats, and mucks and have high water holding capacity. These soils have very poor drainage and water is lost principally through evapotranspiration. Description of different types of wetlands are given in Appendix C. Approximate CN values for wetlands are given in Table 2.

D. Antecedent Soil Moisture Condition

Antecedent soil moisture is an indicator of watershed wetness and availability of soil storage prior to a storm. It can have a significant effect on both runoff volume and runoff rate. Recognizing its significance, the SCS developed a guide for adjusting CN according to antecedent moisture condition (AMC) determined by the total rainfall in the 5-day period preceding a storm. Three levels of AMC are used: AMC-I for dry, AMC-II for normal, and AMC-III for wet conditions. Table 3 gives seasonal rainfall limits for these three antecedent moisture conditions.

Table 3.--Classification of Antecedent Moisture Conditions (SCS, 1972).

AMC	Total 5-day Antecedent Rainfall (inches)	
	Dormant Season	Growing Season
I	Less than 0.5	Less than 1.4
II	0.5 to 1.1	1.4 to 2.1
III	over 1.1	over 2.1

Konyha and others (1982) suggested that the 5-day AMC is not a reliable indicator of watershed wetness for the flatwoods watersheds. According to Rallison and Cronshey (1979), the SCS indicated that a five-day period is a minimum for estimating antecedent conditions. Sometimes longer periods are desirable but the additional work does not always produce additional accuracy in the runoff estimates. Cronshey (1983) suggested that the AMC II CN be used for most practical applications and an AMC curve number adjustment be made only when an actual storm is to be evaluated.

The CN estimates presented in Table 1 are for AMC II. If either AMC I or III is to be used, the CN can be adjusted using Table 4.

Table 4.--Curve Numbers for AMC I and AMC III.

CN for AMC II	Corresponding CN for AMC I	Corresponding CN for AMC III
100	100	100
95	87	99
90	78	98
85	70	97
80	63	94
75	57	91
70	51	87
65	45	83
60	40	79
55	35	75
50	31	70
45	27	65
40	23	60
35	19	55
30	15	50
25	12	45
20	9	39
15	7	33
10	4	26
5	2	17
0	0	0

E. Sensitivity of CN

Curve Number (CN) is an important parameter for determining direct runoff (Q) and peak discharge (q_p). An error in CN estimate will cause errors in Q and q_p. The total error in q_p due to error in CN estimate consists of the errors in Q and time of concentration (t_c) obtained from the SCS lag equation.

Hawkins (1975) performed a sensitivity analysis of Q to error in rainfall (P) and CN. He concluded: (1) For a considerable range of P, accurate values of CN are more important than accurate estimates of P; and (2) The accuracy of estimating Q is very critical near the threshold of runoff (P=0.2S).

Bondelid, et. al. (1982) evaluated the sensitivity of the SCS methodology to errors in CN estimates. They concluded: (1) The effects of CN variation on Q and q_p decrease as P increases; and (2) As both P and CN increase, the effect of the error in Q on q_p decreases while the effect of the error in t_c increases.

Figures 1 and 2 show the relative sensitivities of R_Q and R_q, respectively, due to CN. The terms R_Q and R_q are proportional changes in Q and q_p, respectively, per unit change in CN. Both figures can be used for evaluating the hydrologic effects of differences in the estimated CN's. Figure 3,

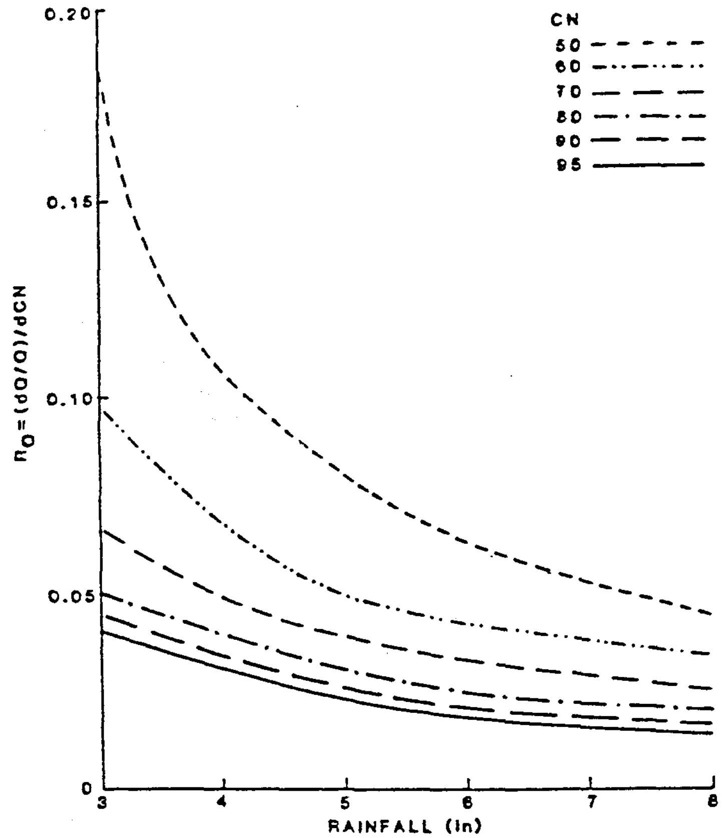

Figure 1.--Relative Sensitivity of R_Q to CN, $0.7<t_c<5.0$ Hours

(Bondelid et. al., 1982)

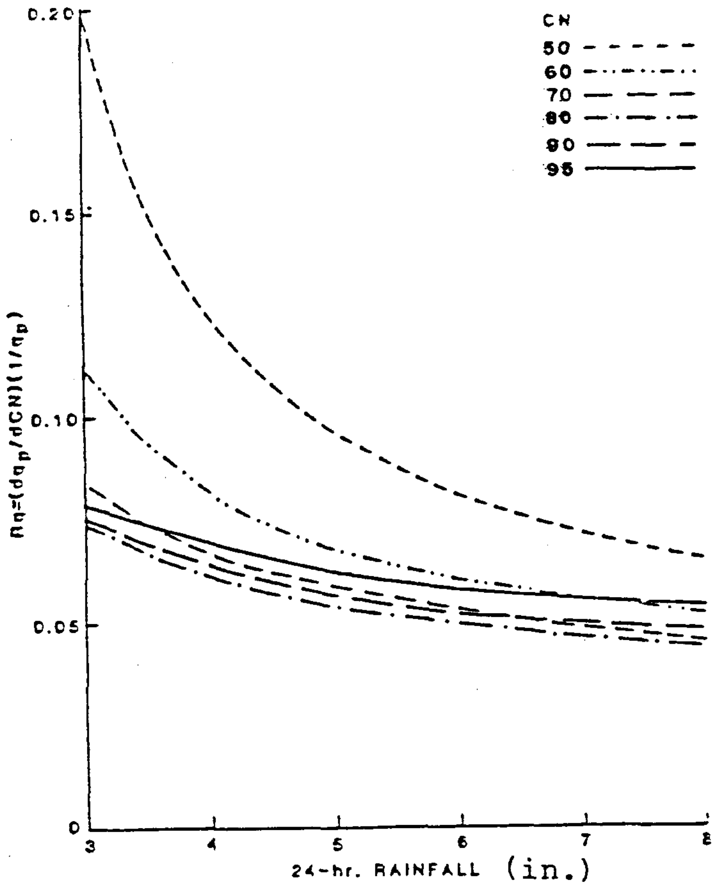

Figure 2.--Relative Sensitivity of R_q to CN, $0.7<t_c<5,0$ Hours

(Bondelid et. al., 1982)

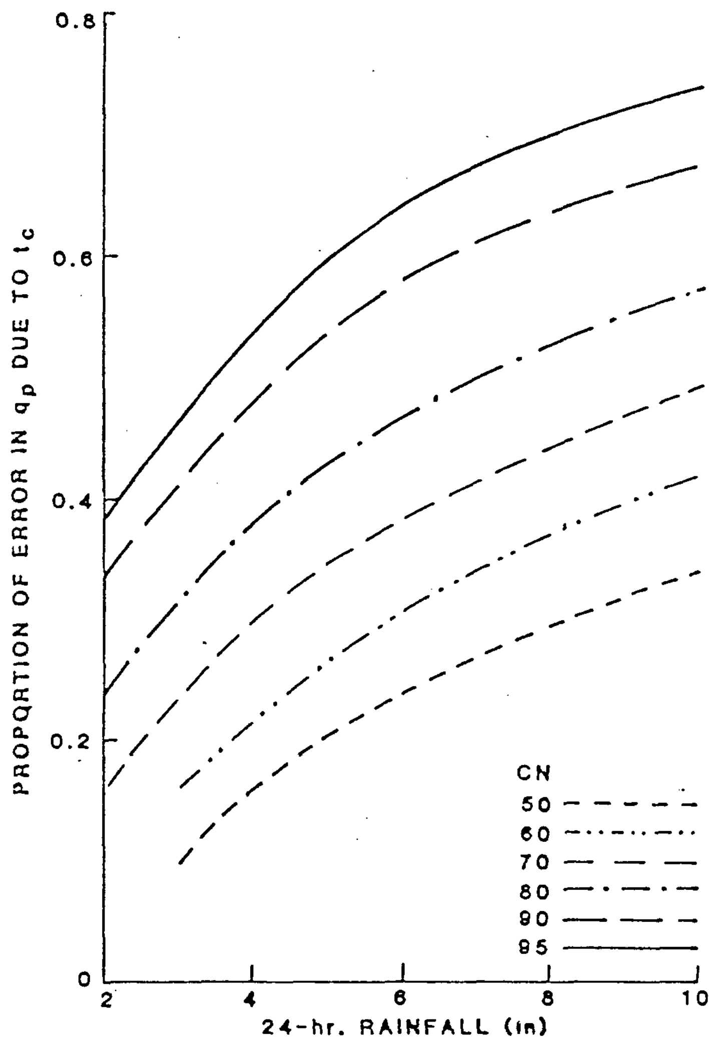

Figure 3.--Proportion of Error Due to t_c, $0.7<t_c<5.0$ Hours (Bondelid et. al., 1982)

which shows the proportional error in q_p due to t_c, can be used to determine the proportional error in q_p due to Q.

F. Summary

1. For design purposes, average condition CN (AMC II) with I = 0.2S should be used and the adjustment of CN based on AMC is not necessary.
2. The EIA method should be used for urbanized basins; it provides better estimates of runoff volume and peak flow than does the TIA method.
3. The ARS method is recommended for watersheds where their CN values vary with depth of water table. Although it is preferrable to determine the depth to water table from the study area, approximate depth during wet periods can be obtained from the SCS soil survey manuals. If depth to water table is not known, then the CN value given in Table 2 can be used.
4. Irrigation practices usually keep the water table high due to low efficiency of irrigation. If water table is maintained within four feet of the ground surface, then the watershed CN should be estimated by the ARS method; otherwise, the watershed CN could be estimated from Table 1.

DISCUSSION OF SCS UNIT HYDROGRAPH METHOD

A unit hydrograph is the hydrograph resulting from one inch of direct runoff generated uniformly over the watershed at a uniform rate during a specified period of time. The assumptions involved in the unit hydrograph concept are:

(1) Rainfall intensity is constant during the storm period.

(2) Rainfall is uniformly distributed throughout the entire watershed.

(3) The time base for the runoff hydrograph of a watershed is constant for storms of the same duration.

(4) The ordinates of unit hydrograph are directly proportional to volume of direct runoff.

The principles of linearity, proportionality, and superposition make the unit hydrograph method a very flexible tool in developing runoff hydrographs for ungaged watersheds. A unit hydrograph of a watershed can be derived by analyzing actual rainfall-runoff data (Linsley, 1975). When these data are not available, a synthetic unit hydrograph technique is normally employed.

A. Development

Victor Mockus developed the SCS synthetic unit hydrograph method for determining runoff hydrograph for ungaged watersheds. Unit hydrographs were derived from observed rainfall-runoff data of natural watersheds with different sizes and geographic locations. The derived unit hydrographs were then made dimensionless and averaged to obtain a standard dimensionless unit hydrograph (DUH) as shown in Figure 4. The area under the rising limb is 37.5% of the total area under the DUH. The time base (t_b) is 5 t_p and the inflection point on the falling limb occurs at 1.7 t_p. The time and discharge ratios for the SCS curvilinear DUH are given in Table 5.

The curvilinear DUH in Figure 4 can be approximated by a triangular DUH having the same percent of runoff volume on the rising side of the triangle. Using the geometry of triangles, the area under the unit hydrograph is estimated by:

$$V = \frac{1}{2} q_p (t_p+t_r)(3600) \quad (8)$$

where V = volume of direct runoff, cubic feet

q_p = peak discharge, cubic feet per second (cfs)

t_p = time to peak, hours

t_r = recession time, hours

Solving Equation (8) for q_p and rearranging yields:

$$q_p = \left[\frac{2}{1+t_r/t_p}\right](V/3600\ t_p) \quad (9)$$

Let K replace the terms in the bracket such that:

$$K = \left[\frac{2}{1+t_r/t_p}\right] \quad (10)$$

then Equation 9 can be written as:

$$q_p = KV/(3600\ t_p) \quad (11)$$

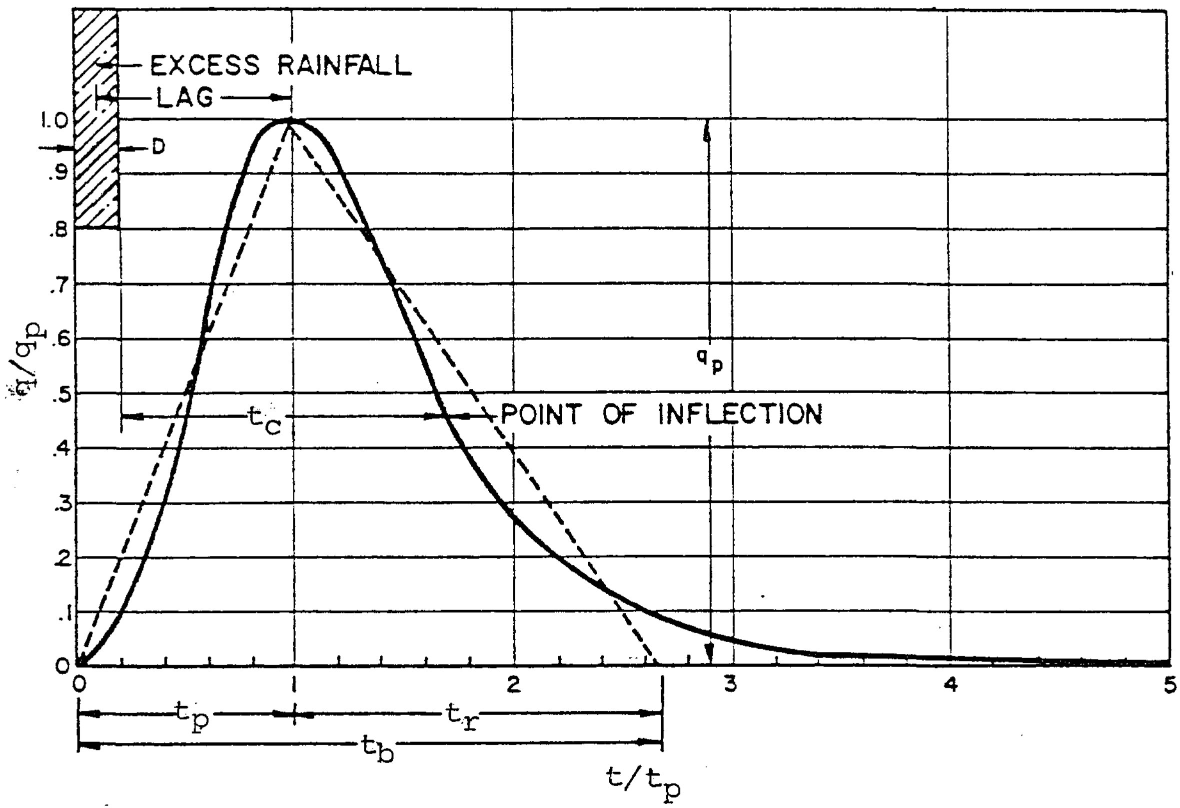

Figure 4.--SCS Dimensionless Curvilinear and Triangular Unit Hydrographs (SCS, 1972)

Table 5.--Ratios for SCS Dimensionless Curvilinear Unit Hydrograph

Time Ratios (t/t_p)	Discharge Ratios (q/q_p)
0	.000
.1	.030
.2	.100
.3	.190
.4	.310
.5	.470
.6	.660
.7	.820
.8	.930
.9	.990
1.0	1.000
1.1	.990
1.2	.930
1.3	.860
1.4	.780
1.5	.680
1.6	.560
1.7	.460
1.8	.390
1.9	.330
2.0	.280
2.2	.207
2.4	.147
2.6	.107
2.8	.077
3.0	.055
3.2	.040
3.4	.029
3.6	.021
3.8	.015
4.0	.011
4.5	.005
5.0	.000

By introducing A and Q into Equation 11, the equation becomes:

$$q_p = \frac{645.33\ KAQ}{t_p} \tag{12}$$

where q_p = peak discharge, cfs

A = drainage area, square miles

Q = direct runoff depth, inches

K = hydrograph shape factor

645.33 = conversion factor

By letting K' = 645.33 K, the SCS unit hydrograph equation simplifies to:

$$q_p = \frac{(K')(A)(Q)}{t_p} \tag{13}$$

where K' is called peak rate factor. It should be noted that the DUH shown in Figure 4 is valid only for the K' value of 484. If the K' value is different from 484, then a new DUH must be developed.

In Equation 13, Q represents direct runoff depth resulting from a given rainfall intensity and duration, while K' accounts for the effect of watershed storages and t_p provides timing of unit hydrograph by incorporating hydraulic or timing parameters such as slope, flow length, and surface roughness.

Figure 4 shows that:

$$t_p = L + \frac{D}{2} \quad (14)$$

where L = watershed time lag, hours

D = duration of unit excess rainfall, hours

The lag (L) of a watershed is defined as the time from the center mass of unit excess rainfall (D) to the time to peak (t_p) of a unit hydrograph. The average relationship of L to t_c is (SCS, 1972):

$$L = 0.6\ t_c \quad (15)$$

Substituting in Equation 14 yields:

$$t_p = 0.6\ t_c + \frac{D}{2} \quad (16)$$

Using the relationships defined for the curvilinear DUH (Figure 4), it can be shown that:

$$D = 0.1333\ t_c \quad (17)$$

Substituting Equation 17 into Equation 16 yields:

$$t_p = 2\ t_c/3 \quad (18)$$

B. Convolution

The method used to compute a design storm hydrograph from rainfall excess and unit hydrograph is called convolution. It is a process of translation, multiplication, and addition. The following example illustrates this process.

Example 1: Develop a runoff hydrograph using the following data:

Drainage area: 1.0 square mile

Time of concentration: 1.50 hours

Curve Number: 85

Storm duration: 1.0 hour

Rainfall interval: 0.25 hours

Rainfall intensity: 0.40, 0.80, 0.50, 0.30

Total rainfall depth: 2.00 inches

Step 1. Develop and plot triangular unit hydrograph.

Using Equation 17, compute D:

$$D = 0.1333\ (1.50) = 0.20 \text{ hours}$$

Using Equation 16, compute t_p:

$$t_p = 0.5(0.20) + 0.6(1.50) = 1.00 \text{ hour}$$

For one inch of direct runoff, the peak discharge is:

$$q_p = \frac{(484)(1)(1)}{(1)} = 484 \text{ cfs}$$

For K' = 484, the time base of the triangular UH is:

$$t_b = 2.67(1) = 2.67 \text{ hours}$$

The resulting triangular UH is shown in Figure 5.

Step 2. Tabulate the ordinates of the triangular UH using time increment D (Table 6, Column 2).

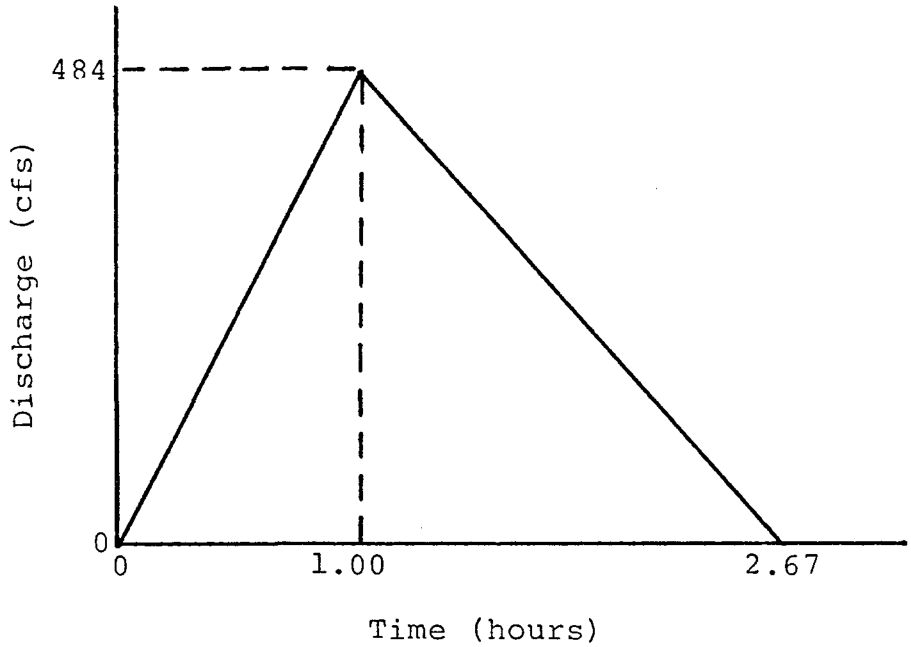

Figure 5.--Triangular Unit Hydrograph for Example 1

Table 6.--Computation of Incremental Runoff for Example 1

TIME (hr)	UH ORDINATES (cfs)	ACCUMULATIVE RAINFALL (in.)	ACCUMULATIVE RUNOFF (in.)	INCREMENTAL RUNOFF (in.)
0	0	0	0	0
0.2	97	0.32	0	0
0.4	194	0.88	0.12	0.12
0.6	290	1.40	0.39	0.27
0.8	387	1.76	0.62	0.23
1.0	484	2.00	0.79	0.17
1.2	426			
1.4	368			
1.6	310			
1.8	252			
2.0	194			
2.2	135			
2.4	77			
2.6	19			
2.8	0			

TOTAL	3233			

$$3233(0.2) = 646.6$$

Step 3. Check the volume under UH by summing the ordinates (Table 6, Column 2) and multiplying by D:

$$3233(0.20) = 646.60 \text{ cfs-hours}$$

Compare this value with the computed volume under UH:

$$645.33(1.0) = 645.33 \text{ cfs-hours}$$

If these values fail to check, re-read the ordinates from Figure 5 until both values agree.

Step 4. Tabulate accumulative rainfall in time increments of D (Table 6, Column 3).

Step 5. Compute the accumulated runoff from Equation (5) (Table 6, Column 4).

Step 6. Tabulate the incremental runoff (Table 6, Column 5).

Step 7. Determine runoff hydrograph by convolution. The ordinates of triangular UH in Table 6, Column 2, is convoluted with rainfall excess in Column 5. The computations of runoff hydrograph is shown in Table 7.

Table 7.--Computation of Runoff Hydrograph for Example 1

TIME (HRS)							DISCHARGE (CFS)
0	0					=	0
0.2	97(0)					=	0
0.4	194(0)	+ 97(0.12)				=	11.6
0.6	290(0)	+ 194(0.12)	+ 97(0.27)			=	49.5
0.8	387(0)	+ 290(0.12)	+ 194(0.27)	+ 97(0.23)		=	109.5
1.0	484(0)	+ 387(0.12)	+ 290(0.27)	+ 194(0.23)	+ 97(0.17)	=	185.9
1.2	426(0)	+ 484(0.12)	+ 387(0.27)	+ 290(0.23)	+ 194(0.17)	=	262.3
1.4	368(0)	+ 426(0.12)	+ 484(0.27)	+ 387(0.23)	+ 290(0.17)	=	320.1
1.6	310(0)	+ 368(0.12)	+ 426(0.27)	+ 484(0.23)	+ 387(0.17)	=	336.3
1.8	252(0)	+ 310(0.12)	+ 368(0.27)	+ 426(0.23)	+ 484(0.17)	=	316.8
2.0	194(0)	+ 252(0.12)	+ 310(0.27)	+ 368(0.23)	+ 426(0.17)	=	271.0
2.2	135(0)	+ 194(0.12)	+ 252(0.27)	+ 310(0.23)	+ 368(0.17)	=	225.2
2.4	77(0)	+ 135(0.12)	+ 194(0.27)	+ 252(0.23)	+ 310(0.17)	=	179.2
2.6	19(0)	+ 77(0.12)	+ 135(0.27)	+ 194(0.23)	+ 252(0.17)	=	133.1
2.8		19(0.12)	+ 77(0.27)	+ 135(0.23)	+ 194(0.17)	=	87.1
3.0			19(0.27)	+ 77(0.23)	+ 135(0.17)	=	45.8
				19(0.23)	+ 77(0.17)	=	17.5
					19(0.17)	=	3.2
					TOTAL	=	2,554.1

Step 8. Check the volume under runoff hydrograph by summing the ordinates (Table 7) and multiplying by D:

$$2554.1(0.20) = 510.8 \text{ cfs-hours}$$

Compare this value with the computed volume:

$$695.33(1.0)(0.79) = 509.8 \text{ cfs-hours}$$

This example illustrates the derivation of runoff hydrograph from rainfall excess and triangular UH by convolution. The same procedure can be used to derive runoff hydrograph from the curvilinear UH. Figure 6 shows that there is little difference in runoff hydrographs using either triangular UH or curvilinear UH, providing that the time increment D is approximately equal to 0.2 t_p. The difference in peak discharges for this example is 5.8%. This difference tends to decrease with increasing storm durations.

C. <u>Limitations</u>

The limitations relating to the unit hydrograph method are given below:

1. The unit hydrograph method cannot accommodate the areal variations in runoff that can affect hydrograph shape. For instance, a rapid rise, sharp peak, and rapid recession would result if urbanization is located near the basin outlet. On the other hand, a slow rise, lower and

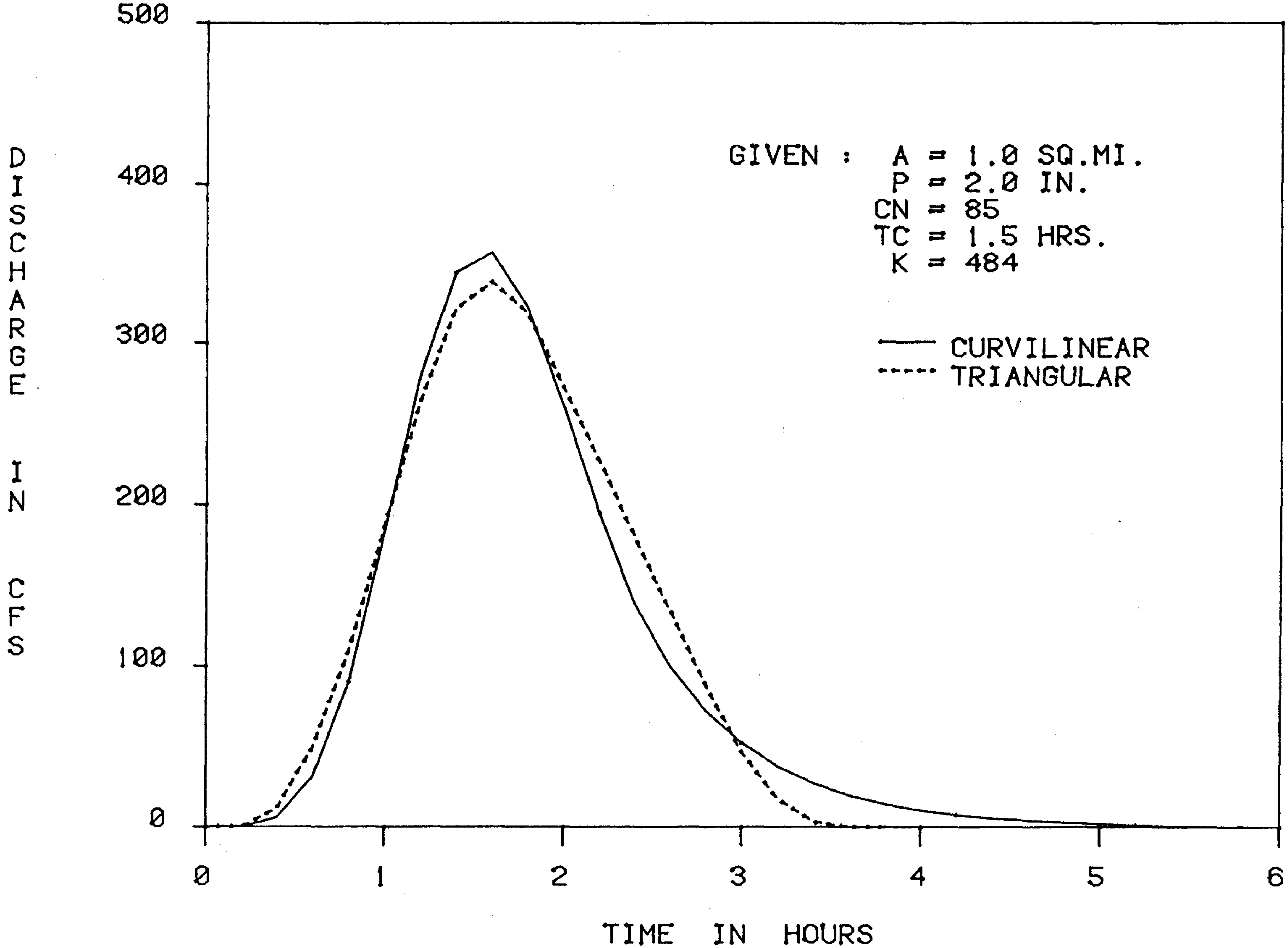

Figure 6.--Runoff Hydrographs of Example 1 Using Curvilinear and Triangular Unit Hydrographs

broader peak, and slow recession would occur if urbanization occurred in the upstream portion of the basin.

2. The unit hydrograph method assumes that ordinates of flow are proportional to volume of direct runoff for all storms of a given duration and that the time bases of all such hydrographs are equal. This assumption is not completely valid because duration of recession is a function of peak flow. The larger the peak flow, the longer the duration of recession. Furthermore, unit hydrographs for storms of the same duration but different magnitudes do not always agree. Peaks of unit hydrographs derived from small storms are normally lower than those derived from larger storms (Linsley, 1975).

D. Summary

1. To obtain a good prediction of runoff hydrograph for a basin, it is important to have accurate estimates of direct runoff (Q), time of concentration (t_c), and peak rate factor (K').
2. The SCS unit hydrograph method should be applied only to the basin small enough so that similar rainfall and runoff characteristics can be attained within the basin. If areal variations in rainfall and runoff are great, it is necessary to divide the basin into smaller subbasins.

TIME OF CONCENTRATION

The time of concentration (t_c) is the time it takes for runoff to travel from the hydraulically most remote part of the watershed to the point of reference downstream. The primary function of t_c is to provide the timing of hydrograph. Besides increasing runoff volume, urbanization generally decreases travel time or t_c, which in turn shortens the time to peak of hydrograph and increases peak discharge.

A. Estimation of t_c

There are numerous methods for estimating t_c. However, the methods recommended by the SCS will be discussed below.

1. SCS Lag Method

The SCS lag method was developed from natural watersheds having areas less than 2,000 acres. The method was intended to be used for different watershed conditions ranging from steep to flat and from heavily forested to smooth surface areas. The equation for watershed lag is:

$$L = \frac{x_w^{0.8} \quad (S+1)^{0.7}}{1900y^{0.5}} \tag{19}$$

where L = watershed time lag, hours

x_w = hydraulic length of watershed, feet

S = watershed storage, inches

y = average watershed land slope, percent

Data collected from small urban watersheds indicated that Equation (19) overestimates lag time for urban areas (SCS, 1975). However, the equation adequately represents lag time for paved areas such as parking lots.

2. SCS Velocity Method

In the SCS velocity method, the flow path is usually divided into segments according to type of flows such as overland, storm sewer or pipe, road gutter, and channel flows. The time of concentration for a given drainage area is estimated by summing the travel time of each flow segment.

a. Overland flow

The travel time for overland flow can be determined from Figure 7. The types of flow included in Figure 7 are: overland, grassed waterways, paved areas, and small upland gullies. If slope and land use of the overland flow segment are known, the average flow velocity can be read from Figure 7. The travel time is computed by dividing the overland flow length by the average velocity.

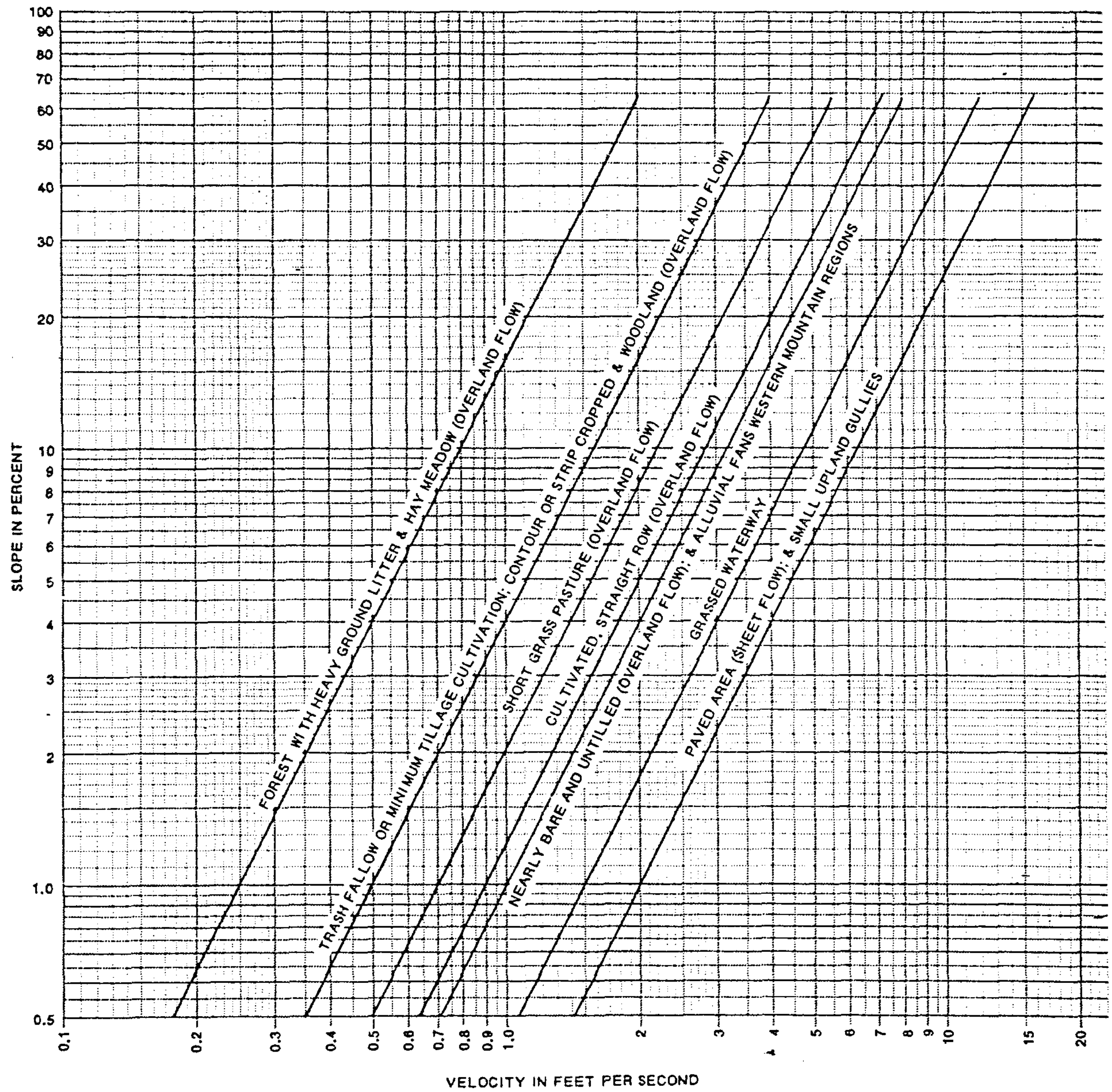

Figure 7.--Average Velocities for Estimating Travel Time for Overland Flow (SCS, 1972).

According to Kibler and Aron (1983), Figure 7 gives very good estimates of overland travel time as long as flow paths exceed 300-400 feet.
However, if flow length is less than 300 feet, the travel time for overland flow can be computed from the simplified Manning-Kinematic wave equation (SCS, 1983):

$$t_o = \frac{0.006(nx_o)^{0.8}}{(P_{24})^{0.5}(S_o)^{0.4}} \tag{20}$$

where t_o = overland flow travel time, hours

n = Manning's roughness coefficient

x_o = overland flow length, feet

P_{24} = 2-year 24-hour rainfall depth, inches

S_o = overland flow slope, feet/foot

Equation (20) is based on the following assumptions: (1) shallow steady uniform flow; (2) constant rainfall excess; (3) 24-hour rainfall duration; (4) SCS Type II rainfall distribution; and (5) impact of infiltration on travel time is minor. Estimates of 'n' values for use in Equation (20) are given in Table 8.

b. Storm sewer or pipe flow

The travel time from storm sewer to open channel is the sum of travel times in each individual component of the system between the uppermost inlet

Table 8.--Manning's 'n' Values for Overland Flow[1] (SCS, 1983)

	Recommended Value	Range of Values
Concrete	.011	.01 - .013
Asphalt	.012	.01 - .015
Bare sand[2]	.010	.010 - .016
Graveled surface[2]	.012	.012 - .03
Bare clay-loam (eroded)[2]	.012	.012 - .033
Fallow (no residue)[3]	.05	.006 - .16
Chisel plow (1/4 ton/acre residue)	.07	.006 - .17
Chisel plow (1/4 - 1 ton/acre residue)	.18	.07 - .34
Chisel plow (1 - 3 tons/acre residue)	.30	.19 - .47
Chisel plow (3 tons/acre residue)	.40	.34 - .46
Disk/Harrow (1/4 ton/acre residue)	.08	.008 - .41
Disk/Harrow (1/4 1 ton/acre residue)	.16	.10 - .25
Disk/Harrow (1 - 3 tons/acre residue)	.25	.14 - .53
Disk/Harrow (3 tons/acre residue)	.30	-- --
No till (1/4 ton/acre residue)	.04	.03 - .07
No till (1/4 1 ton/acre residue)	.07	.01 - .13
No till (1 - 3 tons/acre residue)	.30	.16 - .47
Plow (Fall)	.06	.02 - .10
Coulter	.10	.05 - .13
Range (natural)	.13	.01 - .32
Range (clipped)	.08	.02 - .24
Grass (bluegrass sod)	.45	.39 - .63
Short grass prairie[2]	.15	.10 - .20
Dense grass [4]	.24	.17 - .30
Bermuda grass[4]	.41	.30 - .48
Woods	.45	-- --

1/ Engman (1983).
2/ Woolhiser (1975).
3/ Fallow has been idle for one year and is fairly smooth.
4/ Palmer (1946). Weeping lovegrass, bluegrass, buffalo grass, blue gramma grass, native grass mix (OK), alfalfa, lespedeza.

and the outlet. During major storm events, the sewer system can be assumed flowing full. The average velocity of the sewer system is estimated from the Manning's equation using average conduit size, average slope, and hydraulic radius of full flow condition. Manning's equation is:

$$v = \frac{1.49}{n} r^{2/3} s^{1/2} \quad (21)$$

where v = average flow velocity (ft/sec)

r = hydraulic radius (ft)

s = slope of energy gradient (ft/ft)

n = Manning's roughness coefficient

c. Gutter flow

The average velocity of shallow gutter flow can be estimated from Figure 7 using the paved area curve.

d. Channel flow

The "bank full" velocity is normally used for computing the travel time for channel flow, which is determined by the Manning's equation.

B. Sensitivity of t_c

The primary function of t_c is to provide timing of runoff hydrograph; it is a very important parameter used in determining the peak and shape of runoff hydrograph. Figure 8 illustrates the effect of variation in t_c on peak discharge. The unit of peak discharge in Figure 8 is in cubic feet per

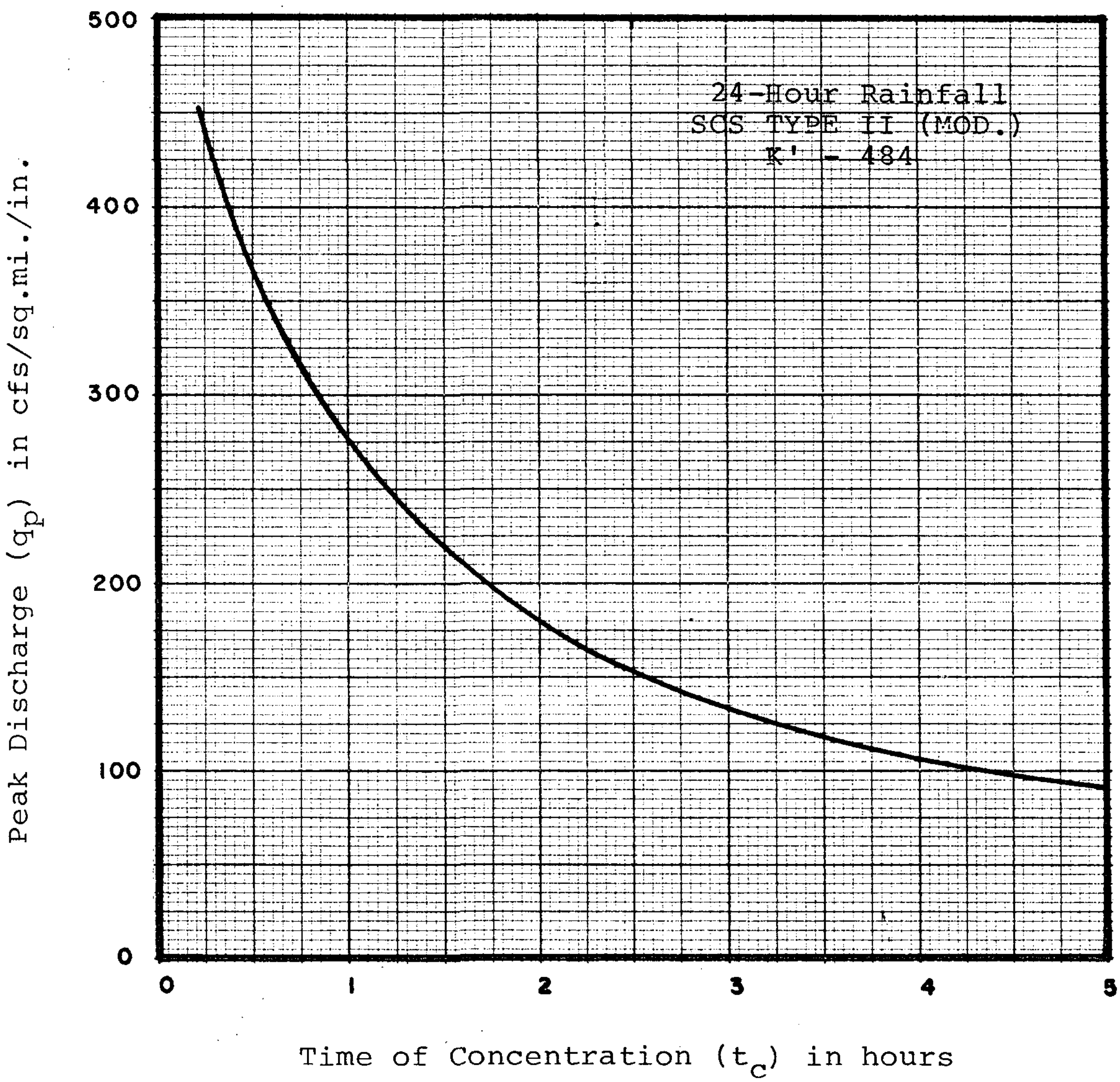

Figure 8.--Sensitivity of q_p to t_c

second per square mile per inch of direct runoff. It can be seen that peak discharge is extremely sensitive to a change in t_c, particularly for small values of t_c. Also, it will be shown later that variation in t_c would change the shape and timing of unit hydrograph, which in turn also affects runoff hydrograph of the basin.

C. Summary

1. The main disadvantage of the t_c approach is that it does not account for the areal distribution of runoff which can affect the shape and timing of hydrograph; i.e.,urbanization occurring upstream or downstream of the basin will result in the same runoff hydrograph as long as the t_c of the basin is equal. As a result, the t_c method should be applied to basins small enough to ensure that areal variation in runoff is not too great.
2. Generally, the SCS lag method is not as accurate as the SCS velocity method because the lag method does not reflect changes in hydraulic properties which can be incorporated in the velocity method. For example, channel modification causes a change in t_c by increasing flow velocity of the channel. Furthermore, t_c obtained from the lag method will be equal for watersheds having the same CN, hydraulic length, and slope.

3. Time of concentration varies with storm events; therefore, it should be estimated for each storm event. For practical purposes, t_c can be calculated using the "bank full" velocities.

4. Since t_c is very important parameter for determining runoff hydrographs for small upland watersheds, great care should be exercised in estimating t_c.

PEAK RATE FACTOR

Peak rate factor (K') is a parameter used to reflect the effect of watershed storage on runoff hydrograph shape. According to the SCS, K' value has been known to vary from 300 in flat swampy country to 600 in steep terrain. Woodward et.al. (1980) suggested a value of 284 for the Delmarva peninsula (Delaware, Maryland, and Virginia) which is characterized by flat topography and considerable natural surface storage due to swales and swamps. This suggests that K' values vary with the watershed storage characteristics and that a constant value cannot be used to represent the storage characteristics of all watersheds. Therefore, it is necessary to develop a method for estimating K' value of a DUH for an ungaged watershed.

A. Development

Before a triangular unit hydrograph can be constructed for a given peak rate factor, the following parameters q_p, t_p, and t_b must be known. Both q_p and t_p are computed from Equations 13 and 16. The equation for solving t_b is derived below.

Using the relation $t_b = t_p + t_r$ and substituting this relation into Equation 10 yields:

$$K = 2t_p/t_b \qquad (22)$$

or

$$t_b = 2t_p/K \qquad (23)$$

Substituting $K = K'/645.333$ into Equation 23 results:

$$t_b = 1290.66\ t_p/K' \qquad (24)$$

Equations 13, 16, and 24 are the basic equations used for constructing a triangular unit hydrograph for a given peak rate factor. By substituting Equation 18 into Equations 13 and 24, the equations for q_p and t_b become:

$$q_p = 1.5K'AQ/t_c \qquad (25)$$

$$t_b = 860.42\ t_c/K' \qquad (26)$$

From Equations 18, 25, and 26, it can be concluded that: (1) t_c is the most important parameter in determining runoff hydrographs--any variation in t_c would cause changes in q_p, t_p, and t_b; and (2) K' is the second most important parameter--any change in K' would result in changes in q_p and t_b.

B. Estimation of K'

McCuen and Bondelid (1983) proposed a method for deriving a DUH from the time-area curve. The method assumes that the proportions under the rising limbs of the time-area curve and DUH are equal. This implies that the K' value of the DUH is the same as that of the time-area curve. The steps involved in deriving a triangular DUH for a given watershed are summarized below.

Step 1. Use the "bank full" velocities to calculate the channel travel times to the watershed outlet.

Step 2. Divide the total channel travel time into a number of equal time intervals, and then divide the watershed into areas of equal travel time.

Step 3. Develop a dimensionless time-area curve.

Step 4. Calculate the proportion (p) of area under the rising limb of the time-area curve. The calculated p is then used to compute K' from the relationship K'=1290.66p. With K' and t_c values known, the terms t_p, q_p, and t_b are determined from Equations 18, 25, and 26, respectively. Consequently, the triangular DUH can be drawn.

Similarly, the same procedure described earlier can be used to derive a curvilinear DUH from the gamma distribution function.

Another approach of estimating K' for a watershed is to multiply the standard SCS K' (484) by an adjustment factor obtained from Tables 9-11. These tables are published in SCS, TR-55 (1975). The values of adjustment factors are given in terms of percent of watershed storage area (e.g. ponds, swamps, ditches, and swales), storm frequency, and areal distribution of watershed storage. It should be noted that this table is not applicable for detention basins. This approach is based on the following reasons:

(1) Watershed storages affect the shape of runoff hydrograph by attenuating its peak and enlarging its time base.

(2) Rainfall characteristics have an effect upon the storage capacity of watershed. Therefore, K', which is used to represent watershed storage effect also varies with storm frequency.

(3) According to Woodward, et.al. (1980), the standard SCS DUH was developed from small watersheds primarily in the Midwest. These watersheds are generally characterized by local relief of 50 to 100 feet with little or no natural storage.

Table 9.--Adjustment factors where ponding and swampy areas occur at the design point (SCS, 1975).

Percentage of ponding and swampy area	Storm frequency (years)					
	2	5	10	25	50	100
0.2	0.92	0.94	0.95	0.96	0.97	0.98
.5	.86	.87	.88	.90	.92	.93
1.0	.80	.81	.83	.85	.87	.89
2.0	.74	.75	.76	.79	.82	.86
2.5	.69	.70	.72	.75	.78	.82
3.3	.64	.65	.67	.71	.75	.78
5.0	.59	.61	.63	.67	.71	.75
6.7	.57	.58	.60	.64	.67	.71
10.0	.53	.54	.56	.60	.63	.68
20.0	.48	.49	.51	.55	.59	.64

Table 10.--Adjustment factors where ponding and swampy areas are spread throughout the watershed or occur in central parts of the watershed (SCS, 1975).

Percentage of ponding and swampy area	Storm frequency (years)					
	2	5	10	25	50	100
0.2	0.94	0.95	0.96	0.97	0.98	0.99
.5	.88	.89	.90	.91	.92	.94
1.0	.83	.84	.86	.87	.88	.90
2.0	.78	.79	.81	.83	.85	.87
2.5	.73	.74	.76	.78	.81	.84
3.3	.69	.70	.71	.74	.77	.81
5.0	.65	.66	.68	.72	.75	.78
6.7	.62	.63	.65	.69	.72	.75
10.0	.58	.59	.61	.65	.68	.71
20.0	.53	.54	.56	.60	.63	.68
25.0	.50	.51	.53	.57	.61	.66

Table 11.--Adjustment factors where ponding and swampy areas are located only in upper reaches of the watershed (SCS, 1975).

Percentage of ponding and swampy area	Storm frequency (years)					
	2	5	10	25	50	100
0.2	0.96	0.97	0.98	0.98	0.99	0.99
.5	.93	.94	.94	.95	.96	.97
1.0	.90	.91	.92	.93	.94	.95
2.0	.87	.88	.88	.90	.91	.93
2.5	.85	.85	.86	.88	.89	.91
3.3	.82	.83	.84	.86	.88	.89
5.0	.80	.81	.82	.84	.86	.88
6.7	.78	.79	.80	.82	.84	.86
10.0	.77	.77	.78	.80	.82	.84
20.0	.74	.75	.76	.78	.80	.82

C. Sensitivity of K'

Figure 9 shows the effect of K' values on the shape of unit hydrographs and that peak discharge is very sensitive to variation in K' values. With parameters A, Q, and t_c held constant, q_p increases and t_b decreases as K' increases, or vice versa. It should be noted that the t_p of unit hydrograph is not a function of K' and therefore is not affected by changing in K' values. Similarly, the effect of K' values on runoff hydrograph is shown in Figure 10.

D. Summary

1. Peak rate factor (K') is a critical parameter for determining the shape of hydrograph. It is used to represent the effect of watershed storage on hydrograph shape. High values of K' are assigned to watersheds with little or no storage effects, and low values of K' are for watersheds with significant ponding effects.
2. The peak rate factor of a watershed can be determined from the proportion of area under the rising limb of the time-area curve or by using the adjustment factor obtained from Tables 9-11.
3. The adjustment of K' value should be made based on natural surface storage rather than watershed slope, because the effect of watershed slope on hydrograph shape is normally taken into account when t_c is being calculated.

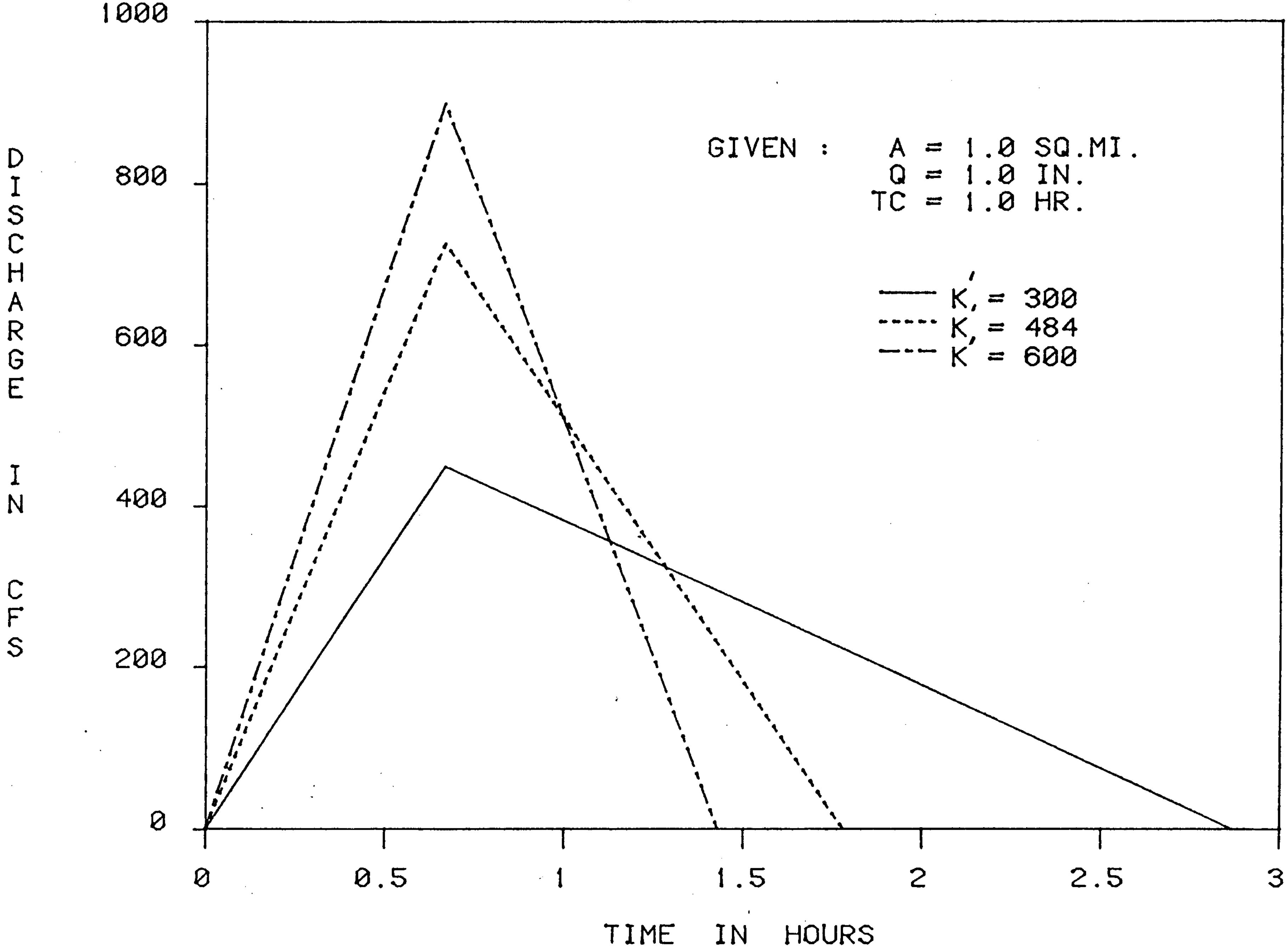

Figure 9.--Sensitivity of Triangular Unit Hydrograph to K'

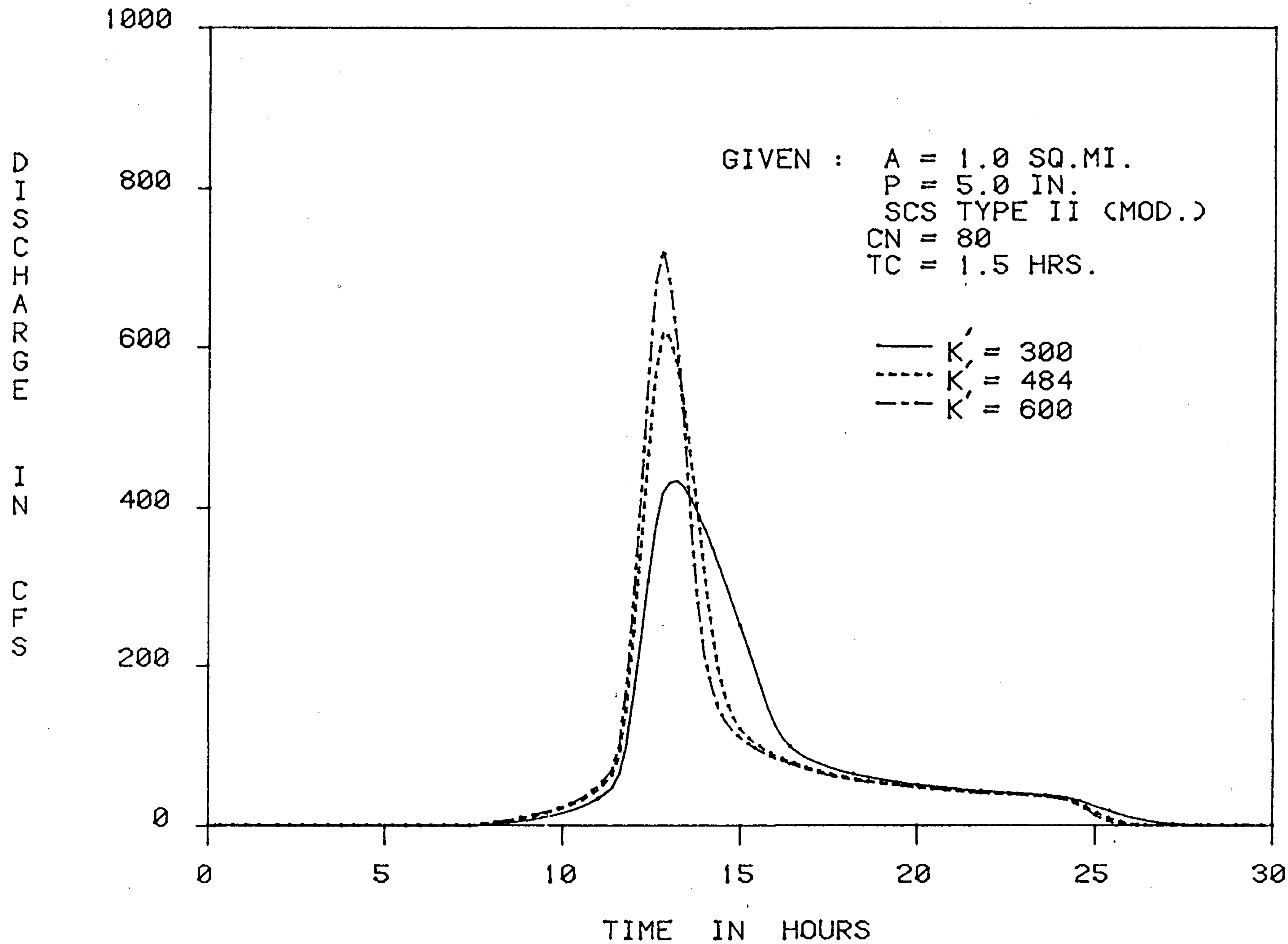

Figure 10.--Sensitivity of Runoff Hydrograph to K'

4. Higher K' value should be used for future condition if significant natural depression and ponding areas are modified by urbanization.

SUMMARY

This report has included background information for the SCS runoff procedures and provided methods for estimating runoff curve number (CN), the time of concentration (t_c), and a peak rate factor (K') for different hydrologic conditions. This report will help to utilize the SCS runoff procedures properly and effectively. The main points of the SCS runoff procedures can be summarized below:

1. The accuracy of runoff volume prediction solely relies on the accuracy of CN which is the only parameter required in the SCS curve number method. In estimating CN, the effective impervious area (EIA) method should be used for urban basins and the ARS method is recommended for basins whose CN values are affected by water table.
2. For practical purposes, CN should be estimated based on the average hydrologic condition (AMC II, I=0.2S). The adjustment of CN is necessary only when an actual storm is to be evaluated.
3. The function of t_c is to provide the timing of runoff hydrograph; it has the most influence on hydrograph shape. An error in t_c estimate will cause errors in peak discharge (q_p), time to peak (t_p), and time base (t_b) of hydrograph. The SCS velocity method is recommended for estimating t_c.

4. Peak rate factor (K') is used to account for the effect of basin storage capacity on hydrograph shape. The K' value of a basin can be determined from the proportion of area under the rising limb of the time-area curve or by using the adjustment factor obtained from Tables 9-11.

5. In order to obtain a good prediction of runoff hydrograph, it is important to have accurate estimates of CN, t_c, and K'.

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APPENDIX A

RAINFALL DISTRIBUTIONS

The intensity of rainfall for a given storm duration is an important factor for determining hydrologic response. Storms having the same magnitude and duration but different intensities will result in different hydrologic responses. The rainfall intensity varies considerably within the storm period and from one region to another region. For uniformity, the SCS developed two synthetic 24-hour rainfall distributions from the Weather Bureau rainfall-frequency data (1, 2, 3). The Type I distribution is representative of the maritime climate, including Hawaii, Alaska, and the coastal side of the Sierra Nevada and Cascade Mountains in California, Oregon, and Washington. The Type II distribution represents the remainder of the United States where high runoff rates are generated from summer thunderstorms.

The procedure used in developing the SCS rainfall distributions are described in the SCS TP-149 (4). In addition to the Type I and II distributions, the SCS modified the Type II distribution for Florida climate. This distribution was developed in the same manner as the SCS Type II distribution, but the data from HYDRO-35 were used instead of TP-40. The SCS rainfall distributions in 30-minute intervals are listed in Table A-1. The 96-hour rainfall distribution is sometimes required, depending on the type of problems. The procedure for determining the rainfall distribution is explained in the District Applicant's Handbook for Management and Storage of Surface Waters (5).

Table A-1.--Ordinates of the SCS 24-Hour Rainfall Distributions

Time (Hrs.)	Rainfall Ratio (Accumulated Total/24-Hour Total) Type I	Type II	Type II (Mod.)
0.0	0.000	0.000	0.000
0.5	0.008	0.005	0.006
1.0	0.017	0.011	0.012
1.5	0.026	0.017	0.018
2.0	0.035	0.022	0.025
2.5	0.045	0.029	0.032
3.0	0.055	0.035	0.039
3.5	0.065	0.042	0.046
4.0	0.076	0.048	0.054
4.5	0.087	0.056	0.062
5.0	0.099	0.064	0.071
5.5	0.122	0.072	0.080
6.0	0.125	0.080	0.089
6.5	0.140	0.090	0.099
7.0	0.156	0.100	0.110
7.5	0.174	0.110	0.122
8.0	0.194	0.120	0.135
8.5	0.219	0.134	0.149
9.0	0.254	0.147	0.164
9.5	0.303	0.163	0.181
10.0	0.515	0.181	0.201
10.5	0.583	0.204	0.226
11.0	0.624	0.235	0.258
11.5	0.654	0.283	0.307
12.0	0.682	0.663	0.606
12.5	0.705	0.735	0.718
13.0	0.727	0.772	0.757
13.5	0.748	0.799	0.785
14.0	0.767	0.820	0.807
14.5	0.784	0.835	0.826
15.0	0.800	0.850	0.842
15.5	0.816	0.865	0.857
16.0	0.830	0.880	0.870
16.5	0.844	0.889	0.882
17.0	0.857	0.898	0.893
17.5	0.870	0.907	0.903
18.0	0.882	0.916	0.913
18.5	0.893	0.925	0.922
19.0	0.905	0.934	0.931
19.5	0.916	0.943	0.939
20.0	0.926	0.952	0.947
20.5	0.936	0.958	0.955
21.0	0.946	0.964	0.962
21.5	0.955	0.970	0.969
22.0	0.965	0.976	0.976
22.5	0.974	0.982	0.983
23.0	0.983	0.988	0.989
23.5	0.992	0.994	0.995
24.0	1.000	1.000	1.000

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APPENDIX B
HYDROLOGIC SOIL GROUPS

This appendix provides a list of soil names and their hydrologic soil group classification (Table B-1). These soils are divided into four groups, A, B, C, or D based on the minimum rate of infiltration obtained for a bare soil after prolonged wetting. The hydrologic soil groups, as defined by the SCS soil scientists, are:

A. (Low runoff potential). Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission (greater than 0.30 in./hr.).

B. Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in./hr.).

C. Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission (0.05 - 0.15 in./hr.).

D. (High runoff potential). Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or

Table B-1--Soil names and hydrologic classifications (1)

AABERG	C	AHL	C	ALMY	B	ANLAUF	C	AROOSTOOK	
AASTAD	B	AHLSTROM	C	ALOHA	C	ANNABELLA	B	ARDSA	C
ABAC	D	AHMEEK	B	ALONSO	B	ANNANDALE	C	ARP	C
ABAJO	C	AHOLT	D	ALOVAR	C	ANNISTON	B	ARRINGTON	B
ABBOTT	D	AHTANUM	C	ALPENA	B	ANOKA	A	ARRITOLA	D
ABBOTTSTOWN	C	AHWAHNEE	C	ALPHA	C	ANONES	C	ARROLIME	C
ABCAL	D	AIBONITO	C	ALPON	B	ANSARI	D	ARRON	D
ABEGG	B	AIKEN	B/C	ALPOWA	B	ANSEL	B	ARROW	B
ABELA	B	AIKMAN	D	ALPS	C	ANSELMO	A	ARROWSMITH	B
ABELL	B	AILEY	B	ALSEA	B	ANSON	B	ARROYO SECO	B
ABERDEEN	D	AINAKEA	B	ALSPAUGH	C	ANTELOPE SPRINGS	C	ARTA	C
ABES	D	AIRMONT	C	ALSTAD	B	ANTERO	C	ARTOIS	C
ABILENE	C	AIROTSA	B	ALSTOWN	B	ANT FLAT	C	ARVADA	D
ABINGTON	B	AIRPORT	D	ALTAMONT	D	ANTHO	B	ARVANA	C
ABIQUA	C	AITS	B	ALTAVISTA	C	ANTHONY	B	ARVESON	D
ABO	B/C	AJO	C	ALTDORF	D	ANTIGO	B	ARVILLA	B
ABOR	D	AKAKA	A	ALTMAR	B	ANTILON	B	ARZELL	C
ABRA	C	AKASKA	B	ALTO	C	ANTIOCH	D	ASA	B
ABRAHAM	B	AKELA	C	ALTOGA	C	ANTLER	C	ASBURY	B
ABSAROKEE	C	ALADDIN	B	ALTON	B	ANTOINE	C	ASCALON	B
ABSCOTA	B	ALAE	A	ALTUS	B	ANTROBUS	B	ASCHOFF	B
ABSHER	D	ALAELOA	B	ALTVAN	B	ANTY	B	ASHBY	C
ABSTED	D	ALAGA	A	ALUM	B	ANVIK	B	ASHCROFT	B
ACACIO	C	ALAKAI	D	ALUSA	D	ANWAY	B	ASHDALE	B
ACADEMY	C	ALAMA	B	~~ALVIN~~	B	ANZA	B	ASHE	B
ACADIA	D	ALAMANCE	B	ALVIRA	C	ANZIANO	C	ASHKUM	C
ACANA	D	ALAMO	D	ALVISO	D	APACHE	D	ASHLAR	B
ACASCO	D	ALAMOSA	C	ALVOR	C	APAKUIE	A	ASHLEY	A
ACEITUNAS	B	ALAPAHA	D	AMADOR	D	APISHAPA	C	ASH SPRINGS	C
ACEL	D	ALAPAI	A	AMAGON	D	APISON	B	ASHTON	B
ACKER	B	ALBAN	B	AMALU	D	APOPKA	A	ASHUE	B
ACKMEN	B	ALBANO	D	AMANA	B	APPIAN	C	ASHUELOT	C
ACME	C	ALBANY	C	AMARGOSA	D	APPLEGATE	C	ASHWOOD	C
ACO	B	ALBATON	D	AMARILLO	B	APPLETON	C	ASKEW	C
ACOLITA	B	ALBEE	C	AMASA	B	APPLING	B	ASO	C
ACOMA	C	ALBEMARLE	B	AMBERSON		APRON	B	ASOTIN	C
ACOVE	C	ALBERTVILLE	C	AMBOY	C	APT	C	ASPEN	B
ACREE	C	ALBIA	C	AMBRAW	C	APTAKISIC	B	ASPERMONT	B
ACRELANE	C	ALBION	B	AMEDEE	A	ARABY		ASSINNIBOINE	B
ACTON	B	ALBRIGHTS	C	AMELIA	B	ARADA	C	ASSUMPTION	B
ACUFF	B	ALCALDE	C	AMENIA	B	ARANSAS	D	ASTATULA	A
ACWORTH	B	ALCESTER	B	AMERICUS	A	ARAPIEN	C	ASTOR	A/D
ACY	C	ALCOA	B	AMES	C	ARAVE	D	ASTORIA	B
ADA	B	ALCONA	B	AMESHA	B	ARAVETON	B	ATASCADERO	C
ADAIR	D	ALCOVA	B	AMHERST	C	ARBELA	C	ATASCOSA	D
ADAMS	A	ALDA	C	AMITY	C	ARBONE	B	ATCO	B
ADAMSON	B	ALDAX	D	AMMON	B	ARBOR	B	ATENCIO	B
ADAMSTOWN		ALDEN	D	AMOLE	C	ARBUCKLE	B	ATEPIC	D
ADAMSVILLE	C	ALDER	B	AMOR	B	ARCATA	B	ATHELWOLD	B
ADATON	D	ALDERDALE	C	AMOS	C	ARCH	B	ATHENA	B
ADAVEN	D	ALDERWOOD	C	AMSDEN	B	ARCHABAL	B	ATHENS	B
ADDIELOU	C	ALDINO	C	AMSTERDAM	B	ARCHER	C	ATHERLY	B
ADDISON	D	ALDWELL	C	AMTOFT	D	ARCHIN	C	ATHERTON	B/D
ADDY	C	ALEKNAGIK	B	AMY	D	ARCO	B	ATHMAR	C
ADE	A	ALEMEDA	C	ANACAPA	B	ARCOLA	C	ATHOL	B
ADEL	A	ALEX	B	ANAHUAC	D	ARD	C	ATKINSON	B
ADELAIDE	D	ALEXANDRIA	C	ANAMITE	D	ARDEN	B	ATLAS	D
ADELANTO	B	ALEXIS	B	ANAPRA	B	ARDENVOIR	B	ATLEE	C
ADELINO	B	ALFORD	B	ANASAZI	B	ARDILLA	C	ATMORE	B/D
ADELPHIA	C	ALGANSEE	B	ANATONE	D	AREDALE	B	ATOKA	C
ADENA	C	ALGERITA	B	ANAVERDE	B	ARENA	C	ATON	B
ADGER	D	ALGIERS	C/D	ANAWALT	D	ARENALES	A	ATRYPA	C
ADILIS	A	ALGOMA	B/D	ANCHO	B	ARENDTSVILLE	B	ATSION	C
ADIRONDACK		ALHAMBRA	B	ANCHORAGE	A	ARENOSA	A	ATTERBERRY	B
ADIV	B	ALICE	A	ANCHOR BAY	D	ARENZVILLE	B	ATTEWAN	A
ADJUNTAS	C	ALICEL	B	ANCHOR POINT	D	ARGONAUT	D	ATTICA	B
ADKINS	B	ALICIA	B	ANCLOTE	D	ARGUELLO	B	ATTLEBORO	
ADLER	C	ALIDA	B	ANCO	C	ARGYLE	B	ATWATER	B
ADOLPH	D	ALIKCHI	B	ANDERLY	C	ARIEL	C	ATWELL	C/D
ADRIAN	A/D	ALINE	A	ANDERS	C	ARIZO	A	ATWOOD	B
AENEAS	B	ALKO	D	ANDERSON	B	ARKABUTLA	C	AUBBEENAUBBEE	B
AETNA	B	ALLAGASH	B	ANDES	C	ARKPORT	B	AUBERRY	B
AFTON	D	ALLARD	B	ANDORINIA	C	ARLAND	B	AUBURN	C/D
AGAR	B	ALLEGHENY	B	ANDOVER	D	ARLE	B	AUBURNDALE	D
AGASSIZ	D	ALLEMANDS	D	ANDREEN	B	ARLING	D	AUDIAN	B
AGATE	D	ALLEN	B	ANDREESON	C	ARLINGTON	C	AU GRES	C
AGAWAM	B	ALLENDALE	C	ANDRES	B	ARLOVAL	C	AUGSBURG	B
AGENCY	C	ALLENS PARK	B	ANDREWS	C	ARMAGH	D	AUGUSTA	C
AGER	D	ALLENSVILLE	C	ANED	D	ARMIJO	D	AULD	D
AGNER	B	ALLENTINE	D	ANETH	A	ARMINGTON	D	AURA	B
AGNEW	B/C	ALLENWOOD	B	ANGELICA	D	ARMO	B	AURORA	C
AGNOS	B	ALLESSIO	B	ANGELINA	B/D	ARMOUR	B	AUSTIN	C
AGUA	B	ALLEY	C	ANGELO	C	ARMSTER	C	AUSTWELL	D
AGUADILLA	A	ALLIANCE	B	ANGIE	C	ARMSTRONG	D	AUXVASSE	D
AGUA DULCE	C	ALLIGATOR	D	ANGLE	A	ARMUCHEE	D	AUZQUI	B
AGUA FRIA	B	ALLIS	D	ANGLEN	B	ARNEGARD	B	AVA	C
AGUALT	B	ALLISON	C	ANGOLA	C	ARNHART	C	AVALANCHE	B
AGUEDA	B	ALLOUEZ	C	ANGOSTURA	B	ARNHEIM	C	AVALON	B
AGUILITA	B	ALLOWAY		ANHALT	D	ARNO	D	AVERY	B
AGUIRRE	D	ALMAC	B	ANIAK	D	ARNOLD	B	AVON	C
AGUSTIN	B	ALMENA	C	ANITA	D	ARNOT	C/D	AVONBURG	D
AHATONE	D	ALMONT	D	ANKENY	A	ARNY	A	AVONDALE	E

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table B-1--Continued

AWBREY	D	BARKER	C	BECKET	C	BERRENDOS	D	BLACKROCK	B
AXTELL	D	BARKERVILLE	C	BECKLEY	B	BERRYLAND	D	BLACKSTON	B
AYAR	D	BARKLEY	B	BECKTON	D	BERTELSON	B	BLACKTAIL	B
AYCOCK	B	BARLANE	D	BECKWITH	C	BERTHOUD	B	BLACKWATER	D
AYON	B	BARLING	C	BECKWOURTH	B	BERTIE	C	BLACKWELL	B/D
AYR	B	BARLOW	B	BECREEK	B	BERTOLOTTI	B	BLADEN	D
AYRES	D	BARNARD	D	BEDFORD	C	BERTRAND	B	BLAGO	D
AYRSHIRE	C	BARNES	B	BEDINGTON	B	BERVILLE	D	BLAINE	B
AYSEES	B	BARNESTON	B	BEDNER	C	BERYL	B	BLAIR	C
AZAAR	C	BARNEY	A	BEEBE	A	BESSEMER	B	BLAIRTON	C
AZARMAN	C	BARNHARDT	B	BEECHER	C	BETHANY	C	BLAKE	C
AZELTINE	B	BARNSTEAD		BEECHY		BETHEL	D	BLAKELAND	A
AZFIELD	B	BARNUM	B	BEEHIVE	B	BETTERAVIA	C	BLAKENEY	C
AZTALAN	B	BARRADA	D	BEEK	C	BETTS	B	BLAKEPORT	B
AZTEC	B	BARRETT	D	BEENOM	D	BEULAH	B	BLALOCK	D
AZULE	C	BARRINGTON	B	BEEZAR	B	BEVENT	B	BLAMER	C
AZWELL	B	BARRON	B	BEGAY	B	BEVERLY	B	BLANCA	B
		BARRONETT	C	BEGOSHIAN	C	BEW	D	BLANCHARD	A
BABB	A	BARROWS	D	BEHANIN	B	BEWLEYVILLE	B	BLANCHESTER	B/D
BABBINGTON	B	BARRY	D	BEHEMOTOSH	B	BEWLIN	D	BLAND	C
BABCOCK	C	BARSTOW	B	BEHRING	D	BEXAR	C	BLANDFORD	C
BABYLON	A	BARTH	C	BEIRMAN	D	BEZZANT	B	BLANDING	B
BACA	C	BARTINE	C	BEJUCOS	B	BIBB	B/D	BLANEY	B
BACH	D	BARTLE	D	BELCHER	D	BIBON	A	BLANKET	C
BACHUS	C	BARTLEY	C	BELDEN	D	BICKELTON	B	BLANTON	A
BACKBONE	A	BARTON	B	BELDING	B	BICKLETON	C	BLANYON	C
BACULAN	A	BARTONFLAT	B	BELEN	C	BICKMORE	C	BLASDELL	A
BADENAUGH	B	BARVON	C	BELFAST	B	BICONDOA	C	BLASINGAME	C
BADGER	C	BASCOM	B	BELFIELD	B	BIDDEFORD	D	BLAZON	D
BADGERTON	B	BASEHOR	D	BELFORE	B	BIDDLEMAN	C	BLENCOE	C
BADO	D	BASHAW	D	BELGRADE	B	BIDMAN	C	BLEND	D
BADUS	C	BASHER	B	BELINDA	D	BIDWELL	B	BLENDON	B
BAGARD	C	BASILE	D	BELKNAP	C	BIEBER	D	BLETHEN	B
BAGDAD	B	BASIN	C	BELLAMY	C	BIENVILLE	A	BLEVINS	B
BAGGOTT	D	BASINGER	C	BELLAVISTA	D	BIG BLUE	D	BLEVINTON	B/D
BAGLEY	B	BASKET	C	BELLE	B	BIGEL	A	BLICHTON	D
BAHEM	B	BASS	A	BELLEFONTAINE		BIGELOW	C	BLISS	D
BAILE	D	BASSEL	B	BELLICUM	B	BIGETTY	C	BLOCKTON	C
BAINVILLE	C	BASSETT	B	BELLINGHAM	C	BIGGS	A	BLODGETT	A
BAIRD HOLLOW	C	BASSFIELD	B	BELLPINE	C	BIGGSVILLE	B	BLOMFORD	B
BAJURA	D	BASSLER	D	BELMONT	B	BIG HORN	C	BLOOM	C
BAKEOVEN	D	BASTIAN	D	BELMORE	B	BIGNELL	B	BLOOMFIELD	A
BAKER	C	BASTROP	B	BELT	D	BIG TIMBER	D	BLOOMING	B
BAKER PASS	B	BATA	A	BELTED	D	BIGWIN	D	BLOOR	D
BALAAM	A	BATAVIA	B	BELTON	C	BIJOU	A	BLOSSOM	C
BALCH	D	BATES	B	BELTRAMI	B	BILLETT	A	BLOUNT	C
BALCOM	B	BATH	C	BELTSVILLE	C	BILLINGS	C	BLOUNTVILLE	C
BALD	C	BATTERSON	D	BELUGA	D	BINDLE	B	BLUCHER	C
BALDER	C	BATTLE CREEK	C	BELVOIR	C	BINFORD	B	BLUEBELL	C
BALDOCK	B/C	BATZA	D	BENCLARE	C	BINGHAM	B	BLUE EARTH	D
BALDWIN	D	BAUDETTE	B	BENEVOLA	C	BINNSVILLE	D	BLUEJOINT	B
BALDY	B	BAUER	C	BENEWAH	C	BINS	B	BLUE LAKE	A
BALE	C	BAUGH	B/C	BENFIRLD	C	BINTON	C	BLUEPOINT	B
BALLARD	B	BAXTER	B	BENGE	B	BIPPUS	B	BLUE STAR	B
BALLER	D	BAXTERVILLE	B	BEN HUR	B	BIRCH	A	BLUEWING	B
BALLINGER	C	BAYAMON	B	BENIN	D	BIRCHWOOD	C	BLUFFDALE	C
BALM	B/C	BAYARD	A	BENITO	D	BIRDOW	B	BLUFFTON	D
BALMAN	B/C	BAYBORO	D	BENJAMIN	D	BIRDS	C	BLUFORD	D
BALON	B	BAYERTON	C	BEN LOMOND	B	BIRDSALL	D	BLY	B
BALTIC	D	BAYLOR	D	BENMAN	A	BIRDSBORO	B	BLYTHE	D
BALTIMORE	B	BAYSHORE	B/C	BENNDALE	B	BIRDSLEY	D	BOARDTREE	C
BALTO	D	BAYSIDE	C	BENNETT	C	BIRKBECK	B	BOBS	D
BAMBER	B	BAYUCOS	D	BENNINGTON	D	BISBEE	A	BOBTAIL	B
BAMFORTH	B	BAYWOOD	A	BENOIT	D	BISCAY	C	BOCK	B
BANCAS	B	BAZETTE	C	BENSON	C/D	BISHOP	B/C	BODELL	D
BANCROFT	B	BAZILE	B	BENTEEN	B	BISPING	B	BODENBURG	B
BANDERA	B	BEAD	C	BENTONVILLE	C	BISSELL	B	BODINE	B
BANGO	C	BEADLE	C	BENZ	D	BISTI	C	BOEL	A
BANGOR	B	BEALES	A	BEOTIA	B	BIT	D	BOELUS	A
BANGSTON	A	BEAR BASIN	B	BEOWAWE	D	BITTERON	A	BOESEL	B
BANKARD	A	BEAR CREEK	C	BERCAIL	C	BITTERROOT	C	BOETTCHER	C
BANKS	A	BEARDALL	C	BERDA	B	BITTER SPRING	C	BOGAN	C
BANNER	C	BEARDEN	C	BEREA	C	BITTON	B	BOGART	B
BANNERVILLE	C/D	BEARDSTOWN	C	BERENICETON	B	BIXBY	B	BOGUE	D
BANNOCK	B	BEAR LAKE	D	BERENT	A	BJORK	C	BOHANNON	C
BANQUETE	D	BEARMOUTH	A	BERGLAND	D	BLACHLY	C	BOHEMIAN	B
BARABOO	B	BEARPAW	B	BERGSTROM	B	BLACKBURN	B	BOISTFORT	C
BARAGA	C	BEAR PRAIRIE	B	BERINO	B	BLACK BUTTE	C	BOLAR	C
BARBARY	D	BEARSKIN	D	BERKELEY		BLACK CANYON	D	BOLD	B
BARBOUR	B	BEASLEY	C	BERKS	C	BLACKCAP	A	BOLES	C
BARBOURVILLE	B	BEASON	C	BERKSHIRE	B	BLACKETT	B	BOLIVAR	B
BARCLAY	C	BEATON	C	BERLIN	C	BLACKFOOT	B/C	BOLIVIA	B
BARCO	B	BEATTY	C	BERMESA	C	BLACKHALL	D	BOLTON	B
BARCUS	B	BEAUCOUP	B	BERMUDIAN	B	BLACKHAWK	D	BOMBAY	B
BARD	D	BEAUFORD	D	BERNAL	D	BLACKLEAF	B	BON	B
BARDEN	C	BEAUMONT	D	BERNALDO	B	BLACKLEED	A	BONACCORD	D
BARDLEY	C	BEAUREGARD	C	BERNARD	D	BLACKLOCK	D	BONAPARTE	A
BARELA	C	BEAUSITE	B	BERNARDINO	C	BLACKMAN	C	BOND	D
BARFIELD	D	BEAUVAIS	B	BERNARDSTON	C	BLACK MOUNTAIN	D	BONDRANCH	D
BARFUSS	B	BEAVERTON	A	BERNHILL	B	BLACKOAR	C	BONDURANT	B
BARGE	C	BECK	C	BERNICE	A	BLACKPIPE	C	BONE	D
BARISHMAN	C	BECKER	B	BERNING	C	BLACK RIDGE	D	BONG	B

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

BONHAM	C
BONIFAY	A
BONILLA	B
BONITA	D
BONN	D
BONNER	B
BONNET	B
BONNEVILLE	B
BONNICK	A
BONNIE	D
BONO	D
BONSALL	D
BONTA	C
BONTI	C
BOOKER	D
BOOMER	B
BOONE	A
BOONESBORO	B
BOONTON	C
BOOTH	C
BORACHO	C
BORAH	A/C
BORDA	D
BORDEAUX	B
BORDEN	B
BORDER	B
BORNSTEDT	C
BORREGO	C
BORUP	B
BORVANT	D
BORZA	C
BOSANKO	D
BOSCO	B
BOSKET	B
BOSLER	B
BOSQUE	B
BOSS	D
BOSTON	C
BOSTWICK	B
BOSWELL	D
BOSWORTH	D
BOTELLA	B
BOTHWELL	C
BOTTINEAU	C
BOTTLE	A
BOULDER	B
BOULDER LAKE	D
BOULDER POINT	B
BOULFLAT	D
BOURNE	C
BOW	C
BOWBAC	C
BOWBELLS	B
BOWDOIN	D
BOWDRE	C
BOWERS	C
BOWIE	B
BOWMAN	B/D
BOWMANSVILLE	C
BOXELDER	C
BOXWELL	C
BOY	A
BOYCE	B/D
BOYD	D
BOYER	B
BOYNTON	
BOYSAG	D
BOYSEN	D
BOZARTH	C
BOZE	B
BOZEMAN	A
BRACEVILLE	C
BRACKEN	D
BRACKETT	C
BRAD	D
BRADDOCK	C
BRADENTON	B/D
BRADER	D
BRADFORD	B
BRADSHAW	B
BRADWAY	D
BRADY	B
BRADYVILLE	C
BRAHAM	B
BRAINERD	B
BRALLIER	D
BRAM	B
BRAMARD	B
BRAMBLE	C
BRAMWELL	C
BRAND	D
BRANDENBURG	A
BRANDON	B
BRANDYWINE	C
BRANFORD	B
BRANTFORD	B
BRANYON	D
BRASHEAR	C
BRASSFIELD	B
BRATTON	B
BRAVANE	D
BRAXTON	C
BRAYMILL	B/D
BRAYS	D
BRAYTON	C
BRAZITO	A
BRAZOS	A
BREA	B
BRECKENRIDGE	D
BRECKNOCK	B
BREECE	B
BREGAR	D
BREMEN	B
BREMER	B
BREMO	C
BREMS	A
BRENDA	C
BRENNAN	B
BRENNER	C/D
BRENT	C
BRENTON	B
BRENTWOOD	B
BRESSER	B
BREVARD	B
BREVORT	B
BREWER	C
BREWSTER	D
BREWTON	C
BRICKEL	C
BRICKTON	C
BRIDGE	C
BRIDGEHAMPTON	B
BRIDGEPORT	B
BRIDGER	A
BRIDGESON	B/C
BRIDGET	B
BRIDGEVILLE	B
BRIDGPORT	B
BRIEDWELL	B
BRIEF	B
BRIENSBURG	
BRIGGS	A
BRIGGSDALE	C
BRIGGSVILLE	C
BRIGHTON	A/D
BRIGHTWOOD	C
BRILL	B
BRIM	C
BRIMFIELD	C/D
BRIMLEY	B
BRINEGAR	B
BRINKERT	C
BRINKERTON	D
BRISCOT	B
BRITE	C
BRITTON	C
BRIZAM	A
BROAD	C
BROADALBIN	C
BROADAX	B
BROADBROOK	C
BROAD CANYON	C
BROADHEAD	C
BROADHURST	D
BROCK	D
BROCKLISS	C
BROCKMAN	C
BROCKO	B
BROCKPORT	D
BROCKTON	D
BROCKWAY	B
BRODY	C
BROE	B
BROGAN	B
BROGDON	B
BROLLIAR	D
BROMO	B
BRONAUGH	B
BRONCHO	B
BRONSON	B
BRONTE	C
BROOKE	C
BROOKFIELD	B
BROOKINGS	B
BROOKLYN	D
BROOKSIDE	C
BROOKSTON	B/D
BROOKSVILLE	D
BROOMFIELD	D
BROSELEY	B
BROSS	B
BROUGHTON	D
BROWARD	C
BROWNELL	B
BROWNFIELD	A
BROWNLEE	B
BROYLES	B
BRUCE	D
BRUFFY	C
BRUIN	C
BRUNEEL	B/C
BRUNO	A
BRUNT	C
BRUSH	
BRUSSETT	B
BRYAN	A
BRYCAN	B
BRYCE	D
BUCAN	D
BUCHANAN	C
BUCHENAU	C
BUCHER	C
BUCKHOUSE	A
BUCKINGHAM	
BUCKLAND	C
BUCKLEBAR	B
BUCKLEY	B/C
BUCKLON	D
BUCKNER	A
BUCKNEY	A
BUCKS	B
BUCKSKIN	C
BUCODA	C
BUDD	B
BUDE	C
BUELL	B
BUENA VISTA	B
BUFFINGTON	B
BUFFMEYER	B
BUFF PEAK	C
BUICK	C
BUIST	B
BUKREEK	B
BULLION	D
BULLREY	B
BULL RUN	B
BULL TRAIL	B
BULLY	B
BUMGARD	B
BUNCOMBE	A
BUNDO	B
BUNDYMAN	C
BUNEJUG	C
BUNKER	D
BUNSELMEIER	C
BUNTINGVILLE	B/C
BUNYAN	B
BURBANK	A
BURCH	B
BURCHARD	B
BURCHELL	B/C
BURDETT	C
BUREN	C
BURGESS	C
BURGI	B
BURGIN	D
BURKE	C
BURKHARDT	B
BURLEIGH	D
BURLESON	D
BURLINGTON	A
BURMA	
BURMESTER	D
BURNAC	C
BURNETTE	B
BURNHAM	D
BURNSIDE	B
BURNSVILLE	B
BURNT LAKE	B
BURRIS	D
BURT	D
BURTON	B
BUSE	B
BUSH	B
BUSHNELL	C
BUSHVALLEY	D
BUSTER	C
BUTANO	C
BUTLER	D
BUTLERTOWN	C
BUTTE	C
BUTTERFIELD	C
BUTTON	C
BUXIN	D
BUXTON	C
BYARS	D
BYNUM	C
BYRON	A
CABALLO	B
CABARTON	D
CABBA	C
CABBART	D
CABEZON	D
CABIN	C
CABINET	C
CABLE	D
CABO ROJO	C
CABOT	D
CACAPON	B
CACHE	D
CACIQUE	C
CADDO	D
CADEVILLE	D
CADMUS	B
CADOMA	D
CADOR	C
CAGEY	C
CAGUABO	D
CAGWIN	B
CAHABA	B
CAHILL	B
CAHONE	C
CAHTO	C
CAID	B
CAIRO	D
CAJALCO	C
CAJON	A
CALABAR	D
CALABASAS	B
CALAIS	C
CALAMINE	D
CALAPOOYA	C
CALAWAH	B
CALCO	C
CALDER	D
CALDWELL	B
CALEAST	C
CALEB	B
CALERA	C
CALHI	A
CALHOUN	D
CALICO	D
CALIFON	C
CALIMUS	B
CALITA	B
CALIZA	B
CALKINS	C
CALLABO	C
CALLAHAN	C
CALLEGUAS	D
CALLINGS	C
CALLOWAY	C
CALMAR	B
CALNEVA	C
CALOUSE	B
CALPINE	B
CALVERT	D
CALVERTON	C
CALVIN	C
CALVISTA	D
CAM	B
CAMAGUEY	D
CAMARGO	B
CAMARILLO	B/C
CAMAS	A
CAMASCREEK	B/D
CAMBERN	C
CAMBRIDGE	C
CAMDEN	B
CAMERON	D
CAMILLUS	B
CAMP	B
CAMPBELL	B/C
CAMPHORA	B
CAMPIA	B
CAMPO	C
CAMPONE	B/C
CAMPSPASS	C
CAMPUS	B
CAMRODEN	C
CANA	C
CANAAN	C/D
CANADIAN	B
CANADICE	D
CANANDAIGUA	D
CANASERAGA	C
CANAVERAL	C
CANBURN	D
CANDELERO	C
CANE	C
CANEADEA	D
CANEEK	B
CANEL	B
CANELO	D
CANEY	C
CANEYVILLE	C
CANEZ	B
CANFIELD	C
CANISTEO	C
CANNINGER	D
CANNON	B
CANOE	B
CANONCITO	B
CANOVA	B/D
CANTALA	B
CANTON	B
CANTRIL	B
CANTUA	B
CANUTIO	B
CANYON	D
CAPAC	B
CAPAY	D
CAPE	D
CAPE FEAR	D
CAPERS	D
CAPILLO	C
CAPLES	C
CAPPS	B
CAPSHAW	C
CAPULIN	B
CAPUTA	C
CARACO	C
CARALAMPI	B
CARBO	C
CARBOL	D
CARBONDALE	D
CARBURY	B
CARCITY	D
CARDIFF	B
CARDINGTON	C
CARDON	D
CAREY	B
CAREY LAKE	B
CAREYTOWN	D
CARGILL	C
CARIBE	B
CARIBEL	B
CARIBOU	B
CARLIN	D
CARLINTON	B
CARLISLE	A/D
CARLOTTA	B
CARLOW	D
CARLSBAD	C
CARLSBORG	A
CARLSON	C
CARLTON	B
CARMI	B
CARNASAW	C
CARNEGIE	C
CARNERO	C
CARNEY	D
CAROLINE	C
CARR	B
CARRISALITOS	D
CARRIZO	A
CARSITAS	A
CARSLEY	C
CARSO	D
CARSON	D
CARSTAIRS	B
CARSTUMP	C
CART	B
CARTAGENA	D
CARTECAY	C
CARUSO	C
CARUTHERSVILLE	B
CARVER	A
CARWILE	D

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TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table B-1--Continued

CARYVILLE	B	CENTRAL POINT	B	CHILGREN	C	CLARESON	C	COKEDALE	B/C
CASA GRANDE	C	CERESCO	A	CHILHOWIE	C	CLAREVILLE	C	COKEL	B
CASCADE	C	CERRILLOS	B	CHILI	B	CLARINDA	D	COKER	D
CASCAJO	B	CERRO	C	CHILKAT	C	CLARION	B	COKESBURY	D
CASCILLA	B	CHACRA	C	CHILLICOTHE	C	CLARITA	D	COKEVILLE	B
CASCO	B	CHAFFEE	C	CHILLISQUAQUE		CLARK	B	COLBATH	C/D
CASE	B	CHAGRIN	B	CHILLUM	B	CLARK FORK	A	COLBERT	D
CASEBIER	D	CHAIX	B	CHILMARK	B	CLARKSBURG	C	COLBURN	B
CASEY	C	CHALFONT	C	CHILO	B/D	CLARKSDALE	C	COLBY	B
CASHEL	C	CHALMERS	C	CHILOQUIN	B	CLARKSON	B	COLCHESTER	B
CASHION	D	CHAMA	B	CHILSON	D	CLARKSVILLE	B	COLDCREEK	B
CASHMERE	B	CHAMBER	C	CHILTON	B	CLARNO	B	COLDEN	D
CASHMONT	B	CHAMBERINO	C	CHIMAYO	D	CLARY	B	COLD SPRINGS	C
CASINO	A	CHAMISE	B	CHIMNEY	B	CLATO	B	COLE	B/C
CASITO	D	CHAMOKANE	B	CHINA CREEK	B	CLATSOP	D	COLEBROOK	B
CASPAR	B	CHAMPION	B	CHINCHALLO	B/D	CLAVERACK	C	COLEMAN	C
CASPIANA	B	CHANCE	B/D	CHINIAK	A	CLAWSON	C	COLEMANTOWN	D
CASS	A	CHANDLER	B	CHINO	B/C	CLAYBURN	B	COLETO	A
CASSADAGA		CHANEY	C	CHINOOK	B	CLAYSPRINGS	D	COLFAX	C
CASSIA	C	CHANNAHON	B	CHIPETA	D	CLAYTON	B	COLIBRO	B
CASSIRO	C	CHANNING	B	CHIPLEY	C	CLEARFIELD	C	COLINAS	B
CASSOLARY	B	CHANTA	B	CHIPMAN	D	CLEAR LAKE	D	COLLAMER	C
CASSVILLE		CHANTIER	D	CHIPPENY	D	CLEEK	C	COLLARD	B
CASTAIC	C	CHAPIN	C	CHIPPEWA	B/D	CLE ELUM	B	COLLBRAN	C
CASTALIA	C	CHAPMAN		CHIQUITO	C/D	CLEGG	B	COLLEEN	C
CASTANA	B	CHAPPELL	B	CHIRICAHUA	D	CLEMAN	B	COLLEGIATE	C
CASTELL	C	CHARD	B	CHISPA	B	CLEMS	B	COLLETT	C
CASTILE	B	CHARGO	D	CHITINA	B	CLEMVILLE	B	COLLIER	A
CASTINO	C	CHARITON	D	CHITTENDEN	C	CLEORA	B	COLLINGTON	B
CASTLE	D	CHARITY	D	CHITWOOD	C	CLERF	C	COLLINS	C
CASTLEVALE	D	CHARLEBOIS	C	CHIVATO	D	CLERMONT	D	COLLINSTON	C
CASTNER	C	CHARLESTON	C	CHIWAWA	B	CLEVERLY	B	COLLINSVILLE	C
CASTO	C	CHARLEVOIX	B	CHO	C	CLICK	A	COLMA	B
CASTRO	C	CHARLOS	A	CHOBEE	D	CLIFFDOWN	B	COLMOR	B
CASTROVILLE	B	CHARLOTTE	A/D	CHOCK	B/D	CLIFFHOUSE	C	COLO	B
CASUSE	D	CHARLTON	B	CHOCOLOCCO	B	CLIFFORD	B	COLOCKUM	B
CASWELL	D	CHASE	C	CHOPAKA	C	CLIFFWOOD	C	COLOMA	A
CATALINA	B	CHASEBURG	B	CHOPTANK	A	CLIFTERSON	B	COLOMBO	B
CATALPA	C	CHASEVILLE	A	CHOPTIE	D	CLIFTON	C	COLONA	C
CATANO	A	CHASKA	C	CHORALMONT	B	CLIFTY	B	COLONIE	A
CATARINA	D	CHASTAIN	D	CHOSKA	B	CLIMARA	D	COLORADO	B
CATAULA	C	CHATBURN	B	CHOTEAU	C	CLIMAX	D	COLOROCK	D
CATAWBA	B	CHATFIELD	C	CHRISTIAN	C	CLINE	C	COLOSO	D
CATH	D	CHATHAM	B	CHRISTIANA	B	CLINTON	B	COLOSSE	A
CATHCART	C	CHATSWORTH	D	CHRISTIANBURG	D	CLIPPER	B/C	COLP	D
CATHEDRAL	D	CHAUNCEY	C	CHRISTY	B	CLODINE	D	COLRAIN	B
CATHERINE	B/D	CHAVIES	B	CHROME	C	CLONTARF	B	COLTON	A
CATHRO	D	CHAWANAKEE	C	CHUALAR	B	CLOQUALLUM	C	COLTS NECK	B
CATLETT	C/D	CHEADLE	C	CHUBBS	C	CLOQUATO	B	COLUMBIA	B
CATLIN	B	CHECKETT	D	CHUCKAWALLA	B	CLOQUET	B	COLUMBINE	A
CATNIP	D	CHEDEHAP	B	CHUGTER	B	CLOUD	D	COLUSA	C
CATOCTIN	C	CHEEKTOWAGA	D	CHULITNA	B	CLOUDCROFT	D	COLVILLE	B/C
CATOOSA	B	CHEESEMAN	C	CHUMMY	C/D	CLOUD PEAK	C	COLVIN	C
CATSKILL	A	CHEHALEM	C	CHUMSTICK	C	CLOUD RIM	B	COLWOOD	B/D
CATTARAUGUS	C	CHEHALIS	B	CHUPADERA	C	CLOUGH	D	COLY	B
CAUDLE	B	CHEHULPUM	D	CHURCH	D	CLOVERDALE	D	COLYER	C/D
CAVAL	B	CHELAN	B	CHURCHILL	D	CLOVER SPRINGS	B	COMER	B
CAVE	D	CHELSEA	A	CHURCHVILLE	D	CLOVIS	B	COMERIO	B
CAVELT	D	CHEMAWA	B	CHURN	B	CLUFF	C	COMETA	D
CAVE ROCK	A	CHEMUNG		CHURNDASHER	B	CLUNIE	D	COMFREY	C
CAVO	D	CHEN	D	CHUTE	A	CLURDE	C	COMITAS	A
CAVODE	C	CHENA	A	CIALES	D	CLURO	C	COMLY	C
CAVOUR	D	CHENANGO	A	CIBEQUE	B	CLYDE	D	COMMERCE	C
CAWKER	B	CHENEY	B	CIBO	D	CLYMER	B	COMO	A
CAYAGUA	C	CHENNEBY	C	CIBOLA	B	COACHELLA	B	COMODORE	B
CAYLOR	B	CHENOWETH	B	CICERO	D	COAD	B	COMORO	B
CAYUGA	C	CHEQUEST	C	CIDRAL	C	COAL CREEK	D	COMPTCHE	B
CAZADERO	C	CHEREETE	A	CIENEBA	C	COALMONT	C	COMPTON	C
CAZADOR	B	CHERIONI	D	CIMA	C	COAMO	C	COMSTOCK	C
CAZENOVIA	B	CHEROKEE	D	CIMARRON	C	COARSEGOLD	B/C	COMUS	B
CEBOLIA	C	CHERRY	C	CINCINNATI	C	COATICOOK	C	CONALB	B
CEBONE	C	CHERRYHILL	B	CINCO	A	COATSBURG	D	CONANT	C
CECIL	B	CHERRY SPRINGS	C	CINDERCONE	B	COBB	B	CONASAUGA	C
CEDA	B	CHESAW	A	CINEBAR	B	COBEN	D	CONATA	D
CEDARAN	D	CHESHIRE	B	CINTRONA	D	COBEY	B	CONBOY	D
CEDAR BUTTE	C	CHESHNINA	C	CIPRIANO	D	COBURG	C	CONCHAS	C
CEDAREDGE	B	CHESNIMNUS	B	CIRCLE	C	COCHETOPA	C	CONCHO	C
CEDAR MOUNTAIN	D	CHESTER	B	CIRCLEVILLE	C	COCOA	A	CONCONULLY	B
CEDARVILLE	B	CHESTERTON	C	CISNE	D	COCOLALLA	C	CONCORD	D
CEDONIA	B	CHETCO	D	CISPUS	A	CODORUS	C	CONCREEK	B
CEDRON	C/D	CHETEK	B	CITICO	B	CODY	A	CONDA	C
CELAYA	B	CHEVELON	C	CLACKAMAS	C	COE	A	CONDIT	D
CELETON	D	CHEWACLA	C	CLAIBORNE	B	COEBURN	C	CONDON	C
CELINA	C	CHEWELAH	B	CLAIRE	A	COEROCK	D	CONE	A
CELIO	A/D	CHEYENNE	B	CLAIREMONT	B	COFF	D	CONEJO	C
CELLAR	D	CHIARA	D	CLALLAM	C	COFFEEN	B	CONESTOGA	B
CENCOVE	B	CHICKASHA	B	CLAM GULCH	D	COGGON	B	CONESUS	B
CENTER	C	CHICOPEE	B	CLAMO	C	COGSWELL	C	CONGAREE	B
CENTER CREEK	B	CHICOTE	D	CLANTON	C	COHASSET	B	CONGER	B
CENTERFIELD	B	CHIGLEY	C	CLAPPER	B	COHOCTAH	D	CONI	D
CENTERVILLE	D	CHILCOTT	D	CLAREMORE	D	COHOE	B	CONKLIN	B
CENTRALIA	B	CHILOS	B	CLARENCE	D	COIT	C	CONLEN	B

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Table B-1--Continued

CONLEY	C	COURT	B	CROWLEY	D	DANSKIN	B	DELLROSE	B
CONNEAUT	C	COURTHOUSE	D	CROWN	B	DANT	D	DELM	D
CONNECTICUT		COURTLAND	B	CROWSHAW	B	DANVERS	C	DELMAR	D
CONNERTON	B	COURTNEY	D	CROZIER	C	DANVILLE	C	DELMITA	C
CONOTTON	B	COURTROCK	B	CRUCES	D	DANZ	B	DELMONT	B
CONOVER	B	COUSE	C	CRUCKTON	B	DARCO	A	DELNORTE	C
CONOWINGO	C	COUSHATTA	B	CRUICKSHANK	C	DARGOL	D	DELPHI	B
CONRAD	B	COVE	D	CRUME	B	DARIEN	C	DELPHILL	C
CONROE	B	COVEILO	B	CRUMP	D	DARLING	B	DELPIEDRA	C
CONSER	C/D	COVELAND	C	CRUTCH	B	DARNELL	C	DELPINE	D
CONSTABLE	A	COVELLO	B/C	CRUTCHER	D	DARNEN	B	DELRAY	A/D
CONSTANCIA	D	COVENTRY	B	CRUZE	C	DARR	A	DEL REY	C
CONSUMO	B	COVEYTOWN	C	CRYSTAL LAKE	B	DARRET	C	DEL RIO	B
CONTEE	D	COVINGTON	D	CRYSTAL SPRINGS	D	DARROCH	C	DELSON	C
CONTINE	C	COWAN	A	CRYSTOLA	B	DARROUZETT	C	DELTA	C
CONTINENTAL	C	COWARTS	C	CUBA	B	DART	A	DELTON	B
CONTRA COSTA	C	COWDEN	D	CUBERANT	B	DARVADA	D	DELWIN	A
CONVENT	C	COWDREY	C	CUCHILLAS	D	DARWIN	D	DELYNDIA	A
COOK	D	COWEEMAN	D	CUDAHY	D	DASSEL	D	DEMAST	B
COOKPORT	C	COWERS	B	CUERO	B	DAST	C	DE MASTERS	B
COOLBRITH	B	COWETA	C	CUEVA	D	DATEMAN	C	DE MAYA	C
COOLIDGE	B	COWICHE	B	CUEVITAS	D	DATINO	C	DEMERS	D
COOLVILLE	C	COWOOD	C	CULBERTSON	B	DATWYLER	C	DEMKY	D
COOMBS	B	COX	D	CULLEN	C	DAULTON	D	DEMONA	C
COONEY	B	COXVILLE	D	CULLEOKA	B	DAUPHIN		DEMOPOLIS	C
COOPER	C	COY	D	CULLO	C	DAVEY	A	DEMPSEY	B
COOTER	C	COYATA	C	CULPEPER	C	DAVIDSON	B	DEMPSTER	B
COPAKE	B	COZAD	B	CULVERS	C	DAVIS	B	DENAY	B
COPALIS	B	CRABTON	B	CUMBERLAND	B	DAVISON	B	DENHAWKEN	D
COPELAND	B/D	CRADDOCK	B	CUMLEY	C	DAVTONE	B	DENISON	C
COPITA	B	CRADLEBAUGH	D	CUMMINGS	B/D	DAWES	C	DENMARK	D
COPLAY		CRAFTON	C	CUNDIYO	B	DAWHOO	B/D	DENNIS	C
COPPER RIVER	D	CRAGO	B	CUNICO	C	DAWSON	D	DENNY	D
COPPERTON	B	CRAGOLA	D	CUPPER	B	DAXTY	C	DENROCK	D
COPPOCK	B	CRAIG	C	CURANT	B	DAY	D	DENTON	D
COPSEY	D	CRAIGMONT	C	CURDLI	C	DAYBELL	A	DENVER	C
COQUILLE	C/D	CRAIGSVILLE	A	CURECANTI	B	DAYTON	D	DEODAR	D
CORA	D	CRAMER	D	CURHOLLOW	D	DAYVILLE	B/C	DEPEW	C
CORAL	C	CRANE	B	CURLEW	C	DAZE	D	DEPOE	D
CORBETT	B	CRANSTON	B	CURRAN	C	DEACON	B	DEPORT	D
CORBIN	B	CRARY	C	CURTIS CREEK	D	DEADFALL	B	DERA	B
CORCEGA	C	CRATER LAKE	B	CURTIS SIDING	A	DEAMA	C	DERINDA	C
CORD	C	CRAVEN	C	CUSHING	B	DEAN	C	DERR	C
CORDES	B	CRAWFORD	D	CUSHMAN	C	DEAN LAKE	C	DERRICK	B
CORDOVA	C	CREAL	D	CUSTER	C	DEARDURFF	B	DESAN	A
CORINTH	C	CREBBIN	C	CUTTER	D	DEARY	C	DESART	C
CORKINDALE	B	CREDO	C	CUTZ	D	DEARYTON	B	DESCALABRADO	D
CORLENA	A	CREEDMAN	D	CUYAMA	B	DEATMAN	C	DESCHUTES	C
CORLETT	B	CREEDMOOR	C	CUYON	A	DEAVER	C	DESERET	C
CORLEY	C	CREIGHTON	B	CYAN	D	DEBENGER	C	DESERTER	B
CORMANT	C	CRELDON	B	CYLINDER	B	DEBORAH	D	DESHA	D
CORNHILL	B	CRESBARD	C	CYNTHIANA	C/D	DECAN	D	DESHLER	C
CORNING	D	CRESCENT	B	CYPREMORT	C	DECATHON	D	DESOLATION	C
CORNISH	B	CRESCO	C	CYRIL	B	DECATUR	B	DESPAIN	B
CORNUTT	C	CRESPIN	C			DECCA	B	DETER	C
CORNVILLE	B	CREST	C	DABOB	B	DECKER	C	DETLOR	C
COROZAL	C	CRESTLINE	B	DACONO	C	DECKERVILLE	C	DETOUR	C
CORPENING	D	CRESTMORE		DACOSTA	D	DECLO	B	DETRA	B
CORRALITOS	A	CRESTON	A	DADE	A	DECORRA	B	DETROIT	C
CORRECO	C	CRESWELL	C	DAFTER	B	DECROSS	B	DEV	B
CORRERA	D	CRETE	D	DAGFLAT	C	DEE	C	DEVILS DIVE	D
CORSON	C	CREVA	D	DAGGETT	A	DEEPWATER	C	DEVOE	D
CURTADA	B	CREVASSE	A	DAGLUM	D	DEER CREEK	C	DEVOIGNES	C/D
CORTEZ	D	CREWS	D	DAGOR	B	DEERFIELD	B	DEVOL	B
CORTINA	A	CRIDER	B	DAGUAO	C	DEERFORD	D	DEVON	B
CORUNNA	D	CRIM	B	DAGUEY	C	DEERING	B	DEVORE	B
CORVALLIS	B	CRISFIELD	B	DAHLQUIST	B	DEERLODGE	D	DEVOY	D
CORWIN	B	CRITCHELL	B	DAIGLE	C	DEER PARK	A	DEWART	
CORY	C	CRIVITZ	A	DAILEY	A	DEERTON	B	DEWEY	B
CORYDON	C	CROCKER	A	DAKOTA	B	DEERTRAIL	C	DEWVILLE	B
COSAD	C	CROCKETT	D	DALBO	B	DEFIANCE	D	DEXTER	B
COSH	C	CROESUS	C	DALBY	D	DEFORD	D	DIA	C
COSHOCTON	C	CROFTON	B	DALCAN	C	DEGARMO	B/C	DIABLO	D
COSKI	B	CROGHAN	B	DALE	B	DEGNER	C	DIAMOND	D
COSSAYUNA	C	CROOKED	C	DALHART	B	DE GREY	D	DIAMOND SPRINGS	C
COSTILLA	A	CROOKED CREEK	D	DALIAN	B	DEJARNET	B	DIAMONDVILLE	C
COTACO	C	CROOKSTON	B	DALLAM	B	DEKALB	C	DIANEV	C
COTATI	C	CROOM	B	DALTON	C	DEKOVEN	D	DIANOLA	D
COTITO	C	CROPLEY	D	DALUPE	B	DELA	B	DIAZ	C
COTO	C	CROSBY	C	DAMASCUS	D	DELAKE	B	DIBBLE	C
COTOPAXI	A	CROSS	D	DAMON	D	DELANCO	C	DICK	A
COTT	B	CROSSVILLE	B	DANA	B	DELANEY	A	DICKEY	A
COTTER	B	CROSWELL	A	DANBURY	C	DELANO	B/C	DICKINSON	A
COTTERAL	B	CROT	D	DANBY		DELECO	D	DICKSON	C
COTTIER	B	CROTON	D	DANDREA	C	DELENA	D	DIGBY	C
COTTONWOOD	C	CROUCH	B	DANDRIDGE	D	DELFINA	B	DIGGER	C
COTTRELL	C	CROW	C	DANGBERG	D	DELHI	A	DIGHTON	B
COUCH	C	CROW CREEK	B	DANIC	C	DELICIAS	B	DILL	B
COUGAR	D	CROWFOOT	B	DANIELS	B	DELKS	B/D	DILLARD	C
COULSTONE	B	CROWHEART	D	DANKO	D	DELL	C	DILLDOWN	
COUNTS	C	CROW HEART	D	DANLEY	C	DELLEKER	B	DILLINGER	B
COUPEVILLE	C	CROW HILL	C	DANNEMORA	D	DELLO	A/C	DILLON	D

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Table B-1--Continued

DILLWYN	A	DOUGHTY	A	DU PAGE	B	EGBERT	B/C	EMILY	B
DILMAN	C	DOUGLAS	B	DUPEE	C	EGELAND	B	EMLIN	B
DILTS	D	DOURO	B	DUPLIN	C	EGGLESTON	B	EMMA	C
DILWORTH	D	DOVER	B	DUPO	C	EGNAR	C	EMMERT	A
DIMAL	D	DOVRAY	D	DUPONT	D	EICKS	C	EMMET	B
DIMYAW	C	DOW	B	DUPREE	D	EIFORT	C	EMMONS	C
DINGLE	B	DOWAGIAC	B	DURALDE	C	EKAH	C	EMORY	B
DINGLISHNA	D	DOWDEN	C	DURAND	B	EKALAKA	B	EMPEDRADO	C
DINKELMAN	B	DOWELLTON	D	DURANT	D	ELAM	A	EMPEY	B
DINKEY	A	DOWNER	B	DURELLE	B	ELBERT	D	EMPEYVILLE	C
DINNEN	B	DOWNEY	B	DURHAM	B	ELBURN	B	EMPIRE	C
DINSDALE	B	DOWNS	B	DURKEE	C	ELCO	B	EMRICK	B
DINUBA	B/C	DOXIE	C	DUROC	B	ELD	B	ENCE	B
DINZER	B	DOYCE	C	DURRSTEIN	D	ELDER	B	ENCIERRO	D
DIOXICE	B	DOYLE	A	DUSTON	B	ELDER HOLLOW	D	ENCINA	B
DIPMAN	D	DOYLESTOWN	D	DUTCHESS	B	ELDERON	B	ENDERS	C
DIQUE	B	DOYN	C	DUTSON	D	ELDON	B	ENDERSBY	B
DISABEL	D	DRA	C	DUTTON	D	ELDORADO	C	ENDICOTT	C
DISAUTEL	B	DRACUT	C	DUVAL	B	ELDRIDGE	C	ENET	B
DISCO	B	DRAGE	B	DUZEL	B	ELEPHANT	D	ENFIELD	B
DISHNER	D	DRAGOON	B	DWIGHT	D	ELEROY	B	ENGLE	B
DISTERHEFF	C	DRAGSTON	C	DWYER	A	ELFRIDA	B	ENGLESIDE	B
DITCHCAMP	C	DRAHAT	D	DYE	D	ELIJAH	C	ENGLEWOOD	C
DITHOD	C	DRAIN	D	DYER		ELIOAK	C	ENGLUND	D
DIVERS	B	DRAKE	B	DYKE	B	ELK	B	ENNIS	B
DIVIDE	B	DRANYON	B	DYRENG	D	ELKADER	B	ENOCHVILLE	B/D
DIX	A	DRAPER	C			ELKCREEK	C	ENOLA	B
DIXIE	C	DRESDEN	B	EACHUSTON	D	ELK HOLLOW	B	ENON	C
DIXMONT	C	DRESSLER	C	EAD	C	ELKHORN	B	ENOREE	D
DIXMORE	B	DREWS	B	EAGAR	B	ELKINS	D	ENOS	B
DIXONVILLE	C	DREXEL	B	EAGLECONE	B	ELKINSVILLE	B	ENOSBURG	D
DIXVILLE	A	DRIFTON	C	EAKIN	B	ELKMOUND	C	ENSENADA	B
DOAK	B	DRIGGS	B	EAMES	B	ELK MOUNTAIN	B	ENSIGN	D
DOBBS	C	DRUM	C	EARLE	D	ELKOL	D	ENSLEY	D
DOBEL	D	DRUMMER	B	EARLMONT	B/C	ELKTON	D	ENSTROM	B
DOBROW	D	DRUMMOND	D	EARP	B	ELLABELLE	B/D	ENTENTE	B
DOBY	D	DRURY	B	EASLEY	D	ELLEDGE	C	ENTERPRISE	B
DOCAS	B	DRYAD	C	EAST FORK	C	ELLERY	D	ENTIAT	D
DOCKERY	C	DRYBURG	B	EAST LAKE	A	ELLETT	D	ENUMCLAW	C
DOCT	B	DRY CREEK	C	EASTLAND	C	ELLIBER	A	EPHRAIM	C
DODGE	B	DRYDEN	B	EASTON	C	ELLICOTT	A	EPHRATA	B
DODGEVILLE	B	DRY LAKE	C	EASTONVILLE	A	ELLINGTON	B	EPLEY	B
DODSON	C	DUANE	B	EAST PARK	D	ELLINOR	C	EPOUFETTE	D
DOGER	A	DUART	C	EASTPORT	A	ELLIOTT	C	EPPING	D
DOGUE	C	DUBAKELLA	C	EATONTOWN		ELLIS	D	EPSIE	D
DOLAND	B	DUBAY	D	EAUGALLIE	B/D	ELLISFORDE	C	ERA	B
DOLE	C	DUBBS	B	EBA	C	ELLISON	B	ERAM	C
DOLLAR	B	DUBOIS	C	EBBERT	D	ELLOAM	D	ERBER	C
DOLLARD	C	DUBUQUE	B	EBBS	B	ELLSBERRY	C	ERIC	B
DOLORES	B	DUCEY	B	EBENEZER	C	ELLSWORTH	C	ERIE	C
DOLPH	C	DUCHESNE	B	ECCLES	B	ELLUM	C	ERIN	B
DOMEZ	C	DUCKETT	C	ECHARD	C	ELMA	B	ERNEST	C
DOMINGO	C	DUCOR	D	ECHLER	B	ELMDALE	B	ERNO	B
DOMINGUEZ	C	DUDA	A	ECKERT	D	ELMENDORF	D	ERRAMOUSPE	C
DOMINIC	A	DUDLEY	D	ECKLEY	B	ELMIRA	A	ESCABOSA	C
DOMINO	C	DUEL	B	ECKMAN	B	ELMO	C	ESCAL	B
DOMINSON	A	DUELM	C	ECKRANT	D	ELMONT	B	ESCALANTE	B
DONA ANA	B	DUFFAU	B	ECTOR	D	ELMORE	B	ESCAMBIA	C
DONAHUE	C	DUFFER	D	EDALGO	C	ELMWOOD	C	ESCONDIDO	C
DONALD	B	DUFFIELD	B	EDDS	B	ELNORA	B	ESMOND	B
DONAVAN	b	DUFFSON	B	EDDY	C	ELOIKA	B	ESPARTO	B
DONEGAL		DUFFY	B	EDEN	C	ELPAN	D	ESPIL	D
DONERAIL	C	DUFUR	B	EDENTON	C	EL PECO	C	ESPINAL	A
DONEY	C	DUGGINS	D	EDENVALE	D	EL RANCHO	B	ESPLIN	D
DONICA	A	DUGOUT	D	EDGAR	B	ELRED	B/D	ESPY	C
DONLONTON	C	DUGWAY	D	EDGECUMBE	B	ELROSE	B	ESQUATZEL	B
DONNA	D	DUKES	A	EDGELEY	C	ELS	A	ESS	B
DONNAN	C	DULAC	C	EDGEMONT	B	ELSAH	B	ESSEN	C
DONNARDO	B	DUMAS	B	EDGEWATER	C	ELSINBORO	B	ESSEX	C
DONNYBROOK	D	DUMECQ	C	EDGEWICK	B	ELSINORE	A	ESSEXVILLE	D
DONOVAN	B	DUMONT	B	EDGEWOOD	A	ELSMERE	A	ESTACADO	B
DOOLEY	A	DUNBAR	D	EDGINGTON	C	ELSO	D	ESTELLINE	B
DOONE	B	DUNBARTON	C	EDINA	D	EL SOLYO	C	ESTER	D
DOOR	B	DUNBRIDGE	B	EDINBURG	C	ELSTON	B	ESTERBROOK	B
DORA	D	DUNCAN	D	EDISON	B	ELTOPIA	B	ESTHERVILLE	B
DORAN	C	DUNCANNON	B	EDISTO	C	ELTREE	B	ESTIVE	C
DORCHESTER	B	DUNCOM	D	EDITH	A	ELTSAC	D	ESTO	B
DOROSHIN	D	DUNDAS	C	EDLOE	B	ELWHA	B	ESTRELLA	B
DOROTHEA	C	DUNDAY	A	EDMONDS	D	ELWOOD	C	ETHAN	B
DOROVAN	D	DUNDEE	C	EDMORE	D	ELY	B	ETHETE	B
DORS	B	DUNELLEN	B	EDMUND	C	ELYSIAN	B	ETHRIDGE	C
DORSET	B	DUNE SAND	A	EDNA	D	ELZINGA	B	ETIL	A
DOS CABEZAS	C	DUNGENESS	B	EDNEYVILLE	B	EMBDEN	B	ETNA	
DOSS	C	DUN GLEN	C	EDOM	C	EMBRY	B	ETOE	B
DOSSMAN	B	DUNKINSVILLE	B	EDROY	D	EMBUDO	B	ETOWAH	B
DOTEN	D	DUNKIRK	B	EDSON	C	EMDENT	C	ETOWN	B
DOTHAN	B	DUNLAP	B	EDWARDS	B/D	EMER	C	ETSEL	D
DOTTA	B	DUNMORE	B	EEL	C	EMERALD	B	ETTA	C
DOTY	B	DUNNING	D	EFFINGTON	D	EMERSON	B	ETTER	B
DOUBLETOP	B	DUNPHY	D	EFWUN	A	EMIDA	D	ETTERSBURG	B
DOUDS	B	DUNUL	A	EGAM	C	EMIGRANT	B	ETTRICK	D
DOUGHERTY	A	DUNVILLE	B	EGAN	B	EMIGRATION	D	EUBANKS	B

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Table B-1--Continued

EUDORA	B	FE	D	FLOWELL	C	FRENCH	C	GARLOCK	C
EUFAULA	A	FEDORA	B	FLOWEREE	B	FRENCHTOWN	D	GARMON	C
EUREKA	D	FELAN	A	FLOYD	B	FRENEAU	C	GARMORE	B
EUSTIS	A	FELDA	B/D	FLUETSCH	C	FRESNO	C/D	GARNER	D
EUTAW	D	FELIDA	B	FLUSHING		FRIANA	D	GARO	D
EVANGELINE	C	FELKER	D	FLUVANNA	C	FRIANT	D	GARR	D
EVANS	B	FELLOWSHIP	D	FLYGARE	B	FRIDLO	C	GARRARD	B
EVANSTON	B	FELT	B	FLYNN	D	FRIEDMAN	B	GARRETSON	B
EVARO	A	FELTA	C	FOARD	D	FRIENDS	D	GARRETT	B
EVART	D	FELTHAM	A	FOGELSVILLE	B	FRIES	D	GARRISON	B
EVENDALE	C	FELTON	B	FOLA	B	FRINDLE	B	GARTON	C
EVERETT	B	FELTONIA	B	FOLEY	D	FRIO	B	GARWIN	C
EVERGLADES	A/D	FENCE	B	FONDA	D	FRIZZELL	C	GASCONADE	D
EVERLY	B	FENDALL	C	FONDIS	C	FROBERG	D	GAS CREEK	C
EVERMAN	C	FENWOOD	B	FONTAL	D	FROHMAN	C	GASKELL	C
EVERSON	D	FERA	C	FONTREEN	B	FRONDORF	C	GASS	D
EVESBORO	A	FERDELFORD	C	FOPIANO	D	FRONHOFER	C	GASSET	D
EWA	B	FERDIG	C	FORBES	B	FRONTON	D	GATESBURG	A
EWAIL	A	FERDINAND	C	FORD	D	FROST	D	GATESON	C
EWALL	A	FERGUS	B	FORDNEY	A	FRUITA	B	GATEVIEW	B
EWINGSVILLE	B	FERGUSON	B	FORDTRAN	C	FRUITLAND	B	GATEWAY	C
EXCELSIOR	B	FERNANDO	B	FORDVILLE	B	FRYE	C	GATEWOOD	D
EXCHEQUER	D	FERN CLIFF	B	FORE	D	FUEGO	C	GAULDY	B
EXETER	C/D	FERNDALE	B	FORELAND	D	FUERA	C	GAVINS	C
EXLINE	D	FERNLEY	C	FORELLE	B	FUGAWEE	B	GAVIOTA	D
EXRAY	D	FERNOW	B	FORESMAN	B	FULCHER	C	GAY	D
EXUM	C	FERNPOINT	C	FORESTDALE	D	FULDA	C	GAYLORD	B
EYERBOW	D	FERRELO	B	FORESTER	C	FULLERTON	B	GAYNOR	C
EYRE	B	FERRIS	D	FORESTON	C	FULMER	B/D	GAYVILLE	B
		FERRON	D	FORGAY	A	FULSHEAR	C	GAZELLE	D
FABIUS	B	FERTALINE	D	FORMAN	B	FULTON	D	GAZOS	B
FACEVILLE	B	FESTINA	B	FORNEY	D	FUQUAY	B	GEARHART	A
FAHEY	B	FETT	D	FORREST	C	FURNISS	B/D	GEARY	B
FAIM	C	FETTIC	D	FORSEY	C	FURY	B/D	GEE	B
FAINES	A	FIANDER	C	FORSGREN	C	FUSULINA	C	GEEBURG	C
FAIRBANKS	B	FIBEA	D	FORT COLLINS	B			GEER	C
FAIRDALE	B	FIDALGO	C	FORT DRUM	C	GAASTRA	C	GEFO	A
FAIRFAX	B	FIDDLETOWN	C	FORT LYON	B	GABALDON	B	GELKIE	B
FAIRFIELD	B	FIDDYMENT	C	FORT MEADE	A	GABBS	D	GEM	C
FAIRHAVEN	B	FIELDING	B	FORT MOTT	A	GABEL	C	GEMID	C
FAIRMOUNT	D	FIELDON	B	FORT PIERCE	C	GABICA	D	GEMSON	C
FAIRPORT	C	FIELDSON	A	FORT ROCK	C	GACEY	D	GENESEE	B
FAIRYDELL	C	FIFE	B	FORTUNA	D	GACHADO	D	GENEVA	C
FAJARDO	C	FIFER	D	FORTWINGATE	C	GADDES	C	GENOA	D
FALAYA	C	FILLMORE	D	FORWARD	C	GADES	G	GENOLA	B
FALCON	D	FINCASTLE	C	FOSHOME	B	GADSDEN	D	GEORGEVILLE	B
FALFA	C	FINGAL	C	FOSSUM	B	GAGE		GEORGIA	B
FALFURRIAS	A	FINLEY	B	FOSTER	B/C	GAGEBY	B	GERALD	D
FALK	B	FIRESTEEL	B	FOSTORIA	B	GAGETOWN	C	GERBER	D
FALKNER	C	FIRGRELL	B	FOUNTAIN	D	GAHEE	B	GERIG	B
FALL	B	FIRMAGE	B	FOURLOG	D	GAINES-	C	GERING	B
FALLBROOK	B/C	FIRO	D	FOURMILE	B	GAINESVILLE	A	GERLAND	C
FALLON	C	FIRTH	B/C	FOUR STAR	B/C	GALATA	D	GERMANIA	
FALLSBURG	C	FISH CREEK	B	FOUTS	B	GALE	B	GERMANY	B
FALLSINGTON	D	FISHERS	B	FOX	B	GALEN	B	GERRARD	D
FANCHER	C	FISHHOOK	D	FOXCREEK	B/D	GALENA	C	GESTRIN	B
FANG	B	FISHKILL		FOXMOUNT	C	GALEPPI	C	GETTA	C
FANNIN	B	FITCH	A	FOXOL	D	GALESTOWN	A	GETTYS	C
FANNO	C	FITCHVILLE	C	FOXPARK	D	GALETON	D	GEYSEN	D
FANU	C	FITZGERALD	B	FOX PARK	D	GALEY	B	GHENT	C
FARADAY	B	FITZHUGH	B	FOXTON	C	GALISTEO	C	GIBBLER	C
FARALLONE	B	FIVE DOT	B	FRAILEY	B	GALLAGHER	B	GIBBON	B
FARAWAY	D	FIVEMILE	B	FRAM	B	GALLATIN	A	GIBBS	D
FARB	D	FIVES	B	FRANCIS	A	GALLEGOS	B	GIBBSTOWN	A
FARGO	D	FLAGG	B	FRANCITAS	D	GALLINA	C	GIFFIN	C
FARISITA	C	FLAGSTAFF	C	FRANK	D	GALLION	B	GIFFORD	C
FARLAND	B	FLAK	B	FRANKFORT	D	GALVA	B	GILA	B
FARMINGTON	C/D	FLAMING	B	FRANKIRK	C	GALVESTON	A	GILBY	B
FARNHAM	B	FLAMINGO	D	FRANKLIN	B	GALVEZ	C	GILCHRIST	B
FARNHAMTON	B/C	FLANAGAN	B	FRANKSTOWN	B	GALVIN	C	GILCREST	B
FARNUF	B	FLANDREAU	B	FRANKTOWN	D	GALWAY	B	GILEAD	C
FARNUM	B	FLASHER	A	FRANKVILLE	B	GAMBLER	A	GILES	B
FARRAGUT	C	FLATHEAD	A	FRATERNIDAD	D	GAMBOA	B	GILFORD	B/D
FARRAR	B	FLAT HORN	B	FRAZER	C	GANNETT	D	GILHOULY	B
FARRELL	B	FLATTOP	D	FRED	C	GANSNER	D	GILISPIE	C
FARRENBURG	B	FLATWILLOW	B	FREDENSBORG	C	GAPO	D	GILLIAM	C
FARROT	C	FLAXTON	A	FREDERICK	B	GAPPMAYER	B	GILLIGAN	B
FARSON	B	FLEAK	A	FREDON	C	GARA	B	GILLS	C
FARWELL	C	FLECHADO	B	FREDONIA	C	GARBER	A	GILLSBURG	C
FASKIN	B	FLEER	D	FREDRICKSON	C	GARBUTT	B	GILMAN	B
FATIMA	B	FLEETWOOD		FREEBURG	C	GARCENO	C	GILMORE	C
FATTIG	C	FLEISCHMANN	D	FREECE	D	GARDELLA	D	GILPIN	C
FAUNCE	A	FLEMING	C	FREEDOM	C	GARDENA	B	GILROY	C
FAUQUIER	C	FLETCHER	B	FREEHOLD	B	GARDINER	A	GILSON	B
FAUSSE	D	FLOKE	D	FREEL	B	GARDNER'S FORK	B	GILT EDGE	D
FAWCETT	C	FLOM	C	FREEMAN	C	GARDNERVILLE	D	GINAT	D
FAWN	B	FLOMATION	A	FREEMANVILLE	B	GARDONE	A	GINGER	C
FAXON	D	FLOMOT	B	FREEON	B	GAREY	C	GINI	B
FAYAL	C	FLORENCE	C	FREER	C	GARFIELD	C	GINSER	C
FAYETTE	B	FLORESVILLE	C	FREESTONE	C	GARITA	C	GIRARDOT	D
FAYETTEVILLE	B	FLORIDANA	B/D	FREEZENER	C	GARLAND	B	GIRD	A
FAYWOOD	C	FLORISSANT	C	FREMONT	C	GARLET	A	GIVEN	C

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Table B-1--Continued

GLADDEN	A	GOTHARD	D	GROWDEN	B	HAMBRIGHT	D	HASTINGS	B
GLADE PARK	C	GOTHIC	C	GROWLER	B	HAMBURG	B	HAT	D
GLADSTONE	B	GOTHO	C	GRUBBS	D	HAMBY	C	HATBORO	D
GLADWIN	A	GOULDING	D	GRULLA	D	HAMEL	C	HATCH	C
GLAMIS	C	GOVAN	C	GRUMMIT	D	HAMERLY	C	HATCHERY	C
GLANN	B/C	GOVE	B	GRUNDY	C	HAMILTON	A	HATFIELD	C
GLASGOW	C	GOWEN	B	GRUVER	C	HAMLET	B	HATHAWAY	B
GLEAN	B	GRABE	B	GRYGLA	C	HAMLIN	B	HATTIE	C
GLEASON	C	GRABLE	B	GUADALUPE	B	HAMMONTON	C	HATTON	C
GLEN	B	GRACEMONT	B	GUAJE	A	HAMPDEN		HAUBSTADT	C
GLENBAR	B	GRACEVILLE	B	GUALALA	D	HAMPSHIRE	C	HAUGAN	B
GLENBERG	B	GRADY	D	GUAMANI	B	HAMPTON	C	HAUSER	D
GLENBROOK	D	GRAFEN	B	GUANABANO	B	HAMTAH	C	HAVANA	B
GLENCOE	D	GRAFTON	B	GUANAJIBO	C	HANA	A	HAVEN	B
GLENDALE	B	GRAHAM	D	GUANICA	D	HANALEI	C	HAVERLY	B
GLENDIVE	B	GRAIL	C	GUAYABO	B	HANAMAULU	A	HAVERSON	B
GLENDORA	D	GRAMM	B	GUAYABOTA	D	HANCEVILLE	B	HAVILLAH	C
GLENELG	B	GRANATH	B	GUAYAMA	D	HANCO	D	HAVINGDON	D
GLENFIELD	D	GRANBY	A/D	GUBEN	B	HAND	B	HAVRE	B
GLENFORD	C	GRANDE RONDE	D	GUCKEEN	C	HANDRAN	C	HAVRELON	B
GLENHALL	B	GRANDFIELD	B	GUELPH	B	HANDSBORO	D	HAW	B
GLENHAM	B	GRANDVIEW	C	GUENOC	C	HANDY	D	HAWES	A
GLENMORA	C	GRANER	C	GUERNSEY	C	HANEY	B	HAWI	B
GLENNALLEN	C	GRANGER	C	GUERRERO	C	HANFORD	B	HAWKEYE	A
GLENOMA	B	GRANGEVILLE	B/C	GUEST	D	HANGAARD	C	HAWKSELL	A
GLENROSE	B	GRANILE	B	GUIN	A	HANGER	B	HAWKSPRINGS	B
GLENSTED	D	GRANO	D	GULER	B	HANIPOE	B	HAXTUN	A
GLENTON	B	GRANT	B	GULKANA	B	HANKINS	C	HAYBOURNE	B
GLENVIEW	B	GRANTSBURG	C	GUMBOOT	C	HANKS	B	HAYBRO	C
GLENVILLE	C	GRANTSDALE	A	GUNBARREL	A	HANLY	A	HAYDEN	B
GLIDE	B	GRANVILLE	B	GUNN	B	HANNA	B	HAYESTON	B
GLIKON	B	GRAPEVINE	C	GUNNUK	C	HANNUM	D	HAYESVILLE	B
GLORIA	C	GRASMERE	B	GUNSIGHT	B	HANOVER	C	HAYFIELD	B
GLOUCESTER	A	GRASSNA	B	GUNTER	A	HANS	C	HAYFORD	C
GLOVER	C/D	GRASSY BUTTE	A	GURABO	D	HANSEL	C	HAYMOND	B
GLYNDON	B	GRATZ	C	GURNEY	C	HANSKA	C	HAYNESS	B
GLYNN	C	GRAVDEN	C	GUSTAVUS	D	HANSON	A	HAYNIE	B
GOBLE	C	GRAVE	B	GUSTIN	C	HANTHO	B	HAYPRESS	A
GODDARD	B	GRAVITY	C	GUTHRIE	D	HANTZ	D	HAYSPUR	B/D
GODDE	D	GRAYCALM	A	GUYTON	D	HAP	B	HAYTER	B
GOECKE	D	GRAYFORD	B	GWIN	D	HAPGOOD	B	HAYTI	D
GODFREY	C	GRAYLING	A	GWINNETT	B	HAPNEY	C	HAYWOOD	B
GODWIN	D	GRAYLOCK	B	GYMER	C	HARBORD	B	HAZEL	C
GOEGLEIN	C	GRAYPOINT	B	GYPSTRUM	B	HARBOURTON		HAZELAIR	D
GOESSEL	D	GRAYS	B			HARCO	B	HAZEN	B
GOFF	C	GREAT BEND	B	HACCKE	C	HARDEMAN	B	HAZLEHURST	C
GOGEBIC	B	GREELEY	B	HACIENDA	D	HARDESTY	B	HAZLETON	B
GOLBIN	C	GREEN BLUFF	B	HACK	B	HARDING	D	HAZTON	D
GOLCONDA	D	GREENBRAE	C	HACKERS	B	HARDSCRABBLE	B	HEADLEY	B
GOLD CREEK	D	GREEN CANYON	B	HACKETTSTOWN	B	HARDY	D	HEADQUARTERS	B
GOLDENDALE	B	GREENCREEK	B	HADAR	A	HARGREAVE	B	HEAKE	D
GOLDFIELD	B	GREENDALE	B	HADES	C	HARKERS	C	HEATH	C
GOLDHILL	B	GREENFIELD	B	HADLEY	B	HARKEY	B	HEATLY	A
GOLDMAN	C	GREENHORN	D	HADO	B	HARLAN	B	HEBBRONVILLE	B
GOLDRIDGE	B	GREENLEAF	B	HAGEN	B	HARLEM	C	HEBER	B
GOLDRUN	A	GREENOUGH	C	HAGENBARTH	B	HARLESTON	C	HEBERT	C
GOLDSBORO	C	GREENPORT		HAGENER	A	HARLINGEN	D	HEBGEN	A
GOLDSTON	C	GREEN RIVER	B	HAGER	C	HARMEHL	C	HEBO	D
GOLDSTREAM	D	GREENSBORO		HAGERMAN	C	HARMONY	C	HEBRON	C
GOLDVALE	C	GREENSON	C	HAGERSTOWN	C	HARNEY	C	HECHT	C
GOLDVEIN	C	GREENTON	C	HAGGA	B	HARPER	D	HECKI	C
GOLIAD	C	GREENVILLE	B	HAGGERTY	B	HARPETH	B	HECLA	B
GOLLAHER	A	GREENWATER	A	HAGSTADT	C	HARPS	B	HECTOR	D
GOLTRY	A	GREENWICH	B	HAGUE	A	HARPSTER	C	HEDDEN	C
GOMEZ	B	GREENWOOD	D	HAIG	C	HARPT	B	HEDRICK	B
GOMM	D	GREER	C	HAIKU	B	HARQUA	C	HEDVILLE	D
GONVICK	B	GREGORY	A	HAILMAN	B	HARRIET	D	HEGNE	D
GOOCH	D	GREHALEM	B	HAINES	B/C	HARRIMAN	B	HEIDEN	D
GOODALE	C	GRELL	D	HAIRE	C	HARRIS	D	HEIDTMAN	C
GOODING	C	GRENADA	C	HALAWA	B	HARRISBURG	D	HEIL	D
GOODINGTON	C	GRENVILLE	B	HALDER	C	HARRISON	C	HEIMDAL	B
GOODLOW	B	GRESHAM	C	HALE	B	HARRISVILLE	C	HEISETON	B
GOODMAN	B	GREWINGK	D	HALEDON	C	HARSTENE	B	HEISLER	B
GOODRICH	B	GREYBACK	B	HALEIWA	B	HARSTINE	C	HEIST	B
GOODSPRINGS	D	GREYBULL	C	HALEY	B	HART	D	HEITT	C
GOOSE CREEK	B	GREYCLIFF	C	HALF MOON	B	HART CAMP	C	HEITZ	D
GOOSE LAKE	D	GREYS	B	HALFORD	A	HARTFORD	A	HEIZER	D
GOOSMUS	B	GRIFFY	B	HALFWAY	D	HARTIG	B	HELDT	C
GORDO	B	GRIGSTON	B	HALGAITOH	B	HARTLAND	B	HELEMANO	C
GORDON	D	GRIMSTAD	B	HALII	B	HARTLETON	B	HELENA	C
GORE	D	GRISWOLD	B	HALIIMAILE	B	HARTLINE	B	HELMER	C
GORGONIO	A	GRITNEY	C	HALIS	B	HARTSBURG	B	HELVETIA	C
GORHAM	B	GRIVER	C	HALL	B	HARTSELLS	B	HELY	B
GORIN	C	GRIZZLY	C	HALLECK	B	HARTSHORN	B	HEMBRE	B
GORING	C	GROGAN	B	HALL RANCH	C	HARVARD	B	HEMMI	C
GORMAN	B	GROSECLOSE	C	HALLVILLE	B	HARVEL	B	HEMPFIELD	
GORUS	A	GROSS	C	HALSEY	D	HARVEY	C	HEMPSTEAD	C
GORZELL	B	GROTON	A	HAMACER	A	HARWOOD	C	HENCRATT	B
GOSHEN	B	GROVE	A	HAMAKUAPOKO	B	HASKI	B	HENDERSON	B
GOSHUTE	D	GROVELAND	B	HAMAN	B	HASKILL	A	HENDRICKS	B
GOSPORT	C	GROVER	B	HAMAR	B	HASKINS	C	HENEFER	C
GOTHAM	A	GROVETON	B	HAMBLEN	C	HASSELL	C	HENKIN	B

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Table B-1--Continued

HENLEY	C
HENLINE	C
HENNEKE	D
HENNEPIN	B
HENNINGSEN	C
HENRY	D
HENSEL	B
HENSHAW	C
HENSLEY	D
HEPLER	D
HERBERT	B
HEREFORD	B
HERKIMER	B
HERLONG	D
HERMISTON	B
HERMON	A
HERNDON	B
HERO	B
HERRERA	A
HERRICK	C
HERRON	B
HERSH	A
HERSHAL	B/D
HESCH	B
HESPER	C
HESPERIA	B
HESPERUS	B
HESSE	C
HESSEL	D
HESSELBERG	D
HESSELTINE	B
HESSLAN	C
HESSON	C
HETTINGER	D
HEXT	B
HEZEL	B
HIALEAH	D
HIAWATHA	A
HIBBARD	D
HIBBING	C
HIBERNIA	C
HICKORY	C
HICKS	B
HIDALGO	B
HIDEAWAY	D
HIDEWOOD	C
HIERRO	C
HIGHAMS	D
HIGHFIELD	B
HIGH GAP	C
HIGHLAND	B
HIGHMORE	B
HIGH PARK	B
HIHIMANU	A
HIIBNER	C
HIKO PEAK	B
HIKO SPRINGS	D
HILDRETH	D
HILEA	D
HILES	B
HILGER	B
HILGRAVE	B
HILLEMANN	C
HILLERY	D
HILLET	D
HILLFIELD	B
HILLGATE	D
HILLIARD	B
HILLON	B
HILLSBORO	B
HILLSDALE	B
HILMAR	C/D
HILO	A
HILT	B
HILTON	B
HINCKLEY	A
HINDES	C
HINESBURG	C
HINKLE	D
HINMAN	C
HINSDALE	
HINTZE	D
HIPPLE	C
HISLE	D
HITT	B
HI VISTA	C
HIWASSEE	B
HIWOOD	A
HIXTON	B
HOBACKER	B
HOBAN	C
HOBBS	B
HOBOG	D
HOBSON	C
HOCHHEIM	B
HOCKING	B
HOCKINSON	C
HOCKLEY	C
HODGE	B
HODGINS	C
HODGSON	C
HOEBE	B
HOELZLE	C
HOFFMAN	C
HOFFMANVILLE	C
HOGANSBURG	B
HOGELAND	B
HOGG	C
HOGRIS	B
HOH	B
HOHMANN	C
HOKO	C
HOLBROOK	B
HOLCOMB	D
HOLDAWAY	D
HOLDEN	A
HOLDER	B
HOLDERMAN	C
HOLDERNESS	C
HOLDREGE	B
HOLLAND	B
HOLLINGER	B
HOLLIS	C/D
HOLLISTER	D
HOLLOMAN	C
HOLLOWAY	A
HOLLY	D
HOLLY SPRINGS	D
HOLLYWOOD	D
HOLMDEL	C
HOLMES	B
HOLOMUA	B
HOLOPAW	B/D
HOLROYD	B
HOLSINE	B
HOLST	B
HOLSTON	B
HOLT	B
HOLTLE	B
HOLTVILLE	C
HOLYOKE	C/D
HOMA	C
HOME CAMP	C
HOMELAKE	B
HOMER	C
HOMESTAKE	D
HOMESTEAD	B
HONAUNAU	C
HONCUT	B
HONDALE	D
HONOO	C
HONDOHO	B
HONEOYE	B
HONEY	D
HONEYGROVE	C
HONEYVILLE	C
HONN	B
HONOKAA	A
HONOLUA	B
HONOMANU	B
HONOULIULI	D
HONUAULU	A
HOOD	B
HOODLE	B
HOODSPORT	C
HOODVIEW	B
HOOKTON	C
HOOLEHUA	B
HOOPAL	D
HOOPER	D
HOOPESTON	B
HOOSIC	A
HOOT	D
HOOTEN	D
HOOVER	B
HOPEKA	D
HOPETON	C
HOPEWELL	
HOPGOOD	C
HOPKINS	B
HOPLEY	B
HOPPER	B
HOQUIAM	B
HORATIO	D
HORD	B
HOREB	B
HORNE	D
HORNELL	D
HORNING	A
HORNITOS	D
HORROCKS	B
HORSESHOE	B
HORTON	B
HORTONVILLE	B
HOSKIN	C
HOSKINNINI	D
HOSLEY	D
HOSMER	C
HOTAW	C
HOT LAKE	C
HOUDEK	B
HOUGHTON	A/D
HOUK	C
HOULKA	D
HOULTON	C/D
HOUNDBY	D
HOURGLASS	B
HOUSATONIC	D
HOUSE MOUNTAIN	D
HOUSEVILLE	C
HOUSTON	D
HOUSTON BLACK	D
HOVDE	A/C
HOVEN	D
HOVENWEEP	C
HOVERT	D
HOVEY	C
HOWARD	B
HOWELL	C
HOWLAND	C
HOYE	B
HOYLETON	C
HOYPUS	A
HOYTVILLE	D
HUBBARD	A
HUBERLY	D
HUBERT	B
HUBLERSBURG	C
HUCKLEBERRY	C
HUDSON	C
HUECO	C
HUEL	A
HUENEME	B/C
HUERHUERO	D
HUEY	D
HUFFINE	A
HUGGINS	C
HUGHES	B
HUGHESVILLE	B
HUGO	B
HUICHICA	C/D
HUIKAU	A
HULETT	B
HULLS	C
HULLT	B
HULUA	D
HUM	B
HUMACAO	B
HUMATAS	C
HUMBARGER	B
HUMBIRD	C
HUMBOLDT	D
HUMDUN	B
HUME	C
HUMESTON	C
HUMMINGTON	C
HUMPHREYS	B
HUMPTULIPS	B
HUNSAKER	B/C
HUNTERS	B
HUNTING	C
HUNTINGTON	B
HUNTSVILLE	B
HUPP	B
HURDS	B
HURLEY	D
HURON	C
HURST	D
HURWAL	B
HUSE	C
HUSSA	B/D
HUSSMAN	D
HUTCHINSON	C
HUTSON	B
HUXLEY	D
HYAM	D
HYAT	A
HYATTVILLE	C
HYDABURG	D
HYDE	D
HYDRO	C
HYMAS	D
HYRUM	B
HYSHAM	D
IAO	C
IBERIA	D
ICENE	C
IDA	B
IDABEL	B
IDAK	B
IDANA	C
IDEON	D
IDMON	B
IGNACIO	C
IGO	D
IGUALDAD	D
IHLEN	D
IJAM	D
ILDEFONSO	B
ILKA	B
ILLION	B/D
IMA	B
IMBLER	B
IMLAY	C
IMMOKALEE	B/D
IMPERIAL	D
INAVALE	A
INDART	B
INDIAHOMA	D
INDIAN	
INDIAN CREEK	D
INDIANO	C
INDIANOLA	A
INDIO	B
INGA	B
INGALLS	B
INGARD	B
INGENIO	C
INGRAM	D
INKLER	B
INKS	D
INMACHUK	D
INMAN	C
INMO	A
INNESVALE	D
INSKIP	C
INVERNESS	D
INVILLE	B
INWOOD	C
IO	B
IOLA	A
IOLEAU	C
IONA	B
IONIA	B
IOSCO	B
IPAVA	B
IRA	C
IREDELL	D
IRETEBA	C
IRIM	C
IROCK	B
IRON BLOSSOM	D
IRON MOUNTAIN	D
IRON RIVER	B
IRONTON	C
IRRIGON	C
IRVINGTON	C
IRWIN	D
ISAAC	C
ISAAQUAH	B/C
ISAN	D
ISANTI	D
ISBELL	C
ISHAM	C
ISHI PISHI	C
ISLAND	B
ISOM	B
ISSAQUAH	B/C
ISTOKPOGA	D
ITCA	D
ITSWOOT	B
IUKA	C
IVA	C
IVAN	B
IVES	B
IVIE	A
IVINS	C
IZAGORA	C
IZEE	C
JABU	C
JACAGUAS	B
JACANA	D
JACINTO	B
JACK CREEK	A
JACKLIN	B
JACKNIFE	C
JACKPORT	D
JACKS	C
JACKSON	B
JACKSONVILLE	C
JACOB	D
JACOBSEN	D
JACOBY	C
JACQUES	C
JACQUITH	C
JACWIN	B
JAFFREY	A
JAGUEYES	B
JAL	B
JALMAR	A
JAMES CANYON	B/C
JAMESTOWN	C
JANE	C
JANISE	C
JANSEN	A
JARAB	D
JARBOE	C
JARITA	C
JARRE	B
JARVIS	B
JASPER	B
JAUCAS	A
JAVA	B
JAY	C
JAYEM	B
JAYSON	D
JEAN	A
JEANERETTE	D
JEAN LAKE	B
JEDD	C
JEDDO	D
JEFFERSON	B
JEKLEY	C
JELM	D
JENA	B
JENKINS	B
JENKINSON	D
JENNESS	B
JENNINGS	C
JENNY	D
JERAULD	D
JERICHO	C
JEROME	C
JERRY	C
JESBEL	D
JESSE CAMP	C
JESSUP	C
JETT	B
JIGGS	C
JIM	C
JIMENEZ	C
JIMTOWN	C
JOB	C
JOBOS	C
JOCITY	B
JOCKO	A
JODERO	B
JOEL	B
JOES	B
JOHNS	C
JOHNSBURG	D
JOHNSON	B
JOHNSTON	B/D
JOHNSWOOD	B
JOICE	D
JOLAN	C
JOLIET	C
JONESVILLE	A
JONUS	B
JOPLIN	B
JOPPA	B
JORDAN	D
JORGE	B
JORNADA	C
JORY	C
JOSE	C
JOSEPHINE	B
JOSIE	B

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Table B-1--Continued

JOY	B	KARNAK	D	KEOWNS	D	KIPP	C	KOVICH	D
JUANA DIAZ	B	KARNES	B	KEPLER	C	KIPPEN	A	KOYEN	B
JUBILEE	C	KARRO	B	KERBY	B	KIPSON	C	KOYUKUK	B
JUDD	D	KARS	A	KERMEL	B	KIRK	B/D	KRADE	B
JUDITH	B	KARSHNER	D	KERMIT	A	KIRKHAM	C	KRANZBURG	B
JUDKINS	C	KARTA	C	KERMO	A	KIRKLAND	D	KRATKA	C
JUDSON	B	KARTAR	B	KERR	B	KIRKTON	B	KRAUSE	A
JUDY	C	KASCHMIT	D	KERRICK	B	KIRKVILLE	C	KREAMER	C
JUGET	D	KASHWITNA	B	KERRTOWN		KIRTLEY	C	KREMLIN	B
JUGHANDLE	B	KASILOF	A	KERSHAW	A	KIRVIN	C	KRENTZ	C
JULES	B	KASKI	B	KERSICK	D	KISRING	D	KRESSON	C
JULESBURG	A	KASOTA	C	KERSTON	A/D	KISSICK	D	KRUM	D
JULIAETTA	B	KASSLER	A	KERT	C	KISTLER	C/D	KRUSE	B
JUMPE	B	KASSON	C	KERWIN	C	KITCHELL	B	KRUZOF	B
JUNCAL	C	KATAMA	B	KESSLER	C	KITCHEN CREEK	B	KUBE	B
JUNCOS	D	KATEMCY	C	KESWICK	D	KITSAP	C	KUBLER	C
JUNCTION	B	KATO	C	KETCHLY	B	KITTANNING		KUBLI	C
JUNEAU	B	KATRINE	B	KETTLE	B	KITTITAS	D	KUCERA	B
JUNIATA		KATULA	B	KETTLEMAN	B	KITTREDGE	C	KUCK	C
JUNIPERO	B	KATY	C	KETTNER	B	KITTSON	C	KUGRUG	D
JUNIUS	C	KAUFMAN	D	KEVIN	C	KIUP	B	KUHL	D
JUNO	B	KAUPO	A	KEWAUNEE	C	KIVA	B	KUKAIAU	A
JUNQUITOS	C	KAVETT	D	KEWEENAW	A	KIWANIS	A	KULA	B
JURA	C	KAWAIHAE	C	KEYA	B	KIZHUYAK	B	KULAKALA	B/C
JUVA	B	KAWAIHAPAI	B	KEYES	D	KJAR	D	KULLIT	B
JUVAN	D	KAWBAWGAM	C	KEYNER	D	KLABER	C	KUMA	B
		KAWICH	A	KEYPORT	C	KLAMATH	B/D	KUNIA	B
KAALUALU	A	KAWKAWLIN	C	KEYSTONE	A	KLAUS	A	KUNUWEIA	C
KACHEMAK	B	KEAAU	D	KEYTESVILLE	D	KLAWASI	D	KUPREANOF	B
KADAKE	D	KEAHUA	B	KEZAR	B	KLEJ	B	KUREB	A
KADASHAN	B	KEALAKEKUA	C	KIAWAH	C	KLICKER	C	KURO	D
KADE	C	KEALIA	D	KIBBIE	B	KLICKITAT	C	KUSKOKWIM	D
KADIN	B	KEANSBURG	D	KICKERVILLE	B	KLINE	B	KUSLINA	D
KADOKA	B	KEARNS	B	KIDD	D	KLINESVILLE	C/D	KUTCH	D
KAENA	D	KEATING	C	KIDMAN	B	KLINGER	B	KUTZTOWN	B
KAHALUU	D	KEAUKAHA	D	KIEHL	A	KLONDIKE	D	KVICHAK	B
KAHANA	B	KEAWAKAPU	B	KIETZKE	D	KLONE	B	KWETHLUK	A
KAHANUI	B	KEBLER	B	KIEV	B	KLOOCHMAN	C	KYLE	D
KAHLER	B	KECH	D	KIKONI	B	KLOTEN	B	KYLER	D
KAHOLA	B	KECKO	B	KILARC	D	KLUTINA	B		
KAH SHEETS	D	KEDRON	C	KILAUEA	B	KNAPPA	B	LA BARGE	B
KAHUA	D	KEEFERS	C	KILBOURNE	A	KNEELAND	C	LABETTE	C
KAIKLI	D	KEEGAN		KILBURN	B	KNIFFIN	C	LABISH	D
KAILUA	A	KEEI	D	KILCHIS	D	KNIGHT	C	LABOU	D
KAIMU	A	KEEKEE	B	KILDOR	C	KNIK	B	LABOUNTY	C
KAINALIU	A	KEELDAR	B	KILGORE	B/D	KNIPPA	D	LA BOUNTY	C
KAIPOIOI	B	KEENE	C	KILKENNY	B	KNOB HILL	B	LA BRIER	C
KAIWIKI	A	KEENO	C	KILLBUCK	C/D	KNOWLES	B	LABSHAFT	D
KALAE	B	KEESE	D	KILLEY	D	KNOX	B	LACAMAS	C/D
KALALOCH	B	KEG	B	KILLINGWORTH		KNULL	C	LA CASA	C
KALAMA	C	KEHENA	C	KILLPACK	C	KNUTSEN	B	LACITA	B
KALAMAZOO	B	KEIGLEY	C	KILMERQUE	C	KOBAR	C	LACKAWANNA	C
KALAPA	B	KEISER	B	KILN	D	KOBEH	B	LACONA	C
KALAUPAPA	D	KEITH	B	KILOA	A	KOCH	C	LACOTA	D
KALIFONSKY	D	KEKAHA	B	KILOHANA	A	KODAK	C	LACY	D
KALIHI	D	KEKAKE	D	KILWINNING	C	KODIAK	B	LADD	B
KALISPELL	A	KELLER	C	KIM	B	KOEHLER	C	LADDER	D
KALKASKA	A	KELLY	D	KIMAMA	B	KOELE	B	LADELLE	B
KALMIA	B	KELN	C	KIMBALL	C	KOEPKE	B	LADOGA	C
KALOKO	D	KELSEY	D	KIMBERLY	B	KOERLING	B	LADUE	B
KALOLOCH	B	KELSO	C	KIMBROUGH	D	KOGISH	D	LADYSMITH	D
KALSIN	D	KELTNER	B	KIMMERLING	D	KOHALA	A	LA FARGE	B
KAMACK	B	KELVIN	C	KIMMONS	C	KOKEE	B	LAFE	D
KAMAKOA	A	KEMMERER	C	KIMO	C	KOKERNOT	C	LAFITTE	D
KAMAOA	B	KEMOO	B	KINA	D	KOKO	B	LA FONDA	B
KAMAOLE	B	KEMPSVILLE	B	KINCO	A	KOKOKAHI	D	LAFONT	B
KAMAY	D	KEMPTON	B	KINESAVA	C	KOKOMO	B/D	LAGLORIA	B
KAMIE	B	KENAI	C	KINGFISHER	B	KOLBERG	B	LAGONDA	C
KAMRAR	B	KENANSVILLE	A	KINGHURST	B	KOLEKOLE	C	LA GRANDE	C
KANABEC	B	KENDAIA	C	KINGMAN	D	KOLLS	D	LAGRANGE	D
KANAKA	B	KENDALL	B	KINGS	C/D	KOLLUTUK	D	LAHAINA	B
KANAPAHA	A/D	KENDALLVILLE	B	KINGSBURY	D	KOLOA	C	LA HOGUE	B
KANDIK	B	KENESAW	B	KINGSLEY	B	KOLOB	C	LAHONTAN	D
KANE	B	KENMOOR	B	KINGS RIVER	C	KOLOKOLO	B	LAHRITY	A
KANEOHE	B	KENNALLY	B	KINGSTON	B	KONA	D	LAIDIG	C
KANEPUU	B	KENNAN	B	KINGSVILLE	C	KONAWA	B	LAIDLAW	B
KANIMA	C	KENNEBEC	B	KINKEAD	C	KONNER	D	LAIL	C
KANLEE	B	KENNEDY	B/C	KINKEL	B	KONOKTI	C	LAIRDSVILLE	D
KANOSH	C	KENNER	D	KINKORA	D	KOOLAU	C	LAIREP	D
KANZA	D	KENNEWICK	B	KINMAN	C	KOOSKIA	C	LAJARA	D
KAPAA	A	KENNEY	A	KINNEAR	B	KOOTENAI	A	LAKE	A
KAPAPALA	B	KENNEY LAKE	C	KINNEY	B	KOPIAH	D	LAKE CHARLES	D
KAPOD	B	KENO	D	KINNICK	C	KOPP	B	LAKE CREEK	C
KAPOWSIN	C	KENOMA	D	KINREAD	D	KOPPES	B	LAKEHELEN	B
KAPUHIKANI	D	KENSAL	B	KINROSS	D	KORCHEA	B	LAKEHURST	A
KARAMIN	B	KENSPUR	A	KINSTON	D	KORNMAN	B	LAKE JANEE	B
KAROE	B	KENT	D	KINTA	D	KOSMOS	D	LAKELAND	A
KARHEEN	D	KENYON	C	KINTON	C	KOSSE	D	LAKEMONT	D
KARLAN	C	KEO	B	KINZEL	B	KOSTER	C	LAKEPORT	B
KARLIN	A	KEOLDAR	B	KIOMATIA	A	KOSZTA	B	LAKESHORE	D
KARLO	D	KEOMAH	C	KIONA	B	KOTEDO	D	LAKESOL	B
KARLUK	D	KEOTA	C	KIPLING	D	KOUTS	B	LAKETON	B

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table B-1--Continued

LAKEVIEW	C	LATAH	C	LENAWEE	B/D	LINVILLE	B	LORADALE	C
LAKEWIN	B	LATAHCO	C	LENNEP	D	LINWOOD	A/D	LORAIN	C/D
LAKEWOOD	A	LATANG	B	LENOIR	D	LIPAN	D	LORDSTOWN	C
LAKI	B	LATANIER	D	LENOX	B	LIPPINCOTT	B/D	LOREAUVILLE	C
LAKIN	A	LATENE	B	LENZ	B	LIRIOS	B	LORELLA	D
LAKOMA	D	LATHAM	D	LEO	B	LIRRET	D	LORENZO	A
LALAAU	A	LATHROP	C	LEON	A/D	LISADE	B	LORETTO	B
LA LANDE	B	LATINA	D	LEONARD	C	LISAM	D	LORING	C
LALLIE	D	LATOM	D	LEONARDO	B	LISBON	B	LOS ALAMOS	B
LAM	B/D	LATONIA	B	LEONARDTOWN	D	LISMAS	D	LOS BANOS	C
LAMAR	B	LATTY	D	LEONIDAS	B	LISMORE	B	LOSEE	B
LAMARTINE	B	LAUDERDALE	B	LEOTA	C	LITCHFIELD	A	LOS GATOS	B/C
LAMBERT	B	LAUGENOUR	B/D	LEPLEY	D	LITHGOW	C	LOS GUINEOS	C
LAMBETH	C	LAUGHLIN	B	LERDAL	C	LITHIA	C	LOSHMAN	D
LAMBORN	D	LAUMAIA	B	LEROY	B	LITIMBER	C	LOS OSOS	C
LAMINGTON	D	LAUREL	C	LESAGE	B	LITLE	C	LOS ROBLES	B
LAMO	B	LAURELHURST	C	LESHARA	B	LITTLEBEAR	A	LOS TANOS	B
LAMONI	D	LAURELWOOD	B	LESHO	C	LITTLEFIELD	D	LOST CREEK	B
LAMONT	A	LAUREN	B	LESLIE	D	LITTLE HORN	C	LOST HILLS	C
LAMONTA	D	LAVALLEE	B	LESTER	B	LITTLE POLE	D	LOS TRANCOS	D
LAMOURE	C	LAVATE	B	LE SUEUR	B	LITTLETON	B	LOSTWELLS	B
LAMPHIER	B	LAVEEN	B	LETA	C	LITTLE WOOD	B	LOTHAIR	C
LAMPSHIRE	D	LAVELDO	D	LETCHER	D	LITZ	C	LOTUS	B
LAMSON	D	LAVERKIN	C	LETHA	D	LIV	C	LOUDON	C
LANARK	B	LA VERKIN	C	LETHENT	C	LIVERMORE	A	LOUDONVILLE	C
LANCASTER	B	LAVINA	C	LETORT	B	LIVIA	D	LOUIE	C
LANCE	C	LAWAI	B	LETTERBOX	B	LIVINGSTON	D	LOUISA	B
LAND	D	LAWET	C	LEVAN	A	LIVONA	A	LOUISBURG	B
LANDES	B	LAWLER	B	LEVASY	C	LIZE	C	LOUP	D
LANDISBURG	C	LAWRENCE	C	LEVERETT	C	LIZZANT	B	LOURDES	C
LANDLOW	C	LAWRENCEVILLE	C	LEVIATHAN	B	LLANOS	C	LOUVIERS	D
LANDUSKY	D	LAWSHE	C	LEVIS	C	LOBDELL	C	LOVEJOY	C
LANE	C	LAWSON	B	LEWIS	D	LOBELVILLE	C	LOVELAND	C
LANEY	C	LAWTHER	D	LEWISBERRY	B	LOBERG	B	LOVELL	C
LANG	B/D	LAWTON	C	LEWISBURG	C	LOBERT	B	LOVELOCK	C/D
LANGFORD	C	LAX	C	LEWISTON	C	LOBITOS	C	LOWELL	C
LANGHEI	B	LAXAL	B	LEWISVILLE	C	LOCANE	D	LOWRY	B
LANGLEY	C	LAYCOCK	B	LEX	B	LOCEY	C	LOWVILLE	B
LANGLOIS	D	LAYTON	A	LEXINGTON	B	LOCHSA	B	LOYAL	B
LANGOLA	B	LAZEAR	D	LHAZ	B	LOCKE	B	LOYALTON	D
LANGRELL	B	LEA	C	LIBBINGS	D	LOCKERBY	C	LOYSVILLE	D
LANGSTON	C	LEADER	B	LIBBY	B	LOCKHARD	B	LOZANO	B
LANIER	B	LEADPOINT	B	LIBEG	A	LOCKHART	B	LOZIER	D
LANIGER	B	LEADVALE	C	LIBERAL	D	LOCKPORT	D	LUALUALEI	D
LANKBUSH	B	LEADVILLE	B	LIBERTY	C	LOCKWOOD	B	LUBBOCK	C
LANKIN	C	LEAF	D	LIBORY	A	LOCUST	C	LUBRECHT	C
LANKTREE	C	LEAHY	C	LIBRARY	D	LODAR	D	LUCAS	C
LANOAK	B	LEAL	B	LIBUTTE	D	LODEMA	A	LUCE	C
LANSDALE	B	LEAPS	C	LICK	B	LODI	C	LUCEDALE	B
LANSDOWNE	C	LEATHAM	C	LICK CREEK	D	LODO	D	LUCERNE	B
LANSING	B	LEAVENWORTH	B	LICKDALE	D	LOFFTUS	C	LUCIEN	C
LANTIS	B	LEAVITT	B	LICKING	C	LOFTON	D	LUCILE	D
LANTON	D	LEAVITTVILLE	B	LICKSKILLET	D	LOGAN	D	LUCILETON	B
LANTONIA	B	LEBANON	C	LIDDELL	D	LOGDELL	D	LUCKENBACH	C
LANTZ	D	LEBAR	B	LIEBERMAN	C	LOGGERT	A	LUCKY	B
LAP	D	LE BAR	B	LIEN	D	LOGHOUSE	B	LUCKY STAR	B
LA PALMA	C	LEBEC	B	LIGGET	B	LOGY	B	LUCY	A
LAPEER	B	LEBO	C	LIGHTNING	D	LOHLER	C	LUDDEN	D
LAPINE	A	LEBSACK	C	LIGNUM	C	LOHMILLER	C	LUDLOW	C
LAPLATTA	C	LECK KILL	B	LIGON	D	LOHNES	A	LUEDERS	C
LAPON	D	LEDBEDER	B	LIHEN	A	LOIRE	B	LUFKIN	D
LAPORTE	C	LEDGEFORK	A	LIHUE	B	LOLAK	D	LUHON	B
LA POSTA	A	LEDGER	D	LIKES	A	LOLALITA	B	LUJANE	C
LA PRAIRIE	B	LEDRU	D	LILAH	A	LOLEKAA	B	LUKIN	C
LARABEE	B	LEDY		LILLIWAUP	A	LOLETA	C/D	LULA	B
LARAND	B	LEE	D	LIMA	B	LOLO	A	LULING	D
LARCHMOUNT	B	LEEDS	C	LIMANI	B	LOLON	A	LUMBEE	D
LARDELL	C	LEEFIELD	C	LIMBER	B	LOMA	C	LUMMI	B/C
LAREDO	B	LEELANAU	A	LIMERICK	C	LOMALTA	D	LUN	C
LARES	C	LEEPER	D	LIMON	C	LOMAX	B	LUNA	C
LARGENT	D	LEESVILLE	B/C	LIMONES	B	LOMIRA	B	LUNCH	C
LARGO	B	LEETON	C	LIMPIA	C	LOMITAS	D	LUNDIMO	C
LARIM	A	LEETONIA	C	LINCO	B	LONDO	C	LUNDY	D
LARIMER	B	LEFOR	B	LINCOLN	A	LONE	C	LUNT	C
LARKIN	B	LEGLER	B	LINCROFT	A	LONEPINE	C	LUPPINO	C
LARKSON	C	LEGORE	B	LINDLEY	C	LONERIDGE	B	LUPTON	D
LA ROSE	B	LEHEW	C	LINDSEY	D	LONE ROCK	A	LURA	D
LARRY	D	LEHIGH	C	LINDSIDE	C	LONETREE	A	LURAY	C/D
LARSON	D	LEHMANS	D	LINDSTROM	B	LONGFORD	C	LUTE	D
LARUE	A	LEHR	B	LINDY	C	LONGLOIS	B	LUTH	C
LARVIE	D	LEICESTER	C	LINEVILLE	C	LONGMARE	D	LUTHER	B
LAS	C	LEILEHUA	B	LINGANORE	B	LONGMONT	C	LUTIE	B
LAS ANIMAS	C	LELA	D	LINKER	B	LONGRIE	C	LUTON	D
LASAUSES	C	LELAND	D	LINKVILLE	B	LONGVAL	B	LUVERNE	C
LAS FLORES	D	LEMETA	D	LINNE	C	LONG VALLEY	B	LUXOR	D
LASHLEY		LEMING	C	LINNET	D	LONGVIEW	C	LUZENA	D
LASIL	D	LEMM	B	LINNEUS	B	LONOKE	B	LYCAN	B
LAS LUCAS	C	LEMONEX	D	LINO	C	LONTI	C	LYCOMING	C
LAS POSAS	C	LEMPSTER	C/D	LINOYER	B	LOOKOUT	C	LYDA	D
LASSEN	D	LEN	C	LINSLAW	D	LOON	B	LYDICK	B
LASTANCE	B	LENA	A	LINT	B	LOPER	B	LYFORD	C
LAS VEGAS	D	LENAPAH	D	LINTON	B	LOPEZ	D	LYLES	B

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LYMAN	C/D	MALIN	C/D	MARLETTE	B	MAY DAY	D	MCPHERSON	C
LYMANSON	C	MALJAMAR	B	MARLEY	C	MAYER	D	MCPHIE	B
LYNCH	D	MALLOT	A	MARLIN	D	MAYES	D	MCQUARRIE	D
LYNCHBURG	B/D	MALM	C	MARLOW	C	MAYFIELD	B	MCQUEEN	C
LYNDEN	A	MALO	B	MARLTON	C	MAYFLOWER	C	MCRAE	B
LYNNDYL	A	MALONE	B	MARMARTH	B	MAYHEW	D	MCTAGGART	B
LYNN HAVEN	B/D	MALOTERRE	D	MARNA	D	MAYLAND	C	MCVICKERS	C
LYNNVILLE	C	MALPAIS	C	MARPA	B	MAYMEN	D	MEAD	D
LYNX	B	MALPOSA	C	MARPLEEN	D	MAYNARD LAKE	B	MEADIN	A
LYONMAN	C	MALVERN	C	MARQUETTE	A	MAYO	B	MEADOWVILLE	B
LYONS	D	MAMALA	D	MARR	B	MAYODAN	B	MEADVILLE	C
LYONSVILLE	B	MAMOU	C	MARRIOTT	B	MAYOWORTH	C	MEANDER	D
LYSINE	D	MANAHAA	C	MARSDEN	C	MAYSDORF	B	MECAN	B
LYSTAIR	B	MANALAPAN		MARSELL	B	MAYSVILLE		MECCA	B
LYTELL	B	MANANA	C	MARSHALL	B	MAYTOWN	C	MECKESVILLE	C
		MANASSA	C	MARSHAN	D	MAYVILLE	B	MECKLENBURG	C
MABANK	D	MANASSAS	B	MARSHDALE	C	MAYWOOD	B	MEDA	B
MABEN	C	MANASTASH	C	MARSHFIELD	C	MAZEPPA	B	MEDANO	C
MABI	D	MANATEE	B/D	MARSING	B	MAZON	C	MEDARY	C
MABRAY	D	MANAWA	C	MART	C	MAZUMA	C	MEDFORD	B
MACAR	B	MANCELONA	A	MARTELLA	B	MCAFEE	C	MEDFRA	D
MACEDONIA	C	MANCHESTER	A	MARTIN	C	MCALLEN	B	MEDICINE LODGE	B
MACFARLANE	B	MANDAN	B	MARTINA	A	MCALLISTER	C	MEDINA	B
MACHETE	C	MANDERFIELD	B	MARTINECK	D	MCALPIN	C	MEDLEY	B
MACHIAS	B	MANDEVILLE	B	MARTINEZ	D	MCBEE	B	MEDWAY	B
MACHUELO	D	MANFRED	D	MARTINI	B	MCBETH	D	MEEKS	A
MACK	C	MANGUM	D	MARTINSBURG	B	MCBRIDE	B	MEETEETSE	D
MACKEN	D	MANHATTAN	A	MARTINSDALE	B	MCCABE	B	MEGGETT	D
MACKINAC	B	MANHEIM	C	MARTINSON	D	MCCAFFERY	A	MEGON	C
MACKSBURG	B	MANI	C	MARTINSVILLE	B	MCCAIN	C	MEHL	C
MACOMB	B	MANILA	C	MARTINTON	C	MCCALEB	B	MEHLHORN	C
MACOMBER	B	MANISTEE	B	MARTY	B	MCCALLY	D	MEIGS	
MACON	B	MANITOU	C	MARVAN	D	MCCAMMON	D	MEIKLE	D
MACY	B	MANLEY	B	MARVELL	B	MCCANN	C	MEISS	D
MADALIN	D	MANLIUS	C	MARVIN	C	MCCARRAN	D	MELBOURNE	B
MADAWASKA	B	MANLOVE	B	MARY	C	MCCARTHY	B	MELBY	C
MADDOCK	A	MANNING	B	MARYDEL	B	MCCLAVE	C	MELITA	B
MADDOX		MANOGUE	D	MARYSLAND	D	MCCLEARY	C	MELLENTHIN	D
MADELIA	C	MANOR	B	MASADA	C	MCCLELLAN	B	MELLOR	D
MADELINE	D	MANSFIELD	D	MASCAMP	D	MCCLOUD	C	MELLOTT	B
MADERA	D	MANSIC	B	MASCHETAH	B	MCCOIN	D	MELOLAND	C
MADISON	B	MANSKER	B	MASCOTTE	D	MCCOLL	D	MELROSE	C
MADONNA	C	MANTACHIE	C	MASHEL	C	MCCONNEL	B	MELSTONE	A
MADRAS	C	MANTEO	C/D	MASHULAVILLE	B/D	MCCOOK	B	MELTON	B
MADRID	B	MANTER	B	MASON	B	MCCORNICK	C	MELVILLE	B
MADRONE	C	MANTON	B	MASONVILLE	C	MCCOY	C	MELVIN	D
MADUREZ	B	MANTZ	B	MASSACK	B	MCCREE	B	MEMALOOSE	D
MAFURT	B	MANU	C	MASSENA	C	MCCRORY	D	MEMPHIS	B
MAGALLON	B	MANVEL	C	MASSILLON	B	MCCROSKIE	D	MENAHGA	A
MAGENS	B	MANWOOD	D	MASTERSON	B	MCCULLOUGH	C	MENAN	C
MAGGIE	D	MANZANITA	C	MATAGORDA	D	MCCULLY	C	MENARD	B
MAGINNIS	C	MANZANO	C	MATAMOROS	C	MCCUNE	D	MENCH	C
MAGNA	D	MANZANOLA	C	MATANUSKA	C	MCCUTCHEN	C	MENDEBOURE	C
MAGNOLIA	B	MAPES	C	MATANZAS	B	MCDOLE	B	MENDOCINO	B
MAGNUS	C	MAPLE MOUNTAIN	B	MATAPEAKE	B	MCDONALD	B	MENDON	B
MAGOTSU	D	MAPLETON	C/D	MATAWAN	C	MCDONALDSVILLE	C	MENDOTA	B
MAGUAYO	D	MARAGUEZ	B	MATCHER	A	MCEWEN	B	MENEFEE	D
MAHAFFEY	C/D	MARATHON	B	MATFIELD	C	MCFADDEN	B	MENFRO	B
MAHAFFY	C/D	MARBLE	A	MATHERS	B	MCFAIN	C	MENLO	D
MAHALA	C	MARBLEMOUNT	B	MATHERTON	B	MCFAUL	C	MENO	C
MAHALASVILLE	B/D	MARCELINAS	D	MATHESON	B	MCGAFFEY	B	MENOKEN	C
MAHANA	B	MARCETTA	A	MATHEWS		MCGARR	C	MENOMINEE	B
MAHASKA	B	MARCIAL	D	MATHIS	A	MCGARY	C	MENTO	C
MAHER	C	MARCUM	B	MATHISTON	C	MCGEHEE	C	MENTOR	B
MAHONING	D	MARCUS	C	MATLOCK	D	MCGILVERY	D	MEQUON	C
MAHUKONA	B	MARCUSE	D	MATMON	D	MCGINTY	B	MERCED	C/D
MAIDEN	B	MARCY	D	MATTAPEX	C	MCGIRK	C	MERCEDES	D
MAILE	A	MARDEN	C	MATTOLE	C	MCGOWAN	B	MERCER	C
MAINSTAY	D	MARDIN	C	MAU	D	MCGRATH	B	MERCEY	C
MAJADA	B	MARENGO	C/D	MAUDE	B	MCGREW	A	MEREDITH	B
MAKAALAE	B	MARESUA	B	MAUGHAN	C	MCHENRY	B	MERETA	C
MAKALAPA	D	MARGERUM	B	MAUKEY	C	MCILWAINE	A	MERGEL	B
MAKAPILI	A	MARGUERITE	B	MAUMEE	A/D	MCINTOSH	B	MERIDIAN	B
MAKAWAO	B	MARIA	B/C	MAUNABO	D	MCINTYRE	B	MERINO	D
MAKAWELI	B	MARIANA	C	MAUPIN	C	MCKAMIE	D	MERKEL	B
MAKENA	B	MARIAS	D	MAUREPAS	D	MCKAY	D	MERLIN	D
MAKIKI	B	MARICAO	B	MAURICE	A	MCKENNA	C/D	MERMILL	B/D
MAKLAK	A	MARICOPA	B	MAURINE	D	MCKENZIE	D	MERNA	D
MAKOTI	C	MARIETTA	C	MAURY	B	MCKINLEY	B	MEROS	A
MAL	B	MARILLA	C	MAVERICK	C	MCKINNEY	D	MERRIFIELD	B
MALA	B	MARINA	A	MAVIE	D	MCLAIN	C	MERRILL	C
MALABAR	A/D	MARION	D	MAWAE	A	MCLAURIN	B	MERRILLAN	C
MALABON	C	MARIPOSA	C	MAX	B	MCLEAN	C	MERRIMAC	A
MALACHY	B	MARISSA	C	MAXEY	C	MCLEOD	B	MERRITT	B/C
MALAGA	B	MARKES	D	MAXFIELD	C	MCMAHON	C	MER ROUGE	B
MALAMA	A	MARKEY	D	MAXSON	A	MCMEEN	C	MERTON	B
MALAYA	D	MARKHAM	C	MAXTON	B	MCMULLIN	D	MERTZ	B
MALBIS	B	MARKLAND	C	MAXVILLE	A	MCMURDIE	C	MESA	B
MALCOLM	B	MARKSBORO	C	MAXWELL	D	MCMURPHY	B	MESCAL	B
MALETTI	C	MARLA	A	MAY	B	MCMURRAY	D	MESCALERO	C
MALEZA	B	MARLBORO	B	MAYBERRY	C	MCNARY	D	MESITA	C
MALIBU	D	MARLEAN	B	MAYBESO	D	MCPAUL	B	MESKILL	C

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table B-1--Continued

MESHAN	C	MINORA	C	MONTOYA	D	MURDOCK	C	NAVARRO	B
MESPUN	A	MINTO	C	MONTPELLIER	C	MUREN	B	NAVESINK	
MESSER	C	MINU	D	MONTROSE	B	MURRILL	B	NAYLOR	
MET	D	MINVALE	B	MONTVALE	D	MURVILLE	D	NAYPED	C
METALINE	B	MIRA	D	MONTVERDE	A/D	MUSCATINE	B	NAZ	B
METAMORA	B	MIRABAL	C	MONTWEL	C	MUSE	C	N-BAR	B
METEA	B	MIRACLE	B	MONUE	B	MUSELLA	B	NEAPOLIS	B/D
METHOW	B	MIRAMAR	B	MOODY	B	MUSICK	B	NEBEKER	C
METIGOSHE	A	MIRANDA	D	MOOHOO	B	MUSINIA	B	NEBGEN	D
METOLIUS	B	MIRES	B	MOOSE RIVER	D	MUSKINGUM	C	NEBISH	B
METRE	D	MIRROR	B	MORA	B	MUSKOGEE	C	NEBO	
METZ	A	MIRROR LAKE	A	MORADO	C	MUSQUIZ	C	NECHE	C
MEXICO	D	MISSION	B	MORALES	D	MUSSEL	B	NEDERLAND	B
MHOON	D	MITCH	B	MORD	C	MUSSELSHELL	B	NEEDHAM	D
MIAMI	B	MITCHELL	B	MOREAU	D	MUSSEY	D	NEEDLE PEAK	C
MIAMIAN	C	MITIWANGA	C	MOREHEAD	C	MUSTANG	A/D	NEEDMORE	C
MICCO	A/D	MITRE	C	MOREHOUSE	C	MUTNALA	B	NEELEY	B
MICHELSON	B	MIZEL	D	MORELAND	D	MUTUAL	B	NEESOPAH	C
MICHIGAMME	C	MIZPAH	C	MORELANDTON	A	MYAKKA	A/D	NEGITA	B
MICK	B	MOANO	D	MORET	D	MYATT	B/D	NEGLEY	B
MIDAS	D	MOAPA	D	MOREY	D	MYERS	D	NEHALEM	B
MIDDLE	C	MOAULA	A	MORFITT	B	MYERSVILLE	B	NEHAR	B
MIDDLEBURY	B	MOBEETIE	B	MORGANFIELD	B	MYLREA	B	NEILTON	A
MIDESSA	B	MOCA	D	MORGNEC		MYRICK	D	NEISSON	B
MIDLAND	D	MOCHO	B	MORIARTY	D	MYRTLE	B	NEKIA	C
MIDNIGHT	D	MODA	D	MORICAL	C	MYSTEN	A	NELLIS	B
MIDVALE	C	MODALE	C	MORLEY	C	MYSTIC	D	NELMAN	B
MIDWAY	D	MODEL	C	MORMON MESA	D	MYTON	B	NELSCOTT	B
MIFFLIN	B	MODENA	B	MOROCCO	A/C			NELSON	B
MIFFLINBURG	B	MODESTO	C	MORONI	D	NAALEHU	B	NEMAH	C
MIGUEL	D	MODOC	C	MOROP	C	NABESNA	D	NEMOTE	A
MIKE	D	MOENKOPIE	D	MORRILL	B	NACEVILLE	C	NENANA	B
MIKESELL	C	MOEPITZ	B	MORRIS	C	NACHES	B	NENNO	B
MILACA	B	MOFFAT	B	MORRISON	B	NACIMIENTO	C	NEOLA	D
MILAN	B	MOGOLLON	B	MORROW	C	NACOGDOCHES	B	NEOTOMA	B
MILES	B	MOGUL	B	MORSE	D	NADEAN	B	NEPALTO	A
MILFORD	C	MOHALL	B	MORTENSON	C	NADINA	D	NEPESTA	C
MILHAM	C	MOHAVE	B	MORTON	B	NAFF	B	NEPHI	B
MILHEIM	C	MOHAWK	B	MORVAL	B	NAGEESI	B	NEPPEL	B
MILL	B	MOIRA	C	MOSBY	C	NAGITSY	C	NEPTUNE	A
MILLARD	B	MOKELUMNE	D	MOSCA	A	NAGLE	B	NERESON	B
MILLBORO	D	MOKENA	C	MOSCOW	C	NAGOS	D	NESDA	A
MILLBROOK	B	MOKIAK	B	MOSEL	C	NAHATCHE	C	NESHAMINY	B
MILLBURNE	B	MOKULEIA	B	MOSHANNON	B	NAHMA	C	NESIKA	B
MILLCREEK	B	MOLAND	B	MOSHER	D	NAHUNTA	C	NESKAHI	B
MILLER	D	MOLCAL	B	MOSHERVILLE	C	NAIWA	B	NESKOWIN	C
MILLERLUX	D	MOLENA	A	MOSIDA	B	NAKAI	B	NESPELEM	B
MILLERTON	D	MOLINOS	B	MOSQUET	D	NAKNEK	D	NESS	D
MILLETT	B	MOLLVILLE	D	MOSSYROCK	B	NALDO	B	NESSEL	B
MILLGROVE	B/D	MOLLY	B	MOTA	B	NAMBE	B	NESSOPAH	B
MILL HOLLOW	B	MOLOKAI	B	MOTLEY	B	NAMON	C	NESTER	C
MILLICH	D	MOLSON	B	MOTOQUA	D	NANAMKIN	A	NESTUCCA	C
MILLIKEN	C	MOLYNEUX	B	MOTTSVILLE	A	NANCY	B	NETARTS	A
MILLINGTON	B	MONAD	A	MOULTON	B/D	NANNY	B	NETCONG	B
MILLIS	C	MONAHAN	D	MOUND	C	NANNYTON	B	NETO	B
MILLRACE	B	MONAHANS	B	MOUNTAINBURG	D	NANSENE	B	NETTLETON	C
MILLSAP	C	MONARDA	D	MOUNTAINVIEW	B/D	NANTUCKET	C	NEUBERT	B
MILLSDALE	B/D	MONCLOVA	B	MOUNTAINVILLE	B	NANUM	C	NEUNS	B
MILLSHOLM	C	MONDAMIN	C	MOUNT AIRY	A	NAPA	D	NEUSKE	B
MILLVILLE	B	MONDOVI	B	MOUNT CARROLL	B	NAPAISHAK	D	NEVADOR	C
MILLWOOD	D	MONEE	D	MOUNT HOME	B	NAPAVINE	B	NEVILLE	B
MILNER	C	MONICO	B	MOUNT HOOD	B	NAPIER	B	NEVIN	C
MILPITAS	C	MONIDA	B	MOUNT LUCAS	C	NAPLENE	B	NEVINE	B
MILROY	D	MONITEAU	D	MOUNT OLIVE	D	NAPLES	B	NEVKA	C
MILTON	C	MONMOUTH	C	MOUNTVIEW	B	NAPPANEE	D	NEVOYER	D
MIMBRES	C	MONO	D	MOVILLE	C	NAPTOWNE	B	NEVTAH	C
MIMOSA	C	MONOLITH	C	MOWATA	D	NARANJITO	C	NEVU	D
MINA	C	MONONA	B	MOWER	C	NARANJO	C	NEWARK	C
MINAM	B	MONONGAHELA	C	MOYERSON	D	NARCISSE	B	NEWART	B
MINATARE	D	MONROE	B	MOYINA	D	NARD	B	NEWAYGO	B
MINCHEY	B	MONROEVILLE	C/D	MUCARA	D	NARLON	C	NEWBERG	B
MINCO	B	MONSE	B	MUCET	C	NARON	B	NEWBERRY	C
MINDALE	B	MONSERATE	C	MUDRAY	D	NARRAGANSETT	B	NEWBY	B
MINDEGO	B	MONTAGUE	D	MUD SPRINGS	C	NARROWS	D	NEW CAMBRIA	C
MINDEMAN	B	MONTALTO	C	MUGHOUSE	C	NASER	B	NEWCASTLE	B
MINDEN	C	MONTARA	D	MUIR	B	NASH	B	NEWCOMB	A
MINE	B	MONTAUK	C	MUIRKIRK	B	NASHUA	A	NEWDALE	B
MINEOLA		MONTCALM	A	MUKILTEO	D	NASHVILLE	B	NEWELL	B
MINER	D	MONTE	B	MULCROW	D	NASON	C	NEWELLTON	D
MINERAL	A	MONTE CRISTO	D	MULKEY	C	NASSAU	C/D	NEWFANE	
MINERAL MOUNTAIN	C	MONTEGRANDE	D	MULLINS	D	NASSET	B	NEWFORK	D
MINERVA	B	MONTELL	D	MULLINVILLE	B	NATALIE	C	NEWKIRK	D
MING	B	MONTELLO	C	MULT	C	NATCHEZ	B	NEWLANDS	B
MINGO	B	MONTEOLA	D	MULTORPOR	A	NATHROP	B	NEWLIN	B
MINIDOKA	C	MONTEROSA	D	MUMFORD	B	NATIONAL	B	NEWMARKET	B
MINNEISKA	C	MONTEVALLO	D	MUNDELEIN	B	NATRONA	B	NEWPORT	C
MINNEOSA	B	MONTGOMERY	D	MUNDOS	B	NATROY	D	NEWRUSS	B
MINNEQUA	B	MONTICELLO	B	MUNISING	B	NATURITA	B	NEWRY	B
MINNETONKA	D	MONTIETH	A	MUNK	C	NAUKATI	D	NEWSKAH	B
MINNEWAUKAN	B	MONTMORENCI	B	MUNSON	D	NAUMBURG	C	NEWSTEAD	D
MINNIECE	D	MONTOSO	B	MUNUSCONG	D	NAVAJO	D	NEWTON	A/D
MINOA	C	MONTOUR	D	MURDO	B	NAVAN	D	NEWTONIA	B

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Table B-1--Continued

NEWTOWN	C	NORTON	C	OKAW	D	ORELLA	D	PACK	C
NEWVILLE	C	NORTONVILLE	C	OKAY	B	OREM	A	PACKARD	B
NEZ PERCE	C	NORTUNE	D	OKEECHOBEE	A/D	ORESTIMBA	C	PACKER	C
NIAGARA	C	NORWALK	B	OKEELANTA	A/D	ORFORD	C	PACKHAM	B
NIART	B	NORWAY FLAT	B	OKEMAH	C	ORIDIA	C	PACKSADDLE	B
NIBLEY	C	NORWELL	C	OKLARED	B	ORIF	A	PACKWOOD	D
NICHOLSON	C	NORWICH	D	OKLAWAHA	A/D	ORIO	C	PACOLET	B
NICHOLVILLE	C	NORWOOD	B	OKMOK	B	ORION	B	PACTOLUS	C
NICKEL	B	NOTI	D	OKO	D	ORITA	B	PADEN	C
NICODEMUS	B	NOTUS	A/C	OKOBOJI	C	ORLAND	B	PADRONI	B
NICOLAUS	C	NOUQUE	D	OKOLONA	D	ORLANDO	A	PADUCAH	B
NICOLLET	B	NOVARA	B	OKREEK	D	ORMAN	C	PADUS	B
NIELSEN	D	NOVARY	B	OKTIBBEHA	D	ORMSBY	B/C	PAESL	B
NIGHTHAWK	B	NOWOOD	C	OLA	C	ORODELL	C	PAGET	B
NIHILL	B	NOYO	C	OLAA	A	ORO FINO	B	PAGODA	C
NIKABUNA	D	NOYSON	C	OLALLA	C	ORO GRANDE	C	PAHRANAGAT	C
NIKEY	B	NUBY	C/D	OLANTA	B	OROND	D	PAHREAH	D
NIKISHKA	A	NUCKOLLS	C	OLATHE	C	OROVADA	C	PAHROC	D
NIKLASON	B	NUCLA	B	OLD CAMP	D	ORPHANT	D	PAIA	C
NIKOLAI	D	NUECES	C	OLDHAM	C	ORR	C	PAICE	C
NILAND	C	NUGENT	A	OLDS	D	ORRVILLE	C	PAINESVILLE	C
NILES	C	NUGGET	C	OLDSMAR	B/D	ORSA	A	PAINTROCK	C
NIMROD	C	NUMA	C	OLDWICK	B	ORSINO	A	PAIT	B
NINCH	C	NUNDA	C	OLELO	B	ORTELLO	A	PAJARITO	B
NINEMILE	D	NUNICA	C	OLENA	B	ORTIGALITA	C	PAJARO	C
NINEVEH	B	NUNN	C	OLEQUA	B	ORTING	C	PAKA	B
NINIGRET	B	NUSS	D	OLETE	C	ORTIZ	C	PAKALA	B
NININGER	B	NUTLEY	C	OLEX	B	ORTLEY	B	PAKINI	B
NINNESCAH	B	NUTRAS	C	OLGA	C	ORWET	A	PALA	B
NIOBELL	C	NUTRIOSO	B	OLI	B	ORWOOD	B	PALACIO	B
NIOTA	D	NUVALDE	C	OLIAGA	B/D	OSAGE	D	PALAPALAI	B
NIPE	B	NYALA	D	OLINDA	B	OSAKIS	B	PALATINE	B
NIPPERSINK	B	NYMORE	A	OLIPHANT	B	OSCAR	D	PALESTINE	B
NIPPT	A	NYSSA	C	OLIVENHAIN	D	OSCURA	C	PALISADE	B
NIPSUM	C	NYSSATON	B	OLIVER	B	OSGOOD	B	PALMA	B
NIRA	B	NYSTROM	C	OLIVIER	C	OSHA	B	PALMAREJO	C
NISHNA	C			OLJETO	A	OSHAWA	D	PALM BEACH	A
NISHON	D	OAHE	B	OLMITO	D	O'SHEA	C	PALMER	D
NISQUALLY	A	OAKDALE	B	OLMITZ	B	OSHKOSH	C	PALMER CANYON	B
NISSWA	B	OAKDEN	D	OLMOS	C	OSHTEMO	B	PALMICH	B
NIU	B	OAKFORD	B	OLMSTED	B/D	OSIER	B/D	PALMS	D
NIULII	C	OAK GLEN	B	OLNEY	B	OSKA	C	PALMYRA	B
NIVLOC	D	OAK GROVE	C	OLOKUI	D	OSMUND	B	PALO	B
NIWOT	C	OAK LAKE	B	OLPE	C	OSO	B	PALODURO	B
NIXA	C	OAKLAND	C	OLSON	D	OSOBB	D	PALOMAS	B
NIXON	B	OAKS RIDGE	C	OLTON	C	OSORIDGE	D	PALOMINO	D
NIXONTON	B	OAKVILLE	A	OLUSTEE	B/D	OSOTE	B	PALOS VERDES	B
NIZINA	A	OAKWOOD	D	OLYIC	B	OSSIAN	C	PALOUSE	B
NOBE	D	OANAPUKA	B	OLYMPIC	B	OST	B	PALSGROVE	B
NOBLE	B	OASIS	B	OMADI	B	OSTRANDER	B	PAMLICO	D
NOBSCOTT	A	OATMAN	B	OMAHA	B	OTERO	B	PAMOA	C
NOCKEN	C	OBAN	C	OMAK	C	OTHELLO	D	PAMSDEL	D
NODAWAY	B	OBARC	B	OMEGA	A	OTIS	C	PAMUNKEY	C
NOEL	D	OBEN	C	OMENA	B	OTISCO	A	PANA	B
NOHILI	D	OBRAST	D	OMNI	C	OTISVILLE	A	PANACA	D
NOKASIPPI	D	OBRAY	D	ONA	A/D	OTLEY	B	PANAEWA	D
NOKAY	C	OBURN	D	ONALASKA	B	OTSEGO	C	PANASOFFKEE	D
NOKOMIS	B	OCALA	D	ONAMIA	B	OTTER	B/D	PANCHERI	B
NOLAM	B	OCEANET	D	ONARGA	B	OTTERBEIN	C	PANCHUELA	C
NOLICHUCKY	B	OCEANO	A	ONAWA	D	OTTERHOLT	B	PANDO	B
NOLIN	B	OCHEYEDAN	B	ONAWAY	B	OTTOKEE	A	PANDOAH	C
NOLO	B	OCHLOCKONEE	B	ONDAWA	B	OTWAY	D	PANDORA	D
NOME	D	OCHO	D	ONEIDA	B	OTWELL	C	PANDURA	D
NONDALTON	B	OCHOCO	C	O'NEILL	B	OUACHITA	C	PANE	B
NONOPAHU	D	OCHOPEE	B/D	ONEONTA	B	OURAY	A	PANGUITCH	B
NOOKACHAMPS	C/D	OCILLA	C	ONITA	C	OUTLET	C	PANHILL	B
NOOKSACK	B	OCKLEY	B	ONITE	B	OVALL	C	PANIOGUE	B
NOONAN	D	OCOEE	A/D	ONOTA	C	OVERGAARD	C	PANKY	C
NORA	B	OCONEE	C	ONOVA	D	OVERLAND	C	PANOCHE	B
NORAD	B	OCONTO	B	ONRAY	[illegible]	OVERLY	C	PANOLA	D
NORBERT	D	OCOSTA	D	ONSLOW	B	OVERTON	D	PANSEY	D
NORBORNE	B	OCQUEOC	B	ONTARIO	B	OVID	C	PANTEGO	D
NORBY	B	OCTAGON	B	ONTKO	B/D	OVINA	B	PANTHER	D
NORD	B	ODEE	D	ONTONAGON	D	OWEGO	D	PANTON	D
NORDBY	B	ODELL	B	ONYX	B	OWEN CREEK	C	PAOLA	A
NORDEN	B	ODEM	A	OOKALA	A	OWENS	D	PAOLI	B
NORDNESS	B	ODERMOTT	C	OPAL	D	OWHI	B	PAONIA	C
NORFOLK	B	ODESSA	D	OPEQUON	C/D	OWOSSO	B	PAPAA	D
NORGE	B	ODIN	C	OPHIR	C	OWYHEE	B	PAPAI	A
NORKA	B	ODNE	C	OPIHIKAO	D	OXALIS	C	PAPAKATING	D
NORMA	B/C	O'FALLON	D	OPPIO	D	OXBOW	C	PAPOOSE	C
NORMANGEE	D	OGDEN	D	OQUAGA	C	OXERINE	C	PARADISE	C
NORREST	C	OGEECHEE	C	ORA	C	OXFORD	D	PARADOX	B
NORRIS	C	OGEMAW	C	ORAN	B	OZAMIS	B/D	PARALOMA	C
NORRISTON	B	OGILVIE	C	ORANGE	D	OZAN	D	PARAMORE	D
NORTE	B	OGLALA	B	ORANGEBURG	B	OZAUKEE	C	PARASOL	B
NORTHDALE	C	OGLE	B	ORCAS	D			PARCELAS	D
NORTHFIELD	B	OHAYSI	D	ORCHARD	B	PAAIKI	B	PARDEE	D
NORTHMORE	C	OHIA	A	ORD	A	PAALOA	B	PAREHAT	C
NORTHPORT		OJAI	B	ORDNANCE	C	PAAUHAU	A	PARENT	C
NORTH POWDER	C	OJATA	D	ORDWAY	D	PACHAPPA	B	PARIETTE	C
NORTHUMBERLAND	C/D	OKANOGAN	B	ORELIA	D	PACHECO	B/C	PARIS	

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Table B-1--Continued

PARISHVILLE	C	PELIC	D	PICAYUNE	B	PLEASANT VIEW	B	POS.	D
PARKAY	B	PELLA	D	PICKAWAY	C	PLEDGER	D	POTAMO	D
PARKDALE	B	PELLEJAS	B	PICKENS	D	PLEEK	C	POTH	C
PARKE	B	PELONA	C	PICKETT	B	PLEINE	D	POTLATCH	C
PARKER	B	PELUK	D	PICKFORD	D	PLEVNA	D	POTRATZ	C
PARKFIELD	C	PEMBERTON	A	PICKRELL	D	PLONE	B	POTSDAM	B
PARKHILL	D	PEMBINA	C	PICKWICK	B	PLOVER	B	POTTER	C
PARKHURST		PEMBROKE	B	PICO	B	PLUMAS	B	POTTS	B
PARKINSON	B	PENA	B	PICOSA	C	PLUMMER	B/D	POUDRE	B
PARKVIEW	B	PENCE	A	PICTOU	B	PLUSH	B	POULTNEY	B
PARKVILLE	C	PENDEN	B	PIE CREEK	D	PLUTH	B	POUNCEY	D
PARKWOOD	A/D	PEND OREILLE	B	PIERIAN	A	PLUTOS	C	POVERTY	A
PARLEYS	B	PENDROY	D	PIERPONT	C	PLYMOUTH	A	POWDER	B
PARLIN	C	PENELAS	D	PIERRE	D	POALL	C	POWDERHORN	C
PARLO	B	PENINSULA	C	PIERSONTE	B	POARCH	B	POWELL	C
PARMA	C	PENISTAJA	B	PIIHONUA	A	POCALLA	A	POWER	B
PARNELL	D	PENITENTE	B	PIKE	B	POCATELLO	B	POWHITE	C
PARR	B	PENLAW	C	PILCHUCK	A	POCKER	D	POWLEY	D
PARRAN	D	PENN	C	PILGRIM	B	POCOMOKE	D	POWWATKA	C
PARRISH	C	PENNEL	C	PILOT	B	PODO	D	POY	D
PARSHALL	B	PENNINGTON	B	PILOT ROCK	C	PODUNK	B	POYGAN	D
PARSIPPANY	D	PENO	C	PIMA	B	POE	B/C	POZO	C/D
PARSONS	D	PENOYER	C	PIMER	B	POEVILLE	D	POZO BLANCO	B
PARTRI	C	PENROSE	D	PINAL	D	POGAL	B	PRAG	C
PASAGSHAK	D	PENSORE	D	PINALENO	B	POGANEAB	D	PRATHER	B
PASCO	B/C	PENTHOUSE	D	PINAMT	B	POGUE	B	PRATLEY	C
PASO SECO	D	PENTZ	D	PINATA	C	POHAKUPU	A	PRATT	A
PASQUETTI	C/D	PENWELL	A	PINAVETES	A	POINDEXTER	C	PREACHER	B
PASQUOTANK	B/D	PENWOOD	A	PINCHER	C	POINSETT	B	PREAKNESS	D
PASSAR	C	PEOGA	C	PINCKNEY	C	POINT	B	PREBISH	D
PASS CANYON	D	PEOH	C	PINCONNING	D	POINT ISABEL	C	PREBLE	C
PASSCREEK	C	PEONE	B/C	PINCUSHION	B	POJOAQUE	B	PRENTISS	C
PASTURA	D	PEORIA	D	PINEDA	B/D	POKEGEMA	B	PRESQUE ISLE	B
PATAHS	B	PEOTONE	C	PINEDALE	B	POKEMAN	B	PRESTO	A
PATENT	C	PEPOON	B	PINEGUEST	B	POKER	C	PRESTON	A
PATILLAS	B	PEQUEA	C	PINELLOS	A/D	POLAND	B	PREWITT	B
PATILO	C	PERCHAS	D	PINETOP	C	POLAR	B	PREY	D
PATIT CREEK	B	PERCIVAL	C	PINEVILLE	B	POLATIS	C	PRICE	C
PATNA	B	PERELLA	C	PINEY	C	POLE	A	PRIDA	D
PATOUTVILLE	C	PERHAM	C	PINICON	B	POLEBAR	C	PRIDHAM	D
PATRICIA	B	PERICO	B	PINKEL	C	POLELINE	B	PRIETA	D
PATRICK	B	PERITSA	C	PINKHAM	B	POLEO	B	PRIMEAUX	C
PATROLE	C	PERKINS	C	PINKSTON	B	POLEY	C	PRIMGHAR	B
PATTANI	D	PERKS	A	PINNACLES	C	POLICH	B	PRINCETON	B
PATTENBURG	B	PERLA	C	PINO	C	POLLARD	C	PRINEVILLE	C
PATTER	C	PERMA	A	PINOLA	C	POLLASKY	C	PRING	B
PATTERSON	C	PERMANENTE	C	PINOLE	B	POLLY	B	PRINS	C
PATTON	B/D	PERRIN	B	PINON	C	POLO	B	PRITCHETT	C
PATHWAY	C	PERRINE	D	PINONES	D	POLSON	C	PROCTOR	B
PAUL	B	PERROT	D	PINTAS	D	POLVADERA	B	PROGRESSO	C
PAULDING	D	PERRY	D	PINTLAR	A	POMAT	C	PROMISE	D
PAULINA	D	PERRYPARK	B	PINTO	C	POMELLO	C	PROMO	D
PAULSELL	D	PERRYVILLE	B	PINTURA	A	POMPANO	A/D	PROMONTORY	B
PAULSON	B	PERSANTI	C	PINTWATER	D	POMPONIO	C/D	PRONG	C
PAULVILLE	B	PERSAYO	D	PIOCHE	D	POMPTON	B	PROSPECT	B
PAUMALU	B	PERSHING	C	PIOPOLIS	D	POMROY	B	PROSPER	B
PAUNSAUGUNT	D	PERSIS	B	PIPER	B/C	PONCA	B	PROSSER	C
PAUSANT	B	PERT	D	PIROUETTE	D	PONCENA	D	PROTIVIN	C
PAUWELA	B	PERU	C	PIRUM	B	PONCHA	A	PROUT	C
PAVANT	D	PESCADERO	C/D	PISGAH	C	POND	B/C	PROVIDENCE	C
PAVILLION	B	PESET	C	PISHKUN	B	POND CREEK	B	PROVO	D
PAVOHROO	B	PESHASTIN	B	PISTAKEE	B	PONDILLA	A	PROVO BAY	D
PAWCATUCK	D	PESO	C	PIT	D	PONIL	D	PROWERS	B
PAWLET	B	PETEETNEET	D	PITTMAN	D	PONTOTOC	B	PTARMIGAN	B
PAWNEE	D	PETERBORO	B	PITTSFIELD	B	PONZER	D	PUAULU	A
PAXTON	C	PETERS	D	PITTSTOWN	C	POOKU	A	PUCHYAN	A
PAXVILLE	D	PETOSKEY		PITTWOOD	B	POOLE	B/D	PUDDLE	D
PAYETTE	B	PETRIE	D	PITZER	C	POOLER	D	PUERCO	D
PAYMASTER	B	PETROLIA	D	PIUTE	D	POORMA	B	PUERTA	D
PAYNE	C	PETTONS	C	PLACEDO	D	POPE	B	PUETT	D
PAYSON	D	PEWAMO	B/D	PLACENTIA	D	POPPLETON	A	PUGET	B/C
PEACHAM	D	PEYTON	B	PLACERITOS	C	POQUONOCK	C	PUGSLEY	B
PEARL HARBOR	D	PFEIFFER	B	PLACID	A/D	PORRETT	B/D	PUHI	A
PEARMAN		PHAGE	B	PLACK	D	PORT	B	PUHIMAU	D
PEARSOLL	D	PHANTOM	C	PLAINFIELD	A	PORTAGEVILLE	D	PULASKI	B
PEAVINE	C	PHARO	B	PLAINVIEW	C	PORTALES	B	PULEHU	B
PECATONICA	B	PHAROLIO	D	PLAISTED	C	PORTALTO	B	PULLMAN	D
PECOS	D	PHEBA	C	PLANO	B	PORT BYRON	B	PULS	D
PEDEE	C	PHEENEY	B	PLASKETT	D	PORTERS	B	PULSIPHER	D
PEDERNALES	C	PHELAN	B	PLATA	B	PORTERVILLE	D	PULTNEY	C
PEDIGO	B/C	PHELPS	B	PLATEA	C	PORTHILL	C	PUMEL	C
PEDLAR	D	PHIFERSON	B	PLATEAU	B	PORTINO	C	PUMPER	C
PEDOLI	C	PHILBON	B/D	PLATNER	C	PORTLAND	D	PUNA	A
PEDRICK	B	PHILIPSBURG	B	PLATO	C	PORTNEUF	B	PUNALUU	D
PEEBLES	C	PHILLIPS	C	PLATORO	B	PORTOLA	C	PUNOHU	A
PEEL	C	PHILO	B	PLATTE	D	PORTSMOUTH	D	PURDAM	C
PEELER	B	PHILOMATH	D	PLATTVILLE	B	PORUM	C	PURDY	D
PEEVER	C	PHIPPS	C	PLAZA	B/C	POSANT	C	PURGATORY	D
PEGLER	D	PHOEBE	B	PLEASANT	C	POSEY	B	PURNER	D
PEGRAM	B	PHOENIX	D	PLEASANT GROVE	B	POSITAS	D	PURSLEY	B
PEKIN	C	PIASA	D	PLEASANTON	B	POSKIN	C	PURVES	D
PELHAM	B/D	PICACHO	C	PLEASANT VALE	B	POSOS	C	PUSTOI	A

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PUTNAM	D	RANDMAN	D	REELFOOT	C	RIFFE	B	ROLETTE	C
PUUKALA	D	RANDOLPH	D	REESER	C	RIFLE	A/D	ROLFE	C
PUUONE	C	RANDS	C	REESVILLE	C	RIGA	D	ROLISS	D
PUU OO	A	RANGER	D	REEVES	C	RIGGINS	A	ROLLA	C
PUU OPAE	B	RANIER	C	REFUGE	C	RIGLEY	B	ROLLII	D
PUU PA	B	RANKIN	C	REGAN	B	RILEY	C	ROLOFF	C
PUYALLUP	B	RANTOUL	D	REGENT	C	RILLA	B	ROMBERG	B
PYLE	A	RANYHAN	B	REHM	C	RILLITO	B	ROMBO	C
PYLON	D	RAPELJE	C	REICHEL	B	RIMER	C	ROMEO	C
PYOTE	A	RAPHO	B	REIFF	B	RIMINI	A	ROMNEY	C
PYRAMID	D	RAPIDAN	B	REILLY	A	RIMROCK	D	ROMULUS	D
PYRMONT	D	RAPLEE	C	REINACH	B	RIN	B	ROND	C
		RARDEN	C	REKOP	D	RINCON	C	RONNEBY	B
QUACKENBUSH	C	RARICK	B	RELAN	A	RINCONADA	C	RONSON	B
QUAKER	C	RARITAN	C	RELAY	B	RINOGE	D	ROOSE	B
QUAKERTOWN	B	RASBAND	B	RELIANCE	C	RINGLING	C	ROOTEL	D
QUAHSA	D	RASSET	B	RELIZ	D	RINGO	D	ROSACHI	C
QUAMON	A	RATAKE	C	RELSE	B	RINGOLD	B	ROSAMOND	B
QUANAH	B	RATHBUN	C	REMBERT	D	RINGWOOD	B	ROSANE	C
QUANDAHL	B	RATLIFF	B	REMMIT	A	RIO	D	ROSANKY	C
QUARLES	D	RATON	D	REMSEN	D	RIO ARRIBA	D	ROSARIO	C
QUARTZBURG	C	RATTLER	B	REMUDAR	B	RIOCONCHO	C	ROSCOE	D
QUATAMA	C	RATTO	D	REMUNDA	C	RIO GRANDE	B	ROSCOMMON	D
QUAY	B	RAUB	B	RENBAC	D	RIO KING	C	ROSEBERRY	B/D
QUAZO	D	RAUVILLE	D	RENCALSON	C	RIO LAJAS	A	ROSEBLOOM	D
QUEALY	D	RAUZI	B	RENCOT	A	RIO PIEDRAS	B	ROSEBUD	B
QUEBRADA	C	RAVALLI	C	RENFROW	D	RIPLEY	B	ROSEBURG	B
QUEENY	D	RAVENDALE	D	RENICK	D	RIPON	B	ROSE CREEK	C
QUEETS	B	RAVENNA	C	RENNIE	C/D	RIRIE	B	ROSEGLEN	B
QUEMADO	C	RAVOLA	B	RENO	D	RISBECK	B	ROSEHILL	D
QUENZER	D	RAWAH	B	RENOHILL	C	RISLEY	D	ROSELAND	D
QUICKSELL	D	RAWHIDE	D	RENOVA	B	RISTA	C	ROSELLA	D
QUIETUS	C	RAWSON	B	RENOX	B	RISUE	D	ROSELMS	D
QUIGLEY	B	RAY	B	RENSHAW	B	RITCHEY	B	ROSEMOUNT	B
QUILCENE	C	RAYADO	C	RENSLOW	B	RITNER	C	ROSENDALE	B
QUILLAYUTE	B	RAYENOUF	B	RENSSELAER	C	RITO	B	ROSE VALLEY	C
QUIMBY	B	RAYMONDVILLE	D	RENTIDE	C	RITTER	B	ROSEVILLE	B
QUINCY	A	RAYNE	B	RENTON	B/C	RITTMAN	C	ROSEWORTH	C
QUINLAN	C	RAYNESFORD	B	RENTSAC	C	RITZ	B/D	ROSHE SPRINGS	D
QUINN	D	RAYNHAM	C	REPARADA	D	RITZCAL	B	ROSITAS	A
QUINNEY	C	RAYNOR	D	REPP	A	RITZVILLE	B	ROSLYN	B
QUINTON		RAZOR	C	REPPART	B	RIVERHEAD	B	ROSMAN	B
QUITMAN	C	RAZORT	B	REPUBLIC	B	RIVERSIDE	A	ROSNEY	C
QUONSET	A	READING	C	RESCUE	C	RIVERTON	C	ROSS	B
		READINGTON	C	RESERVE	B	RIVERVIEW	B	ROSS FORK	C
RABER	C	READLYN	B	RESNER	B	RIVRA	A	ROSSI	C
RABEY	A	REAGAN	B	RET	B/C	RIXIE	C	ROSSMOYNE	C
RABIDEUX	B	REAKOR	B	RETRIEVER	D	RIXON	C	ROSS VALLEY	C
RABUN	B	REAL	C	RETSOF	C	RIZ	D	ROTAN	C
RACE	D	REAP	D	RETSOK	B	ROANOKE	D	ROTHIEMAY	B
RACHERT	D	REARDAN	C	REXBURG	B	ROBANA	B	ROTHSAY	B
RACINE	B	REAVILLE	C	REXFORD	C	ROBBINS	B	ROTTULEE	B
RACOON	D	REBA	C	REXOR	A	ROBBS	D	ROUBIDEAU	C
RAD	C	REBEL	B	REYES	C/D	ROBERTS	D	ROUEN	C
RADERSBURG	B	REBUCK		REYNOLDS		ROBERTSDALE	C	ROUND BUTTE	D
RADFORD	B	RECAL	D	REYNOSA	B	ROBERTSVILLE	D	ROUNDLEY	C
RADLEY	C	RECLUSE	C	REYWAT	D	ROBIN	B	ROUNDTOP	C
RADNOR	D	REDBANK	B	RHAME	B	ROBINSON	D	ROUNDUP	C
RAFAEL	D	RED BAY	B	RHEA	B	ROBINSONVILLE	B	ROUNDY	C
RAGER	B	RED BLUFF	C	RHINEBECK	D	ROBLEDO	D	ROUSSEAU	A
RAGLAN	C	RED BUTTE	B	RHOADES	D	ROB ROY	C	ROUTON	D
RAGNAR	B	REDBY	C	RHOAME	C	ROBY	C	ROUTT	C
RAGO	C	REDCHIEF	C	RIB	C	ROCA	D	ROVAL	D
RAGSDALE	B/D	REDCLOUD	B	RICCO	D	ROCHE	C	ROWE	D
RAGTOWN	D	REDDICK	C	RICETON	B	ROCHELLE	C	ROWENA	C
RAHAL	C	REDDING	D	RICEVILLE	C	ROCHEPORT	C	ROWLAND	C
RAHM	C	REDFIELD	B	RICHARDSON	B	ROCKAWAY	C	ROWLEY	B
RAIL	C/D	RED HILL	C	RICHEAU	C	ROCKCASTLE	D	ROXAL	D
RAINBOW	C	RED HOOK	C	RICHEY	C	ROCK CREEK	D	ROXBURY	B
RAINEY	B	REDLAKE	D	RICHFIELD	C	ROCKFORD	B	ROY	B
RAINS	B/D	REDLANDS	B	RICHFORD	A	ROCKHOUSE	A	ROYAL	B
RAINSBORO	C	REDLODGE	D	RICHLIE	A	ROCKINGHAM	C/D	ROYALTON	C
RAKE	D	REDMANSON	B	RICHMOND	D	ROCKLIN	C/D	ROYCE	B
RALSEN	B/C	REDMOND	C	RICHTER	B	ROCKLY	D	ROYSTONE	B
RAMADA	C	REDNUN	C	RICHVALE	B	ROCKPORT	C	ROZA	D
RAMADERO	B	REDOLA	B	RICHVIEW	C	ROCK RIVER	B	ROZELLVILLE	B
RAMBLER	B	REDONA	B	RICHWOOD	B	ROCKTON	B	ROZETTA	B
RAMELLI	C	REDRIDGE	B	RICKMORE	C	ROCKWELL	B	ROZLEE	C
RAMIRES	D	REDROB	D	RICKS	A	ROCKWOOD	B	RUARK	C
RAMMEL	C	RED ROCK	B	RICO	C	ROCKY FORD	B	RUBICON	A
RAMO	C	RED SPUR	B	RICREST	B	RODDY		RUBIO	C
RAMONA	B	REDSTOE	B	RIDD	C	RODMAN	A	RUBY	B
RAMPART	B	REDTHAYNE	B	RIDGEBURY	C	ROE	B	RUBYHILL	C
RAMPARTAR	A	REDTOM	C	RIDGECREST	C	ROEBUCK	D	RUCH	B
RAMPARTER	A	REDVALE	C	RIDGEDALE	B	ROELLEN	D	RUCKLES	D
RAMSEY	D	REDVIEW	C	RIDGELAND	D	ROEMER	C	RUCLICK	C
RAMSHORN	B	REE	B	RIDGELAWN	A	ROESIGER	B	RUDD	D
RANCE	C	REEBEX	C	RIDGELY	B	ROGERT	D	RUDEEN	B
RANCHERIA	B	REED	D	RIDGEVILLE	B	ROHNERVILLE	B	RUDOLPH	C
RAND	B	REEDER	B	RIDGEWAY	D	ROHRERSVILLE	C	RUDYARD	D
RANDADO	C	REEDPOINT	C	RIDIT	C	ROIC	D	RUELLA	B
RANDALL	D	REEDY	D	RIETBROCK	C	ROKEBY	D	RUGGLES	B

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Table B-1--Continued

RUIDOSO	C	SALVISA	C	SAUK	B	SEDAN		SHELBY	B
RUKO	D	SALZER	D	SAULICH	D	SEOILLO	B	SHELBYVILLE	B
RULE	B	SAMBA	D	SAUM	C	SEOWELL	C	SHELDON	
RULICK	C	SAMISH	C/D	SAUNDERS	C	SEEDSKADEE	D	SHELIKOF	D
RUMBO	C	SAMMAMISH	C	SAUVIE	C/D	SEES	C	SHELLABARGER	B
RUMFORD	B	SAMPSEL	D	SAUVOLA	C	SEEWEE	B	SHELLDRAKE	A
RUMNEY	C	SAMPSON	B	SAVAGE	C	SEGAL	D	SHELLROCK	A
RUMPLE	C	SAMSIL	D	SAVANNAH	C	SEGNO	C	SHELMADINE	D
RUM RIVER	C	SAN ANDREAS	C	SAVENAC	C	SEHORN	D	SHELOCTA	B
RUNE	C	SAN ANTON	B	SAVO	C	SEITZ	C	SHELTON	C
RUNGE	B	SAN ANTONIO	C	SAVOIA	B	SEJITA	D	SHENA	C
RUNNELLS	C	SAN ARCACIO	B	SAWABE	D	SEKIL	C	SHENANDOAH	C
RUNNYMEDE	B	SAN BENITO	B	SAWATCH	C	SEKIU	D	SHEP	B
RUPERT	A	SANCHEZ	D	SAWCREEK	B	SELAH	C	SHEPPARD	A
RUSCO	C	SANDALL	C	SAWMILL	C	SELDEN	C	SHERANDO	A
RUSE	D	SANDERSON	B	SAWYER	C	SELEGNA	D	SHERAR	C
RUSH	C	SANDLAKE	C	SAXBY	D	SELFRIDGE	C	SHERBURNE	B
RUSHTOWN	A	SANDLEE	A	SAXON	B	SELKIRK	D	SHERIDAN	B
RUSHVILLE	D	SANELI	D	SAYBROOK	B	SELLE	B	SHERLOCK	B
RUSS	B	SAN EMIGDIO	B	SAYLESVILLE	C	SELLERS	A/D	SHERM	D
RUSSELL	B	SANFORD	A	SAYLOR	A	SELMA	B	SHERRYL	B
RUSSELLVILLE	C	SANGER	B	SCALA	B	SEMIAHMOO	D	SHERWOOD	B
RUSSLER	C	SAN GERMAN	D	SCAMMAN	C	SEMIHMOO	D	SHIBLE	B
RUSTON	B	SANGO	C	SCANDIA	B	SEMINARIO	D	SHIELDS	C
RUTLAND	C	SANGREY	A	SCANTIC	C	SEMIX	C	SHIFFER	B
RUTLEGE	D	SANILAC	C	SCAR	A	SEN	B	SHILOH	C
RYAN	D	SAN ISABEL	B	SCARBORO	D	SENECAVILLE	C	SHINAKU	D
RYAN PARK	B	SAN JOAQUIN	D	SCAVE	C	SEQUATCHIE	B	SHINGLE	D
RYDE	B/D	SAN JON	C	SCHAFFENAKE›	A	SEQUIM	A	SHINGLETOWN	C
RYDER	C	SAN JOSE	B	SCHAMBER	A	SEQUIN	B	SHINN	B
RYEGATE	B	SAN JUAN	A	SCHAMP	C	SEQUOIA	C	SHINROCK	C
RYELL	A	SAN LUIS	B	SCHAPVILLE	C	SERENE	D	SHIOCTON	B
RYEPATCH	D	SAN MATEO	B	SCHEBLY	D	SERNA	D	SHIPLEY	C
RYER	C	SAN MIGUEL	C	SCHERRARD	D	SEROCO	A	SHIPROCK	B
RYORP	C	SANPETE	B	SCHLEY	B	SERPA	C/D	SHIRAT	B
RYUS	C	SANPITCH	C	SCHMUTZ	B	SERVOSS.	D	SHIRK	C
		SAN POIL	B	SCHNEBLY	D	SESAME	C	SHOALS	C
SABANA	D	SAN SABA	D	SCHNEIDER	C	SESPE	C	SHOEBAR	B
SABANA SECA	D	SAN SEBASTIAN	B	SCHNOORSON	B/D	SESSIONS	C	SHOEFFLER	B
SABENYO	B	SANTA	C	SCHNORBUSH	C	SESSUM	D	SHONKIN	D
SABINA	C	SANTA CLARA	C	SCHODACK		SETTERS	C	SHOOFLIN	C
SABINE	A	SANTA FE	D	SCHODSON	C	SETTLEMEYER	D	SHOOK	A
SABLE	D	SANTA ISABEL	D	SCHOFIELD	B	SEVAL	D	SHOREWOOD	C
SAC	B	SANTA LUCIA	C	SCHOHARIE	C	SEVERN	B	SHOREY	B
SACO	D	SANTA MARTA	C	SCHOLLE	B	SEVILLE	D	SHORN	B
SACRAMENTO	C/D	SANTANA	C	SCHOOLEY	C/D	SEVY	C	SHORT CREEK	D
SACUL	D	SANTAQUIN	A	SCHOONER	D	SEWARD	B	SHOSHONE	D
SADDLE	B	SANTA YNEZ	C	SCHRADER	D	SEWELL	B	SHOTWELL	D
SADDLEBACK	B	SANTEE	D	SCHRAP	D	SEXTON	D	SHOUNS	B
SADER	D	SANTIAGO	B	SCHRIER	B	SEYMOUR	C	SHOWALTER	C
SADIE	B	SANTIAM	C	SCHROCK	B	SHAAK	D	SHOWLOW	C
SADLER	C	SAN TIMOTEO	C	SCHUMACHER	B	SHADELAND	C	SHREWSBURY	D
SAFFELL	B	SANTONI	D	SCHUYLKILL	B	SHAFFER	A	SHRINE	B
SAGANING	D	SANTOS	C	SCIO	B	SHAKAN	B	SHROE	D
SAGE	D	SANTO TOMAS	B	SCIOTOVILLE	C	SHAKESPEARE	C	SHROUTS	D
SAGEHILL	B	SAN YSIDRO	D	SCISM	B	SHAKOPEE	C	SHUBUTA	C
SAGEMOOR	C	SAPINERO	B	SCITUATE	C	SHALCAR	D	SHULE	B
SAGERTON	C	SAPP	D	SCOBEY	C	SHALET	D	SHULLSBURG	C
SAGINAW		SAPPHIRE	B	SCOOTENEY	B	SHAM	D	SHUMWAY	D
SAGO	D	SAPPHO	B	SCORUP	C	SHAMBO	B	SHUPERT	C
SAGOUSPE	C	SAPPINGTON	B	SCOTT	D	SHAMEL	B	SHUWAH	B
SAGUACHE	A	SARA	C	SCOTT LAKE	B	SHANAHAN	B	SI	B
SAHALIE	B	SARALBGUI	B	SCOUT	B	SHANDON		SIBLEYVILLE	B
SAINT HELENS	A	SARANAC	D	SCOWLALE	C	SHANE	D	SIBYLEE	D
SAINT MARTIN	C	SARAPH	D	SCRANTON	B/D	SHANO	B	SICILY	B
SALADO	B	SARATOGA	B	SCRAVO	A	SHANTA	B	SICKLESTEETS	C
SALADON	D	SARATON	B	SCRIBA	C	SHAPLEIGH	C/D	SIDELL	B
SALAL	B	SARBEN	A	SCRIVER	B	SHARATIN	B	SIEANCIA	B
SALAMATOF	D	SARCO	B	SCROGGIN	C	SHARKEY	D	SIEBER	A
SALAS	C	SARDINIA	C	SCULLIN	C	SHARON	B	SIELO	C
SALCHAKET	B	SARDO	B	SEABROOK	C	SHARPSBURG	B	SIEROCLIFF	D
SALEM	B	SARGEANT	D	SEAMAN	C	SHARROTT	D	SIERRA	B
SALEMSBURG	B	SARITA	A	SEAQUEST	C	SHARVANA	C	SIERRAVILLE	B
SALGA	C	SARKAR	D	SEARCHLIGHT	C	SHASKIT	B/C	SIESTA	D
SALIDA	A	SARPY	A	SEARING	B	SHASTA	A	SIFTON	B
SALINAS	C	SARTELL	A	SEARLA	B	SHAVANO	B	SIGNAL	C
SALISBURY	D	SASKA	B	SEARLES	C	SHAVER	B	SIGURD	B
SALIX	B	SASPAMCO	B	SEATON	B	SHAWA	B	SIKESTON	D
SALKUM	C	SASSAFRAS	B	SEATTLE	D	SHAWANO	A	SILCOX	B
SALLISAW	B	SASSER	B	SEAWILLOW	B	SHAWMUT	B	SILENT	D
SALLYANN	C	SATANKA	C	SEBAGO	D	SHAY	D	SILER	B
SALMON	B	SATANTA	B	SEBASTIAN	D	SHEAR	C	SILERTON	B
SALOL	D	SATELLITE	C	SEBASTOPOL	C	SHECKLER	C	SILI	D
SALONIE	D	SATT	D	SEBEKA	D	SHEDADO	B	SILSTID	A
SALREE	C/D	SATTLEY	B	SEBEWA	B/D	SHEDO	C	SILVER	C
SALTAIR	D	SATTRE	B	SEBREE	D	SHEEGE	D	SILVERADO	C
SALT CHUCK	A	SATURN	B	SEBRING	D	SHEEP CREEK	C	SILVERBOW	D
SALTER	B	SATUS	B	SEBUD	B	SHEEPHEAD	C	SILVER CREEK	D
SALTERY	D	SAUCIER	B	SECATA	C/D	SHEEPROCK	A	SILVERTON	C
SALT LAKE	D	SAUDE	B	SECCA	C	SHEETIRON	B	SILVIES	D
SALUDA	C	SAUGATUCK	C	SECRET	C	SHEFFIELD	D	SIMAS	C
SALUVIA		SAUGUS	B	SECRET CREEK	B	SHELBURNE	C	SIMCOE	C

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

SIMEON	A	SNOW	B	SQUALICUM	B	STISSING	C	SURGH	B
SIMMLER	D	SNOWDEN	C	SQUAW	B	STIVERSVILLE	B	SURPRISE	B
SIMMONT	C	SNOWLIN	B	SQUILLCHUCK	B	STOCKBRIDGE	B	SURRENCY	B/D
SIMNER	A	SNOWVILLE	D	SQUIMER	B	STOCKLAND	B	SURVYA	C
SIMON	C	SNOWY	A	SQUIRES	B	STOCKPEN	D	SUSIE CREEK	D
SIMONA	D	SOAKPAK	B	ST. ALBANS	B	STOCKTON	D	SUSITNA	B
SIMOTE	C	SOAP LAKE	B	ST. CHARLES	B	STODICK	D	SUSQUEHANNA	D
SIMPERS	B	SOBOBA	A	ST. CLAIR	D	STOKES	D	SUTHER	C
SIMPSON	C	SOBRANTE	C	ST. ELMO	A	STOMAR	C	SUTHERLIN	C
SIMS	D	SODA LAKE	B	ST. GEORGE	C	STONER	B	SUTLEW	B/C
SINAI	C	SODHOUSE	D	ST. HELENS	A	STONEWALL	A	SUTPHEN	D
SINCLAIR	C	SODUS	C	ST. IGNACE	C	STONO	B/D	SUTTLER	B
SINE	C	SOELBERG	B	ST. JOE	B/D	STONYFORD	D	SUTTON	B
SINGLETREE	C	SOFIA	B	ST. JOHNS	B/D	STOOKEY	B	SVEA	B
SINGSAAS	B	SOGN	D	ST. LUCIE	A	STORDEN	B	SVERDRUP	B
SINNIGAM	C	SOGZIE	B	ST. MARTIN	C	STORLA	B	SVOLD	C
SINOMAX	B	SOKOLOF	B	ST. MARYS	B	STORMITT	B	SWAGER	C
SINTON	B	SOLANO	D	ST. NICHOLAS	D	STORM KING	D	SWAKANE	C
SINUK	D	SOLDATNA	B	ST. PAUL	B	STORY	C	SWAN	C
SION	B	SOLDIER	C	ST. THOMAS	D	STOSSEL	C	SWANBOY	D
SIOUX	A	SOL DUC	B	STAATSBURG		STOUGH	C	SWANNER	D
SIPPLE	A	SOLDUC	B	STABLER	B	STOWELL	D	SWANSON	B
SIRI	B	SOLLEKS	C	STACY	B	STOY	C	SWANTON	B/D
SISKIYOU	B	SOLLER	D	STADY	B	STRAIGHT	C	SWANTOWN	C
SISSETON	B	SOLOMON	D	STAFFORD	C	STRAIN	B	SWAPPS	C
SISSON	B	SOLONA	B	STAGECOACH	B	STRASBURG	C	SWARTSWOOD	C
SITES	C	SOMBRERO	D	STAHL	C	STRATFORD	B	SWARTZ	D
SITKA	B	SOMERS	B	STALEY	C	STRAUSS	C	SWASEY	D
SIXMILE	B	SOMERSET	D	STAMBAUGH	B	STRAW	B	SWASTIKA	C
SIZEMORE	B	SOMERVELL	B	STAMFORD	D	STRAWN	B	SWATARA	A
SIZER	B	SOMSEN	C	STAMPEDE	D	STREATOR	C	SWAUK	C
SKAGGS	B	SONOITA	B	STAN	B	STROLE	B	SWAWILLIA	A
SKAGIT	B/C	SONOMA	D	STANDISH	C/D	STRONGHURST	B	SWEATMAN	C
SKAHA	A	SONTAG	D	STANEY	D	STRONTIA	B	SWEDE	B
SKALAN	C	SOPER	B/C	STANFIELD	C	STROUPE	C	SWEDEN	B
SKAMANIA	B	SOQUEL	B	STANLEY	C	STRYKER	B	SWEEN	C
SKAMOKAWA	B	SORDO	C	STANSBURY	D	STUBBS	C	SWEENEY	B
SKANEE	C	SORF	C	STANTON	D	STUCKCREEK	B	SWEET	C
SKELLOCK	B	SORRENTO	B	STAPLETON	B	STUKEL	D	SWEETGRASS	B
SKERRY	C	SORTER	B/D	STARBUCK	D	STUKEY	B	SWEETWATER	D
SKIDMORE	B	SOSA	C	STARGO	B	STUMBLE	A	SWENODA	B
SKILLET	C	SOTELLA	C	STARICHKOF	D	STUMPP	D	SWIFTCREEK	B
SKINNER	C	SOTIM	B	STARKS	C	STUMP SPRINGS	B	SWIFTON	A
SKIYOU	C	SOUTHFORK	D	STARLEY	D	STUNNER	B	SWIMS	A
SKOKOMISH	B/C	SOUTHGATE	D	STARR	B	STUTTGART	D	SWINGLER	C
SKOOKUMCHUCK	B	SOUTHWICK	C	STASER	B	STUTZMAN	C	SWINK	D
SKOWHEGAN	B	SPAA	D	STATE	B	STUTZVILLE	B/C	SWISBOB	D
SKULL CREEK	D	SPACE CITY	A	STATEN	D	SUBLETTE	B	SWITCHBACK	C
SKUMPAH	D	SPADE	B	STATLER	B	SUDBURY	B	SWITZERLAND	B
SKUTUM	C	SPALDING	D	STAVE	D	SUDDUTH	C	SWOPE	C
SKYBERG	C	SPAN	D	STAYTON	D	SUFFIELD	C	SWYGERT	C
SKYHAVEN	D	SPANAWAY	B	STEAMBOAT	D	SUGARLOAF	B	SYCAMORE	B/C
SKYKOMISH	B	SPANEL	D	STEARNS	D	SUISUN	D	SYCAN	A
SKYLICK	C	SPARTA	A	STECUM	A	SULA	B	SYLACAUGA	B/D
SKYLINE	D	SPEARFISH	B	STEED	A	SULLY	B	SYLVAN	B
SKYWAY	B	SPEARMAN	C	STEEDMAN	D	SULPHURA	D	SYMERTON	B
SLAB	D	SPEARVILLE	C	STEEKEE	C	SULTAN	B	SYNAREP	B
SLATE CREEK	C	SPECK	D	STEELE	B	SUMAS	B/C	SYRACUSE	B
SLAUGHTER	C	SPECTER	D	STEESE	C	SUMDUM	D	SYRENE	D
SLAVEN	D	SPEELYAI	C	STEFF	C	SUMMA	B	SYRETT	C
SLAWSON	B	SPEIGLE	B	STEGALL	C	SUMMERFIELD	C		
SLAYTON	D	SPENARD	D	STEIGER	A	SUMMERS	B	TABERNASH	B
SLEETH	C	SPENCER	B	STEINAUER	B	SUMMERVILLE	C	TABIONA	B
SLETTEN	D	SPENLO	B	STEINBECK	B	SUMMIT	C	TABLE MOUNTAIN	B
SLICKROCK	B	SPERRY	C	STEINMETZ	D	SUMMITVILLE	B	TABLER	D
SLIGHTS	D	SPICER	C	STEINSBURG	C	SUMTER	C	TABOR	D
SLIGO	B	SPILLVILLE	B	STEIWER	C	SUN	D	TACAN	B
SLIKOK	D	SPINKS	A	STELLAR	C	SUNBURST	C	TACOMA	D
SLIP	B	SPIRES	D	STEMILT	C	SUNBURY	B	TACOOSH	D
SLIPMAN	B/C	SPIRIT	B	STENDAL	C	SUNCOOK	A	TAFT	C
SLOAN	D	SPIRO	B	STEPHEN	C	SUND	C	TAGGERT	C
SLOCUM	B	SPLENDORA	C	STEPHENSBURG	B	SUNDELL	C	TAHOMA	B
SLODUC	C	SPLITRO	D	STEPHENVILLE	B	SUNDERLAND	C/D	TAHQUAMENON	D
SLOSS	C	SPOFFORD	C	STERLING	B	SUNDOWN	B	TAHQUATS	C
SLUICE	B	SPOKANE	B	STERLINGTON	B	SUNFIELD	B	TAINTOR	C
SMARTS	B	SPONSELLER	B	STETSON	B	SUNNILAND	C	TAJO	C
SMITH CREEK	A	SPOON BUTTE	C	STETTER	D	SUNNYHAY	D	TAKEUCHI	C
SMITHDALE	B	SPOONER	C	STEUBEN	B	SUNNYSIDE	B	TAKILMA	B
SMITHNECK	B	SPOTTSWOOD	B	STEVENS	B	SUNNYVALE	C	TAKOTNA	B
SMITHTON	D	SPRAGUE	B/C	STEVENSON	B	SUNRAY	B	TALAG	D
SMOLAN	C	SPRECKELS	C	STEWART	D	SUNRISE	D	TALANTE	C
SMOOT	D	SPRING	C/D	STICKNEY	C	SUNSET	B	TALAPUS	B
SNAG	B	SPRING CREEK	C	STIDHAM	A	SUNSHINE	C	TALBOTT	C
SNAHOPISH	B	SPRINGDALE	B	STIGLER	C	SUNSWEET	C	TALCOT	C
SNAKE	C	SPRINGER	B	STILLMAN	A	SUNUP	D	TALIHINA	D
SNAKE HOLLOW	B	SPRINGERVILLE	D	STILLWATER	D	SUPAN	B	TALKEETNA	C
SNAKELUM	B	SPRINGFIELD	D	STILSON	B	SUPERIOR	C	TALLAC	B
SNEAD	D	SPRINGMEYER	C	STIMSON	B/C	SUPERSTITION	A	TALLADEGA	C
SNELL	C	SPRINGTOWN	C	STINGAL	B	SUPERVISOR	C	TALLAPOOSA	C
SNELLING	B	SPROUL	D	STINSON	C	SUPPLEE	B	TALLEYVILLE	B
SNOHOMISH	D	SPUR	B	STIRK	D	SUR	B	TALLS	B
SNOQUALMIE	B	SPURLOCK	B	STIRUM	B	SURGEM	C	TALLULA	B

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Table B-1--Continued

TALLY	B	TENINO	B	TIGERON	A	TOMERA	D	TRENTON	D
TALMAGE	A	TENNO	D	TIGIWON	B	TOMICHI	A	TREP	B
TALMO	B	TENORIO	B	TIGRETT		TOMOKA	A/D	TRES HERMANOS	B
TALOKA	D	TENOT	C	TIGUA	D	TONASKET	B	TRETTEN	C
TALPA	D	TENRAG	B	TIJERAS	B	TONATA	C	TREVINO	D
TAMA	B	TENSAS	D	TILFORD	B	TONAWANDA	C	TREXLER	C
TAMAHA	C	TENSED	C	TILLEDA	B	TONEY	D	TRIAMI	C
TAMALCO	D	TENSLEEP	B	TILLICUM	B	TONGUE RIVER	C	TRIASSIC	
TAMBA	C/D	TEOCULLI	B	TILLMAN	C	TONINI	B	TRICON	C
TAMELY		TEPEE	D	TILMA	C	TONKA	C	TRIDELL	B
TAMMANY CREEK	B	TEPETE	B/D	TILSIT	C	TONKEY	D	TRIDENT	D
TAMMANY RIDGE	B	TERBIES	C	TILTON	B	TONKIN	C	TRIGO	C
TAMMS	C	TERESA	C	TIMBERG	C	TONKS	B/D	TRIMBLE	B
TAMPICO	B	TERINO	D	TIMBERLY	B	TONOPAH	B	TRIMMER	B
TANAMA	D	TERMINAL	D	TIMBLIN	D	TONOR	C	TRINCHERA	C
TANANA	D	TERMO	C	TIMENTWA	B	TONOWEK	B	TRINITY	D
TANBERG	D	TEROUGE	D	TIMKEN	D	TONRA	A	TRIOMAS	B
TANDY	C	TERRA CEIA	A/D	TIMMERMAN	B	TONSINA	B	TRIPIT	C
TANEUM	C	TERRAD	D	TIMMONS	B	TONUCO	C	TRIPLEN	B
TANEY	C	TERRERA	C	TIMPAHUTE	D	TOOLE	D	TRIPOLI	C
TANGAIR	C	TERRETON	C	TIMPANOGOS	B	TOOMES	D	TRIPP	B
TANNA	C	TERRIL	B	TIMPER	D	TOP	C	TRITON	C
TANNER	C	TERRY	B	TIMPOONEKE	B	TOPIA	D	TRIX	B
TANSEM	B	TERWILLIGER	C	TIMULA	B	TOPPENISH	B/C	TROJAN	B
TANTALUS	A	TESAJO	A	TINA	C	TOPTON		TROMMALD	D
TANWAX	D	TESCOTT	C	TINDAHAY	A	TOQUERVILLE	C	TROMP	C
TAOPI	C	TESUQUE	B	TINE	A	TOQUOP	A	TRONSEN	C
TAOS	D	TETON	A	TINGEY	B	TORBOY	B	TROOK	B
TAPIA	C	TETONIA	B	TINSLEY	A	TORCHLIGHT	C	TROPAL	D
TAPPEN	D	TETONKA	C	TINTON	A	TORDIA	D	TROSI	D
TARA	B	TETOTUM	C	TINYTOWN	B	TORHUNTA	C	TROUP	A
TARKIO	D	TEW	B/D	TIOCANO	D	TORNING	B	TROUT CREEK	C
TARKLIN	C	TEX	B	TIOGA	B	TORODA	B	TROUTDALE	B
TARPO	C	TEXLINE	B	TIPPAH	C	TORONTO	C	TROUT LAKE	C
TARRANT	D	TEZUMA	C	TIPPECANOE	B	TORPEDO LAKE	D	TROUT RIVER	A
TARRETE	D	THACKERY	B	TIPPER	A	TORREON	C	TROUTVILLE	B
TARRYALL	B	THADER	C	TIPPERARY	A	TORRES	B	TROXEL	B
TASCOSA	B	THAGE	C	TIPPIPAH	D	TORRINGTON	B	TROY	C
TASSEL	D	THANYON	A	TIPPO	C	TORRO	C	TRUCE	C
TATE	B	THATCHER	B	TIPTON	B	TORSIDO	D	TRUCKEE	C
TATIYEE	C	THATUNA	C	TIPTONVILLE	B	TORTUGAS	D	TRUCKTON	B
TATU	C	THAYNE	B	TIRO	C	TOSTON	D	TRUEFISSURE	A
TATUM	C	THEBES	B	TISBURY	B	TOTELAKE	A	TRUESDALE	C
TAUNTON	C	THEBO	D	TISCH	C	TOTEM	B	TRULL	C
TAVARES	A	THEDALUND	C	TISH TANG	B	TOTTEN	B	TRULON	B
TAWAS	A/D	THENAS	C	TITUSVILLE	C	TOUCHET	B	TRUMAN	B
TAWCAW	C	THEO	C	TIVERTON	A	TOUHEY	B	TRUMBULL	D
TAYLOR	C	THERESA	B	TIVOLI	A	TOULON	B	TRUMP	D
TAYLOR CREEK	D	THERIOT	D	TIVY	C	TOURN	C	TRYON	D
TAYLORSFLAT	D	THERMAL	C	TOA	C	TOURNQUIST	B	TSCHICOMA	B
TAYLORSVILLE	C	THERMOPOLIS	D	TOBICO	D	TOURS	B	TUB	C
TAYSOM	B	THESS	B	TOBIN	B	TOUTLE	A	TUBAC	C
TAZLINA	A	THETFORD	A	TOBISH	C	TOWER	D	TUCANNON	C
TEAL	D	THIEL	A	TOBLER	B	TOWHEE	D	TUCKERMAN	D
TEALSON	C	THIOKOL	C	TOBOSA	D	TOWNER	B	TUCSON	B
TEALWHIT	C	THOENY	D	TOBY	B	TOWNLEY	C	TUCUMCARI	B
TEANAWAY	C	THOMAS	D	TOCCOA	B	TOWNSBURY	B	TUFFIT	D
TEAPO	B	THORNDALE	D	TODD	B	TOWNSEND	C	TUGHILL	D
TEAS	C	THORNDIKE	C/D	TODDLER	B	TOWSON	B	TUJUNGA	A
TEASDALE	B	THORNOCK	D	TODDVILLE	B	TOXAWAY	D	TUKEY	C
TEBO	B	THORNTON	D	TOEHEAD	C	TOY	D	TUKWILA	D
TECHICK	B	THORNWOOD	B	TOEJA	C	TOYAH	B	TULA	C
TECOLOTE	B	THOROUGHFARE	B	TOEM	C	TOZE	B	TULANA	C/D
TECUMSAH	B	THORP	C	TOGO	B	TRABUCO	C	TULARE	C/D
TEDROW	B	THORR	B	TOGUS	D	TRACK	B/C	TULAROSA	B
TEEL	B	THORREL	B	TOHONA	C	TRACY	B	TULIA	B
TEHACHAPI	D	THOW	B	TOINE	C	TRAER	C	TULLAHASSEE	C
TEHAMA	C	THREE MILE	D	TOISNOT	D	TRAIL	A	TULLER	D
TEJA	C	THROCK	C	TOIYABE	C	TRAIL CREEK	B	TULLOCK	B
TEJON	B	THUNDERBIRD	D	TOKEEN	B	TRAM	B	TULLY	C
TEKOA	C	THURBER	C	TOKUL	C	TRANSYLVANIA	B	TULUKSAK	D
TELA	B	THURLONI	C	TOLBY	A	TRAPPER	A	TUMBEZ	D
TELEFONO	C	THURLOW	C	TOLEDO	D	TRAPPIST	C	TUMEY	D
TELEPHONE	D	THURMAN	A	TOLICHA	D	TRAPPS	B	TUMITAS	B
TELFER	A	THURMONT	B	TOLKE	B	TRASK	C	TUMWATER	A
TELFERNER	D	THURSTON	B	TOLL	A	TRAVELERS	D	TUNEHEAN	D
TELIDA	D	TIAGOS	B	TOLLGATE	B	TRAVER	B/C	TUNICA	D
TELL	B	TIAK	C	TOLLHOUSE	D	TRAVESSILLA	D	TUNIS	D
TELLER	B	TIBAN	B	TOLMAN	D	TRAVIS	C	TUNITAS	B
TELLICO	B	TIBBITTS	B	TOLNA	B	TRAWICK	B	TUNKHANNOCK	A
TELLMAN	B	TICA	D	TOLO	B	TRAY	C	TUNNEL	B
TELSTAD	B	TICE	C	TOLSONA	D	TREADWAY	D	TUPELO	D
TEMESCAL	D	TICHIGAN	C	TOLSTOI	D	TREASURE	B	TUPUKNUK	D
TEMPLE	B/C	TICHNOR	D	TOLT	D	TREBLOC	D	TUQUE	B
TEMVIK	B	TICKAPOO	D	TOLTEC	C	TREGO	C	TURBEVILLE	C
TENABO	D	TICKASON	B	TOLUCA	B	TRELONA	D	TURBOTVILLE	C
TENAHA	B	TIDWELL	D	TOLVAR	B	TREMANT	B	TURBYFILL	B
TENAS	C	TIERRA	D	TOMAH	C	TREMBLES	B	TURIN	B
TENCEE	D	TIETON	B	TOMAS	B	TREMPE	A	TURK	D
TENERIFFE	C	TIFFANY	C	TOMAST	C	TREMPEALEAU	B	TURKEYSPRINGS	C
TENEX	A	TIFTON	B	TOME	B	TRENARY	B	TURLEY	C
TENIBAC	B	TIGER CREEK	B	TOMEL	D	TRENT	B	TURLIN	B

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Table B-1--Continued

TURNBOW	C	USINE	B	VERDUN	D	WADDELL	B	WARDEN	B
TURNER	B	USKA	D	VERGENNES	D	WADDOUPS	B	WARDWELL	C
TURNERVILLE	B	UTALINE	B	VERHALEN	D	WADELL	B	WARE	B
TURNEY	B	UTE	C	VERMEJO	D	WADENA	B	WAREHAM	C
TURRAH	D	UTICA	A	VERNAL	B	WADESBORO	B	WARMAN	D
TURRET	B	UTLEY	B	VERNALIS	B	WADLEIGH	D	WARM SPRINGS	C
TURRIA	C	UTUADO	B	VERNIA	A	WADMALAW	D	WARNERS	A/D
TURSON	B/C	UVADA	D	VERNON	D	WADSWORTH	C	WARREN	
TUSCAN	D	UVALDE	C	VERONA	C	WAGES	B	WARRENTON	B/D
TUSCARAWAS	C	UWALA	B	VESSER	C	WAGNER	D	WARRIOR	
TUSCARORA	C			VESTON	D	WAGRAM	A	WARSAW	B
TUSCOLA	B	VACHERIE	C	VETAL	A	WAHA	C	WARSING	B
TUSCUMBIA	D	VADER	B	VETERAN	B	WAHEE	D	WARWICK	A
TUSEL	C	VADO	B	VEYO	D	WAHIAWA	B	WASATCH	A
TUSKEEGO	C	VAIDEN	D	VIA	B	WAHIKULI	B	WASEPI	B
TUSLER	B	VAILTON	B	VIAN	B	WAHKEENA	B	WASHBURN	
TUSQUITEE	B	VALBY	C	VIBORAS	D	WAHKIACUS	B	WASHINGTON	B
TUSTIN	B	VALCO	C	VIBORG	B	WAHLUKE	B	WASHOE	C
TUSTUMENA	B	VALDEZ	B/C	VICKERY	C	WAHMONIE	D	WASHOUGAL	B
TUTHILL	B	VALE	B	VICKSBURG	B	WAHPETON	C	WASHTENAW	C/D
TUTNI	B	VALENCIA	B	VICTOR	A	WAHTIGUP	B	WASILLA	D
TUTWILER	B	VALENT	A	VICTORIA	D	WAHTUM	D	WASIOJA	B
TUXEDO		VALENTINE	A	VICTORY	B	WAIAHA	D	WASSAIC	B
TUXEKAN	B	VALERA	C	VICU	D	WAIAKOA	C	WATAB	C
TWIN CREEK	B	VALKARIA	B/D	VIDA	B	WAIALEALE	D	WATAUGA	B
TWINING	C	VALLAN	D	VIDRINE	C	WAIALUA	B	WATCHAUG	B
TWISP	B	VALLECITOS	C/D	VIEJA	D	WAIAWA	D	WATCHUNG	D
TWO DOT	C	VALLEONO	B	VIENNA	B	WAIHUNA	D	WATERBORO	
TYBO	D	VALLERS	C	VIEQUES	B	WAIKALOA	B	WATERBURY	D
TYEE	D	VALMONT	C	VIEW	C	WAIKANE	B	WATERINO	C
TYGART	D	VALMY	B	VIGAR	C	WAIKAPU	B	WATERS	C
TYLER	D	VALOIS	B	VIGO	D	WAIKOMO	D	WATKINS	B
TYNDALL	B/C	VAMER	D	VIGUS	C	WAILUKU	B	WATKINS RIDGE	B
TYNER	A	VANAJO	D	VIKING	D	WAIMEA	B	WATO	B
TYRONE	C	VANANDA	D	VIL	D	WAINEE	B	WATOPA	B
TYSON	C	VAN BUREN		VILAS	A	WAINOLA	A	WATROUS	B
		VANCE	C	VILLA GROVE	B	WAIPAHU	C	WATSEKA	C
UANA	D	VANDA	D	VILLARS	B	WAISKA	B	WATSON	C
UBAR	C	VANDALIA	C	VILLY	D	WAITS	B	WATSONIA	D
UBLY	B	VANDERDASSON	D	VINA	B	WAKE	D	WATSONVILLE	D
UCOLA	D	VANDERGRIFT	C	VINCENNES	C	WAKEEN	B	WATT	D
UCOLO	C	VANDERHOFF	D	VINCENT	C	WAKEFIELD	B	WATTON	C
UCOPIA	B	VANDERLIP	A	VINEYARD	C	WAKELAND	B/D	WAUBAY	B
UDEL	D	VAN DUSEN	B	VINGO	B	WAKONDA	C	WAUBEEK	B
UDOLPHO	C	VANET	D	VINING	C	WAKULLA	A	WAUBONSIE	B
UFFENS	D	VANG	B	VINITA	C	WALCOTT	B	WAUCHULA	B/D
UGAK	D	VANHORN	B	VINLAND	C	WALDECK	C	WAUCOMA	B
UHLAND	B	VAN NOSTERN	B	VINSAD	C	WALDO	D	WAUCONDA	B
UHLIG	B	VANNOY	B	VINT	B	WALDRON	D	WAUKEE	B
UINTA	B	VANOSS	B	VINTON	B	WALDROUP	D	WAUKEGAN	B
UKIAH	C	VANTAGE	C	VIRA	C	WALES	B	WAUKENA	D
ULEN	B	VAN WAGONER	D	VIRATON	C	WALFORD	C	WAUKON	B
ULLOA	B	VARCO	C	VIRDEN	C	WALKE	C	WAUMBEK	B
ULM	B	VARELUM	C	VIRGIL	B	WALL	B	WAURIKA	D
ULRICHER	B	VARICK	D	VIRGIN PEAK	D	WALLACE	B	WAUSEON	B/D
ULUPALAKUA	B	VARINA	C	VIRGIN RIVER	D	WALLA WALLA	B	WAVERLY	B/D
ULY	B	VARNA	C	VIRTUE	C	WALLER	B/D	WAWAKA	C
ULYSSES	B	VARRO	B	VISALIA	B	WALLINGTON	C	WAYCUP	B
UMA	A	VARYSBURG	B	VISTA	C	WALLIS	B	WAYDEN	D
UMAPINE	B/C	VASHTI	C	VIVES	B	WALLKILL	C/D	WAYLAND	C/D
UMIAT	D	VASQUEZ	B	VIVI	B	WALLMAN	C	WAYNE	B
UMIKOA	B	VASSALBORO	D	VLASATY	C	WALLOWA	C	WAYNESBORO	B
UMIL	D	VASSAR	B	VOCA	C	WALLPACK	C	WAYSIDE	
UMNAK	B	VASTINE	C	VODERMAIER	B	WALLROCK	B/C	WEA	B
UMPA	B	VAUCLUSE	C	VOLADORA	B	WALLSBURG	D	WEAVER	C
UMPQUA	B	VAUGHNSVILLE	C	VOLCO	D	WALLSON	B	WEBB	C
UNA	D	VAYAS	D	VOLENTE	C	WALPOLE	C	WEBER	B
UNADILLA	B	VEAL	B	VOLGA	D	WALSH	B	WEBSTER	C
UNAWEEP	B	VEAZIE	B	VOLIN	B	WALSHVILLE	D	WEDEKIND	D
UNCOM	B	VEBAR	B	VOLINIA	B	WALTERS	A	WEDERTZ	C
UNCOMPAHGRE	D	VECONT	D	VOLKE	C	WALTON	C	WEDGE	A
UNEEDA	B	VEGA	C	VOLKMAR	B	WALUM	B	WEDOWEE	D
UNGERS	B	VEGA ALTA	C	VOLMER	D	WALVAN	B	WEED	B
UNION	C	VEGA BAJA	C	VOLNEY	B	WAMBA	B/C	WEEDING	A/C
UNIONTOWN	B	VEKOL	D	VOLPERIE	C	WAMIC	B	WEEDMARK	B
UNIONVILLE	C	VELDA	B	VOLTAIRE	D	WAMPSVILLE	B	WEEKSVILLE	B/D
UNISON	C	VELMA	B	VOLUSIA	C	WANATAH	B	WEEPON	D
UPDIKE	D	VELVA	B	VONA	B	WANBLEE	D	WEHADKEE	D
UPSAL	C	VENA	C	VORE	B	WANDO	A	WEIKERT	C/D
UPSATA	A	VENANGO	C	VROOMAN	B	WANETTA	A	WEIMER	D
UPSHUR	C	VENATOR	D	VULCAN	C	WANILLA	C	WEINBACH	C
UPTON	C	VENETA	C	VYLACH	D	WANN	A	WEIR	D
URACCA	B	VENEZIA	D			WAPAL	B	WEIRMAN	B
URBANA	C	VENICE	D	WABANICA	D	WAPATO	C/D	WEISER	C
URBO	D	VENLO	D	WABASH	D	WAPELLO	B	WEISHAUPT	D
URICH	D	VENUS	B	WABASHA	D	WAPINITIA	B	WEISS	A
URNE	B	VERBOORT	D	WABASSA	B/D	WAPPING	B	WEITCHPEC	B
URSINE	D	VERDE	C	WABEK	B	WAPSIE	B	WELAKA	A
URTAH	C	VERDEL	D	WACA	C	WARBA	B	WELBY	B
URWIL	D	VERDELLA	D	WACOTA	B	WARD	D	WELCH	C
USAL	B	VERDICO	D	WACOUSTA	C	WARDBORO	A	WELD	C
USHAR	B	VERDIGRIS	B	WADAMS	B	WARDELL	D	WELDA	C

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table B-1--Continued

WELDON	D	WICKIUP	C	WISNER	D	YALMER	B	ZUNDELL	B/C
WELDONA	B	WICKLIFFE	D	WITBECK	D	YAMAC	B	ZUNHALL	B/C
WELLER	C	WICKSBURG	B	WITCH	D	YAMHILL	C	ZUNI	D
WELLINGTON	D	WIDTSOE	C	WITHAM	D	YAMPA	C	ZURICH	B
WELLMAN	B	WIEHL	C	WITHEE	C	YAMSAY	D	ZWINGLE	D
WELLNER	B	WIEN	D	WITT	B	YANA	B		
WELLSBORO	C	WIGGLETON	B	WITZEL	D	YANCY	C		
WELLSTON	B	WIGTON	A	WODEN	B	YARDLEY	C		
WELLSVILLE	B	WILBRAHAM	C	WODSKOW	B/C	YATES	D		
WELRING	D	WILBUR	C	WOLCOTTSBURG		YAUCO	C		
WEMPLE	B	WILCO	C	WOLDALE	C/D	YAWDIM	D		
WENAS	B/C	WILCOX	D	WOLF	B	YAWKEY	C		
WENATCHEE	C	WILCOXSON	C	WOLFESEN	C	YAXON	B		
WENDEL	B/C	WILDCAT	D	WOLFESON	C	YEARY	C		
WENHAM		WILDER	B	WOLFORD	B	YEATES HOLLOW	C		
WENONA	C	WILDERNESS	C	WOLF POINT	D	YEGEN	B		
WENTWORTH	B	WILDROSE	D	WOLFTEVER	C	YELM	B		
WERLOW	C	WILDWOOD	D	WOLVERINE	A	YENRAB	A		
WERNER	B	WILEY	C	WOODBINE	B	YEOMAN	B		
WESO	C	WILKES	C	WOODBRIDGE	C	YESUM	B		
WESSEL	B	WILKESON	C	WOODBURN	C	YETULL	A		
WESTBROOK	D	WILKINS	D	WOODBURY	D	YODER	B		
WESTBURY	C	WILL	D	WOODCOCK	B	YOKOHL	D		
WESTCREEK	B	WILLACY	B	WOODENVILLE	C	YOLLABOLLY	D		
WESTERVILLE	C	WILLAKENZIE	C	WOODGLEN	D	YOLO	B		
WESTFALL	C	WILLAMAR	D	WOODHALL	B	YOLOGO	D		
WESTFIELD		WILLAMETTE	B	WOODHURST	A	YOMBA	C		
WESTFORD		WILLAPA	C	WOODINVILLE	C/D	YOMONT	B		
WESTLAND	B/D	WILLARD	B	WOODLY	B	YONCALLA	C		
WESTMINSTER	C/D	WILLETTE	A/D	WOODLYN	C/D	YONGES	D		
WESTMORE	B	WILLHAND	B	WOODMANSIE	B	YONNA	B/D		
WESTMORELAND	B	WILLIAMS	B	WOODMERE	B	YORDY	B		
WESTON	D	WILLIAMSBURG	B	WOOD RIVER	D	YORK	C		
WESTPHALIA	B	WILLIAMSON	C	WOODROCK	C	YORKVILLE	D		
WESTPLAIN	C	WILLIS	C	WOODROW	C	YOST	C		
WESTPORT	A	WILLITS	B	WOODS CROSS	D	YOUGA	B		
WESTVILLE	B	WILLOUGHBY	B	WOODSFIELD	C	YOUMAN	C		
WETHERSFIELD	C	WILLOW CREEK	B	WOODSIDE	A	YOUNGSTON	B		
WETHEY	B/C	WILLOWDALE	B	WOODSON	D	YOURAME	A		
WETTERHORN	C	WILLOWS	D	WOODSTOCK	C/D	YOVIMPA	D		
WETZEL	D	WILLWOOD	A	WOODSTOWN	C	YSIDORA	D		
WEYMOUTH	B	WILMER	C	WOODWARD	B	YTURBIDE	A		
WHAKANA	B	WILPAR	D	WOOLMAN	B	YUBA	D		
WHALAN	B	WILSON	D	WOOLPER	C	YUKO	C		
WHARTON	C	WILTSHIRE	C	WOOLSEY	C	YUKON	D		
WHATCOM	C	WINANS	B/C	WOOSLEY	C	YUNES	D		
WHATELY	D	WINBERRY	D	WOOSTER	C	YUNQUE	C		
WHEATLEY	D	WINCHESTER	A	WOOSTERN	B				
WHEATRIDGE	C	WINCHUCK	C	WOOTEN	A	ZAAR	D		
WHEATVILLE	B	WINDER	B/D	WORCESTER	B	ZACA	D		
WHEELER	B	WINDHAM	B	WORF	D	ZACHARIAS	B		
WHEELING	B	WINDMILL	B	WORK	C	ZACHARY	D		
WHEELON	D	WINDOM	B	WORLAND	B	ZAFRA	B		
WHELCHEL	B	WIND RIVER	B	WORLEY	C	ZAHILL	B		
WHETSTONE	B	WINDSOR	A	WORMSER	C	ZAHL	B		
WHIDBEY	C	WINDTHORST	C	WOROCK	B	ZALESKI	C		
WHIPPANY	C	WINDY	C	WORSHAM	D	ZALLA	A		
WHIPSTOCK	C	WINEG	C	WORTH	C	ZAMORA	B		
WHIRLO	B	WINEMA	C	WORTHEN	B	ZANE	C		
WHIT	B	WINETTI	B	WORTHING	D	ZANEIS	B		
WHITAKER	C	WINFIELD	C	WORTHINGTON	C	ZANESVILLE	C		
WHITCOMB	C	WING	D	WORTMAN	C	ZANONE	C		
WHITE BIRD	C	WINGATE	B	WRENTHAM	C	ZAPATA	C		
WHITECAP	D	WINGER	C	WRIGHT	C	ZAVALA	B		
WHITEFISH	B	WINGVILLE	B/D	WRIGHTMAN	C	ZAVCO	C		
WHITEFORD	B	WINIFRED	C	WRIGHTSVILLE	D	ZEB	B		
WHITEHORSE	B	WINK	B	WUNJEY	B	ZEESIX	C		
WHITE HOUSE	C	WINKEL	D	WURTSBORO	C	ZELL	B		
WHITELAKE	B	WINKLEMAN	C	WYALUSING	D	ZEN	C		
WHITELAW	B	WINKLER	A	WYARD	B	ZENDA	C		
WHITEMAN	D	WINLO	D	WYARNO	B	ZENIA	B		
WHITEROCK	D	WINLOCK	C	WYATT	C	ZENIFF	B		
WHITESBURG	C	WINN	C	WYEAST	C	ZEONA	A		
WHITE STORE	D	WINNEBAGO	B	WYEVILLE	C	ZIEGLER	C		
WHITE SWAN	C	WINNEMUCCA	B	WYGANT	C	ZIGWEID	B		
WHITEWATER	B	WINNESHIEK	B	WYKOFF	B	ZILLAH	B/C		
WHITEWOOD	C	WINNETT	D	WYMAN	B	ZIM	D		
WHITLEY	B	WINONA	D	WYMORE	C	ZIMMERMAN	A		
WHITLOCK	B	WINOOSKI	B	WYNN	B	ZING	C		
WHITMAN	D	WINSTON	A	WYNOOSE	D	ZINZER	B		
WHITNEY	B	WINTERS	C	WYO	B	ZION	C		
WHITORE	A	WINTERSBURG	C	WYOCENA	B	ZIPP	C/D		
WHITSOL	B	WINTERSET	C			ZITA	B		
WHITSON	D	WINTHROP	A	XAVIER	B	ZOAR	C		
WHITWELL	C	WINTONER	C			ZOATE	D		
WHOLAN	C	WINU	C	YACOLT	B	ZOHNER	B/D		
WIBAUX	C	WINZ	C	YAHARA	B	ZOOK	C		
WICHITA	C	WIOTA	B	YAHOLA	B	ZORRAVISTA	A		
WICHUP	D	WISHARD	A	YAKI	D	ZUFELT	B/D		
WICKERSHAM	B	WISHEYLU	C	YAKIMA	B	ZUKAN	D		
WICKETT	C	WISHKAH	C	YAKUS	D	ZUMBRO	B		
WICKHAM	B	WISKAH	C	YALLANI	B	ZUMWALT	C		

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission (0 - 0.15 in./hr.).

The infiltration rate is the rate at which water enters the soil at the soil surface and is controlled by surface conditions. The transmission rate is the rate at which the water moves in the soil and is controlled by the soil profile.

In the situation where high water table limits the storage capacity of a soil, a dual classification is given to the soil. For instance, a Pompano sand is classified as A/D. The first letter applies to the artificial drained condition and the second to the undrained natural condition. Higher hydrologic soil group should be used if the water table is lowered by an artificial drainage such as a network of canals or ditches.

Very often, soil profiles are disturbed and altered by urbanization to an extent that the existing hydrologic soil group is no longer applicable. Under this circumstance, Table B-2 should be used to determine the new hydrologic soil group based on soil texture of the new surface soil.

Table B-2.--Approximate Hydrologic Grouping of Soil Textures for Disturbed Soils (2).

Hydrologic Soil Group	Soil Textures
A	Sand, loamy sand, and sandy loam
B	Silt loam and loam
C	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty clay, and clay

REFERENCES

1. Soil Conservation Service, 1972. National Engineering Handbook, Section 4, Hydrology, pp. 7.6-7.26, USDA-SCS, Washington, D.C.

2. Soil Conservation Service, 1983. Urban Hydrology for Small Watersheds (Revised), Technical Release No. 55, USDA-SCS, Washington, D.C. (Draft)

APPENDIX C

DESCRIPTION OF SELECTED LAND USES

The SCS has provided a description of cover complex classification for the following land covers (1):

Fallow is the agricultural land use and treatment with the highest potential for runoff because the land is kept as bare as possible to conserve moisture for use by a succeeding crop.

Row crop is any field crop (maize, sorghum, soybeans, sugar beets, tomatoes, tulips) planted in rows far enough apart that most of the soil surface is exposed to rainfall impact throughout the growing season. At planting time, it is equivalent to fallow and may be so again after harvest. In most evaluations, average seasonal condition can be assumed.

Small grain (wheat, oats, barley, flax, etc.) is planted in rows close enough that the soil surface is not exposed during planting and shortly thereafter.

Close-seeded legumes or rotation meadow (alfalfa, sweet clover, timothy, etc., and combinations) are either planted in close rows or broadcast.

Native pasture or range is evaluated based on cover effectiveness as shown in the table below.

Table C-1.--Classification of Hydrologic Condition for Native Pasture or Range (1)

Vegetative Condition	Hydrologic Condition
Heavily grazed (plant cover 50%)	Poor
Not heavily grazed (50% plant cover 75%)	Fair
Lightly grazed (plant cover 75%)	Good

Meadow is a field on which grass is continuously grown, protected from grazing, and generally mowed for hay. Drained meadows (those having low water tables) have little or no surface runoff except during storms that have high rainfall intensities. Undrained meadows (those having high water tables) may be so wet as to be the equivalent of water surfaces. If a wet meadow is drained, its soil-group classification as well as its land use and treatment class may change.

Woods are usually small isolated groves of trees being raised for farm or ranch use. Woods are evaluated based on cover effectiveness as shown in the table below:

Table C-2.--Classification of Hydrologic Conditions for Woods (1)

Vegetative Condition	Hydrologic Condition
Heavily grazed or regularly burned. Litter, small trees, and brush are destroyed.	Poor
Grazed but not burned. There may be some litter but these woods are not protected.	Fair
Protected from grazing. Litter and shrubs cover the soil.	Good

In addition to the land uses described above, there are two distinct types of land cover that are common in Florida: pine flatwoods and wetlands. The pine flatwoods is a major forest type of Florida. Wetlands can be classified into two groups: forested wetlands and non-forested wetlands. The following descriptions of pine flatwoods and wetlands were extracted from the Phase I report of Water Resource Management, Appendix G (2).

Pine flatwoods consist of more than one pine species with a dense shrub and herbaceous plants (e.g. saw palmetto, gallberry, runner oak and wire grass) growing underneath. Flatwoods are frequently subjected to fire because of the understory density.

The flatwoods occur on a variety of soil types (e.g. Leon, Immokalee, St. Johns, Plummer, Rutledge, and Bladen), all of which are poorly to very poorly drained. These soils generally occur on areas which have flat topography and clay layer or organic hardpan 2-4 feet below the ground. Water table is often located near the ground surface.

During the dry months, high loss rate of moisture due to evapotranspiration from the top horizons exceeds the rate of moisture supplied from the lower horizons, which is impeded by the hardpan. This condition makes the flatwoods extremely dry in the dry months. During the heavy rains of the summer months, water may perch above the hardpan, often flooding the flatwoods to above ground level.

Forested wetlands include floodplain forests (river swamps), bayheads, lake border swamps, bog swamps, and cypress domes.

Floodplain forests (river swamps) are wetland forests occupying stream floodplains and backswamp wetlands formerly in contact with a stream. River swamps are found on alluvial river deposits rich in clay, organic deposits, peats and mucks. Flooding occurs annually, or more frequently.

Bayheads are wetland forests dominated by evergreen and broad-leafed bay trees that grow in acid, peat forming depressions. Bayheads occur in depressions in the flatwoods or as marginal growth mound flatwoods ponds with stable water levels. Bay swamps are maintained by a high water table or seepage from higher terrain.

Lake border swamps are cypress or ash-gum-cypress swamp occurring on lake borders.

Bog swamps are a mixture of cypress swamp, marshes and prairies, lakes and shrub bogs. Bog swamps occur on thick peat deposits above sand with the peat tending to build up to the water surface.

Cypress domes are forested wetlands which are commonly found in flatwoods regions. They occur in lens shaped depressions and are usually underlain by a clay or hardpan layer which impedes seepage. Cypress domes are seasonally or permanently wet. Water is supplied directly by rainfall and indirectly by seepage from surrounding terrain. During drought periods, many cypress domes go dry and burn along with the surrounding flatwoods.

Non-forested wetlands include wet prairies and fresh water marsh.

Wet prairies are dominated by grass, sedges, herbs and occasionally shrubs. Wet prairies occur on coarse to fine grained, poorly to very poorly drained sandy soils. Due to the nature of sandy soils, their low capillary activity and their occurrence on upland areas, prairies become dry and burn during drought periods.

The water which maintains wet prairies comes primarily from rainfall, local runoff, and seepage. Water is lost principally through evapotranspiration, as prairies generally do not drain freely.

Fresh water marsh, like wet prairies, is dominated by grasses, sedges and herbs. It remains wetter than prairies during dry periods, because it occurs in low areas on organic soils with high water holding capacity.

REFERENCES

1. Soil Conservation Service, 1972. National Engineering Handbook, Section 4, Hydrology, pp. 8.1-8.6; USDA-SCS, Washington, D.C.

2. St. Johns River Water Management District, 1977. Water Resource Management Plan, Phase I, Appendix G, Palatka, Florida.

APPENDIX D

APPLICATIONS OF SCS RUNOFF PROCEDURES

Example D-1: Determine a design storm hydrograph using the following data:

Drainage area = 200 acres
Time of concentration = 0.75 hours
Rainfall depth = 5.0 inches
Storm duration = 6.0 hours
Rainfall interval = 0.25 hours
Rainfall distribution (see computer printout)
Pervious area = 20%; CN=60
Noneffective impervious area = 50%; CN = 100
Effective impervious area = 30%; CN = 100

A. **TIA Method:** CN = (0.20)(60) + (0.80)(100) = 92.0

B. **Modified TIA Method:** Since the TR-20 program cannot model the EIA Method, CN has to be adjusted in order to obtain the same runoff volume as computed from the EIA Method. The steps used to find the equivalent CN is given below:

Step 1. Compute watershed storage:

$$S = \frac{1000}{60} - 10 = 6.67 \text{ inches}$$

Step 2. Adjust rain for the pervious area:

$$P' = (1 + \frac{0.50}{0.20})(5.0) = 17.5 \text{ inches}$$

Step 3. Compute runoff from the pervious area:

$$Q_{perv} = \frac{(17.5 - 0.2(6.67))^2}{17.5 + 0.8(6.67)} (.20)/100 = 2.289 \text{ inches}$$

Step 4. Compute runoff from the effective impervious area:

$$Q_{ei} = (5.0)(30)(100) = 1.50 \text{ inches}$$

Step 5. Compute total runoff:

$$Q = 2.289 + 1.50 = 3.789 \text{ inches}$$

Step 6. Compute the equivalent S from the following equation:

$$S = 5[5.0 + 2(3.789) - (4(3.789)^2 + 5(5.0)(3.789))^{0.5}] = 1.215$$

Step 7. Compute the equivalent CN:

$$CN = 1000/(1.215+10) = 89.16$$

The resulting runoff hydrographs generated from the TIA Method (Page D-3) and modified TIA Method (Page D-4) are plotted in Figure D-1.

Example D-2: Determine a design storm hydrograph using the data given in Example D-1.

If one third of effective impervious area in Example D-1 is converted into swales, then the basin t_c would be increased. In this example, the new basin t_c is assumed to be 1.0 hour. For design purpose, swales are assumed to be saturated prior to storm event and can be treated as effective impervious area. As a result, the basin CN remains the same (CN = 89.16). This example will show the effect of two methods used in estimating peak rate factor on storm hydrographs.

A. Using standard SCS peak rate factor: K' = 484

B. Using adjustment factor:

Step 1. Determine the adjustment factor according to % of ponding areas and storm frequency. If swales are assumed to spread throughout the basin, then the adjustment factor can be obtained from Table 10. For 10% as swales and a 25-year design storm, the adjustment factor is 0.65. Therefore, the adjusted K' would be (0.65)(484) = 314.6.

Step 2. Draw a triangular dimensionless unit hydrograph (DUH).

For $t_p = 1.0$ hour, $t_b = \frac{(1290.66)(1)}{314.6} = 4.10$ hours

The resulting DUH is shown on Page D-6.

Step 3. Tabulate the ratios of t/t_b and q/q_p. If unit hydrograph time increment is 0.25 hours, then the interval of t/t_b ratio is 0.25/4.10 = 0.061. The ordinates of q/q_p corresponding to t/t_p are determined from the following equations:

$$q/q_p = t/t_p \quad ; \quad 0<t/t_p<1.0$$
$$q/q_p = 1.0 - 0.3226(t/t_p - 1.0) \quad ; \quad 1.0<t/t_p<t_b$$

The resulting storm hydrographs obtained from the standard K' (Page D-8) and adjusted K' (Pages D-9 through D-10) are compared in Figure D-2.

```
******************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB                           FULLPRINT
TITLE     EXAMPLE D-1A
TITLE     USING TOTAL IMPERVIOUS AREA METHOD
 5 RAINFL 1             0.25
 8         .000         .017        .035        .055        .080
 8         .107         .135        .180        .230        .410
 8         .600         .650        .700        .740        .780
 8         .810         .835        .860        .880        .900
 8         .920         .940        .960        .980        1.00
 9 ENDTBL
 6 RUNOFF 1    01     1 0.3125      92.0        0.75        1 1   1
   ENDATA
 7 INCREM 6             0.10
 7 COMPUT 7    01    01 0.0         5.00        1.0         1 2   1   1
   ENDCMP 1
   ENDJOB 2

*******************************END OF 80-80 LIST*******************************

TR20 XEQ             EXAMPLE D-1A                                                    JOB  1   PASS   1
     REV 09/01/83            USING TOTAL IMPERVIOUS AREA METHOD

EXECUTIVE CONTROL OPERATION INCREM     MAIN TIME INCREMENT =  0.10 HOURS                      RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT     FROM STRUCTURE  1  TO STRUCTURE  1                     RECORD ID
        STARTING TIME =  0.00    RAIN DEPTH =  5.00    RAIN DURATION=  1.00    RAIN TABLE NO.= 1    ANT. MOIST. COND= 2
        ALTERNATE NO.= 1         STORM NO.= 1    MAIN TIME INCREMENT =  0.10 HOURS


OPERATION RUNOFF   STRUCTURE  1
           OUTPUT HYDROGRAPH=  1
           AREA=   0.31 SQ MI   INPUT RUNOFF CURVE= 92.    TIME OF CONCENTRATION=  0.75 HOURS
           INTERNAL HYDROGRAPH TIME INCREMENT= 0.1000 HOURS

           PEAK TIME(HRS)              PEAK DISCHARGE(CFS)            PEAK ELEVATION(FEET)
               2.76                         481.89                          (RUNOFF)

TIME(HRS)        FIRST HYDROGRAPH POINT =  0.00 HOURS     TIME INCREMENT = 0.10 HOURS     DRAINAGE AREA =   0.31 SQ.MI.
```

0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.33	1.12	2.79
1.00	DISCHG	5.58	9.57	14.59	20.39	26.64	33.02	39.94	48.03	58.30	70.63
2.00	DISCHG	84.10	104.35	138.10	194.60	270.40	353.79	427.26	475.03	479.33	448.07
3.00	DISCHG	400.34	349.35	302.46	266.48	239.10	217.60	199.99	185.52	172.39	159.90
4.00	DISCHG	148.08	137.01	127.28	119.33	112.69	106.68	101.02	95.80	91.27	87.61
5.00	DISCHG	84.95	83.05	81.72	80.76	80.08	79.61	79.27	79.04	78.88	78.78
6.00	DISCHG	78.72	77.51	73.84	66.04	55.07	43.27	32.30	23.10	16.50	11.90
7.00	DISCHG	8.60	6.16	4.42	3.16	2.25	1.60	1.13	0.79	0.54	0.37
8.00	DISCHG	0.24	0.14	0.07	0.02	0.00					

```
  RUNOFF VOLUME ABOVE BASEFLOW =  4.09 WATERSHED INCHES,    824.07 CFS-HRS,    68.10 ACRE-FEET;  BASEFLOW =   0.00 CFS


 EXECUTIVE CONTROL OPERATION ENDCMP     COMPUTATIONS COMPLETED FOR PASS   1                    RECORD ID
```

```
******************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY******************

JOB                          FULLPRINT
TITLE     EXAMPLE D-1B
TITLE     USING ADJUSTED CURVE NUMBER
 5 RAINFL 1             0.25
 8          .000        .017       .035       .055       .080
 8          .107        .135       .180       .230       .410
 8          .600        .650       .700       .740       .780
 8          .810        .835       .860       .880       .900
 8          .920        .940       .960       .980       1.00
 9 ENDTBL
 6 RUNOFF 1    01     1 0.3125     89.16      0.75       1 1   1
   ENDATA
 7 INCREM 6             0.10
 7 COMPUT 7    01    01 0.0        5.00       1.0        1 2   1   1
   ENDCMP 1
   ENDJOB 2

*******************************END OF 80-80 LIST*******************************
```

```
TR20 XEQ             EXAMPLE D-1B                                                      JOB  1   PASS   1
    REV 09/01/83             USING ADJUSTED CURVE NUMBER

EXECUTIVE CONTROL OPERATION INCREM     MAIN TIME INCREMENT =  0.10 HOURS                      RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT     FROM STRUCTURE  1  TO STRUCTURE  1                     RECORD ID
       STARTING TIME =  0.00    RAIN DEPTH =  5.00    RAIN DURATION=  1.00    RAIN TABLE NO.= 1    ANT. MOIST. COND= 2
       ALTERNATE NO.= 1         STORM NO.= 1    MAIN TIME INCREMENT =  0.10 HOURS


OPERATION RUNOFF   STRUCTURE  1
          OUTPUT HYDROGRAPH=  1
          AREA=   0.31 SQ MI    INPUT RUNOFF CURVE= 89.    TIME OF CONCENTRATION=  0.75 HOURS
          INTERNAL HYDROGRAPH TIME INCREMENT= 0.1000 HOURS

          PEAK TIME(HRS)              PEAK DISCHARGE(CFS)            PEAK ELEVATION(FEET)
             2.77                          445.99                          (RUNOFF)
```

TIME(HRS)   FIRST HYDROGRAPH POINT = 0.00 HOURS   TIME INCREMENT = 0.10 HOURS   DRAINAGE AREA =   0.31 SQ.MI.

0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.43
1.00	DISCHG	1.37	3.20	6.06	9.90	14.53	19.68	25.56	32.62	41.64	52.57
2.00	DISCHG	64.74	83.21	114.23	166.47	237.46	317.01	388.66	437.02	444.71	418.38
3.00	DISCHG	375.78	329.39	286.35	253.26	228.07	208.25	191.97	178.55	166.28	154.53
4.00	DISCHG	143.34	132.81	123.54	115.95	109.62	103.86	98.43	93.41	89.05	85.52
5.00	DISCHG	82.96	81.14	79.87	78.96	78.33	77.89	77.59	77.38	77.25	77.18
6.00	DISCHG	77.14	75.97	72.38	64.76	54.00	42.44	31.68	22.66	16.18	11.67
7.00	DISCHG	8.43	6.04	4.34	3.10	2.21	1.57	1.11	0.78	0.53	0.36
8.00	DISCHG	0.23	0.14	0.07	0.02	0.00					

```
  RUNOFF VOLUME ABOVE BASEFLOW =  3.79 WATERSHED INCHES,    763.46 CFS-HRS,    63.09 ACRE-FEET;   BASEFLOW =   0.00 CFS

 EXECUTIVE CONTROL OPERATION ENDCMP     COMPUTATIONS COMPLETED FOR PASS   1                          RECORD ID
```

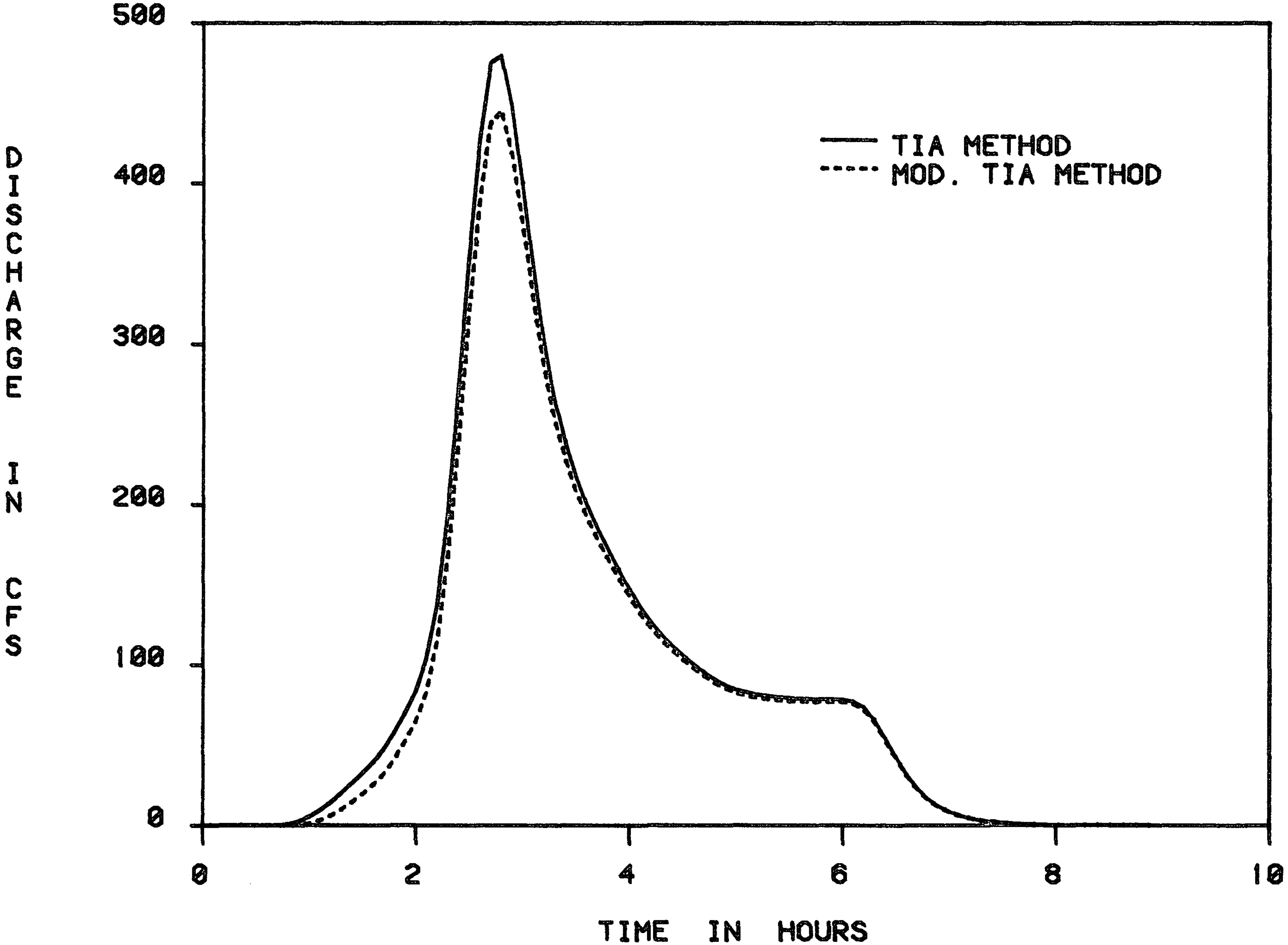

Figure D-1. Runoff Hydrographs of Example D-1 using TIA and Modified TIA Methods.

```
******************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY******************

JOB                           FULLPRINT
TITLE     EXAMPLE D-2A
TITLE     USING STANDARD PEAK RATE FACTOR (484)
 5 RAINFL 1           0.25
 8         .000       .017        .035        .055        .080
 8         .107       .135        .180        .230        .410
 8         .600       .650        .700        .740        .780
 8         .810       .835        .860        .880        .900
 8         .920       .940        .960        .980        1.00
 9 ENDTBL
 6 RUNOFF 1    01     1 0.3125     89.16       1.00        1 1   1
   ENDATA
 7 INCREM 6           0.10
 7 COMPUT 7    01    01 0.0        5.00        1.0         1 2   1   1
   ENDCMP 1
   ENDJOB 2

********************************END OF 80-80 LIST********************************

TR20 XEQ              EXAMPLE D-2A                                                                   JOB  1   PASS   1
     REV 09/01/83             USING STANDARD PEAK RATE FACTOR (484)

EXECUTIVE CONTROL OPERATION INCREM     MAIN TIME INCREMENT =  0.10 HOURS                                     RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT     FROM STRUCTURE  1  TO STRUCTURE  1                                    RECORD ID
        STARTING TIME =  0.00    RAIN DEPTH =  5.00    RAIN DURATION=  1.00    RAIN TABLE NO.= 1    ANT. MOIST. COND= 2
        ALTERNATE NO.= 1          STORM NO.= 1    MAIN TIME INCREMENT =  0.10 HOURS


OPERATION RUNOFF   STRUCTURE  1
           OUTPUT HYDROGRAPH=  1
           AREA=   0.31 SQ MI   INPUT RUNOFF CURVE= 89.    TIME OF CONCENTRATION=  1.00 HOURS
           INTERNAL HYDROGRAPH TIME INCREMENT= 0.0952 HOURS

           PEAK TIME(HRS)              PEAK DISCHARGE(CFS)           PEAK ELEVATION(FEET)
               2.96                         376.51                         (RUNOFF)

TIME(HRS)         FIRST HYDROGRAPH POINT =  0.00 HOURS      TIME INCREMENT = 0.10 HOURS      DRAINAGE AREA =   0.31 SQ.MI.
   0.00    DISCHG         0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.05      0.23
   1.00    DISCHG         0.67      1.56      3.09      5.34      8.33     12.04     16.53     21.94     28.44     36.28
   2.00    DISCHG        45.46     58.54     78.17    107.51    149.73    203.11    260.21    312.84    352.75    373.73
   3.00    DISCHG       375.20    360.88    336.83    308.48    279.71    253.81    232.53    214.92    199.63    185.56
   4.00    DISCHG       172.46    160.47    149.42    139.37    130.36    122.39    115.31    108.94    103.22     98.22
   5.00    DISCHG        93.91     90.26     87.24     84.81     82.90     81.42     80.28     79.44     78.84     78.41
   6.00    DISCHG        78.09     77.28     75.41     71.89     66.16     58.56     50.05     41.43     33.35     26.22
   7.00    DISCHG        20.33     15.82     12.37      9.69      7.57      5.90      4.60      3.57      2.77      2.15
   8.00    DISCHG         1.66      1.28      0.99      0.75      0.57      0.42      0.31      0.22      0.15      0.10
   9.00    DISCHG         0.05      0.02      0.00

  RUNOFF VOLUME ABOVE BASEFLOW =  3.78 WATERSHED INCHES,    763.15 CFS-HRS,    63.07 ACRE-FEET;   BASEFLOW =   0.00 CFS


 EXECUTIVE CONTROL OPERATION ENDCMP     COMPUTATIONS COMPLETED FOR PASS   1                                   RECORD ID
```

```
******************8Ø-8Ø LIST OF INPUT DATA FOR TR-2Ø HYDROLOGY******************

JOB                          FULLPRINT
TITLE     EXAMPLE D-2B
TITLE     USING ADJUSTED PEAK RATE FACTOR
 4 DIMHYD               Ø.Ø61
 8         Ø.ØØØ        Ø.25Ø       Ø.5ØØ       Ø.75Ø       1.ØØØ
 8         Ø.919        Ø.839       Ø.758       Ø.677       Ø.596
 8         Ø.516        Ø.435       Ø.354       Ø.274       Ø.193
 8         Ø.112        Ø.Ø31       Ø.ØØØ       Ø.ØØØ       Ø.ØØØ
 9 ENDTBL
 5 RAINFL 1             Ø.25
 8         .ØØØ         .Ø17        .Ø35        .Ø55        .Ø8Ø
 8         .1Ø7         .135        .18Ø        .23Ø        .41Ø
 8         .6ØØ         .65Ø        .7ØØ        .74Ø        .78Ø
 8         .81Ø         .835        .86Ø        .88Ø        .9ØØ
 8         .92Ø         .94Ø        .96Ø        .98Ø        1.ØØ
 9 ENDTBL
 6 RUNOFF 1    Ø1     1 Ø.3125      89.16       1.ØØ        1 1   1
   ENDATA
 7 LIST
 7 INCREM 6             Ø.1Ø
 7 COMPUT 7    Ø1    Ø1 Ø.Ø         5.ØØ        1.Ø         1 2   1   1
   ENDCMP 1
   ENDJOB 2

********************************END OF 8Ø-8Ø LIST********************************

TR2Ø XEQ              EXAMPLE D-2B                                                    JOB  1   PASS   1
    REV Ø9/Ø1/83              USING ADJUSTED PEAK RATE FACTOR

EXECUTIVE CONTROL OPERATION LIST                                                                RECORD ID
                    TIME INCREMENT
4 DIMHYD                   Ø.Ø588    (INPUT VALUE OF  Ø.Ø61 NOT EQUAL TO COMPUTED VALUE; COMPUTED VALUE USED.)
8             Ø.ØØØØ       Ø.25ØØ     Ø.5ØØØ      Ø.75ØØ      1.ØØØØ
8             Ø.919Ø       Ø.839Ø     Ø.758Ø      Ø.677Ø      Ø.596Ø
8             Ø.516Ø       Ø.435Ø     Ø.354Ø      Ø.274Ø      Ø.193Ø
8             Ø.112Ø       Ø.Ø31Ø     Ø.ØØØØ      Ø.ØØØØ      Ø.ØØØØ
9 ENDTBL
  COMPUTED PEAK RATE FACTOR =  314.64
     TABLE NO.      TIME INCREMENT
5 RAINFL 1                 Ø.25ØØ
8             Ø.ØØØØ       Ø.Ø17Ø     Ø.Ø35Ø      Ø.Ø55Ø      Ø.Ø8ØØ
8             Ø.1Ø7Ø       Ø.135Ø     Ø.18ØØ      Ø.23ØØ      Ø.41ØØ
8             Ø.6ØØØ       Ø.65ØØ     Ø.7ØØØ      Ø.74ØØ      Ø.78ØØ
8             Ø.81ØØ       Ø.835Ø     Ø.86ØØ      Ø.88ØØ      Ø.9ØØØ
8             Ø.92ØØ       Ø.94ØØ     Ø.96ØØ      Ø.98ØØ      1.ØØØØ
9 ENDTBL

                   STANDARD CONTROL INSTRUCTIONS
6 RUNOFF 1     1     1     Ø.3125    89.16ØØ     1.ØØØØ1 1 Ø 1 Ø Ø
  ENDATA

END OF LISTING
```

EXECUTIVE CONTROL OPERATION INCREM MAIN TIME INCREMENT = 0.10 HOURS RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT FROM STRUCTURE 1 TO STRUCTURE 1 RECORD ID
STARTING TIME = 0.00 RAIN DEPTH = 5.00 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 1 MAIN TIME INCREMENT = 0.10 HOURS

OPERATION RUNOFF STRUCTURE 1
OUTPUT HYDROGRAPH= 1
AREA= 0.31 SQ MI INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= 1.00 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= 0.0952 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.14	276.23	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = 0.00 HOURS TIME INCREMENT = 0.10 HOURS DRAINAGE AREA = 0.31 SQ.MI.

0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.27
1.00	DISCHG	0.67	1.36	2.40	3.87	5.80	8.22	11.33	15.19	19.85	25.37
2.00	DISCHG	31.74	43.21	60.08	82.47	110.70	143.80	178.08	210.66	237.46	257.75
3.00	DISCHG	270.75	275.72	275.39	273.29	270.16	265.94	260.39	253.67	245.96	237.23
4.00	DISCHG	227.49	216.72	205.16	193.18	180.74	168.05	155.23	142.58	130.79	120.27
5.00	DISCHG	111.54	104.84	99.81	95.86	92.59	89.74	87.28	85.17	83.39	81.88
6.00	DISCHG	80.64	78.83	76.41	73.31	69.53	64.99	59.69	53.97	48.59	43.54
7.00	DISCHG	38.79	34.33	30.15	26.24	22.60	19.24	16.14	13.31	10.76	8.47
8.00	DISCHG	6.46	4.74	3.28	2.10	1.19	0.55	0.19	0.05	0.00	

RUNOFF VOLUME ABOVE BASEFLOW = 3.79 WATERSHED INCHES, 763.95 CFS-HRS, 63.13 ACRE-FEET; BASEFLOW = 0.00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 1 RECORD ID

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID

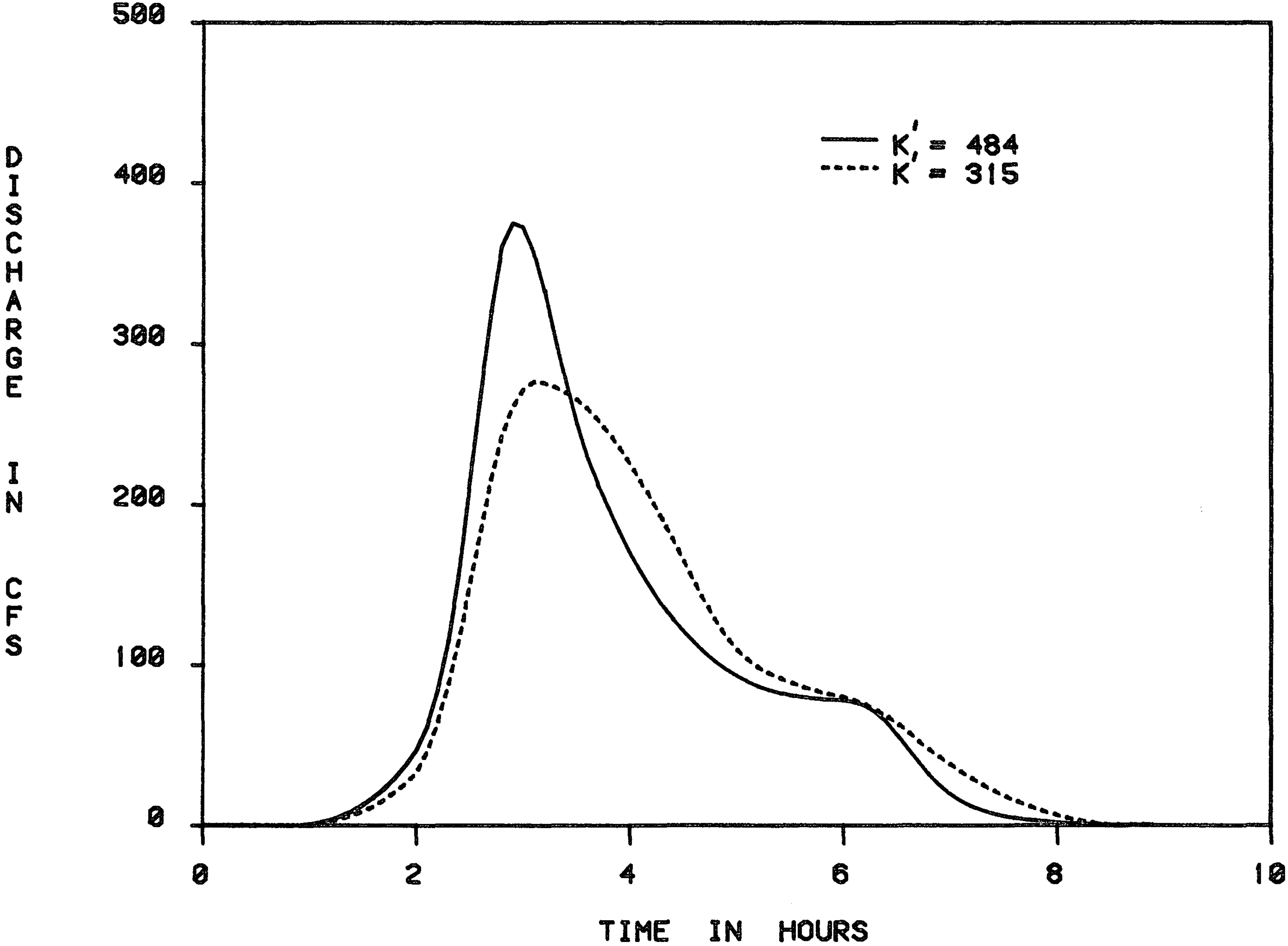

Figure D-2. Runoff Hydrographs of Example D-2 using Different Peak Rate Factors.