

United States Department of Agriculture

Natural Resources Conservation Service

Conservation Engineering Division

Technical Release 55

June 1986

Urban Hydrology for Small Watersheds

TR-55

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Preface

Technical Release 55 (TR-55) presents simplified procedures to calculate storm runoff volume, peak rate of discharge, hydrographs, and storage volumes required for floodwater reservoirs. These procedures are applicable in small watersheds, especially urbanizing watersheds, in the United States. First issued by the Soil Conservation Service (SCS) in January 1975, TR-55 incorporates current SCS procedures. This revision includes results of recent research and other changes based on experience with use of the original edition.

The major revisions and additions are:

- A flow chart for selecting the appropriate procedure:
- Three additional rain distributions;
- Expansion of the chapter on runoff curve numbers;
- A procedure for calculating travel times of sheet flow:
- Deletion of a chapter on peak discharges;
- Modifications to the Graphical Peak Discharge method and Tabular Hydrograph method;
- A new storage routing procedure;
- Features of the TR-55 computer program; and
- Worksheets.

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Metric conversions

The English system of units is used in this TR. To convert to the International System of units (metric), use the following factors:

From English unit	To metric unit	Multiply by
Acre	Hectare	0.405
Square mile	Square kilometer	2.59
Cubic feet per second	Cubic meters per seco	ond 0.0283
Inch	Millimeter	25.4
Feet per second	Meters per second	0.3048
Acre-foot	Cubic meter	1233.489
Cubic foot	Cubic meter	0.0283

Perform rounding operations as appropriate to indicate the same level of precision as that of the original measurement. For example:

- 1. A stream discharge is recorded in cubic feet per second with three significant digits.
- 2. Convert stream discharge to cubic meters per second by multiplying by 0.0283.
- 3. Round to enough significant digits so that, when converting back to cubic feet per second, you obtain the original value (step 1) with three significant digits.

Definitions of symbols

Symbol	Unit	Definition
a	ft ²	Cross sectional flow area
Am	mi^2	Drainage area
CN		Runoff curve number
CN_e		Composite runoff curve
- 16		number
CN_{p}		Pervious runoff curve number
E_{max}		Maximum stage
$F_{\rm p}$		Pond and swamp adjustment
- p		factor
$H_{\rm w}$	\mathbf{ft}	Head over weir crest
I_a	in	Initial abstraction
Ľ	ft	Flow length
$L_{\rm w}$	ft	Weir crest length
m m		Number of flow segments
n		Manning's roughness coefficient
P	in	Rainfall
P_{imp}	111	Percent imperviousness
P_2	in	Two-year frequency, 24-hour
12	ш	rainfall
$p_{\rm w}$	ft	Wetted perimeter
q	ft³/s (cfs)	Hydrograph coordinate
q_i	ft³/s (cfs)	Peak inflow discharge
q_0	ft³/s (cfs)	Peak outflow discharge
q_p	ft³/s (cfs)	Peak discharge
\mathbf{q}_{t}	csm/in	Tabular hydrograph unit
10		discharge
$\mathbf{q_u}$	csm/in	Unit peak discharge
Q	in	Runoff
r	ft	Hydraulic radius
R	10	Ratio of unconnected
10		impervious area to total
		impervious area
C	ft/ft	Slope of hydraulic grade line
s S		Potential maximum retention
S	in	
_	la sa	after runoff begins
t	hr	Hydrograph time
T_c	hr	Time of concentration
$T_{\rm p}$	hr	Time to peak
$T_{\rm t}$	hr	Travel time
V	ft/s	Average velocity
V_{r}	acre-ft, ft ³	Runoff volume
	or water-	
	shed-inch	
V_s	acre-ft, ft³	Storage volume
	or water-	
	shed-inch	

Introduction

The conversion of rural land to urban land usually increases erosion and the discharge and volume of storm runoff in a watershed. It also causes other problems that affect soil and water. As part of programs established to alleviate these problems, engineers increasingly must assess the probable effects of urban development, as well as design and implement measures that will minimize its adverse effects.

Technical Release 55 (TR-55) presents simplified procedures for estimating runoff and peak discharges in small watersheds. In selecting the appropriate procedure, consider the scope and complexity of the problem, the available data, and the acceptable level of error. While this TR gives special emphasis to urban and urbanizing watersheds, the procedures apply to any small watershed in which certain limitations are met.

Effects of urban development

An urban or urbanizing watershed is one in which impervious surfaces cover or will soon cover a considerable area. Impervious surfaces include roads, sidewalks, parking lots, and buildings. Natural flow paths in the watershed may be replaced or supplemented by paved gutters, storm sewers, or other elements of artificial drainage.

Hydrologic studies to determine runoff and peak discharge should ideally be based on long-term stationary streamflow records for the area. Such records are seldom available for small drainage areas. Even where they are available, accurate statistical analysis of them is usually impossible because of the conversion of land to urban uses during the period of record. It therefore is necessary to estimate peak discharges with hydrologic models based on measurable watershed characteristics. Only through an understanding of these characteristics and experience in using these models can we make sound judgments on how to alter model parameters to reflect changing watershed conditions.

Urbanization changes a watershed's response to precipitation. The most common effects are reduced infiltration and decreased travel time, which significantly increase peak discharges and runoff. Runoff is determined primarily by the amount of precipitation and by infiltration characteristics related to soil type, soil moisture, antecedent rainfall, cover type, impervi-

ous surfaces, and surface retention. Travel time is determined primarily by slope, length of flow path, depth of flow, and roughness of flow surfaces. Peak discharges are based on the relationship of these parameters and on the total drainage area of the watershed, the location of the development, the effect of any flood control works or other natural or manmade storage, and the time distribution of rainfall during a given storm event.

The model described in TR-55 begins with a rainfall amount uniformly imposed on the watershed over a specified time distribution. Mass rainfall is converted to mass runoff by using a runoff curve number (CN). CN is based on soils, plant cover, amount of impervious areas, interception, and surface storage. Runoff is then transformed into a hydrograph by using unit hydrograph theory and routing procedures that depend on runoff travel time through segments of the watershed.

For a description of the hydrograph development method used by SCS, see chapter 16 of the SCS National Engineering Handbook, Section 4—Hydrology (NEH-4) (SCS 1985). The routing method (Modified Att-Kin) is explained in appendixes G and H of draft Technical Release 20 (TR-20) (SCS 1983).

Rainfall

TR-55 includes four regional rainfall time distributions. See appendix B for a discussion of how these distributions were developed.

All four distributions are for a 24-hour period. This period was chosen because of the general availability of daily rainfall data that were used to estimate 24-hour rainfall amounts. The 24-hour duration spans most of the applications of TR-55.

One critical parameter in the model is time of concentration (T_c), which is the time it takes for runoff to travel to a point of interest from the hydraulically most distant point. Normally a rainfall duration equal to or greater than T_c is used. Therefore, the rainfall distributions were designed to contain the intensity of any duration of rainfall for the frequency of the event chosen. That is, if the 10-year frequency, 24-hour rainfall is used, the most intense hour will approximate the 10-year, 1-hour rainfall volume.

Runoff

To estimate runoff from storm rainfall, SCS uses the runoff curve number (CN) method (see chapters 4 through 10 of NEH-4, SCS 1985). Determination of CN depends on the watershed's soil and cover conditions, which the model represents as hydrologic soil group, cover type, treatment, and hydrologic condition. Chapter 2 of this TR discusses the effect of urban development on CN and explains how to use CN to estimate runoff.

Time parameters

Chapter 3 describes a method for estimating the parameters used to distribute the runoff into a hydrograph. The method is based on velocities of flow through segments of the watershed. Two major parameters are time of concentration (T_c) and travel time of flow through the segments (T_t). These and the other parameters used are the same as those used in accepted hydraulic analyses of open channels.

Many methods are empirically derived from actual runoff hydrographs and watershed characteristics. The method in chapter 3 was chosen because it is basic; however, other methods may be used.

Peak discharge and hydrographs

Chapter 4 describes a method for approximating peak rates of discharge, and chapter 5 describes a method for obtaining or routing hydrographs. Both methods were derived from hydrographs prepared by procedures outlined in chapter 16 of NEH-4 (SCS 1985). The computations were made with a computerized SCS hydrologic model, TR-20 (SCS 1983).

The methods in chapters 4 and 5 should be used in accordance with specific guidelines. If basic data are improperly prepared or adjustments not properly used, errors will result.

Storage effects

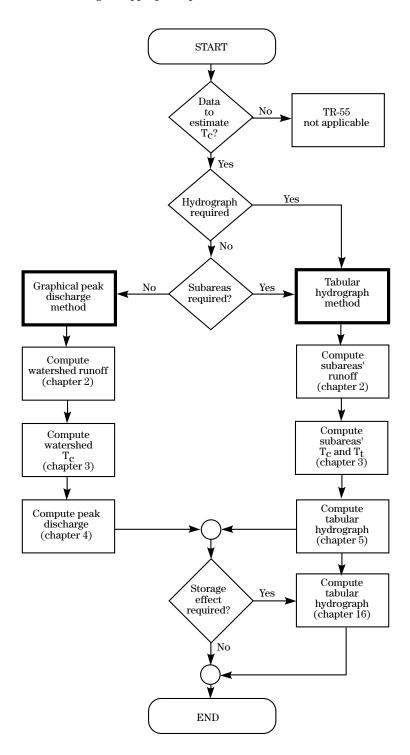
Chapter 6 outlines procedures to account for the effect of detention-type storage. It provides a shortcut method to estimate temporary flood storage based on hydrologic data developed from the Graphical Peak Discharge or Tabular Hydrograph methods.

By increasing runoff and decreasing travel times, urbanization can be expected to increase downstream peak discharges. Chapter 6 discusses how flood detention can modify the hydrograph so that, ideally, downstream peak discharge is reduced approximately to the predevelopment condition. The shortcuts in chapter 6 are useful in sizing a basin even though the final design may require a more detailed analysis.

Selecting the appropriate procedures

Figure 1-1 is a flow chart that shows how to select the appropriate procedures to use in TR-55. In the figure, the diamond-shaped box labeled "Subareas required?" directs the user to the appropriate method based on whether the watershed needs to be divided into subareas. Watershed subdivision is required when significantly different conditions affecting runoff or timing are present in the watershed—for example, if the watershed has widely differing curve numbers or nonhomogeneous slope patterns.

Figure 1-1 Flow chart for selecting the appropriate procedures in TR-55.



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		Urban Hydrology for Small Watersheds

Limitations

To save time, the procedures in TR-55 are simplified by assumptions about some parameters. These simplifications, however, limit the use of the procedures and can provide results that are less accurate than more detailed methods. The user should examine the sensitivity of the analysis being conducted to a variation of the peak discharge or hydrograph. To ensure that the degree of error is tolerable, specific limitations are given in chapters 2 through 6. Additional general constraints to the use of TR-55 are as follows:

- The methods in this TR are based on open and unconfined flow over land or in channels. For large events during which flow is divided between sewer and overland flow, more information about hydraulics than is presented here is needed to determine T_c. After flow enters a closed system, the discharge can be assumed constant until another flow is encountered at a junction or another inlet.
- Both the Graphical Peak Discharge and Tabular Hydrograph methods are derived from TR-20 (SCS 1983) output. Their accuracy is comparable; they differ only in their products. The use of T_c permits them to be used for any size watershed within the scope of the curves or tables. The Graphical method (chapter 4) is used only for hydrologically homogeneous watersheds because the procedure is limited to a single watershed subarea. The Tabular method (chapter 5) can be used for a heterogeneous watershed that is divided into a number of homogeneous subwatersheds. Hydrographs for the subwatersheds can be routed and added.
- The approximate storage-routing curves (chapter 6) should not be used if the adjustment for ponding (chapter 4) is used. These storage-routing curves, like the peak discharge and hydrograph procedures, are generalizations derived from TR-20 routings.

Estimating Runoff

SCS runoff curve number method

The SCS Runoff Curve Number (CN) method is described in detail in NEH-4 (SCS 1985). The SCS runoff equation is

$$Q = \frac{\left(P - I_a\right)^2}{\left(P - I_a\right) + S}$$
 [eq. 2-1]

where

Q = runoff(in)

P = rainfall (in)

S = potential maximum retention after runoff begins (in) and

I_a = initial abstraction (in)

Initial abstraction (I_a) is all losses before runoff begins. It includes water retained in surface depressions, water intercepted by vegetation, evaporation, and infiltration. I_a is highly variable but generally is correlated with soil and cover parameters. Through studies of many small agricultural watersheds, I_a was found to be approximated by the following empirical equation:

$$I_a = 0.2S$$
 [eq. 2-2]

By removing I_a as an independent parameter, this approximation allows use of a combination of S and P to produce a unique runoff amount. Substituting equation 2-2 into equation 2-1 gives:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$
 [eq. 2-3]

S is related to the soil and cover conditions of the watershed through the CN. CN has a range of 0 to 100, and S is related to CN by:

$$S = \frac{1000}{CN} - 10$$
 [eq. 2-4]

Figure 2-1 and table 2-1 solve equations 2-3 and 2-4 for a range of CN's and rainfall.

Factors considered in determining runoff curve numbers

The major factors that determine CN are the hydrologic soil group (HSG), cover type, treatment, hydrologic condition, and antecedent runoff condition (ARC). Another factor considered is whether impervious areas outlet directly to the drainage system (connected) or whether the flow spreads over pervious areas before entering the drainage system (unconnected). Figure 2-2 is provided to aid in selecting the appropriate figure or table for determining curve numbers.

CN's in table 2-2 (a to d) represent average antecedent runoff condition for urban, cultivated agricultural, other agricultural, and arid and semiarid rangeland uses. Table 2-2 assumes impervious areas are directly connected. The following sections explain how to determine CN's and how to modify them for urban conditions.

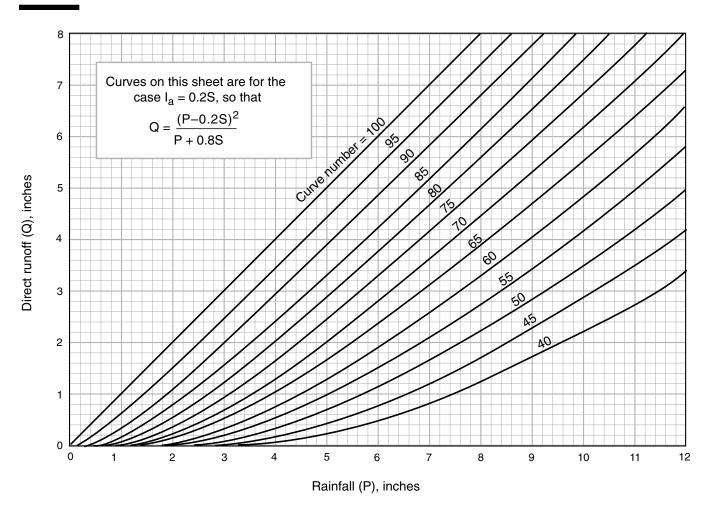
Hydrologic soil groups

Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSG's (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. Appendix A defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of interest may be identified from a soil survey report, which can be obtained from local SCS offices or soil and water conservation district offices.

Most urban areas are only partially covered by impervious surfaces: the soil remains an important factor in runoff estimates. Urbanization has a greater effect on runoff in watersheds with soils having high infiltration rates (sands and gravels) than in watersheds predominantly of silts and clays, which generally have low infiltration rates.

Any disturbance of a soil profile can significantly change its infiltration characteristics. With urbanization, native soil profiles may be mixed or removed or fill material from other areas may be introduced. Therefore, a method based on soil texture is given in appendix A for determining the HSG classification for disturbed soils.

Figure 2-1 Solution of runoff equation.



Cover type

Table 2-2 addresses most cover types, such as vegetation, bare soil, and impervious surfaces. There are a number of methods for determining cover type. The most common are field reconnaissance, aerial photographs, and land use maps.

Treatment

Treatment is a cover type modifier (used only in table 2-2b) to describe the management of cultivated agricultural lands. It includes mechanical practices, such as contouring and terracing, and management practices, such as crop rotations and reduced or no tillage.

Hydrologic condition

Hydrologic condition indicates the effects of cover type and treatment on infiltration and runoff and is generally estimated from density of plant and residue cover on sample areas. *Good* hydrologic condition indicates that the soil usually has a low runoff potential for that specific hydrologic soil group, cover type, and treatment. Some factors to consider in estimating the effect of cover on infiltration and runoff are (a) canopy or density of lawns, crops, or other vegetative areas; (b) amount of year-round cover; (c) amount of grass or close-seeded legumes in rotations; (d) percent of residue cover; and (e) degree of surface roughness.

Table 2-1 Runoff depth for selected CN's and rainfall amounts 1/2

					Runo	ff depth f	or curve n	umber of	_				
Rainfall	40	45	50	55	60	65	70	75	80	85	90	95	98
							-inches						
1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.17	0.32	0.56	0.79
1.2	.00	.00	.00	.00	.00	.00	.03	.07	.15	.27	.46	.74	.99
1.4	.00	.00	.00	.00	.00	.02	.06	.13	.24	.39	.61	.92	1.18
1.6	.00	.00	.00	.00	.01	.05	.11	.20	.34	.52	.76	1.11	1.38
1.8	.00	.00	.00	.00	.03	.09	.17	.29	.44	.65	.93	1.29	1.58
2.0	.00	.00	.00	.02	.06	.14	.24	.38	.56	.80	1.09	1.48	1.77
2.5	.00	.00	.02	.08	.17	.30	.46	.65	.89	1.18	1.53	1.96	2.27
3.0	.00	.02	.09	.19	.33	.51	.71	.96	1.25	1.59	1.98	2.45	2.77
3.5	.02	.08	.20	.35	.53	.75	1.01	1.30	1.64	2.02	2.45	2.94	3.27
4.0	.06	.18	.33	.53	.76	1.03	1.33	1.67	2.04	2.46	2.92	3.43	3.77
4.5	.14	.30	.50	.74	1.02	1.33	1.67	2.05	2.46	2.91	3.40	3.92	4.26
5.0	.24	.44	.69	.98	1.30	1.65	2.04	2.45	2.89	3.37	3.88	4.42	4.76
6.0	.50	.80	1.14	1.52	1.92	2.35	2.81	3.28	3.78	4.30	4.85	5.41	5.76
7.0	.84	1.24	1.68	2.12	2.60	3.10	3.62	4.15	4.69	5.25	5.82	6.41	6.76
8.0	1.25	1.74	2.25	2.78	3.33	3.89	4.46	5.04	5.63	6.21	6.81	7.40	7.76
9.0	1.71	2.29	2.88	3.49	4.10	4.72	5.33	5.95	6.57	7.18	7.79	8.40	8.76
10.0	2.23	2.89	3.56	4.23	4.90	5.56	6.22	6.88	7.52	8.16	8.78	9.40	9.76
11.0	2.78	3.52	4.26	5.00	5.72	6.43	7.13	7.81	8.48	9.13	9.77	10.39	10.76
12.0	3.38	4.19	5.00	5.79	6.56	7.32	8.05	8.76	9.45	10.11	10.76	11.39	11.76
13.0	4.00	4.89	5.76	6.61	7.42	8.21	8.98	9.71	10.42	11.10	11.76	12.39	12.76
14.0	4.65	5.62	6.55	7.44	8.30	9.12	9.91	10.67	11.39	12.08	12.75	13.39	13.76
15.0	5.33	6.36	7.35	8.29	9.19	10.04	10.85	11.63	12.37	13.07	13.74	14.39	14.76

Figure 2-2 Flow chart for selecting the appropriate figure or table for determining runoff curve numbers.

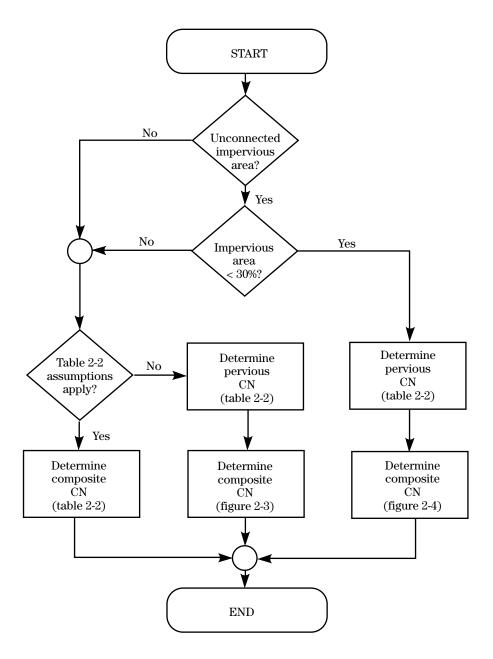


Table 2-2a Runoff curve numbers for urban areas 1/

Cover description			Curve nu hydrologic-	umbers for soil group	
	Average percent		-		
Cover type and hydrologic condition i	mpervious area ² /	A	В	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) 3/:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc.					
(excluding right-of-way)	••••	98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding					
right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) 4/		63	77	85	88
Artificial desert landscaping (impervious weed barrier,					
desert shrub with 1- to 2-inch sand or gravel mulch					
and basin borders)		96	96	96	96
Urban districts:					
Commercial and business		89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)		77	85	90	92
1/4 acre		61	7 5	83	87
1/3 acre		57	72	81	86
1/2 acre		54	70	80	85
1 acre		51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas					
(pervious areas only, no vegetation) 5/		77	86	91	94
Idle lands (CN's are determined using cover types					
similar to those in table 2-2c).					

¹ Average runoff condition, and $I_a = 0.2S$.

² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

 Table 2-2b
 Runoff curve numbers for cultivated agricultural lands \underline{V}

	Cover description			Curve num hydrologic s		
	cover description	Hydrologic		11, 01 010 610 5	on group	
Cover type	Treatment 2/	condition 3/	A	В	С	D
Fallow	Bare soil	_	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
-		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	7 5	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded	SR	Poor	66	77	85	89
or broadcast	_	Good	58	72	81	85
legumes or	C	Poor	64	75	83	85
rotation		Good	55	69	78	83
meadow	C&T	Poor	63	73	80	83
		Good	51	67	76	80

 $^{^{1}}$ Average runoff condition, and I_a =0.2S

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

² Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

 $^{^3}$ Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good \geq 20%), and (e) degree of surface roughness.

 $\textbf{Table 2-2c} \qquad \text{Runoff curve numbers for other agricultural lands } \underline{1}{}^{\underline{1}}$

Cover description		Curve numbers for hydrologic soil group				
Cover type	Hydrologic condition	A	В	С	D	
Pasture, grassland, or range—continuous	Poor	68	79	86	89	
forage for grazing. 2/	Fair	49	69	79	84	
Totage for grazing.	Good	39	61	74	80	
Meadow—continuous grass, protected from grazing and generally mowed for hay.	_	30	58	71	78	
Brush—brush-weed-grass mixture with brush	Poor	48	67	77	83	
the major element. 3/	Fair	35	56	70	77	
•	Good	30 4/	48	65	73	
Woods—grass combination (orchard	Poor	57	73	82	86	
or tree farm). 5/	Fair	43	65	76	82	
,	Good	32	58	72	79	
Woods. 6/	Poor	45	66	77	83	
	Fair	36	60	73	79	
	Good	30 4/	55	70	77	
Farmsteads—buildings, lanes, driveways, and surrounding lots.	_	59	74	82	86	

¹ Average runoff condition, and $I_a = 0.2S$.

² *Poor:* <50%) ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: > 75% ground cover and lightly or only occasionally grazed.

³ *Poor*: <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

⁴ Actual curve number is less than 30; use CN = 30 for runoff computations.

⁵ CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

⁶ Poor: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

 $\textbf{Table 2-2d} \qquad \text{Runoff curve numbers for arid and semiarid rangelands } \underline{\lor}$

Cover description			Curve numbers for hydrologic soil group				
Cover type	Hydrologic condition 2/	A 3/	В	C	D		
Herbaceous—mixture of grass, weeds, and	Poor		80	87	93		
low-growing brush, with brush the	Fair		71	81	89		
minor element.	Good		62	74	85		
Oak-aspen—mountain brush mixture of oak brush,	Poor		66	74	79		
aspen, mountain mahogany, bitter brush, maple,	Fair		48	57	63		
and other brush.	Good		30	41	48		
Pinyon-juniper—pinyon, juniper, or both;	Poor		75	85	89		
grass understory.	Fair		58	73	80		
	Good		41	61	71		
Sagebrush with grass understory.	Poor		67	80	85		
	Fair		51	63	70		
	Good		35	47	55		
Desert shrub—major plants include saltbush,	Poor	63	77	85	88		
greasewood, creosotebush, blackbrush, bursage,	Fair	55	72	81	86		
palo verde, mesquite, and cactus.	Good	49	68	79	84		

 $^{^{\, 1}}$ $\,$ Average runoff condition, and $I_a,$ = 0.2S. For range in humid regions, use table 2-2c.

Good: > 70% ground cover.

Poor: <30% ground cover (litter, grass, and brush overstory).
 Fair: 30 to 70% ground cover.

 $^{^{\}scriptscriptstyle 3}$ $\,$ Curve numbers for group A have been developed only for desert shrub.

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Antecedent runoff condition

The index of runoff potential before a storm event is the antecedent runoff condition (ARC). ARC is an attempt to account for the variation in CN at a site from storm to storm. CN for the average ARC at a site is the median value as taken from sample rainfall and runoff data. The CN's in table 2-2 are for the average ARC, which is used primarily for design applications. See NEH-4 (SCS 1985) and Rallison and Miller (1981) for more detailed discussion of storm-to-storm variation and a demonstration of upper and lower enveloping curves.

Urban impervious area modifications

Several factors, such as the percentage of impervious area and the means of conveying runoff from impervious areas to the drainage system, should be considered in computing CN for urban areas (Rawls et al., 1981). For example, do the impervious areas connect directly to the drainage system, or do they outlet onto lawns or other pervious areas where infiltration can occur?

Connected impervious areas — An impervious area is considered connected if runoff from it flows directly into the drainage system. It is also considered connected if runoff from it occurs as concentrated shallow flow that runs over a pervious area and then into the drainage system.

Urban CN's (table 2-2a) were developed for typical land use relationships based on specific assumed percentages of impervious area. These CN vales were developed on the assumptions that (a) pervious urban areas are equivalent to pasture in good hydrologic condition and (b) impervious areas have a CN of 98 and are directly connected to the drainage system. Some assumed percentages of impervious area are shown in table 2-2a

If all of the impervious area is directly connected to the drainage system, but the impervious area percentages or the pervious land use assumptions in table 2-2a are not applicable, use figure 2-3 to compute a composite CN. For example, table 2-2a gives a CN of 70 for a 1/2-acre lot in HSG B, with assumed impervious area

of 25 percent. However, if the lot has 20 percent impervious area and a pervious area CN of 61, the composite CN obtained from figure 2-3 is 68. The CN difference between 70 and 68 reflects the difference in percent impervious area.

Unconnected impervious areas — Runoff from these areas is spread over a pervious area as sheet flow. To determine CN when all or part of the impervious area is not directly connected to the drainage system, (1) use figure 2-4 if total impervious area is less than 30 percent or (2) use figure 2-3 if the total impervious area is equal to or greater than 30 percent, because the absorptive capacity of the remaining pervious areas will not significantly affect runoff.

When impervious area is less than 30 percent, obtain the composite CN by entering the right half of figure 2-4 with the percentage of total impervious area and the ratio of total unconnected impervious area to total impervious area. Then move left to the appropriate pervious CN and read down to find the composite CN. For example, for a 1/2-acre lot with 20 percent total impervious area (75 percent of which is unconnected) and pervious CN of 61, the composite CN from figure 2-4 is 66. If all of the impervious area is connected, the resulting CN (from figure 2-3) would be 68.

Figure 2-3 Composite CN with connected impervious area.

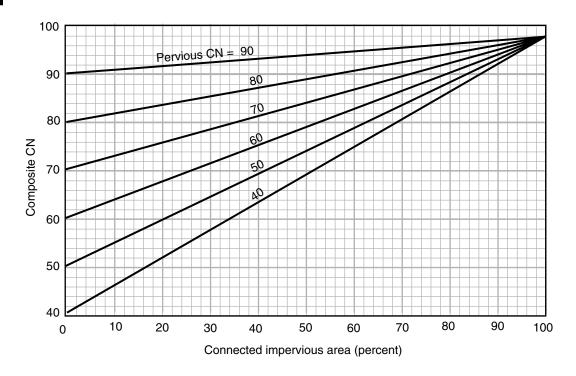
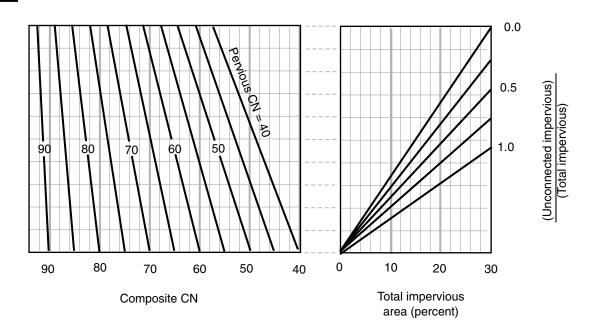


Figure 2-4 Composite CN with unconnected impervious areas and total impervious area less than 30%



Runoff

When CN and the amount of rainfall have been determined for the watershed, determine runoff by using figure 2-1, table 2-1, or equations 2-3 and 2-4. The runoff is usually rounded to the nearest hundredth of an inch.

Limitations

- Curve numbers describe average conditions that are useful for design purposes. If the rainfall event used is a historical storm, the modeling accuracy decreases.
- Use the runoff curve number equation with caution when re-creating specific features of an actual storm. The equation does not contain an expression for time and, therefore, does not account for rainfall duration or intensity.
- The user should understand the assumption reflected in the initial abstraction term (Ia) and should ascertain that the assumption applies to the situation. I_a, which consists of interception, initial infiltration, surface depression storage, evapotranspiration, and other factors, was generalized as 0.2S based on data from agricultural watersheds (S is the potential maximum retention after runoff begins). This approximation can be especially important in an urban application because the combination of impervious areas with pervious areas can imply a significant initial loss that may not take place. The opposite effect, a greater initial loss, can occur if the impervious areas have surface depressions that store some runoff. To use a relationship other than $I_a = 0.2S$, one must redevelop equation 2-3, figure 2-1, table 2-1, and table 2-2 by using the original rainfall-runoff data to establish new S or CN relationships for each cover and hydrologic soil group.
- Runoff from snowmelt or rain on frozen ground cannot be estimated using these procedures.
- The CN procedure is less accurate when runoff is less than 0.5 inch. As a check, use another procedure to determine runoff.

- The SCS runoff procedures apply only to direct surface runoff: do not overlook large sources of subsurface flow or high ground water levels that contribute to runoff. These conditions are often related to HSG A soils and forest areas that have been assigned relatively low CN's in table 2-2. Good judgment and experience based on stream gage records are needed to adjust CN's as conditions warrant.
- When the weighted CN is less than 40, use another procedure to determine runoff.

Examples

Four examples illustrate the procedure for computing runoff curve number (CN) and runoff (Q) in inches. Worksheet 2 in appendix D is provided to assist TR-55 users. Figures 2-5 to 2-8 represent the use of worksheet 2 for each example. All four examples are based on the same watershed and the same storm event.

The watershed covers 250 acres in Dyer County, northwestern Tennessee. Seventy percent (175 acres) is a Loring soil, which is in hydrologic soil group C. Thirty percent (75 acres) is a Memphis soil, which is in group B. The event is a 25-year frequency, 24-hour storm with total rainfall of 6 inches.

Cover type and conditions in the watershed are different for each example. The examples, therefore, illustrate how to compute CN and Q for various situations of proposed, planned, or present development.

Example 2-1

The present cover type is pasture in good hydrologic condition. (See figure 2-5 for worksheet 2 information.)

Example 2-2

Seventy percent (175 acres) of the watershed, consisting of all the Memphis soil and 100 acres of the Loring soil, is 1/2-acre residential lots with lawns in good hydrologic condition. The rest of the watershed is scattered open space in good hydrologic condition. (See figure 2-6.)

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Example 2-3

This example is the same as example 2-2, except that the 1/2-acre lots have a total impervious area of 35 percent. For these lots, the pervious area is lawns in good hydrologic condition. Since the impervious area percentage differs from the percentage assumed in table 2-2, use figure 2-3 to compute CN. (See figure 2-7.)

Example 2-4

This example is also based on example 2-2, except that 50 percent of the impervious area associated with the 1/2-acre lots on the Loring soil is "unconnected," that is, it is not directly connected to the drainage system. For these lots, the pervious area CN (lawn, good condition) is 74 and the impervious area is 25 percent. Use figure 2-4 to compute the CN for these lots. CN's for the 1/2-acre lots on Memphis soil and the open space on Loring soil are the same as those in example 2-2. (See figure 2-8.)

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Figure 2-5 Worksheet 2 for example 2-1

Project Heavenly A	cres	By WJR				Date 10/	′1/85
Dyer Coun	Checked NN	/			Date 10/3/85		
Check one: X Pres	sent Developed						
1. Runoff curve Soil name	number Cover description	n		CN -	/	Area	Product
and hydrologic group (appendix A)	(cover type, treatment, and hydrologic impervious; unconnected/connected in	condition; percent	Table 2-2	Figure 2-3	Figure 2-4	□ acres □ mi² X %	of CN x area
Memphis, B	Pasture, good condit	ion	61			30	1830
Loring, C	Pasture, good condition					70	5180
_1/ Use only one CN source	ce per line		1	Γotal	s 🖈	100	7010
CN (weighted) =	total product total area = $\frac{7010}{100}$	_=70.1;	Use	e CN	•	70	
2. Runoff		Storm #1		Stor	m #2		Storm #3
Frequenc	:y yr	25					
	, P (24-hour) in	6.0					
D# C) in	2.81					

Figure 2-6 Worksheet 2 for example 2-2

Project Heavenly A	cres	By WJR				Date 10/	/1/85
Dyer County, Tennessee Cher		Checked NN	necked NM			Date 10/3/85	
Check one: Pres	ent 🗓 Developed	175 Acres	resid	entia	ıl	'	
1. Runoff curve	number						
Soil name	Cover description	Cover description		CN ¹	<u>/</u>	Area	Product of
and hydrologic							CN x area
group	(cover type, treatment, and hydrologic co	ndition; percent	Table 2-2	Figure 2-3	Figure 2-4	i X iacres □ mi²	
(appendix A)	impervious; unconnected/connected impe	<u> </u>	Table	Figur	Figu	□ %	
Memphis, B	25% impo 1/2 acre lots, good co		70			75	5250
·	25% impe					/3	
Loring, C		1/2 acre lots, good condition				100	8000
Loring, C	Open space, good condition		74			75	5550
1/ Use only one CN sour	ce per line		1	Totals	s p	250	18,800
					,		
CN (weighted) =		= <u>75.2</u> ;	Use	CN	•	75	
	total area 250						
2. Runoff							
		Storm #1		Storr	n #2		Storm #3
Frequenc	y yr	25					
Rainfall, F	P (24-hour) in	6.0					
Runoff, Q	in	3.28					

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Figure 2-7 Worksheet 2 for example 2-3

Heavenly Acres WJR						Date 10/1/85	
Dyer County	y, Tennessee	Checked NM	l	Date 10/3/85			
Check one: Preser	nt 🛛 Developed						
1. Runoff curve n	umber						
Soil name and hydrologic	Cover description			CN ¹		Area	Product of CN x area
group (appendix A)	(cover type, treatment, and hydrologic con impervious; unconnected/connected imper	vious area ratio)	Table 2-2	Figure 2-3	Figure 2-4	☆ acres □ mi ² □ %	
Memphis, B	35% impervious 1/2 acre lots, good condition			74		75	5550
Loring, C	35% impervious 1/2 acre lots, good condition			82		100	8200
Loring, C	Open space, good condition					75	5550
1/ Use only one CN source p	er line		-	Totals	s •	250	19,300
t	al product otal area = 19,300 = 250	<u>77.2</u> ;	Use	e CN I	•	77	
2. Runoff				C:	110		Otomor !! O
		Storm #1 25		Storr	n #2		Storm #3
	yr	6.0					
	24-hour) in	0.0					
	in CN with table 2-1, figure 2-1, or	3.48					

Figure 2-8 Worksheet 2 for example 2-4

Heavenly Ac	res	By WJR				Date 10/	/1/85
Dyer County, Tennessee Checked NM						Date 10/3/85	
Check one: Prese	nt 🗓 Developed						
I. Runoff curve n	umber				. /		
Soil name and	Cover description			CN ¹		Area	Product of
hydrologic group (appendix A)	(cover type, treatment, and hydrologic con- impervious; unconnected/connected imper		Table 2-2	Figure 2-3	Figure 2-4	i X iacres □mi² □%	CN x area
Memphis,B	25% connected impe 1/2 acre lots, good cor	rvious adition	70			75	5250
Loring, C	25% impervious with 50% unconnected 1/2 acre lots, good condition				78	100	7800
Loring, C	Open space, good condition					75	5550
1/ Use only one CN source p	per line		7	Fotals	s 🖈	250	18,600
	total product total area = \frac{18,600}{250} =	<u>74.4</u> ;	Use	CN	•	74	
2. Runoff							<u> </u>
		Storm #1 25	+	Storr	m #2		Storm #3
	yr	6.0	+				
Raintall, P	(24-hour) in	0.0	\perp				

Time of Concentration and Travel Time

Travel time ($T_{\rm t}$) is the time it takes water to travel from one location to another in a watershed. $T_{\rm t}$ is a component of time of concentration ($T_{\rm c}$), which is the time for runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. $T_{\rm c}$ is computed by summing all the travel times for consecutive components of the drainage conveyance system.

 $T_{\rm c}$ influences the shape and peak of the runoff hydrograph. Urbanization usually decreases $T_{\rm c},$ thereby increasing the peak discharge. But $T_{\rm c}$ can be increased as a result of (a) ponding behind small or inadequate drainage systems, including storm drain inlets and road culverts, or (b) reduction of land slope through grading.

Factors affecting time of concentration and travel time

Surface roughness

One of the most significant effects of urban development on flow velocity is less retardance to flow. That is, undeveloped areas with very slow and shallow overland flow through vegetation become modified by urban development: the flow is then delivered to streets, gutters, and storm sewers that transport runoff downstream more rapidly. Travel time through the watershed is generally decreased.

Channel shape and flow patterns

In small non-urban watersheds, much of the travel time results from overland flow in upstream areas. Typically, urbanization reduces overland flow lengths by conveying storm runoff into a channel as soon as possible. Since channel designs have efficient hydraulic characteristics, runoff flow velocity increases and travel time decreases.

Slope

Slopes may be increased or decreased by urbanization, depending on the extent of site grading or the extent to which storm sewers and street ditches are used in the design of the water management system. Slope will tend to increase when channels are straightened and decrease when overland flow is directed through storm sewers, street gutters, and diversions.

Computation of travel time and time of concentration

Water moves through a watershed as sheet flow, shallow concentrated flow, open channel flow, or some combination of these. The type that occurs is a function of the conveyance system and is best determined by field inspection.

Travel time ($T_{\rm t}$) is the ratio of flow length to flow velocity:

$$T_{\rm t} = \frac{L}{3600V}$$
 [eq. 3-1]

where:

 T_t = travel time (hr)

L = flow length (ft)

V = average velocity (ft/s)

3600 = conversion factor from seconds to hours.

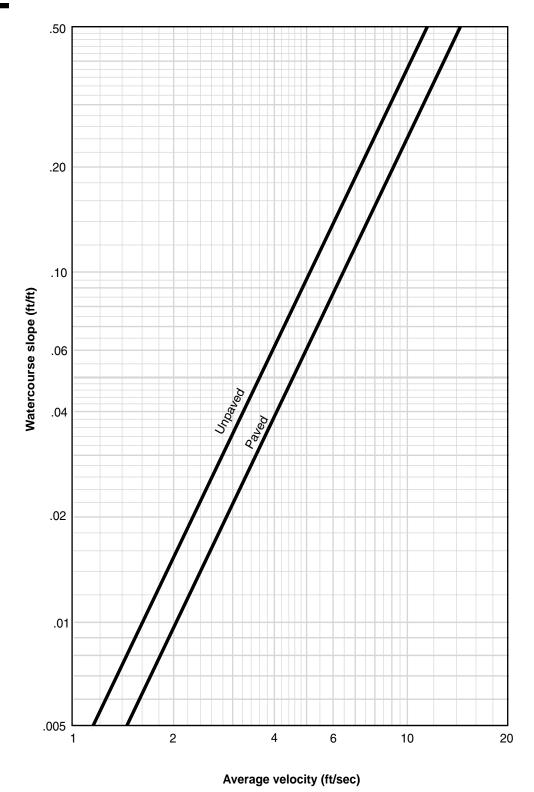
Time of concentration ($T_{\rm c}$) is the sum of $T_{\rm t}$ values for the various consecutive flow segments:

$$T_c = T_{t_1} + T_{t_2} + \dots T_{t_m}$$
 [eq. 3-2]

where:

 T_c = time of concentration (hr) m = number of flow segments

Figure 3-1 Average velocities for estimating travel time for shallow concentrated flow



Sheet flow

Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. With sheet flow, the friction value (Manning's n) is an effective roughness coefficient that includes the effect of raindrop impact; drag over the plane surface; obstacles such as litter, crop ridges, and rocks; and erosion and transportation of sediment. These n values are for very shallow flow depths of about 0.1 foot or so. Table 3-1 gives Manning's n values for sheet flow for various surface conditions.

Table 3-1 Roughness coefficients (Manning's n) for sheet flow

Surface description	n <u>1</u> /
Smooth surfaces (concrete, asphalt,	
gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤20%	0.06
Residue cover >20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses 2/	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:3/	
Light underbrush	0.40
Dense underbrush	0.80

¹ The n values are a composite of information compiled by Engman (1986)

For sheet flow of less than 300 feet, use Manning's kinematic solution (Overtop and Meadows 1976) to compute T_t :

$$T_{t} = \frac{0.007(nL)^{0.8}}{(P_{2})^{0.5} s^{0.4}}$$
 [eq. 3-3]

where:

 $T_t = \text{travel time (hr)},$

n = Manning's roughness coefficient (table 3-1)

L = flow length (ft)

 $P_2 = 2$ -year, 24-hour rainfall (in)

s = slope of hydraulic grade line

(land slope, ft/ft)

This simplified form of the Manning's kinematic solution is based on the following: (1) shallow steady uniform flow, (2) constant intensity of rainfall excess (that part of a rain available for runoff), (3) rainfall duration of 24 hours, and (4) minor effect of infiltration on travel time. Rainfall depth can be obtained from appendix B.

Shallow concentrated flow

After a maximum of 300 feet, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from figure 3-1, in which average velocity is a function of watercourse slope and type of channel. For slopes less than 0.005 ft/ft, use equations given in appendix F for figure 3-1. Tillage can affect the direction of shallow concentrated flow. Flow may not always be directly down the watershed slope if tillage runs across the slope.

After determining average velocity in figure 3-1, use equation 3-1 to estimate travel time for the shallow concentrated flow segment.

Open channels

Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets.

Manning's equation or water surface profile information can be used to estimate average flow velocity. Average flow velocity is usually determined for bankfull elevation.

² Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.

 $^{^3}$ When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

Manning's equation is:

$$V = \frac{1.49r^{\frac{2}{3}}s^{\frac{1}{2}}}{n}$$
 [eq. 3-4]

where:

V = average velocity (ft/s)

$$\begin{split} r = & \text{ hydraulic radius (ft) and is equal to a/p}_w \\ a = & \text{ cross sectional flow area (ft}^2) \\ p_w = & \text{ wetted perimeter (ft)} \end{split}$$

s = slope of the hydraulic grade line (channel slope, ft/ft)

n = Manning's roughness coefficient for open channel flow.

Manning's n values for open channel flow can be obtained from standard textbooks such as Chow (1959) or Linsley et al. (1982). After average velocity is computed using equation 3-4, $T_{\rm t}$ for the channel segment can be estimated using equation 3-1.

Reservoirs or lakes

Sometimes it is necessary to estimate the velocity of flow through a reservoir or lake at the outlet of a watershed. This travel time is normally very small and can be assumed as zero.

Limitations

- Manning's kinematic solution should not be used for sheet flow longer than 300 feet. Equation 3-3 was developed for use with the four standard rainfall intensity-duration relationships.
- In watersheds with storm sewers, carefully identify
 the appropriate hydraulic flow path to estimate T_c.
 Storm sewers generally handle only a small portion
 of a large event. The rest of the peak flow travels
 by streets, lawns, and so on, to the outlet. Consult a
 standard hydraulics textbook to determine average
 velocity in pipes for either pressure or nonpressure
 flow.
- The minimum T_c used in TR-55 is 0.1 hour.

• A culvert or bridge can act as a reservoir outlet if there is significant storage behind it. The procedures in TR-55 can be used to determine the peak flow upstream of the culvert. Detailed storage routing procedures should be used to determine the outflow through the culvert.

Example 3-1

The sketch below shows a watershed in Dyer County, northwestern Tennessee. The problem is to compute T_c at the outlet of the watershed (point D). The 2-year 24-hour rainfall depth is 3.6 inches. All three types of flow occur from the hydraulically most distant point (A) to the point of interest (D). To compute T_c , first determine T_t for each segment from the following information:

Segment AB: Sheet flow; dense grass; slope (s) = 0.01 ft/ft; and length (L) = 100 ft. Segment BC: Shallow concentrated flow; unpaved; s = 0.01 ft/ft; and L = 1,400 ft. Segment CD: Channel flow; Manning's n = .05; flow area (a) = 27 ft²; wetted perimeter (p_w) = 28.2 ft; s = 0.005 ft/ft; and L = 7,300 ft.

See figure 3-2 for the computations made on worksheet 3.

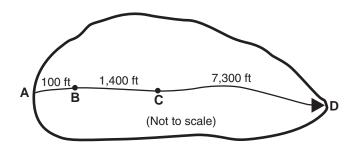


Figure 3-2 Worksheet 3 for example 3-1

Project Heavenly Acres	By DW	Date 10	0/6/85
Dyer County, Tennessee	Checked NM	Date 10	0/8/85
Check one: Present Developed			
Check one: T _C T _t through subarea			
Notes: Space for as many as two segments per flow tyl Include a map, schematic, or description of flow		heet.	
Sheet flow (Applicable to T _C only)			
Segment ID	AB		
Surface description (table 3-1)	Dense Grass		
Manning's roughness coefficient, n (table 3-1)	0.24		
3. Flow length, L (total L ≤ 300 ft) ft	100		
4. Two-year 24-hour rainfall, P in	3.6		
5. Land slope, s ft/ft	0.01		
6. $T_{\star} = 0.007 \text{ (nL)}^{0.8}$ Compute T_{t} hr	0.30 +	=	0.30
6. $T_t = \frac{0.007 \text{ (nL)}^{0.8}}{P_2^{0.5} \text{ s}^{0.4}}$ Compute T_t hr		'	
Shallow concentrated flow			
Segment ID	BC		
7. Surface description (paved or unpaved)	Unpaved		
8. Flow length, Lft	1400		
9. Watercourse slope, s ft/ft	0.01		
10. Average velocity, V (figure 3-1) ft/s	1.6		0.24
11. $T_t = \frac{L}{3600 \text{ V}}$ Compute T_t	0.24 +	=	0.24
Channel flow			
Segement ID	CD		
12. Cross sectional flow area, a ft ²	27		
13. Wetted perimeter, p _w	28.2		
14. Hydraulic radius, $r = \frac{a}{r}$ Compute rft	0.957		
15 Channel slope, s ft/ft	0.005		
16. Manning's roughness coefficient, n	0.05		
17. $V = \frac{1.49 \text{ r}^{2/3} \text{ s}^{1/2}}{n}$ Compute Vft/s	2.05		
18. Flow length, L''ft	7300		
19. $T_t = \frac{L}{3600 \text{ V}}$ Compute T_t hr	0.99 +	=	0.99

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Graphical Peak Discharge Method

This chapter presents the Graphical Peak Discharge method for computing peak discharge from rural and urban areas. The Graphical method was developed from hydrograph analyses using TR-20, "Computer Program for Project Formulation—Hydrology" (SCS 1983). The peak discharge equation used is:

$$q_{p} = q_{u}A_{m}QF_{p}$$
 [eq. 4-1]

where:

 q_p = peak discharge (cfs)

q_u = unit peak discharge (csm/in)

 $A_m = drainage area (mi²)$

Q = runoff(in)

 F_p = pond and swamp adjustment factor

The input requirements for the Graphical method are as follows: (1) $T_{\rm c}$ (hr), (2) drainage area (mi²), (3) appropriate rainfall distribution (I, IA, II, or III), (4) 24-hour rainfall (in), and (5) CN. If pond and swamp areas are spread throughout the watershed and are not considered in the $T_{\rm c}$ computation, an adjustment for pond and swamp areas is also needed.

Peak discharge computation

For a selected rainfall frequency, the 24-hour rainfall (P) is obtained from appendix B or more detailed local precipitation maps. CN and total runoff (Q) for the watershed are computed according to the methods outlined in chapter 2. The CN is used to determine the initial abstraction (I_a) from table 4-1. I_a/P is then computed.

If the computed I_a/P ratio is outside the range in exhibit 4 (4-I, 4-IA, 4-II, and 4-III) for the rainfall distribution of interest, then the limiting value should be used. If the ratio falls between the limiting values, use linear interpolation. Figure 4-1 illustrates the sensitivity of I_a/P to CN and P.

Peak discharge per square mile per inch of runoff (q_u) is obtained from exhibit 4-I, 4-IA, 4-II, or 4-III by using T_c (chapter 3), rainfall distribution type, and I_a/P ratio. The pond and swamp adjustment factor is obtained from table 4-2 (rounded to the nearest table value). Use worksheet 4 in appendix D to aid in computing the peak discharge using the Graphical method.

Table 4-1 I_a values for runoff curve numbers

Curve	I_a	Curve	I _a
number	(in)	number	(in)
40	3.000	70	0.857
41	2.878	71	0.817
42			0.778
43		73	0.740
44	2.545	74	0.703
45		75	0.667
46		76	0.632
47			0.597
48		78	0.564
49		79	0.532
50			0.500
51		81	0.469
52		82	0.439
53	1.774	83	0.410
54		84	0.381
55	1.636	85	0.353
56			0.326
57		87	0.299
58	1.448	88	0.273
59	1.390	89	0.247
60	1.333	90	0.222
61	1.279	91	0.198
62	1.226	92	0.174
63	1.175	93	0.151
64	1.125	94	0.128
65	1.077	95	0.105
66	1.030	96	0.083
67	0.985	97	0.062
68	0.941	98	0.041
69	0.899		
		l	

Table 4-2

Adjustment factor (\boldsymbol{F}_p) for pond and swamp areas that are spread throughout the watershed

Percentage of pond and swamp areas	F_{p}
0	
0.2 1.0	
3.0	
5.0	0.72

Limitations

The Graphical method provides a determination of peak discharge only. If a hydrograph is needed or watershed subdivision is required, use the Tabular Hydrograph method (chapter 5). Use TR-20 if the watershed is very complex or a higher degree of accuracy is required.

- The watershed must be hydrologically homogeneous, that is, describable by one CN. Land use, soils, and cover are distributed uniformly throughout the watershed.
- The watershed may have only one main stream or, if more than one, the branches must have nearly equal $T_C{}'$ s.
- The method cannot perform valley or reservoir routing.
- The F_p factor can be applied only for ponds or swamps that are not in the T_c flow path.
- Accuracy of peak discharge estimated by this method will be reduced if I_a/P values are used that are outside the range given in exhibit 4. The limiting I_a/P values are recommended for use.
- This method should be used only if the weighted CN is greater than 40.

- When this method is used to develop estimates of peak discharge for both present and developed conditions of a watershed, use the same procedure for estimating T_c.
- T_c values with this method may range from 0.1 to 10 hours.

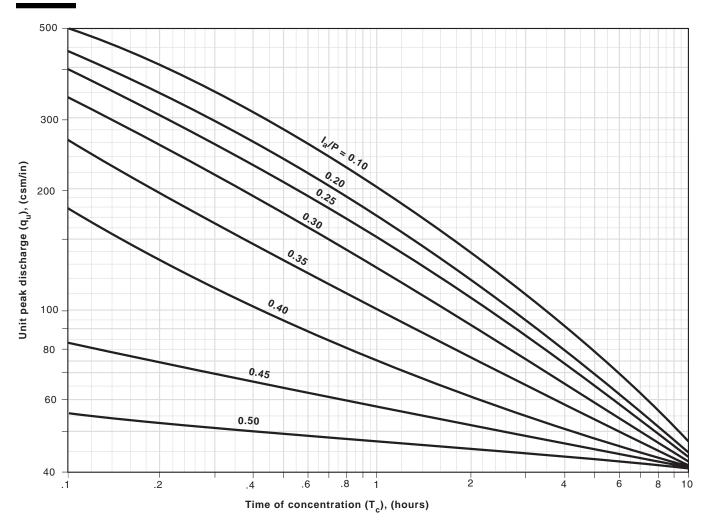
Example 4-1

Compute the 25-year peak discharge for the 250-acre watershed described in examples 2-2 and 3-1. Figure 4-2 shows how worksheet 4 is used to compute $q_{\rm p}$ as $345~{\rm cfs.}$

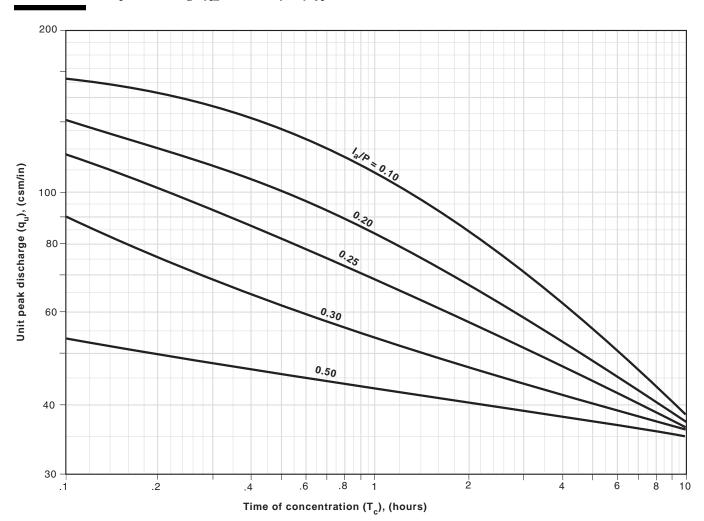
Example 4-1 Worksheet 4 for example 4-1

oject Heavenly Acres	By RHM		Dat	e 10/15/85
Dyer County, Tennessee	Checked NN		Da	te 10/17/85
Check one: Present 🛮 Developed				
1. Data	0.20			
Drainage areaA _m =	0.39 mi² (a			
Runoff curve numberCN =	(From	worksheet 2	2),Figui	e 2-6
Time of concentrationT _C =	hr (Fi	om workshe	et 3), <i>Fi</i> (gure 3-2
Rainfall distribution =	(I, IA, I	I III)		
Pond and swamp areas sprea throughout watershed=	percent of	of A _m (acres	or mi ² covered)
		Storm #1	Storm #2	Storm #3
2. Frequency	vr	25		
3. Rainfall, P (24-hour)	,	6.0		
	·			
Initial abstraction, I _a (Use CN with table 4-1)	in	0.667		
5. Compute I _a /P		0.11		
3. Compute 1 ₂ /1				
6. Unit peak discharge, qu(Use T _C and I _a /P with exhibit 4- II)	csm/in	270		
7. Runoff, Q		3.28		
(From worksheet 2). Figure 2-6			1	
8. Pond and swamp adjustment factor, F _p		1.0		
(Use percent pond and swamp area' with table 4-2. Factor is 1.0 for zero percent pond ans swamp area.)				
9. Peak discharge, q _p	cfs	345		
(Where $q_p = q_u A_m Q F_p$)				
v u m p/				

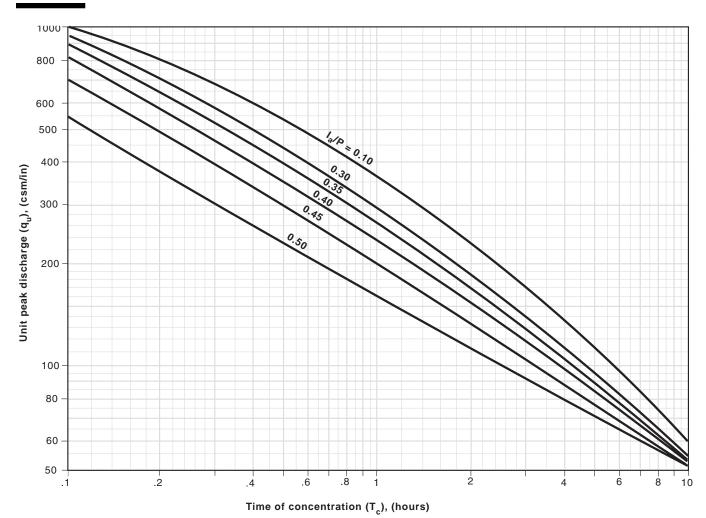
Exhibit 4-I Unit peak discharge (q_{tt}) for NRCS (SCS) type I rainfall distribution



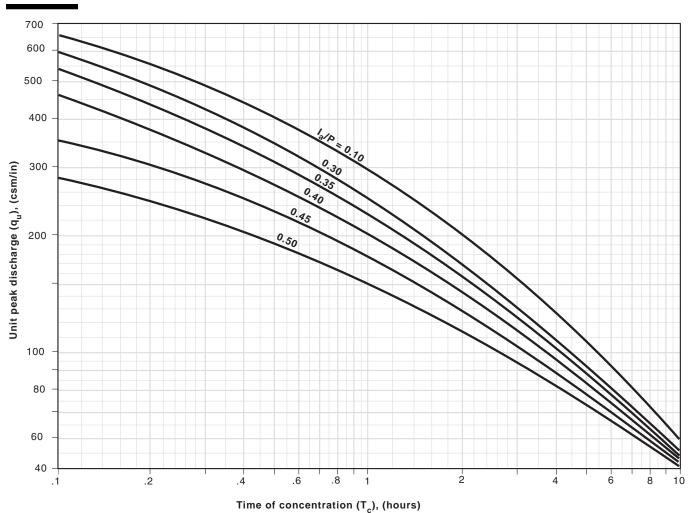
 $\textbf{Exhibit 4-IA} \quad \text{Unit peak discharge } (q_u) \text{ for NRCS (SCS) type IA rainfall distribution}$



 $\textbf{Exhibit 4-II} \quad \text{Unit peal discharge } (q_u) \text{ for NRCS (SCS) type II rainfall distribution}$



 $\textbf{Exhibit 4-III} \ \ \text{Unit peal discharge } (q_u) \ \text{for NRCS (SCS) type III rainfall distribution}$



Chapter 5

Tabular Hydrograph Method

This chapter presents the Tabular Hydrograph method of computing peak discharges from rural and urban areas, using time of concentration (T_c) and travel time (T_t) from a subarea as inputs. This method approximates TR-20, a more detailed hydrograph procedure (SCS 1983).

The Tabular method can develop partial composite flood hydrographs at any point in a watershed by dividing the watershed into homogeneous subareas. In this manner, the method can estimate runoff from nonhomogeneous watersheds. The method is especially applicable for estimating the effects of land use change in a portion of a watershed. It can also be used to estimate the effects of proposed structures.

Input data needed to develop a partial composite flood hydrograph include (1) 24-hour rainfall (in), (2) appropriate rainfall distribution (I, IA, II, or III), (3) CN, (4) T_c (hr), (5) T_t (hr), and (6) drainage area (mi²).

Tabular Hydrograph method exhibits

Exhibit 5 (5-I, 5-IA, 5-II, and 5-III) shows tabular discharge values for the various rainfall distributions. Tabular discharges expressed in csm/in (cubic feet of discharge per second per square mile of watershed per inch of runoff) are given for a range of subarea $T_{\rm c}$'s from 0.1 to 2 hours and reach $T_{\rm t}$'s from 0 to 3 hours.

The exhibit was developed by computing hydrographs for 1 square mile of drainage area for selected $T_{\rm c}$'s and routing them through stream reaches with the range of $T_{\rm t}$'s indicated. The Modified Att-Kin method for reach routing, formulated by SCS in the late 1970's, was used to compute the tabular hydrographs (Comer et al., 1981). A CN of 75 and rainfall amounts generating appropriate $I_{\rm a}/P$ ratios were used. The resulting runoff estimate was used to convert the hydrographs in exhibits 5-I through 5-III to cubic feet of discharge per second per square mile of watershed per inch of runoff.

An assumption in development of the tabular hydrographs is that all discharges for a stream reach flow at the same velocity. By this assumption, the subarea flood hydrographs may be routed separately and added at the reference point. The tabular hydrographs in exhibit 5 are prerouted hydrographs.

For T_t 's other than zero, the tabular discharge values represent the contribution from a single subarea to the composite hydrograph at T_t downstream.

Information required for Tabular Hydrograph method

The following information is required for the Tabular method:

- Subdivision of the watershed into areas that are relatively homogeneous and have convenient routing reaches.
- 2. Drainage area of each subarea in square miles.
- 3. T_c for each subarea in hours. The procedure for estimating T_c is outlined in chapter 3. Worksheet 3 (appendix D) can be used to calculate T_c .
- 4. T_t for each routing reach in hours. The procedure for estimating T_t is outlined in chapter 3. Worksheet 3 can be used to calculate T_t through a subarea for shallow concentrated and open channel flow.
- 5. Weighted CN for each subarea. Table 2-2 shows CN's for individual hydrologic soil cover combinations. Worksheet 2 can be used to calculate the weighted runoff curve number.
- 6. Appropriate rainfall distribution according to figure B-2 (appendix B).
- 7. The 24-hour rainfall for the selected frequency. Appendix B contains rainfall maps for various frequencies (figures B-3 to B-8).
- 8. Total runoff (Q) in inches computed from CN and rainfall.
- 9. I_a for each subarea from table 5-1, which is the same as table 4-1.
- 10. Ratio of I_a/P for each subarea. If the ratio for the rainfall distribution of interest is outside the range shown in exhibit 5, use the limiting value.

Development of composite flood hydrograph

This section describes the procedure for developing the peak discharge and selected discharge values of a composite flood hydrograph.

Selecting T_c and T_t

First, use worksheet 5a to develop a summary of basic watershed data by subarea. Then use worksheet 5b to develop a tabular hydrograph discharge summary; this summary displays the effect of individual subarea hydrographs as routed to the watershed point of

Table 5-1 I_a values for runoff curve numbers

Curve	I_a	Curve	I_a
number	(in)	number	(in)
40	3.000	70	0.857
41	2.878	71	0.817
42	2.762	72	0.778
43	2.651	73	0.740
44	2.545	74	0.703
45	2.444	75	0.667
46	2.348	76	0.632
47	2.255	77	0.597
48	2.167	78	0.564
49	2.082	79	0.532
50	2.000	80	0.500
51	1.922	81	0.469
52	1.846	82	0.439
53	1.774	83	0.410
54	1.704	84	0.381
55	1.636	85	0.353
56	1.571	86	0.326
57	1.509	87	0.299
58	1.448	88	0.273
59	1.390	89	0.247
60	1.333	90	0.222
61	1.279	91	0.198
62	1.226	92	0.174
63	1.175	93	0.151
64	1.125	94	0.128
65	1.077	95	0.105
66	1.030	96	0.083
67	0.985	97	0.062
68	0.941	98	0.041
69	0.899		

interest. Use $\sum T_t$ for each subarea as the total reach travel time from that subarea through the watershed to the point of interest. Compute the hydrograph coordinates for selected $\sum T_t$'s using the appropriate sheets in exhibit 5. The flow at any time is:

$$q = q_t A_m Q [eq. 5-1]$$

where:

q = hydrograph coordinate (cfs) at hydrograph time t

q_t = tabular hydrograph unit discharge from exhibit 5 (csm/in)

A_m = drainage area of individual subarea (mi²)

Q = runoff(in)

Since the timing of peak discharge changes with T_c and T_t interpolation of peak discharge for T_c and T_t values for use in exhibit 5 is not recommended. Interpolation may result in an estimate of peak discharge that would be invalid because it would be lower than either of the hydrographs. Therefore, round the actual values of T_c and T_t to values presented in exhibit 5. Perform this rounding so that the sum of the selected table values is close to the sum of actual T_c and T_t . An acceptable procedure is to select the results of one of three rounding operations:

- 1. Round T_c and T_t separately to the nearest table value and sum,
- 2. Round $T_{\rm c}$ down and $T_{\rm t}$ up to nearest table value and sum.
- 3. Round T_c up and T_t down to nearest table value and sum.

From these three alternatives, choose the pair of rounded T_c and T_t values whose sum is closest to the sum of the actual T_c and T_t . If two rounding methods produce sums equally close to the actual sum, use the combination in which rounded T_c is closest to actual T_c . An illustration of the rounding procedure is as follows:

		Table v	alues by rou method	nding
	Actual values	1	2	3
T_{c}	1.1	1.0	1.0	1.25
$\mathrm{T_{t}}$	1.7	1.5	2.0	1.5
Sum	2.8	2.5	3.0	2.75

In this instance, the results from method 3 would be selected because the sum 2.75 is closest to the actual sum of 2.8.

Selecting I_a / P

The computed I_a/P value can be rounded to the nearest I_a/P value in exhibits 5-I through 5-III, or the hydrograph values (csm/in) can be linearly interpolated because I_a/P interpolation generally involves peaks that occur at the same time.

Summing for the composite hydrograph

The composite hydrograph is the summation of prerouted individual subarea hydrographs at each time shown on worksheet 5b. Only the times encompassing the expected maximum composite discharge are summed to define a portion of the composite hydrograph.

If desired, the entire composite hydrograph can be approximated by linear extrapolation as follows:

- 1. Set up a table similar to worksheet 5b. Include on this table the full range of hydrograph times displayed in exhibit 5.
- 2. Compute the subarea discharge values for those times and insert them in the table.
- 3. Sum the values to obtain the composite hydrograph.
- 4. Apply linear extrapolation to the first two points and the last two points of the composite hydrograph. The volume under this approximation of the entire composite hydrograph may differ from the computed runoff volume.

Limitations

The Tabular method is used to determine peak flows and hydrographs within a watershed. However, its accuracy decreases as the complexity of the watershed increases. If you want to compare present and developed conditions of a watershed, use the same procedure for estimating $T_{\rm c}$ for both conditions.

Use the TR-20 computer program (SCS 1983) instead of the Tabular method if any of the following conditions applies:

- T_t is greater than 3 hours (largest T_t in exhibit 5).
- T_c is greater than 2 hours (largest T_c in exhibit 5).
- Drainage areas of individual subareas differ by a factor of 5 or more.
- The entire composite flood hydrograph or entire runoff volume is required for detailed flood routings. The hydrograph based on extrapolation is only an approximation of the entire hydrograph.
- The time of peak discharge must be more accurate than that obtained through the Tabular method.

The composite flood hydrograph should be compared with actual stream gage data where possible. The instantaneous peak flow value from the composite flood hydrograph can be compared with data from USGS curves of peak flow versus drainage area.

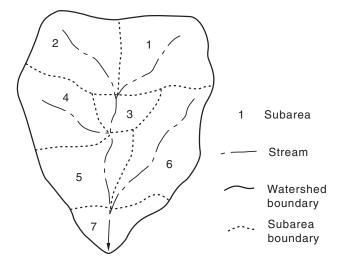
Examples

A developer proposes to put a subdivision, Fallswood, in subareas 5, 6, and 7 of a watershed in Dyer County, northwestern Tennessee (see sketch below). Before approving the developer's proposal, the planning board wants to know how the development would affect the 25-year peak discharge at the downstream end of subarea 7. The rainfall distribution is type II (figure B-2), and the 24-hour rainfall (P) is 6.0 inches (figure B-6).

Example 5-1

Compute the 25-year frequency peak discharge at the downstream end of subarea 7 for present conditions, using worksheets 5a and 5b. To do this, first calculate the present condition CN, $T_{\rm c}$, and $T_{\rm t}$ for each subarea, using the procedures in chapters 2 and 3. Enter the values on worksheet 5a (figure 5-1).

Next, compute the prerouted hydrograph points for each subarea hydrograph over a range of time near the peak discharge using worksheet 5b (figure 5-2) and the appropriate exhibit 5. For example, for subarea 4, in which $T_{\rm c}$ = 0.75 hr, refer to sheet 6 of exhibit 5-II. With ΣT_t of 2.00 hr (the sum of downstream travel time through subareas 5 and 7 to the outlet) and Ia / P of 0.1, the routed peak discharge of subarea 4 at the outlet of subarea 7 occurs at 14.6 hr and is 274 csm/in.



Solving equation 5-1 with appropriate values provides the peak discharge (q) for subarea 4 at 14.6 hr:

$$q = qt(A_mQ) = (274)(0.70) = 192 \text{ cfs.}$$

Once all the prerouted subarea hydrographs have been tabulated on worksheet 5b, sum each of the time columns to obtain the composite hydrograph. The resulting 25-year frequency peak discharge is 720 cfs at 14.3 hr (figure 5-2).

Example 5-2

Compute the 25-year frequency peak discharge at the downstream end of subarea 7 for the developed conditions, using worksheets 5a and 5b.

First, calculate the developed condition CN, T_c , and T_t for each subarea, using the procedures in chapters 2 and 3. Enter the values on worksheet 5a (figure 5-3).

Next, compute the prerouted hydrograph points for each subarea hydrograph over a range of time near the peak discharge using worksheet 5b (figure 5-4) and the appropriate exhibit 5. For example, for subarea 6, in which $T_{\rm c}{=}~1.0$ hr, refer to sheet 7 of exhibit 5-II. With $\Sigma T_{\rm t}$ of 0.5 hr (downstream travel time through subarea 7 to the outlet) and $I_{\rm a}/P$ of 0.1, the peak discharge of subarea 6 at the outlet of the watershed occurs at 13.2 hr and is 311 csm/in. Solving equation 5-1 provides the peak discharge (q):

$$q = q_t (A_m Q) = (311)(1.31) = 407 \text{ cfs}$$

Once all the prerouted subarea hydrographs have been tabulated on worksheet 5b, sum each of the time columns to obtain the composite hydrograph. The resulting 25-year frequency peak discharge is 872 cfs

Comparison

According to the results of the two examples, the proposed subdivision at the downstream end of subarea 7 is expected to increase peak discharge from 720 to 872 cfs and to decrease the time to peak from 14.3 to 13.6 hr.

Figure 5-1

Worksheet 5a: Basic watershed data

Project Fa	allswood			Location D	yer Coun	ty, Ten	nessee	Ву	DW	Date 10)/1/85
Check or	ne: 🕅 Pres	sent Dev	/eloped	Frequency (yr)	25			Checked	NM	Date 10	/3/85
Subarea name	Drainage area	Time of concentration	Travel time through subarea	Downstream subarea names	Travel time summation to outlet	24-hr rain- fall	Runoff curve number	Runoff		Initial abstraction	
	A _m	T _C	Tt		ΣT_{t}	Р	CN	Q	A _m Q	la	I _a /P
	(mi ²)	(hr)	(hr)		(hr)	(in)		(in)	(mi ² —in)	(in)	
1	0.30	1.50		3, 5, 7	2.50	6.0	65	2.35	0.71	1.077	0.18
2	0.20	1.25		3, 5, 7	2.50	6.0	70	2.80	0.56	0.857	0.14
3	0.10	0.50	0.50	5, 7	2.00	6.0	75	3.28	0.33	0.667	0.11
4	0.25	0.75		5, 7	2.00	6.0	70	2.80	0.70	0.857	0.14
5	0.20	1.50	1.25	7	0.75	6.0	75	3.28	0.66	0.667	0.11
6	0.40	1.50		7	0.75	6.0	70	2.80	1.12	0.857	0.14
7	0.20	1.25	0.75		0	6.0	75	3.28	0.66	0.667	0.11
		From work	sheet 3				From wor	ksheet 2	·	From table 5-1	

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(210-VI-TR-55, Second Ed., June 1986)

Worksheet 5b for example 5-1

Worksheet 5b: Basic watershed data

Project	allswoo	od		Location	Dye	r Cou	ınty, ī	Tenne	ssee	Ву		DV	V	Dat	10/1	
Check	one: 🖾 P	resent [Developed	Frequency	(yr)	2	25			Chec	ked	NN	1	Dat	°10/3	8/85
Subarea name	Ва	asic watershe	ed data used	1_1/			Sel	ect and e	enter hyd	rograph	times in h	nours fro	m exhibit	5-II <u>2</u> /		
Hame	Subarea T _C	ΣΤ _t to outlet	I _a /P	A _m Q	12.7	12.8	13.0	13.2	13.4	13.6	13.8	14.0	14.3	14.6	15.0	15.5
	(hr)	(hr)		(mi ² —in)		,		Dis	charges		ed hydro efs)	graph tin	nes <u>3</u> /	,		
1	1.50	2.50	0.10	0.71	4	4	5	6	6	8	10	113	24	49	100	149
2	1.25	2.50	0.10	0.56	3	4	4	6	7	8	11	16	32	64	110	127
3	0.50	2.00	0.10	0.33	5	5	6	8	12	21	41	67	98	92	60	29
4	0.75	2.00	0.10	0.70	8	9	11	14	20	34	62	106	172	192	149	81
5	1.50	0.75	0.10	0.66	21	28	50	83	118	147	158	154	127	98	67	44
6	1.50	0.75	0.10	1.12	36	47	85	140	200	249	269	261	216	166	114	75
7	1.25	0	0.10	0.66	169	187	205	176	140	108	85	69	51	40	31	24
Compo	site hydrogr	aph at outlet			246	284	366	433	503	575	636	686	720	701	631	529

^{1/} Worksheet 5a. Rounded as needed for use with exhibit 5.

 $[\]overline{\underline{2}}$ / Enter rainfall distribution type used.

^{3/} Hydrograph discharge for selected times is A_mQ multiplied by tabular discharge from appropriate exhibit 5.

Worksheet 5a: Basic watershed data

Project Fa	allswood	d		Location	yer Cour	nty, Ten	nessee	Ву	DW	Date 1	0/1/85
Check or	ne: Pres	sent 🕅 Dev	veloped	Frequency (yr)	25			Checked	NM	Date 1C	/3/85
Subarea name	Drainage area	Time of concentration	Travel time through subarea	Downstream subarea names	Travel time summation to outlet	24-hr rain- fall	Runoff curve number	Runoff		Initial abstraction	
	A _m	T _c	Tt		ΣT _t	Р	CN	Q	A _m Q	l _a	I _a /P
	(mi ²)	(hr)	(hr)		(hr)	(in)		(in)	(mi ² —in)	(in)	
1	0.30	1.50		3, 5, 7	2.00	6.0	65	2.35	0.71	1.077	0.18
2	0.20	1.25		3, 5, 7	2.00	6.0	70	2.80	0.56	0.857	0.14
3	0.10	0.50	0.50	5, 7	1.50	6.0	75	3.28	0.33	0.667	0.11
4	0.25	0.75		5, 7	1.50	6.0	70	2.80	0.70	0.857	0.14
5	0.20	1.50	1.00	7	0.50	6.0	85	4.31	0.86	0.353	0.06
6	0.40	1.00		7	0.50	6.0	75	3.28	1.31	0.857	0.14
7	0.20	0.75	0.50		0	6.0	90	4.85	0.97	0.222	0.04
		From work	csheet 3				From wor	ksheet 2		From table 5-1	

(210-VI-TR-55, Second Ed., June 1986)

(210-VI-TR-55, Second Ed., June 1986)

Figure 5-4

Worksheet 5b for example

^{1/} Worksheet 5a. Rounded as needed for use with exhibit 5.

^{2/} Enter rainfall distribution type used.

^{3/} Hydrograph discharge for selected times is A_mQ multiplied by tabular discharge from appropriate exhibit 5.

Exhibit 5-I: Tabular hydrograph unit discharges (csm/in) for type I rainfall distribution -----HYDROGRAPH TIME(HOURS)-----TIME 9.9 10.1 10.3 10.5 10.7 11.0 11.4 11.8 12.3 13.0 14.0 15.0 16.0 18.0 $9.6 \quad 10.0 \quad 10.2 \quad 10.4 \quad 10.6 \quad 10.8 \quad 11.2 \quad 11.6 \quad 12.0 \quad 12.6 \quad 13.5 \quad 14.5 \quad 15.5 \quad 17.0 \quad 20.0$ (hr)9.0* * * TC = 0.1 HR * * * IA/P = 0.1052 49 46 44 40 36 32 0.0 30 40 56 183 337 504 326 155 122 107 93 81 73 66 60 56 30 29 28 27 48 93 153 276 428 360 223 156 123 103 83 72 51 47 .20 23 41 60 82 129 227 361 360 269 194 147 118 73 111 188 303 341 293 227 173 136 56 54 .40 96 157 255 312 300 56 52 34 46 251 199 126 .50 84 133 214 280 293 265 221 144 .75 134 190 234 252 221 162 115 98 141 222 1.0 238 191 139 1.5 44 74 132 191 13 17 190 151 101 22 24 29 2.0 148 193 193 141 2.5 14 16 19 23 29 39 58 93 154 181 147 87 41 37 30 28 25 18 7 8 9 9 10 3.0 10 11 13 15 19 23 28 39 72 124 170 138 61 50 45 40 33 29 26 19 ---+ -- + - + - + -- + --- + -- IA/P = 0.30* * * TC = 0.1 HR * * *IA/P = 0.30-- +-- + -- + -- + -- + -- + -- + -- + -- + -- + -- + 0.0 0 61 195 343 232 129 113 103 91 81 76 71 61 59 56 54 51 47 43 40 40 .10 12 45 145 277 247 169 131 112 60 57 33 107 220 238 192 151 125 107 94 79 62 61 58 .20 .30 79 173 216 200 168 139 118 90 .40 59 135 189 196 177 152 129 97 43 104 161 185 180 161 121 .50 .75 92 130 153 159 142 114 92 1.0 92 144 152 128 79 121 136 127 109 85 1.5 Λ 6 32 2.0 0 1 70 105 126 118 2.5 0 0 0 2 11 32 63 105 118 100 50 46 0 0 1 3 12 43 84 112 96 42 40 3.0 * * * TC = 0.1 HR * * *- + - - + - - + - - + - -0.0 39 44 46 46 48 54 54 55 56 55 53 49 49 49 48 54 54 .10 .20 .30 34 43 .40 53 54 .50 .75 1.0 1.5 2.0 2.5 0 0 0 0 0 3 14 32 3.0 0 Ω Ω Ω 51 49

* * * TC = 0.1 HR * * *

SHEET 1 OF 10

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RAINFALL TYPE = I

	E	xhib	it 5	5-I:	Tab	oula	r hy	dro	gra	ph t	ınit	disc	cha	rges	s (cs	sm/i	n) f	or t	уре	e I r	ainf	all	dist	ribu	ıtioı	n—(cont	inue	l	
TRVL TIME (hr)9.	9.3		9.9		10.1		10.3		10.5		10.7	1	1.0	HYDRO 1 11.2	11.4		11.8	1	2.3		13.0		14.0		15.0		6.0	18.	0 20.0	24.0
+	+ I A	+ /P =	0.10	- + O	+	+	+	+	+	+	+	- + - * * *	- + * TC	+ = 0.	+ 2 HR	* *	+ *	+	+	+	+	+	+-	- + -	+	+-	IA/P	= 0.1	+ - + O	+
0.0 28 .10 24 .20 21 .30 20	32		126		379 182	405 313 153	267 375 260	168 303 336	129 213	108 157 247	92 124 187	80	69 78 97		58 61 67 69	55 57 60 62	53 55 57 58	50 52 54 55	47 49 50 51	44 46 47 47	41 42 44 44	37 38 39 40	33 34 35 36	30 30 30 31 32	29 29 30 30	28 29 29 29 29	27 28 28 28 28	- + 26 2 26 2 26 2 26 2	4 21 4 21 5 21	13 14 14
.40 17 .50 16 .75 13 1.0 11	5 22 3 17	31 30 24 17	42 40 32 24	47 45 35 26	56 52 39 29	74 66 44 32			258 223 99 45		273 194	234 247 229 107	171 240	103 115 183 229		68 71 97 158	61 63 77 115	57 58 66 88	53 54 58 67	49 50 53 58	45 46 48 52	41 42 44 46	37 37 39 42	33 33 35 38	30 30 31 34	29 29 30 31	28 28 29 29	27 2 27 2 27 2 28 2	5 22 6 22	14 15
1.5 8 2.0 5 2.5 3 3.0 2	5 7 3 5 2 3				19 12 9 6	21 13 10 7			28 17 12 8	31 18 13 9	9		11	+	49 26 16	+	23	169 77 29	188 136 49	91	60 97 155 154		46 52 64 102	42 46 52 67	37 42 46 53	33 38 42 47	+-	28 2 29 2 31 2 34 2	8 24 8 25 9 26 + - +	17 18
+		/P =	- +	- +							+	- + -	- +		+	+	+								+		+-	= 0.3	+ - +	+
0.0 C .10 C .20 C .30 C	0	0 0 0	22 3 2 0	16 11 2	206 56 41 8	156	224 189	213 205	179	135 150	92 114 126 161	108	74 81 85 103	68 73 75 83	65 67 69 74	63 65 65 68	62 63 63 65	60 61 62 63	57 58 59 60	55 56 56 57	52 53 54 55	48 50 50 51	44 45 46 47	40 41 41 42	40 40 40 40	39 40 40 40	39 39 39 39	38 3 38 3 38 3 38 3	6 32 6 32	22
.40 0 .50 0 .75 0	0 0	0 0 0	0 0 0 0	1 0 0 0	6 1 0 0	22 4 2 0	66 16 7 0		167 100 50 3	145	166 167 119 28	166 140	136 148	88 105 124 142	76 85 101 135	69 75 85 113	66 69 74 93	63 65 69 80	61 62 64 69	58 59 61 64	55 56 57 60	51 53 54 56	47 49 50 52	43 44 45 48	40 41 42 44	40 40 40 41	39 40 40 40	38 3 38 3 38 3 39 3	7 33 7 33	23 23
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	2 0 0 0	17 0 0 0	52 4 0 0	97 19 1 0	124 49 6 0	20	111 45 7	89 30	68	65 79 104 108	59 65 78 99	55 59 65 77	52 55 59 65	48 51 55 58	43 47 51 54	50	39 3 40 3 41 3 43 4	9 36 9 36 0 37	26 28
+	ΙA	/P =		С	+						7	* * *	∗ TC	= 0.	2 HR	* *	*								+ -		IA/P	= 0.5	О	+
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.40 0 .50 0 .75 0	0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 1 0 0	4 3 0 0	10 8 3 0	19 15 8 0	27 23 14 0	34 30 20 2	39 36 27 4	44 43 37 14	47 46 43 26	49 48 46 36	50 50 48 42	52 51 50 46	53 53 52 48	53 53 53 51	53 53 53 52	53 53 53 53	53 53 53 53	51 52 52 53	50 50 50 52	50 50 50 50	49 49 50 50	49 49 49	49 4 49 4 49 4	8 46 8 46	33
1.5 0 2.0 0 2.5 0 3.0 0	0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	5 1 0 0	13 3 0 0	23 8 1 0	33 16 3 0			49 44 31 11		53 52 50 41		53 53 53 52	51 53 53 53	50 51 52 53		49 4 49 4 50 4 50 4	9 48 9 48 9 48	38 39 41
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+-	I A /	+ P =	- + 0.10	- +)	+-	+	+	+	+	+	+	- + · * *	+ * TC	= 0.	+ .3 HR	* *	+ *	+	+	+	+	+	+-	+-			IA/P			- +	+
0.0 25 .10 24 .20 21 .30 20	34 32 28 27	46	87	138 118	242 200	349 299 167	346 330 255	256 281 305	182 215 289 285	141 166 240		97 109 152	76 82 103	66 69 79 85	60 62 67 71	57 58 61 63	54 55 57 58	52 52 54	48 49 50 51	45 46 47 48	42 42 44 44	38 38 40 40	34 34 35 36	30 30 31 32	29 29 30 30	28 29 29	28 28 28 28 28	26 26 26 26 26	24 24 25 25	21 21 21 21 21	13 14 14 14
.40 17 .50 16 .75 13 1.0 11	23 22 17 13	31 30 24 17	42 40 32 24	48 45 35 26	58 54 39 29			158	246 216 104 46	253	189	238 219	173 231	108 120 182 221		69 72 100 158	62 63 79 118	57 58 67 90	53 54 58 68	49 50 53 58	45 46 48 52	41 42 44 46	37 37 40 42	33 33 35 38	30 30 32 34	29 29 30 31	28 28 29 29	27 27 27 28	25 25 26 26	22 22 22 23	14 14 15 15
1.5 8 2.0 5 2.5 3 3.0 2	10 7 5 3	12 9 6 4	15 10 8 6	17 11 8 6	19 12 9 7	21 13 10 7	-	25 15 11 8	28 17 12 9	31 18 13 9	35 20 14 10	11	62 27 18 12	107 35 22 14	50 27 17	199 80 35 21	125 50 26	34	184 134 61	173 107	61 99 154 164		46 53 64 94	42 47 52 64	37 42 46 52	46	31 34 37 41	28 29 31 33	29	23 24 25 26	16 17 18 19
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.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	2 1 0 0	9 6 1 0	30 22 3 0		122 100 26 5				135 143	100 107 134 138	83 87 113 132	73 76 93 113	68 69 80 94	65 65 72 81	62 62 65 69	59 59 62 64	56 56 58 60	52 53 54 56	48 49 51 52	44 44 46 48	41 41 42 44	40 40 40 41	39 40 40 40	38 38 39 39	37 37 37 37	33 33 33 34	23 23 23 24
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1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	3 0 0 0	9 2 0 0	18 5 0 0	28 12 2 0	5 1	44 33 15 3	48 42 27 11	51 48 40 25	52 51 48 41	52 52 51 48	52 52 52 51	51 52 52 52	50 51 52 52		49 49 50 50	49 49 49	48 48 48 48	37 38 40 41
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(hr)			+	- +	- +	+						+	- +	+	+	+	11.6	+				+		+		1			- +	+	0.0	+
	- + -		/P =			+	+	+	+	+	+						* *		+	+	+	+	+	+	+-	+	+	IA/P +-		.10	- +	+
0.0 .10 .20 .30	22 19	31 29 26 24	42 40 34 33	66 61 47 45		157 133 75 67	211 114	277 178	295 244	278	211 267	149 170 230 241	138 190	98 128	78 93	64 66 75 80	59 60 65 68	56 56 59 61	53 54 56 57	49 50 52 52	46 47 48 49	43 43 44 45	39 39 40 41	35 35 36 37	31 31 32 32	29 29 30 30	29 29 29 29	28 28 28 28	26 26 27 27	25 25 25 25	21 21 21 21	14 14 14 14
.75	15	21 20 16 12	28 27 21 16	38 36 29 21	43 41 32 24	49 46 35 26	61 56 39 29		112 57	185 161 77 40	209	253 238 147 61	243 184	201		97 106 157 212		66 69 91 138	60 61 74 105	55 55 61 75	51 51 55 62	46 47 50 54	42 42 45 47	38 38 40 43	34 34 36 39	30 31 32 35	29 29 30 31	28 29 29 29	27 27 27 28	25 25 26 26	22 22 22 23	14 14 15 16
1.5 2.0 2.5 3.0	8 5 3 2	9 6 4 3	11 8 6 4	14 10 7 5	16 10 8 6	17 11 8 6	19 12 9 7		-	25 15 11 8	28 17 12 9		14 10	16 11	31 20 13	134 42 24 16	179 64 30 19	23	144 63 30	179 114 51	160 90	148					34 39 43 47	31 35 38 42	29 30 31 34	27 28 29 29		16 17 18 19
		IΑ	/P =	0.30)								* *	* TC	= 0	.4 HR	+ +	*										IA/P	= 0	.30	- +	
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.40 .50 .75 1.0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	1 1 0 0	4 3 0 0	14 10 1 0	39 29 4 0		120 101 31 7	148 132 58 18	152 87		120 138	92 97 123 134	79 82 103 122	71 73 87 104	67 68 77 88	63 63 68 73	60 60 63 66	57 57 59 61	53 53 55 57	49 50 51 53	45 45 47 49	41 41 43 45		40 40 40 40	38 38 39 39	37 37 37 38	33 33 34 34	23 23 24 24
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TDVI	E	xh	ibi	t 5	-I: '	Tab	ulaı	r hy	dro	grap	oh u	nit										ainfa	all d	listr	ribu	ıtion	ı—c	onti	inue	d		
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0.0 21 .10 20 .20 17 .30 16) 27 7 23	7 3	38 36 31 30	56 52 42 40	73 66 49 46	96 60 55	149 84	247 214 127 110	259 185	267 234	242 256	204		119 156	84 90 112 123	71 74 86 93	63 65 72 76	58 59 63 66	55 55 58 59	51 51 53 54	47 48 49 50	44 44 45 46	40 40 41 42	35 36 37 38	31 32 33 33	30 30 30 30	29 29 29 29	28 28 28 28	27	25 25 25 25	21 21 22 22	14 14 14 14
.40 14 .50 14 .75 11 1.0 10	1 18 L 14	} -	26 25 19 15	35 33 26 19	38 37 29 21	43 41 32 24	51 48 35 26	67 61 40 29	95 84 48 32	138 120 61 36	186 164 83 41		237 229 148 65	216 202	157 170 210 176	115 126 176 203	89 96 137 190	73 77 106 156	64 66 84 122	57 58 66 85	52 53 57 67	47 48 51 56	43 43 46 49	39 39 41 44	35 35 37 40	31 31 33 35	29 30 30 32	29 29 29 30	28	25 25 26 26	22 22 22 23	15 15 15 16
1.5 7 2.0 4 2.5 3 3.0 1	4 6 3 4) 	11 7 5 3	13 9 7 5	14 10 7 5	16 10 8 6	17 11 8 6	19 12 9 6	21 13 9 7	23 14 10 8	25 15 11 8	9	18 13 9	11	27 18 12	36 22 15	157 53 27 17	83 36 21	27	175 97 43	146 76	72 124 166 135	158		43 49 57 75	39 44 49 57	35 40 44 48	43	32 35		24 25 25 26	17 18 18 19
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0.0 0 .10 0 .20 0 .30 0) (C		0 0 0 0	1 1 0 0	6 5 1 0	22 16 3 2		123 98 36	168 144 77		165 165 150	143	126 134 154	100 106 126	84 87 101 107	74 77 85 89	68 70 75 77	65 66 69 70	63 63 65		57 58 59 60	54 55 56 56	51 51 52 53	47 47 48 49	42 42 44 44	40 40 41 41	40 40 40 40	39 39 39 40	38 38 38	36	32 32 33 33	22 22 23 23
.40 0 .50 0 .75 0 1.0 0) (C))	0 0 0	0 0 0	0 0 0 0	0 0 0 0	2 1 0 0	_	20 15 6 0	47 36 17 1	83 68 36 3	117 101 60 9	127 87	144	125 130 133 106	108 121	86 90 103 126	76 78 88 112	69 71 78 96	64 65 68 78	61 62 63 69	57 58 59 62	54 54 55 57	50 50 52 54	46 46 47 50	42 42 43 46	40 40 41 42	40 40 40 40	39 39	37 37 37 38	33 33 34 34	23 23 24 25
1,5 0 2.0 0 2.5 0 3.0 0) ()	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	Ō	0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	6 0 0 0	23 0 0 0	56 3 0 0	92 14 1 0				87 113 85 32	71 96 109 77	62 74 93 105	57 63 73 90	53 58 63 72	49 54 57 62	45 50 53 57	42 46 49 53	40 42	38 39 40 40	35 36 37 38	26 27 28 30
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0.0 0 .10 0 .20 0	+ +))))	+ 0 0 0 0	- + 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	+ 1 1 0 0	+ 4 3 2 1	+ 10 8 6 4	+ 18 15 12 9	26 22 19 16	- +		45 44 43 41	47 47 47 46 45	49 49 48 48		50 50	50 50	50 50 50 50	50 50 50 50 50	50 50 50 50	50 50 50 50 50	50 50 50 50	50 50 50 50 50	50 50 50 50 50	49 49	49 49 49	- + - 48 48	46 46 46 46	33 34 34 34
.40 C .50 C .75 C) ())	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	1 1 0 0	3 2 1 0	7 6 3 0	13 10 6 0	19 16 10 0	31 28 20 3	39 37 30 10	44 43 38 20	47 46 43 30	49 48 46 38	50 50 48 43	50 50 50 47	50 50 50 49	50 50 50 50	50 50 50 50	50 50 50 50	50 50 50 50	50 50 50 50	50 50 50 50	49 49 49 50	49 49	49 49 49 49	46 46 47 47	34 34 35 36
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+	RAIN					+	+	+	+	+	+						+		+	+	+	+	+	+ -	- +	+			5 01	F 10	+	- +

	Tabular hydrograph		n) for type I rainfall distributi	on—continued
		HYDROGRAPH TIM 10.7 11.0 11.4	11.8 12.3 13.0 14.0 15.0	
++++	10.2 10.4 10.	+ + - + + +	12.0 12.6 13.5 14.5	
IA/P = 0.10			++	
0.0 16 22 30 41 47 .10 14 19 26 35 39 .20 13 16 22 30 33 .30 12 16 21 28 31	59 82 119 167 209 22 44 54 72 104 146 18 37 42 50 65 91 12 35 39 46 59 80 11	8 215 227 197 150 116 93 8 168 200 218 183 142 110	69 62 56 51 46 42 38 33 31 77 68 59 53 48 43 39 35 31 89 75 63 56 49 44 40 36 32 94 79 65 57 50 45 41 36 32	1 30 29 27 25 22 15 2 30 29 27 26 22 15
.40 12 15 20 27 30 .50 11 13 18 24 26 .75 10 12 15 21 23 1.0 8 10 12 16 17	33 37 43 54 71 9 29 32 36 41 49 6 25 28 31 35 40 4 19 21 23 25 28 3	4 87 117 178 204 186 152 9 63 83 136 180 190 171	100 83 67 58 51 45 41 37 33 120 96 74 62 53 47 42 38 34 142 115 85 69 57 49 44 39 38 180 157 116 86 65 53 46 42 38	4 31 29 28 26 23 15 5 32 30 28 26 23 16
1.5 5 7 8 10 11 2.0 3 5 6 8 8 2.5 2 3 4 5 6 3.0 1 1 2 3 4		3 14 15 18 22 27 36 9 10 11 12 14 17 21 6 7 7 8 10 11 13	124 159 174 147 102 69 54 47 42 52 80 131 165 148 99 68 54 47 26 35 63 107 157 141 96 67 54 15 19 26 42 86 151 141 101 73	7 42 38 31 28 25 18 4 46 42 34 29 26 19 1 55 47 38 31 27 20
IA/P = 0.30	. + + + + +	* * * TC = 0.75 HR * *		IA/P = 0.30
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	4 14 35 69 105 13 1 3 10 27 55 8 0 2 7 20 43 7 0 0 1 5 15 3	1 143 146 124 104 89 79 8 117 134 142 118 100 87 3 102 123 137 123 105 90	72 68 64 60 56 53 49 44 41 77 71 66 62 58 54 50 46 42 80 73 66 62 58 54 50 46 42 88 78 69 64 60 55 52 48 43	1 40 40 38 37 33 23 2 40 40 39 37 33 23 2 40 40 39 37 33 23
.40 0 0 0 0 0 0 .50 0 0 0 0 0 .75 0 0 0 0 0 1.0 0 0 0 0	0 0 0 0 1	7 49 75 118 131 121 105 9 21 39 87 122 128 116 4 10 21 56 95 118 121 0 1 2 12 39 76 106	91 80 71 65 60 56 52 48 44 101 88 75 68 62 57 53 49 45 110 98 82 72 64 58 54 50 46 119 115 98 82 69 61 57 53 49	5 42 40 39 38 34 24 5 42 41 39 38 34 25
1.5 0 0 0 0 0 0 2.0 0 0 0 0 0 0 2.5 0 0 0 0 0 0 3.0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	67 95 112 105 85 69 61 56 52 15 35 74 102 107 84 69 61 56 1 5 23 55 94 103 82 68 60 0 0 3 15 50 93 100 81 68	5 52 48 41 39 37 28 0 56 52 44 40 37 29 3 60 55 47 41 38 30
IA/P = 0.50	. + + + +	* * * TC = 0.75 HR * *		IA/P = 0.50
0.0 0 0 0 0 0 0 .10 0 0 0 0 0 0 .20 0 0 0 0 0 .30 0 0 0 0 0	0 0 0 1 2 0 0 0 0 2 0 0 0 0 1	5 10 17 29 37 42 45 4 8 14 26 35 41 45 3 7 11 23 33 39 44 2 5 9 20 30 38 43	48 49 49 49 49 49 49 49 49 49 49 49 49 49	9 49 49 49 49 47 34 9 49 49 49 49 47 35 9 49 49 49 49 47 35
.40 0 0 0 0 0 0 .50 0 0 0 0 0 0 .75 0 0 0 0 0 1.0 0 0 0 0	0 0 0 0	2 4 8 17 28 36 41 1 3 6 15 25 34 40 1 1 3 9 18 27 35 0 0 1 4 10 18 27	45 47 49 49 49 49 49 49 49 49 49 49 49 49 49	9 49 49 49 49 47 35 9 49 49 49 49 47 36
1.5 0 0 0 0 0 2.0 0 0 0 0 0 2.5 0 0 0 0 0 3.0 0 0 0 0 0 RAINFALL TYPE = I	0 0 0 0 0 0 0 0 0	0 0 0 0 2 6 13 0 0 0 0 0 0 1 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ++-+-+++ * * * TC = 0.75 HR * *	21 29 38 44 48 49 49 49 49 49 49 49 49 15 26 36 44 48 49 49 49 49 49 49 49 49 49 49 49 49 49	9 49 49 49 49 48 39 3 48 48 48 48 48 48 40 3 48 48 48 48 48 42

	Ex	hib	it 5	-I: 7	Γabι	ular	hy	dro	grap	oh u	nit	disc	cha	rges	cs (cs	m/i	n) f	or t	ype	Ir	ainf	all d	dist	ribu	tior	1—C	ont	inu	ed		
TRVL TIME (hr)9.0	9.3		9.9	1	0.1	1	0.3		10.5		10.7		1.0	HYDRO)GRAP 11.4	H TIN	1E(H0 11.8	URS)	 12.3		 13.0		14.0		15.0		6.0		18.0	20.0	4.0
+			- +	- + -							+	- +	+	+	+		+											- +	+	- +	+
0.0 14	+-				+ - 46	+ · 58					+	- +	+	+	+	+	+		+ 63	+ 56	+ 50	+ 44	+ 40	+- 35	32	+ 30			+	- +	+
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.40 10 .50 10 .75 9 1.0 8	13 13 11 9	17 16 14 11	22 19	25 24 21 16	28 27 23 17	31 30 26 19	35 33 29 21	42 39 33 23	52 48 38 26	67 61 47 29	79	112 101 75 40	148	181 153	181 172	151 157 167 162	131 148	108 125	81 84 96 126	67 69 77 97	56 58 62 72	48 49 51 57	43 43 45 49	39 39 40 43	35 35 36 39	31 32 33 35	30 30 30 32	28 28 28 29	26 26 27 27	23 23 23 24	15 16 16 16
1.5 5 2.0 3 2.5 2 3.0 1	6 4 3 1	8 6 4 2	10 7 5 3	10 8 5 3	11 8 6 4	12 9 6 4	13 9 7 4	14 10 7 5	16 11 8 5	17 12 9 6	19 13 9 6	14 10 7	25 17 12 8	33 20 14 9	48 25 16 10	74 33 20 12	48 25 14	33 17	115 56 24	153 94 38	111 153 139 76	131	143		44 49 58 78	39 43 49 60	35 39 43 50	30 32 34 39	28 29 30 32	25 25 26 27	17 18 19 20
+	IA/	/P =	0.30)	•	·	•	·	·						.0 HR	* *	*									·	IA/P	= 0		- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0 0	- + 0 0 0 0	1 0 0 0	2 0 0 0	7 2 1 0	17 5 4	34 13 10 3	55 27 21 8	79 46 37 17	99 68 58	78	116 109		100 110 113	89 98 101 109	80 87 90	74 79	68 71 72	63 65 66 69	59 60 61 63	54 56 56 57	51 52 52 53	46 48 48 48	43 43 44 45	41 41 41 41 42	40 40 40 40 40	39 39 39 39	37 37 37 37 38	33 34 34 34 34	23 24 24 24
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	1 0 0 0	2 2 0 0	6 5 1 0	13 10 2 0	25 20 5 1	41 34 10 3	78 69 31 12			111 113 107 89	101 103 110 105	93	78 80 90 99	70 71 79 86	63 64 69 73	58 58 61 64	54 54 56 58	50 50 52 54	45 46 48 50	42 42 44 45	41 41 41 42	39 39 40 40	38 38 38 38	34 34 35 35	25 25 25 26
1.5 0 2.0 0 2.5 0 3,0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	4 0 0 0	13 0 0 0	31 2 0 0	55 8 1 0	20 3 0	51 13 2	104 82 37 9	88 100 76 34	73 90 98 77	63 74 88 95	58 64 73 86	53 58 64 73	49 54 58 63	45 50 53 58	41 42 45 49	39 40 41 42	36 37 38 38	27 28 30 31
+		/P =	0.50)	+-							* *	* TC	= 1.	.0 HR	* * +	*				+						IA/P	= 0		- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 1 1 0	3 2 2 1	5 4 3 3	9 7	18 16 14 12	28 25 23 21	35 33 31 29	40 39 38 36	44 43	47 46 45	48 48 47 47	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48	48 48 48 48	48 48 48 48	48 48 48 48	47 47 47 47	35 35 36 36
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	1 1 1 0	2 2 2 0	4 3 3 0	10 8 8 2	19 16 15 5	27 25 23 11	34 33 30 19	40 38 36 27	43 41	47 46 45 41	48 48 47 45	48 48 48 47	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	48 48 48 48	47 47 47 48	36 36 36 37
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	2 0 0 0	5 1 0 0	11 3 0	1	28 16 5	37 26 12 5	44 38 24 14	47 45 38 29		48 48 47 46	48 48 47 47			48 48 47 47	48 48 47 47	48 48 47 47	39 40 41 42
+ R <i>A</i>	AINF <i>A</i>	+ \LL T	YPE	= I	+-	+	+	+	+	+	+	- + * *	+ * TC	= 1	.0 HR	+		+	+	+	+	+	+	+-	+		+- SHEET	7 0	F 10	- +	+

			hib	it 5	-I: ˈ]	[ab	ular	hye	drog	grap	h u						m/ir				I ra	inf	all d	list	ribu	tion	1— 0	onti	inu	ed		
TRVL TIME (hr)	9.0	9.3	9.6	1	0.0		10.2]	10.4		10.6	10.7	1.0.8	1.0	11.2	11.4	H TIM	11.8	2.0	12.3	12.6		13.5		14.5	1	15.5	1	7.0		0.0	4.0
		IΑ	/P =	0.10)							*	* *	TC	= 1.	25 H	+ R * * +	*										IA/P	= 0	.10	- +	+
0.0 .10 .20 .30	12 11 11	16 14 14 12	22 19 18 16	29 25 24 21	33 28 27 23	38 31 30 25	47 36 34 28	61 44 40 32			127	149 116 105 75	164 138	180 167 160	163 175 172	138 156 160	115 132	98 111 116 132	85 95 99	71 77 80	62 66 68 74	53 56 57 61	47 48 49 51	41 43 43	37 38 39 40	33 34 34 36	31 31 31 32	29 30 30 30	27 28 28 28	26 26 26 26	23 23	15 15 15 16
.40 .50 .75 1.0	9 9 7 6	12 11 9 8	15 13 11 10	20 17 14 12	22 19 15 13	24 21 17 14	27 23 18 15	30 26 20 17	35 29 22 19	42 33 25 20	53 39 28 23	68 49 32 25	86 61 38 29	126 97 59 40	134	160	157 165 150 123	137 152 159 148	132 152	104 126		62 67 77 88	52 55 60 66	46 47 51 54	40 42 45 47	36 37 40 41	33 33 35 37	30 31 32 33	28 28 29 29	26 27 27 27		16 16 17 17
1.5 2.0 2.5 3.0	4 2 1 1	6 3 2 1	7 5 3 2	9 6 4 2	9 6 4 3	10 7 5 3	11 7 5 3	12 8 6 4	13 9 6 4	14 9 7 5	15 10 7 5	16 11 8 5	6	22 13 10 7	28 16 11 8		59 24 16 11	33 19 13	47 24 15	80 38 21	32		140 114	136			41 47 54 66	37 42 47 54		28 29 31 33	27 27	13 19 20 20
		I A	/P =)		+					*	* *	TC	= 1.	25 H	+ R * * +	*										IA/P	= 0	.30	•	+
0.0 .10 .20	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	4 1 1 0	10 3 2 0	21 8 6 2	35 16 13 4	53 29 23 10	71 45 37 19	86 62	106	115 107 104	104 113	94 101 104 109		79 84 86 92	72 75 77 81	66 69 70 73	61 63 64 66	56 58 58 60	52 53 54 55	48 49 49 51	44 45 45 46		40 41	39 39 39 39	37 38 38 38	34 34 34 34	24 24 24 25
.40 .50 .75 1.0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	3 1 0 0	8 3 0 0	15 6 1 0	26 12 3 1	55 33 12 4	83 62 31 13	102 38 56 32	107 103 80 56		94 100 103 95	83 88 97 101	74 78 87 94	67 69 75 80	60 62 65 69	56 57 59 61	51 53 55 56	47 48 50 52	43 44 46 48	41 42 43 44	39 40 40 40	38 38 39 39	35 35 35 36	25 25 26 27
1.5 2.0 2.5 3.0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	4 0 0 0	13 1 0 0		51 13 2 0		98 66 26	94 95 61 24	79 95 93 64			56 61 67 76	52 56 60 66	47 51 55 60		39 40 41 43	36 37 38 39	28 29 30 31
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	- + - R	RAINF	+ ALL ⁻			- + -	+	+	+-	+	+						+ R * *		+	+	+	+	+	+	+-	+		+- SHEET	- + 8 0		- +	+

	F	Exhi	bit	5-I:	Tab	ulaı	r hy	dro	graj	ph u	ınit	disc	cha	rges	s (c	sm/i	n) f	or	typ	e I ı	rainf	all	dist	ribu	ıtio	n—	cont	inu	ed		
TRVL	9.3		9.9		0.1		0.3		0.5		10.7	1:	1.0	1	11.4		11.8		12.3		13.0		14.0		15.0		6.0		8.0		4.0
(hr)9.	+ +		+			L0.2			- +			- + -	- + -	+	+	+	+				+		1		1		- + -		+	0.0	+
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	1 14 0 12 9 11 9 11	16	22	24 21	32 27 23 22	39 30 25 24	48 36 29 27	60 44 34 31	76 55 41 38	94 69 50 46	86	129 1 103 1 78 1 71 1	135 112	163 152 140 133	159 155	130 143 152 154	112 125 138 141	121	88 98	69 75 81 84	59 62 67 68	50 52 55 56	44 46 43 48	39 41 42 43	35 36 37 38	32 32 33 34	30 30 31 31	28 28 28 29	26 26 27 27	23 23 23 23	15 16 16 16
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2.0	4 5 2 3 1 2 0 1	5 6 3 2 2 2 1 1	2 3	2	9 6 4 2	10 6 4 2	10 7 5 3	11 7 5 3	12 8 6 3	13 9 6 4	14 9 7 4		19 12 8 6	24 14 10 7	32 17 11 8	46 21 14 9		38 20 12	31 16	96 51 23			124 123	59 76 98 128		44 51 60 77			29 30 32 35	25 26 27 28	18 19 20 21
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.50	0 C 0 C 0 C) (0 0	0	0 0 0	0 0 0	0 0 0	1 1 0 0	2 2 0 0	5 4 1 0	9 8 2 0	13	36 31 13 5	59 54 28 13	80 75 49 29	94 91 69 49	99 98 85 69	96 97 95 84	87 88 95 95	79 80 87 92	70 71 76 81	63 64 67 71	58 58 61 63	53 54 56 58	49 49 51 53	45 45 47 49	42 42 44 45	40 40 40 41	38 38 39 39	35 35 36 36	26 26 26 27
2.0) (0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 0 0 0	9 1 0 0	20 3 0 0	1		84 50 18 4	92 79 46 17	83 90 79 50	72 81 88 79	64 71 80 87	58 63 70 79	54 58 63 70	49 53 57 62	43 45 49 52	40 41 42 45	37 38 38 39	28 29 31 32
		A/P =		0	+-	·	·		- +		+	* * *	TC	= 1.			*				+						IA/P	= 0	.50	- T	
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	RAIN	FALL	TYPE		+-	+	+-	+-	- +	+	+				+ 5 HR	* *		+	+	+	+	+	+	+-			HEET	9 (+)F 10	- +·)	+

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TRVL TIME (hr)9.0		9.6	1	0.0			-	10.4	1	0.6	1	0.8	1.0	1 11.2	1.4	H TIN	11.8	1 12.0	12.3	12.6		13.5		14.5		15.5		7.0		0.0	4.0
+	ΙA	/P =	0.10)							+	* * 7	∗ TC	= 2.	0 HR	* *	*										IA/P	= 0	.10	- +	+
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.40 7 .50 6 .75 5 1.0 4	8 8 7 5	10 10 8 7	13 13 11 8	15 14 12 9	16 15 13 10	18 17 14 11	20 19 15 12	22 21 16 13	25 24 18 14	30 28 20 15	35 33 23 17	43 39 27 18	61 56 38 24	83 78 53 32	104 99 73 45	120 116 93 63	131 127 111 83	130 123	121 127	106	84 86 98 113	68 69 77 89	57 58 63 71		43 44 47 51	38 39 41 44	34 35 37 39	30 30 31 32	28 28 28 29	24	17 17 17 18
1.5 3 2.0 1 2.5 1 3.0 0	4 2 1 0	5 3 2 1	6 4 2 1	7 5 3 1	7 5 3 2	8 5 3 2	8 6 4 2	9 6 4 3	10 7 4 3	10 7 5 3		6	10 7 5	18 12 8 5	23 14 9 6	32 18 11 8	23 13 9	31 16 10	49 22 14	74 35 19	34	121 101 67	107 118 103	108 116		58 71 86	44 49 59 70		30 32 35 39	26 27 28 29	19 20 21 21
+	ΙA	/P =	0.30)							+	* * 7	∗ TC	= 2.	0 HR	· * * +	*										IA/P	= 0	.30	- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 1 0 0	6 2 1 1	10 5 2 1	16 9 4 3	23 13 7 6	31 19 11 9	49 35 24 20	65 53 40 36	77 68 57 53	84 79 71 68	92 85 81 78		80 83 89 88	75 77 80 81	69 71 73 74	63 64 66 67	58 59 61 61	56	49 50 51 52	45 46 47 48	43 43 44 44	40 40 41 41	38 39 39 39	35 35 35 36	26 26 26 26
.40 0 .50 0 ,75 0 1.0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 0 0	2 2 1 0	5 4 2 0	12 10 6 1	24 21 14 4	40 36 26 10	57 53 41 20	70 67 56 34	80 77 69 49	87 87 82 68	84 85 85 81	76 77 80 85	69 69 72 77	63 63 65 69	58 58 60 63	53 54 55 58	49 49 51 53	45 46 47 49	41 41 42 43	39 39 40 40	36 36 36 37	27 27 27 28
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 - + -	0 0 0 0	0 0 0 0 0 - + -	0 0 0 0	0 0 0 0	1 0 0 0	4 0 0 0	10 2 0 0	4 0 0	38 13 2 0	58 29 6 1	78 55 22 6	83 77 51 25	76 82 75 54	75		57 62 68 75	53 57 62 68		41 43 45 48	37 38 39 43	29 30 32 33						
+		/P =)	+-	+	+	+-	- +	+		· * ·				* *	*							+-			IA/P	= 0	.50	- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 1 0 0	2 1 1 0	4 3 2 1	8 7 4 4	13 12 8 7	18 17 13 12	24 22 18 17	28 24	36 35 31 30	41 40 38 37	46 45 44 43	46 46 46 45	46 46 46 46	46	46 46 46 46		46 46 46 46	46 46 46 46	46 46 46 46	46 46 46 46	38 38 39 39
.40 0 .50 0 .75 0 1.0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 1 1 0	3 3 2 0	6 5 5 1	11 9 9 3	16 14 13 5	21 20 18 9	29 28 26 16	36 35 33 24	42 42 41 33	45 45 45 42	46 45 45 45	45	46 45 45 45	46 45 45 45	46 45 45 45	46 45 45 45	46 45 45 45	46 45 45 45	39 39 39 40
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	2 0 0 0		8 2 0 0	15 6 2 0	25 14 6 2	36 26 15 3	43 37 27 19	43 37 30	45 45 43 39	45 44		45 45 45 45	45 45 45 45	45 45	42 43 44 45						
++	+ RAINF	+ ALL T			+-	+	+	+-	- +	+	+	- + -	- + * TC	= 2.	+ 0 HR	+	+ *	+	+	+	+	+	+	+-	+		+ - HEET		+)F 10		

Exhibit 5-IA: Tabular hydrograph unit discharges (csm/in) for type IA rainfall distribution -----HYDROGRAPH TIME(HOURS) TIME 7.3 7.9 8.1 8.3 8.5 8.7 9.0 9.4 9.8 10.3 11.0 12.0 13.0 14.0 16.0 22.0 (hr)7.0 7.6 8.0 8.2 8.4 8.6 8.8 9.2 9.6 10.0 10.6 11.5 12.5 13.5 15.0 18.0 IA/P = 0.10* * * TC = 0.1 HR * * *IA/P = 0.100.0 28 36 50 143 154 163 140 103 87 76 68 67 65 61 54 49 45 44 44 41 40 39 36 33 32 32 31 30 39 37 .10 27 43 104 130 146 157 145 117 97 83 73 69 65 59 53 45 42 34 33 32 31 30 29 39 37 37 59 89 116 136 150 147 127 107 91 79 68 47 45 44 35 33 32 31 30 29 .20 26 35 53 77 103 125 142 145 133 116 48 46 .30 25 99 86 71 91 114 132 141 136 122 107 82 .40 24 31 41 49 81 103 123 135 135 127 114 88 73 65 53 49 .50 .75 20 32 35 76 94 111 122 125 114 94 79 61 55 48 32 32 33 32 1.0 77 94 118 122 104 31 30 1.5 12 18 22 23 36 42 61 86 107 112 104 91 73 34 33 31 30 2.0 7 12 15 16 18 25 26 30 36 50 90 106 103 87 67 52 36 34 32 31 14 15 16 17 18 26 30 36 49 66 91 101 51 44 41 38 36 33 31 29 8 11 12 13 19 21 23 89 66 2.5 4 3.0 2 3 5 7 8 9 10 11 11 12 13 14 16 18 20 23 25 29 36 55 79 98 86 65 51 44 41 38 34 32 30 25 * * * TC = 0.1 HR * * * IA/P = 0.30IA/P = 0.3059 54 54 53 51 50 48 45 44 43 43 43 42 42 41 40 40 1 45 65 78 64 40 40 40 62 57 55 53 51 .10 0 0 18 43 43 40 40 .20 0 0 13 29 46 74 71 65 60 56 54 52 44 43 43 43 40 40 39 39 .30 0 10 22 58 56 52 39 39 64 60 55 44 43 39 39 39 39 ,50 49 47 44 .75 55 61 1.0 53 60 50 48 45 1.5 9 15 31 53 50 51 55 54 2.0 0 0 0 0 0 0 1 5 15 28 42 41 40 40 39 40 40 IA/P = 0.50* * * TC = 0.1 HR * * * 0.0 0 0 0 0 2 7 12 14 18 21 23 4 9 41 42 45 48 .10 .20 39 41 42 45 48 .30 .40 9 13 18 39 41 44 47 6 10 tS 44 47 .50 .75 6 11 43 46 40 43 2.0 0 0 38 42 3 10 18 2.5 0 0 0 0 0 28 31 36 40 0 0 0 0 24 28 3.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 11 18

* * * TC = 0.1 HR * * *

SHEET 1 OF 10

RAINFALL TYPE = IA

Exhibit 5-IA: Tabular hydrograph unit discharges (csm/in) for type IA rainfall distribution—continued

TRVLTIME 7.3 7.9 8.1 8.3 (hr)7.0 7.6 8.0 8.2 8.	HYDROGRAPH TIME(H 8.5 8.7 9.0 9.4 9. 4 8.6 8.8 9.2 9.6	0URS)3 3 10.3 11.0 12.0 10.0 10.6 11.5 12.5	13.0 14.0 16.0 22.0 5 13.5 15.0 18.0
+ + + - + - + - + + +	* * * TC = 0.2 HR * * *	++++	IA/P = 0.10
0.0 27 34 46 124 143 153 153 127 10 .10 27 33 44 108 131 146 151 135 11 .20 26 29 38 67 95 119 137 146 13 .30 25 27 33 45 60 83 107 127 14	3 87 76 68 67 63 57 51 47 4 3 96 83 73 69 65 59 53 48 4 9 122 105 90 79 69 63 57 52 4	5 44 42 40 39 36 33 33	3 32 32 31 30 29 27 22 3 32 32 31 30 29 27 22
		6 51 46 44 41 39 37 34 1 55 48 45 42 39 37 34	4 33 32 32 30 29 27 22 4 33 32 32 30 30 27 22
1.5 12 15 19 22 23 24 26 27 2 2.0 7 10 12 16 17 18 19 20 2 2.5 4 6 9 11 12 13 14 15 1 3.0 2 3 5 7 7 8 9 10 1	2 23 24 25 27 30 38 52 71 9 6 17 19 20 21 23 26 30 38 5 1 12 13 14 15 17 19 22 24 2	1 105 101 86 66 52 45 41 0 68 92 101 88 65 51 44 8 33 49 72 97 89 68 53	1 39 36 34 32 31 29 24 4 41 38 36 33 31 29 25 3 45 41 39 34 32 30 25
IA/P = 0.30	* * * TC = 0.2 HR * * *		IA/P = 0.30
0.0 0 0 0 26 45 64 76 74 6 .10 0 0 0 20 37 55 69 72 6 .20 0 0 0 5 15 30 47 61 6 .30 0 0 0 4 11 23 39 54 6	5 59 55 53 52 51 49 46 44 4 7 62 57 54 53 52 50 47 44 4 8 68 64 59 56 53 52 49 46 4	4 43 43 42 42 41 40 40 4 43 43 42 42 41 40 40	0 40 40 40 39 39 38 33 0 40 40 40 39 39 38 34 0 40 40 40 39 39 38 34
.40 0 0 0 3 8 18 32 47 5 .50 0 0 0 0 2 6 14 26 4 .75 0 0 0 0 1 3 7 14 2 1.0 0 0 0 0 0 0 1 4	0 52 60 63 62 58 54 52 50 4	7 45 44 43 42 42 41 40 9 47 44 43 43 42 41 41	0 40 40 40 40 39 38 34 1 40 40 40 40 39 38 34
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 0 0 0 0 2 6 14 2	9 54 54 51 47 44 43 42 5 36 49 53 51 47 44 43 6 13 28 42 52 51 47 44	2 41 41 40 40 40 39 36 3 42 41 41 40 40 39 36 4 43 42 41 40 40 39 37
IA/P = 0.50	* * * TC = 0.2 HR * * *	· · · · · · · · · · · · · · · · · · ·	IA/P = 0.50
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	6 19 23 25 29 32 33 36	5 39 41 42 46 48 50 49 5 40 41 42 45 48 50 49 4 39 40 41 45 48 50 49
.50 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$egin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	5 9 15 19 23 28 31 32 3 6 12 17 22 27 31 32 1 4 9 14 20 25 30 31 0 1 4 9 16 22 27 31	2 34 39 40 43 46 50 50 1 33 37 39 42 46 50 50
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		3 28 31 32 38 42 48 50 5 22 27 30 35 40 46 50 9 17 23 27 33 38 45 50
RAINFALL TYPE = IA	* * * TC = 0.2 HR * * *	++++	SHEET 2 OF 10

	E	xhi	bit	5-I	A: '	Гаb	ular	hy	drog	grap	h u	nit (disc		rges						IA	rain	fall	dis	trib	utio	on—	-con	tin	ued		
TRVL TIME (hr)7.	0		7.6		8.0		8.2		8.4		8.6		8.8	9.0	9.2	9.4	9.6	9.8	1.0.0	0.3		1	1.5	1	12.5		13.5	1	5.0		8.0	22.0
		IA/	P =	0.1	0							7	* *	* TC	+ = 0.	3 HR	* *	*			+							IA/P	= 0		- +	+
0.0 26 .10 26 .20 25 .30 24	6 6 5	31 30 28 26	41 39 34 31	92		138 128	145 139 117	144 142 131	125 131	105 113 133	90 98 120	78 85 105 124	71 76 92	66 68 74 87	60 62 67 73	54 56 60 65	49 51 54 59	46 47 49 53	45	43 43 44 45	40 41 42 43	39 39 40 40	37 37 38 39	34 34 35 36	33 33 33 33	32 32 33 33	32 32	31 31 31 31 32	30 30 30 30	29 29 29 29	27 27 27 27 27	22 22 22 22
.40 23 .50 21 .75 19	1 9	26 25 23 19	30 28 26 23	38 34 31 26	44 37 33 27	56 42 36 29	75 51 42 31	95 67 51 33	114 86 64 37	127 104 80 44		127 127 109 66	127	110 116	76 88 102 116	67 74 85 109	60 66 73 93	55 59 65 79	50 53 58 69	46 47 50 58	43 45 46 51	40 41 43 45	39 39 40 41	36 37 38 39	34 34 35 37	33 33 33 34	32 32 33 33	32 32 32 32	30 30 31 31	29 30 30 30	27 27 28 28	22 22 23 23
1.5 11 2.0 6 2.5 4 3.0 2	6 4 2	14 9 5 3	17 11 8 5	21 14 10 7	22 16 11 7	23 17 12 8	24 18 13 9	26 19 14 10	27 20 15 11	29 21 16 12	31 23 17 13	34 24 19 14	38 25 20 15	53 28 22 17	75 34 25 19	97 44 28 22	109 61 34 24		58 33		64 91 59 71	52 71 92 96	45 54 70 89	41 46 54 68	39 42 46 53	36 39 41 45	34 37 39 41	33 34 36 39	32 32 33 34	30 31 32 32	28 29 29 30	24 24 25 25
4		IA/	P =		0								* *	* TC	= 0.		* *	*			+-							IA/P	= 0		- +	+
0.0 (.10 (.20 (0 0 0	0 0 0	13 9 7 1	28 21 17 5	45 37 30 13	63 54 46 25	69 64 58 39	69 67 64 52	65 65 65 60	60 62 63 63	55 57 59 63	53 54 56 60	53 53 53 55	51 51 52 53	48 49 49 51	45 46 46 49	44 44 44 46	43 43 44 44	43 43 43 43	42 42 42 43	42 42 42 42	42 42 42 42	40 41 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 40 40 40	39 39 39 39	38 38 38 38	34 34 34 34
.50 (C	0 0 0 0	0 0 0 0	0 0 0 0	1 1 0 0	4 3 1 0	10 7 3 0	20 15 8 0	33 27 15 2	45 39 24 4	55 50 34 9	61 57 43 16	62 60 51 25	61 61 55 34	56 57 58 49	54 54 56 56	52 52 54 57	49 50 52 55	46 47 49 53	45 45 47 50	43 44 44 47	43 43 43 44	42 42 43 43	42 42 42 42	41 41 41 42	40 40 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	38 38 38 39	34 34 34 35
2.0		0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 0 0 0	5 0 0 0	10 1 0 0	23 3 0 0	37 10 1 0	49 21 4 0	54 33 10 1	55 44 19 4	54 51 30 9	51 54 45 23	47 52 53 37	44 48 53 50	43 44 48 52	42 43 44 47	42 42 43 44	41 41 42 43	40 41 41 42	40 40 41 41	40 40 40 40	39 40 40 40	39 39 39 39	35 36 37 37
			P =	0.5	0		+		•	·	+				= 0.		* *	*			+							IA/P	= 0		- +	+
0.0 (.10 (.20 (0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	3 1 0 0	7 4 1 1	11 8 5 4	14 12 9 8	18 15 13 12	22 20 18 17	24 23 21 21	28 27 25 25	32 31 30 30	32 31 31 31	35 34 33 33	40 39 37 37	41 40 39 39	42 41 41 41	45 45 44 44	48 48 47 47	48 48 48 48	48 48 48 48
,50	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	2 0 0 0	5 1 1 0	9 4 3 1	14 10 7 4	19 15 13 9	23 21 19 16	28 26 24 22	31 30 29 27	32 31 31 31	35 33 33 32	39 38 36 35	41 40 39 38	44 43 42 42	47 46 46 45	48 48 48 48	48 48 48
2.5	0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	3 0 0 0	8 2 0 0	16 8 2 0	23 16 9 3	27 22 16 9	31 27 22 17	32 30 27 23	35 32 30 27	40 38 35 33	43 42 40 38	48 47 46 45	48 48 48 48							
•	RAI	INFAI				١	·	·	·	•	•				= 0.				•	•	•	•		·				SHEET			•	·

	Ex	hibi	t 5-l	[A :	Tab	ula	r hy	dro	gra	ph u	ınit	dis	cha	rges	cs (cs	sm/iı	ı) fo	or t	ype	IA	raiı	nfal	l dis	stril	outi	on–	-co	ntin	ued	i	
TRVL TIME (hr)7.		7.6		8.0		8.2		8.4		8.6	8.7	8.8	9.0	9.2	9.4	H TIM 9.6	9.8	0.0	0.3	.0.6	11.0	11.5		2.5		13.5		5.0			22.0
+	I	A/P =	0.10)								* *				* *	*										IA/P	= 0	.10	- +	+
0.0 26 .10 25 .20 24 .30 24	5 29 5 29 1 27	37 36 32	67 60 43	93	117 105 73 65	134 124 94	137 133 114	136 135 127	121	105 112 128	91 98 117 121	81 87 104	70 73 83 88	64 66 71 74	58 59 64 66	52 53 58 59	48 49 52 54	46 46 48 49	44 44 45 46	41 41 43 43	40 40 40 40	37 38 38 39	34 34 35 35	33 33 33 34	+ 33 33 33 33	32 32 32 32 32	31 31 31 32 32	30 30 30 30 30	29 29 29 29	27 27 27 27 27	22 22 22 22 22
.40 22 .50 20 .75 16 1.0 14) 23 5 20	3 26) 24	31 27	39 34 29 26	46 37 31 27	59 43 33 29	76 54 37 31	95 69 43 34	111 86 53 38	122 103 65 45	126 116 80 54	123 94		85 98 116 111		64 71 86 101	58 63 74 87	56 65	47 49 56 62	44 46 49 53	41 42 44 47	39 40 41 42	37 38 39 40	34 34 36 37	33 33 34 34	32 33 33 33	32 32 32 33	30 30 31 31	29 30 30 30	27 27 28 28	22 22 23 23
1.5 10 2.0 6 2.5 3 3.0 1	5 8 3 5	3 11	13 9 6	21 14 10 7 -+	22 16 11 7	23 17 12 8	24 18 13 9	26 19 14 10	27 20 15 11	29 21 16 12	+		+		39 26 20 +	102 52 31 23	+	88 51 30	102 75 43	69 96 94 64	55 76 98 89	46 57 74 95	42 47 57 72	39 42 47 56	37 40 42 47	34 37 39 42	33 35 37 39	32 33 33 34 - +	30 31 32 33	28 29 30 30 - +	24 24 25 25 +
+	I 	A/P =	0.30		+-	+	+	+	+	+		* * ·	* TC +	= 0.	4 HR	* * +		+	+	+-	- +	+	+-	- +-	+	+	IA/P +-	= 0	.30	- +	+
0.0 0 .10 0 .20 0 .30 0) (0 0	4	15 12 9 7	29 23 19 15	46 38 32 26	60 53 46 39	65 61 56 50	65 63 61 57	63 62 61	59 60 61 61	56 57 59 59	53 54 55 56	52 53 53 53	49 50 51 51	47 47 48 49	44 45 45 46	44 44 44	43 43 43 44	42 42 43 43	42 42 42 42	42 42 42 42	41 41 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	38 38 38 38	34 34 34 34
.40 0 .50 0 .75 0) (0 0	0	2 1 0 0	5 4 2 0	11 9 4 1	21 17 9 2	33 28 16 5	44 39 25 10	53 48 34 17	58 55 43 25	60 59 49 34	58 59 57 48	55 56 57 55	53 53 55 56	51 51 53 55	48 49 50 53	45 46 48 50	44 44 45 47	43 43 44 45	42 42 43 43	42 42 42 42	41 41 41 42	40 40 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	38 38 39 39	34 34 35 35
1.5 0 2.0 3 2.5 0 3.0 0	3 (0 0	0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	3 0 0 0	6 0 0 0	16 2 0 0	30 6 1 0	43 15 2 0	51 27 7 1	14	7		49 53 50 32	45 49 52 47		42 43 45 48	42 42 43 45	41 42 42 43	40 41 41 42	40 40 41 41	40 40 40 40	40 40 40 40	39 39 39 39	36 36 37 37
		A/P =			+ -	+	+	+	+	+						* *	*			+-					+		IA/P			- +	+
0.0 0 .10 0 .20 0) (0	0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	5 2 1 0	9 6 3 1	13 10 7 4	16 13 11 8	20 18 16 13	23 22 20 18	27 26 24 23	31 30 29 28	32 31 31 31	34 33 33 32	39 38 36 35	40 39 39 39	42 41 41 41	45 45 44 43	47 47 47 47	47 47 47 47	47 47 47 47
.40 C .50 C .75 C) (0 0	0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	2 1 0 0	5 3 2 0	11 8 6 2	16 13 11 6	21 19 17 12	26 25 23 20	30 29 28 25	32 31 31 29	34 33 32 31	38 37 35 33	40 39 39 37	43 42 42 41	46 46 45 44	47 47 47 47	47 47 47 47
1.5 C 2.0 C 2.5 C 3.0 C) (0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	1 0 0 0	5 1 0 0	13 6 2 0	20 14 7 2	26 21 15 8	30 26 21 15	22	34 32 30 27	40 37 34 32	43 41 40 38	47 47 46 45	47 47 47 47
+	RAIN	+ -ALL -		- + = IA	+ -	+	+	+	+	+	+	- + · * *	+ * TC	= 0.	+ 4 HR	* *	*	+	+	+-	- +	+	+-	+-	+		+- SHEET	- + 4 0	+ F 10	- +	+

T0	Ex	hibi	t 5-	IA:	Tal	bula	r hy	ydro	ogra	ph	unit	dis	sch	arge	s (c	sm/i	n) f	for	typ	e IA	rai	nfa	ll di	stri	buti	ion-	—co	nti	nue	d	
TRVL	7.3		7.9		8.1	0 2	8.3		8.5	0 6	8.7			HYDR0	9.4		9.8	1	0.3	0.6	11.0	1	2.0	2 E	13.0		4.0		6.0		22.0
(hr)7.0 ++	+	7.6 + /P =	- +		+-		+		+		+			9.2 + = 0.	+		+	+	+	+-	- +	+	- +	.2.5	+		1 - + IA/P	- +	+	8.0	
0.0 25 .10 24 .20 23 .30 21						115	129 121	130 127 112	129 128 122 103	117 121 126	104	- + 92 98 114	76 80 93	- 0. + 68 70 78 89				47 48	+ 44 45 46 48	42 42 44 45	40 40 41 42	+ 38 38 39 39	34 34 36 37	33 33 34 34	33 33 33 33 33	32 32 32 32 33	31 32 32	30 30 30 30 30	29 29 29 30	- + 27 27 27 27	+ 22 22 22 22 22
.40 20 .50 18 .75 15 1.0 13	24 22 19 16	27 25 23 20	32 29 26 24	35 31 27 25	40 34 29 26	49 38 31 27	61 45 34 29	78 56 38 31	95 70 45 34	109 87 54 39	118 101 67 46		118	93 106 112 102	79 89 106 110	69 77 93 105	62 67 80 93	55 60 70 81	49 52 59 66	45 47 51 56	42 43 46 48	40 40 41 43	37 38 39 40	34 35 36 38	33 33 34 35	33 33 33 33	32 32 33 33	30 31 31 31	30 30 30 30	27 28 28 28	22 23 23 23
1.5 9 2.0 5 2.5 3 3.0 1	12 7 4 2			- +	21 14 10 7	22 15 11 7		-	26 19 14 10	27 20 15 11	12		15 +	+		94 45 28 21	24	79 45 28		88 56	58 81 96 83	48 61 79 93		40 43 49 59	37 40 43 48	35 38 40 43	+-	32 33 33 35 - +	31 31 32 33	29 29 30 30 - +	24 25 25 26 +
+	1 A +	/P =	- +								+	- +	+		+	+	+											- +	+	- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	2 0 0	8 6 1 1	18 14 4 3	31 25 11 8	46 39 21 16	57 51 33 27	61 58 45 39	61 60 54 49	61 61 58 55	58 59 60 59	54 55 58 59	53 53 55 55	51 51 53 53	48 49 51 51	45 46 48 49	44 46	44 44 44	43 43 43 43	42 42 42 42	42 42 42 42	41 41 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	38 38 38 39	34 34 34 34
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	2 0 0 0	6 2 1 0	13 5 2 0	23 10 5 0	34 18 10 1	44 29 17 3	51 39 25 6	56 47 34 11	58 56 48 26	56 57 54 41	54 55 56 51	52 53 55 55	49 51 53 55	47 49 50 54	44 45 47 50	43 44 45 47	42 43 43 44	42 42 42 43	41 41 42 42	40 41 41 41	40 40 40 41	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 40	39 39 39 39	34 35 35 35
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	4 0 0 0	11 2 0 0	23 7 1 0	36 16 3 0	1	15 3	10	52 53 43 23	48 51 52 40	44 47 50 51	43 44 46 50	42 42 44 46	41 42 42 44	40 41 42 42	40 40 41 42	40 40 40 40	40 40 40 40	39 39 39 39	36 36 37 37
+	ΙA	/P =)		·	•	•	·			* *		= 0.		* *	*	·	•	·	•	·	·	·	+	·	IA/P	= 0		- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	3 1 0 0	7 4 2 1	11 8 5 3	14 12 9 6	19 17 14 12	22 21 19 17	26 25 23 22	30 29 28 27	31 31 31 31 31	34 33 32 32	38 37 35 34	40 39	41 41 41 40	45 44 43 43	46 46 46 46	46 46 46 46	46 46 46 46
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	2 1 0 0	5 3 2 0	11 8 6 1	16 13 11 4	21 19 17 11	26 25 23 18	30 29 28 24	32 31 31 29	34 33 32 31	38 37 35 33	40 39 39 36	43 42 42 41	46 46 45 44	46 46 46 46	46 46 46 46
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0 0	1 0 0 0	4 1 0 0	11 5 1 0		24 19 13 7		31 29 25 20		39 37 34 32	42 41 39 37	46 46 45 44	46 46 46
+ - R	AINFA	LL T	- + YPE	= IA	+-	+	+	+	+	+	+	- + * *	* TC	= 0.	5 HR			+	+	+-	- +	+	+	+-	+		SHEET	5 0	F 10	- +	+

(hr)7.0 7.6 8.0 + + + - + - + - + - + IA/P = 0.10	8.2	+ ++ + 13 114 117 117 1 15 108 114 116 1 12 87 101 110 1 16 80 94 104 1 19 61 74 87 16 56 68 81 18 45 54 64 19 31 34 39	8.8 9.2 -++++	9.8 10.3 11.0 12 9.6 10.0 10.6 11.5 - + - + - + - + - + - + - + - + - + - +	IA/P = 0.10
IA/P = 0.10 0.0 22 25 29 38 45 56 10 21 25 28 36 42 51 20 19 23 26 32 35 39 30 19 22 26 31 33 37 .40 17 21 24 28 30 32 .50 16 20 23 27 29 31 .75 15 18 22 25 27 28 1.0 12 15 18 22 23 24 1.5 7 10 12 15 17 18	++	** ** ** ** ** ** ** ** ** ** ** ** **	* * * TC = 0.75 HR - + - + - + - + - + - + - + - + - + - +	* * * 65 58 53 48 45 41 39 66 60 54 48 45 42 39 72 65 58 51 47 43 40 75 67 60 52 47 43 40 82 73 65 56 49 45 41 85 75 67 57 50 45 41 93 83 74 62 54 47 42	IA/P = 0.10 36 33 33 33 32 30 29 27 22 37 34 33 33 32 30 30 27 22 38 34 33 33 32 31 30 27 23 38 34 33 33 32 31 30 28 23 39 35 33 33 33 31 30 28 23 39 36 33 33 33 31 30 28 23
0.0 22 25 29 38 45 56 .10 21 25 28 36 42 51 .20 19 23 26 32 35 39 .30 19 22 26 31 33 37 .40 17 21 24 28 30 32 .50 16 20 23 27 29 31 .75 15 18 22 25 27 28 1.0 12 15 18 22 23 24 1.5 7 10 12 15 17 18	6 71 87 10 1 64 79 9 9 47 58 7 7 44 54 6 2 36 41 4 1 34 39 4 8 31 34 3 4 25 27 2 8 19 20 2 3 14 15 1 9 10 11 1	33 114 117 117 1 <	111 95 81 72 113 99 85 74 114 109 95 82 112 110 98 85 99 111 106 94 93 109 107 97 75 95 104 102	65 58 53 48 45 41 39 66 60 54 48 45 42 39 72 65 58 51 47 43 40 75 67 60 52 47 43 40 82 73 65 56 49 45 41 85 75 67 57 50 45 41 93 83 74 62 54 47 42	36 33 33 33 32 30 29 27 22 37 34 33 33 32 30 30 27 22 38 34 33 33 32 31 30 27 23 38 34 33 33 32 31 30 28 23 39 36 33 33 33 31 30 28 23 39 36 33 33 33 31 30 28 23
.50 16 20 23 27 29 31 .75 15 18 22 25 27 28 1.0 12 15 18 22 23 24 1.5 7 10 12 15 17 18	1 34 39 4 8 31 34 3 4 25 27 2 8 19 20 2 3 14 15 1 9 10 11 1	66 56 68 81 88 45 54 64 89 31 34 39	93 109 107 97 75 95 104 102	85	39 36 33 33 33 31 30 28 23
	3 14 15 1 9 10 11 1	21 22 24 25		103 30 00 71 02 32 13	41 39 35 33 33 32 30 28 23
2.5 2 3 5 7 8 9 3.0 0 1 2 4 4 5	5 6 6	6 17 18 19 1 12 13 14 7 8 8 9	26 31 39 53 21 23 26 31 16 18 20 23 10 12 14 16	39 51 67 88 95 86 67 26 30 38 56 77 93 84	46 41 39 36 34 33 31 29 24 53 45 41 38 36 33 32 29 25 66 52 45 41 38 34 33 30 25 84 68 54 46 42 36 33 30 26
IA/P = 0.30					IA/P = 0.30
0.0 0 0 0 0 0 2 4 .10 0 0 0 0 1 3 .20 0 0 0 0 0 1 .30 0 0 0 0 0 1	4 10 19 2 3 8 15 2 1 2 6 1	29 39 48 53 24 34 43 50 2 20 30 39	56 56 54 53 54 56 54 53 46 54 55 54 42 52 55 54	51 49 46 44 44 42 42 53 51 49 46 44 43 42 53 51 49 46 44 43 42 53	40 40 40 40 40 40 39 39 34 41 40 40 40 40 40 39 39 34 41 40 40 40 40 40 39 39 35 42 40 40 40 40 40 39 39 35
.40 0 0 0 0 0 0 0 .50 0 0 0 0 0 0 0 .75 0 0 0 0 0 0 0 1.0 0 0 0 0 0 0	0 1 3 0 1		38 50 55 55 34 47 53 54 23 37 47 52 7 17 30 42	54 52 50 47 45 43 42 53 53 52 49 46 44 42	42 40 40 40 40 39 39 35 42 40 40 40 40 39 39 35 42 41 40 40 40 40 39 35 42 41 40 40 40 40 39 35 42 41 40 40 40 40 39 36
1.5 0 0 0 0 0 0 0 2.0 0 0 0 0 0 0 0 2.5 0 0 0 0 0 0 0 3.0 0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 4 11 21 0 0 1 4 0 0 0 0 0 0 0 0 0 0	11 20 30 43 50 51 48 2 5 10 23 36 48 51 0 0 2 7 17 34 48	43 42 41 40 40 40 40 39 36 45 43 42 41 40 40 40 39 37 47 44 43 42 41 40 40 39 37 50 47 44 43 42 40 40 39 38
IA/P = 0.50	+++		* * * TC = 0.75 HR		IA/P = 0.50
0.0 0 0 0 0 0 0 0 .10 0 0 0 0 0 0 0 .20 0 0 0 0 0 0 0 .30 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0	3 6 10 15 19 23 28 1 1 4 7 12 17 22 27 1 1 2 5 10 15 20 25	31 32 36 39 41 44 44 44 44 30 32 34 38 40 43 44 44 44 30 31 33 37 39 43 44 44 44 29 31 33 36 39 42 44 44 44
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0 0 1 3 7 14 21 0 0 0 2 5 11 19	27 30 32 35 38 42 44 44 44 26 30 31 34 38 41 44 44 44 24 29 31 33 36 41 44 44 44 22 27 30 32 35 40 43 44 44
1.5 0 0 0 0 0 0 0 2.0 0 0 0 0 0 0 0 2.5 0 0 0 0 0 0 0 3.0 0 0 0 0 0 0 0 RAINFALL TYPE = IA	0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 3	16 23 27 30 32 38 42 44 44 10 17 23 28 30 36 40 44 44 4 11 18 23 28 33 39 44 44 1 4 10 17 23 30 36 43 44

	Ex	hibi	t 5-	IA:	Tal	oula	r hy	ydro	gra	ph	unit	dis	sch	arge	s (c	sm/i	n) f	for	typ	e IA	rai	nfa	ll di	stri	but	ion-	-co	nti	nue	d	
TRVL TIME (hr)7.0	7.3	7.6	7.9 8	3.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	9.0		9.4	H TIM 9.6	E(H01 9.8 1	1	0.3		11.0		2.0		13.0	1.3.5	4.0	5.0	16.0	2.8.0	22.0
+ +	ΙA	/P =	0.10								,		* TC	= 1.	0 HR	* *	*										IA/P	= 0	.10	- +	+
0.0 19 .10 19 .20 17 .30 16	23 22 21 20	26 26 24 23	33 32 28 27	37 35 30 29	43 41 34 32	52 48 38 36	63 58 45 42	76 70 54 50	88 82 65 60	97 92 76 71		96		91 94 100 101	81 83 91 93	72 75 81 84	65 67 73 75	59 61 66 67	52 53 57 58	+- 48 48 51 52	43 44 45 46	40 40 41 42	38 38 39 39	34 35 36 36	33 33 33 34	33 33 33 33	32 32 32 33 33	31 31 31 31 31	30 30 30 30 30	28 28 28 28 28	23 23 23 23 23
.40 15 .50 14 .75 13 1.0 10	18 18 16 13	22 21 19 16	25 25 23 19	27 26 24 20	29 28 25 22	31 30 27 23	35 33 29 24	40 37 32 26	46 43 37 27	55 51 42 30	65 61 49 33	76 71 58 37	94 90 76 50	102 101 91 67	99 101 98 83	91 93 96 94	81 84 89 97	73 75 81 93	63 64 70 81	55 56 60 70	48 49 51 58	43 43 45 48	40 40 41 43	37 37 38 40	34 34 35 37	33 33 34 34	33 33 33 33	31 31 32 32	30 30 30 31	28 28 28 29	23 23 23 24
1.5 6 2.0 3 2.5 1 3.0 0	8 5 2 1	10 7 4 2	13 9 6 3 - +	14 10 7 3 - + -	15 11 7 4	16 12 8 4	18 13 9 5	19 14 10 6	20 15 11 6	21 16 11 7		9 - +		33 23 18 12 +			18	21		89 88 64 35	75 91 84 55	59 74 89 81	49 59 72 87	44 49 58 73	40 43 48 59	50	35 37 40 44 +-	33 34 34 37 - +	31 32 33 34 +	29 30 30 31 - +	24 25 26 26
+	+	/ P = +	0.30		- + -						+	- +	- +	+	+	+	+			+-							- + -	- +	+	- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	0 0 0	0 0	1 0 0	5 2 1 1	10 4 3 2	16 8 6 5	23 13 11 9	31 20 17 14	38 27 24 21	44 35 31 28	51 46 43 40	53 51 50 48	52 53 52 52	52 52 52 52	50 51 51 52	48 50 50 50	46 47 47 48	44 45 45 46	43 44 44 44	42 42 42 43	41 42 42 42	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	35 35 35 35
.40 0 .50 0 .75 0 1.0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	1 1 0 0	2 1 1 0	4 3 1 0	7 6 3 0	12 10 6 1	18 15 9 2	31 28 19 6	42 39 31 14	49 47 41 25	52 51 47 36	52 52 50 44	51 51 51 49	49 49 50 51	47 47 48 50	45 45 46 47	43 43 43 45	42 42 42 43	41 41 41 42	40 40 40 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	35 35 36 36
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	1 0 0 0	2 0 0 0	6 1 0 0	13 2 0 0	23 6 1 0	33 13 3 0	44 25 9 2	49 38 19 6	50 48 36 18	47 50 48 37	44 47 49 47	43 44 47 49	42 43 44 46	43 44	40 41 42 43	40 40 40 41	40 40 40 40	39 39 39 40	37 37 38 38						
+	-		0.50	- + -		+	+	+-		+	+	* *			0 HR		*	+	·	+-		•	·	·	+	•	IA/P	= 0		- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	2 1 0 0	4 2 1 0	7 5 3	11 9 7 5	16 14 11 9	21 19 17 15	26 25 23 21	30 29 28 27	32 31 30 30	34 33 32 32	38 37 36 35	40 39 39 38	43 42 42 41	43 43 43 43	43 43 43 43	43 43 43 43
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 2 1 0	7 5 3 2	13 11 8 6	20 18 16 13	25 24 22 20	29 28 27 25	31 31 30 29	34 33 32 31	37 36 35 34	41 41 40 39	43 43 43 42	43 43 43 43	43 43 43 43
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	2 0 0 0	7 2 0 0	14 7 3 0	20 14 8 3	25 20 15 8	29 26 21 14	31 29 26 20	37 34 32 29	41 39 37 34	43 43 43 42	43 43 43 43
+ R	+ RAINFA	+ \LL T	- + YPE =	- + - = IA	+-	+	+	+-	+	+	+	* *	* TC	= 1.	0 HR	* *	*	+	+	+-	- +	+	+-	+-	+		HEET	7 0	+ F 10	- +	+

TDVI	Exh	ibit	t 5-I	A:	Tab	ulaı	r hy	dro	gra	ph u	ınit	dis	cha	rges	s (cs	m/i	n) fo	or t	уре	IA	raiı	nfal	l di	stril	buti	on-	-co	ntir	uec	l	
TRVL TIME (hr)7.0		7.6		3.0	8.1	8.2	8.3	8.4		8.6		8.8	9.0	HYDRO 9.2	9.4	9.6	9.8	0.0	1	0.6	1.0	1.5		12.5		13.5		5.0		8.0	2.0
+	IΑ	/P =	0.10								*	* *	TC	= 1.		* *	*										IA/P	= 0		- +	+
0.0 17 .10 16 .20 15 .30 14	21 19 19 17	24 23 22 20	29 27 26 24	33 29 28 25	37 31 30 27	43 35 33 29	52 41 38 32	61 48 45 36	71 57 53 42	81 66 62 49	89 76 71 58	95 85 80 67		94 99 97 95	86 92 93 96	78 84 86 91	71 76 78 84	64 69 71 76	57 60 62 66	+ - 51 54 55 58	46 47 48 50	42 43 43 44	39 40 40 41	35 36 37 38	34 34 34 35	33 34 34 34 34	33 33 33 33 33	31 31 31 31	30 30 30 30	28 28 28 28 28	23 23 23 23 23
.40 13 .50 12 .75 10 1.0 8	16 15 13 10	20 18 16 13	21 20	25 23 21 17	26 24 22 19	28 25 23 20	31 27 25 21	34 29 27 22	39 33 29 23	46 37 32 25	54 43 36 27	62 50 42 29	80 67 55 37	92 83 71 49	96 93 84 63	93 95 93 78	86 91 93 88	78 84 88 92	68 73 78 88	59 63 68 78	51 54 57 65	45 46 49 53	41 42 43 46	38 39 40 42	35 36 37 39	34 34 34 36	33 33 34 34	31 32 32 33	30 30 31 31	28 28 28 29	23 23 24 24
1.5 5 2.0 2 2.5 1 3.0 0	1	9 6 3 1	12 8 4 2	13 9 5 3	14 10 6 3	15 10 6 4	16 11 7 4	17 12 8 5	18 13 8 5	19 14 9 6	20 15 10 7	22 16 11 7	25 19 13 9	29 21 15 11	36 24 17 12	47 29 19 14	60 36 22 17		87 64 35 23	89 80 49 31	79 87 72 47	64 77 85 73	53 63 78 84	46 52 65 76	42 46 53 63	38 41 46 53	36 38 42 46	33 34 36 38	32 32 33 34	29 30 30 31	25 25 26 26
	'	/P =			4 -	+ -		•	•	+	*	* *	TC	= 1.3		* *	*	·	•	+-	·		•	+-	·	·	IA/P				+
0.0 0 .10 0 .20 0 .30 0		0 0 0	0 0 0 0	0 0 0	1 0 0 0	3 1 1 1	6 2 2 1	10 5 4 3	15 8 7 5	22 13 11 9	28 19 16 14	34 25 22 19	43 36 34 31	48 45 43 40	51 49 48 46	51 51 50 49	51 50 50 50		47 48 48 48	45 46 46 46	44 44 44 45	43 43 43 43	42 42 42 42	40 40 41 41	40 40 40 40	40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	35 35 35 35 35
.40 0 .50 0 .75 0 1.0 0	Ō	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 1 0 0	2 2 0 0	4 4 1 0	8 6 2 0	12 10 3 1	17 14 6 2	28 25 13 6	38 36 23 14	45 43 33 23	49 48 41 32	50 50 46 40	50 50 49 46	49 49 50 49	47 47 48 49	45 45 46 47	43 43 44 45	42 42 43 43	41 41 42 42	40 40 40 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	35 35 36 36
1.5 0 2.0 0 2.5 0 3.0 0	0 0	0 0 0 0 +	0 0 0 0 - +	0 0 0 0	0 0 0 0 - + -	1 0 0 0		6 1 0 0			30 12 3 0	41 23 8 2	47 35 18 6	49 45 33 17	47 48 45 34	45 47 48 45	43 45 46 48	42 43 44 46	41 42 43 44		40 40 40 41	40 40 40 40	39 40 40 40 - +	37 37 38 38 +							
+	+	/P =	0.50	- + -	+ -			+-		+	*	* *	- +	= 1.3	+	+	+-		+					+-		+	IA/P	- +	+	- +	+
0.0 0 .10 0 .20 0 .30 0	-	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	1 0 0 0	3 1 1 0	5 3 2 1	9 7 5 3	14 11 9 7	19 17 15 13	24 23 21 19	28 27 26 25	31 30 29 29	33 32 32 31	37 36 35 34	39 38 38 37	42 42 41 41	42 42 42 42	42 42 42 42	42 42 42 42
.40 0 .50 0 .75 0 1.0 0	-	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	2 1 1 0	5 3 2 1	11 8 7 4	17 15 13 11	23 22 20 17	28 26 25 23	30 30 29 27	33 32 31 30	36 35 34 33	40 40 39 38	42 42 42 42	42 42 42 42	42 42 42 42						
1.5 0 2.0 0 2.5 0 3.0 0	0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	1 0 0 0	5 1 0 0	11 6 2 0	18 12 6 2	23 18 13 6	28 24 19 12	30 28 24 18	36 33 31 28	40 39 37 33	42 42 42 42	42 42 42 42
+ F	+ RAINFA	+ .LL T		- + - = IA	+-	+	+	+-	- +	+	+ *	* *	TC	= 1.	+ 25 HR	+	*	+	+	+-	- +	+	+	+-	+		+- SHEET	8 0	F 10	- +	+

TDVI	Exh	ibit	5 -l	[A: '	Tab	ulaı	hy	dro	grap	oh u	nit	disc	cha	rges	(cs	m/ir) fo	r t	ype	IA	raiı	ıfal	l dis	stril	outio	on–	-coı	ntin	ued	l	
TRVL TIME (hr)7.0	7.3	7.6		8.0		8.2		8.4		8.6		8.8	9.0	HYDRO 9.2	9.4	9.6	9.8	0.0	0.3	0.6	1	1.5	1	2.5	1	3.5		5.0	6.0	8.0	2.0
+	IΑ	/P =	0.1	0							4	* * *	⁺ TC	+ = 1.	5 HR	* *	*								+ .		IA/P	= 0	.10	- +	+
0.0 15 .10 14 .20 13 .30 12	19 17 16	22 20 20 18	27 24 23	29 26 25 23	32 28 27 24	37 31 29 26	42 35 33 28	49 40 37 31	57 46 43 35	65 53 50 41	73 61 57 47	80 69	89 82 79 69	94 90 88 81	89 92 91 89	83 87 88 90	76 81 82 86	70 74 76 81	62	55 58 59 63	49 51 52 54	44 45 46 47	40 41 42 43	37 38 38 39	35 35 35 36	34 34 34 34	33 33 33 34	31 31 32 32	30 30 30 30	28 28 28 28	23 23 23 24
.40 11 .50 10 .75 9 1.0 7	13 11	18 16 14 11	21 19 18 14	22 20 19 15	24 22 20 16	25 23 21 18	27 24 22 19	30 26 24 20	34 29 26 21	38 32 28 22	44 36 31 24	51 41 35 26	65 54 46 32	78 69 58 40	87 81 71 52	90 88 82 65	87 89 88 76	82 86 88 84	73 77 81 87	64 68 73 81	55 58 62 70	48 50 52 58	43 44 46 49	40 41 42 44	36 37 38 40	34 35 35 37	34 34 34 35	32 32 32 33	30 31 31 31	28 29 29 29	24 24 24 24
1.5 4 2.0 2 2.5 1 3.0 0	3 1 0	8 5 2 1	10 7 3 2	11 7 4 2	12 8 5 2	13 9 5 3	14 10 6 3	15 11 6 4	16 12 7 4	17 12 8 5	18 13 9 5	19 14 9 6	22 17 11 8	26 19 13 9	31 22 15 11	39 25 17 13		62 38 23 17		85 69 41 27	81 83 61 40	69 80 82 63	57 68 82 80	49 56 69 78	44 48 58 68	40 43 49 57	37 40 44 49	34 35 37 40	32 33 34 35	30 30 31 31	25 25 26 27
+		/P =		0	+-							* * *	⁺ TC	= 1.		* *	*								+ -		IA/P	= 0	.30	- +	+
0.0 0 .10 0 .20 0 .30 0	0	0 0 0	0 0 0	0 0 0	1 0 0 0	2 1 0 0	4 1 1	6 3 2 2	10 5 4 3	14 8 7 6	19 12 10 9	24 17 15 13	34 27 24 22	41 36 33 31	46 42 41 39	48 46 45 44	49 48 48 47	48 49 49 48	47 48 48 48	46 46 47 47	44 45 45 45	43 43 43 44	42 42 43 43	41 41 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 39	35 36 36 36
.40 0 .50 0 .75 0 1.0 0	0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	1 1 1 0	3 2 1 0	5 4 2 0	7 6 4 1	15 13 9 2	24 22 16 6	33 31 24 12	40 38 33 20	45 44 39 29	47 47 44 36	48 48 47 44	47 48 48 47	46 46 47 48	44 44 45 46	43 43 43 44	42 42 42 43	40 40 41 42	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 39 39 40	36 36 36 36
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	3 1 0 0	6 2 0 0	12 4 1 0	19 8 2 0	30 17 6 1	39 28 13 4	46 40 26 12	47 46 40 28	46 47 47 41	44 45 47 46	43 44 45 46	42 42 43 45	40 41 42 43	40 40 40 41	40 40 40 40	40 40 40 40	37 37 38 38
+	ÍΑ	/P =		0	+-					+	4	* * *	⁺ TC	= 1.	5 HR		*								+ -		IA/P	-		- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0 0	- + 0 0 0 0	0 0 0	+- 0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	1 0 0 0	2 1 0 0	3 1 1 1	7 4 3 3	11 7 7 6	16 13 12 12	22 19 19 18	27 24 24 23	30 28 28 28	32 31 31 30	35 34 33 33	38 37 36 36	42 41 41 40	42 42 42 42 42	- + 42 42 42 42	+ 42 42 42 42
.40 0 .50 0 .75 0 1.0 0	0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 1 0	3 2 2 0	6 5 5 2	11 10 10 5	17 17 16 11	23 22 22 17	27 27 26 23	30 30 29 27	33 32 32 30	36 36 35 33	40 40 40 38	42 41 41 41	42 41 41 41	42 41 41 41
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	1 0 0 0	5 2 0 0	12 6 2 1	18 12 7 3	23 18 13 7		30 28 24 19	36 33 31 28	40 39 36 34	41 41 41	41 41 41 41
+	+ RAINFA				+-	+	+	+-	- +	+	+			= 1.	+ 5 HR			- +	+	+-	- +	+	+-	+-	+		+- SHEET		+ F 10	- +	+

TDVI		Exh	ibi	t 5-I	A:	Tab	ula	r hy	dro	gra	ph ı	ınit	dis	cha	rge	s (c	sm/i	n) f	or t	type	e IA	raiı	nfal	l di	stril	buti	on-	-co	ntiı	ıue	d	
TRVL- TIME (hr)	7.0		7.6		3.0	8.1	8.2	8.3	8.4		8.6		8.8	9.0	9.2	9.4	9.6	9.8	1.0.0	1	0.6	1	1.5		12.5]	13.5	1	15.0		8.0	22.0
		+ IA	/P =	0.10									* *	+ * TC	= 2	+ .0 HR		*										IA/P			- +	+
0.0		15 13 12 12	18 16 15 14	22 20 18	24 21 19	26 23 21 20	28 25 22 21	32 27 24 23	36 30 26 25	41 34 29 28	46 38 32 31	52 43 36 34	58 49 41 39	68 60 52 49	76 70 63 60	80 77 72 70	84 83 78 77	79 83 82 81		68 72 75 76	62 65 68 70	55 57 60 61	48 50 52 53	44 45 46 47	40 41 42 43	37 38 39 39	35 36 36 36 36	34 34 35 35	32 32 32 32 33	31 31 31 31 31	28 29 29 29	24 24 24 24 24
.40 .50 .75 1.0	9 7 6 5	11 10 9 6	14 12 11 9	15	18 17 15 12	19 18 16 13	21 19 17 14	22 20 18 15	24 21 20 16	26 23 21 17	29 25 23 18	33 28 25 20	37 31 27 21	47 39 34 25	57 49 42 30	67 60 52 38	75 69 62 47	80 76 70 57	81 81 76 66	77 79 79 76	71 74 76 79	62 65 68 75	53 56 59 64	47 49 51 55	43 44 46 49	39 40 41 44	37 37 38 40	35 35 36 37	33 33 33 34	31 31 31 32	29 29 29 29	24 24 24 25
1.5 2.0 2.5 3.0	3 1 0 0	4 2 1 0	6 3 1 1	8 4 2 1	8 5 3 1	9 5 3 2	10 6 4 2	11 7 4 2	12 7 5 3	13 8 5 3	14 9 6 3	15 10 6 4	16 10 7 4	18 12 8 5	21 14 10 7	24 16 12 8	30 19 14 10	37 22 16 11	45 26 18 13		71 48 31 21	78 65 46 30	73 77 66 49	63 73 76 67	55 64 72 75	48 56 63 71	43 49 55 63	40 44 48 54	35 37 40 43	33 34 35 37	30 31 31 32	25 26 27 27
	- + -	IA,	/P =	0.30		+-	·	•		+	+		- + * *	* TC		.0 HR	· * *	*				·		·	+-	•	·	IA/P		.30	•	+
0.0 .10 .20 .30	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	2 1 0 0	3 1 1 0	5 2 1 1	7 4 2 2	10 6 3 3	13 8 5 4	20 15 10 9	27 22 17 15	34 29 24 22	39 35 31 29	42 40 36 35	44 43 41 39	47 45 44 44	45 46 46 46	45 45 45 45	44 44 44 44	43 43 43 43	42 42 42 42	40 41 41 41	40 40	40 40 40 40	40 40 40 40	40 40 40 40	39 40 40 40	36 36 36 36
.40 .50 .75 1.0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	1 1 0 0	2 1 1 0	4 2 1 0	8 5 3 1	14 9 6 2	20 15 11 5	27 22 17 9	33 29 24 14	38 35 30 21	43 41 38 30	46 44 42 38	46 45 45 43	44 45 45 45	43 44 44 44	42 43 43 44	41 42 42 43	40 40 41 41	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	36 36 37 37
1.5 2.0 2.5 3.0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	2 0 0 0	4 1 0 0	8 2 0 0	16 6 1 0	25 12 4 1	36 24 12 4	43 36 25 13	45 43 37 26	44 45 43 37	43 44 45 43	42 43 44 44	41 42 43 44	40 40 41 42	40 40 40 40	40 40 40 40	38 38 38 39
	- + -	ΙΑ		0.50	- + -	+-	+	+	+-	+	+	; +	* * - +	* TC	= 2	.0 HR	· * * +	*			+-				+-		+	IA/P			- +	+
0.0 .10 .20 .30	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	2 1 1 0	4 3 2 1	7 5 4 3	12 10 8 6	18 16 14 12	23 21 20 18	27 26 25 23	30 29 28 27	33 32 31 30	36 35 34 33	40 40 39 38	40 40 40 40	40 40 40 40	40 40 40 40
.40 .50 .75 1.0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	2 1 1 0	5 4 3 1	11 9 7 3	16 15 13 8	22 20 19 14	26 25 24 20	29 28 27 24	32 31 30 28	38 37 36 34	40 40 40 39	40 40 40 40	40 40 40 40
1.5 2.0 2.5 3.0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	1 0 0 0	5 2 0	10 5 2 0	16 11 6 2	21 16 11 6	25 21 17 11	32 29 26 21	37 35 32 29	40 40 40 39	40 40 40 40
	R /		+ LL T	YPE =	- + ·	+-	+	+	+-	+	+		- + * *		= 2	+ .0 HR	+	*	+	+	+-	+	+	+	+-	+				OF 10	- +	+

Exhibit 5-II: Tabular hydrograph unit discharges (csm/in) for type II rainfall distribution

TRVI	Tabulai nyuru	HYDROGRAPH TI	ME (HOURS)	amian distribution
TIME 11.3 11.9 12.	1 12.3 12.5	12.7 13.0 13.4 5 12.8 13.2 13.6	13.8 14.3 15.0	16.0 17.0 18.0 20.0 26.0 16.5 17.5 19.0 22.0
++++		++	+ + + + +	++++++
IA/P = 0.10	++++	* * * TC = 0.1 HR * *		IA/P = 0.10
0.0 24 34 53 334 647101 .10 21 29 43 134 267 52 .20 18 25 35 61 110 23	0 623 217 147 123 100 0 847 701 378 224 15 5 418 704 702 486 31: 4 337 582 662 545 38:	4 86 76 66 57 51 46 7 122 98 75 64 56 50 2 209 151 94 73 62 54	42 38 34 32 29 26 45 41 36 33 30 27 49 44 38 34 31 28	23 21 20 19 18 15 13 12 0 24 21 20 19 18 16 13 12 0 25 22 21 19 18 16 14 12 0 25 22 21 20 18 16 14 12 0 25 22 21 20 18 16 14 12 0
.40 15 20 28 41 51 7 .50 14 19 26 39 47 6 .75 12 15 21 29 33 3 1.0 9 12 15 21 23 2	8 117 220 392 531 553 8 49 73 126 224 343	3 482 380 209 121 84 67 3 432 464 385 252 156 103	57 51 43 38 33 30 76 62 50 43 36 31	26 23 21 20 19 17 14 12 0 27 23 21 20 19 17 14 12 0 28 25 22 21 19 17 15 12 0 30 27 24 22 20 18 16 12 0
3.0 1 2 3 4 4	0 11 12 13 15 10 7 8 8 9 10 1 5 5 6 6 7	5 18 20 25 37 72 150 1 12 13 16 19 25 39 7 8 8 10 12 14 17	252 336 312 216 109 58 75 142 262 308 229 108 22 31 76 169 288 236	34 30 27 24 21 19 17 12 2 42 34 30 27 24 20 18 13 8 58 41 34 30 27 22 19 14 11 122 64 43 35 30 24 20 16 11
IA/P = 0.30		* * * TC = 0.1 HR * *	*	IA/P = 0.30
0.0 0 0 0 154 568 93 .10 0 0 0 19 109 41 .20 0 0 0 0 13 7	6 524 217 172 149 120 5 762 603 346 230 170	5 143 119 96 84 74 68 7 217 167 115 94 81 73	58 53 48 46 42 38 62 57 50 47 44 40 66 60 53 48 45 41	34 31 30 28 27 24 20 19 0 35 32 30 29 27 24 21 19 0 37 33 31 29 28 25 21 19 0 37 33 31 29 28 25 21 19 0
.40 0 0 0 0 0 0 .50 0 0 0 0 0 0 .75 0 0 0 0 0 0 1.0 0 0 0 0			76 68 59 52 47 43 94 80 67 58 50 45	38 34 31 30 28 25 22 19 0 39 34 32 30 29 25 22 19 0 41 37 33 31 29 26 23 19 0 42 38 34 32 30 27 24 19 0
2.0 0 0 0 0 0 2.5 0 0 0 0 0 3.0 0 0 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0 0 1 10 49 130 0 0 0 0 2 14	221 279 255 182 108 70 52 119 224 256 193 107 1 9 52 141 240 199	
IA/P = 0.50		* * * TC = 0.1 HR * *		IA/P = 0.50
0.0 0 0 0 0 70 53 .10 0 0 0 0 47 37 .20 0 0 0 0 0 3	9 377 196 171 154 134	4 117 108 99 89 83 77 5 126 114 102 92 85 79 9 160 138 112 99 90 83	72 67 61 59 56 51 73 68 62 59 56 52 77 72 64 60 57 53	46 43 42 40 38 34 30 28 0 47 43 42 40 38 34 30 28 0 48 44 42 41 39 35 30 28 0 50 45 43 41 39 36 31 28 0
.40 0 0 0 0 0 0 .50 0 0 0 0 0 0 .75 0 0 0 0 0 0 1.0 0 0 0 0 0	0 9 86 183 239 248	211 213 184 147 121 103	85 79 71 64 59 55 92 84 75 67 61 57	50 45 43 41 40 36 31 28 0 51 46 43 41 40 36 32 28 0 52 47 44 42 40 37 32 28 0 55 50 46 43 41 38 34 28 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	148 168 156 127 96 76 31 69 131 159 140 101 2 11 46 101 151 134	59 54 50 45 43 39 35 28 2 65 58 54 49 45 41 37 29 12 78 66 59 54 50 43 39 31 24 99 77 65 59 54 45 41 33 26
RAINFALL TYPE = II	+++++	* * * TC = 0.1 HR * *		SHEET 1 OF 10

Exhibit 5-II: Tabular hydrograph unit discharges (csm/in) for type II rainfall distribution—continued

TRVLHYDROGRAPH TIME(H	HOURS)			
TIME 11.3 11.9 12.1 12.3 12.5 12.7 13.0 13.4 13.4 (hr)11.0 11.6 12.0 12.2 12.4 12.6 12.8 13.2 13.6	14.0 14.6 15.5 16.5 17.5 19.0 22.0			
IA/P = 0.10				
.10 19 26 39 86 168 325 601 733 565 355 229 161 122 83 69 59 53 4 .20 17 23 32 49 74 136 262 488 652 594 435 298 207 115 81 67 58 5	44 40 35 33 30 27 24 21 20 19 18 16 13 12 0 47 43 37 34 31 28 25 22 21 19 18 16 14 12 0 51 46 40 35 32 29 26 23 21 20 19 16 14 12 0 53 48 41 36 32 29 26 23 21 20 19 16 14 12 0			
2.0 4 5 7 8 9 10 10 11 12 14 15 16 18 23 31 55 114 20 2.5 3 4 5 6 6 7 7 8 9 9 10 11 12 15 18 22 32 56	37 264 154 91 57 42 35 30 27 24 22 19 17 13 3 06 291 324 239 125 63 44 35 31 28 24 20 18 14 9 58 111 227 298 246 122 63 43 35 31 27 22 19 15 11 19 27 59 138 280 248 137 70 46 36 31 25 21 16 11			
IA/P = 0.30 * * * TC = 0.2 HR * * *	IA/P = 0.30			
0.0 0 0 39 180 545 697 497 276 198 158 130 110 93 81 73 67 6 .10 0 0 0 2 27 129 407 600 532 361 252 190 150 108 90 79 71 69 .20 0 0 0 2 19 92 302 501 521 415 306 228 176 119 95 82 73 69	61 56 49 46 43 39 35 32 30 29 27 24 21 19 0 65 59 52 48 44 41 36 32 31 29 28 25 21 19 0 67 61 53 48 45 41 37 33 31 29 28 25 21 19 0 72 65 57 51 46 42 38 34 31 30 28 25 22 19 0			
.50 0 0 0 0 0 0 6 33 120 258 374 415 391 271 173 121 95 8 .75 0 0 0 0 0 0 2 13 50 126 221 302 348 323 240 167 121 90	74 67 58 52 47 43 38 34 31 30 28 25 22 19 0 81 72 62 55 48 44 40 35 32 30 29 26 22 19 0 96 81 68 59 50 45 41 37 33 31 29 26 23 19 0 45 109 82 68 56 48 43 39 35 32 30 27 24 19 0			
2.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 6 2	63 235 262 202 123 76 58 49 43 39 35 30 27 21 13 28 77 179 242 207 120 75 57 48 43 39 32 29 22 17 0 4 30 101 207 227 130 80 59 49 44 35 30 24 18			
IA/P = 0.50				
0.0 0 0 0 0 7 98 371 322 221 182 158 137 120 104 94 86 80 76 100 0 0 0 0 4 67 270 305 249 204 174 149 130 108 97 88 82 76 120 0 0 0 0 0 3 45 195 268 255 221 189 163 125 106 95 87 86	74 69 62 60 57 52 47 44 42 40 39 35 30 28 0 76 71 64 60 57 53 48 44 42 41 39 35 30 28 0 80 75 67 62 58 54 49 45 43 41 39 35 31 28 0 82 76 68 62 59 55 50 45 43 41 39 36 31 28 0			
.50 0 0 0 0 0 0 1 14 72 146 199 218 213 175 137 113 99 8	84 78 69 63 59 55 50 45 43 41 40 36 31 28 0 89 82 73 66 60 56 52 47 43 42 40 36 32 28 0 98 88 78 70 62 57 53 48 44 42 41 37 33 28 0 22 105 89 78 68 60 56 51 46 43 42 38 34 28 0			
2.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 8 20	12 146 157 134 103 79 67 60 55 50 46 41 38 29 14 26 60 117 148 136 101 79 66 59 54 50 43 39 31 24 2 9 40 90 142 130 99 78 66 59 54 45 41 33 26			
RAINFALL TYPE = II	SHEET 2 OF 10			

T.D.V.I		Exh	ibit	5 -1	II:	Tab	ula	r hy	dro	graj	ph u	nit	disc				sm/i				e II i	rain	fall	dis	trib	utio	n—	con	tin	ued		
TRVL- TIME (hr)1	1.0	11	L.6	1	2.0		12.2		12.4		12.6	1	12.8	3.0	13.2	13.4	13.6	13.8	14.0	4.3	14.6		15.5	1	16.5		17.5	1	9.0		2.0	6.0
		IA/F	=	0.10	1								* * 7	* TC	= 0.	.3 HR	+	+ *	+	+	+							+- IA/P +-	= 0		- +	+
0.0 2 .10 . .20 . .30	20 19 17	28 26 23 22		118 99 53	235 189 83	447	676 571 292	676 641 478	459 520 587	283 362	196 251 422	146 181 308	114	80 89 127	66 70 86 97	57 60	51 53 58 61		42 43	37	33 34 35 36	31 31 32 32	28 28 29 29	24 25 26 26	22 22 23 23	20 21 21 21	19 19	18 18 19 19	16 16 16 16	13 14 14 14	12 12 12 12	0 0 0
.40 .50 .75 1.0	13 11	19 18 14 11	25 24 19 14	37 35 26 19	45 42 30 21	63 56 34 24	105 89 42 27	193 158 59 30	272	459 397 160 46	472 250	477 475 339 109	424 417	274 398	139 163 299 396	196	70 76 128 248	59 62 89 163	52 54 69 109	44 46 54 70	38 39 45 54	34 34 37 43	30 30 32 35	27 27 29 31	24 24 26 28	21 22 23 24	20 20 21 22	19 19 20 20	17 17 17 18	14 15 15 16	12 12 12 12	0 0 0
1.5 2.0 2.5 3.0) =	0.30	1						+		18 12 8 - + -	* TC	32 18 11 + = 0	57 23 13 + .3 HR	116 33 16 +	205 60 20 +	113 27 +	317 223 61 +	+		246	139			+	IA/P			13 14 15 16	3 9 11 11 +
0.0 .10 .20	+ 0 0 0 0	0 0 0	0 0 0 0	- + 11 0 0 0	- + 64 7 5	251	525 183	574 411 318	454 520 452	303 476	221 360 396	173 268	140 205 240	104 133 151	88 101 109 142	77 85 90	70 76 78 87	64 69 70 76	58 62 64	51 55 56 60	47 49 50 53	44 45 46 47	40 41 42 43	36 37 38 39	32 33 33 33 35	31 31 31 31 32	29 30 30 30 30	28 28 28 28 29	24 25 25 26	21 21 22 22	19 19 19 19	0 0 0
.40 ,50 .75 1.0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	2 0 0 0	16 2 1 0	69 11 4 0		317 140 63 2		352 219	365 389 290 78	327 335			92 110 146 243	79 89 110 176		61 66 72 90	54 57 62 72	48 50 52 59	43 45 46 49	39 41 42 44	35 36 38 40	32 33 34 36	30 31 31 33		26 26 27 28	22 23 23 24	19 19 19 19	0 0 0 1
1.5 2.0 2.5 3.0	0 0 0	0 0 0 0	0 0 0 0 +	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	2 0 0 0		1 0 0	185 12 0 0	264 50 3 0	121 16 0	51 2	257 145 19	224 239 74	184			44 50 60 89	40 44 50 63	36 40 44 51	32 36 40 45	29 31 33 36	26 28 29 31	20 21 22 24	5 14 17 18
	·) =	0.50	1								* * >	* TC	= 0.	.3 HR	· * * +	*										IA/P	= 0	.50	- +	+
0.0 .10 .20 .30	0 0 0	0 0 0	0 0 0 0	0 0 0	1 1 0 0	25 17 0 0	151	299 235 75	277 263 182		187 202 234	162 175	141 152 188	113 120 144	100 104 116	90 93 101	84 85 91 94	78 79 84 86	73	65 66 70 71	61 61 63 64	58 58 59 59	53 54 55 55	48 49 50 51	44 44 45 46	42 42 43 43	41 41 41 42		35 35 36 36	31 31 31 32	28 28 28 28	0 0 0
.40 .50 .75 1.0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	5 0 0	37 4 1 0	105 26 10 0	170 78 34 0	206 140 73 4	184	203	191 184	131 155 173 168	126 146	97 107 122 159	88 95 105 134	81 86 94 114	72 76 82 94	65 69 73 82	60 62 64 70	56 57 58 61	51 53 54 57	46 48 49 52	43 44 45 47		40 41 41 42	36 37 37 39	32 33 33 35	28 28 28 28	0 0 0 0
1.5 2.0 2.5 3.0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	10 0 0 0	44 2 0 0	98 14 0 0	144 44 4 0	87 16 1	42 5	153 97 27	141 138 71	84 110 145 127	139		56 61 68 81	52 56 60 68	47 51 55 60	44 47 51 55	40 42 43 46	36 38 40 41	29 30 32 33	6 17 25 27
	+ RAI	- + - · [NFAL	- + L T\	- + /PE =	- + = II		+	+	+	+	+						+		+	+	+	+	+	+	+-	+		+ - HEET			- +	+

Exhibit 5-II: Tabular hydrograph unit discharges (csm/in) for type II rainfall distribution—continued

TRVI	····	IIRS)	
TIME 11.3 11.9 12.1 (hr)11.0 11.6 12.0 1	12.3 12.5 12.7 13.0 13.4 13.8	14.3 15.0 16.0 14.0 14.6 15.5 16.5	17.0 18.0 20.0 26.0 5 17.5 19.0 22.0
$I\Delta/P = 0.10$	* * * TC = 0.4 HR * * *		IA/P = 0.10
0.0 18 25 36 77 141 271 .10 18 24 34 67 116 219 .20 15 20 28 44 59 97	468 592 574 431 298 216 163 104 77 63 55 49 385 523 557 473 357 263 196 119 84 67 57 51 179 316 454 523 489 401 309 178 112 81 65 56	44 38 34 31 28 25 22 46 39 35 32 29 25 22 49 42 37 33 30 26 23 51 43 38 33 30 27 24	2 21 20 18 16 14 12 0 2 21 20 19 16 14 12 0 3 21 20 19 17 14 12 0
.40 13 17 23 33 38 48 .50 12 16 22 31 36 44 .75 10 13 17 24 26 30 1.0 8 10 13 17 19 21	71 121 214 331 429 467 442 308 189 120 85 66 62 102 176 279 379 438 440 339 218 137 94 71 35 45 65 106 170 251 326 393 341 245 164 112 24 27 31 37 50 75 118 251 360 376 292 205	59 49 42 35 31 28 25 81 59 48 39 33 30 26	5 22 21 19 17 15 12 0 6 23 21 20 18 15 12 0
1.5 6 7 9 12 13 14 2.0 4 5 6 8 8 9 2.5 2 3 4 5 6 6 3.0 1 2 2 3 4 4	7 7 8 9 9 10 11 13 16 20 27 46	243 306 264 154 74 47 37 85 184 285 262 147 74 47 23 47 109 227 268 160 83	7 32 28 25 21 18 14 9 7 37 32 28 22 19 15 11 3 50 38 32 25 21 16 11
IA/P = 0.30	* * * TC = 0.4 HR * * *		IA/P = 0.30
	296 480 495 413 306 234 186 127 100 84 74 67 81 224 395 462 430 347 272 172 121 96 82 73 59 169 320 414 424 373 305 196 134 103 85 75	61 54 49 45 41 37 33 66 57 51 46 42 38 34 67 59 52 47 43 39 34 73 63 55 48 44 40 36	3 31 29 28 25 21 19 0 4 31 30 28 25 22 19 0 4 32 30 29 25 22 19 0
.40 0 0 0 0 0 1 .50 0 0 0 0 0 0 0 .75 0 0 0 0 0 0 0 1.0 0 0 0 0 0	6 30 94 202 308 372 379 298 203 141 106 87 0 4 21 70 158 258 334 364 270 187 133 102 0 2 8 30 76 145 219 321 305 241 177 130 0 0 0 1 4 15 42 150 267 308 272 209	102 78 65 55 47 43 38	7 33 31 30 26 23 19 0 3 34 32 30 27 24 19 0
1.5 0 0 0 0 0 0 0 2.0 0 0 0 0 0 0 0 2.5 0 0 0 0 0 0 0 3.0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 1 9	162 252 239 162 93 64 52 33 112 202 235 155 92 64 2 21 76 182 221 148 90	2 45 41 37 31 28 21 15 4 52 45 41 33 29 23 18 0 63 51 45 36 31 24 18
IA/P = 0.50	* * * TC = 0.4 HR * * *	+++	IA/P = 0.50
0.0 0 0 0 0 0 7 .10 0 0 0 0 0 0 .20 0 0 0 0 0 0 .30 0 0 0 0 0	5 41 125 205 240 222 198 154 123 106 94 86 3 28 93 168 216 220 205 164 131 110 97 88	75 67 62 58 54 50 45 79 71 64 60 56 51 46 81 72 65 60 56 51 46 86 77 69 62 57 53 48	6 43 42 40 36 32 28 0 6 43 42 40 36 32 28 0
.40 0 0 0 0 0 0 0 .50 0 0 0 0 0 0 .75 0 0 0 0 0 0 1.0 0 0 0 0	0 1 14 50 106 161 193 202 163 133 112 98 0 1 9 37 83 135 174 194 171 140 117 102 0 0 0 3 15 40 76 147 177 169 146 124 0 0 0 0 1 7 21 78 141 173 167 146	91 80 71 63 58 54 49 107 90 79 68 60 56 51	9 45 43 41 37 33 28 0 1 47 43 42 38 34 28 0
1.5 0 0 0 0 0 0 0 2.0 0 0 0 0 0 0 0 2.5 0 0 0 0 0 0 0 3.0 0 0 0 0 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	86 138 150 125 93 74 64 17 59 112 143 121 91 73 1 11 40 101 138 117 90	4 58 53 48 42 39 31 20 3 63 57 53 45 40 32 26 0 73 63 57 48 42 34 27
RAINFALL TYPE = II	* * * TC = 0.4 HR * * *	++++	SHEET 4 OF 10

T.D.V.		hibi	it 5	-II:	Tal	oula	r hy	dro	gra											e II	rair	ıfall	l dis	tril	outio	n—	-con	tin	ued		
(hr)11.	11.3	1.6	1	2.0		12.2		12.4		12.6	12.7	1 12.8	3.0	13.2	13.4	13.6	13.8	14.0	14.3	14.6	-	15.5	1	16.5	1	7.5	1	9.0		2.0	6.0
+	IΑ	/P =	0.10)								* *	* TC	= 0	.5 HR	* *	*										IA/P	= 0	.10	- + -	+
0.0 17 .10 16 .20 14 .30 13	23 22 19 18	32 30 25 24	57 51 38 35	94	170 140	308 252 116	467 395 207	529 484 332		402 434 477	297 343 449	226	140 162 238	96 108 149 171	74 80 101	61 65 77 83	53 55	47 49 53	41 42		32 33 34 34	29 29 30 31	26 26 27 27	23 23 24 24	21 21 22 22	20 20 20	19	16 16 17 17	14 14 14 15	12 12 12 12	0 0 0
.40 12 .50 11 .75 9 1.0 7	15 15 11 9	21 20 14 12		33 31 21 17	40 37 24 19	53 48 27 21			233 194 49 32		367 118	434 412 182 83	378 319	271 374	328	107 119 244 322	169	64 68 117 172		43 44 56 68	36 37 43 49	32 32 35 38	28 29 31 32	25 25 28 29	22 23 25 26	21 21 22 23	20 20 21 21	17 17 18 19	15 15 16 16	12 12 12 12	0 0 1 1
1.5 5 2.0 3 2.5 2 3.0 1	7 4 3 1	8 6 4 2	11 7 5 3	12 8 5 3	13 8 6 4	14 9 6 4	15 10 7 4	17 10 7 5	19 11 8 5	21 12 9 6	9 6	15 10 7		23 15 9	175 35 18 11	269 65 24 13	123 36 16	20	297 150 37	244 86	198			96	29 33 39 56	25 29 33 40			17 19 20 21	13 14 15 16	5 10 11 11
+	IΑ	/P =	0.30)								* *	* TC	= 0	.5 HR	* *	*								+ -		IA/P	= 0	.30	- + -	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	1 0 0 0	9 1 1 0		157	314 117	433 248 194	439 372 313 151	379 416 382	299 391 388		159 218 244	118 150	95 113 122	81 92 97 117	71 79	65 70 72	56	50 53 54 58	46 47 48 50	42 43 43 45	38 39 39 41	34 35 35 36	31 32 32 33	30 30 30 31	28 29 29	25 26 26 26	22 22 22 23	19 19 19	0 0 0
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	2 0 0 0	13 1 1 0	47 9 4 0	116 34 14 0	211 89 41 2	170 89	354 255 152 22	341 270	303	268	127 161 207 285			69 76 87 120	59 64 70 88	51 54 57 67	45 47 48 53	41 42 44 46	37 38 39 42	33 34 35 38	31 31 32 34	30	26 27 27 28	23 24 24 25	19 19 19	0 0 0 2
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	Ö	0 0 0	0 0 0	0 0 0	5 0 0	30 0 0	3 0 0	183 18 1 0	59 5 0	1	221 84 13	245 174 56	230 157	217		101	41 47 54 68	37 42 46 53	34 38 42 46		26 28 30 31	20 22 23 25	8 16 18 18
+	IΑ	/P =	0.50)								* *	* TC	= 0	.5 HR	* *	*								+		IA/P	= 0	.50	- +	
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	0 0 0 0	0 0 0	2 0 0 0	26 1 1 0		170 65	217 135		200 216 198	179 205	144 170 178	119 137 145	104 115 121	93 101 105 117	85 91 94 102	78 83 85	70 74 76 80	64 67 68 71	59 61 61 63	55 56 57 58	51 52 52 54	46 47 48 49	43 44 44 45	41 42 42 43	40 40 40 41	36 36 37 37	32 32	28 28 28 28	0 0 0
.40 0 .50 0 .75 0 1.0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	6 4 1 0	25 18 7 0	63 48 22 1	90 47	80	184 142	174 177 169 112	152 164	144	106 110 124 154	108	91	73 74 79 91	64 65 68 76	58 59 61 65	54 55 56 59	50 50 51 54	45 45 47 49	43 43 44 45	41 41 42 43	37 38 38 39	33 33 34 35	28 28 28 28	0 0 0 2
1.5 0 2.0 0 2.5 0 3.3 0	0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0		2 0 0 0	16 0 0 0	50 4 0 0	97 18 0 0	47 3 0	11 1	134 44 7	29	86			58 64 77 95	54 58 65 76		45 49 54 58	41 42 45 49	37 39 41 43	29 31 33 35	10 21 26 27
	RAINFA							,								* *		,		,	'	,	,	,	,		HEET			,	,

RAINFALL TYPE = II

Exhibit 5-II: Tabular hydrograph unit discharges (csm/in) for type II rainfall distribution—continued TRVI - - - - -----HYDROGRAPH TIME(HOURS)----TIME 11.3 11.9 12.1 12.3 12.5 12.7 13.0 13.4 13.8 14.3 15.0 16.0 17.0 18.0 20.0 2 (hr)11.0 11.6 12.0 12.2 12.4 12.6 12.8 13.2 13.6 14.0 14.6 15.5 16.5 17.5 19.0 22.0 26.0 * * * TC = 0.75 HR * * *IA/P = 0.10IA/P = 0.100.0 13 18 24 36 46 68 115 194 294 380 424 410 369 252 172 123 93 74 61 49 41 35 31 27 24 22 20 19 17 15 12 .10 34 42 97 162 250 337 395 405 381 279 191 135 100 79 65 51 42 21 19 17 15 12 28 32 39 52 82 135 211 295 362 391 351 255 178 127 95 75 57 46 21 20 17 15 12 .20 11 15 26 30 70 113 179 256 326 379 360 277 196 140 103 80 60 48 .30 11 14 18 15 .40 10 16 22 25 96 151 221 291 367 336 255 182 131 98 69 22 20 18 16 16 21 24 82 128 190 258 358 343 274 200 144 106 74 .50 18 16 13 17 18 39 55 82 122 230 314 329 281 217 161 104 72 51 38 23 21 19 16 .75 1.0 10 13 14 23 27 32 42 89 177 272 319 303 249 163 105 1.5 15 16 18 20 27 90 163 241 295 275 204 119 2.0 3 13 16 20 28 48 89 151 245 274 213 115 30 27 22 19 1.0 2.5 1 8 10 12 14 17 24 37 86 170 260 219 127 71 36 31 4 4 24 20 16 3.0 1 5 6 7 8 10 11 14 17 30 64 157 247 205 122 70 46 36 27 22 17 * * * TC = 0.75 HR * * *IA/P = 0.30IA/P = 0.300.0 0 0 0 0 1 6 30 86 174 266 326 348 328 246 181 138 110 92 79 66 57 49 44 40 36 32 31 29 26 23 19 4 22 65 137 223 292 329 303 228 170 131 106 89 73 61 52 46 41 37 31 29 26 23 19 .10 0 3 15 48 108 185 256 305 321 245 184 141 112 93 75 63 53 46 42 31 30 .20 0 27 23 19 84 151 221 277 308 260 199 152 120 98 78 31 30 27 23 .40 0 122 188 286 301 243 187 144 114 87 98 158 263 292 254 200 155 122 91 .50 0 .75 0 23 51 140 231 269 253 211 167 119 1.0 4 29 96 186 249 261 231 169 120 1.5 0 0 1 91 163 220 241 197 32 29 2.0 0 0 0 0 0 0 0 2 11 36 85 174 226 200 127 82 0 0 0 0 0 1 6 37 105 196 214 135 87 62 51 44 2.5 o 0 0 36 31 24 18 0 0 0 0 0 0 0 0 0 0 0 0 4 24 96 205 189 130 3.0 0 0 0 0 0 0 85 62 50 39 32 26 18 IA/P = 0.50* * * TC = 0.75 HR * * * IA/P = 0.50- + - + - - + - - - + 0 2 16 45 92 137 166 185 170 146 125 110 98 89 79 70 63 58 53 48 44 42 41 37 33 0.0 .10 0 34 73 115 149 180 163 141 122 107 96 84 43 41 38 33 .20 0 25 57 96 131 173 166 146 126 111 99 86 43 41 38 34 38 34 44 79 143 170 160 141 122 108 92 44 42 .30 .40 34 64 127 166 162 145 127 111 95 44 42 38 34 .50 26 82 138 162 157 140 123 103 45 43 .75 12 47 98 139 154 148 135 113 96 39 36 73 119 146 151 134 113 1.0 1.5 66 105 143 143 117 90 52 48 42 39 2.0 0 0 0 0 0 0 11 30 77 121 137 114 57 52 44 40 2.5 0 0 0 0 0 0 0 0 0 0 0 1 3 19 55 111 132 111 87 62 56 47 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 12 51 112 128 108 86 71 62 51 44 36 27 3.0 0

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* * * TC = 0.75 HR * * *

		\mathbf{E}	xhi	bit	5-I	I: T	abu	lar l	hydi	rogi	rapl	h un	it di	sch	arg	es	(csn	ı/in) fo	r ty	/ pe]	II ra	inf	all d	listı	ribut	tion	— c	ontir	ıue	d
(hr)11	1.0	1.3 1	1.6	.1.9 1	2.0	2.1	12.2	12.3 1	1 12.4	12.5	12.6	12.7	13 12.8	.0	3.2	.3.4	13.6	13.8	14.0	14.3	14.6	15.0	15.5	16.0	16.5	17.0	1 17.5	.8.0 1	20 .9.0	.0	26.0 .0
		IA/	P =	0.10)								* * *	TC =	= 1.	0 HR	* *	*										IA/P	= 0.1	L O	
0.0 1 .10 1 .20 1	1	15 13 13 12	20 17 17 17	29 24 23 22	35 27 26 24	47 33 30 28		112 62 54 48	168 95 82		289 202 176	329 260 232	357 3 306 3 281 3 256 3	13 2 40 2 32 3	239 293 303	175 222 238	133 165 179 193	103 126 136	83	63 72 76	50 56	40 43 45 46	33 35 35 36	29 30 30 31	26 27 27 27	23 24 24 24 24	21 22 22 22 22	20 20	18 18	15 15 16	+ 12 (12 (12 (12 (12 (12 (12 (12 (12 (12
.50 .75	8 8 7 5	11 10 8 7	13 11	19 18 14 11	20 16	23 22 17 13	27 25 19 14	32 30 21 16	42 38 25 17	61 53 30 19		114 53	181 2 159 2 76 1 31	53 3 46 <i>2</i>	311 228	300 284	237 251 293 256	195 256	149 208	102 143	70 74 99 144	51 53 66 90	39 40 46 56	32 33 36 41	28 29 31 33	25 25 27 29	23 23 24 26	21 21 22 23	18 18 19 20	16 17	12 12 13 13
	0	5 3 2 1	6 4 2 1	8 5 3 2	8 5 4 2	9 6 4 3	10 6 4 3	11 7 5 3		8 6 4	14 9 6 4	15 9 7 5		12 8 6	10 7	19 12 8	107 27 15 10	44 19 12	78 27 14	157 58 22	231 120 44	157 252 214 113	241 214	231		33 42 59 91	29 34 42 58	42	23 2	20 21 23	
		IA/	P =	0.30)								* * *	TC =	= 1.	0 HR	* *	*										IA/P	= 0.3	30	
.10	0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	4 0 0 0	16 3 2 1	42 12 9 6	83 32 24 18		113 93	168 143	271 2 218 2 193 2 169 2	79 <i>2</i> 71 <i>2</i>	260 271	213 225	169 180	136 145	113 119	88 92	66 72 75 78	55 59 60 62	47 49 50 51	42 43 44 44	38 39 39 40	34 35 35 36	31 32 32 33	30 30 30 31	27 2 27 2	24 24	19 (19 : 19 :
,50 ,75	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 1 0 0	4 3 0 0	14 10 1 0	32 24 4 0	61 49 12 1		68 2	237 150	259 254 213 113	222 230 239 182	191 228		115 149	86 90 112 150	67 69 82 104	53 54 61 72	46 47 50 56	41 42 44 47	37 37 39 42	33 34 35 38	31 31 32 34	28 2 29 2	25 26	19 2 19 2 20 2
2.0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0			18 1 0 0	51 5 0 0	20 2 0	49 7 0	121 32 2	187 87 13	171 62	152 199 158	146 192			42 47 54 73		34 2 37 3 41 3	29 31	22 13 23 13 24 18 26 18
		IA/	P =	0.50)	+-							- + + * *	TC =	= 1.	0 HR		*								+		IA/P	= 0.5	50	+
0.0 .10 .20	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	1 0 0 0	7 1 1 0	21 5 4 3	42 15 12 9	71 33 26 20		126 1 87 1 74 1 62 1	60 : 34 : 23 :	154 156 153	138 149 153	123 134 137	110 120 123	100 108 111	87 93 95	77 82 84 86	67 71 72 73	60 62 63 63	55 57	50 52 52 53	46 47 47 48	43 44 44 45	41 42	38 3 38 3	34 34 34	28 : 28 : 28 :
.50 .75	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	2 1 0 0	6 5 2 0	16 12 5 0	25	64	109 78	145 139 115 59	148 146 136 96	139 140	123 127 134 139	108 117		77 79 84 97	66 67 70 78	59 60 62 66	54 55 56 59	49 50 51 54	45 46 47 49	43 43 44 46	39 40	36 36	29 2 29 2 29 2
2.0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	-	-	2 0 0 0	9 0 0 0	26 3 0 0	54 10 0	25 2 0	64 10 1	34 6	129 84 32	125 89	77 93 117 122	114	59 65 78 94	54 58 66 77		45 49 53	41 43	31 11 33 24 35 21 37 21
	+ RA	INFA		- + YPE			+	+	+-	- +	+		- + * * *						+	+	+	+	+	+	+-	+			7 OF	10	+

Exhibit 5-II: Tabular hydrograph unit discharges (csm/in) for type II rainfall distribution —continued .3 11.9 12.1 12.3 12.5 12.7 13.0 13.4 13.8 14.3 15.0 16.0 17.0 18.0 20.0 2 11.6 12.0 12.2 12.4 12.6 12.8 13.2 13.6 14.0 14.6 15.5 16.5 17.5 19.0 22.0

TIME 11.3 11.9 12.1 12.3		18.0 20.0 26.0
++++++	.4 12.6 12.8 13.2 13.6 14.0 14.6 15.5 16.5 17.	++++
	* * * TC = 1.25 HR * * * ++++++++++++++++++++++++++	
.10 10 13 17 23 27 34 47 69 1 .20 9 11 15 20 22 26 31 42	02 143 189 234 267 297 274 226 175 138 111 82 64 48 38 31 27 24 2 50 88 124 168 212 280 292 261 212 166 131 95 72 53 40 33 28 25 2	22 20 18 16 12 1 22 20 18 16 12 1 23 21 18 16 12 1 23 21 18 16 12 1 23 21 18 16 12 2
.75 6 8 10 14 15 17 19 21	31 41 58 82 114 190 256 279 262 222 178 127 93 65 46 36 31 27 2 25 31 41 56 78 139 207 254 265 245 208 152 110 75 51 39 32 28 2	23 21 19 16 12 2 24 22 19 17 13 2 25 22 19 17 13 3 26 24 20 18 13 5
2.0 2 3 4 5 6 6 7 7 2.5 1 2 2 3 4 4 4 5 3.0 0 1 1 2 2 2 2 3	8 8 9 10 11 13 16 22 35 59 98 171 236 236 156 95 62 44 3 5 5 6 6 7 8 10 12 14 19 28 58 114 197 226 163 102 65 4	
IA/P = 0.30	* * * TC = 1.25 HR * * *	IA/P = 0.30
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	50 86 130 174 208 253 235 201 164 136 115 92 76 61 51 44 39 35 3 19 40 71 110 153 217 247 227 191 157 131 103 84 66 53 46 41 36 3 14 31 58 93 133 202 239 231 199 165 138 108 87 68 55 47 41 37 3	32 30 27 24 19 1 33 31 28 24 19 2
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0 2 6 14 30 82 151 206 228 217 189 146 113 85 64 52 45 40 3 0 1 2 7 15 49 105 164 205 218 205 166 129 95 69 55 47 41 3	85 32 28 25 20 3 86 33 29 26 20 5 87 33 29 26 20 6 89 35 30 27 21 10
1.5 0 0 0 0 0 0 0 0 0 2.0 0 0 0 0 0 0 0 0 0 2.5 0 0 0 0 0 0 0 0 0 3.0 0 0 0 0 0 0 0 0		33 63 44 35 27 18
IA/P = 0.50	* * * TC = 1.25 HR * * *	IA/P = 0.50
	13	4 42 38 34 28 2
.40 0 0 0 0 0 0 0 0 0 0 0 0 0 0 .50 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	47 44 40 36 29 5 47 44 40 36 29 6 49 46 41 37 29 9 51 47 42 38 30 13
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
RAINFALL TYPE = II	* * * TC = 1.25 HR * * *	SHEET 8 OF 10

Exhibit 5-II: Tabular hydrograph unit discharges (csm/in) for type II rainfall distribution—continued -----HYDROGRAPH TIME(HOURS)------TIME 11.3 11.9 12.1 12.3 12.5 12.7 13.0 13.4 13.8 14.3 15.0 16.0 17.0 18.0 20.0 26.0 (hr)11.0 11.6 12.0 12.2 12.4 12.6 12.8 13.2 13.6 14.0 14.6 15.5 16.5 17.5 19.0 22.0 * * * TC = 1.5 HR * * * IA/P = 0.100.0 9 11 15 21 25 31 41 58 82 112 147 184 216 255 275 236 198 159 129 98 76 57 43 35 30 18 16 12 265 254 63 46 23 21 .10 131 166 226 19 16 24 22 .20 17 19 116 149 212 259 259 197 160 119 76 103 134 197 244 255 238 206 169 125 24 22 208 247 .40 11 14 15 91 151 .50 80 136 194 238 249 235 204 154 115 .75 125 179 240 233 193 148 201 236 230 95 141 203 226 9 10 34 56 110 172 2.0 187 126 2.5 1 9 11 14 18 34 69 141 210 190 133 60 44 30 23 17 12 5 6 3.0 0 3 4 5 9 11 16 27 66 149 204 181 128 -+--+--+ --+--+--+--+--+ * * * TC = 1.5 HR * * * IA/P = 0.30IA/P = 0.30-- + -- + -- + -- + 6 15 31 0.0 53 80 112 144 193 225 208 186 157 134 108 89 70 56 48 42 34 31 28 25 .10 0 68 97 157 198 219 203 178 151 120 .20 0 57 114 168 201 213 196 171 135 108 .30 48 100 155 193 210 200 177 140 113 .40 141 184 202 182 146 117 .50 Ω 101 153 205 197 164 131 .75 68 116 160 189 197 179 147 1.0 138 175 195 178 1.5 47 85 145 187 2.0 0 0 0 0 0 0 4 13 45 162 180 138 2.5 0 0 0 0 0 0 0 0 0 1 8 31 89 161 174 133 72 58 3.0 0 0 0 0 0 0 0 0 0 1 5 29 98 160 169 129 -+--+--+ * * * TC = 1.5 HR * * *IA/P = 0.508 16 42 59 92 116 128 130 121 112 100 90 78 67 60 46 43 110 125 123 114 102 .10 .20 91 114 128 120 108 7 1 24 52 83 108 123 126 122 110 .30 49 45 .40 90 112 124 126 116 104 .50 121 125 118 106 .75 108 119 122 112 1.0 98 118 121 45 80 107 2.0 4 11 32 63 115 104 2.5 0 0 0 1 4 16 94 113 105 76 66 53 45 0 0 0 0 0 0 0 0 0 3 15 54 96 111 103 3.0 0 0 0 0 0

* * * TC = 1.5 HR * * *

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RAINFALL TYPE = II

T. 0.11		Exh	ibit	5 -]	[I :]	Γab	ular	hye	drog	grap	h u	nit (disc	ha	rges	(cs	m/ir	ı) fo	or t	ype	II 1	rain	fall	dist	trib	utio	n—	con	tinı	ued		
TRVL TIME (hr)11	11						12.2							3.0		13.4	H TIM	13.8		14.3		15.0				17.0		 18.0		20.0	22.0	26.0
	+	-+- IA/	- + P =	0.10	- + -)	- + -	+	+	+-	- +	+	+	- + - * * *	- + + TC	+ = 2.	+ 0 HR	+	+ *	+	+	+	+	+	+	+-	+	+	IA/P	= 0	.10		+
.20	+ · 7 6 6 6	9 8 8 7	12 10 10 10	16 14 13	18 15 14 14	21 17 16 15	27 20 19 18	36 25 23 21	49 33 29 27	64 43 39 35	82 57 51 45	104 74 66 59	127 94	171 139 128	201 179 169	226 204 198	208 218	193 205 207	171 188 192	132 150 157	105 118 123	79 88 91 95	58 63 65 68		36 38 39 40	30 32 33 33	26 27 28 28	23 24 24 24 25	20 20 20		- + 13 13 13 13	+ 3 4 4 4
.75	5 5 4 3	6 6 6 4	8 8 7 6		12 11 10 8	13 13 11 8	15 14 12 9	17 16 13 10	20 18 15 11	24 22 18 12	31 28 22 14	41 37 27 16	53 48 35 18	87 78 58 28	118	158 129	197 190 164 110	208 191	208 202	185 194	167	106 111 125 156	75 77 87 108	55 57 63 76	43 44 48 56	35 36 38 43	30 30 32 35	26 26 27 30	21 21 22 23	18	14 14 14 14	5 5 6 8
1.5 2 2.0 2 2.5 0 3.0 0	0	3 2 1 0	3 2 1 1	5 3 2 1	5 3 2 1	5 4 2 1	6 4 3 1	6 4 3 2	2	8 5 4 2	2	9 6 4 3	10 7 5 3	8 6 3	16 10 7 4	5	36 16 9 6	7	35 16 8	67 28 12	112 52 18		190 170 99	154 185 161	149 180	58 78 107 152	112	36 44 56 80	26 30 35 45	30	16 17 18 19	11 11 12 12
		IA/	P =	0.30)							7	* * *	⁺ TC	= 2.	0 HR	* *	*										IA/P	= 0	.30		+
.10 (0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	3 0 0 0	8 2 2 0	15 6 4 1	25 12 10 3	38 21 17 7	54 32 27 14		115 85 75 49	124 114	153 146		180 175	168 170	145 149	120 124	89 96 99 107	70 75 76 82	57 60 62 66	49 51 52 54	42 44 45 47	38 39 39 41	34 35 35 37	29 30 30 31		20 20 21 21	5 6 6 8
.50 (0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 1 0 0	2 2 0 0	6 4 1 0	11 9 2 0	19 16 5 0	43 37 15 3		113 104 62 24	144 136 96 48	160 127	171 152	165 167	160	111 114 132 153		67 69 77 90	55 56 62 71	47 48 52 58	42	37 37 40 43	31 31 32 34	27 27 28 29	21 21 22 23	8 9 11 14
2.0 (0 0 0 0 +	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 - + -	0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 0 0 0	10 1 0 0	4 0 0	1 0	32 4 0	68 16 3	15	157 114 59	143 153 118	144 150	140				42	24 26 27 29	17 18 19 19
	+		P =	0.50)	+ -	+	+		- +	+	7	* * >	⁺ TC	= 2.	0 HR	* *	*					+				+	IA/P	= 0	.50	- +	+
.10 (0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	1 1 1 0	4 3 2 0	8 6 5 2	13 11 9 4	20 17 14 7	28 24 21 12	51 45 40 26	73 68 62 46	92 87 82 67	104 101 98 86	107	112	107 108		86 88 89 93	75 76 77 80	66 67 68 70	60 60 61 63	54 55 55 57	49 50 50 52	46 46 47 48	41 41 41 42	37	30 30 30 30	7 8 8 10
.50 (0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 1 0 0	6 2 1 0	10 4 2 0	22 13 7 1	41 27 18 5	62 46 33 13	81 67 52 25	85 71	88	110 104		94 98 102 108	81 85 89 97	71 74 77 84	63 66 68 73	57 59 61 65	52 54 55 59	48 49 50 53	42 43 44 45	39 39	30 31 31 32	11 13 15 20
2.0 (0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	2 0 0 0	5 0 0 0	12 2 0 0	5 0 0	17 2 0	74 37 8 1	99 69 27 8	65 32	95 68		72 82 95 101	64 72 83 93	0_	48 52 58 64	43 45 49 52	34 36 38 40	25 27 28 28
	RAI	-+- NFAL		- + YPE :	- + - = II	+ -	+	+	+-	- +	+						+		+	+	+	+	+	+	+-	+		HEET			- +	+

Exhibit 5-III: Tabular hydrograph unit discharges (csm/in) for type III rainfall distribution TIME 11.3 11.9 12.1 12.3 12.5 12.7 13.0 13.4 13.8 14.3 15.0 16.0 17.0 18.0 20.0 26.0 (hr)11.0 11.6 12.0 12.2 12.4 12.6 12.8 13.2 13.6 14.0 14.6 15.5 16.5 17.5 19.0 22.0 IA/P = 0.10* * * TC = 0.1 HR * * * IA/P = 0.100.0 29 38 57 172 241 425 662 531 345 265 191 130 101 83 68 62 58 54 50 44 41 37 32 27 23 21 19 16 14 13 11 47 98 147 210 353 559 540 410 313 231 164 101 80 67 61 57 53 47 43 39 34 .10 26 28 24 22 19 17 39 34 29 24 22 44 86 127 182 296 471 517 446 357 273 200 117 86 70 63 58 54 48 44 20 17 .20 25 14 13 11 0 .30 22 37 57 76 110 158 250 398 477 457 390 312 178 111 83 69 62 57 51 41 36 31 25 20 18 137 213 336 430 448 410 345 210 128 90 41 24 30 43 49 62 85 120 182 284 382 426 415 305 188 120 71 63 55 49 43 38 33 27 24 21 19 15 .50 19 86 14 11 0 .75 17 27 37 41 49 62 84 120 181 258 327 375 353 264 177 120 88 72 59 52 45 39 34 29 25 22 20 15 14 11 0 43 37 32 30 33 37 43 52 66 91 131 190 315 358 307 220 149 104 50 23 21 0 1.5 9 37 44 70 134 229 304 318 269 172 106 52 38 19 15 11 14 18 19 21 23 25 27 29 33 68 32 27 2.0 6 10 13 14 15 16 17 19 20 22 24 26 32 45 73 130 207 271 292 216 121 68 51 43 37 21 16 13 2.5 3 6 8 9 10 10 11 12 13 14 16 17 20 23 29 38 57 97 189 271 244 136 75 53 44 38 33 24 19 14 4 5 6 6 7 8 8 9 10 11 12 14 16 19 23 28 38 74 146 256 226 131 74 53 44 37 27 21 14 10 IA/P = 0.30 * * * TC = 0.1 HR * * * IA/P = 0.300 48 106 296 597 496 368 300 221 155 125 106 89 83 79 74 69 62 59 54 47 40 35 0 35 82 225 473 488 408 336 260 190 147 113 94 85 80 75 70 63 59 54 48 40 32 .10 0 35 29 25 .20 0 0 7 26 64 171 372 449 422 365 295 225 142 109 92 84 79 74 66 61 56 50 43 36 33 30 26 22 20 17 0 33 30 27 .30 0 5 19 49 130 291 397 414 381 323 258 161 118 96 86 80 75 68 50 43 37 22 20 17 99 227 340 389 384 343 229 152 113 85 79 71 46 31 28 10 28 75 177 286 355 374 354 256 170 123 99 87 80 60 53 46 39 35 31 28 23 21 18 .50 0 66 0 86 161 238 296 325 266 194 141 110 93 80 50 37 33 30 .75 0 0 1 4 13 35 71 63 43 24 21 18 0 1.0 0 0 2 6 19 48 99 165 282 311 264 197 144 112 88 77 67 59 52 45 39 34 31 24 22 18 0 1.5 0 0 0 1 4 29 99 197 265 277 236 162 113 84 69 60 2.0 0 0 0 0 0 0 0 0 0 0 0 0 1 8 35 94 172 233 253 196 124 83 68 59 52 45 39 31 25 8 2.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 11 37 88 184 235 201 122 83 67 59 52 45 34 27 13 * * * TC = 0.1 HR * * *0 0 0 107 226 282 258 209 155 130 123 107 97 95 91 87 82 78 74 69 61 52 47 0 0 0 71 174 246 254 224 178 146 130 112 100 96 92 88 83 78 75 70 62 53 48 44 40 35 0 .10 0 0 .20 0 48 132 208 239 229 195 162 127 95 91 87 80 77 72 65 56 49 36 32 30 25 0 0 0 0 0 109 99 45 41 0 . 30 0 32 99 172 216 225 205 176 136 113 101 96 92 88 81 77 72 57 45 41 37 32 30 0 .40 73 139 191 213 208 164 131 111 100 95 91 43 33 30 0 60 0 53 110 164 197 204 174 139 116 103 97 92 86 80 75 52 43 39 33 30 0 0 0 0 14 68 60 47 0 .50 0 .75 0 0 0 22 54 96 137 166 180 159 134 115 103 96 89 83 77 70 63 48 44 40 33 31 0 2 10 29 60 132 175 169 146 124 109 97 47 43 0 2 17 0 0 0 0 0 0 0 0 58 112 150 159 148 122 104 91 81 74 59 51 46 2.0 0 0 0 0 0 0 0 0 0 0 0 4 20 54 98 133 149 133 108 80 73 66 58 51 42 34 29 0 0 0 90 0 0 0 0 0 0 0 0 0 0 0 2 12 35 87 131 141 111 92 81 74 66 59 0 0 0 0 0 0 0 0 0 0 1 4 22 63 120 136 110 91 81 73 66 2.5 0 0 0 46 38 30 0 0 0 18 3.0 0 0 0 0 0

* * * TC = 0.1 HR * * *

SHEET 1 OF 10

RAINFALL TYPE = III

T.D.//		Exl	iibi	t 5-	III	: Ta	bula	ar h	ydr	ogr	aph	uni	t di	sch	arge	es (e	csm/	in)	for	typ	e Il	II ra	infa	all d	istr	ibut	tion	—с	onti	nue	d	
TRVL- TIME (hr)1	11 11.0	1	1.6		2.0		12.2		12.4		12.6	12.7	1 12.8	3.0	13.2	13.4		13.8	14.0	4.3	14.6		15.5		6.5	1	7.5	8.0	9.0		2.0	6.0
		IA/	P =	0.10)								* *	* TC	= 0.	2 HR	* *	*										IA/P	= 0.	10	. + -	+
0.0 .10 .20 .30	27 24 23	34 30 29 26		119 70 64	176 103	258 151	448	565 372 312	483 501 438	358 489 472	270 402 425	194 314	137 234 273	93 128 153			60 64 66 75	56 59	52 55 56	46 49		38 40 40 40 42	33 35 35 35 37	28 30 30 30 32		21 22 22 23	19 20 20 21	17 17 18	15	13 13	11 11 11 11	0 0 0
.40 .50 .75 1.0	18 15	25 22 18 16	32 28 23 20	45 38 30 25	54 43 33 28	71 51 37 30	99 64 42 33			328 191 87 53		422 363 184 94	402	356 359	165 241 341 345	151 260	81 102 177 260	68 78 121 181	66	54 57 67 81	48 51 57 63	43 44 48 52	37 39 42 44	32 34 36 38	27 28 31 33	23 24 26 28	21 22 23 24	19 19 21 21	15 16	14 14 14 14	11 11 12 12	0 0 0
1.5 2.0 2.5 3.0	8 5 2 1	10 7 4 2	9 5 3	12 7 5	8	19 14 9 6	21 15 10 6	23 16 10 7		27 19 12 8		22 14 10	24 16 11	18 13	38 22 15		266 99 33 21	166 46 25		284 155 59	239 240 118		250			34 38 46 56	29 33 39 45	24 28 34 39	21 25	15 17 19 22	12 13 14 14	2 6 9 10
	- +		P =	0.30)								* * :	* TC	= 0.	2 HR	* *	*								•	•		= 0.		- + -	+
0.0 .10 .20 .30	0 0 0	0 0 0		17 12 1 1		115 89 27 20	297 228 69	489 402 175	462 442 326	379 400 403 356	307 338 401	230 266 359	167 200 297	119 131 182	98 104 126 140	86 89 100	81 82 88 91	76 78 81	72	64 65 69	60 61 63 64	55 56 58 58	48 49 51 52	41 42 44 45	36 36 37 38	32 33 34 34	29 29 30 31	26 26 27	22 22	20 20 21	17 17 17 17	0 0 0
.40 .50 .75 1.0	0 0 0	0 0 0	0 0 0 0	1 0 0 0	4 0 0 0	15 3 1 0	40 11 5 0	103 30 14 0		307 165 83 7		327 220	352 276	305 311	157 213 264 299	147 196	95 111 144 230			72 75 80 95	65 68 72 81	59 61 64 69	53 55 56 61	46 48 50 54	39 41 43 47	34 35 37 40	31 32 33 35	28 29 30 32	23 24	21	17 18 18 18	0 0 0 0
1.5 2.0 2.5 3.0		0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	Ō	Õ	0 0 0 0	Õ	0 0 0	3 0 0	17 1 0		126 21 0	57 3	245 145 23	214 228 78	89 140 213 180	215		54 61 70 94	48 54 60 72	41 47 53 61		32 35 41	23 25 28 32	19 20 21 22	3 9 13 15
	. +			0.50)								* * :	* TC	= 0.	2 HR	* *	*										IA/P	= 0.	50	. + -	+
0.0 .10 .20 .30	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	10 7 0 0		163	217 126	235	217 219	162 181 218 211	152 193	122 145	102 106 119 125	98 104	93 94 97 99	90	85 86 89 90	79 80 83 84	76 76 78 79	71 71 73 74	63 64 66 67	54 55 58 59	48 49 50 51	44 45 46 46	40 41 42 42	36 36 37 38	32	29 29 30 30	25 25 26 26	0 0 0 0
.40 .50 .75 1.0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	2 1 0 0	24 17 6 0	72 54 23 0	128 103 52 2	151 90	183 127	194 174	147 156 168 149	127 146	109 124				81 82 85 92	76 76 78 83	69 70 72 76	61 62 65 69	53 54 56 61	48 48 49 53		39 40 41 43	33 34	30 30 31 32	26 26 26 27	0 0 0
1.5 2.0 2.5 3.0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	_	0 0 0 0		0 0 0			10 0 0	34 3 0	12 1	112 33 4	145 83 21	139 126 60	94 114 139 116	133		68 74 81 92		60 67 73		43	33 35 38 42	28 29 30 31	2 9 18 22
	RAI	NFAL	- + L TY				+	+	+	+	+						* *		+	+	+	+	+	+ -	- +-	+			2 of	10	- + -	- +

	Exl	nibit	5 -1	III:	Tal	oula	r hy	ydro	ogra	ph 1	unit	dis	cha	arge	s (c	sm/i	n) :	for	typ	e II	I rai	infa	ll di	stri	buti	ion-	-co	nti	nue	d	
	11.3		1.9		12.1	12 2	12.3	12 4	12.5	2 6	12.7	 1 12 8	3.0		13.4	н ТІМ 13.6	13.8		14.3	14 6	15.0	 1 15 5	16.0		17.0		8.0		20.0	2.0	6.0
	+ + I A	+ /P =	- + 0.10	- +)	+-	+	+	+	+	+	+	- + - * * *	+ * TC	= 0	+ .3 HR	+ * *	+ *	+	+	+	+	+	+-	- +-	+	- + -	- + - IA/P	- +	+		- +
0.0 2 .10 2 .20 2 .30 1	2 28 1 27	44 37 35 30		124	181 108	287 156 136	441 244 208	498 375 319		358 453 439	276 389 406	204 314 345 409	118 180 212	87 113 130 190	70 83 91	63 69 73 87	58 62 64	54 57	48 51 52 55	44 46 46 46	39 41 42 43	34 36 36 38	29 31 31 33	24 26 26 27	22 23 23 24	20 20 21	17 18 18 18	14 15 15 15	13 13 13 14	11 11 11 11	0 0 0
.40 1 .50 1 .75 1 1.0 1	6 21 4 18	29 26 23 18	40 34 30 23	46 38 33 25	56 43 37 28	74 52 43 30	103 67 52 33		232 132 91 44		280 187	400 349 251 98	383 347	297	260	96 128 182 294	75 91 126 221	65 73 92 154	57 60 68 94	50 53 57 69	44 46 49 55	38 40 42 45	33 35 36 40	28 30 31 34	24 25 26 29	22	19 20 21 22	15 16 16 17	14 14 14 15	11 11 12 12	0 0 0
2.0		12 8 5 3	15 11 7 4	17 12 7 5	18 13 8 5	19 14 9 6	21 15 10 6	23 16 10 7	25 17 11 8	27 19 12 8		10	45 26 17 12	33 20 14	137 46 24 16	222 76 29 19	131 39 23	29	278 125 48	95	195		47 57 94 167	40 46 60 93	35 40 47 60	30 34 40 47	25 29 35 40	20 22 25 29	16 17 20 22	13 13 14 15	3 7 9 10
		/P =)	+ -							* * :	* TC		.3 HR	* * +	*								•	•	IA/P	= 0	.30	- + -	- +
.20	0 0 0 0 0 0 0 0	0 0 0	6 4 3 0	22 16 12 2	58	146 112	308 243 190	424 364 306	422 402 370 254	367 379 376	303 328 344	234 266 292	145 166 189	111 120 132 175	92 97 103	84 86 89 100	79 80 82	74	67 68 69	62 62 63 66	57 57 58 60	50 51 51 53	43 44 44 46	36 37 37 39	33 33 34 35	30 30 30	26	22 22	20 21 21 21	17 17 17 18	0 0 0
.50	0 0 0 0 0 0 0 0	0 0 0	0 0 0 0	1 0 0 0	6 1 0 0	19 4 2 0	50 14 6 0	116 38 17 1	208 90 43 3	290 168 89 9	250	346 308 213 53	333	195 256 286 253	180	107 131 171 257		83 89 104 150		67 71 75 85	60 63 65 72	54 56 58 62	47 49 51 55	40 42 44 48	35 36 38 41	32 33 34 36	28 29 30 32	23 23 24 26	21 21 22 22	18 18 18 19	0 0 0
2.0	0 0 0 0 0 0 0 0 + +	0 0 0 0	0 0 0 0 - +	0 0 0 0 - +	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	2 0 0 0	15 0 0 0	1 0 0	138 9 0 0	217 36 2 0	90 12 1	37 4	239 113 24	194 78	176	211	62 74 96 145	55 63 73 95	48 55 62 73	41 48 55 62	36 42 48 54	29 32 36 41 - +	23 26 29 32	19 20 21 22 + + -	3 10 14 15
	I A + +	/P =	0.50		+-	+	+	+	+	+						* *		+	+	+	+	+	+-	- +-	+	+-	IA/P	-	.50	- + -	- +
.10	0 0 0 0 0 0 0 0	0 0 0	0 0 0	0 0 0	2 1 1 0	33 23 15 0	85	193 157 125 45	175	221 214 201 149	205 203	165 178 187 197	138 147	110 115 121 140	105	95 96 98 104	92 92 94 97	89	81 82 83 86	77 77 78 80	72 73 73 75	65 66 66	56 57 58 61	49 50 50 52	45 46 46 47	41 42 42 43	37 37 38 39	32 32 32 33	30 30 30 30	25 26 26 26	0 0 0
.50	0 0 0 0 0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	7 0 0 0	32 5 2 0	76 23 9 0	125 59 27 1	103 55	144 89	183 148	148 169 168 119	141 156	107 119 135 163		94 98 105 126	87 90 94 105	81 84 87 95	76 78 80 85	69 71 73 77	62 64 66 71	53 55 58 63	48 49 51 55	44 45 46 49	39 41 42 44	33 33 34 36	30 31 31 32	26 26 27 27	0 0 0
2.0	0 0 0 0 0 0 0 0 + +	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	3 0 0 0	19 1 0 0	5 0 0	103 21 1 0	52 7 0	22 2	135 65 13	45	102			70 76 83 95	62 69 75 83	54 61 68 75	48 54 60 67	40 44 48 53	33 35 39 43	28 29 30 31	3 11 19 22
	RAINFA					т		Т	T	T						* *		T	T	T	Τ	干	Т -	Τ-	Τ.		HEET				Г

Exhibit 5-III: Tabular hydrograph unit discharges (csm/in) for type III rainfall distribution—continued

Section Color Co	TRVI	ĽXII		. J-		. 1а	Dui	41 II	yuı	ugra	ahn	uiii	t u13	· · · ·	argu	CDAD	L TIM	111 <i>)</i> 15 (U O	IIDC)	tyl	 E 11	11 1 a		111 U	15U	nbut	.101	.—	J11C1	mue	:u	
	TIME 11	1.3			1	2.1	1	12.3		12.5		12.7	13	3.0		13.4		13.8		14.3		15.0		16.0								6.0
TAPP = 0.10					2.0 -+	- + -	12.2	+	12.4	+	12.6	+	12.8	- +	13.2	+	13.6															+
0.0 23 29 39 66 91 132 198 308 422 449 417 345 274 162 108 82 68 61 57 50 45 41 35 30 25 22 20 18 15 13 11 0 10 10 20 26 368 422 448 370 242 149 102 79 66 60 53 46 46 42 37 32 27 23 21 18 15 13 11 0 1.0 10 20 25 33 48 65 77 100 147 224 370 388 408 383 77 171 114 85 70 62 54 48 43 37 32 27 23 21 19 15 14 11 0 1.0 147 274 370 388 408 383 77 171 114 85 70 62 54 48 43 37 32 27 23 21 19 15 14 11 0 1.0 147 274 370 388 408 383 77 171 114 85 70 62 54 48 43 37 32 27 23 21 19 15 14 11 0 1.0 147 21 37 36 41 47 89 79 111 165 240 314 378 359 268 178 120 88 72 60 52 45 40 34 29 25 22 20 15 14 11 0 1.0 147 21 37 34 34 44 47 19 81 42 70 772 364 33 32 70 35 113 18 56 5 53 44 39 33 28 24 22 17 14 12 0 1.0 11 13 17 22 23 25 28 30 34 38 44 57 0 77 138 249 333 320 257 185 131 85 65 53 44 39 33 28 24 22 17 14 12 0 1.0 11 13 17 22 12 32 5 28 34 6 7 7 7 18 20 34 38 44 57 0 77 138 249 333 320 257 185 131 85 65 53 44 39 33 28 24 22 17 14 12 0 1.0 11 12 13 14 15 16 17 19 70 24 30 39 61 103 166 252 257 176 98 61 48 41 36 51 26 20 16 13 4 4 20 40 40 40 40 40 40 40 40 40 40 40 40 40		IA/F	P = 1	0.10									* * *	TC	= 0.	4 HR	* *	*										IA/P	= 0	.10		•
15 19	0.0 23 .10 20 .20 20	29 26 25	39 33 32	65 48 45	91 60 55	132 80 72	198 114 100	308 170 147	422 262 224	449 368 320	417 422 388	345 418 408	274 1 370 2 383 2	62 242 272	108 149 171	82 102 114	68 79 85	61 67 70	57 60 62	50 53 54	45 47 48	41 42 43	35 37 37	30 32 32	25 27 27	22 23 23	20 21 21	18 18 19	15 15 15	13 13 14	11 11	0
2.0	.50 15 .75 12	19 16	24 20	31 25	34 27	38 30	44 33	54 38	71 44	98 54	142 70	207 97	278 3 138 2	64 249	332 333	243 320	163 257	113 185	84 131	65 85	56 65	48 53	41 44	36 39	31 33	26 28	23 24	20 22	16 17	14 14	12 12	0
0.0 0 0 0 0 2 10 30 78 177 306 379 379 347 293 187 133 105 90 82 77 69 63 58 51 44 38 34 30 27 23 21 17 0 10 0 0 0 2 7 22 59 138 250 336 365 353 313 212 146 112 98 84 78 77 69 63 58 51 44 38 34 31 27 23 21 17 0 120 0 0 0 1 5 17 45 107 202 292 341 349 325 235 162 121 98 87 80 72 65 59 52 45 38 34 31 27 23 21 17 0 120 0 0 0 0 1 5 17 45 107 202 292 341 349 325 235 162 121 98 87 80 72 65 59 53 46 39 34 31 28 23 21 17 0 120 0 0 0 0 0 1 4 12 34 83 162 249 310 336 298 215 152 116 96 85 76 68 61 55 48 41 36 32 29 23 21 18 0 120 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.0 4 2.5 2 3.0 1	6 3 1	8 4 2	10 6 4	11 7 4	12 7 5	13 8 5	14 9 6	15 10 6	16 10 7	17 11 8	19 12 8	20 13 9	24 16 11	30 18 13	39 22 15	61 26 18	103 34 21	166 49 26	253 100 40	272 183 77	189 255 169	98 198 243	61 108 185	48 66 106	41 50 65	35 42 49	30 36 41	23 26 30	18 20 23	13 14 15	9
0.0 0 0 0 0 2 10 30 78 177 306 379 379 347 293 187 133 105 90 82 77 69 63 58 51 44 38 34 30 27 23 21 17 0 10 0 0 0 0 2 7 22 59 138 250 336 365 353 313 212 146 112 94 84 78 71 64 59 52 45 38 34 31 27 23 21 17 0 30 0 0 0 0 1 5 17 45 107 202 292 341 349 325 255 162 121 98 87 80 72 65 59 53 46 39 34 31 28 23 21 17 0 30 0 0 0 0 0 1 4 12 34 83 162 249 310 336 298 215 152 116 96 85 76 68 61 55 48 41 36 32 29 23 21 18 0 18 0 18 0 18 0 18 0 18 0 18 0 1																																
10 0 0 0 0 1 5 17 45 107 202 292 341 349 325 235 162 121 94 87 80 72 65 59 53 46 39 34 31 27 23 21 17 0 20 0 0 0 1 5 17 45 107 202 292 341 349 325 235 162 121 98 87 80 72 65 59 53 46 39 34 31 27 23 221 17 0 30 0 0 0 0 0 1 4 12 34 83 162 249 310 336 298 215 152 116 96 85 76 68 61 55 48 41 36 32 29 23 21 18 0 40 0 0 0 0 0 0 0 3 9 26 64 130 209 276 324 307 234 168 125 101 88 77 70 62 55 49 41 36 32 29 23 21 18 0 50 0 0 0 0 0 0 0 0 0 2 7 19 49 103 173 242 313 285 216 157 119 98 82 73 65 57 51 44 37 33 30 24 22 18 0 1.0 0 0 0 0 0 0 0 0 1 4 13 30 104 204 276 276 226 175 120 92 75 64 57 50 43 37 33 26 22 19 1 1.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 4 13 30 104 204 276 276 226 175 120 92 75 64 57 50 43 37 33 26 22 19 1 1.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	+	+	- +	- +	- + -	+-	+	+	+	+	+	+	- + -	- +	+	+	+	+	+	+	+	+	+	+ -	- +	+-	- +	+-	- +	+	- + -	- +
.50 0 0 0 0 0 0 0 2 7 19 49 103 173 242 313 285 263 109 151 118 91 78 68 59 57 51 44 37 33 30 24 22 18 0 10 0 0 0 0 0 0 0 0 0 1 3 9 23 52 97 153 253 285 285 219 151 118 91 78 68 59 53 46 39 35 31 25 22 18 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 4 13 30 104 204 276 276 226 175 120 92 75 64 57 50 43 37 33 26 22 19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	.10 0 .20 0	Ō	Ö	_	7 5		59 45	138 107	250 202	336 292	365 341	353 349	313 2 325 2	212 235	146 162	112 121	94 98	84 87	78 80	71 72	64 65	59 59	52 53	45 46	38 39	34 34	31 31	27 28	23 23	21 21	17 17	Ō
2.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.50 0 .75 0	0	0	0	0	0	2	7	19 9	49 23	103 52	173 97	242 3 153 2	13 253	285 285	216 253	157 199	119 151	98 118	82 91	73 78	65 68	57 59	51 53	44 46	37 39	33 35	30 31	24 25	22 22	18 18	Ō
TA/P = 0.50	2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0	5 0 0	22 1 0	62 7 0	124 24 2	210 85 15	232 167 58	176 219 152	107 167 207	78 106 159	65 77 104	57 64 76	50 56 64	43 49 55	33 37 42	27 29 33	20 21 22	14
0.0 0 0 0 0 0 0 0 0 10 54 121 182 204 204 191 146 121 106 98 94 90 83 78 73 66 58 50 46 42 38 32 30 26 0 10 0 0 0 0 0 0 0 0 7 38 94 153 187 198 193 155 128 110 100 95 91 84 79 74 67 59 51 46 42 38 32 30 26 0 10 0 0 0 0 0 0 0 0 0 5 27 71 126 166 187 191 164 134 114 103 96 92 85 80 75 68 60 52 47 43 38 33 30 26 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		IA/F	P = 1	0.50									* * *	TC	= 0.	4 HR	* *	*										IA/P	= 0	.50		
1.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$ \begin{array}{ccc} 0.0 & 0 \\ .10 & 0 \\ .20 & 0 \end{array} $	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	10 7 5	54 38 27	121 94 71	182 153 126	204 187 166	204 198 187	191 1 193 1 191 1	.46 .55 .64	121 128 134	106 110 114	98 100 103	94 95 96	90 91 92	83 84 85	78 79 80	73 74 75	66 67 68	58 59 60	50 51 52	46 46 47	42 42 43	38 38 38	32 32 33	30 30 30	26 26 26	0 0 0
2.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.50 0 .75 0	0	0	0	0	0	0	Ō	1	9	30 13	64 32	104 1 59 1	63	174 157	154 162	130 145	113 126	102 111	93 98	86 90	79 82	73 75	66 68	57 60	50 52	46 47	42 43	34 35	31 31	27 27	0
	2.0 0 2.5 0	0 0 0	0 0 0	0 0 0	0	0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0	0 0	2 0 0	13 1 0	36 4 0	71 14 1	121 49 9	140 97 33	126 135 88	101 122 130	86 100 119	78 86 98	70 77 85	63 70 76	55 62 69	44 49 54	36 40	29 30	20
	RAI				II	+ - I	+	+	+	+	+								+	+	+	+	+	+ -	- +	+-				10	- + -	- +

	E	xhil	it 5	5-II	I: T	abu	lar i	hyd	rog	rapl	h un	it d	isc	harg	ges	(csn	ı/in) fo	r ty	pe]	III r	ain	fall	dist	ribu	ıtio	n—	con	tinu	ıed	
TRVL TIME (hr)11	11.3		1.9										3.0		13.4	H TIM	13.8		14.3		15.0	15.5	16.0		17.0		18.0		20.0	2	6.0
+	IΑ	/P =	0.10)								* *	* TC	= 0	.5 HR	+ . * * +	*										IA/P	= 0		- + -	+
0.0 21 .10 19 .20 18 .30 16	27 24 3 23	35	54 43 40 34	70 50 47 38		144 86	217 125	316 186 161	397 273 235 139	411 355 315	388 392 367	330 390 382	214 296 318	139 194 218 289	99 129 145	78 94 103 135	67 75 80	60 65	52 56 57	47 49 50 54	42 43 44 46	36 38 39 40	31 33 33 35	26 28 28 30	23 24 24 25	21 21 22	18 19 19 20	15 15 15 16	13 14 14 14	11 11 11 11	0 0 0
.40 16 .50 14 .75 12 1.0 10	18 2 16	25 22 20 16	33 28 25 20	36 31 28 22	41 35 30 23	49 39 34 25	62 46 38 28	84 57 45 31	121 75 56 34	176 106 75 39	104	213 145	323 246	346 319	282 308	151 202 252 309	140 187	102 135	64 73 89 138	55 59 67 90	47 50 53 63	41 42 44 49	35 37 39 42	30 32 33 37	25 27 28 31	23 23 24 26	20 21 22 23	16 17	14 14 14 15	12 12 12 12	0 0 0 1
1.5 6 2.0 3 2.5 2 3.0 1	5 2 3 1	10 7 4 2	13 9 6 3	14 10 7 4	15 11 7 4	17 12 8 5	18 13 9 5	19 14 10 6	21 15 10 6	23 16 11 7	8	13 8	34 22 16 10	49 27 18 12	34 22 14	143 50 26 16	82 34 19	135 50 23	226 102 34	182 63	211 249 144	197 238		121	37 42 50 72	52	27 31 36 43		16 18 20 23	13 13 14 15	4 8 9 10
	I A	/P =	0.30)							•	* *	* TC	= 0	.5 HR	* *	*										IA/P	= 0	.30	- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	1 1 0 0	4 3 2 0	15 11 8 2		101 77		295 249 208	345 313	345 335 316	325 329 324	232 253 271	161 178 196 249	122 132 144	100 106 112 136	88 91 95 108	80 82 85	72 73 75 80	65 66 67 71	59 60 61 63	53 53 54 56	46 47 47 49	39 40 40 42	34 35 35 36	31 31 32 33	28 28 28 29	23 23 23 24	21 21 21 21	18 18 18 18	0 0 0
.40 0 .50 0 .75 0	0 0	0 0 0 0	0 0 0 0	0 0 0	1 0 0 0	4 1 0 0	13 3 1 0	34 10 4 0	77 26 12 1	140 60 29 2		177 104	276	295	244 263		174	97 111 136 198	101	72 77 83 102	64 67 70 80	57 59 61 66	50 52 54 58	43 45 47 51	37 39 40 44	33 34 35 38	30 31 32 34	24 24 25 27	21 22 22 23	18 18 18 19	0 0 0 1
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	4 0 0 0	22 0 0 0	3 0 0	138 13 1 0	42 4 0	93 15 1	182 62 10	41	191 213 127	203	171		51 58 67 81		38 44 51 57	30 34 38 43	24 27 30 33	20 21 22 23	5 12 15 16
+	IΑ	/P =	0.50)		•						* *	* TC	= 0	.5 HR	+ . * * +	*									·	IA/P		.50	- +	+
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	3 2 1 0	24 17 12 1	68	124 100	174 149 126	190 177	190 186 181	162 169 173	133 140 147	114 119 124	103 106 109		92 93 95		80 81 81 84	75 75 76 78	68 69 69 71	60 61 62 64	52 52 53 56	47 47 48 49	43	39 39	33	30 30 30 31	26 26 26 26	0 0 0
.40 0 .50 0 .75 0	0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	6 4 0 0	20 15 1 0	48 37 6 1		123 105 37 9	157		151 157	125 130 150 153	134	104		85 87 93 99	79 79 84 88	72 73 76 79	65 66 69 72	56 57 62 65	50 50 54 57	45 46 48 50	41 42 44 45	34 34 35 37	31 31 32 32	26 27 27 27	0 0 0 1
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	5 0 0	24 1 0 0	59 7 0 0	25 2 0	55 9 0	106 36 5	138 81 24	107 130 133 74	133 128	122	103	65 72 79 88	57 65 71 78	51 57 64 70	41 45 50 55	34 37 41 45	29 30 31 32	6 15 21 23							
+ F	RAINFA	+ LL TY		- + : : II		+	+	+	+	+	+					+		+	+	+	+	+	+	+-	+	+ S	+ - HEET	5 (+)F 10	- + -	+

T.0.//	Exh	ibit	5-I	II:	Tab	ulaı	r hy	dro	gra													nfa	ll di	stri	buti	on-	-co	ntin	ued	
(hr)11.	11.3	11.6	1	2.0	1	2.2]	12.4	1	2.6	12.7 1	12.8	3.0	13.2	13.4	13.6	13.8	14.0	14.3	14.6	15.0	15.5		16.5	1	7.5	1	9.0		26.0
+	IΑ	/P =	0.10	1							*	* *	TC	= 0.	75 HF	<pre>{ * *</pre>	*										IA/P	= 0.	10	++
0.0 17 .10 17 .20 15 .30 14	22 21 19	28 27 24 23	39 37 31 30	45 42 35 33	56 51 40 38	73	104	151 131 81	215 187 114 100	281 250 163	328 302 221	343 3 336 3	310 319 328		163 179 229		94 101 124	77 82			45 46 49 50	39 40 42 42	34 35 36 37	29 29 31 31	25 25 26 27	22 22 23 23	20 20 20	15 16 16	14 14 14	11 0 11 0 12 0 12 0
.40 13 .50 12 .75 10 1.0 8	16 13	20 16	26 25 21 16	29 28 23 18	32 30 25 19	36 34 27 21	41 39 30 23	50 46 33 25	65 59 38 27	88 78 46 30	109 58	150 i	244 140		294 277	228 242 287 249	184 248	127 138 197 265	94 133	68 71 92 134	54 56 66 85	44 45 50 58	38 39 42 46	33 34 36 40	28 28 31 34	24 24 26 29	21 22 23 25	18	14 15	12 0 12 0 12 1 12 2
1.5 5 2.0 2 2.5 1 3.0 0	4 2 1	9 5 3 2	12 7 5 3	13 8 5 3	14 9 6 3	15 9 6 4	16 10 7 4	17 11 8 5		20 13 9 6	10 7	11 7		40 22 15 10	26 18 12		50 26 17	21	155 62 29	226 120 50	209 113	209		144	39 47 60 88	34 40 47 59	46	25 29 33	20 22 25	13 5 14 9 15 10 16 10
+	IΑ	/P =	0.30	1							*	* *	TC	= 0.	75 HF	<pre>{ * *</pre>	*										IA/P	= 0.1	30	++
0.0 0 .10 0 .20 0 .30 0	0 0 0	0 0 0	0 0 0 0	1 0 0 0	3 2 0	8 6 1 1	24 18 5 3		113		243 212 125	283 259 183	287 284 263	233 245 277	178 191 230	139 149 180 192	114 120 142	98 102 116	83 85 93	73 75 80 82	64 65 68 69	56 57 59 60	50 50 52 53	43 43 45 46	37 37 39 39	33 33 34	30 30 31 31	24 24 25	21 21 22	18 0 18 0 18 0 18 0
.40 0 .50 0 .75 0 1.0 0	0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	2 2 0 0	8 6 0 0	20 15 1 0	45 35 2 1	83 67 7 4	158				192 242	144 153 217 229	113 163		73 75 90 97	62 63 71 74	55 56 61 63	48 49 54 55	41 42 47 48	36 36 40 41	32 33 35 36	26 28	22 23	19 0 19 1 19 2 19 3
1.5 0 2.0 0 2.5 0 3.0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	2 0 0 0	13 1 0 0	42 4 0 0	15 1 0	42 5 0	113 27 1	184 80 10	168 56	151 199 154	191	151		49 55 63 78		36 41 48	29 32	20 10 21 14 22 15 24 16
+	IΑ	/P =	0.50	1							*	* *	TC	= 0.	75 HF	? * *	*										IA/P	= 0.	50	++
0.0 0 .10 0 .20 0 .30 0	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	3 2 0	13 10 1	37 28 7 5	71 57 21 15	108	140 124 76	167 163 135	156 158 159 157	136 140 153	120 124 136	108 111 120	101 103	92 94 98	85 86 90 91	78 79 82 83	72 72 74 75	64 65 67 68	56 57 59 60	50 50 52 52	45	41 41	34 34 35	31 31 31	26 0 27 0 27 0 27 0
.40 0 .50 0 .75 0 1.0 0	0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	3 0 0 0	11 2 1 0	27 8 4 0	50 21 10 0		146 118 82 24	148 122	152 142	139 144	115 125 133 142	108 116	93 97 103 116	84 87 91 99	76 78 80 86	69 71 73 77	61 63 66 70	53 55 58 62		43 45 46 49	36 37	32 32	27 0 27 1 28 1 28 3
1.5 0 2.0 0 2.5 0 3.0 0	0 0				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0+	0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0		- + -				25 2 0 0 +	+	25 3 0	16 2	109 47 10	44	102	124	112	69 76 84 95	75 83 +-	- + -	48 53	39 43 47 - + -	29 11 30 18 31 22 33 23 ++
,	AVTINI WI			111	1								10	٠.	, , , , , , ,	`										5		0 01	10	

T.D.V.I		Exh	ibit	5 -]	III:	Tab	ula	r hy	dro	gra	ph	unit	dis	cha	arge	s (c	sm/i	in)	for	typ	e II	I rai	infa	ıll di	istr	ibut	ion-	—co	nti	nue	d	
TRVL- TIME (hr)1	1	1.3	1.6	1.9	2.0	2.1	2.2	2.3	2.4			12.7		3.0		13.4		13.8		14.3	14.6	15.0	15.5	16.0	16.5	17.0		8.0		0.0	2.0	6.0
	+	+- IA/	- + P =	- + 0.10	- + -)	- + -	+	+-	- + -	- +	+	+	- + - * * *	- + * TC	+ = 1.	+ .0 HR	+ * *	+ *	+	+	+	+	+	+	+-	+	+	IA/P	= 0	.10	- + -	+
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	11 11 8 6	14 13 10 9	18 17 13 11	22 17	25 24 18 15	27 26 19 17	30 29 21 18	34 32 23 20	40 37 25 21	48 45 28 23	62 56 31 25	74 36	112 99 44 32	167 72	235 122	270 186	256 261 239 185	223 258	179 243	126 189		65 67 90 110	50 51 62 71	41 42 48 53	35 36 40 43	30 31 34 37	26 26 29 31	23 23 25 27	18 20	15 15 16 16	12 12 12 13	1 1 2 4
3.0		6 3 1 0	8 4 2 1	10 6 4 2	11 7 4 2	12 7 5 2	13 8 5 3	14 9 6 3	15 10 6 3	16 10 7 4	17 11 8 4	19 12 8 5	9 5	25 16 11 7	32 18 13 8	46 22 15 10	74 28 18 12	38 22 14	28 16	111 46 21	179 87 32	167 68	185 219 156	210	179		78	43 56	23 27 31 37	27	13 14 15 16	7 9 10 11
		+- IA/ +-	P =)							-	* * *	⁺ TC	= 1.	.0 HR	* *	*								+ :		IA/P	= 0		- + -	+
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.40 .50 .75 1.0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 1 0 0	4 3 0 0	11 8 1 0	23 18 4 1	43 34 9 2		162	214 145	233 230 196 144	213 218		139 174	109 135	84 86 101 116	68 70 77 85	59 60 64 69	51 52 56 59	44 45 48 51	38 39 42 44	34 34 37 38	27 27 29 30	23 23 24 25	19 19 19 20	1 1 3 5
-,-	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	7 0 0 0	23 2 0 0	8 1 0	24 3 0	73 15 1	139 51 6	35	169 186 117	162 180	164		52 59 69 90	45 51 59 71	35 39 44 51			11 14 16 16
	•	+- IA/ +-	P =			+ -			•		+	-	* * *	⁺ TC	= 1.	.0 HR	+ * *	*								+	·	IA/P	= 0		- + -	+
0.0 .10 .20 .30	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	2 1 1 0	6 5 3 0	17 13 10 2	34 27 21 7	57 47 38 16	83 71 60	127 117 106	151 146 138	142 144 143	130 133	118 121 124	109 112 114	99 101 102	91 92 94 98	83 84 85 88	75 76 76 79	68 68 69 71	59 60 61 64	52 53 54 56	47 48	43 43 44 45	35	31 32 32 32	27 27 27 27 27	1 1 1 1
.40 .50 .75 1.0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	2 0 0 0	5 1 0 0	13 4 2 0	25 10 5 1	62 35 19 6		133 112 84 49	140 134 115 84	138 131	124 131 134 129	117 123	110	89 93 97 103	80 82 85 89	72 74 77 80	64 67 69 72	56 59 61 64	50 52 54 56	45 47 48 50	37 38 39 41	32 33 33 34	27 28 28 28	1 2 3 5
1.5 2.0 2.5 3,0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0	1 0 0 0	7 0 0 0	21 1 0 0	46 4 0 0	14 1 0	1	82 29 5	28	124 117 80	121 118	118		63 72 79 88	56 64 71 79	45 50 56 63	37 41 45 49	29 31 32 34	12 20 23 24
	RAI	NFAL	- + L TYI		- + - = II	- + - I	+	+-	+-	- +	+	+					* *		+	+	+	+	+	+	+-	+	+ -	HEET	- + 7 0	+ F 10	- + -	+

		Exh	ibit	5 -]	III:	Tal	oula	r hy	dro	gra	ph ւ	unit	disc	ha	rge	s (c	sm/i	n) 1	for	typ	e II	I rai	infa	ll di	istri	ibut	ion-	—co	nti	nue	d	
	1 11.0	1.3	1 11.6	1.9	2.0	2.1	1 12.2	.2.3 1	12.4	12.5 1	2.6	12.7	13 2.8	1.0	.3.2	13.4	13.6	13.8	14.0	14.3	14.6	15.0	15.5	16.0	16.5	17.0	1 17.5	.8.0 1	9.0	20.0 2	2.0	26.0
		IΑ	/P =	0.10)							*	- + * *	TC :	= 1.	25 HF	R * *	*										IA/P	= 0	.10	- +	+
0.0 .10 .20 .30	13 13 11	17 16 15 14	22 21 18 18	28 27 24 23	32 30 26 25	37 34 29 27				100	133	170 152 105	206 2 188 2 137 2 122 1	55 43 03	264 261 248	236 243 256	194 204 232	155 164 193	125 133 156 165	95 100 115	75 79 88 92		47 48 51 53		33 34 35 36	28 29 30 30	24 25 26 26	22 22 23 23	17 17 18 18	14 15 15 15	12 12 12 12	1 1 1 1
.40 .50 .75	10 9 8 6	12 12 11 8	16 15 14 11	19 17	22 21 19 15	24 23 20 16	26 25 22 17	29 28 24 19	34 32 27 20	40 37 31 22	49 45 36 25	64 58 44 28	75 1 56	26	186 144		250 248 230 170	233 237	193 201 220 234	150 174	111 131	77 80 91 120	57 58 64 79	46 47 50 58	38 39 41 46	32 33 34 38	27 28 29 32	24 24 25 27	19 19 20 21	15 15 16 17	12 12 12 13	1 2 2 4
1.5 2.0 2.5 3.0	3 2 1 0	5 3 1 0	7 4 2 1	9 6 3 2	9 6 3 2	10 7 4 2	11 8 4 2	12 8 5 3	13 9 5 3	14 10 6 4	16 11 7 4	17 12 7 5	13	22 15 10 6	27 18 11 8	9	58 27 16 11	38 19 13	24 16	106 38 21	166 68 31	137 66	184 206 145	186 200	178	47 59 87 126	39 47 62 85	33 39 48 61	24 28 33 39	19 21 24 28	14 14 15 17	7 9 10 11
	- + -	IA	/P =	0.30)	·	•	•	·			*	* *	TC :	= 1.	25 HF		*								·	•	IA/P			- +	+
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.40 .50 .75 1.0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 0 0 0	2 1 0 0	6 2 1 0	14 5 2 0	26 11 5 0			116			209 201	174 192 201 186	156 172	124 140	89 97 107 131	72 76 82 95	61 64 67 75	53 55 58 63	45 47 50 54	39 41 43 47	35 36 37 41	28 29 30 32	23 24 24 25	19 19 20 20	2 3 4 7
1.5 2.0 2.5 3.0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0	2 0 0 0	8 0 0 0	24 2 0 0	54 9 0 0	24 2 0	69 10 1	127 35 6	182 99 34	167 176 107	167 171	161	63 74 96 125	54 62 76 94	46 53 63 75	35 40 46 53	28 31 35 40	21 22 23 25	12 15 16 17							
	· - + -	IA,	/P =			· + -	+	· + ·	+	+	+	*	* *			25 HF		*										IA/P	= 0	.50	- +	+
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1.5 2.0 2.5 1.0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	2 0 0 0	8 1 0 0	22 3 0 0	9 1 0	30 6 0		19	118 104 64	116 104	114		68 75 83 92	60 67 74 82	48 53 59 65	39 43 47 52	30 31 33 35	16 21 23 24
	RA	INFAL	+ _L T\	- + /PE =			+	+	+	+	+		* *						+	+	+	+	+	+	+-	+		SHEET		+ F 10	- +	+

TDVI	E	xh	ibit	5 -	III:	Tal	oula	r hy	dro	gra	ph	unit	dis	sch	arge	es (c	sm/	in)	for	typ	e II	I ra	infa	ıll d	istr	ibut	ion	—co	nti	nue	d	
(hr)11	11.	11	L.6	1	2.0	1	2.2	1	2.4	1	2.6	12.7	2.8	3.0	13.2	13.4	13.6	13.8	14.0	14.3	14.6	15.0	15.5		16.5	1	17.5	1	9.0		2.0	6.0
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.50 .75			11	17 14	19 18 15 12	21 20 16 13	23 22 18 14	25 24 19 15	29 27 21 16	33 31 23 18	40 37 26 19	50 46 31 21		93 55		186 130		224 205	208 212 217 189	173 202	133 165	92 96 119 153	66 69 81 102	52 53 60 72	42 43 48 55	35 36 39 44	33	25 26 28 31	21	16 16 17 18	13 13 13 13	2 3 4 6
2.0	1 0 0	4 2 1 0	5 3 1 1	7 5 2 1	8 5 3 1	2	10 6 4 2	11 7 4 2	11 8 4 3	3	14 9 6 3	10 6	11 7 4	19 13 8 5	24 16 10 7		45 23 14 10	31 17 11	13	81 31 18	132 53 26	107 51	199 179 116	194 178	188	142		36 43 55 71		20 22 26 30	14 15 16 18	8 10 10 11
		IA/F) =	0.30)								* * >	* TC	= 1	.5 HR	* *	*								+		IA/P	= 0	.30	- +	+
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		IA/I) =	0.50)							7	* * >	* TC	= 1.	.5 HR	* *	*										IA/P	= 0		- +	+
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	+ RAIN						+	+ -	+-	- +	+	+					+		+	+	+	+	+	+	+	+		+- SHEET	9 0		- +	+

$ \begin{array}{c} \mathbf{r} \mathbf{r} 1 1 1 0 & 1 1 1 0 & 1 1 2 0 & 1 2 2 2 & 1 2 4 & 1 2 0 6 & 1 2 3 8 & 1 3 0 & 1 4 4 6 & 1 4 5 6 & 5 & 16 5 & 17 5 & 16 5 & 17 7 5 & 19 0 & 22 0 \\ 0 & 9 & 1 & 1 1 7 7 9 & 10 & 1 1 7 7 7 9 & 1 3 7 7 3 3 3 9 9 8 6 6 6 7 9 7 7 7 3 7 7 3 3 7 9 9 8 6 6 6 9 5 9 1 7 9 1 1 9 7 9 1 9 7 7 9 3 3 9 9 8 6 6 9 9 7 9 9 9 1 9 7 9 7 9 9 9 9 1 9 7 9 7 9 9 9 9 9 1 9 9 9 9 9 9 9 9$		\mathbf{E}	xhi	bit	5-II	[I: T	abı	ular	hyc	drog	grap	h u	nit (disc	cha	rges	(cs	m/iı	1) fo	or t	ype	III	raiı	nfal	l dis	stril	buti	on–	-coi	ntin	ued	l	
TAPP	IME	11	1.3	1	1.9	1	2.1	1	2.3	1	2.5		12.7	1	3.0		13.4		13.8		14.3		15.0		16.0		17.0	1	8.0	Ź	20.0	2	26.0
0 9 11 15 19 21 23 27 31 39 48 60 75 91 129 164 187 200 191 178 147 119 92 66 55 46 57 31 26 20 16 13 10 0 7 10 13 16 18 19 21 24 28 33 40 50 62 93 129 162 185 195 190 168 137 101 77 60 48 40 33 28 21 17 13 17 18 20 27 25 29 36 44 56 68 151 139 170 189 191 188 163 132 101 75 59 47 59 33 28 21 17 13 13 17 18 20 27 25 25 29 36 44 56 56 810 139 170 189 191 187 163 132 101 75 69 47 59 33 28 21 17 13 13 14 16 17 19 12 15 17 18 18 20 27 25 29 36 44 56 56 810 189 191 188 163 132 101 75 69 47 191 181 17 13 14 16 17 191 191 191 191 191 191 191 191 191			- + -	- +	- +	- + -	- + -	+	+	+-	- +	+	+	- +	+	+	+	+	+	+	+	+	+	+	+	+-			- + -	- +	+		
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Chapter 6

Storage Volume for Detention Basins

As rural areas become urbanized, the resulting increases in peak discharges can adversely affect downstream flood plains. Increasingly, planners, developers, and the public want these downstream areas to be protected. Many local governments are adopting ordinances to control the type of development and its allowable impacts on the watershed. One of the most common controls requires that postdevelopment discharges do not exceed present-condition discharges for one or more storm frequencies at specified points along a channel.

This chapter discusses ways to manage peak discharges by delaying runoff. It also presents a procedure for estimating the storage capacity required to maintain the peaks within a specified level.

Efforts to reduce the effects of increased runoff from urban areas have been innovative and diverse. Many methods have been used effectively, such as infiltration trenches, porous pavement, rooftop storage, and cisterns. But these solutions can be expensive or require site conditions that cannot be provided.

The detention basin is the most widely used measure for controlling peak discharge. It is generally the least expensive and most reliable of the measures that have been considered. It can be designed to fit a wide variety of sites and can accommodate multiple-outlet spillways to meet requirements for multifrequency control of outflow. Measures other than a detention basin may be preferred in some locations; their omission here is not intended to discourage their use. Any device selected, however, should be assessed as to its function, maintenance needs, and impart.

Estimating the effect of storage

When a detention basin is installed, hydrologic routing procedures can be used to estimate the effect on hydrographs. Both the TR-20 (SCS 1983) and DAMS2 (SCS 1982) computer programs provide accurate methods of analysis. Programmable calculator and computer programs are available for routing hydrographs through dams.

This chapter contains a manual method for quick estimates if the effects of temporary detention on peak discharges. The method is based on average storage and routing effects for many structures.

Figure 6-1 relates two ratios: peak outflow to peak inflow discharge (q_o/q_i) and storage volume runoff volume (V_s/V_r) for all rainfall distributions.

The relationships in figure 6-1 were determined on the basis of single stage outflow devices. Some were controlled by pipe flow, others by weir flow. Verification runs were made using multiple stage outflow devices, and the variance was similar to that in the base data. The method can therefore be used for both single- and multiple-stage outflow devices. The only constraints are that (1) each stage requires a design storm and a computation of the storage required for it and (2) the discharge if the upper stage(s) includes the discharge of the lower stage(s).

The brevity of the procedure allows the planner to examine many combinations of detention basins. When combined with the Tabular Hydrograph method, the procedure's usefulness is increased. Its principal use is to develop preliminary indications of storage adequacy and to allocate control to a group of detention basins. It is also adequate, however, for final design of small detention basins.

Input requirements and procedures

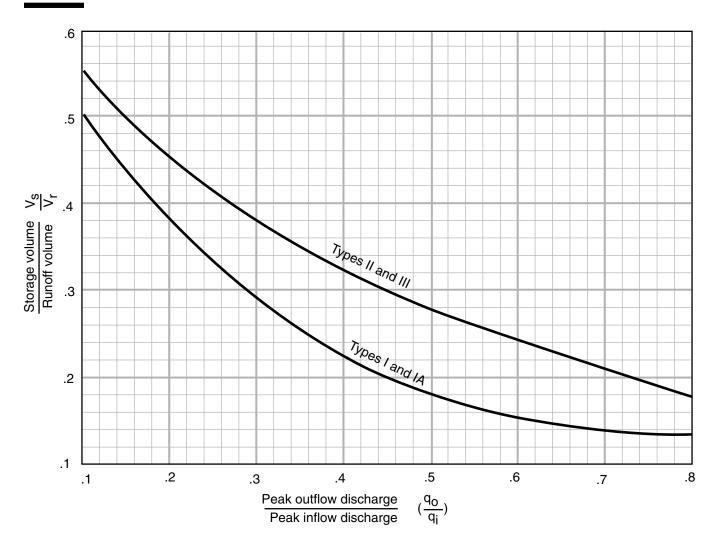
Use figure 6-1 estimate storage volume (V_s) required or peak outflow discharge $(q_o).$ The most frequent application is to estimate $V_s,$ for which the required inputs are runoff volume $(V_r),\,q_o,$ and peak inflow discharge $(q_i).$ To estimate $q_o,$ the required inputs are $V_r,\,V_s,$ and $q_i.$

Estimating V_s

Use worksheet 6a to estimate $V_{\rm s}$, storage volume required, by the following procedure.

- 1. Determine q_o . Many factors may dictate the selection of peak outflow discharge. The most common is to limit downstream discharges to a desired level, such as predevelopment discharge. Another factor may be that the outflow device has already been selected.
- 2. Estimate q_i by procedures in chapters 4 or 5. Do not use peak discharges developed by other procedure. When using the Tabular Hydrograph method to estimate q_i for a subarea, only use peak discharge associated with $T_t=0$.

 $\textbf{Figure 6-1} \qquad \text{Approximate detention basin routing for rainfall types I, IA, II, and III}$



- 3. Compute q_0/q_i and determine V_s/V_r from figure 6-1.
- 4. Q (in inches) was determined when computing q_i in step 2, but now it must be converted to the units in which V_s is to be expressed—most likely, acre-feet or cubic feet. The most common conversion of Q to V_r is expressed in acre-feet:

$$V_r = 53.33Q(A_m)$$
 [eq. 6-1]

where

 V_r = runoff volume (acre-ft)

Q = runoff(in)

A_m = drainage area (mi²), and

53.33 = conversion factor from in-mi² to acre-ft.

5. Use the results of steps 3 to 4 to compute V_s :

$$V_s = V_r \left(\frac{V_s}{V_i} \right)$$
 [eq. 6-2]

where

 V_s = storage volume required (acre-ft).

6. The stage in the detention basin corresponding to V_s must be equal to the stage used to generate q_o . In most situations a minor modification of the outflow device can be made. If the device has been preselected, repeat the calculations with a modified q_o value.

Estimating qo

Use worksheet 6b to estimate \mathbf{q}_{o} , required peak outflow discharge, by the following procedure.

- 1. Determine V_s . If the maximum stage in the detention basin is constrained, set V_s by the maximum permissible stage.
- 2. Compute Q (in inches) by the procedures in chapter 2, and convert it to the same units as V_s (see step 4 in "estimating V_s ").
- 3. Compute V_s/V_r and determine q_o/q_i from figure 6-1.
- 4. Estimate q_i by the procedures in chapters 4 or 5. Do not use discharges developed by any other method. When using Tabular method to estimate q_i for a subarea, use only the peak discharge associated with $T_t = 0$.

5. From steps 3 to 4, compute q_o:

$$q_o = q_i \left(\frac{q_o}{q_i}\right)$$
 [eq. 6-3]

6. Proportion the outflow device so that the stage at q_o is equal to the stage corresponding to V_s . If q_o cannot be calibrated except in discrete steps (i.e., pipe sizes), repeat the procedure until the stages for q_o and V_s are approximately equal.

Limitations

- This routing method is less accurate as the q_0/q_i ratio approaches the limits shown in figure 6-1. The curves in figure 6-1 depend on the relationship between available storage, outflow device, inflow volume, and shape of the inflow hydrograph. When storage volume (V_s) required is small, the shape of the outflow hydrograph is sensitive to the rate of the inflow hydrograph. Conversely, when V_s is large, the inflow hydrograph shape has little effect on the outflow hydrograph. In such instances, the outflow hydrograph is controlled by the hydraulics of the outflow device and the procedure therefore yields consistent results. When the peak outflow discharge (q_o) approaches the peak flow discharge (q_i) parameters that affect the rate of rise of a hydrograph, such as rainfall volume, curve number, and time of concentration, become especially significant.
- The procedure should not be used to perform final design if an error in storage of 25 percent cannot be tolerated. Figure 6-1 is biased to prevent undersizing of outflow devices, but it may significantly overestimate the required storage capacity. More detailed hydrograph development and routing will often pay for itself through reduced construction costs.

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Examples

Four examples illustrate the use of figure 6-1. Examples 6-1 through 6-4, respectively, show estimation of $V_{\rm s}$ of a two-stage structure, estimation of $q_{\rm o}$, and use the Tabular Hydrograph method.

Example 6-1: Estimating V_s , single-stage structure

A development is being planned in a 75-acre (0.1170 mi²) watershed that outlets into an existing concrete-lined channel designed for present conditions. If the channel capacity is exceeded, damages will be substantial. The watershed is in the type II storm distribution region. The present channel capacity, 180 cfs, was established by computing discharge for the 25-year-frequency storm by the Graphical Peak Discharge method (chapter 4).

The developed-condition peak discharge (q_i) computed by the same method is 360 cfs, and runoff (Q) is 3.4 inches. Since outflow must be held to 180 cfs, a detention basin having that maximum outflow discharge (q_o) will be built at the watershed outlet.

How much storage $(V_{\rm s})$ will be required to meet the maximum outflow discharge $(q_{\rm o})$ of 180 cfs, and what will be the approximate dimensions of a rectangular weir outflow structure? Figure 6-2 shows how worksheet 6a is used to estimate required storage $(V_{\rm s}$ = 5.9 acre-ft) and maximum stage $(E_{\rm max}$ = 105.7 ft).

The rectangular weir was chosen for its simplicity; however, several types of outlets can meet the outflow device proportion requirement. Most hydraulic references, along with considerable research data that are available, provide more guidance on variations of outlet devices that can be summarized here.

An outlet device should be proportioned to meet specific objectives. A single-stage device was specified in this example because only one storm was considered. A weir is suitable here because of the low head. The weir crest elevation is 100.00 ft.

Using V_s = 5.9 acre-ft (figure 6-2, step 9) and the elevation-storage curve, the maximum stage (E_{max}) is 105.7 ft.

The rectangular weir equation is

$$q_o = 3.2L_w H_w^{-1.5}$$
 [eq. 6-4]

where

 q_0 = peak outflow discharge (cfs)

 L_w = weir crest length (ft)

 H_w = head over weir crest (ft)

H_w and q_o are computed as follows:

 $H_w = E_{max}$ – weir crest elevation

= 105.7 - 100.0 = 5.7 ft.

Since q_o is known to be 180 cfs, solving equation 6-4 for L_w yields

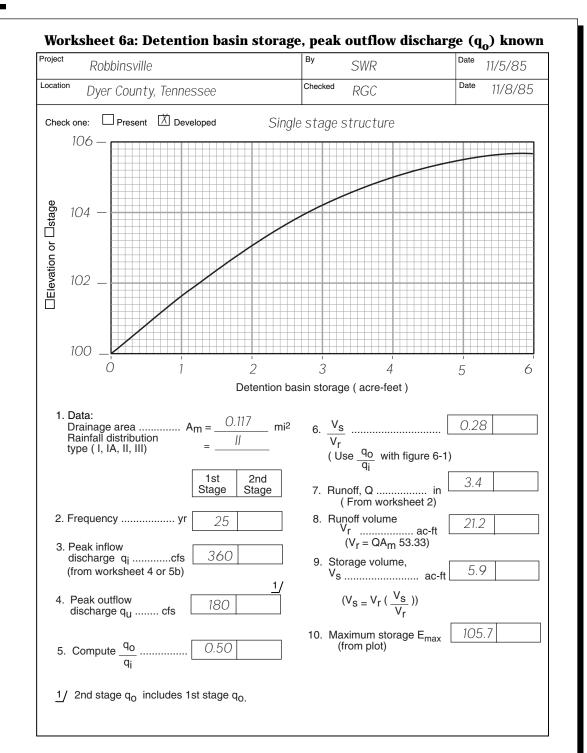
$$L_{w} = \frac{q_{o}}{3.2H_{w}^{1.5}}$$

$$= \frac{180}{3.2(5.7)^{1.5}}$$

$$= 4.1 \text{ ft}$$
[eq. 6-5]

In summary, the outlet structure is a rectangular weir with crest length of 4.1 ft, H_w = 5.7 ft, and q_o = 180 $\,$ cfs corresponding to a V_s = 5.9 acre-ft.

Figure 6-2 Worksheet 6a for example 6-1



Example 6-2 Estimating V_s, Two-stage structure

In addition to the requirements for a 25-year peak outflow discharge of 180 cfs stated in example 6-1, a decision was made to limit the 2-year outflow discharge to 50 cfs because of potential damages to agricultural property below the lined channel. by the method in chapter 4, the estimated 2-year peak discharge for developed conditions will be 91 cfs and runoff (Q) will be 1.5 inches.

Again, a rectangular concrete weir outlaw device was selected; the device could have been another type, but it is important to remember that the flows through the first stage are part of the total discharge of the higher stage.

Figure 6-3 shows how worksheet 6a is used to compute the $V_{\rm s}$ of 2.4 acre-ft and $E_{\rm max}$ of 103.6 for the stage. $E_{\rm max}$ of 103.6 is the weir crest elevation for the second stage.

Equation 6-5 is again used to compute L_w for the first stage. The weir crest elevation for the first stage is $100.00~\rm{ft}$ and q_o = 50 cfs. The first-stage computations for H_w and L_w are

$$H_w = E_{max} - weir crest elevation$$

$$= 103.6 - 100.0 = 3.6 \ ft;$$

and, from equation 6-5,

$$L_{w} = \frac{50}{3.2(3.6)^{1.5}}$$
$$= 2.3 \text{ ft}$$

The second stage is then proportioned to discharge the correct amount at 105.7 feet (fig. 6-2, step 10). Compute the discharge through the first stage for elevation 105.7 feet using

$$L_w = 2.3 \ \text{ft (first stage)}$$
 and
$$H_w = 105.7 - 100.0 = 5.7 \ \text{ft}$$

By substituting these values in equation 6-4, discharge (q_0) through the first stage at 105.7 feet is calculated:

$$q_o = 3.2(2.3)(5.7)^{1.5}$$

= 100 ft³ / s

Now compute the required weir crest length $(L_{\rm w})$ for the second stage, using equation 6-5. Since the second stage crest elevation is 103.6 feet,

$$H_w = 105.7 - 103.6$$

= 2.1 ft

and, since \mathbf{q}_{o} for the second stage equals the total discharge from example 6-1 minus discharge through the first stage,

$$q_o = 180 - 100$$

= 80 ft³ / s

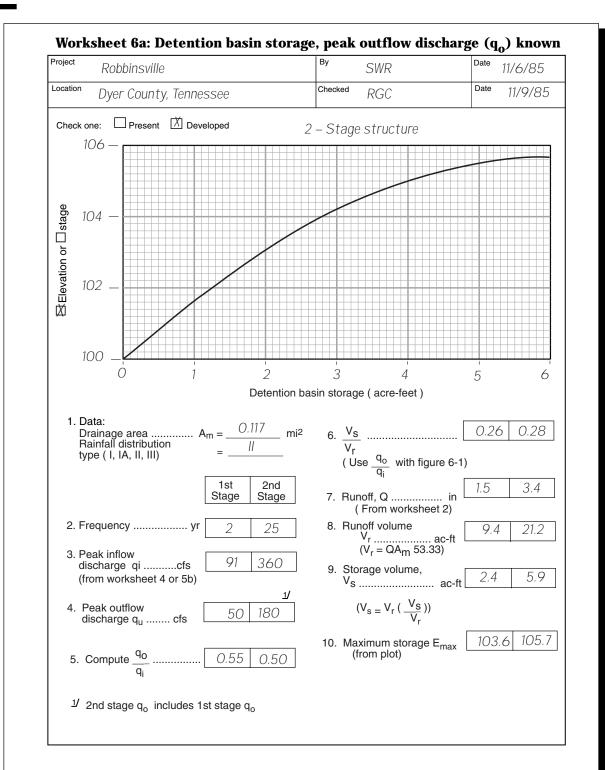
Finally, substituting these $H_{\rm w}$ and $q_{\rm o}$ values in equation 6-5 results in

$$L_{w} = \frac{80}{3.2(2.1)^{1.5}}$$
$$= 8.2 \text{ ft}$$

In summary, the outlet structure is a two-stage rectangular weir with first stage crest length of 2.3 feet at elevation 100.0, and second stage crest length of 8.2 feet at elevation 103.6 feet.

The weir equation used is probably less accurate for the two-stage example than for the single-stage example. The actual second-stage discharge will be slightly more that the one computed. but a discussion of hydraulics of outflow devices is outside the scope of this technical release. Example 6-2 is presented only to illustrate the interrelationship of outflow discharges and storage volume and to show how to develop preliminary estimates of storage requirements for two-stage outlet structures.

Figure 6-3 Worksheet 6a for example 6-2



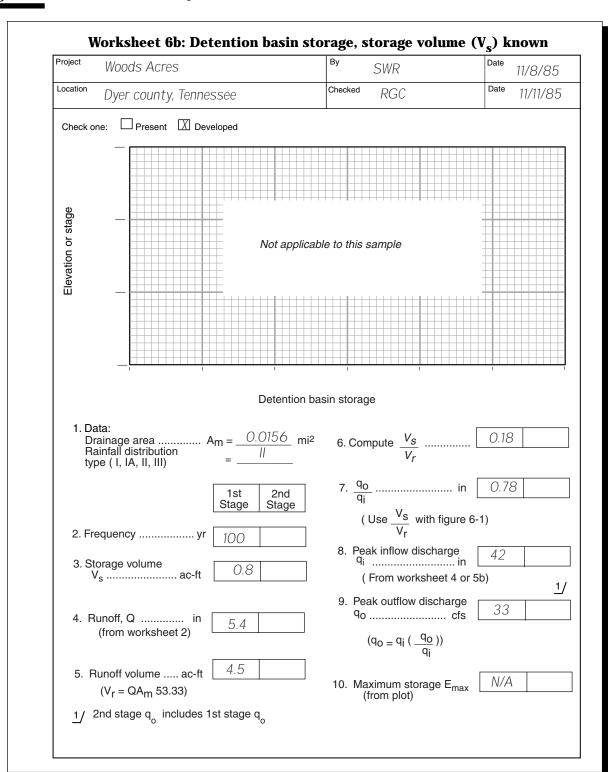
Chapter 6	Storage Volume for Detention Basins
Chapter 0	Storage volume for Detention Dasins

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Example 6-3 Estimating qo

A development is being planned for a 10-acre watershed (0.0156 mi²). A county ordinance requires that the developed-condition outflow from the watershed for 24-hr, 100-year frequency storm does not exceed the outflow for present conditions. The peak discharge from the watershed for present conditions, 35 cfs, is calculated from procedures in chapter 4. For developed conditions, runoff (Q) is 5.4 inches, peak discharge from the watershed is 42 cfs from procedures in chapter 4, and rainfall distribution is type II. What will be the peak outflow discharge (q_0) from a detention basin that is located at the outlet and has maximum allowable storage volume (V_s) of 35,000 ft³ and peak inflow discharge (q_i) of 42 cfs? Figure 6-4 shows how worksheet 6b is used to estimate qo as 33 cfs, which is within the 35 cfs limit. An outflow device will be selected to discharge 33 cfs at a stage corresponding to a V_s of 35,000 ft³.

Figure 6-4 Worksheet 6b for example 6-3



Example 6-4 Estimating V_S, Tabular Hydrograph method

This example builds on examples 5-1 and 5-2. If peak outflow discharge from subarea 7 must not exceed the discharge for present conditions, what will be the storage volume (V_s) required in a detention basin at the outlet of subarea 6?

First, compute the outflow hydrograph without subarea 6 as shown in the table below, which presents developed-condition discharges for example 5-2. (The information in the table is from figure 5-4.)

Discharge (cfs) at time (hr)											
Sub area	13.0	13.2	13.4	13.6	13.8	14.0	14.3	14.6	15.0		
					- cfs						
1	7	9	11	16	24	40	78	122	155		
2	7	9	12	20	33	55	96	132	132		
3	14	29	58	89	106	102	74	46	25		
4	19	32	63	114	169	207	193	143	83		
5	117	167	205	214	202	175	132	99	70		
6 omitted	_	_	_	_	_	_	_				
7	244	167	119	90	72	59	48	40	34		
Total without subarea 6	408	413	468	543	606	638	621	582	499		

After computing the outflow hydrograph, determine the maximum permissible outflow discharge from subarea 6. The present condition peak discharge at the outlet of subarea 7 is 750 cfs at 14.3 hr (figure 5-2), and the developed condition peak discharge at the outlet of subarea 7 minus subarea 6 is 638 cfs (table above). The difference between these two discharges, 82 cfs, is the maximum outflow discharge (q_o) for the detention basin.

Next, determine the peak discharge for subarea 6 for developed conditions by substituting values in equation 5-1:

$$q = q_t A_m Q [eq 5-1]$$

From exhibit 5-II, the largest q_t value is 357 csm/in (exhibit 5-II, sheet 7: T_c = 1.0 hr, T_t = 0, and I_a/P = 0.10 at 12.8 hr). From figure 5-4, A_mQ for subarea 6 is 1.31. Therefore,

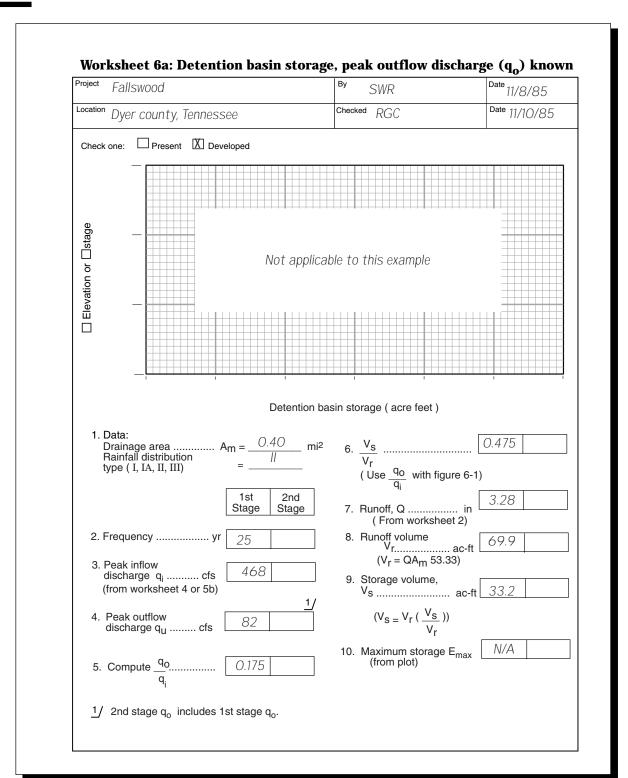
$$q = (357)(1.31) = 468 cfs$$

This q value is, of course, the same as the peak inflow discharge (q_i) into the detention basin.

Finally, use worksheet 6a (fig. 6-5) to compute Vs as 33.2 acre-feet.

The required storage volume of 33.2 acre-feet is the basis for determining the required stage in the detention basin. This stage is a guide proportioning a spill-way that will discharge 82 cfs or less at that storage. The timing or routing effect is not considered because the outflow hydrograph will discharge at near $q_{\rm o}$ for a significant period.

Figure 6-5 Worksheet 6a for example 6-4



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Appendix A Hydrologic Soil Groups

Soils are classified into hydrologic soil groups (HSG's) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSG's, which are A, B, C, and D, are one element used in determining runoff curve numbers (see chapter 2). For the convenience of TR-55 users, exhibit A-1 lists the HSG classification of United States soils.

The infiltration rate is the rate at which water enters the soil at the soil surface. It is controlled by surface conditions. HSG also indicates the transmission rate—the rate at which the water moves within the soil. This rate is controlled by the soil profile. Approximate numerical ranges for transmission rates shown in the HSG definitions were first published by Musgrave (USDA 1955). The four groups are defined by SCS soil scientists as follows:

Group Asoils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sand or gravel and have a high rate of water transmission (greater than 0.30 in/hr).

Group Bsoils have moderate infiltration rates when thoroughly wetted and consist 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).

Group Csoils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr).

Group Dsoils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).

In exhibit A-1, some of the listed soils have an added modifier; for example, "Abrazo, gravelly." This refers to a gravelly phase of the Abrazo series that is found in SCS soil map legends.

Disturbed soil profiles

As a result of urbanization, the soil profile may be considerably altered and the listed group classification may no longer apply. In these circumstances, use the following to determine HSG according to the texture of the new surface soil, provided that significant compaction has not occurred (Brakensiek and Rawls 1983).

HSG	Soil textures
A	Sand, loamy sand, or sandy loam
В	Silt loam or loam
\mathbf{C}	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty clay, or clay

Drainage and group D soils

Some soils in the list are in group D because of a high water table that creates a drainage problem. Once these soils are effectively drained, they are placed in a different group. For example, Ackerman soil is classified as A/D. This indicates that the drained Ackerman soil is in group A and the undrained soil is in group D.

AADAD	ACTID	ACHILITA	ALBUS B
AABABAABERG		AGUILITA B	ALCALDED
		AGUSTINB	ALCAND
AARON		AHARTB	ALCESTERB
		AHCHEWD	
AASTAD			ALCOAB
AAZDAHL		AHLC AHLSTROM D	ALCONAB
ABAC	-		ALCOY
ABAJO		AHMEEKC	ALCOVAB
ABALAN		AHOLTD	ALCOVYC
ABALOBADIAH		AHPAHC	ALDA, Saline B/D
ABARCA		AHRENB	ALDAC
ABBAYE		AHRNKLINC	ALDAPED
ABBEYLAKE		AHRSB	ALDAXD
ABBIE		AHSAHKAC	ALDEND
ABBOTT		AHTANUMC/D	ALDENLAKEB
ABBOTTSPRING		AHWAHNEEB	ALDERC
ABBOTTSTOWN		AIBONITOD	ALDERDALEC
ABEGG		AIDOD	ALDERFLATSD
ABELA		AIKEN B	ALDERMAND B
ABELL		AIKMAN D	ALDERON B
ABENAKI		AILEY B	ALDERWOODC
ABERDEEN		AIMELIIKB	ALDI D
ABERONE		AINAKEA B	ALDINED
ABERSITO	C ADEL, WetD	AINSLEYB	ALDING D
ABERT		AINSWORTHB	ALDINOC
ABES	ADELANTOB	AIRMONTC	ALDO A
ABGESE		AIRPORT, WetC	ALDRICHC
ABILENE		AIRPORTD	ALEDOC
ABIN		AITSB	ALEGROSC
ABIQUA		AJAX	ALEKNAGIKC
ABIQUA. Flooded		AJOC	ALEMEDAC
ABIQUIU		AJOLITOD	ALESNAC
ABITA	·	AKADC	ALEXB
ABO	9 -	AKAKAA	ALEX, Wet SubstratumC
ABOR		AKANB/D	ALEXANDERC
ABORIGINE	-	AKASKAB	ALEXANDRIAC
ABOTEN		AKBASHB	ALFLACKC
ABRA	-	AKELAD	ALFORDB
ABRACON	- I	AKELEY A	ALGARROBO A
	- I	AKERCANB	ALGIERS C/D
ABRAM		AKERITEB	ALGOAC
ABRAZO, Gravelly		AKERSB	ALGOMAD
ABRAZO		AKERUE D	
ABREU			ALIBATESB
ABRIGO		AKHONID	ALIBIC
ABSAQUIL		AKINAB	ALICEL B
ABSAROKEE		AKINVILLEB	ALICIAB
ABSAROOK Cool		AKLERD	ALIDAB
ABSAROOK		AKSARBENB	ALIKCHIB
ABSAY		ALABASTERD	ALINEA
ABSCO		ALADDINB	ALIRE B
ABSCOTA		ALADSHIB	ALIVAR B
ABSHER		ALAE A	ALKABOC
ABSTON		ALAELOAB	ALKIRIDGEC
ACACIO		ALAGAA	ALLAGASHB
ACADEMY		ALAKAID	ALLAMORED
ACADIA	O AFLEYB	PARANATC	ALLANTONB/D
ACADIANA		ALAMAB	ALLARDB
ACAMPO	C AFTADB	ALAMADITASC	ALLDOWNC
ACANA	D AFTADEND	ALAMANCEB	ALLEN B
ACANOD		ALAMBIQUEB	ALLENDALEC
ACASCO	O AGAC	ALAMEDAWELL B	ALLENS PARKB
ACCELERATOR		ALAMOD	ALLENS PARK, StonyC
ACCOLA		ALAMOGORDOB	ALLENTINED
ACEITUNAS		ALAMUCHEEB	ALLENWOODB
ACEL		ALANGOD	ALLHANDSD
ACHELAKE		ALANOS B	ALLINGHAMB
ACHIMIN	C AGAWAMB	ALANOS, CoolD	ALLIS D
ACKELTON	B AGEED	ALAPAHA B/D	ALLIVAR B
ACKER	B AGENCYB	ALAPAI A	ALLKER B
ACKERMAN A/	AGENCY, StonyC	ALAZANC	ALLOUEZ B
ACKETT		ALBAN B	ALLOWAY B
ACKLEY	B AGFAYAND	ALBANO D	ALLUVIAL LAND A
ACKMEN		ALBANYC	ALLWITD
ACKMEN, Wet		ALBATOND	ALMAC B
ACKMORE, Poorly Drained	-	ALBEEC	ALMAVILLED
ACKNA		ALBEMARLEB	ALMIRANTEB
ACKWATER		ALBERS D	ALMOD
ACME	-	ALBERTIC	ALMONDC
ACO	·	ALBERTONB	ALMONTD
ACOMA		ALBERTVILLEC	ALMORA B
ACORD	-	ALBICALISD	ALNITE
	- ,	ALBINASB	ALNULTB
ACOVE	C AGUA FRIAC	ALDINAS	ALINOL
ACOVE			ALOGIAC
ACREE	AGUADILLAA	ALBION B	ALOGIAC
ACREEACRELANE	AGUADILLA A AGUALT B	ALBIONB ALBRIGHTSC	ALOGIAC
ACREE	AGUADILLA A AGUALT B	ALBION B	ALOGIAC

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ALONA		AMITYD	ANOKAB	ARGALTD
ALONEMILL		AMMONB	ANONESC	ARGEEC
ALONSO		AMNICOND	ANOWELLD	ARGENTAC
ALONZEVILLE		AMODACC	ANSGAR B/D	ARGONNEB
ALOVAR		AMOLEC	ANSPINGB	ARGORAB
ALPENA		AMOR B	ANT FLATD	ARGOVARD
ALPHA		AMORUSD	ANTARESA	ARGYLE B
ALPIN	A	AMOSC	ANTARESC	ARIDIC USTIFLUVENTS B
ALPINEPEAK	C	AMOSTOWNC	ANTELOPE SPRINGSD	ARIELC
ALPON	B	AMPADC	ANTEROD	ARIMO B
ALPOWA	B	AMPHIONC	ANTHOLOPD	ARISTINEC
ALRED		AMSDENB	ANTIGOB	ARIVACAC
ALROS		AMSTERDAMB	ANTILONC	ARIVACA, Very CobblyD
ALS		AMTOFTD	ANTIOCHD	ARIZERB
ALSASH		AMUZETA	ANTOINEB	ARKABUTLAC
ALSCO		AMUZET, GravellyB	ANTOKENC	ARKAQUAC
ALSEA		AMWELLC		ARKONAB
ALSPAUGH		AMYD	ANTON D	
				ARKPORTB
ALSTAD		ANACAPAB	ANTOSAB	ARKRIGHTB
ALSTONY		ANACOCOD	ANTWERPC	ARKSONB
ALSTOWN		ANACONDAB	ANUNDEB	ARKTONC
ALSUP		ANAHEIMC	ANVILC	ARLANDB
ALTA		ANAHUACD	APALACHEED	ARLEC
ALTAMONT	D	ANALULU B	APALO B	ARLENB
ALTAPEAK		ANAMAC B	APELDORND	ARLINGTON, Thick Solum B
ALTAR	B	ANAMITED	APEXB	ARLINGTONC
ALTASLOUGH		ANAND	APISONB	ARLOVAL A
ALTAVISTA		ANAPRAB	APMATB	ARLYNDAD
ALTDORF		ANASAZIC	APMAYB	ARMENDARISC
ALTHOUSE		ANATOLIANC	APOLLOB	ARMENIAD
ALTICREST		ANATONED	APOPKAA	ARMESAB
ALTITA		ANAUDD	APPAMB	ARMESPANB
ALTMAR		ANAVERDEB	APPANOOSED	ARMINGTOND
		ANAWALTD		
ALTO			APPERSONC	ARMISTEADC
ALTOGA		ANCENYB	APPLEDELLIAC	ARMITAGEC
ALTON		ANCHOB	APPLEGATEC	ARMO B
ALTUDA		ANCHO, SalineC	APPLERIVERB	ARMOINED
ALTURAS		ANCHOR POINTD	APPLESEEDD	ARMPUPC
ALTUS	B	ANCHORAGEA	APPLESHALLD	ARNESSD
ALTVAN	B	ANCHUSTEQUID	APPLINGB	ARNEY B
ALUF	A	ANCHUTZB	APPOMATTOXB	ARNHEIMD
ALUM	B	ANCLOTEB/D	APPOQUINMINKD	ARNOD
ALUSA		ANCOC	APRONB	ARNOLDA
ALVADA		ANDERGEORGEB	APTB	ARNTZC
ALVARADO		ANDERLYC	APTAKISICB	AROLD
		ANDERSONB	APTOSC	AROSAC
			AF 103	
ALVIN		ANDEDSON Hard Substratum C	A OLIANDIC LILIMA OLIEDTO C	ADD 0
ALVISO	D	ANDERSON, Hard Substratum C	AQUANDIC HUMAQUEPTS C	ARPC
ALVISOALVODEST	D D	ANDOKB	AQUARIUSC	ARRADAD
ALVISOALVODESTALVOR	D D	ANDOK B ANDOVER D	AQUARIUS C AQUATNA D	ARRADAD ARRASTREB
ALVISOALVODESTALVORALVIDA	D D B	ANDOK B ANDOVER D ANDRADA D	AQUARIUS C AQUATNA D AQUILLA A	ARRADA D ARRASTRE B ARRIBA C
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	AVERYC	BALDKNOBD	BARTB
ASHKUMB/D	AVISA	BALDMOUNTAINB	BARTHOLFB
ASHLEYB	AVISTONB	BALDRIDGEB	BARTINEC
ASHLOB	AVOCAB	BALDWIND	BARTMUSD
ASHMEDB	AVONC	BALEB	BARTOD
ASHMUND	AVONDAB	BALE, WetD	BARTOMED
ASHNOLAB	AVONVILLE B	BALHUD LOAMB	BARTONB
ASHOLLOW B	AVTABLED	BALLAHACKD	BARTONFLAT B
ASHONEC	AWBRIG D	BALLARD B	BARTONHILLB
ASHPORT B	AWET B	BALLINGERD	BARZEED
ASHTREC	AXFORDB	BALLTOWND	BASCALB
ASHUEB	AXISD	BALLVARB	BASCOMB
ASHUELOTD	AXTELLD	BALMD	BASCOVYD
ASHVILLED	AYCOCKB	BALMANC	BASHC
ASHWOODC	AYDELOTTED	BALMLAKEB	BASHER B
ASHWOODB	AYERSVILLEB	BALONB	BASILED
	AYLMER A		
ASKECKSYA/D		BALSORAB	BASINC
ASLINGERC	AYMATEC	BALTIMOREB	BASINGER B/D
ASOLTD	AYOCKB	BAMAB	BASINPEAK B
ASOTINC	AYOUBC	BAMBERB	BASKETB
ASPARASB	AYR B	BAMFIELDC	BASNOBA
ASPEN B	AYRMOUNTB	BANADERUD	BASSELB
ASPENLAKEC	AZAAR C	BANATB	BASSFIELDB
ASPERMONTB	AZABACHED	BANBURYD	BASTIANC
ASPERSONC	AZELTINEB	BANCAS B	BASTONC
ASSATEAGUE A	AZTALANC	BANCKERD	BASTROPB
ASSININSB	AZTEC	BANDANAB	BASTSIL B
ASTATULA A	AZTEC, High RainfallC	BANDONC	BATA
ASTORB/D	AZURED	BANE A	BATEMAN B
ASTOR, FloodedD	AZWELLC	BANGTAILC	BATES B
ASTRAG A	BAAHISHB	BANIDAD	
	BABBINGTONB		BATESVILLEC
ATASCOC		BANKERD	BATHELC
ATATEB	BABCOC	BANKHEADB	BATTEAUC
ATCHISONB	BABELTHUAPB	BANLICC	BATTLE CREEKC
ATCO B	BABERWITC	BANNEL B	BATTLEBUTTED
ATESHC	BABOON C	BANNERC	BATTLEFIELDA/D
ATLANTISC	BABOQUIVARI B	BANNINGC	BATTLEGROUNDB
ATLAS D	BABOQUIVARI, Sandy	BANQUITOB	BATTYDOEB
ATLATLC	SubstratumC	BANTRY A/D	BATZA D
ATLEE	BACBUSTERC	BARANAB	BAUDETTEB
ATMORE B/D	BACHB/D	BARANOFC	BAUGOC
ATOKAC	BACHELORB	BARASCOC	BAUMANC
ATOMB	BACHOD	BARATARI A/D	BAUXB
ATRAVESADAD	BACHUSC	BARBARELAB	BAUXSON B
ATRYPAD	BACIDB	BARBAROSAD	BAVARIAC
ATSIONC/D	BACKBAYD	BARBARYD	BAVDARKB
ATSION, Tide FloodedD	BACKCANYOND	BARBERMILLC	BAXTERVILLE B
ATTELLAD	BACKROADB	BARBERTD	BAYAMONB
ATTEWAN, WetD	BACLIFFD	BARBOURB	BAYFIELDD
ATTICA B	BACONAB	BARBOURVILLEB	BAYHOOK B
ATTOYACB			BAYHORSED
	BADAXE B	BARCEB	DATIONSE
ATWELL D	BADEN C/D	BARCEB	BAYLISB
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	BADENC/D		
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DEADVILLE	0	BELTAVA	В	DEW	_	DIGUED	_
BEARVILLE				BEW		BISHOP	
BEARWALLOW		BELTON		BEWEARZE		BISON	
BEASLEY		BELTSVILLE		BEWLEYVILLE		BISPING	
BEASON		BELUGA		BEXAR		BISSETT	
BEATRICE		BELVOIR		BEZO		BISSONNET	
BEAUCOUP		BELZAR		BIAGGI		BIT	
BEAUFORD		BEMIDJI		BICKERDYKE		BITCREEK	
BEAUGHTON		BEMIS		BICKETT		BITCREEK LOAM	
BEAUREGARD	C	BEMISHAVE	C	BICKFORD	D	BITNER	
BEAUSITE	C	BEN LOMOND	B	BICKLETON	B	BITTER	B
BEAUVAIS	B	BENADUM	C/D	BICONDOA	C/D	BITTERCREEK	D
BEAVERCREEK	B	BENCHLEY	D	BIDDLE	C/D	BITTERROOT	C
BEAVERDAM		BEND		BIDONIA		BIVANS	
BEAVERDUMP		BENDAHL		BIDRIM		BIWABIK	
BEAVERFLAT		BENDAVIS		BIEDELL		BIXBY	
BEAVERTAIL		BENDER		BIEDSAW		BJORKLAND	
BEBEEVAR		BENDERLY		BIFFLE		BLACK CANYON	
BECA		BENDOH		BIG TIMBER		BLACKBURN	
BECHTEL		BENEMES		BIGA		BLACKCREEK	
BECHYN		BENEVOLA		BIGBEAVER		BLACKDOG	
BECKER		BENEWAH		BIGBEE		BLACKFOOT	
BECKHAM		BENFIELD		BIGBOW		BLACKHAMMER	
BECKMAN		BENITO		BIGBROWN		BLACKHOOF	
BECKS		BENKA		BIGCREEK		BLACKHORSE	
BECKSTRAND		BENKELMAN		BIGDRAW		BLACKLAKE	
BECKVILLE	B	BENKLIN		BIGDUTCH		BLACKLEG	
BECKWITH		BENMAN		BIGELOW	B	BLACKMORE	
BECRAFT		BENNDALE		BIGFOOT		BLACKMOUNT	
BEDEN		BENNING		BIGFROG		BLACKNEST	
BEDFORD		BENRIDGE		BIGGSVILLE		BLACKOAR	
BEDKE		BENSLEY		BIGHAT		BLACKPIPE	
BEDNER		BENSON		BIGHILL		BLACKRIVER	
BEDSTEAD		BENSTOT		BIGLAKE		BLACKSAN	
BEDWYR		BENTAXLE		BIGLICK		BLACKSANBLACKSPAR	
BEDZEE		BENTEEN		BIGLOST		BLACKSPOT	
BEECH		BENTILLA		BIGLOST, Wet		BLACKTOP	
BEECH GROVE		BENTONSPORT		BIGPAW		BLACKWATER	
BEECHER		BENZ		BIGPOOL		BLACKWOOD	
BEECHWOOD		BEOR		BIGRIVER		BLAG	
BEELEM		BEOWAWE		BIGSAG		BLAGO	
BEENO	C	BEQUINN	B	BIGSHEEP	B	BLAINEGATE	D
BEERBO	D	BERDA	B	BIGWIN	C	BLAIR	C
BEERSHEBA	B	BERDUGO	C	BIJORJA	C	BLAKABIN	C
BEESKOVE	B	BEREA	C	BIKEN	D	BLAKENEY	D
BEEWON		BERGQUIST		BIKEYAH		BLALOCK	
BEEZEE		BERGSTROM		BILGER		BLAMER	
BEHEMOTOSH		BERGSVIK		BILGRAY		BLANCA	
BEHRING		BERLAND		BILHAUL		BLANCHE	
BEIGLE		BERLIN		BILHIL		BLANCHESTER	
BEIRMAN		BERMUDIAN		BILLMAN		BLANCOVERDE	B/D
BEJUCOS		BERN		BILLYBOY		BLAND	
BELAIN		BERNALDO		BILLYCREEK		BLANEY	
BELATE		BERNARD		BILLYHAW		BLANKET	
BELCHER		BERNICE		BILLYRIDGE		BLANKOUT	
BELDEN		BERNOW		BILMOD		BLANTON	
BELDING		BERON		BILSON		BLAPPERT	
BELFON		BERRAY		BILTMORE		BLAQUIRRE	
BELGARRA		BERRYHILL		BIMINI	C	BLASE	C
BELGRADE	B	BERRYMAN		BIMMER	D	BLASHKE	A
BELINDA		BERTHAHILL		BINDLE		BLAYDEN	
BELK		BERTHOUD	B	BINFORD	B	BLAZEFORK	
BELKNAP	C	BERTOLOTTI	B	BINGER	B	BLEAKHILL	
BELLA		BERTRAND		BINGHAMPTON		BLEAKWOOD	
BELLAMY		BERVILLE		BINGHAMVILLE		BLEIBLERVILLE	
BELLAVISTA		BERWOLF		BINNSVILLE		BLEUMONT	
BELLE		BERZATIC		BINS		BLEVINS	
BELLECHESTER		BESHERM		BINTON. Reclaimed		BLEVINTON	
BELLEHELEN		BESNER		BINTON, Heciainled		BLEWETT	
BELLENMINE		BESS		BINVAR		BLICHTON	
						BLIMO	
BELLEVILLE		BESSIE		BIPLANE			
BELLEVILLE, Ponded		BESSLEN		BIPPUS		BLIND	
BELLEVUE		BESTPITCH		BIRCHBAY		BLINDSPRING	
BELLICUM		BESTROM		BIRCHFIELD		BLINN	
BELLINGHAM		BETHALTO		BIRCHLAKE		BLINT	
BELLOTA		BETHANY		BIRDSALL		BLISSHILL	
BELLPASS		BETHUNE		BIRDSBEAK		BLITZEN	
BELLPINE		BETIS		BIRDSVIEW	A	BLIZZARD	
BELLSLAKE	D	BETRA		BIRKBECK		BLOCKER	D
BELLTOWER		BETTERAVIA		BIRMINGHAM		BLOCKHOUSE	
BELLWOOD		BEULAH		BISBEE		BLOCKTOWN	
BELMILL		BEVERIDGE		BISCAY		BLOOMFIELD	
BELPRE		BEVERLY		BISCAYNE		BLOOMING	
BELRICK		BEVIER		BISCHOFF		BLOOMINGDALE	
BELROSE		BEVIL		BISCUIT		BLOOR	
BELSAC		BEVINGTON		BISGANI		BLOSSBERG	
5220AO		DEVINOTON	ں	DIGUARI	Б	DE000DE110	
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BLUCHER		BONAB	BOTETOURTC	BRASHEARC
BLUE EARTH	.D	BONAIRD	BOTHOMPEEKD	BRASSFIELDB
BLUE LAKE	Α	BONANZA B	BOTHWELLB	BRASSTOWNB
BLUEAGLE		BONAPARTE A	BOTLEGC	BRATTONB
BLUEBIRD		BONDMAND	BOTTB	BRAUNC
BLUECANYON		BONDOEB	BOTTINEAUB	BRAVOB
BLUECREEK		BONDUELC	BOTTLEC	BRAWLEYD
BLUEDOME	.С	BONED	BOTTLEROCKC	BRAYD
BLUEGULCH	В	BONFIELDB	BOULDER POINTB	BRAYSC
BLUEHILL		BONFRIC	BOULDINB	BRAZILTOND
BLUEMASS		BONG A		
			BOULOGNEB/D	BRAZITO, Thck Surface B
BLUENOSE		BONHAMD	BOUNCERD	BRAZITO, Saline-AlkaliC
BLUERIM		BONIDUC	BOUNDARYB	BREADLOAFD
BLUESKY	.D	BONIFAY A	BOURBONB	BRECKENB
BLUESLIDE	D	BONJEAD	BOURNEC	BRECKENRIDGE B/D
BLUESTOCKING		BONJONB	BOUSIC	BRECKSVILLEC
BLUESTONE		BONND	BOWBACB	BREEDSB
BLUEWATER		BONNASHB	BOWERSC	BREHMC
BLUEWING	. B	BONNEAU A	BOWERYB	BREIEN B
BLUEYE	C	BONNEFEMMEC	BOWESB	BREMER, Sandy Substratum B
BLUFF		BONNERDALEB	BOWIEB	BREMERC
BLUFFCREEK		BONNETB	BOWLAKEC	BREMONDD
BLUFFTONC/		BONNEVILLEA	BOWLUSB	BREMS A
BLUFORD		BONNICK A	BOWMANC	BRENDAC
BLUHOL	D	BONOLDENB	BOWMANSVILLE B/D	BRENHAMC
BLULA		BONSAID	BOWNSC	BRENNANB
BLUM		BONSALLD	BOWSTRING A/D	BRENNERD
BLY		BONWIERC	BOXA	BRENNYVILLEC
BLYBURG		BONWIERD	BOXELDERC	BRENT, Dry A
BLYTHE	.D	BOOFUSS C/D	BOXFORDC	BRENTD
BOARDBURN	В	BOOKOUTC	BOXIROND	BRENTWOODB
BOARDFLOWER		BOOKWOODB	BOXJOEA	BREQUITOB
BOARDMAN		BOOMSTICKD	BOXSPRINGD	BRESSAC
BOARDTREE		BOOMTOWND	BOXVILLEC	BREVATORC
BOASH	.D	BOONDOCKD	BOXWELLB	BREVCO B
BOAZ	C	BOONE A	BOYB	BREWC
BOBERTB		BOONESBOROB	BOYDD	BREWERC
BOBILLO			BOYERLAKEC	
		BOONTLINGC		BREWLESSC
BOBKITTY		BOONVILLED	BOYKINB	BREWTONC
BOBS	.D	BOOTEN B	BOYLESTONB	BREZNIAKD
BOBSGARDEN		BOOTLAKEB	BOYLESTON, Gravelly Subsoil C	BRIABBITB
BOBTAIL		BOOTS A/D	BOYSEND	BRICKHAVENC
BOBTOWN		BOPLAIN A	BOZEB	BRICKMILLC
BOCK	. В	BOQUILLASC	BOZEMANB	BRICKTONC
BOCOX	.D	BORACHOD	BRABAS D	BRICKYARDD
BODECKER	В	BORAH A	BRABBLEC	BRICOC
BODIFORD		BORCOA	BRACKETTC	BRIDGECREEKC
BODORUMPE		BORDAD	BRACOSB	BRIDGERC
BOEL		BORDENGULCHB	BRADBOLDTB	BRIDGESONC/D
BOEL, Overwash	.С	BORDERLINE B	BRADCOC	BRIERYC
BOERNE	. В	BOREAD	BRADDALEB	BRIFOXC
BOESEL, Protected		BOREALISD	BRADENB	BRIGGSA
BOESEL		BOREHAMB/C	BRADENTON D	BRIGHTONB/D
BOGA		BORFINC	BRADERD	BRIGHTWOODB
BOGACHIEL	. А	BORGEAUB	BRADFIELDC	BRILEY B
BOGAN	.С	BORGESD	BRADGATEB	BRILL B
BOGGIANO		BORGSTROMB	BRADSONB	BRILLIANTB
BOGGS		BORIANAD	BRADWAY. ThawedC	BRIMHALL
BOGGY		BORIDD	BRADWAY, Mawed	BRIMLEYC
BOGUE		BORKYC	BRADYB	BRIMSONC
BOGUSCREEK		BORLANDD	BRADYVILLEC	BRINGMEEB
BOHICA	В	BORNSTEDTC	BRAGGC	BRINKERHOFFD
BOHICKET		BORO D	BRAGTON D	BRINKLOWB
BOHNA		BOROSAPRISTSD	BRAILSFORDC	BRINNUM
BOHNLY		BORPARKB	BRAMC	BRIONES B
BOHNSACK		BORREGOD	BRAMANB	BRISBANEB
BOILER	.С	BORREGUEROC	BRAMARDB	BRISCOTC/D
BOISE	. В	BORSKI B	BRAMLETTD	BRISKYD
BOISTFORT		BORUNDAC	BRANCHVILLE A	BRISTOLA
BOLACK		BOSA D	BRANCROFTC	BRISTOWD
BOLD		BOSCOB	BRANDD	BRITTOND
BOLENT		BOSKETB	BRANDENBERRYB	BRITWATERB
BOLES	.C	BOSLANDC	BRANDENBURG A	BROADHEADD
BOLES Loam Substratum		BOSLERC	BRANDERB	BROADHURSTD
BOLEY		BOSO D	BRANDONB	BROADKILL
BOLFARB		BOSONOAKC	BRANDTB	BROADLANDC
BOLICKER		BOSQUEB	BRANDYPEAKB	BROADUSB
BOLIO	.D	BOSQUEJO, OverwashC	BRANDYWINE A	BROADWATER A
BOLLIBOKKA		BOSQUEJOD	BRANFORDB	BROADWAYB
BOLLING		BOSSBURG C/D	BRANNANB	BROADWELL B
BOLTON		BOSTONC	BRANSCOMBB	BROBETTC
BOLTZ		BOSTRUMD	BRANSONB	BROCKATONORTOND
BOLUDO	.D	BOSTWICK B	BRANSTADB	BROCKETC
BOMAR	C	BOSVILLED	BRANTLEYC	BROCKGULCHB
BOMBAY		BOSWELLD	BRANYOND	BROCKLISSB
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BROCKMAN		BURNEYB	CALDC
BROCKO E		BURNSCREEKB	CALDERD
BROCKPORT		BURNSIDEB	CALDERWOODD
BROCKROAD	BUCKINGHAMC	BURNSVILLEB	CALDWELL B/C
BROCKSBURG	BUCKLAKED	BURNSWICKB	CALEASTC
BROCKWAYE	BUCKLEB	BURNT LAKEA	CALEDONIAB
BROCKWELL E	BUCKLICKB	BURNTCREEKD	CALENDARC
BRODALE		BURNTHILLB	CALERAC
BRODEER		BURNTRIVERB	CALFRANCH
BRODY		BURPEAKB	CALHIB
BRODYK		BURRD	CALICOTTA
BROE		BURRANTB	CALICREEKB
BROGAN		BURRFOOTB	CALKINSC
BROGDON		BURROWSVILLEC	CALLAB
BROKENFINGER		BURSLEYD	CALLABOC
BROKENHORN		BURSONC	CALLADITOA
BROKITC	BUCYRUSC	BURSTEADTB	CALLAN
BROLAND		BURWELLC	CALLEGUAS D
BROMAGLIN E	BUENA VISTAB	BURWILLC	CALLISBURGC
BROMER	BUFALOB	BUSACCAC	CALLISONC
BROMIDE		BUSHMANB	CALNATC
BROMO		BUSHNELLC	CALNEVAC
BRONELL		BUSHONGC	CALODOC
BRONSON		BUSHVILLEC	CALOOSAC
BRONTE		BUSSYC	CALPEAKD
BROOKE		BUSTERB	CALROYB
BROOKLINE		BUSTERBACKB	CALVERTONC
BROOKSHIRE		BUSTIC	CALVISTAD
BROOKSVILLE		BUSYWILDB	CALWOODSD
BROOME		BUTANOC	CALZACORTAD
BROPHY A/E	BUICKC	BUTCHERKNIFEC	CAMACC
BROSE	BUKOB	BUTLER D	CAMAGUEYD
BROSELEY		BUTLERTOWNC	CAMARGOB
BROUGHTON		BUTTECREEKB	CAMARILLOB/C
BROUILLETT		BUTTERMILKB	CAMASCREEKD
BROWARD		BUTTERSB	CAMATTA
BROWER		BUTTONCREEKB	CAMBARGE
BROWNBEAR		BUXIND	CAMBERNC
BROWNDELL		BUZZTAILD	CAMILLUSB
BROWNELL		BYBEED	CAMMASPATCHD
BROWNFIELD		BYGLANDC	CAMOCCA A/D
BROWNSBURGE		BYINGTONC	CAMPAIRC
BROWNSCOMBE		BYLERC	CAMPANAB
BROWNSCREEK E	BULLOCKC	BYRAMC	CAMPANILEC
BROWNSDALE	BULLTOWNB	BYWELL D	CAMPBELL B/C
BROWNSTONE E	BULLVAROB	CABINETC	CAMPBELLTONC
BROWNSTOWN		CABLON B	CAMPCREEKC
BROWNSVILLE		CABO ROJOC	CAMPFOURB
BROWNTON		CABOOLB	CAMPIAB
BROXON		CABOOSEB	CAMPONEC
BRUBECK		CABRILLOC	CAMPRAB
BRUCE B.[CABSTONB	CAMPSPASSB
		CACHEBUTTE	
BRUELLA			CAMPSPASS, DeepC
BRUELLA, Hard Substratum		CACHECANC	CAMPTOWND
BRUFFY		CACHECREEKB	CAMPUSB
BRUHEL		CACIQUED	CAMPWOODD
BRUJA		CACTUSFLATC	CAMRODENC
BRULE		CADDOD	CANAC
BRUNEEL	BUNDYC	CADELAKED	CANADIANB
BRUNELDA	BUNDYMANC	CADELL D	CANALC
BRUNSWICK		CADEVILLED	CANALOUB
BRUSHCREEK		CADILLACA	CANASERAGAC
BRUSHER		CADIZB	CANCIENNEC
BRUSHTON		CADMUSB	CANDELEROC
BRUSHYE		CADOMAC	CANDERLY B
BRUSSELS		CADOTTEB	CANDLESTICK
BRYARLY		CAESARA	CANEADEA
BRYDE		CAFETALB	CANEADEAD
BRYDEN		CAFFEYC	CANEEKB
BRYSTAL		CAGASC	CANELOD
BRYWAYC		CAGEYC	CANESTD
BTREEC		CAHABA B	CANEYHEADC
BUB	BURCOD	CAHONAB	CANEZ B
BUCAN	BURENC	CAIDB	CANISTEOD
BUCCANEER		CAINHOYA	CANIWEB
BUCHEL		CAIRNB	CANLOND
BUCHENAU		CAJALCO	CANMER
BUCKBAY		CAJONB	CANNELL B
BUCKBERT		CALABARD	CANNING B
BUCKBOARDE		CALABASASB	CANNONB
BUCKCREEK		CALAMINED	CANONEROSD
BUCKEAR	BURLINGTON A	CALAMITYD	CANOSIAC
BUCKETLAKE	BURMANC	CALAMUSA	CANOVA B/D
BUCKEYE	BURMANC BURNBOROUGHB	CALAMUS A CALAWAH B	CANQUYAD
	BURMANC BURNBOROUGHB	CALAMUSA	

CANTEEN	D	CARRIZALESA	CEBONEC	CHARROTON
CANTINA		CARROLLTONC	CEBOYAC	CHARDOTON
CANTLIN		CARRWASHA	CEDAR BUTTED	CHARETTEC
CANTON BEND		CARSITASB	CEDARAND	CHARGOD
CANTRIL	. B	CARSTAIRSA	CEDARBLUFFC	CHARITONC
CANTUA		CART B	CEDARCREEKC	CHARITYD
CANTUCHE		CARTAGENAD	CEDARFALLSA	CHARLEBOIS B/C
CANWALL		CARTERD	CEDARGROVEB	CHARLESTONC
CANYADA		CARTEREYD	CEDARLAKED	CHARLOS B/D
CANYONCREEKCANYOUNG		CARTERSVILLE D CARTHAGE B	CEDARPASSB	CHARLOTTE B/D
CAPA		CARTWRIGHTB	CEDARTOWNA	CHARNOCK, Moderately Wet B CHARNOCK C
CAPAC		CARVERA	CEDONIAB	CHARTERSB
CAPE		CARVIXB	CEDRICD	CHARWELLD
CAPE FEAR		CARWALKERC	CEDVARB	CHATBURN B
CAPEBLANCO		CARWAYD	CEEBEEB	CHATCOLETB
CAPEHORN		CARWILED	CEEJAYD	CHATHAM B
CAPERS		CARYTOWND	CEEKC	CHATTC
CAPERTON		CASABONNEB	CELACYC	CHATTERDOWNB
CAPHEALY		CASAMEROD	CELAVARB	CHATTERTONA
CAPISTRANO		CASCILLAB	CELAVAR, Loamy SurfaceC	CHATTICUPD
CAPITAN		CASEB	CELESTED	CHATUGED
CAPLESC		CASEY D	CELETON D	CHAUMONTD
CAPOOSE		CASEYVILLEB/C	CELIOC	CHAUTAUQUAC
CAPPS		CASHELC	CELTC	CHAVIESB
CAPSHAW		CASHIERS B	CENCOVEB	CHAWANAKEEC
CAPSUS		CASHNERC	CENIZAB	CHAZNERC
CAPTIVA B		CASITOD	CENTENARY A	CHAZOSC
CAPTOM		CASLO	CENTENNIALC	CHAZYC
CARACARA		CASPIANAB	CENTERC	CHEAHAD
CARACOLES		CASSALB	CENTER CREEK A	CHECKERC
CARADAN		CASSIA B/C	CENTERBURGC	CHEDATNAB
CARALAMPI		CASSIDAYC	CENTERVILLE, Gravelly Substra-	CHEDESKIB
CARAMON		CASSOLARYB	tumB	CHEDSEY C
CARBERRY		CASTAIC	CENTISSIMAB	CHEESEMANB
CARBIKA		CASTAN A	CENTISSIMAB	CHEESEMAN, Loamy Surface C
CARBINE		CASTANAB	CENTRALPEAKC	CHEETHAMB
CARBONDALE A		CASTANEDAC	CERBATD	CHEHALEMC
CARBONTON		CASTEEB	CERPB	CHEHULPUMD
CARDENAS		CASTELLC	CERROCOSOB	CHEKIKAD
CARDIFF	. B	CASTELLEIAB	CESARIOC	CHELINA B
CARDINAL		CASTEPHENC	CESSNAB	CHELMOD
CARDINGTON		CASTILEB	CESTNIKC	CHEMAWAB
CARDON		CASTLED	CETRACKB	CHEMED
CARDSOUND		CASTLEPEAKA	CETREPAS D CEWAT C	CHENA A
CARETT		CASTLEROCKD	CHABENEAUB	CHENEGA A
CAREY LAKE		CASTLEWOOD	CHACOND	CHENOA
CARFALL		CASTOC	CHACUACOC	CHENOWETHB
CARGENT		CASTROVILLEB	CHADC	CHEOAHB
CARGILL	.C	CASVARED	CHAFFEED	CHEOSAD
CARIB		CASWELLB	CHAGRINB	CHEQUESTC
CARIBEL		CATALINA B	CHAINC	CHEROKEED
CARIBOU		CATALPAC	CHAINLINKD	CHERRYCREEKB
CARIBOURIDGE		CATANOA	CHAIRESD	CHERRYHILL B
CARIOCACARIOCA		CATALLA	CHALKCREEKB	CHESANINGB
CARIS, High Hainfall		CATAULA B	CHALKFORDC	CHESBROOK D CHESNIMNUS B
CARLAIN		CATHC	CHALKVILLED	CHESTATEE
CARLIN		CATHARPINC	CHALLENGERB	CHESTERTON
CARLITO	.D	CATHEENB	CHALLENGER, AlkaliD	CHESTOA B
CARLOS A		CATHERINEC	CHALLISC	CHESTONIAD
CARLOTTA		CATHLAMETB	CHALMERS B/D	CHETASLINAB
CARLSBAD		CATILLA B	CHAMAC	CHETCOD
CARLSBORG		CATLAD	CHAMATEB	CHETEKB
CARLSON		CATNIPD	CHAMBEAMB	CHETOMBAB/D
CARLSTROMCARLTON		CATPOINT A	CHAMBERLAINB	CHEVAL C
CARMAN		CATTO	CHAMOKANEC	CHEWACK
CARMEL		CAULEYB	CHAMPLAINA	CHEWAUCANC
CARMI		CAUSEWAC	CHANACB	CHEWELAHC
CARMINE		CAVANAUGHC	CHANCELLORC	CHEYENNE B
CARMODY	. C	CAVENDISHB	CHANNAHOND	CHIAD
CARNEGIE		CAVERNSB	CHANTIERD	CHIC B
CARNERO		CAVINESSB	CHANYBUCKD	CHICANEC
CAROLINE		CAVOD	CHAPANOKEC	CHICHAGOFD
CAROLLO		CAX B	CHAPARRALB	CHICHANTNAD
CARONA		CAYAGUAC	CHAPELD	CHICKASAWB
CARPENTERVILLE		CAYOB	CHAPETTB	CHICKASAW
CARRCREEK		CAYUSEB	CHAPPUISC	CHICOB
CARRI		CAZADEROC	CHARBONOB	CHICOLETEC
CARRICK		CEBOLIAC	CHARCOC	CHICONE
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CHICOTE	CHICOTE	n	CHUMMYD		CLIMAX		COL DEDDING	Б
CHIELEY								
CHILLOY								
CHILAD								
CHILDOTT								
CHILDS								
CHILLIGATE C								
CHILLIOTAL B CHUTUM B CLOUNE D COLLEGEREK B			CHURUBUSCOD					
CHILLICATH B CIALES D CLOQUET B COLLEGENEEK B	CHILHOWEE	В	CHUTE A	.	CLITHERALL	В	COLIBRO	B
CHILLIAN	CHILICOTAL	В	CHUTUM B	:	CLODINE	D	COLINAS	B
CHILLUM	CHILLICOTHE	В	CIALESD		CLOQUALLUM	С	COLLEGECREEK	B
CHILLYBU D CIDEMUL B CLOTHO CID COLLINGTON B CHILDOUN D CIDEAD C. B CLOUD PEART B COLLINGTON B COLLINGTON C. COLLIN	CHILLIGAN	В	CIBEQUEB	:	CLOQUET	В		
CHILSON D CIENEGA B CLOUD PEAK B OLLINSTER B CHILSON D CIENEGA B CLOUD CONTROL B CLOUD CONTROL B COLLING B								
CHIRDY D CIENDO D CIENDO D CLOUDLESS COLLISTER 8 B CHIMAY D CIENDO								
CHIMAY								
CHINNE								
CHININET								
CHIMNEY A CINCO A CIONELLY D COMPANDO B CINNAMON BAY D CLOVERCREEK C COLORDOX D B CINNAMON BAY D CLOVERCREEK C C CLOVER D COLORDOX D B CINNAMON BAY D CLOVERCREEK C C CLOVER D CLOVERCREEK C CLOVER D CLOVERCREEK C CLOVER D CLOVERD								
CHIMENTROCK								
CHINALOTE D D CINTANON BAY B CLOVERCREEK C COLOROCK D CINTANON CALL B COLOROW B COLORO								
CHINARJUTE D CINTRONA D CLOWERS B COLOROW B CHINARJUTE B CINCAP. CHINARJUTE B CINCLEBACK A CLOWEN B COLOROW B COLOROW B CHINARJUTE B COLOROW B CO								
CHINAPAT								
CHINCAP D CIRCLEBACK A CLOWEIN D COLUMBINE C CHINDE C CRICLEVALLEY B CUBCAF D COLUMBINS C CRICLEVALLEY B CUBCAF D COLUMBINS C CRICLEVALLEY C CLOYD CRICLEVALLEY C CLOYD CRICLEVALLE C COLUMBINS C CRICLEVALLEY C CLOYD CRICLEVALLE C COLUMBINS C COLUMBINS C CRICLEVALLE C COLUMBINS C CRICLEVALLE C COLUMBINS C COLUMBINS C COLUMBINS C CRICLEVALLE C COLUMBINS C COLU								
CHINCOTEAGUE D CIRCLEARA C CLOYD D COLUMBINE A CHINDRE C C CIRCLEARY B CLUIRE D COLUMBUS C C CHINHILL B CIRCULAR B CLUNIE D COLUMBUS C C CHINHILL B CIRCULAR B CLUNIE D COLUMBUS C C CHINHILL B CIRCULAR B CLUNIE D COLUMBUS C C COLUMBUS C C CHINHILL B CIRCULAR B CLUNIE D COLUMBUS C C CIRCLEARY C C CIRCLEARY C C CITTO C B CLUNIE D COLUMBUS C C C CIRCLEARY C C CITTO C B CLUNIE D COLUMBUS C C C CIRCLEARY C C CITTO C C C C C C C C C C C C C C C C C C								
CHINDE				1				
CHINIAL								
CHINIAK								
CHINKIE								
CHINLIN B COTICO								
CHINO								
CHINVAR								
CHINWHISKER								
CHIPENDALE								
CHIPLEY								
CHIPLEY								
CHIPPOLA								
CHIPPENY								
CHIRENO								
CHISOLM								
CHISOLM				:				
CHISPA								
CHISTOCHINA B CLAREVILLE C COBEY B COMSTOCK. C CHITA B CLARITA D COBLENTZ C COMUS B B CHITINA B CLARK B COBLENTZ C COMUS B CHITINA C C CLARKIA C C COBOC C C CONABY B/D CHITIVOOD D D CLARKARANGE C C COBSC C C CONABY B/D CHITIVOOD C C CLARKSDALE C C COBSTONE B CONAL B C C CONECTION D CONECTION D CONAL B	CHISPA	В	CLARENDONC	:	COBERLY	В		
CHITINA	CHISTNA	В						
CHITINA	CHISTOCHINA	В	CLAREVILLEC	:	COBEY	В	COMSTOCK	C
CHITYUM	CHITA	В					COMUS	B
CHITWOOD	CHITINA	В	CLARKB	:	COBLYNN	В	CONA	C
CHIVATO	CHITTUM	С	CLARKIAC	:	COBOC	С	CONABY	B/D
CHIVATO, Elevation>8000	CHITWOOD	D	CLARKRANGEC	:	COBRE	С	CONALB	B
CHIMAUKUM	CHIVATO	С	CLARKSDALEC	:				
CHIWAWA								
CHO C CLAYBANKS C/D COCOA A CONCHAS C CHOATES C CLAYCREEK C COCODIBE C CONCHOVAR C CHOCCOLOCO B CLAYHAM B COCONINO B CONCORDI D CHOCK D CLAYSVILLE C COD B CONCORDIA D CHOCORUA D CLAYTON B CODOUNIS C CONDIDO D CHOICE D CLEARCREEK D CODQUIN D CONDIDO D CHOOP D CLEARCREEK D CODYLAKE B CONDON C CHORALMONT A CLEARCREEK D COESSE C/D CONETOE A CHOSKA B CLEARNIVER B COFFE C CONEWARD A CHRISHALL B CLEARVIVER B COFFEE B CONGAREE B CHRISHANA D C								
CHOATES C CLAYCREEK C COCODRIE C CONCHOVAR C CHOCCOLOCCO B CLAYHAM B COCOLALLA CD CONCORD D CHOCK D CLAYHOLE B COCONINO B CONCORDIA D CHOCORUA D CLAYSULE C COD B CONDA D CHOCRUA D CLAYSULE C COD B CONDA D CHOICE D CLEARUM C CODQUIN D CONDIT D CHOKE B CLEARCREK D CODQUIN D CONDIT D CHOY D CLEARCREK D CODQUIN D CONDIT D CHORALMONT A CLEARFORK D COE A CONECUH D CHOSKA B CLEARRINER B COSFF C CONECUH D CHOSAL B CLEARRINER B								
CHOCCOLOCCO B CLAYHAM B COCOLALLA C/D CONCORD D CHOCK D CLAYSVILE C COD B CONCORDIA D CHOCKTOOT B CLAYSVILE C COD B CONCORDIA D CHOCORUA D CLEAVTON B CODORUS C CONDIDO D CHOICE D CLE ELUM C CODQUIN D CONDIT D CHOKE B CLEARCREEK D CODYLAKE B CONECUH D CHOOP D CLEARROREK D COE A CONECUH D CHOORALMONT A CLEARRIVER B COESSE C/D CONETOE A CHOSKA B CLEARRIVER B COFFEE B CONEVARD A CHRIS C CLEARVIEW B COFFEE B CONIGAREE B CHRISHALL B CLEARVIE								
CHOCK D CLAYHOLE B COCONINO B CONCORDIA D CHOCKTOOT B CLAYSVILLE C CD B CONDA D CHOCORUA D CLAYTON B CODORUS C CONDIDO D CHOICE D CLE ELUM C CODQUIN D CONDIT D CHOOP D CLEARGREEK D CODYLAKE B CONDON C CHOOP D D CLEARGREEK D CODYLAKE B CONDON C CHOOP D D CLEARGREEK D CODYLAKE B CONDON C CHOOP D D CLEARFORK D COE A CONDECUH D CONDECUH								
CHOCKTOOT B CLAYSVILLE C COD B CONDA D CHOCORUA D CLAYTON B CODDRUS C CONDIDO D CHOCE D CLE ELUM C CODQUIN D CONDIDO D CHOKE B CLEARCREEK D CODYLAKE B CONDON C CHOOPO D CLEARFORK D COESSE C/D CONETOE A CHORALMONT A CLEARRINE B COESSE C/D CONETOE A CHOSKA B CLEARRIVER B COFFE C CONEWARD A CHOYEAU C CLEARVIEW B COFFEE B CONGAREE B CHOWAN D CLEAVIMOR D COFFEEN B CONICAL B CHRIS C CLEGHORN C COFFEEN B CONICAL B CHRISMAN D CLEGMENTINE								
CHOCORUA D CLAYTON B CODQUIN C CONDIDO D CHOICE D CLE ELUM C CODQUIN D CONDIT D CHOCE B CLEARCREEK D CODYLAKE B CONDON C CHOOP D CLEARFORK D COE A CONECUH D CHORALMONT A CLEARRIVER B COESSE C/D CONECUH D CHOSKA B CLEARRIVER B COFFE C CONEWARD A CHOWAN D CLEARVIEW B COFFEE B CONGAREE B CHRIS C CLEGHORN C COFFEEN B CONICAL B CHRISHALL B CLEMENTINE B/C COFFEEPOT B CONICAL B CHRISTIANA C CLENAGE C COGHILL C CONLEY C CHRISTIANA C CLENAGE <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
CHOICE D CLE ELUM C CODQUIN D CONDIT D CHOKE B CLEARCREEK D CODYLAKE B CONDON C CHOOP D D CLEARFORK D COE A CONECUH D CHOMAN A CLEARLINE B COESSE C/D CONECUE A CHOWAN D CLEARVIEW B COFFEE B CONGAREE B CHRIS C CLEGHORN D COFFEEN B CONGAREE B CHRISHALL B CLEMENTINE B/C COFFEEN B CONGAREE B CHRISHALL B CLEMENTINE B/C COFFEEN B CONGALE B CHRISHALL B CLEMENTINE B/C COFFTON B CONLEN C CHRISHALL B CLEMENTINE B/C COGHILL C CONLEN B CHRISHALL B								
CHOKE B CLEARCREEK D CODYLAKE B CONDON C CHOOP D CLEARFORK D COE A CONECUH D CONECUH D COE A COE A CONECUH D COE A COE A CONECUH D COE A COE								
CHOOP D CLEARINE D COE A CONECUH D CHORALMONT A CLEARLINE B COESSE C/D CONETOE A CHOSKA B CLEARNIEW B COFF C CONEWARD A CHOWAN D CLEARWIEW B COFFEE B CONGAREE B CHRIS C CLEGHORN C COFFEEN B CONICAL B CHRISHALL B CLEMVILLE B COFFTON B CONICAL B CHRISHAN D D CLEMVILLE B COFFTON B CONICAL B CHRISTIANA C CLENAGE C COFTON B CONICAL B CHRISTIANA C CLENAGE C COGLIN C CONNAH D CHRISTIANA C CLEONE D COHAGEN C CONNAH D CHRISTIANA C								
CHORALMONT CHOSKA B CLEARRIVER B COFF C CONEWARD A CHOTEAU CHOWAN D CLEAVWOR D CLEAVWOR D CLEAVWOR D CLEAVWOR D CLEAVWOR D CLEGHORN C COFFEEN B CONGLE B CHRIS C CLEGHORN C COFFEEN B CONICAL C CONI								
CHOSKA B CLEARRIVER B COFF C CONEWARD A CHOTEAU C CLEARVIEW B COFFEE B CONGAREE B CONGAREE B CHOWAN D D CLEAVMOR D COFFEEN B CONGLE B CHOWAN C CLEGHORN C COFFEEN B CONICAL B CONICAL B CHRISHALL B CLEMENTINE B/C COFFTON B CONLEN B CONLEN B CONLEN B CONLEN B CONLEN B CONLEN C CHRISTIANA D CLEMVILLE B COGLIN C CONLEY C COLENGARE C COGLIN C CONLEY C COLENGARE C COGLIN C CONLEY C CONLEY C CONLESTIANA D C CLENDENEN D COHAGEN C CONNAH D CONLESTIANA D CLEMENTINE D CLEONE B COHAGEN C CONNET D								
CHOTEAU C CLEARVIEW B COFFEE B CONGAREE B CHOWAN D CLEAVMOR D COFFEEN B CONGLE B CHOWAN D CLEAVMOR D COFFEEN B CONGLE CONGLE C C C C C C C C C C C C C C C C C C C								
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CHRISHALL B CLEMENTINE B/C COFFTON B CONLEN B CHRISMAN D CLEMYILLE B COGHILL C CONLEY C CONLEY C CHRISTIANA C CLENAGE C COGLIN C CONNAH D CHRISTIANBURG C CLENAGE C COGLIN C CONNAH D CHRISTIANBURG C CLENAGE C CONNAH D CONNET D CHRISTINE D CLEONE B COHAGEN C CONNET D CONNET D CHRISTOFF C CLEORA B COHAS C CONOSTA C CHRISTY C CLEORA B COHAS C CONOSTA C CHRISTY C CLERGERN B COHOE B CONOTTON B CONOTTON B CONOTTON B CONOTTON B CONOTTON C CHRYSLER C CLEVELAND C COLEVELAND C CONOWINGO C CHUBBFLAT C CLEVELAND C COONCE C CHUCKANUT B CLEYMOR B CONOTTON B CONOWINGO C CHUCKANUT B CLEYMOR B CONOTTON B CONOWINGO C CHUCKRIDGE D CLICK A COKEDALE C/D CONRAD A/D CHUCKRIDGE D CLIFF B COKER D CONSEJO C CHUFFA B COKER D CONSEJO C CHUFFA B COKER D CONSEJO C CHUGCREK C CLIFFIELD B COKER D CONSTANCE D CHUCKGTER B CLIFFORD C COLEBET D CONSTANCE D CHUCKTON D CLIFFSIDE B COLBURN C CONSTANCIA D								
CHRISMAN D CLEMVILLE B COGHILL C CONLEY C CHRISTIANA C CLENAGE C COGLIN C CONNAH D CONNAM D C								
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CHRISTINE D CLEONE B COHAGEN, Cool D CONNET D CHRISTOFF C CLEORA B COHAS C CONOSTA C CHRISTY C CLERGERN B COHOE B CONOTTON B CHROME C CLERGENN D COILE D CONOTTON B CHRYSLER C CLEVELAND C COILS C CONOWINGO C CHUBBFLAT C CLEVESCOVE B COIT D CONPEAK D CHUCKANUT B CLEYMOR B COKATO B CONQUISTA D CHUCKRIDGE D CLICK A COKEOALE C/D CONRAD A/D CHUCKRIVER D CLIFF B COKER D CONSEJO C CHUGFA B CUIFFIELD B COKEVILLE B CONSER D CHUGCREK C CLIFFIELD<								
CHRISTINE D CLEONE B COHAGEN, Cool D CONNET D CHRISTOFF C CLEORA B COHAS C CONOSTA C CHRISTY C CLERGERN B COHOE B CONOTTON B CHROME C CLERMONT D COILE D CONOWINGO C CHRYSLER C CLEVELAND C COILS C CONOWINGO C CHUBBFLAT C CLEYESCOVE B COIT D CONPEAK D CHUCKANUT B CLEYMOR B COKATO B CONQUISTA D CHUCKRIDGE D CLICK A COKEATO B CONGUISTA D CHUCKRIVER D CLIFF B COKER D CONSEJO C CHUFFA B COKER D CONSER D CONSTANCE D CHUGCREK C CLIFFIELD	CHRISTIANBURG	С			COHAGEN	Ċ		
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CHROME C CLERMONT D COILE D CONOVER C CHRYSLER C CLEVELAND C COILS C CONOWINGO C CHUBBFLAT C CLEVESCOVE B COIT D CONPEAK D CHUCKANUT B CLEYMOR B COKATO B CONQUISTA D CHUCKRIDGE D CLICK A COKEDALE C/D CONRAD A/D CHUCKRIVER D CLIFF B COKER D CONSEJO C CHUFFA B CLIFFDELL B COKEVILLE B CONSER D CHUGCREEK C CLIFFIELD B COLBE D CONSTANCE A CHUICHU D CLIFFSIDE B COLBURN C CONSTANCIA D								
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CHUBBFLAT C CLEVESCOVE B COIT D CONPEAK D CHUCKANUT B CLEYMOR B COKATO B CONQUISTA D CHUCKRIDGE D CLIFK A COKEDALE C/D CONRAD A/D CHUCKRIVER D CLIFF B COKER D CONSEJO C CHUFFA B CLIFFDELL B COKEVILLE B CONSER D CHUGCREEK C C CLIFFIELD B COLBE D CONSTABLE A CHUGTER B CLIFFORD C COLBERT D CONSTANCE D CHUICHU D CLIFFSIDE B COLBURN C CONSTANCIA D								
CHUCKANUT								
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CHUCKRIVER D CLIFF B COKER D CONSEJO C CHUFFA B CLIFFDELL B COKEVILLE B CONSER D CHUGCREEK C CLIFFIELD B COLBE D CONSTABLE A CHUGTER B CLIFFORD C COLBERT D CONSTANCE D CHUICHU D CLIFFSIDE B COLBURN C CONSTANCIA D								
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CHUGTER B CLIFFORD C COLBERT D CONSTANCE D CHUICHU D CLIFFSIDE B COLBURN C CONSTANCIA D								
CHUICHU D CLIFFSIDE B COLBURN C CONSTANCIA								
COLDENT C CONSUMO B								
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CONTACT	000000000000000000000000000000000000000	00500	
CONTACTA	COSPERVILLEC	CREDOB	CUCAMUNGOD
CONTENTION D	COSTAVAD	CREEDMOORC	CUCHARASC
CONTENTION D CONTIDE B	COSTAVAR D	CREELC CREFORKC	CUCHILLASC
CONTOB	COTHAC	CREOLED	CUDJOE
CONVENTC	COTITOB	CRESALB	CUERBIOB
COOERSB	COTO	CRESKEN	CUERO
COOKCAND	COTT	CRESPIN	CUESTAC
COOLBRITHC	COTTER	CRESS A	CUEVA
COOLVILLEC	COTTONC	CRESSLER	CUEVITASD
COOMBSB	COTTONBENDB	CRESTC	CUEVOLANDB
COONSKINC	COTTONEVAC	CRESTMEADED	CUJOB
COOPERB	COTTONTHOMASB	CRESTVALEC	CULBERTSONB
COOPMONTB	COTTONWOODC	CRESTWAYB	CULDECOLEB
COOSAWB	COTTREEB	CREVAD	CULDESACB
COOSCANYONB	COTTRELLC	CREVISCREEKC	CULITASC
COOTB	COTULLA D	CREXB	CULLIUSD
COOTERC	COUGARBAYD	CRIMSD	CULLOWHEE B/D
COPALISC	COUGHANOURC	CRINKERC	CULPC
COPANOD	COULTERVILLED	CRISFIELDB	CULPEPERC
COPASTOND	COUNTRYMANC	CRISPINC	CULTUS B
COPEAKC	COUNTSD	CRITCHELLB	CULVINGC
COPELANDB/D	COUPEEB	CRITTENDENB	CULVOPB
COPELAND, DepressionalD	COUPEVILLE	CROCAMPB	CUMBERLAND B
COPENHAGEND	COURSEYC	CROCAND	CUMBRESC
COPITAB	COURTB	CROCKETTD	CUMLEYC
COPPER RIVERD	COURTNEYD	CROFLANDC	CUMMINGSD
COPPERSAND	COURTOISB	CROFTSHAWB	CUMMISKEYB
COPPERCAND	COURVASH B	CROGHANB	CUNDICKD
COPPERCREEK B COPPEREID D	COUSEB	CROKEB	CUNIFFD
COPPERFIELDB	COVEDALEB	CRONESEA	CUNNIFFC
COPPLER A	COVELAND	CRONKS	CUPCO
COPUSC	COVERTFALLSC	CROOKEDD	CUPELD
COQUATD	COVILLEB	CROOKSFORDB	CUPINEC
CORAD	COVING	CROOKSTONB	CUPOLAB
CORALC	COVINGTON	CROOMC	CUPPERB
CORAZONES A	COWAN	CROPLEYD	CUPPLESC
CORBINB	COWBONED	CROQUIBD	CUPPY
CORBLYA	COWCREEKB	CROSIERC	CUPVARD
CORCEGAC	COWCREEK, ProtectedC	CROSSCREEKB	CURABITH A
CORDALEB	COWDEND	CROSSEND	CURANTB
CORDELLD	COWEEMAND	CROSSETTC	CURDLIB
CORDESB	COWHORNB	CROSSNOREB	CURRANC
CORDOVAC/D	COWSPRINGB	CROSSPLAINC	CURRENT SPRINGC
CORDYB	COWTRACK A	CROSSTELLD	CURRIER A
CORIFF B/D	COXD	CROSSVILLEB	CURRITUCKD
CORINTHC	COXITB	CROSWOODA	CURRYC
CORKSTONED	COXLAKED	CROTD	CURTIN D
CORLENA A	COXRANCHC	CROWC	CURTIS CREEKD
CORLETTA	COXVILLED	CROW CREEKB	CURTIS SIDING A
CORLEY B/D	COXWELLC	CROW HILLC	CURTISTOWN B
CORLISSA	COYD	CROWELL A	CURTISVILLED
CORNELIA A	COYANOSAD	CROWERSB	CUSHENBURY B
CORNELIUSC	COYATAC	CROWFORKA	CUSHING B
CORNHILLB	COYNE B	CROWHEARTC	CUSHMANB
CORNICKD	COYOTEA	CROWLEYD	CUSHOOLB
CORNVILLE B	COZETICAA	CROWRIVER B/D	CUSICKD
CORNWALLC	COZYC	CROWSHAWB	CUSTCOB
COROLLAD	CRABCREEKB	CROZIERC	CUSTER
CORONAB	CRABTREEC	CRUBASD	CUTCOMBD
CORONACAB	CRACKER D	CRUCES D CRUCKTONB	CUTHAND B
COROZOA	CRACKLER B	CRUICKSHANKC	CUTHBERT D
CORRALCREEKC	CRADLEBAUGHD	CRUMARINEB	CUTTOR
CORRALITOS, Silty Substratum B	CRAFTONC	CRUMLEYB	CUTZD
CORRALITOS, Clayey SubstratumC	CRAGGEY, Organic Surface A	CRUNKERB	CUYAMAB
CORRALRIDGEB	CRAGGEYD	CRUNKVARA	CUYAMUNGUE A
CORRIGAND	CRAIG	CRUSTOWNC	CUYON
CORSAIR A	CRAIGEN	CRUTCHC	CYANB
CORSICA	CRAMERC	CRUTCHFIELDB	CYCLONEB/D
CORTAD	CRAMONTC	CRUZEC	CYCLOPICC
CORTADAB	CRANECREEKC	CRYLUHAC	CYGNETB
CORTAROD	CRANFILL B	CRYSTAL LAKEB	CYMRICD
CORTELYOUD	CRANNLERB	CRYSTALCREEKB	CYNTHIANAD
CORTINA A	CRANSTONB	CRYSTALEXB	CYPRESSD
CORUMC	CRASHB	CRYSTALGYPC	CYRIL B
CORVUSOC/D	CRATER LAKEB	CRYUMBREPTSB	CYVARD
CORWITHB	CRATERMOC	CUATEC	CZARB
CORYC	CRAVENC	CUBAB	DABB
CORZUNI B	CRAWFISHD	CUBCREEKC	DABNEY A
COSADC	CRAWFORDD	CUBDENC	DABOBC
COSHC	CRAWLEYD	CUBERANTB	DACKEYC
COSLAWD	CRAWLEYVILLEB	CUBHILLC	DACRONB
COSMOSC/D	CREASEYC/D	CUBLAKEA	DADE A
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DADINA	_	DAXTYC	DELEGN	, I	DECKAMD	_
			DELEON		DESKAMP	
DAGUAO		DAYBROOKC	DELEPLAIN		DESKER	
DAGUEY		DAYCREEKA	DELETTE		DESMET	
DAHAR		DAYSCHOOLB	DELHEW		DESOLATION	
DAHL		DAYTONAB	DELICIAS		DESONS	
DAILEY		DAYVILLEC	DELISH		DESTER	
DAINT		DAZED	DELKS C/[DETERSON	
DAISY		DEACONB	DELL(DETOUR	B
DAISYBAY	Α	DEADFALLC	DELLO)	DETRITAL	B
DALBY	D	DEADFOOTB	DELLS	2	DETROIT	C
DALCO	D	DEADHORSEC	DELLWOOD	Δ	DEUCE	D
DALECREEK		DEADLINEB	DELMITA		DEUCHARS	
DALEROSE		DEADWOODD	DELMO		DEV	
DALESBURG		DEADYONB	DELNORTE		DEVARGAS	
DALEVILLE		DEAMC	DELOSSB/I		DEVILFENCE	
DALHART		DEANBURGB	DELP		DEVILS	
DALIG		DEANRAND	DELPHI		DEVILSCREEK	
DALKENA		DEARYTONC	DELPLAIN		DEVINE	
DALLAM		DEATMANC	DELRAY		DEVISADERO	
DALLARDSVILLE		DEAVERC	DELRIDGE E		DEVNOT	
DALTON		DEBENGERC	DELRIO E		DEVOE	
DALUPE	В	DEBEQUE B	DELTAJO	0	DEVOIGNES	D
DALVORD	D	DEBOOK B	DELUGE	0	DEVRIES	C
DAMASCUS B/	D	DEBORAHD	DELVALLE	3	DEWBERRY	B
DAMEWOOD		DEBSB	DELVAR		DEWEY	
DAMON		DEBUTEC	DELWAY		DEWEYVILLE	
DAMORE		DECANC	DELWIN		DEWITT	
DANABROOK					DEWITT	
		DECATION C	DELYNDIA			
DANAVORE		DECATHONC	DEMAYO		DEWRUST	
DANCY B/		DECATURB	DEMENT		DEWVILLE	
DANDAN		DECEPTIONB	DEMILL		DEXTER	
DANDREA	C	DECHELD	DEMING		DEZELLEM	
DANGULCH	D	DECKERVILLEC/D	DEMKY)	DIAFLATS	B
DANHUNT	В	DECORDOVAB	DEMOGUL	3	DIAGULCH	B
DANIA B/		DECRAMC	DEMONA		DIAMOND	
DANIELSON		DECYB	DEMONTREVILLE		DIAMONDHIL	
DANIELVIL		DEDASD	DEMOPOLIS		DIAMONKIT	
DANJER		DEDMOUNTC	DEMOPOLIS, cobbly		DIANEV	
DANKO		DEDMOUNT, Lacustrine Substra-	DEMORY		DIANOLA	
DANKWORTH		tumD	DEMOSS		DIATEE	
DANSKIN	В	DEDRICKD	DEMOX E	3	DIAWELL	
DANT	D	DEEC	DEMPSEY	3	DIBOLL	D
DANUBEB/	/D	DEECREE B	DEMPSTER	3	DICECREEK	C
DAPOIN		DEEFAND	DENAUDB/[DICK	
DARAS		DEEMERB	DENBAR		DICKERSON	
DARBONNE		DEEPCUT	DENBY		DICKEYPEAK	
DARBY		DEEPEEKD	DENCO		DICKLE	
DARCO		DEEPWATERB	DENEKA		DICKSON	
DARDANELLE		DEEPWOODB	DENIO		DIEBERT	
DARDEN		DEER PARKA	DENNIS		DIEHLSTADT	
DARDOOW	В	DEERCUTC	DENNISVILLE	3	DIERSSEN	D
DARE	D	DEERFIELDB	DENOMIE	2	DIGBY	B
DARFUR B/	/D	DEERHEARTC	DENROCK)	DIGHTON	B
DARKCANYON	С	DEERHORNC	DENT E	3	DIGIORGIO	B
DARL	С	DEERRUNC	DENTDRAW)	DILLARD	C
DARLAND		DEERWOOD B/D	DENTON		DILLCOURT	
DARLEY		DEFENBAUGHB	DENURE		DILLEY	
DARLINGTON		DEFIANCED	DENVACA		DILLINGHAM	
DARLOW		DEGATERD	DEPALT		DILLWYN	
		=	5=5005	_	DULLANI	
DAROW		DEGNERB	DEPCOR		DILMAN	
DARR		DEGOLAB	DEPEYSTER		DILTON	
DARRAH		DEGRANDB	DEPNER		DILWORTH	
DARROCH		DEGREYD	DEPOE		DIMAL	
DARROUZETT		DEHAVENB	DEPORT		DIME	
DARSIL		DEHILLB	DERAPTER		DIMEBOX	
DART		DEHLINGERB	DERB		DIMO	
DARTMOUTH	В	DEIGHT B	DERBY	4 Ι	DINA	C
DARVEY	В	DEINACHE A/D	DERECHO	3	DINCO	B
DARWASH		DEKALB, Stony A	DERMALA		DINES	
DASHER		DEKALBB	DEROIN		DINEVO	
DASHIKI		DEKAPENC	DEROUX		DINGLE	
DASSELB/		DEKKAS A	DERR		DINGLE	
DATINO						
		DEKOVEN B	DERRINGER		DINGMAN	
DATINO		DEKOVEND	DERRYNANE		DINKEY	
DATOM		DELAB	DERWELL		DINZER	
DATWYLER		DELACITD	DES MOINES, Dry		DIOBSUD	
DAVEGGIO		DELAMARB	DES MOINES, Cobbly		DIPCREEK	
DAVIDELL	В	DELAMETER A	DESAN		DIPMAN	D
DAVIDSON		DELAND A	DESATOYA		DIPSEA	
DAVILLA		DELANOB	DESCALABRADO		DIQUE	
DAWHOO B/		DELANO, SandyC	DESCHUTES		DIREGO	
DAWN		DELAWAREB	DESERTLAKE		DIRTYHEAD	
DAWNY						
		DELCOMBD	DESFIREX		DISAGE	
DAWSIL A/		DELENAD	DESHA		DISAPPOINT	
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DONALD C DRURY B DUTTON C EDGEWICK C DONALDSON C DRY LAKE C DUVAL B EDGINGTON C/D DONEGAN C DRYADINE C DUZEL C EDINBURG C/D DONEGAN C DRYADINE C DUZEL C EDINBURG C/D DONEGAN C DRYBED B DWARF D EDISTO C DONEGAN B DRYBUCK B DWORSHAK B EDJOBE C DONKEHILL D DRYBURG B DYE D EDMINSTER D DONLONTON C DRYCK A DYERHILL B EDMORE D DONNEL B DRYCK B DYLAN D EDMUNDSTON B DONNELSVILLE B DRYFALLS B DYLAN D EDMUNDSTON B DONNELSVILLE B DRYFALLS B DYNAL A EDOM C DONNING D DRYN C EACH C EDSON C DONNING D DRYN C EACH B EDWARDS B/D DONNELSVILLE B DUBAY B EACHUS B EDWARDS B/D DONNING D DRYN C EACH B EDWARDS B/D DONNING D DRYN C EACH B EDWARDS B/D DONNING D DRYN C EACH B EDWARDS B/D DONNING D DUBACH B EAGLECAP B EDWARDS B/D DONNING D DUBACH B EAGLECAP B EDWARDS B/D DONNE B DUBAY B EAGLECAP B EDWARDS B/D DONNE B DUBAY B EAGLECAP B EDWARDS B/D DORAA B/D DUBBS B EAGLECAPE B EDWARDS B EDWIN B EDWIN B DONNING B DUBBS B EAGLECAPE B EDWARDS B/D DORAA B/D DUBBS B EAGLECAPE B EDWARDS B EDWIN B DONNING B DUBBS B EAGLECAPE B EDWARDS B/D DORAA B/D DUBBS B EAGLECAPE B EDWARDS B EDWIN B DORAA B/D DUBBS B EAGLECAPE B EDWARDS B DUBNA B EAGLECAPE B EDWIN B DORAA B/D DUBBS B EAGLECAPE B EDWIN B DORAA B/D DUBBS B EAGLECAPE B EDWIN B DORAA B/D DUBBS B EAGLECAPE B EDWIN B EAGLECAPE B EDWIN B DORAA B DUBBNA C EAGLECAPE B EDWIN B EAGLECAPE B EDWIN B DORAA B DUBBNA C EAGLECAPE B EDWIN B EAGLECAPE B EDWIN B DORAA B DUBBNA C EAGLECAPE B EDWIN B EAGLECAPE B EACH B EELCOVE B D DORAA B DUBLON B EAGLECAPE B EACH B	DOLEKEI DOLEN DOLES DOLLAR DOLLARD DOLLARHIDE DOLLYCLARK DOLMAN DOLUS DOME DOME DOMERIE DOMEZ DOMINGUEZ DOMINSON DOMKEY DOMO DOMO DOMPIER	BBCCCCDCCCBCBBCABBC	DRAKE B DRAKESPLAT B DRAKESPEAK B DRAMMEN A DRAMBURN B DRASCO C DRASCO C DREKA D DRESDEN B DREWING D DREWSEY B DREWSGAP C DREXEL B DRIFTWOOD C/D DRIGGS B DRINO C DRIVER C DROEM C	DURANGO B DURANT D DURAZO A DURBIN D DURELLE B DURKEE C DURRSTEIN D DURSTON C DUSEN B DUSKPOINT A DUSON C DUSTON A DUSTON A DUSTY B DUTCHATT B DUTCHENRY C DUTCHFLAT C	ECLIPSE
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EGGLESON		ELMVILLE		ERMABELL		EYAK	
EGHELM		ELMWOOD		ERMATINGER		EYERBOW	
EGLIN		ELNORA		ERNBET		EYLAU	
EGLIRIM	C	ELOCHOMAN		ERNO		EYOTA	
EGUAJE	B	ELOCIN	D	ERRAMOUSPE	C	EZEL	B
EGYPT	D	ELON	B	ERVIDE	C	EZELL	C
EGYPTCREEK		ELOSO		ESAU		FABIUS	
EICKS		ELPAM		ESCAMBIA		FACEVILLE	
EIGHTLAR		ELPASO		ESCANABA		FACEY	
EIGHTMILE		ELRED		ESCANO		FACTORY	
EILERTSEN		ELRIN		ESCARLO		FADDIN	
EINE							
		ELROSE		ESCONDIDO/ Thick Solum		FADOLL	
EITZEN		ELSIE		ESCONDIDO		FAGAN	
EKAH		ELSINBORO		ESEL		FAGASA	
EKAL		ELTOPIA		ESHA		FAGES	
EKIM		ELTSAC		ESHAMY		FAHNESTOCK	
EKOMS		ELVERS		ESKA		FAIM	
EKRUB	D	ELVIRA	B/D	ESMERALDA	B	FAIRANGEL	B
EL PECO	C	ELWELL	C	ESMOD	D	FAIRBERG	C
ELAM	A	ELWHA	C	ESPARTO		FAIRBIRCH	
ELAM, Hard Substratum		ELWOP		ESPELIE		FAIRBURN	
ELANDCO		ELY		ESPERANZA		FAIRCHILD	
ELBA		ELYSIAN		ESPIL		FAIRFAX	
ELBAVILLE		EMACHAYA		ESPINAL			
						FAIRHAVEN	
ELBERT		EMAGERT		ESPINOSA		FAIRLESS	
ELBON		EMBAL		ESPINT		FAIRLIE	
ELBOW		EMBERTON		ESPY		FAIRLO	
ELBOWLAKE	B	EMELINE	D	ESRO		FAIRMOUNT	
ELBUCK		EMERALDA		ESSEN		FAIRPLAY	
ELBUTTE		EMERSON		ESTACION		FAIRSMITH	
ELCANEJO		EMERY		ESTATE		FAIRYDELL	
						FAIRYLAWN	
ELCAPITAN		EMIGHA		ESTELLE			
ELD		EMIGHA, Alkaline		ESTELLINE		FAJADA	
ELDADO		EMILY		ESTER, Thawed		FAJARDO	
ELDER HOLLOW	D	EMMA	C	ESTER		FALAYA	D
ELDERON, Stony	A	EMMERT	A	ESTERO	D	FALBA	D
ELDERON		EMOT	B	ESTESLAKE	D	FALERIA	В
ELDRIDGE		EMPIRE		ESTO	B	FALFA	
ELEMENTS		EMYD		ETACH		FALFURRIAS	
ELENORE		ENBAR		ETHEL		FALK	
ELEROY		ENBAR, Stony		ETHELMAN		FALKIRK	
ELEVASIL		ENBAR, Wet		ETHETE		FALKNER	
ELEVATOR		ENCANTADO		ETHETE, Saline		FALLBROOK	
ELFCREEK	C	ENCHANTED	B	ETIL	A	FALLCREEK	C
ELFLINT	B	ENCICADO	C	ETOILE	D	FALLERT	B
ELGEE		ENCINA		ETOWAH		FALLON	
ELGIN		ENCROW		ETOWN		FALLSINGTON	
ELIAS		ENDERSBY		ETTER		FALSEN	
ELIZABETH		ENERGY		ETTRICK		FANAL	
ELK HOLLOW		ENFIELD		EUCHRAND		FANCHER	
ELKADER		ENGADINE		EUCHRE		FANDOW	
ELKHEIGHT		ENGLE		EUCLID	-	FANNO	
ELKHEIGHTS		ENKO		EUDY		FANSHAW	
ELKHORN		ENKO, Overblown		EUER		FANTZ, High Rainfall	
ELKINSVILLE	B	ENLOÉ	D	EUFAULA	A	FANTZ	
ELKINTON	B	ENNING		EUHARLEE		FANU	
ELKMOUND		ENOCHVILLE		EULONIA		FARBER	
		ENOLA		EUNOLA		FARDRAW	
ELKPRAIRIE.		ENOREE		EUREKA	-	FARDRAW, Dark Surface	
ELKPRAIRIE	R				u	FARISITA	
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ELKRIDGEELKTON	C/D	ENOS	C	EUSBIO			^
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ELKRIDGEELKTON ELKWALOWELLAELLENELLENELLEN	C/D B B C	ENOSENOSBURGENSENADAENSTROM		EUSBIOEUSTIS EUTAWEUTROBORALFSEUTA EVA	A B B	FARLOW FARMERSTOWN FARMINGTON	
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ELKRIDGE ELKTON ELKWALOW ELLA ELLEN ELLEN ELLENT ELLICOTT ELLIJAY ELLINGTON ELLINOR ELLIOTT ELLISTON ELLISTON ELLISTON ELLISTON ELLISTON ELLISTON ELLISTON ELLISVILLE ELLOREE ELLSBURG ELLOM ELLWOOD		ENOS ENOSBURG ENOSBURG ENSENADA ENSTROM ENTENTE ENTERO ENTERPRISE ENVILLE ENVOL ENZIAN EODY EOJ EOLA EPHRATA, Cool EPHRATA EPITAPH EPLEY EPOT	C C B B B D B C D D C D D A B D C B	EUSBIO EUSTIS EUTAW EUTROBORALFS	A D B B D C B D D C C B D D C B B D C B B D C B B D C C B D D C C B D D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C B D C C C C	FARLOW FARMERSTOWN FARMINGTON FARMINGTON FARNHAMTON FARNUF FARQUAR FARRAGUT FARRENBURG FARRINGTON FARROT FARROT FARROT FARROT FARROT FARROT FARROT FARROT FARROT FARSON FARVA FARVANT FARVIEW	C C C C C B C B B C C C D D
ELKRIDGE ELKTON ELKWALOW ELLA ELLEN ELLEN ELLENT ELLICOTT ELLIJAY ELLINGTON ELLINOR ELLIOTT ELLIS ELLISTON ELLISTON ELLISTON ELLISTON ELLISVILLE ELLOREE ELLSBURG ELLUM ELLUM ELLUM ELLUW ELLUSTON ELLISWICE ELLOREE		ENOS ENOSBURG ENOSBURG ENSENADA ENSTROM ENTENTE ENTERO ENTERPRISE ENVILLE ENVOL ENZIAN EODY EOJ EOLA EPHRATA, Cool EPHRATA EPITAPH EPLEY EPOT EPSOM	C C B B B B D B C D D C D D A B D C B B/D	EUSBIO EUSTIS EUTAW EUTROBORALFS	A D B B D C B D D C C B B D D C B A	FARLOW FARMERSTOWN FARMINGTON FARNITON FARNUF FARQUAR FARRAGUT FARRENBURG FARRINGTON FARROT FARRY FARSIDE FARSON FARVA FARVA FARVAUT	C C C C C B C B B C C D D D B
ELKRIDGE ELKTON ELKWALOW ELLA ELLEN ELLENA ELLETT ELLICOTT ELLIJAY ELLINGTON ELLINOTT ELLISTON ELLISTON ELLISTON ELLISTON ELLISVILLE ELLOREE ELLSBURG ELLUM ELLWOOD ELLUWOOD ELLZEY ELM LAKE		ENOS ENOSBURG ENSENADA ENSTROM ENTENTE ENTERO ENTERPRISE ENVILLE ENVOL ENZIAN EODY EOJ EOLA EPHRATA, Cool EPHRATA EPITAPH EPLEY EPOT EPSOM EPVIP	C C B B B D B C D D C D D A B D C B B/D D C B/D D	EUSBIO EUSTIS EUTAW EUTROBORALFS EVA EVADALE EVANGELINE EVANSHAM EVANT EVART EVELETH EVERETT EVERGLADES EVERGREEN EVERGREEN EVERMAN EVERNY EVERRY	A D B B D C B D D C C B D D C B A D	FARLOW FARMERSTOWN FARMINGTON FARNINGTON FARNHAMTON FARNUF FARQUAR FARRAGUT FARRENBURG FARRINGTON FARROT FARROT FARSIDE FARSON FARSON FARVA FARVA FARVANT FARVEW FARNUF	C C D C C B C B B C C D D B D
ELKRIDGE ELKTON ELKWALOW ELLA ELLEN ELLEN ELLENA ELLETT ELLICOTT ELLIJAY ELLINGTON ELLINOR ELLISTON ELLISTON ELLISTON ELLISVILLE ELLOREE ELLSBURG ELLUM ELLWOOD ELLZEY ELM LAKE ELMDALE		ENOS	C C B B B D B C D D C D D A B D C B D D C B D C C D D C D C D D C	EUSBIO EUSTIS EUTAW EUTROBORALFS EVA EVADALE EVANGELINE EVANSHAM EVANT EVART EVELETH EVERDALE EVERGLADES EVERGREEN EVERRY EVERTY EVERRY EVERWAN EVERRY EVERWAN EXCLOSE	A D B B D C B D D C C C B D D C C B A D B	FARLOW FARMERSTOWN FARMINGTON FARMINGTON FARNHAMTON FARNUF FARQUAR FARRAGUT FARRENBURG FARRINGTON FARROT FARRY FARSIDE FARSON FARVA FARVA FARVANT FARVIEW FARWAY FASHING FASHING FASHING FASKIN	C C D C C B C B B C C D D B D B D B
ELKRIDGE ELKTON ELKWALOW ELLA ELLEN ELLENA ELLETT ELLICOTT ELLIJAY ELLINGTON ELLINOTT ELLISTON ELLISTON ELLISTON ELLISTON ELLISVILLE ELLOREE ELLSBURG ELLUM ELLWOOD ELLUWOOD ELLZEY ELM LAKE		ENOS ENOSBURG ENSENADA ENSTROM ENTENTE ENTERO ENTERPRISE ENVILLE ENVOL ENZIAN EODY EOJ EOLA EPHRATA, Cool EPHRATA EPITAPH EPLEY EPOT EPSOM EPVIP	C C B B B D B C D D C D D A B D C B D D C B D C C D D C D C D D C	EUSBIO EUSTIS EUTAW EUTROBORALFS EVA EVADALE EVANGELINE EVANSHAM EVANT EVART EVELETH EVERETT EVERGLADES EVERGREEN EVERGREEN EVERMAN EVERNY EVERRY	A D B B D C B D D C C C B D D C C B A D B	FARLOW FARMERSTOWN FARMINGTON FARNINGTON FARNHAMTON FARNUF FARQUAR FARRAGUT FARRENBURG FARRINGTON FARROT FARROT FARSIDE FARSON FARSON FARVA FARVA FARVANT FARVEW FARNUF	C C D C C B C B B C C D D B D B D B

E4.TTIO	_	- IDODEEL			_		_
FATTIG		FIRCREEK		FLYCREEK		FRAILEY	
FAUNCE		FIREBALL		FLYNN		FRAILTON	
FAUNSDALE		FIREBAUGH		FLYVALLEY		FRANCIS	
FAVORETTA	D	FIRESTEEL	B	FOAD	.С	FRANCISQUITO	C
FAVRET	С	FIRESTONE	C	FOARD	.D	FRANCITAS	D
FAWCETT	В	FIRETOWER	B	FOGGYFLAT	. В	FRANCONIA	B
FAWIN	В	FIRMAGE	c	FOGLAKE	C	FRANEAU	D
FAWNSPRING		FIROKE		FOLAVAR. Elevation 6000-7400.		FRANKCREEK	
FAYETTEVILLE		FIRTH		FOLAVAR		FRANKENMUTH	
FE		FISHAVEN		FOLDAHL		FRANKENSTEIN	
FEAGINRANCH		FISHBERRY		FOLEY		FRANKFORT	
FEARS		FISHERHILL		FOLLET		FRANKIRK	
FEATHER		FISHERMAN		FOMSENG		FRANKLIN	
FEATHERSTONE		FISHHOOK		FONDA		FRANKTOWN	
FEDJI	Α	FISHLAKE	D	FONDILLAS	.D	FRAVAL, Gravelly	B
FEDORAB	/D	FISHPOT	c	FONNER	. В	FRAVAL	C
FELDA		FISHROCK		FONS		FRAZERTON	
FELDHAUSER		FISHWAY		FONTAFLORA		FRED	
FELDTMAN		FISK		FONTAINE		FREDA	
FELICIANA		FITZHUGH		FONTANA		FREDENSBORG	
FELICITY		FITZWIL		FOOLHEN, Stony, Cool		FREDERICKTOWN	
FELIPE		FIVEBLOCK		FOOLHEN		FREDONYER	
FELIX		FIVEMILE		FOOTHILL		FREDRIKSDAL	
FELKER	С	FIVEMILE, Saline	C	FOPIANO	.D	FREE	. B/D
FELLA B	/D	FIVES	B	FORAKER	D	FREEBURG	C
FELOR		FIVESPRINGS		FORBAR		FREECE	
FELT		FLACKVILLE		FORBES		FREEHOLD	
FELTA		FLAGG		FORBESVILLE		FREELAND	
FELTNER		FLAGSTAFF		FORBING		FREELS	
FENELON		FLAMBEAU		FORDBUTTE		FREEMAN	
FEPS		FLAMEN		FORDCREEK		FREEMANVILLE	
FERA		FLAMING		FORDICE		FREEON	
FERBALL	С	FLANAGAN	B	FORDNEY A	/C	FREER	
FERD	С	FLANDREAU	B	FORDSTERROR	.С	FREESOIL	B
FERDELFORD	С	FLANE	c	FORDTOWN	В	FREEST	C
FEREBEE		FLANK		FORDTRAN		FREESTONE	
FERGIE		FLANLY		FORELAND		FREETPEAK	
FERGUS		FLANNERY					
				FORELEFT		FREEWATER	
FERGUSON		FLARM		FORESTBURG		FREEZENER	
FERN		FLAT HORN		FORESTCITY B		FREEZEOUT	
FERN CLIFF	В	FLATCREEK	D	FORESTDALE	. D	FRELSBURG	D
FERNCREEK	D	FLATHEAD	B	FORESTER	.С	FREMKLE	C
FERNDALE	В	FLATIRONS	c	FORESTON	C	FRENCH	C
FERNHAVEN		FLATONIA		FORK		FRENCHJOHN	
FERNOW		FLATSTONE		FORKHORN		FRENCHMAN	
FERNPOINT		FLATTOP		FORLORN		FRENCHMILL	
FERNWOOD		FLATWOODS		FORMADER		FRENCHOLLOW, Moist	
FERRELO		FLAXTON		FORMDALE		FRENCHOLLOW	
FERROBURRO		FLEAK		FORNOR		FRESHWATER	
FERTEG		FLEAK, cool		FORSEER		FRESNO, Thick Solum	
FESSLER	В	FLEENER	B	FORSGREN		FRESNO, Saline Alkali	D
FESTINA	В	FLEER	D	FORSGREN	.С	FREWA	B
FETCH	D	FLEISCHMANN	D	FORT MEADE	. Α	FREWSBURG	C
FETERITA		FLEMING		FORT MOTT		FREYA	
FETT		FLEMINGTON		FORT ROCK		FRIANA	
FETZER		FLETCHER		FORTBENTON		FRIBERG	
FEZ		FLEWSIE		FORTBOIS		FRICABA	
FEZIP		FLINK		FORTESCUEC		FRIEDLANDER	
FIANDERC		FLINTCREEK		FORTRAN		FRIENDLY	
FIAT		FLO		FORTSAGE		FRIENDS	
FIBRE B		FLOER		FORTUNA		FRIES	
FICO		FLOKE		FORTYONE		FRINDLE	
FIDALGO		FLOMATON		FOSS		FRINES	
FIDDLETOWN		FLOMOT		FOSSILON		FRINT	C
FIDDYMENT	D	FLOODWOOD	в 🛚	FOSTERBURG	D	FRIO	B
FIDISIX	В	FLORAHOME	A	FOSTORIA		FRIONA	C
FIELDCREEK		FLORALA		FOUNTAIN		FRIOTON	
FIELDING		FLORAS		FOUNTAINVILLE		FRIPP	
FIELDON B							
		FLORAVILLE		FOUR STARB		FRISITE	
FIFESRIDGE		FLORENCE		FOURCHE		FRITSLAND	
FIFIELD		FLORESVILLE		FOURCORNERS		FRIZZELL	
FIG		FLORIDANA		FOURLOG		FRODO	
FIGARO			C	FOURME	. В	FROHMAN	
	С	FLORIN					
FIKEL	C C	FLORIS		FOURSIXES		FROLIC	
	C C			FOURSIXESFOURWHEEL		FROLIC	
FIKEL	C C D	FLORIS	в		D		B
FIKELFILBERTFILION	C C D D	FLORISFLOTAGFLOTT	B B	FOURWHEELFOXCAN	.D .D	FRONDORFFRONTENAC	B B
FIKELFILBERTFILIONFILIRAN		FLORIS FLOTAG FLOTTFLOUTIER	B B B	FOURWHEELFOXCAN	. D . D /D	FRONDORFFRONTENAC	B C
FIKELFILBERTFILIONFILIRANFINAL		FLORIS FLOTAG FLOTT FLOUTIER FLOYD	B B B	FOURWHEELFOXCAN	.D .D /D .B	FRONDORFFRONTENACFRONTIERFRONTON	B C D
FIKELFILBERT FILIONFILIRAN FINAL FINCHFORD		FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE	B B B B	FOURWHEELFOXCAN FOXCREEK	.D .D /D .B	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD	B C D
FIKELFILBERTFILIONFILIRANFINALFINCHFORDFINDOUT		FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE FLUE FLUE, Gravelly	B B B C	FOURWHEEL FOXCAN C FOXCREEK C FOXHOME FOXLAKE FOXMOUNT	D /D B C C	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD FRUITA	B C D
FIKEL		FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE FLUE FLUE FLUE FLUETSCH	B B B C D	FOURWHEEL FOXCAN FOXCREEK C FOXHOME FOXLAKE FOXMOUNT FOXVILLE	D D D B C C D	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD FRUITA FRUITFIELD	B C D C
FIKEL		FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE FLUE FLUE, Gravelly FLUETSCH FLUKER	B B B C D	FOURWHEEL FOXCAN FOXCREEK FOXHOME FOXLAKE FOXMOUNT FOXWILLE FOXVIRE	DD/DBCCDB	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD FRUITA FRUITFIELD FRUITLAND	B C C C B A
FIKEL		FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE FLUE, Gravelly FLUETSCH FLUKER FLUMECREEK	B B B C B	FOURWHEEL FOXCAN FOXCREEK FOXHOME FOXLAKE FOXMOUNT FOXVILLE FOXVIRE FOXWORTH	DD /DB CC DB A	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD FRUITA FRUITFIELD FRUITLAND FRUITVALE	B C C B A A
FIKEL		FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE FLUE FLUE, Gravelly FLUETSCH FLUKER	B B B C B	FOURWHEEL FOXCAN FOXCREEK FOXHOME FOXLAKE FOXMOUNT FOXWILLE FOXVIRE	DD /DB CC DB A	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD FRUITA FRUITFIELD FRUITLAND	B C C B A A
FIKEL	CCDDDDADCDBC	FLORIS FLOTAG FLOTT FLOUTIER FLOYD FLUE FLUE, Gravelly FLUETSCH FLUKER FLUMECREEK	B B B C B B B B	FOURWHEEL FOXCAN FOXCREEK FOXHOME FOXLAKE FOXMOUNT FOXVILLE FOXVIRE FOXWORTH	DD /DB CC DB AB	FRONDORF FRONTENAC FRONTIER FRONTON FROZARD FRUITA FRUITFIELD FRUITLAND FRUITVALE	B C C B A A C

EDVDE AD	_	CAREAN	0.101.001	00470004
FRYREAR		GARFAND	GHOLSONB	GOATROCKB
FT. DRUM		GARHILLD	GHORMLEYC	GOATROCKSB
FUEGO		GARIPERD	GIANELLAB	GOBARB
FUEGOSTA		GARLANDB	GIARCHD	GOBBLERB
FUGAWEE		GARLIC A	GIBBONSCREEKC	GOBERNADORD
FULCHER		GARLIND	GIBNEYC	GODDED
FULCRUM		GARLOCKC	GIBRALTARC	GODECKEC
FULDA		GARMONC	GIBSONVILLED	GODECKE, Clay Substratum D
FULLER	D	GARMOREB	GIBWELLC	GODWIND
FULMER	C.D	GARNE B	GICHIGAMIC	GOEMMERC
FULSHEAR	C	GARNELD	GIDEONC	GOESSELD
FULTS	D	GARNERD	GIDWIND	GOFFPEAK B
FUNMAR	C	GARNES B	GIELOWC	GOGOMAINB/D
FUNTER	D	GAROD	GIESED	GOLC
FURLONG	A	GARRD	GIGGERC	GOLD CREEKD
FURNISS		GARRETT B	GILBERTD	GOLDAHOD
FURSHUR		GARROCHALESD	GILBOA	GOLDBEACHC
FURY		GARSIDC	GILEADC	GOLDCORDD
FUSULINA		GARTONC	GILES	GOLDEAGELC
FUSUVAR		GARVIND	GILFORDD	GOLDEND
GABBS		GARWOODD	GILLANDC	GOLDFINCHC
GABEL		GASPERB	GILLENDERD	GOLDHEADB/D
GABINO		GASQUETB		
			GILLIAMC	GOLDHILL, Loamy Substratum C
GABRIEL		GASSAWAYD	GILLIGANB	GOLDHILLD
GACIBA		GASSVILLEC	GILLSC	GOLDIVIDEB
GADONA		GASTONC	GILLSBURGD	GOLDLAKEB
GADONA		GASTROWC	GILMAND	GOLDMANC
GADWELL		GASUPD	GILMORED	GOLDMIREC
GAGEBY		GAT B	GILROYC	GOLDSBOROB
GAGETOWN		GATCHELB	GILT EDGED	GOLDSMITHB
GAHEE		GATERIDGEC	GILWOODB	GOLDSTONC
GAIA		GATESONC	GIMLETTB	GOLDSTREAM, Thawed B
GAIBSON	D	GATEWALL B	GINATD	GOLDSTREAMD
GAILA	B	GATLIN B	GINEXD	GOLDVALEC
GAINESVILLE	A	GATTONB	GINGERD	GOLDVEINC
GAKONA	B	GAULD B/D	GINIB	GOLDYKED
GALATA		GAULDYB	GINSBERGB	GOLETAB
GALBRETH		GAUSEC	GIRARDD	GOLIADC
GALCHUTT		GAVELB	GIRARDOTD	GOLIMEC
GALESTINA		GAVERSC	GISTD	GOLLAHERD
GALEY		GAVILANC	GITABYTE	GOLONDRINAB
GALIENTE		GAVINSD	GITAKUPC	GOLTRYA
GALILEE		GAY B/D		GOLVAB
			GITAMD	
GALLEGOS		GAYHARTC	GIVEOUTC	GOMERYB
GALLEN		GAYLORDC	GIVINC	GOMEZB
GALLIA		GAYVILLED	GLADDICEC	GOMINED
GALLIME		GAZELLED	GLADEVILLED	GONZALESD
GALLIMORE		GAZWELLD	GLANCE B	GOODINGTOND
GALLION		GEARHARTA	GLASGOWC	GOODLANDB
GALLIPOLIS		GEDD	GLASSNERD	GOODLOWB
GALLUP	B	GEEC	GLAWE B/D	GOODNESSB
GALTSMILL	B	GEEBURGC	GLAZE B	GOODPASTERD
GALVESTON	A	GEEMOREC	GLEN B	GOODRICHB
GALVEZ	C	GEERTSEN B	GLENBLAIRC	GOODSONC
GALVIN	D	GEISEL B	GLENCARBC	GOODVIEWD
GALZUNI	C	GEISERCREEK B	GLENCOE	GOODWILL B
GAMBOA	B	GELSINGERC	GLENDENNINGC	GOODWINB
GAMBOGY	B	GEMC	GLENDERSONB	GOOLAWAYC
GAMELAKE		GEM, StonyD	GLENDIVEC	GOOSE CREEKC
GAMM		GEMELOB	GLENDOB	GOOSEBURYB
GANADO		GEMSONB	GLENEDEND	GOOSENAWTB
GANAFLAN		GENATSD	GLENEYRED	GOOVALD
GANHONA		GENEVAB	GLENHAMB	GORDONPOINTB
GANIS		GENTILLYD	GLENMENB	GORED
GANO		GENTRYD	GLENMORAC	GOREEND
GANSNER		GEOCONDAC	GLENOMAB	GORESVILLEB
GANY		GEORGECANYON B	GLENPOOLA	GORGONIOB
GAP		GEORGECREEKB	GLENRIOD	GORHAMB/D
GAPBUTTE		GERBANAD	GLENROSSD	GORIN
GAPCOT		GERBERD	GLENSTEDD	GORMANC
GAPHILL		GERLACHD	GLENTONC	GORUSB
GAPO		GERLANE B	GLENTONA	GOSHAWKB
GARCENO		GERMANO B	GLENVIEWB	GOSHAWKA
			GLENVIEWB	
GARCIAS		GERMANTOWNB		GOSINTAC
GARCITAS		GERMERC	GLENYONB	GOSNEYC
GARDELLA		GERRARDB	GLIDEB	GOSPERB
GARDENCAN		GERSTLEB	GLOHMC	GOTCHELLD
GARDENCREEK		GESSNER B/D	GLOINC	GOTEBOB
GARDENISLE		GESTRINB	GLORIAD	GOUGEVILLE A/D
GARDENS		GETA B	GLYNNC	GOULDERB
GARDENVALE		GETCHELLC	GLYPHSB	GOULDSBOROD
GARDINER		GETRAILD	GNAWBONEB	GOURDINC
GARDNER'S FORK		GETZVILLED	GNOJEKD	GOURLEYC
GARECK		GEWTERC	GOATBUTTEB	GOUVERNEURD
GAREY	B	GEYSENC	GOATJOEA	GOVE B

00/15/	ODEENWILLE D	OUDE	LIAI EMAY
GOVEY C GOWDY B	GREENVILLE B GREENVINED	GUBEC	HALFWAY D
GOWENB	GREENWAYB	GUDGREYB	HALIIMAILEB
GOWKERC	GREENWICHB	GUERIND	HALLCREEK A
GOWTONB	GREGGOD	GUEROC	HALLECKB
GOZEMD	GREGORYD	GUERREROA	HALLENTON D
GRACOT A	GREGSONC	GUESTC	HALLETTSVILLED
GRADCOC	GRELLD	GUEYDAND	HALLIHANB
GRADONC	GREMMERSD	GUFFIND	HALLISONC
GRAFFD	GRENETA	GUGUAKD	HALLORANC
GRALICB	GRENNANB	GUIJARRALB	HALLSBLUFFD
GRANATU D	GRENOBLED	GUISERB	HALSOD
GRANATH B GRANBULD	GRETDIVIDB	GULFB/D	HALVERSONB
GRANDC	GRETORC	GULKANAB	HAMACERA
GRANDADB	GRETTUMA	GULLIED LANDD	HAMAKUAPOKOB
GRANDBENDB	GREWINGKC	GULLION	HAMBLENC
GRANDFIELDB	GREYBEARC	GULLROCKB/D	HAMBONEB
GRANDJEAND	GREYBOB	GULNARED	HAMBROOKB
GRANDMESAC	GREYBROOKB	GUMBOOT C/D	HAMBURGB
GRANDMOREB	GREYCLIFFC	GUNCLUBC/D	HAMBURNB
GRANDPONB	GREYLOCKB	GUNDYC	HAMBYC
GRANDVIEW B/C	GREYSB	GUNNELD	HAMDENB
GRANDWASHD	GREYSTOKEB	GUNNINGSB	HAMEL B/D
GRANERB	GRIBBLED	GUNNUKC	HAMILTONB
GRANFLATA	GRIDELLD	GUNSONED	HAMLETB
GRANGEC	GRIDLEYC	GUNSTOCKC	HAMMACKB
GRANGEVILLE	GRIERD	GURDANE C	HAMMAHAMMAC
GRANGEVILLEC GRANIPEAKB	GRIFTOND	GURDANEC	HAMMERSLEYC
GRANITEPASSB	GRIMMB	GURLEYC	HAMPLAINB
GRANMOUNTC	GRINDALL	GURNEYB	HAMPSHIREC
GRANSHAW B	GRINDSTONEC	GUSTIND	HAMPSONC
GRANTCENTERB	GRINKD	GUSTSPRINGB	HAMRE
GRANTFORKD	GRISDALEB	GUTPORTD	HAMRUBB
GRANTHAMD	GRISMARA	GUVOD	HANA A
GRANTSBURGC	GRISWOLD B	GUYANC	HANAGITAD
GRANTSDALE B	GRITNEYC	GUYANDOTTEB	HANAKERC
GRANTURKD	GRIVERB/D	GWENAD	HANAMAULUB
GRANVILLEB	GRIZZLED	GWINNERC	HANCEVILLE B
GRANYONB	GRIZZLYB	GWINNETTB	HANDB
GRANZANB	GRIZZLYBLUFFB	GYBERGC	HANDKEA
GRAPELAND A GRASMERE B	GROESBECK B	GYPLA C HAAR D	HANDOFF B HANDSBORO D
GRASSHOPPERB	GROOMC	HAARVARD	HANEYB
GRASSTOFFERB	GROSSC	HACCKEC	HANGAARD A/D
GRASSVALD	GROSSCHATD	HACHITAC	HANGDOB
GRASSVALLEYD	GROTONA	HACKBERRYB	HANGROCKD
GRASSYCAND	GROTTOA	HACKERSB	HANGTOWNB
GRASSYCONE A	GROUNDHOUSEB	HACKNEYD	HANIPOEC
GRASSYKNOBB	GROUSECREEKB	HACREEKB	HANISC
GRASSYLAKEC	GROUSEHAVEND	HADARB	HANKS B
GRASSYTRAIL B	GROUSEVILLEC	HADENCREEKC	HANKSVILLEC
GRAUFELSC	GROUSLOUSD	HADLEYB	HANLONB
GRAVELTON B/D	GROVEA	HADSELVILLED	HANNB
GRAVESD	GROVETON B	HAFLINGERA	HANNAB
GRAVEYA B GRAVEYARD B	GROVETON B GROWDEN, Shaly Substratum B	HAGATA D HAGENB	HANNAHATCHEEB
GRAYBERTB	GROWDEN, Shary Substratum C	HAGENSVILLEC	HANNEGAND
GRAYFORDB	GROWLER	HAGERB	HANNOND
GRAYLOCKB	GROWLER, Sandy Substratum C	HAGERMANB	HANSB
GRAYMONTB	GROWSETD	HAGGAC	HANTHOB
GRAYPOINTB	GRUBBSD	HAGGARDD	HAOZOUSB
GRAYROCKC	GRUBEB	HAGSTADTC	HAPJACKD
GRAYSILLC	GRUBROBB	HAGUEA	HAPNEYD
GRAYSTONEB	GRUBSTAKEB	HAIG	HAPPLEB
GRAYWOLFB GRAZANEC	GRUENED	HAIGHTB	HAPPUS A
GRAZERC	GRULLA D GRUMBLEN D	HAIGLERC	HAPURD
GREANEYC	GRUNDELEINB	HAIKUB	HARAHILLC
GREDGED	GRUVERC	HAILESBOROC	HARBESOND
GREEN BLUFFB	GRYTALB	HAINESC	HARBORC
GREEN CANYONB	GSCHWENDB	HAIRED	HARBORDB
GREENBRIARB	GUADALUPEB	HAKKERC	HARCOB
GREENCREEKB	GUAMD	HALB	HARCOTB/D
GREENDALEB	GUAMANIB	HALACAND	HARDEMANB
GREENEC	GUANABANOC	HALAWAB	HARDESTY B
GREENFIELDC	GUANAJIBOC	HALBERTD	HARDHARTB
GREENHOPN D	GUANICAD	HALDERC	HARDISTERB
GREENHORN D GREENLEE B	GUANO D GUARDLAKE A	HALE C/D HALEY B	HARDOLB
GREENLEE	GUAYABOA	HALF MOONB	HARDTRIGGERB
GREENOUGHB	GUAYABOTAD	HALFADAYA	HARDWICKC
GREENSCOMBEB	GUAYAMAD	HALFCIRCLEB	HARDYC
GREENTIMBERC	GUAYNAKAD	HALFOSSB	HARDZEMC

HARECREEK HARGILL HARGREAVE HARJO HARKEN HARL HARLAKE HARLESTON HARM HARMILLER HARNEY HARPER HARPERSVILLE HARPETL HARPOLE HARPOLE	BDCBD	HAWICK	A C/D B B	HENCO HENDAP HENDERSON HENDON HENDRICKS	B C	HIGHLANDHIGHPOINTHIGHSPLINTHIGHSPLINTHIGHTOWERHIGHUP	D B C
HARGILL HARGREAVE HARJO HARKEN HARL HARLAKE HARLESTON HARM HARMILLER HARNEY HARPER HARPERSVILLE HARPETH HARPOLE HARPOLE	BDCBD	HAWKEYE HAWKSNEST HAWKSPRINGS HAWKSTONE HAWLEY	A C/D B B	HENDAP HENDERSON HENDON HENDRICKS	B C	HIGHPOINT HIGHSPLINT HIGHTOWER	D B C
HARGREAVE HARJO HARKEN HARL HARLAKE HARLESTON HARM HARMILLER HARNEY HARPER HARPERSVILLE HARPETH HARPOLE HARPOLE	B C B D	HAWKSNEST HAWKSPRINGS HAWKSTONE HAWLEY	C/D B B	HENDERSONHENDONHENDRICKS	B C B	HIGHSPLINTHIGHTOWER	B C
HARJO HARKEN HARL HARL HARLESTON HARM HARMILLER HARNEY HARPER HARPERSVILLE HARPETH HARPOLE HARPOLE	DBDD	HAWKSPRINGS HAWKSTONE HAWLEY	B B B	HENDON	C B	HIGHTOWER	C
HARJO HARKEN HARL HARL HARLESTON HARM HARMILLER HARNEY HARPER HARPERSVILLE HARPETH HARPOLE HARPOLE	DBDD	HAWKSPRINGS HAWKSTONE HAWLEY	B B B	HENDON	C B	HIGHTOWER	C
HARKEN	CBCCD	HAWKSTONE HAWLEY	B B	HENDRICKS	B		
HARL HARLAKE	B C D B	HAWLEY	B			HIGHUP	\sim
HARLAKE	D D B			LIENIEN (U
HARLAKE	D D B			HENDY	C	HIGHVALLEY	В
HARLESTONHARMHARMILLERHARNEYHARPERHARPETHHARPETHHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLE	C D B		D	HENKIN		HIHIMANU	
HARM HARMILLER HARNEY HARPER HARPERSVILLE HARPETH HARPOLE HARPOLE	D B	HAWTHORNE					
HARMILLERHARNEYHARPERHARPERSVILLEHARPETHHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLE	B	HAXBY		HENKLE, Extremely Cobby .		HILAIRE	В
HARMILLERHARNEYHARPERHARPERSVILLEHARPETHHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLE	B	HAYCRIK	C	HENKLE	C	HILDEBRECHT	C
HARNEYHARPER HARPERSVILLE HARPETH HARPOLE HARPOLE		HAYES		HENLEY		HILDRETH	
HARPER HARPETSVILLE HARPETH HARPOLE HARPOLE							
HARPERSVILLEHARPETHHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLE	D	HAYESTON	В	HENLINE	C	HILEA	D
HARPERSVILLEHARPETHHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLEHARPOLE	D	HAYESVILLE	В	HENMEL	C	HILES	В
HARPETH HARPOLE HARPOLE		HAYESVILLE, Stony					
HARPOLE				HENNEWAY		HILGRAVE	
HARPOLE	B	HAYFORD	C	HENNINGS	B	HILINE	D
HARPOLE	Δ	HAYLAND	C	HENRIETTA	R/D	HILKEN	C
		HAYNAP		HENRY		HILLBRICK	
HARPS	C	HAYNER	C	HENRYSFORK	C	HILLCITY	B
HARPT	B	HAYNESS	B	HENRYSLAKE		HILLCO	- B
HARRAH	B	HAYRACK	C	HEPPSIE	D	HILLCREEK	В
HARREL	В	HAYRIVER	В	HERAKLE	D	HILLEMANN	C
HARRIMAN		HAYSPUR		HERBEL		HILLIARD	B
HARRINGTON	C	HAYSTACK	B	HERBERT	B	HILLIARD, Moderatelly Well	
HARRIS		HAYSTORE		HERBMAN		Drained	Γ
HARRISBURG		HAYSUM		HERBOLD		HILLSDALE	
HARRISON	B	HAYTI	D	HERCULES		HILLTISH	B
HARROD		HAYWIRE		HERDCAMP		HILLTO	
HARSLOW		HAZELAIR		HERITO		HILLTOPPE	
HARSTINE	C	HAZELCAMP	B	HERJUN	B	HILLVIEW	B/D
HART		HAZEN		HERLONG		HILLWOOD	
HARTER		HAZLEHURST		HERMANTOWN		HILMAR	
HARTFORD	A	HAZTON	D	HERMERING	B	HILO	Α
HARTLAND		HEADLEY		HERMIT		HILTABIDEL	
HARTLESS	B	HEADQUARTERS	B	HERMSHALE	C	HINDES	C
HARTNIT	C	HEAKE	D	HERNANDEZ	B	HINDMAN	R
HARTOP		HEALDTON		HERNDON		HINESBURG	
HARTSELLS	B	HEALING	B	HERO	B	HINGHAM	B
HARTSHORN	R	HEAPO	R	HEROD	D	HINKER	_
HARTWELL		HEAPO		HERRICK		HINKLE	
HARTWICK	A	HEARNE	D	HERSEY	В	HINMAN	C
HARTZ		HEATH		HERSH		HINSDALE	
HARVESTER	B	HEATHCOAT	D	HERTY		HINTERLAND	D
HARVEY	С	HEATLY	Α	HESHOTAUTHLA	D	HINTON	В
HASKILL		HEATON		HESPER		HIRAMSBURG	
HASLIE	A/D	HEBBRONVILLE	В	HESS	B	HIRSCHDALE	C
HASSEE	D	HEBER	Δ	HESSELBERG	D	HISEGA	C
HASSELL		HEBO		HESSING		HISNA	
HASSLER	C	HECETA	D	HESSLAN	C	HISTOSOLS	D
HASSMAN	D	HECHTMAN	D	HETLAND	Ċ	HITCHCOCK	R
HASTEE		HECKER		HETTINGER		HITILO	
HAT	C	HECKISON	D	HEUSSER	C	HITT	B
HATBORO	D	HECKLY	_	HEUVELTON	_	HIWOOD	^
HATCH		HEDGE		HEVERLO		HOADLY	
HATCHERY	C	HEDSTROM	B	HEWITT	D	HOBAN	B
HATCHET		HEDVILLE		HEWOLF	B	HOBBS	
HATCHIE		HEELAND		HEXT		HOBBY	
HATERMUS	D	HEELY	B	HEYDER	B	HOBE	A
HATERTON		HEESER		HEYDLAUFF		HOBIT	
HATFIELD		HEFED		HEYTOU		HOBONNY	ט
HATHAWAY	B	HEFLIN	B	HEYTO, Stony, Cool	C	HOBSON	C
HATKNOLL		HEGGE		HIARC	č	HOBUCKEN	0
HATLIFF		HEGLAR		HIATHA		HOCAR	
HATMAKER	C	HEIDEL	B	HIBAR	C	HOCKINSON	B/D
HATRANCH	D	HEIGHTS		HIBBARD		HOCKINSO, Moderately Wet	
HATSPRING		HEIL		HIBBING		HOCKLEY	
HATTON	C	HEINSAW	C	HIBLER	C	HOCKLE, Graded	D
HATU		HEINZ		HIBRITEN		HODEDO	
HATUR		HEISLER		HIBSAW		HODENPYL	
HATWAI	C	HEISSPITZ	D	HICKEY	B	HODGSON	C
HAUBSTADT		HEITT		HICKIWAN		HOEHNE	
HAUG		HEIZER		HICKS		HOFFMAN	
HAUGAN	B	HELEMANO	B	HICKSVILLE	C	HOFFMANVILLE	C
HAUGEN		HELLGATE		HICORIA		HOFSTAD	
HAULINGS		HELLMAN		HICOTA		HOGADERO	
HAUZ		HELLWIG	C/D	HIDATSA		HOGAN	
HAVA							
		HELM		HIDEAWAY		HOGCREEK	
HAVANA		HELMER	C	HIDEWOOD	B/D	HOGENSBORG	D
HAVELOCK		HELMET		HIDVALLE		HOGHEAVEN	
HAVEN		HELMICK		HIGGINS		HOGMALAT	
HAVENSNECK	B	HELVETIA	C	HIGGINSVILLE	C	HOGRANCH	B
HAVERDAD		HELY		HIGH GAP		HOGRIS	
HAVERHILL	D	HEMAN	D	HIGHBANK	C	HOGRIS, Extremely Cobbly	D
HAVERMOM		HEMCROSS		HIGHCAMP		HOH	
HAVERSID		HEMINGFORD		HIGHCREEK		HOHMANN	
HAVERTEL	B	HEMPHILL	D	HIGHHORN	B	HOKO	C
HAVILAND		HEMPSTEAD		HIGHLAND		HOLBORN	
11/2 VILAIND	Б	TILIVIE STEAD	D	THIGHTLAND	D	LIOLDONIA	U

HOLCOMB	D	HOREBC	HUGUSTOND	IDWAY B
HOLDEN		HORNBECKD	HUICHICAC/D	IFFGULCHD
HOLDERMAN	C	HORNELLD	HUILEPASSB	IFTEENB
HOLDERTON		HORNELLSVILLED	HULDAD	IGERTC
HOLDINGFORD		HORNER A	HULDERMAND	IGNORDC
HOLINROCK		HORNER, Graavelly Substratum . B	HULETTB	IGUALDADD
HOLKAT HOLLACE		HORNEYBUCKC	HULLIGANB/D HULLSC	IHLENB
HOLLANDLAKE		HORNICKC	HULLSGULCHB	IJAM D IKE D
HOLLISTER		HORNITOSD	HULLTB	IKITD
HOLLOMEX		HORNSBOROD	HULUAD	IKSGIZAD
HOLLOW		HORNSBYC	HUMACAOB	ILACHETOMELD
HOLLOWTREE		HORNSVILLEC	HUMATASC	ILDECARBB
HOLLY	B/D	HORROCKSC	HUMBARGERB	ILIILID
HOLLYBROOK		HORSECAMPD	HUMBARSPRINGSB	ILLABOTC
HOLLYWOOD		HORSEHEADA	HUMBUGB	ILLAHEE B
HOLMAN		HORSEPRAIRIEB	HUMEC	ILLERB
HOLMOLUST		HORSLEYD	HUMMINGTONC	ILLIANOD
HOLMQUIST HOLMZIE		HORTONVILLE, Limestone Substratum	HUMSKEL C HUNCHBACK D	ILLITO D
HOLOHAN		HORTONVILLEC	HUNDRAWD	ILWACOB
HOLOMUA		HOSFORDD	HUNGRYC	IMBLERB
HOLSINE		HOSKAYC	HUNGRYGULCHB	IMLAYD
HOLSTEIN		HOSLEYD	HUNSINGERB	IMMANUELC
HOLSTON		HOSMERC	HUNTDALEB	IMMIANTC
HOLT	B	HOSPAHD	HUNTERSB	IMMOKALEED
HOLTER		HOSSICKB	HUNTERSCOVEC	IMNAHAC
HOLTVILLE		HOSTA, Loamy SurfaceC	HUNTIMERC	INCELLD
HOMA		HOSTAD	HUNTLEYD	INCHELIUMB
HOMELAKE		HOSTAGEB	HUNTMOUNTB	INCY A
HOMELAND		HOT LAKEC	HUNTROCKB	INDARTC
HOMEN		HOTAWB	HUNTSBURGD	INDEXA
HOMESTEAD		HOTCREEKD	HUOTB	INDIAHOMAD
HOMEWOOD		HOTELC	HURDSB	INDIANOLA A
HOMME, Moderately Wet		HOTSPOTD	HURLBUTC	INDIANTOWN
HOMME		HOTSPRINGSB	HURLOCK B/D	INDIANTOWN D
HONAUNAU		HOTTIS D HOUCKTOWNB	HURRYBACKB	INDLETOND
HONDEE		HOUGHTOND	HUSKAD	INEZD
HONEYCREEK		HOUKC	HUSSAB/C	INFERNOC
HONEYDEW		HOULAB	HUSSELLB	INGALLS B
HONEYVILLE		HOULKAD	HUSSEYB	INGALES
HONGA		HOURGLASSC	HUSTONTOWNC	INGERSOLL B
HONLAK		HOUSEROCKD	HUSUMB	INGLEDOVE
HONOBIA		HOUSTENADERD	HUTCHINSONC	INGLESIDE
HONOKAA		HOUSTOND	HUTSONB	INKOM
HONOLUA		HOUSTON BLACKD	HUTTD	INKOSRD
HONOMANU		HOVDED	HUXLEYC	INLOWC
HONONEGAH	A	HOVEN D	HUYSINKB	INMACHUKD
HONOULIULI	D	HOVERTD	HYALLC	INPENDENCEB
HONTAS		HOWARD A	HYANNISB	INSAKD
HONTOON		HOWARDSVILLE A	HYASB	INSIDERTD
HONUAULU		HOWCREEC	HYATTSC	INSKIPC
HOOD		HOWEC	HYATTSTOWND	INVERNESSB
HOOD CANAL		HOWELLC	HYATTVILLEC	INVERSHIELC
HOODVIEW		HOWMEADOWSD	HYDABURGD	IOB
HOOGDAL		HOWSONC	HYDEB/D	IOGOONB
HOOKSAN HOOKTON		HOXIED	HYDELANDB/D HYDROC	IONB
HOOLEHUA		HOYLETON, Mines SinksD	HYEB	IONA B
HOOLY		HOZHOD	HYLOCD	IONA B
HOOP		HOZOMEEND	HYNESB	IOTAD
HOOPAL		HUACHUCAD	HYPRAIRIEC	IOTLA
HOOPPOLE	B/D	HUALAPAIC	HYSHAMD	IPANOC
HOOSAN		HUBB	HYSHOTD	IPAVA B
HOOSEGOW	B	HUBBELLB	HYZEND	IPISHC
HOOSIERVILLE		HUBERLYD	IAOB	IPSOOT A
HOOSKANADEN		HUBERTB	IARGOC	IRAAN B
HOOTEN		HUBLERSBURGB	IBERIAD	IRAKD
HOOTENTOWN		HUCKLEBERRY, High Rainfall B	IBEXB	IRASBURGC
HOOTER		HUCKLEBERRYC	IBOLAC	IRENEB
HOOVERS		HUCKRIDGEB	ICACOSD	IRISB
HOOVERTON HOPBURN		HUDDLEB	ICARIAD	IRMA B
HOPCO		HUDNUT B HUDSPETHC	ICESLEW. Cool	IRON BLOSSOMC
HOPDRAW		HUECOC	ICESLEW, CoolD	IRONAD
HOPKINS		HUEL A	ICHBODD	IRONBRIDGED
HOPLAND		HUEYD	ICHETUCKNEED	IRONGITY B
HOPLEY		HUFFLINGD	IDABELB	IRONDALEC
HOPPERS		HUFFMANB	IDAHOMEB	IRONDYKEB
HOPPS		HUFFTONB	IDAMONTB	IRONGATEB
HOPPSWELL			IDEEC	IRONGOLD
	B	HUFMAND		
HUQUIAW				
HOQUIAM HORCADO	B	HUGGINS C HUGHES B	IDLEWILD	IRONRUN B
	B A	HUGGINSC	IDLEWILDC/D	IRONRUNB

	_		_		_	
IRRAWADDY		JARDAL		JOLAN		KAIMU A
IRRIGON		JARDIN		JOLIET		KAINALIU
IRVINE		JAREALES		JOLLIES		KAINTUCKE
IRVINGTON	C	JARITA	.С	JONATHAN	B	KAIPOIOIE
ISAAC	C	JAROSO	. B	JONCA	C	KAITOE
ISCHUA	B	JARRE	. B	JONDA	B	KAIWIKIA
ISELLA		JARRON		JONES		KALAEE
ISHI PISHI		JASCO		JONESBORO		KALALOCH
ISHMAEL		JASSEEK		JONESVILLE		KALAMA
ISIDOR		JAUCAS		JONLAKE		KALAMAZOO
ISKNAT		JAURIGA		JONNIC		KALAMBACH
ISLAMORADA		JAWBONE		JONPOL		KALAPAE
ISLAND		JAY		JOPPA		KALAUPAPA
ISLANDLAKE		JAYAR		JORDY		KALEETANE
ISLANDPARK		JAYEL		JORGE	B	KALEETAN, Till Substratum C
ISLES	A/D	JAYHAWKER	.D	JORGENSEN	B	KALIFONSKY
ISLOTE	В	JAYNES		JORN		KALIGA B/D
ISMAY		JAYPE		JORNAHAM		KALIHI
ISTOKPOGA		JAYPEAK		JORSTED		KALLIO
ITANO		JAYWI		JOSHUA		KALMARVILLE B/D
ITASCA		JEAGER		JOSIE		KALOC
ITAT		JEALOUSY		JOSLIN		KALOKO
ITHACA	C	JEAN LAKE	. B	JOSSET	C	KALONAC
ITMANN	C	JEANERETTE	.D	JOTAVA		KALSIN
ITSWOOT		JEBE		JOURDANTON		KAMAKOAE
IUKA		JEBO		JOVEATCH		KAMAOLE
IULUS		JEBO		JOVINE		KAMAY
IVA		JEDBURG		JOWEC		KAMELA
IVAN		JEDDOC		JOYCE		KAMIEE
IVANELL	C	JEFFERS B	/D	JUANA DIAZ		KAMM E
IVANHOE	D	JEFFLAKE	.С	JUANDEFUCA	B	KAMPVILLEC
IVANPATCH		JEKLEY		JUBILEE		KANACKEY
IVER		JELLICO		JUBIN		KANAKA
IVERSEN		JEMERSON		JUDA		KANARANZI
IVES		JENA		JUDD		KANASKATE
IVIE		JENERA		JUDGETOWN		KANCANE
IVORY	C	JENEVA	. B	JUDICE		KANDALY A
IWAIT	B	JENKINS	. A	JUG	B	KANDIKE
IWELA	B	JENKINSON	.D	JUGHANDLE	В	KANDIYOHIC/D
IWICA		JENKS		JUGSON		KANEBREAKC
IXIAN		JENOR		JUGTOWN		KANELOA
IZAGORA		JERAG		JULIN		KANEOHE
IZEE		JERKTAIL		JUMBLE		KANEPUUE
JABU		JEROME		JUMBO		KANER A
JACAGUAS	B	JERUSALEM	. A	JUMPCREEK	C	KANESPRINGS
JACANA	D	JESBEL	.D	JUMPER	C	KANGC
JACEE		JESKE		JUMPMORE		KANGAS
JACINTO		JESSIETOWN		JUMPOFF		KANIKSUE
JACK CREEK		JESSUP		JUNALUSKA		KANKAKEE
JACKLAND		JESTER		JUNCAL		KANORADO
JACKMAN		JETCOP		JUNCOS		KANOTIN A/D
JACKPORT		JETMINE		JUNEBEE		KANTISHNA
JACKPOT	C	JETSTER	.C	JUNGO	B	KANUTCHAN D
JACKSBACK	C	JEVETS	.С	JUNIPERO	B	KANZA
JACKSBORO	D	JEVNE	.C	JUNIUS	C	KAPAAE
JACKSON		JIGSAW	B	JUNQUITOS		KAPAPALAE
JACOBSEN		JILSON		JUNTURA		KAPAPALA. Bedrook Substratum C
JACOBY		JIM		JURVANNAH		KAPLAN
JACONITA						
		JIMBEE		JUSTIN		KAPPES
JACQUITH		JIMBLUFF		KAALUALU		KAPUHIKANI
JACRATZ		JIMCOMLATE		KAB		KARAMIN
JADIS		JIMCREEK		KABEAR		KARANKAWA
JADPOR	B	JIMEK		KABOOM	D	KARBANAC
JAFA	C	JIMENEZ	.С	KACHEMAK	B	KARHEEN
JAGERSON		JIMGREEN		KACHESS		KARLANC
JAGON		JIMLAKE		KACKLEY		KARLO
JAGUEYES		JIMSAGE		KADLETZ		KARLOFF
JAHANT				KADCE1Z		
		JIMTOWN		_	-	KARLSBORG
JAHJO		JIVAS		KAENA		KARLSRUHE
JALMAR		JOBOS		KAFFUR		KARLSTAD
JAM		JOBPEAK	.D	KAFING	B	KARLUK
JAMES CANYON	B/D	JOEBALDY	. B	KAHALUU	D	KARMAE
JAMESTON		JOEBAS		KAHANA		KARNES
JAMESTOWN		JOEMRE		KAHANUI		KARNEY
JANELEW		JOENEY		KAHLOTUS		KAROC
JANESBURG		JOEVAR		KAHMAH		KARPP
JANILE, Bouldery		JOHNS		KAHN		KARS
JANISE, Overblown, Drained		JOHNSBURG C	/D	KAHNEETA	C	KARS/ Loamy Substratum E
JANKOSH	C	JOHNSBUTTE	.С	KAHOLA	B	KARSHNER
JANNEY		JOHNSTON		KAHOOLAWE		KARTAC
JANSITE		JOHNSTOWN		KAHUA		KASEBERG
JANUDE		JOHNSTOWN		KAI		KASHWITNA E
JARAB		JOICE		KAIDERS		KASIANA
JARBIDGE		JOINER		KAIKLI		KASKELA
JARBOE	D	JOKODOWSKI	.D	KAILUA	A	KASOTAC
				1		1

KASPAL	C KENOTRAILC	KINCOA	KLAWATTIC
			KLAYENTC
KASSON		KINDANINAD	1
KATAMA		KINDERC	KLICKIMAD
KATELANA	B KENSALB	KINDIGB	KLICKO B
KATEMCY	C KENSINGTONC	KINDYC	KLIENPETERB
KATHER		KINESAVAC	KLINE, Cobbly B
KATKA			
		KINGCOD	KLINE, ProtectedC
KATLON	C KENTUCKB/D	KINGDONB	KLINGERB
KATPA	B KENUSKYD	KINGFISHERB	KLIPSTEINB
KATSEANES		KINGILEC	KLISKONC
KATULA		KINGINGHAMC	KLONDIKED
KATY		KINGMAND	KLOOQUEHB
KATYBLAY	B KEOTAB	KINGMONTB	KLOOTCHC
KAUDER	D KEOWNSB/D	KINGSD	KLOSSNERD
KAUKAUNA		KINGSBURYD	KLOTEND
KAUPO		KINGSDOWNB	KLUGB
KAUPPI		KINGSFERRY B/D	KLUMP B
KAVON	B KERHAYDENB	KINGSLAND A/D	KLUNA DEEPB
KAWAH	A KERMIT A	KINGSLEYB	KNAPPAB
KAWAIHAE	C KERNANC	KINGSPOINTB	KNAPPTONB
KAWEETA		KINGSRIVER B/D	KNEELANDC
KAWKAWLIN		KINGSTONB	KNEFFC
KAYMINE	C KERRDAMC	KINGTUTD	KNEPC
KAYO	B KERRFIELDC	KINKEADC	KNICKERBOCKER A
KEALIA		KINKEL, GravellyB	KNIFEHILLC
KEANSBURG		KINKEL, Graveny	KNIFFINC
KEARL		KINKORAD	KNIGHT B/D
KEARNSAR		KINLEY B	KNIK B
KEATING	C KERTC	KINMANC	KNIKLIKB
KEAUALALO		KINNEARB	KNIPPAC
KEAUKAHA		KINNICKB	KNOB HILLB
KEAWAKAPU		KINNICKC	KNOBBYD
KEBA		KINOCKITYD	KNOLLE B
KEBLER	B KETTLEBELLYB	KINSMANC	KNOSSD
KECKSROAD	C KETTLEMAN, GravellyB	KINSTON B/D	KNOWLESB
KEDA		KINTAD	KNOWLTONC
KEECHI		KINTONC	
			KNOXB
KEEFA		KINUSTAD	KNOXDALEB
KEEI	C KEVANTONC	KINZEL B	KNULL B
KEEKEE	3 KEVILARB	KINZUAB	KOBARTERC
KEEL		KIOMATIAA	KOCHC/D
KEELDAR		KIOTE	KODAKB
KEELE		KIOUSD	KODAK, NonfloodedC
KEENE	C KEYNER B	KIPERB	KODIAK B
KEENER	B KEYOLE B	KIPLINGD	KODRAC
KEESE		KIPSOND	KOEHLERC
KEETER			KOELEB
		KIRBYVILLEB	
KEEWATIN		KIRKENDALLC	KOERLINGC
KEG	3 KEYWESTD	KIRKLANDD	KOETHERD
KEGEL C/	D KEZAR B	KIRKSEYC	KOFFGOC
KEGLER	C KIANC	KIRKVILLEC	KOGISHD
KEGONSA		KIRLEYC	KOHALAB
KEHAR		KIRVINC	KOHATKD
KEHENA		KIRVIN, Graded D	KOKEEB
KEHOE	B KICKERVILLEB	KISATCHIED	KOKERNOTC
KEIFFER	C KICKINGHORSEB	KISCOVED	KOKO B
KEISER	3 KIDAMIB	KISHWALKD	KOKORUDAB
KEITHVILLE		KISHWAUKEEB	KOKOSINGC
	KIESELC	KISRING C/D	KOLARD
			1102,111
KELL		KISSICKC	KOLBERGC
KELLER		KISTIRNB	KOLEKOLEC
KELLERBUTTE	B KILDORC	KITCARSONB	KOLINC
KELLISON		KITCHEN CREEKB	KOLLUTUKD
KELLOGG		KITID	KOLOAC
KELLOGGS		KITKUND	KOLOBC
KELLY		KITSAPC	KOLOMOKI B
KELSEY		KITSILIB	KOMONDOR B
KELSO	C KILLINGTOND	KITTERLLD	KOMRO A
KELSTRUP		KITTERMANC	KONAD
KELTYS		KITTITAS	KONAWAB
KELVIN		KITTLESONB	KONERTC/D
KEMAH		KITTSONC	KONNAROCKC
KEMAN	B KILOA A	KIYIC	KONNERC/D
KEMMERER		KIZHUYAK, Modeately Wet B	KONOCTI, Stony B
KEMOO		KIZHUYAKD	KONOCTIC
KEMP		KLABERC/D	KONSILB
KENAI		KLACKING A	KONZAD
KENDRICK	A KIMC	KLADNICK A	KOOCHC
KENEFICK		KLADNICK, Stony B	KOOLAUC
KENESAW		KLAHOWYAC	KOONICHA
KENILWORTH		KLAMATHD	KOOSKIAC
KENMOOR		KLANELNEECHENAD	KOOTENAI B
KENNEY	A KIMROSED	KLAPOTB	KOPIED
KENNY LAKE		KLASID	KOPPERLB
KENO		KLAUSC	KOPPES A
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KORNMAN		LA GRANDE		LAMINE		LASVAR	
KOROBAGO		LA POSTA		LAMINGTON	D	LATAH	
KORONIS	B	LA ROSE	B	LAMKIN	B	LATAHCO	D
KORTTY	B	LABELLE	D	LAMOILLE	B	LATANIER	D
KOSETH	B	LABETTE	C	LAMOTTE	В	LATCH	A
KOSMOS		LABKEY		LAMPASAS		LATES	
KOSSE		LABLUE		LANARK		LATEX	
KOSSUTH		LABORCITA		LANCASTER		LATHER	
KOST		LABOU				LATIERRA	
				LANCE			
КОТО		LABRE		LAND		LATIGO	
KOTZMAN		LABSHAFT		LANDAVASO		LATIMER	
KOUNTER	D	LABU	D	LANDCO		LATINA	D
KOURY	B	LABYRINTH	A	LANDINGHAM	B	LATIUM	D
KOYNIK	D	LACERDA	D	LANDMAN		LATONIA	B
KOYOKEE		LACEYCREEK		LANDO		LATOUCHE	
KOYUKTOLIK		LACKSCREEK		LANDUSKY		LATOUR	
KRACKLE		LACLEDE					
				LANEVILLE		LATOURELL	
KRADE		LACONNER		LANEXA		LATRASS	
KRAKON		LACOOCHEE		LANEY		LATTAS	
KRAKOW	B	LACOSTE	C	LANFAIR		LAUBY	B
KRAM	D	LACOTA	B/D	LANGDON	A	LAUDERDALE	D
KRANSKI	B	LACRESCENT	B	LANGELLAIN	D	LAUDERHILL	B/D
KRANZBURG		LACROL		LANGER		LAUER	
KRAUSE		LADERLY		LANGLADE		LAUGENOUR	
KREAMER		LADNER		LANGLESS		LAURAMIE	
KREBS		LADO		LANGLOIS		LAUREL	
KREFT		LADRON		LANGOLA		LAURELWOOD	
KREM		LADUE		LANGSPRING		LAUREN	
KRENKA	B	LADYBIRD	B	LANGSTON	B	LAVALLEE	B
KRESSON		LADYCOMB		LANGWELL		LAVEAGA	
KREYENHAGEN		LADYSMITH		LANIER		LAVELLGA	
KREZA		LAFAYETTE		LANIP		LAVELLGALAVENDER	
KRIER		LAFE		LANKBUSH		LAVENTANA	
KRIEST		LAFOLLETTE		LANOAK		LAVEY	
KROME		LAGITOS		LANONA		LAVINA	
KRON	D	LAGLORIA	B	LANSDOWNE	C	LAVODNAS	C
KROTO	B	LAGO	C	LANTERN	В	LAWAI	B
KRUBATE	В	LAGONOT		LANTIS		LAWEN	
KRUEGER		LAGRANGE		LANTON. Low Rainfall		LAWNDALE	
KRUM		LAGROSS		LANTON, LOW Hairian		LAWNES	
KRUTAR		LAGUNITA		LANTONIA		LAWNWOOD	
KUBE		LAHAINA		LANTRY		LAWRENCE	
KUBLER	C	LAHOGUESS	B	LANTZ	D	LAWRENCEVILLE	C
KUBLI	D	LAHOOD	B	LANYON	C/D	LAWSON	C
KUCKUP	A	LAHRITY	C	LAOLAO	B	LAWVER	B
KUDLAC		LAHTIDA		LAONA		LAX	
KUKAIAU		LAINAND		LAPARITA		LAXTON	
KUKAIAU, Bedrock Substratum		LAIRDSVILLE		LAPHAM		LAYCOCK	
KUKVEY		LAKASH		LAPLATTA		LAYTON	
KULA		LAKASKIA		LAPOINTE		LAZAN	
KULLIT		LAKE		LAPON	D	LAZBUDDIE	D
KULSHAN	C	LAKE, Clayey Surface	C	LAPPANS	A	LE BAR	B
KUNAYOSH	A	LAKE CHARLES	D	LAPWAI	B	LEA	C
KUNCEIDER	Α	LAKEBEDDER		LARA		LEADER	
KUNIA		LAKEFIELD		LARCHMOUNT		LEADORE	
KUNUWEIA		LAKELAND		LARCHPOINT		LEADPOINT	
KUPREANOF		LAKEPARK		LAITOTH OHN!	U		
				LADEO	_		
KUPREANOF, Moderately Wet .	١,			LARES		LEADVALE	
		LAKESHORE		LARIAT	B	LEAF	D
KUREB	A	LAKESHORE	D	LARIAT	B D	LEAFLEAFLAKE	D B
KURK	A C	LAKESHORE	D B	LARIATLARICLARIM	B D B	LEAFLEAFLAKELEAGUE	
	A C	LAKESHORELAKESOLLAKETON	D B C	LARIAT	B D B	LEAFLEAFLAKE	
KURK	A C D	LAKESHORE	D B C	LARIATLARICLARIM	B D B B	LEAFLEAFLAKELEAGUE	D B D
KURKKURO	A C D B	LAKESHORELAKESOLLAKETONLAKEWOOD	B C A	LARIAT	B B B B	LEAFLEAFLAKELEAGUELEAGUEVILLELEAKEY	D B D D D D B/D D
KURKKUROKURSTANKURTENKURTEN	A C D B D	LAKESHORELAKESOL LAKETONLAKEWOOD LAKIN	D B C A	LARIAT	B B B D	LEAFLEAFLAKELEAGUELEAGUEVILLELEAKEYLEAKSVILLE	
KURKKUROKURSTANKURTENKURTH	A C D B D	LAKESHORELAKESOL LAKETONLAKEWOODLAKEWOOD LAKIN LAKOMA	D B C A D	LARIAT	B B B D	LEAFLEAFLAKELEAGUE LEAGUEVILLELEAKEY LEAKSVILLELEAKSVILLE	
KURKKUROKURSTANKURTENKURTENKURTHKURTZ	A D B D	LAKESHORELAKESOL LAKETONLAKEWOOD LAKIN LAKOMA LAKOTA	DBAAD	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE	B B B D D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA	DBDB/DDDD
KURKKUROKURSTANKURTENKURTEHKURTZKUSAL	A D B C C C	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOMA LAKOTA LAKRIDGE	DADD	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROQUE LAROSS	B B B D D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANDER LEANNA LEATHAM	
KURK KURO KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY	A CB DC C C CC	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOMA LAKOTA LAKOTA LAKINGE LALAU	DADDD	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR	B B D B B	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK	
KURKKUROKURSTANKURSTENKURTHKURTZKUSALKUSDRYKUSHNEAHIN	A D B C C C	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LAKIDGE LALAAU LALINDA	D B C A A D C C A B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARRY	B B D D B B B B	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS	D B D D D C C C B
KURK	ADDDDDD	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOMA LAKOTA LAKRIDGE LALAU LALINDA LALINDA LALOS	D B C A D C A B B B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARRY LARTON	B B D D B D B C/D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERS	D B D D D C C C B B B B B
KURKKUROKURSTANKURSTENKURTHKURTZKUSALKUSDRYKUSHNEAHIN	ADDDDDD	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LAKIDGE LALAAU LALINDA	D B C A D C A B B B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARRY	B B D D B D B C/D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS	D B D D D C C C B B B B B
KURK	ADBDCCDD	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOMA LAKOTA LAKRIDGE LALAU LALINDA LALINDA LALOS	D B C A D C A B B D D	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARRY LARTON LARUE	B B D D B B C/D B	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERS	D B B/D D C C C B B B C C
KURK KURO KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY KUSHNEAHIN KUSKOKWIM KUSLINA	ADB D C C C CD DD	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOMA LAKOTA LAKRIDGE LALAAU LALINDA LALINDA LAM	D B C A A D D C A B B D C	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARRY LARTON LARTON LARUE LARUSH	BBBBBBBBB	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERBARK LEATHERS LEATHERWOD LEAVENWORTH LEBAM	D B B D D C C C C B B B B B B B B B B B
KURK	ADBD C C CDDDDD	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LAKIDGE LALAAU LALINDA LALOS LAM LAM LAM LAMA LAMA	D B C A A D D C A B B D C C B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARTON LARUE LARUE LARUE LARUSH LARUSH LARIC	BBBBBBBBB	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERWOOD LEAVENWORTH LEBAM LEBAU	D B B D C C C C B B B D D C C D D D D D
KURK KURO KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY KUSHNEAHIN KUSKOKWIM KUSLINAD KUSSHI KUTLER	A	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKRIDGE LALAAU LALINDA LALOS LAM LAMA LAMA LAMA LAMA LAMA LAMA LAMA	D B C A A D D C A B B D C B C C C B C C	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARY LARTON LARUE LARUSH LARUSH LARUSH LARUSH LARUSH LARWOOD	B D B B D B B C A A B D C	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERWOOD LEAVENWORTH LEBAM LEBEAU LEBEC	D B B B C C B B B B B B B B B B B B B B
KURK KURO KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY KUSHNEAHIN KUSKOKWIM KUSLINA KUSSHI KUSHI	ABBCDBCDDDDDDDDD	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKRIDGE LALAAU LALINDA LALOS LAM LAMA LAMA LAMA LAMA LAMA LAMA LAMA	D B C A A D D C A B B D C B C B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARRY LARTON LARUE LARUE LARUSH LARVIE LARVIE LARVIE LARVIE LARVOOD LAS FLORES	B D B B D D B B C A A B D C D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERBOD LEAVENWORTH LEBAM LEBAM LEBEAU LEBEC LEBRON	D B B D D C C B B B B B B B B B B B B B
KURK KURO KURSTAN KURTEN KURTEN KURTZ KUSAL KUSDRY KUSHNEAHIN KUSKOKWIM KUSLINA KUSSHI KUTLER KUVASZ KUYASZ	ABBC C C C D D D D B C C C A	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOMA LAKOTA LAKRIDGE LALAAU LALINDA LALOS LAM LAMA LAMA LAMADRE LAMANGA LAMANGA LAMAR LAMARSH	D B C A A D D C A B B D C B C B C	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARTON LARTON LARUE LARUE LARUSH LARWOOD LAS FLORES LAS LARICS LAS LARES LARUSH LARUSH LARUSH LARUSH LARUSH LARUSS LAS LOCAS	B D B B D D B B C A A B D C D B	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERWOOD LEAVENWORTH LEBEAU LEBEC LEBRON LECKMAN	D B B D C C C C B B B B C D B B B B B B
KURK	A CBBC C C C D D D D B C C C A B	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LAKIDGE LALANU LALINDA LALOS LAM LAMA LAMA LAMA LAMA LAMARSH LAMARSH LAMARSOL	D B C A A D D C A B B D C B C B C C C C C C C C C C C C C	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARY LARTON LARUE LARUSH LARUSH LARWOOD LAS FLORES LAS VEGAS	B D B B D D B B D C D B D D C D B D D C D B D D C D B D D C D B D D C D B D D C D B D D C D B D D D C D B D D D D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEAVENWORTH LEBAM LEBEC LEBRON LECKMAN LECKMAN LECKMAN	D B B B B B B B B B B B B B B B B B B B
KURK KURO KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY KUSHNEAHIN KUSLINA KUSLINAD KUSSHI KUTLER KUVASZ KUY KUYAKINA	A C D B D C C C C C D D D D B C C A B B	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKRIDGE LALAU LALINDA LALOS LAM LAMA LAMA LAMA LAMABARE LAMARSH LAMARSH LAMARSH LAMARSH LAMARSH LAMARSH LAMATINE	D B C A A A D D C C A B B D C C B C C C D	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARY LARTON LARUE LARUSH LARUSH LARUSH LARUSH LARUSH LARWOOD LAS FLORES LAS LUCAS LAS LUCAS LAS AC	B B B D D B B B D C D B D C D B D A	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERWOOD LEAVENWORTH LEBAM LEBEAU LEBEC LEBRON LECKMAN LECOMA	D B B B B B B B B B B B B B B B D D
KURK	A C D B D C C C C C D D D D B C C A B B	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LAKIDGE LALANU LALINDA LALOS LAM LAMA LAMA LAMA LAMA LAMARSH LAMARSH LAMARSOL	D B C A A A D D C C A B B D C C B C C C D	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARY LARTON LARUE LARUSH LARUSH LARWOOD LAS FLORES LAS VEGAS	B B B D D B B B D C D B D C D B D A	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEAVENWORTH LEBAM LEBEC LEBRON LECKMAN LECKMAN LECKMAN	D B B B B B B B B B B B B B B B D D
KURK KURO KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY KUSHNEAHIN KUSLINA KUSLINAD KUSSHI KUTLER KUVASZ KUY KUYAKINA	ACDBDCCCCDDDDBCCABBBB	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LAKIDGE LALAAU LALINDA LALOS LAM LAMA LAMA LAMADRE LAMADRE LAMANGA LAMARSH LAMARTINE LAMAWA	D B C A A D D C A B B D C B C C D B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARY LARTON LARUE LARUE LARUSH LARVIE LARV	B D B B D D B B D A A B D C D B D A D D B D A D D B D A D D B D A D D B D A D D D B D A D D D B D A D D D D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERBOD LEAVENWORTH LEBAM LEBEAU LEBEC LEBRON LECKMAN LECKMAN LECOMA	D B B B B B B B B B B B B B B B B B B B
KURK KURO KURSTAN KURSTAN KURTEN KURTH KURTZ KUSAL KUSDRY KUSHNEAHIN KUSKOKWIM KUSLINA KUSLINAD KUSSHI KUTLER KUVASZ KUY KVICHAK KWAKINA KWAKINA KWAKINA KWATAHEIN KWEO	ACDBDCCCCCDDDDBCCABBBA	LAKESHORE LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKOTA LALINDA LALINDA LALOS LAMA LAMADRE LAMANGA LAMANGA LAMARSH LAMARTINE LAMATH LAMAWA LAMBERJACK	D B C A A D D C C A B B D C C B C C D B B B B B B B B B B B	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARTON LARUE LARUSH LARWOOD LAS FLORES LAS VEGAS LAS VEGAS LASAC LASAC LASIM	B D B B D A A B D C D B D A D D	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEATHERWOOD LEAVENWORTH LEBEC LEBEC LEBRON LECKMAN LECOMA LECCAG LECRAG LEDGER	D B B D C C C B B B B D D B B B B D D B B B B
KURK KURO KURSTAN KURTEN KURTEN KURTL KUSAL KUSAL KUSHNEAHIN KUSKOKWIM KUSLINAD KUSLINAD KUSSHI KUTLER KUVASZ KUY KVICHAK KWAKINA KWATAHEIN KWEO KYBURZ	ACDBDCCCCDDDDBCCABBBAB	LAKESHORE LAKESOL LAKESOL LAKETON LAKEWOOD LAKIN LAKOMA LAKOTA LAKRIDGE LALAAU LALINDA LALOS LAM LAMA LAMA LAMA LAMA LAMARE LAMARSH LAMARTINE LAMAWA LAMAWA LAMAWA LAMAWA LAMAWA LAMAWA LAMAWA LAMAWA LAMARSH LAMARTINE	D B C A A A D D C C A B B D C B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C C D B B C D C D	LARIAT LARIC LARIM LARIMER LARIOSCAMP LARMINE LAROQUE LAROSE LAROSS LARPENTEUR LARY LARTON LARUE LARUSH LARWOOD LAS FLORES LAS VEGAS LAS VEGAS LASALLE LASALLE LASAUSES LASIMM	B D B B D D B B D A D D C D B D A D D C	LEAF LEAFLAKE LEAGUE LEAGUEVILLE LEAKEY LEAKSVILLE LEANDER LEANNA LEATHAM LEATHERBARK LEATHERS LEAVENWORTH LEBAM LEBEC LEBRON LECKMAN LECOMA LECRAG LEDFORD LEDGER LEDGER LEDGER LEDGER LEDGUE LEBGUE LEBGUE LEBCON LECKMAN LECRAG LEDFORD LEDGER LEDGER	D B B B B B B B B B B B B B B B B B B B
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	Δ	LIBERALD	LITROD	LONELYC
LEELANAU		LIBERTYB	LITTLE HORNC	LONELYB
LEEMORRIS		LIBRARYD	LITTLEAXEB	LONEOAKC
LEEN		LIBUSEC	LITTLEBALDB	LONEPINEB
LEEPER	D	LICKB	LITTLEFAWNC	LONERANCHB
LEERAY		LICKCREEKB	LITTLEFIRC	LONESOME B
LEERCO		LICKINGC	LITTLEHATB	LONEWOODB
LEESVILLE		LICKSKILLETC	LITTLEJOHNC	LONGBAR B
LEGALL		LIDAB	LITTLEMOB	LONGBELL A
LEGAULT		LIDAN C LIDDELL B/D	LITTLEMUDC LITTLEREDB	LONGBILLYD
LEIDIG		LIDDIEVILLEB	LITTLESALMON A	LONGHIKEC
LEILEHUA		LIDOSB	LITTLESANDB	LONGHOPE, Ponded
LEISY		LIEBERC	LITTSANC	LONGJOHNB
LEITER		LIEBERMANB	LIVAN A	LONGLOISB
LEMAH	A	LIESNOI D	LIVCOD	LONGMAREC
LEMBOS		LIGAIC	LIVENGOODB	LONGMARSHD
LEMCAVE		LIGHTNINGD	LIVERMOREB	LONGMONTC
LEMCO		LIGNUMC	LIVIAD	LONGORTB
LEMETA		LIGNUMVITAED	LIVONAB	LONGPEN B
LEMHI		LIGOCKIC	LIZARDHEADB	LONGPINED
LEMING		LIGURTAB	LIZARDLAKED	LONGSB
LEMM		LIHUEB	LIZE B LIZZIE B	LONGSHOAL D LONGSIDING B
LEMMON		LILAH A LILBERT B	LIZZYSPRINGSC	LONGVALB
LEMONEX		LILBOURNB	LLANOSC	LONGVALC
LEMOORE		LILLEB	LOARCB	LONIGAN, Cobbly Substratum C
LEMOYNE		LILLINGSB	LOBATB	LONJONB
LEMPIRA		LILLINGTONB	LOBEISNERB	LONNIEBEE B
LEMROI		LILLISD	LOBERTB	LONOKE
LENA	. A/D	LILLIWAUPB	LOBO D	LONON B
LENACREEK	B	LILLYLANDSC	LOBURND	LONTID
LENAPAH		LILSHEEPB	LOCEYC	LOONLAKEB
LENAPE		LILSNAKEC	LOCHLOOSAC	LOONYC
LENAWEE		LILTENC	LOCHSAB	LOPENO A
LENBERG		LILYLAKED	LOCKDOWND	LOPERB
LENGBY		LIMC	LOCKEB	LOPEZD
LENNEP		LIMBERJIMB	LOCKERBYD	LOPWASHB
LENOIR		LIMECREEKB	LOCKHARTB	LORACKB
LENORAH		LIMINGAA	LOCKNEYD	LORADALEC
LENZLO LENZWHEEL		LIMKINGB	LOCKPORT D LOCKSPRINGS C	LORAY A LOREAUVILLEC
LEOLA		LIMONESB	LOCKTONB	LORENZOB
LEONARD		LIMPYD	LOCOC	LORHUNTD
LEONARDO		LINCO	LOCOBILLB	LORING
LEONARDTOWN		LINDALEC	LOCUSTC	LORMAN
LEOPOLD		LINDELLC	LODALLEYD	LORRAINEB
LEPNER		LINDENB	LODEB	LOS ALAMOSC
LEQUIEU	D	LINDERB	LODICOD	LOS OSOSC
LEQUIRE		LINDQUIST A	LOEBC	LOS TANOSC
LEROUX		LINDSTROMB	LOEMSTONEC	LOSANTVILLEC
		LINDYC	LOFFTUSC	LOSEGATEC
LEROY	A	LINGANOREB	LOFTON D	LOSLOBOSB
LEROY	_			1.0011100
LEROY LESBUT LESIER		LINGUAD	LOGDELLB	LOSMARIOSC
LEROY LESBUT LESIER LESON	D	LINHART A	LOGDELLB LOGGERTB	LOSTBASINC
LEROY	D C	LINHART A LININGER B	LOGDELL	LOSTBASIN C LOSTCOVE B
LEROY	D C B	LINHART A LININGER B LINKLETTER C	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C	LOSTBASIN C LOSTCOVE B LOSTCREEK B
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA	D C B D	LINHART A LININGER B LINKLETTER C LINKSTERLY B	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D	LOSTBASIN C LOSTCOVE B LOSTCREEK B LOSTHORSE D
LEROY	D B D	LINHART A LININGER B LINKLETTER C	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C	LOSTBASIN C LOSTCOVE B LOSTCREEK B
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LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETOR LETOR LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENGOOD LEVENMILE LEVRETT LEVIK LEVIK LEVY	D B D B B B B C B	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOTEX D LOTHAIR C LOTT C LOUDON C LOUDON C LOUDONVILLE C LOUGHBORO C
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LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETRI LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENMILE LEVERETT LEVNIK LEVY LEVYVILLE	D C B D A B B B D A B B D A D B D B D B D B D	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMALTA D	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOTUS C LOUDON C LOUDON C LOUDONVILLE C LOUELLA B LOUGHBORO C LOUELLA B LOUGHBORO C LOUICREEK B
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETTIA LEVAC LEVAC LEVASSEUR LEVENGOOD LEVENMILE LEVERETT LEVNIK LEVY LEVY LEVU	DBBBBBBBBBDBDBDBB	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMALTA D LOMART B	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOU B LOUDON C LOUDONVILLE C LOUGHBORO C LOUGEREEK B LOUIN D
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETRI LETTIA LEVELTON LEVENGOOD LEVENGOOD LEVENMILE LEVENT LEVIK LEVYVILLE LEWDLAC LEWBLEN LEW	D B C B C B B B B B C B C B C B C B C B D B D B D D D	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMALTA D LOMART B LOMASA B LOMBARD C LOMETA C	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOTUS C LOU B LOUDON C LOUDON C LOUDON C LOUGHBORO C LOUELLA B LOUGHBORO C LOUIECREEK B LOUIN D LOUISA B LOUIN D LOUISA B
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETTIA LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENMILE LEVERETT LEVNIK LEVY LEVY LEWDLAC LEWBLEN LEWHAND LEWBBURG LEWISSUR	D C B C A B B B B D B D B D B D B D B D D D D D	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKERN C LOLALITA B LOLEKAA B LOLETA C LOLON B LOLOPEAK A LOMAKI B LOMALTA D LOMART B LOMBARD C LOMETA C LOMIL D	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOU B LOUDON C LOUDONVILLE C LOUBLIA B LOUGHBORO C LOUGHBORO C LOUGIECREEK B LOUIN D LOUISA B LOURIS B LOURIS B LOURIS B LOURIS C LOURIS C LOUIS C LOUGHBORO C LOUGHBORO C LOUGHBORO C LOUGHBORO C LOUGISA B LOURIS B
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETON LETON LETOR LETON LETOR LETIA LEVAC LEVACSEUR LEVENGOOD LEVENMILE LEVENMILE LEVY LEVY LEVY LEVY LEVYVILLE LEWBLEN LEWBSBURG LEWISBURG LEWISBURG	D B C B	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMALTA D LOMART B LOMBARD C LOMILL D LOMIRA B	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTTA C LOTT C LOU B LOUDON C LOUDONVILLE C LOUBLIA B LOUDON C LOUGELBA B LOUGHBORO C LOUGIECREEK B LOUISA B LOURIS B LOUSCOT C LOVEJOY C
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETRI LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENMILE LEVERTT LEVINIK LEVERTT LEVYILLE LEWDLAC LEWBLEN LEWBSBURG LEWISVILLE LEWKALB	D C C C C C C C C C C C C C C C C C C C	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLEKAA B LOLOFETA C LOLOPEAK A LOMAKI B LOMALTA D LOMAT B LOMAX B LOMETA C LOMIL D LOMIRA B LOMIRA B	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOTUS C LOUDON C LOUDONVILLE C LOUDELLA B LOUDELLA B LOUGHBORO C LOUELLA B LOUGHBORO C LOUISA B LOUISA B LOUISA B LOUISA B LOUISA B LOUSCOT C LOVEDALE B LOVEDALE B LOVEDALE B LOVELOY C LOVELACE B
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETTIA LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENGOOD LEVENMILE LEVENT LEVY LEVY LEVY LEWULE LEWDLAC LEWBLEN LEWBSURG LEWISVILLE LEWNOT	D B C B C B B B B B C B C B D B B D B	LINHART A LININGER B LINKLETTER C LINKSTERLY B LINLITHGO B LINNE C LINNEUS B LINO A LINPEAK B LINDEAK B LINO B LINFEAK B LINSLAW D LINTON B LINFEAK B LINSLAW D LINTON B LINFEAD B LIONHEAD C LIFE D LIFE D LIFE B LITAG B LITCHY C LITEN A LITEN A LITEN TIII Substratum B LITHEE C	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMOND B LOMIRA B LOMOND B LOMPICO B	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOTUS C LOU B LOUDON C LOUDONVILLE C LOUELLA B LOUGHBORO C LOUELLA B LOUGHBORO C LOUISC B LOUIN D LOUISC B LOUIN D LOUISC B LOUIN D LOUISC B LOVELACE B LOVELACE B LOVELACE B
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETTIA LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENMILE LEVERETT LEVNIK LEVY LEVYVILLE LEWDLAC LEWBLEN LEWHAND LEWHAND LEWISBURG LEWISBURG LEWISBURG LEWKALB LEWKALB LEWKALB LEWMOT LEXON	D B D B B B B B B D B D B D B D B D B D B D B D B D B D B D B B D B	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C COGHILL, Thick Solum D LOGSDEN B LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKOSEE B/D LOALITA B LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMART B LOMART B LOMBARD C LOMETA C LOMIL D LOMIRA B LOMOND B LONCAN C	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOU B LOUDON C LOUDONVILLE C LOUELLA B LOUGHBORO C LOUGEREK B LOUISA B LOURIS B LOURIS B LOURIS B LOURIS C LOUIS C LOUELLA B LOUGHBORO C
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETRI LETTIA LEVAC LEVASSEUR LEVELTON LEVELTON LEVENGOOD LEVENMILE LEVERETT LEVIK LEVY LEVYVILLE LEWDLAC LEWDLAC LEWBAND LEWBSURG LEWBOND LEWNOT LEXINGTON LEXTON	DC B D C A D B B C D D C B B C C D D B D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C B B C C D D C C C D C C C C	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C LOGHILL, Thick Solum D LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKERN C LOKOSEE B/D LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMALTA D LOMART B LOMBARD C COMILL D LOMIRA B LOMOND B LONCAN C LONDO C	LOSTBASIN
LEROY LESBUT LESIER LESON LESPATE LESWILL LETAVARIA LETHENT LETNEY LETON LETORT LETTIA LETTIA LEVAC LEVASSEUR LEVELTON LEVENGOOD LEVENMILE LEVERETT LEVNIK LEVY LEVYVILLE LEWDLAC LEWBLEN LEWHAND LEWHAND LEWISBURG LEWISBURG LEWISBURG LEWKALB LEWKALB LEWKALB LEWMOT LEXON	DC B D B D B B D B B C D B B C D B B C D B B C D B B C D B B C B B C B B B B B B B B B B B B B B B B	LINHART	LOGDELL B LOGGERT B LOGHILL B LOGHILL, Very Deep C COGHILL, Thick Solum D LOGSDEN B LOGSDEN B LOGSPRINGS C LOHSMAN D LOIRE B LOKEN C LOKOSEE B/D LOALITA B LOLALITA B LOLEKAA B LOLETA C LOLITE D LOLON B LOLOPEAK A LOMAKI B LOMART B LOMART B LOMBARD C LOMETA C LOMIL D LOMIRA B LOMOND B LONCAN C	LOSTBASIN C LOSTCOVE B LOSTCOVE B LOSTCREEK B LOSTHORSE D LOSTINE B LOSTPOINT D LOSTSPRING B LOSTVALLEY D LOSTWELLS B/C LOTEX D LOTHAIR C LOTT C LOU B LOUDON C LOUDONVILLE C LOUELLA B LOUGHBORO C LOUGEREK B LOUISA B LOURIS B LOURIS B LOURIS B LOURIS C LOUIS C LOUELLA B LOUGHBORO C

LOVETT		LYNXCREEK		MALLOPASS		MARIMEL	
LOVLINE	C	LYONMAN	B	MALMESA	D	MARINA	B
LOWASSIE	D	LYRA	D	MALMESBURY	C	MARINE	C
LOWDER	C	LYSTAIR	B	MALMO		MARION	D
LOWE		LYTELL		MALO	B	MARIOSA	D
LOWERBLUFF		LYTLE		MALONEY		MARISCAL	
LOWERCREEK		LYX		MALOTERRE		MARJANE	
LOWLEIN		MABANK		MALSTROM		MARKER	
LOWNDES		MABEN		MALTESE		MARKES	
LOWRY	B	MABI		MAMALA		MARKESAN	B
LOWS	B/D	MACAREENO	C	MANADA	C	MARKEY	D
LOWVILLE	B	MACE	B	MANAHAWKIN		MARKLAKE	
LOX		MACEDONIA		MANANA		MARKLEPASS	
LOYAL		MACHETE		MANARD		MARKSBUTTE	
		MACHIAS					
LOYALTON				MANARY		MARKTON	
LOYPLACE		MACHONE		MANASHTASH		MARLA	
LOYSVILLE		MACHUELO		MANASSAS		MARLEY	
LOZANO	B	MACIVER	B	MANATEE	B/D	MARLTON	C
LOZEAU	C	MACKERRICHER	A	MANAWA	C	MARMARTH	C
LUANA	B	MACKINAC	B	MANBURN	D	MARNA	
LUBBOCK		MACKLYN		MANCHESTER		MAROTZ	
LUBKIN		MACKSBURG		MANCO		MARPA	
LUBRECHT		MACLAREN		MANCOS		MARPLEEN	
LUCE		MACOMB		MANDARIN, Flooded		MARQUAND	
LUCEDALE		MACON		MANDARIN		MARQUETTE	
LUCILE	B/C	MACREEING	B	MANDERSON	C	MARQUEZ	C
LUCKENBACH		MACYFLET		MANGUM		MARR	
LUCKETTS		MADAWASKA		MANHATTAN		MARRIOTT	
LUCKIAMUTE		MADDEN		MANI		MARSDEN	
LUCKYFUSE						MARSH	
		MADELIA E		MANIKAN			
LUCKYRICH		MADERBAK		MANILA		MARSHDALE	
LUCY		MADGE		MANITA		MARSHFIELD	
LUDINGTON	B	MADILL	B	MANITOWISH	B	MARSHILL	B
LUFKIN	D	MADONNA	C	MANKOMEN	D	MARSING	B
LUGERT	B	MADRAK	C	MANN	B/D	MARSITE	D
LUGOFF		MADUREZ		MANNINGTON		MART	
LUKE		MAES		MANNIXLEE		MARTEE	
LUKIN		MAGDALENA		MANSIC		MARTEL	
LULA		MAGENS		MANSKER		MARTELLA	
LULUDE, High Rainfall		MAGGIE		MANSON		MARTILLO	
LULUDE, Short FFS	C	MAGGIN	C	MANTECA	C	MARTIN PENA	D
LUMAN	B	MAGIC	D	MANTON	B	MARTINEZ	D
LUMBEE		MAGNET		MANU		MARTINSBURG	
LUMMI		MAGNETIC		MANVEL		MARTINSON	
LUMMUS		MAGOTHA		MANZANITA, Gravelly		MARTINTON	
LUNCH		MAGROC		MANZANITA		MARTIS	
LUNDER		MAGUAYO		MANZANST		MARTY	
LUNDGREN		MAHAFFEY		MAPLE HOLLOW		MARUMSCO	
LUNDLAKE	B/D	MAHAN	C	MAPLECREEK	C	MARVELL	B
LUNSFORD	D	MAHANA	B	MAPLECREST	B	MARVYN	B
LUNT		MAHASKA		MAPLEHILL		MARYSTOWN	
LUPCHO		MAHKONCE		MAPLEHURST		MARYSVILLE	
LUPE		MAHO BAY		MAPLEWOOD		MASARYK	
		MAHOGAN					
LUPINE				MARA		MASCARENAS	
LUPINTO		MAHOOSUC		MARACK		MASCHETAH	
LUPOYOMA		MAHTOWA C	C/D	MARAGUEZ		MASCOTTE	
LUPPINO		MAIDENPEAK	A	MARANA	B	MASCOUTAH	
LUPTON	D	MAILE	A	MARBIE	C	MASEEYA	B
LURAY	C/D	MAILTRAIL	C	MARBLECREEK	B	MASET	B
LURNICK		MAJIK		MARBLEHEAD		MASHAM	
LUSETTI		MAJUBA		MARBLEMOUNT		MASHEL	
LUSK		MAJURO		MARBLEMOUNT, Channery .		MASHULAVILLE	
LUTA		MAKAH		MARBLETOWN		MASKELL	
LUTAK		MAKALAPA		MARCADO		MASON	
LUTHER		MAKAPILI		MARCEL		MASONFORT	
LUTIE		MAKAWAO	B	MARCELINAS	D	MASONTOWN	
LUTZCAN	D	MAKAWELI	B	MARCELLON	C	MASSACK	B/C
LUTZKE		MAKENA		MARCETTA		MASSADONA	
LUVAR		MAKI		MARCLAY		MASSADONA	
LYBRAND		MAKIKI		MARCOLA		MASSANETTA	
LYCURGUS				MARCONI			
		MAKLAK				MASSBACH	
LYDICK		MAL		MARCOU		MASSIE	
LYERLY		MALA		MARCUS		MASTERSON	
LYFORD		MALACHY		MAREMMA		MASTLY	
LYKAL	C	MALAMA		MARENGO	C/D	MATA	C
LYKENS	C	MALARDI		MARESUA		MATAGORDA	
LYKORLY		MALARGO		MARGERUM		MATAMOROS	
LYMANSON		MALAYA		MARGIE		MATANUSKA	
LYNCH		MALBIS		MARGO		MATANZAS	
LYNDEN		MALCOLM		MARIANA		MATAWAN	
LYNN HAVEN		MALDEN		MARIAVILLE		MATCHER	
		MALEZA	B	MARICAO	B	MATECUMBE	D
LYNNBOW							
LYNNBOW LYNNE	B/D	MALHEUR	C	MARIEL	D	MATFIELD	
LYNNBOW	B/D						C
LYNNBOW	B/D C	MALHEUR	D	MARIEL	C	MATFIELD	

MATHERTON, Clay Substratum C	MCCUEC	MECOSTAA	METANOBB
MATHIASB	MCCULIGAND	MEDFRAD	METCALFD
MATHISTONC	MCCULLANB	MEDICI A	METHC
MATHONB	MCCUMBER	MEDICINEB	METIGOSHEB
MATILOB	MCCUNED	MEDLAKEA	METOLIUS B
MATMOND	MCCURDYC	MEDLAVALD	METONGA
MATOOND	MCCUTCHEND	MEDLEYB	METRE
MATOYC	MCDANIELAKE B	MEDOA/D	METSERC
MATQUAW, DryB	MCDERMOTTB	MEDOCC	MEXICOD
MATQUAWC	MCDOLE	MEDRICKB	MEXISPRINGD
MATTAMUSKEETD	MCDONALDSVILLE	MEEGERNOTB	MEXTANK B
MATTAN D	MCDOUGB	MEENON	MEYSTRE B
MATTAPEXC	MCDUFFC	MEGONOTC	MEZZER B
MATTERHORN A	MCELMOD	MEGUINB	MICANOPYC
MATTEXC	MCEWEN	MEHURINC	MICAVILLE
MATTIXB	MCFAINC	MEIKLED	MICCOB/D
MATUNUCKD	MCFARLANDB	MEISSD	MICCOSUKEEC
MAUC	MCFAUL	MEKINOCKD	MICKEYD
MAUDEB	MCGAFFEYB	MELAKWAC	MICROSPEECHD
MAUKEYC	MCGARVEYC	MELBOURNEB	MICROYC
MAUMEED	MCGEHEEC	MELBYB	MIDASC
MAUNABOD	MCGILVERYD	MELDC	MIDCOA
MAUPINC	MCGINNB	MELDERB	MIDDLEBOX
MAURYB	MCGINNISC	MELFAD	MIDDLEBROOKC
MAVCOC	MCGIRKC	MELGAD	
			MIDDLEBURGB
MAVERICKC	MCGOWAN Rainfall	MELHOMESD	MIDDLEBURYB
MAVREESO B	MCGDATH B	MELHORNB	MIDDLEHILLC
MAVREESOB	MCGRAYEY	MELLINGD	MIDDLEWOODB
MAWAEA	MCGRAVEYB	MELLOTTB	MIDELIGHT B
MAWER B	MCGUFFEYD	MELLOWMOONB	MIDESSA B
MAXEYC	MCGUIREB	MELOCHED	MIDFORKB
MAXTONB	MCHANDYD	MELOZAC	MIDO B
MAY B	MCINTOSHC	MELROSEC	MIDPEAKB
MAYBELL A	MCIVORD	MELRUDEC/D	MIDVALEC
MAYBESOD	MCKAMIED	MELTOND	MIERHILLC
MAYBIDD	MCKAYC	MELVINAC	MIERUFB
MAYDOLB	MCKEED	MEMALOOSEC	MIFFLIN B
MAYESD	MCKEETHB	MEMMOTT B	MIGERNB
MAYFLOWERC	MCKENNAC/D	MENAC	MIGUEL D
MAYGALD	MCKENTOND	MENAN B	MIJAY C
MAYGERC	MCKINLEYB	MENARDB	MIKADOC
MAYHEWD	MCKINNEYC	MENBARC	MIKIM, Wet SubstratumC
MAYMEADB	MCKNIGHTB	MENDEBOUREC	MIKIM, Saline-Alkali, WetD
MAYNARD LAKE A	MCLAINC	MENDELTNAD	MILAN B
MAYO B	MCLANGORD	MENDENHALLD	MILBY B
MAYQUEEN B	MCLAURINB	MENDIB	MILCANC
MAYSPRINGSB	MCLEAND	MENDNAD	MILDREDD
MAYSWELLD	MCLENNANC	MENDONB	MILES B
MAYTAGD	MCLEOD B	MENDOTAB	MILITARY B
MAYTOWNC	MCLOUGHLINB	MENFROB	MILKWEEDC
MAYVILLE B	MCMANUSC	MENINIKD	MILL D
MAZARNC	MCMEENC	MENOC	MILLADOREC
MAZASKA	MCMILLAN A	MENOKENC	MILLAN B
MAZDALEB	MCMILLEB	MENOMINB	MILLBOROD
MAZIED	MCMURDIEB	MENTOC	MILLBURNE B
MAZUMAC	MCMURRAYC/D	MENTONEC	MILLDAMC
MCADOOB	MCNABC	MENTZD	MILLECOQUINSC
MCAFEEC	MCNARYD	MENZEL B	MILLERDITCHC
MCALLENB	MCNEELY A	MEQUITHYB	MILLERFLATB
MCALLISTERB	MCNULTYB	MEQUONC	MILLERPOINTB
MCARTHURB	MCNYEB	MER ROUGEB	MILLERSBURGB
MCBAINB	MCPANC	MERCERC	MILLERTOND
MCBIGGAMC	MCQUEENC	MERCEYC	MILLERVILLE A/D
MCCAFFERY A	MCRAEB	MEREDITHB	MILLHEIMC
MCCALEB B	MCRAVENC	MERIMODB	MILLHID
MCCALLY D	MCTAGGARTB	MERINO D	MILLICH D
MCCAMMONC	MCVAR A	MERITB	MILLIGANC
MCCANN B	MCVICKERSC	MERKLEYB	MILLING D
MCCASH B	MCWATT B	MERMENTAUD	MILLOX, NonsalineC
MCCAY B	MEADD	MERNAB	MILLOX, Saline-Sodic D
MCCLANAHAND	MEADOWBANK B	MEROS A	MILLPAWC
MCCLAVEC	MEADOWLAKEC	MERRILLC	MILLPAW, Sandy Subsoil D
MCCLELLAN B	MEADOWPASSC	MERRILLANC	MILLPOCKETD
MCCLOUDC	MEADOWPEAKC	MERRIMAC A	MILLPONDB
MCCLUNGB	MEADOWPORTC	MERRYVILLED	MILLPONDC
MCCLUREC	MEADOWSD	MERSHONC	MILLPOT
MCCOIN	MEADOWVILLEB	MERTONB	MILLRACEB
MCCOLLD	MEANSC	MERWINA/D	MILLROCK A
MCCOMASC	MEARESD	MESABAC	MILLSAPD
MCCONAUGHYB	MEATONC	MESCALC	MILLSDALEC/D
MCCORNICKC	MECAN B	MESCALEROC	MILLSITEB
MCCOYC	MECHANICSBURGC	MESEID	MILLSITE, StonyC
MCCREEB	MECKLENBURGC	MESSERC	MILLSTADT, DrainedC
MCCRORYD	MECKLINGB	MET B	MILLSTONEB
			MILLSTREAMB
MCCROSKETB	MECLO D	METALLAKB	WILLS I REAW

MILLWARD		MODYONC	MOONSTONEC	MOUNTZION	
MILLWOOD		MOEB	MOONVILLEB	MOUZON	
MILNER		MOENKOPICB	MOORETOWN C/D	MOVIEFLAT	
MILTON		MOENTRIAD	MOORHEADC	MOVILLE	
MILVAR		MOFFSPRINGC	MOOSE RIVER, Moderately Wet . C	MOWAKO	
MINA		MOGGD	MOOSE RIVERD	MOWATA	
MINALOOSA		MOGLIAC	MOOSECREEKB	MOWBRAY	
MINCHUMINA	D	MOGOLLONB	MOOSEDC	MOWICH	
MINCO	B	MOGOTEC	MOOSED, SandyD	MOYERS	C
MINDEN	B	MOHAT B	MOOSEFLAT D	MOYINA	D
MINEOLA	A	MOHLER B	MOOSEHEADB	MT. AIRY	A
MINERAL, Dry		MOHOCKENC	MOOSELAKEA/D	MT. HOOD	
MINERAL		MOHONC	MOOSHAUNEEC	MT. OLIVE	
MINERAL MOUNTAIN		MOIESEB	MOPANAD	MT. VERNON	
MINERSVILLE		MOINESC	MOPANGB	MT.ZION	
MINERVA		MOINGONAB	MOPPETB	MTSTERLING	
		MOJOC			
MINESINGER			MOQUAHB	MUCKALEE	
MINGO		MOKAACA	MORADOC	MUDBUZ	
MINGPOINT		MOKENAC	MORALESC	MUDCO	
MINKLER		MOKIAKC	MORANCHB	MUDCREE	
MINKWELL		MOKINSD	MORANVILLE B	MUDLAKE	
MINLITH		MOKULEIAB	MORBENCHB	MUDLAVIA	
MINNEHA		MOLALLA B	MORCLAY D	MUDPOT	
MINNEHAHA	B	MOLAND B	MORCOMC	MUELLER	B
MINNEISKA	B	MOLASD	MORCONICKB	MUES	C
MINNETONKA	C/D	MOLENA A	MOREGLADEB	MUGATU	C
MINNIEPEAK	A	MOLIOND	MOREHEADC	MUGGINS	B
MINNIEVILLE		MOLLCOD	MORETD	MUGHUT	
MINNIMAUD		MOLLICYC	MOREYD	MUIRKIRK	
MINNYE		MOLOKAIB	MORGAMINEC	MUKILTEOC	
MINO		MOLTKEB	MORGANFIELD B	MULA	
MINOA		MOLTONERC	MORGANFIELD	MULAT	
MINOCQUA			MORIAHB	MULDOON	
		MOLTONER, Silty Clay Loam			
MINONG		SubstratumD	MORIAH, Clayey SubsoilC	MULDROW	
MINWELLS		MONA B	MORICALC	MULE	
MIPPON		MONACANC	MORIMOUNTD	MULETT	
MIRABAL		MONACHEB	MORITZC	MULHALL	
MIRACLE		MONAHANSB	MORLINGD	MULHOLLAND	
MIRAGE	C	MONARCH D	MORMON MESAD	MULKEY	C
MIRAMAR	B	MONASTERIOC	MORMOUNTD	MULLERS	D
MIRASOL	B	MONAVILLEB	MORNINGSTARB	MULLICA	C
MIREROCK	D	MONBUTTEC	MOROCCOB	MULLIG	B
MIRES		MONCHAB	MORPH B/D	MULLINS	
MIRES, Stony		MONCISCOA	MORPHEYD	MULLYON	
MISENHEIMER		MONEE	MORRISVILLEC	MULSTAY	
MISERY		MONGLEC	MORSED	MULT	
MISFIRE		MONGOD	MORTENSON	MULTEY	
MISHAK		MONIDAB	MORTIMERD	MULTORPOR	
MISHAKAL		MONIDAC	MORVENC	MULVEY	
MISHAWAKA		MONITORC	MOSBYC	MUMFORD	
MISKOAKI		MONJEAUD	MOSELC	MUNCIE	
MISLATNAH		MONORIDGEC	MOSHANNONB	MUNDALITE	
MISPILLION		MONOXB	MOSHEIMD	MUNDELEIN	
MISSION		MONPARKD	MOSHUPC	MUNDEN	
MISSISQUOI		MONSEC	MOSLANDER, Elevation 7000-9000	MUNDOS	
MISSISSINEWA	C	MONSERATEC	В	MUNDT	C
MISSLER	B	MONSERATE, Thin Surface D	MOSLANDERD	MUNI	D
MISSOULA	D	MONTBORNEC	MOSMAND	MUNSET	D
MISTEGUAY	D	MONTCALM A	MOSOB	MUNSON	D
MITCH		MONTCANB	MOSQUITOD	MUNUSCONG	3/D
MITCHELLPOINT		MONTE CRISTOD	MOSROCD	MURAD	
MITIWANGA		MONTEAGLEB	MOSSBACKB	MURANCH	
MITKOF		MONTEGRANDED	MOSSCREEKB	MURDO	
MITRE		MONTELLOC	MOSSYROCKB	MUREN	
MITRING		MONTEOCHAD	MOSWELLD	MURHUT	
MITTEN		MONTEROSAC	MOTARKB	MURKEN	
MIZEL		MONTESAC	MOTENC	MUROC	
MIZPAH		MONTEVALLOD	MOTLEYB	MURPHILL	
MOANO		MONTEZ B	MOTTB	MURPHY	
MOAPA		MONTEZUMAA	MOTTOD	MURRAY	
MOAULA		MONTIETHB	MOULTRIED	MURRIETA	
MOBATE		MONTONIAB	MOUNDHAVEN A	MURRSTEAD	
MOBEETIE		MONTOSOB	MOUNDPRAIRIE B/D	MURVILLE A	
MOBERG		MONTOURD	MOUNDVILLE A	MUSCATUNE	
MOBL		MONTROSSC	MOUNTADAMSB	MUSE	
MOCA	D	MONTVERDEB/D	MOUNTAINBOYD	MUSGRAVE	D
MOCAREY		MONTWELB	MOUNTAINEERC	MUSGROVE	B
MOCKLEY		MONVERO A	MOUNTAINVILLEC	MUSHEL	
MOCKSVILLE		MONZAC	MOUNTEMILYB	MUSKELLUNGE	
MOCO		MONZINGOB	MOUNTHATB	MUSKOGEE	
MOCTILEME		MOOERSB	MOUNTMCULLD	MUSOFARE	
MODALE		MOOHOOB	MOUNTMEDC	MUSQUIZ	
MODESTY		MOOLACKA	MOUNTOMD	MUSSENTUCHIT	
MODOC		MOONLIGHTB	MOUNTPLEASANTB	MUSSENTUCHIT, Dry	
MODOC	B	MOONSHINED	MOUNTPOORC	MUSSERHILL	. C
		ı	1	ı	

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MUSSEY	B/D	NARUC	NEMOURSC	NICELYTOWN	C
MUSTANG		NASHB	NENNOC	NICHOLFLAT	
MUSTANG					
		NASHMEAD B	NEOLAD	NICHOLIA	
MUSTINKA		NASHVILLEB	NEOPITB	NICHOLSON	
MUSTY	C	NASHWAUKC	NEOTOMAB	NICHOLVILLE	
MUTNALA	B	NASKEAGC	NEOTSUC	NICKEL	C
MUTT	C	NASON, Gravelly B	NEPONSETC	NICKERSON	B
MUTTON		NASONC	NEPTUNEA	NICKIN	
MYATT		NASSD	NERELNAB	NICKLUND	
MYERS		NASSAUC	NERESONB	NICKOLNA	
MYFORD		NASSAWANGOB	NERWOODSB	NICODEMUS	
MYOMA	A	NATAANI B	NESBITTB	NICOLAS	A
MYOMA, Wet	B	NATAGAA	NESDAA	NIDAROS	D
MYRA		NATALD	NESHOBAC	NIDIX	
MYRICK		NATALBANYD	NESIKAB	NIDO	
MYRTLE		NATAPOCB	NESIUS A	NIELSVILLE	
MYRTLECREEK		NATCHEZB	NESKOWINC	NIKAL	
MYSOL		NATCHITOCHESD	NESOD	NIKFUL	
MYSTEN	A	NATHALEC	NESSD	NIKISHKA	B
NAALEHU	B	NATHROPC	NESSELB	NIKLAVAR	D
NAALEHU, Bedrock Substra		NATIC	NESTLEYB	NIKWASI	
NABB		NATIONALB	NETARTSB	NILE	
NABESNA		NATKIMB	NETAWAKAB	NILER	
NABOR		NATOMAS B	NETOMAB	NILRAP	
NACHES		NATROYD	NETRAC A	NIMERICK	
NACHUSA		NATURITAB	NETTLETONC	NIMMO	
NACIMIENTO	C	NAUKATID	NEUBERTB	NIMROD	B
NACLINA		NAUMBURGC	NEVARCC	NIMS	
NACO		NAUVOO B	NEVATB	NINCH	
		NAVACAD			
NACONICHE			NEVENSC	NINEPIPE	
NADA		NAVAND	NEVILLEC	NINEVEH	
NADEAU	B	NAVASAN A	NEVOD	NINIGRET	B
NADRA	D	NAVIDADB	NEVTAHC	NINOT	B
NAEGELIN	D	NAVINAB	NEVUČ	NIOBRARA	
NAGEEZI		NAVOD	NEWALBINB/D	NIOTA	
NAGLEZI		NAWAKWAC		NIPE	
			NEWALLAD		
NAHA		NAWTD	NEWANNAC	NIPINTUCK	
NAHA	C	NAYEC	NEWAUKUMB	NIPISSING	B
NAHUNTA	C	NAYFANC	NEWAYGOB	NIPPENO	D
NAILKEG	В	NAYPEDB	NEWBERNC	NIPSUM	
NAIWA		NAYRIBD	NEWCOD	NIRAC	
		NAYTAHWAUSHB	NEWCOMERB		
NAKAIBITO				NIRE	
NAKINA		NAZATONB	NEWDALEB	NIRLING	
NAKNEK	D	NEABSCOC	NEWDEALD	NISENE	B
NAKOCHNA	D	NEAHB	NEWFLATD	NISHNA	. C.D
NAKWASINA	D	NEALY B	NEWFOLDENC	NISHNA, Ponded	
NALAKI		NEARLC	NEWFORKD	NISHON, Warm	
NALDO		NEBGEN	NEWFOUNDC	NISHON	
NALIVAG		NEBISHB	NEWGLARUSB	NISQUALLY	
NALL		NEBONAD	NEWGLARUS, Severely ErodedC	NISULA	
NAMEOKI	D	NECESSITYC	NEWHANA	NITCHA	B
NAMMOTH	C	NECHEC	NEWHAVENB	NITCHE	B
NAMUR		NECHESC	NEWHORNB	NITCHLY	R
NANA		NECKROCK	NEWHOUSEB	NITER	
NANAMKIN		NECONDAC			
			NEWKIRKD	NITPAC	
NANIAK		NECTARC	NEWLANDSC	NIU	
NANICH		NEDAC	NEWLANG A/D	NIULII	
NANNYTON	B	NEDHILLC	NEWLINB	NIVA	D
NANSEMOND	C	NEEDHILL B	NEWLONDONC	NIWANA	B
NANSEPSEP		NEEDLE PEAKC	NEWMARCC	NIXON	B
NANTAHALA		NEEDMOREC	NEWNAN	NIXONTON	
NANTICOKE		NEELD	NEWRYB	NIZHONI	
NAPIER		NEELEYB	NEWSKAHB	NOAH	
NAPOLEON		NEEN B/C	NEWSROCKB	NOBLE	
NAPOLEON		NEEN, WetD	NEWSTEADC	NOBLETON	
NAPOLI	C	NEEPERB	NEWTMAND	NOBOCO	B
NAPPANEE		NEESESC	NEWTONIAB	NOBSCOT	
NAPTOWNE		NEHALEMB	NEWULMB	NOBUCK	
NARANJITO		NEHALEM, FloodedC	NEWVIENNAB	NOCKAMIXON	
NARANJO		NEHARC	NEWVILLED	NOCKEN	
NARBONA		NEHASNEB	NEYGATD	NODHILL	
NARCISSE		NEICEB	NEZ PERCEC	NODINE	
NARD	C	NEISSENBERGC	NEZ PERCE, Friable Substratum D	NODMAN	B
NARDINE		NEKIA B	NGARDMAUB	NODUR	
NARDMONT		NEKIA. Stony C	NGARDOKB	NOELKE	
NAREA		NEKKEN B	NGERSUULC	NOHILI	
NAREL		NEKOMAB	NGERUNGORD	NOKASIPPI	
NARGAR	B	NELLSPRINGD	NIARADAB	NOKHU	
NARGON	C	NELSCOTTC	NIBBS B	NOLAVA	C
NARK		NELSEB	NIBENB	NOLTEN	
NARLON		NELSONC	NIBLACKD	NOMARA	
				NOMBERVILLE	
NARNETT		NEMADJI B	NIBLEYC		
NARRAGUINNEP		NEMAHC/D	NIBSOND	NOME	
NARROWS		NEMICOD	NICANORD	NOMRAH	
NARTA	D	NEMOTE A	NICELYC	NONAME	D

NONAMELAKE	_	NI IOII	OUTOO W.	011500	
NONAMELAKE		NUSIL A	OHTOG, WetC	ONECO	
NONAMEWASH		NUSMAGD	OHTWOC	ONEIL	
NONDALTON		NUTREEAHC	OIDEMA	ONEONTA	
NONOPAHU		NUTTERB	OJATAC	ONKEYO	
NONPAREIL		NUTVALB	OJIBWAYC	ONOVILLEC	
NOOBAB		NUTZANC	OJITOC	ONSLOW	
NOOK	C	NUVALDEB	OKANB	ONSTAD	,
NOOKSACK	C	NYAK B	OKAYB	ONTKO	,
NOPAH	C	NYALA B	OKEE B	ONTRAIL	
NORA		NYE B	OKEECHOBEEB/D	OOKALA	
NORA VARIANT		NYMANC	OKEELALAB	OOSEN	
NORAD		NYMOREA	OKEELANTAB/D	OPALOCKA	
NORAX		NYSERVAB	OKEETEED	OPIE	
NORBERT		NYSSATONB	OKEMAHC	OPIHIKAO	
NORBORNE		NYSWONGERD	OKERLANDB	OPLINC	
NORDBY	B	NYTHARD	OKIOTAD	OPNISHC	
NORDHOUSE	A	O'BRIEN B	OKLAREDB	OPOLIS	
NORENE		O'NEILL B	OKLARKB	OPPIO. StonyC	
NORFOLK		OAHEB	OKLAWAHAB/D	OPPIO	
NORGE		OAK GROVEB	OKOC	OPTIMA	
NORGO		OAKALLAB	OKOBOJID	OQUIN	
NORIA		OAKBOROC	OKOLONAD	OQUOSSOC	
NORKOOL	B	OAKCITYC	OKREEKD	ORAC	
NORMA	C/D	OAKCREEKB	OKRIST B	ORAGRAN	
NORMAL		OAKDALEB	OKTAHAB	ORAIDC	
NORMANDY		OAKHURSTD	OLALLIE	ORAMEL	
NORMANGEE		OAKLANDC	OLANCHAB	ORAN	
NORMANIA		OAKLETC	OLANDB	ORANGEVALE	
NORMANNA		OAKLIMETERC	OLANTAB	ORCADIA	
NOROD		OAKTONB	OLASHESB	ORDNA	
NORPEL		OAKWOODB	OLATHED	ORDNANCEC	
NORRIS		OAKYD	OLATON B	ORDWAY	
NORTE		OANAPUKAB	OLBUTD	OREANNA	
NORTH POWDER	Ċ	OATUUD	OLDBUTTEC	ORENDA	
NORTHBEND		OBANC	OLDMANC	OREOKE	
NORTHCASTLE		OBAROB	OLDS	ORHOOD	
		OBIE			
NORTHCOVE			OLDSMARD	ORIF	
NORTHFIELD		OBISPOD	OLDSPANB	ORINOCOC	
NORTHFORK		OBNOTD	OLDTRAILB	ORIOB/D	
NORTHMORE	C	OBRAYC	OLDWOLFB	ORIONC	
NORTHMOUND	B	OBRIENC	OLEANB	ORITA	,
NORTHPOINT	D	OBSCURITYB	OLELOB	ORIZABAB/C	;
NORTHRUP		OBURND	OLEMANB	ORLA	
NORTHVILLE		OCCIDENTAL	OLEMAN	ORLANDO	
NORTHWAY		OCCUMB	OLENO	ORLIE	
NORTON		OCCURC	OLENTANGY A/D	ORMSBY	
NORWEST		OCEANETD	OLEO A	ORNBAUNE	
NORWIDGE	B	OCEANO A	OLEPHANTB	ORNEA E	
NORWOOD	B	OCHLOCKONEEB	OLEQUAB	ORO FINO E	,
NOSAL	C	OCHOD	OLETEC	ORONOCO	,
NOSLO	C	OCHOPEE B/D	OLETHA D	ORONTOC	
NOSONI		OCOEEB/D	OLEXB	OROSEC	
NOSSER		OCONALUFTEEB	OLFD	ORPARK	
NOTCHER		OCONEEC	OLGUNB	ORR	
NOTI		OCONTOB	OLIB	ORSET	
NOTNED		OCQUEOC A	OLIAGAC	ORSINO	
NOTSTEW		OCQUEOC, Moderately Wet B	OLINB	ORTEGA	
NOTTAWA		OCUDD	OLINDAB	ORTELLCREEKC	
NOTUS	B/C	ODANAHD	OLIVED	ORTHENTS, Maat47-53C	
NOUQUE		ODASD	OLIVENHAIND	ORTING	
NOVACAN		ODEM, Overwash A	OLIVIERC	ORTIZC	
NOVAK		ODEMB	OLLAB	ORTON	
NOVARK		ODENSOND	OLLEI	ORTONVILLE	
NOVARY		ODERMOTTB	OLLIERIVASD	ORUPA	
			I -		
NOVINA		ODESSAD	OLMITOD	ORWET A/D	
NOWATA		ODINC	OLMITZB	ORWIG E	
NOWEN		ODONNELLC	OLMOSC	OSAGE	
NOWOY		OESTERLEC	OLOAVAB	OSBORNC	
NOYES		OFFENBACHERC	OLOKUID	OSCAR	
NOYO		OFUB	OLOMOUNTC	OSCEOLA	
NOYSON		OGDENC	OLOMPALI	OSCO	
NUAHS		OGDENSBURGC	OLPEC	OSDITCH	
NUBY		OGEMAW C/D	OLYICB	OSGOOD	
NUC		OGILVIE B/D	OLYMPUS A	OSHAWA	
NUCKOLLS		OGLEB	OMAHALINGC	OSHONE	
NUCLA		OGLESB	OMAKC	OSHOTO	
NUECES		OGLESBYD	OMENAB	OSITOC	
	C				
NUFFEL	C	OGRALB	OMIOB	OSKAC	
	C B		OMIOB OMROC	OSKA C	
NUFFELNUFFER	C B C	OGRAL B	OMROC	OSMUND E	;
NUFFEL NUFFER NUKA	C B C	OGRAL	OMROC OMSTOTTC	OSMUND E	;
NUFFEL NUFFER NUKA NUKRUM	C B C D	OGRAL B OGTNA B OHACO C OHANA C	OMRO C OMSTOTT C OMULGA C	OSMUND E OSO C OSOLL D	;
NUFFELNUFFER NUKA NUKRUM NULEY	C B D D	OGRAL B OGTNA B OHACO C OHANA C OHMAN A	OMRO C OMSTOTT C OMULGA C ONASON, Nongravelly C	OSMUND	;
NUFFEL NUFFER NUKA NUKRUM NULEY NUMA	CDD	OGRAL B OGTNA B OHACO C OHANA C OHMAN A OHOP C	OMRO C OMSTOTT C OMULGA C ONASON, Nongravelly C ONASON D	OSMUND	;
NUFFELNUFFER NUKA NUKRUM NULEY NUMA NUPART	B D D D	OGRAL B OGTNA B OHACO C OHANA C OHMAN A OHOP C OHSCOW B	OMRO C OMSTOTT C OMULGA C ONASON, Nongravelly C ONASON D ONATE A	OSMUND E OSO C OSOLL C OSOLO A OSSIAN B/D OSSIPEE D	;
NUFFEL NUFFER NUKA NUKRUM NULEY NUMA	B D D D	OGRAL B OGTNA B OHACO C OHANA C OHMAN A OHOP C	OMRO C OMSTOTT C OMULGA C ONASON, Nongravelly C ONASON D	OSMUND	;
NUFFEL NUFFER NUKA NUKRUM NULEY NUMA NUPART	B D D D	OGRAL B OGTNA B OHACO C OHANA C OHMAN A OHOP C OHSCOW B	OMRO C OMSTOTT C OMULGA C ONASON, Nongravelly C ONASON D ONATE A	OSMUND E OSO C OSOLL C OSOLO A OSSIAN B/D OSSIPEE D	;

007	DADEN	DANIMOD	DATRICIA
OST E		PANMOD C PANOLA D	PATRICIA B
OSTRANDER			PATRICKSBURGD
OSWALD		PANORAMAB	PATROLEC
OTANYA E			PATTANID
OTEEN			PATTEEB
OTEGO			PATTENBURGB
OTERODRY		PANTERAB	PATTERSONC
OTHELLO C/D	PADWOODB	PANTEXC	PATTIWAYC
OTHELLO, Very Wet	PAGARIB	PANTOND	PAULDINGD
OTISVILLE	PAGELANDC	PAOLAA	PAULSONB
OTOE	PAGESPRINGSD	PAPAAD	PAUMALUB
OTOMO		PAPACC	PAUPACKD
OTOOLE		PAPAGUAC	PAUSANTB
OTTERHOLT		PAPAI A	PAUWELA B
OTTERSON		PAPALOTEC	PAVAIAIC
OTTMAR		PAPASPILAC	PAVELEKD
OTTMAR, Very Deep		PAPEEKD	PAVERB
OTTOKEE			PAVER, FanC
OTTOSEN E		PAQUIN A	PAWCATUCKD
OTWAY		PARADISEC	PAWHUSKAB
OTWAT		PARADISE SPRINGD	PAWTOOTC
OUACHITA			PAXB
OUARD		PARADOX, WetD	PAXVILLEB/D
OULA		PARAGONC	PAYNEC
OUPICO		PARAGONAHD	PAYPOINTB
OURAY. Cool		PARAJEB	PEACHSPRINGSB
OURAY, Sandy Loam Surface E		PARANAT, Drained, Saline B	PEAHKE B
OUSELFAL			PEARCED
OUSLEY	PAKAB	PARCELAS D	PEARL B
OUTLAW		PARCHINC	PEARL HARBORD
OUTLETC			PEARLWISEB
OUTLOOK		PARDEEVILLEB	PEARNED
OUTPOST		PARIATOD	PEARSONCREEKB
OVALL	PALANUSH	PARIDAB	PEASLEYD
OVAN			PEASPEARD
OVERCUP			PEAVINE B
OVERLAKE			PEAWICKD
OVERLOOKE		PARKFIELDC	PEBBLEPOINTC
OVERSHUEB/E		PARKINSONB	PECATONICAB
OVERSIGHT E		PARKSB	PECKHAM C
OVIDCREEK	PALISADE, wetC	PARKVILLEC	PEDEEC
OVINAE			PEDERNALESC
OVINGTON		PARLE	PEDIGOB/D
OWANKA		PARMELEC	PEDLEFORDC
OWENTOWN			PEDREGALB
OWINZA		PARREGOC	PEDRICKB
OWLCAN E	PALMAREJOC	PARRITAC	PEDRICKTOWND
OWLHOLE		PARSIPPANYC/D	PEDROC
OWLROCK		PARSNIPD	PEEBLESC
OWLSPRINGC		PARSONSD	PEEDEE A
OWSEL		PARTLOWD	PEEKOD
OWYHEE		PARTOVD	PEELC
OXBOW	PALO	PARTRIDGEB	PEERLESS B
OXFORD			PEETZ A
OXHEAD			PEGLEGC
OXLEY		· · · · · · · · · · · · · · · · · · ·	PEJI A PEKAY C
OXMAN		DrainedB PASCACK, Smowhat Poorly	PELAHATCHIEC
OYHUTC			PELANB
OYLEN			PELATO
OZAN			PELELIUD
OZETTE			PELICANB
OZIAS			PELION
PAAIKI E	PAMOA B	PASQUOTANK B/D	PELKIE A
PAALOA E		PASSAICD	PELLEJAS B
PAAUHAU A			PELLICERD
PABLO			PELTONB
PACER			PEMBERTONB
PACHAPPA			PEMIC
PACHEL E			PEN ARGYLB
PACHNEUME			PENAGULD
PACKARD			PENALOSAC
PACKARD E PACKMO E		PATELZICKD	PENASCO D
PACKSADDLE		PATEMOSB	PEND OREILLE B PENDARVIS
PACKTRAIL			PENDENB
PACKWOOD			PENDERC
PACO			PENDERGRASSD
PACTOLUS			PENDOLAB
PADDY			PENELASD
PADDYKNOB, Stony	PANKYB	PATOUTVILLEC	PENEYD
PADDYKNOBC	PANKY, ClayeyC	PATOUZAC	PENGILLY B/D
	I	I	I

DENIODA	DETTUO	DIVISION AND	DI III ODEEK
PENGRAC	PETTUSB	PINEISLANDC	PLUMCREEKB
PENINSULA B PENLAW C	PETTYJONB	PINELLAS B/D PINENUT D	PLUMFIELDC PLUSHB
PENNARGYLB	PEVELYB	PINEOLAB	PLUTOSB
PENNEKAMPD	PEVETO A	PINERUNB	POACHIEB
PENNELL B	PHALANXB	PINESPRINGC	POALLC
PENNEYA	PHANTOMC	PINETOPC	POALL. CoolD
PENNICHUCKB	PHAROAHD	PINETUCKYB	POARCHB
PENNINGB	PHEBAC	PINETUCKY.GradedC	POBER
PENNYCREEKD	PHELAND	PINEVILLAGEB	POCALLA A
PENTHOUSEC	PHERSONB	PINEYNECKB	POCASSETB
PENWELLA	PHIFERSONC	PINEYWOODSD	POCATELLOB
PENWOODA	PHILBOND	PINEZB	POCATYD
PENZANCEC	PHILIPPAC	PINGREED	POCKERC
PEOH	PHILIPSBURGB	PINHOOKB/D	POCOLAD
PEOLAC	PHILLCHERB	PINICONB	POCUMD
PEONE	PHILLIPSC	PINKELC	PODEN B
PEORIAD	PHILLIPSBURG B	PINKHAM A	PODMORC
PEOTONE	PHILOMATHD	PINNEBOG A/D	PODUNKB
PEPB	PHILOMONTB	PINNOBIEB	PODUSC
PEPAL B	PHINGC	PINNTANKC	POEC
PEPIN B	PHLISSD	PINONESD	POGALC
PEPOOND	PHLYNSPAB	PINOTY B	POHAKUPUB
PEPPERD	PHOEBEB	PINRIDGEB	POHOCCOB
PEPPERBOXB	PHOENIXD	PINSPRINGC	POINSETTB
PEPTOND	PHYSB	PINTASB	POINTC
PEQUAYWANB	PIANKESHAWB	PINTOC	POINT ISABELC
PEQUEAB	PIANOHILLC	PINWHEELD	POINTLAC
PERCELLB	PIARB	PIOCHED	POISONHOLC
PERCHASD	PIASAD	PIONEERD	POJOC
PERCHEB	PICACHOC	PIPEFLATA	POKEGEMAB
PERCHLAKEB	PICANTED	PIPELINED	POKERC
PERCILLAD	PICARD B	PIPPIN A	POKEYC
PERCOUNC	PICEANCEC	PIPPODA	POLALLIEC
PERDIDOB	PICKAWAYC	PIRAPEAKB	POLANDERB
PERECHENEYB	PICKENSD	PIRD B	POLARB
PERFAD	PICKETPINB	PIRKEYC	POLAWANA A/D
PERGRINB	PICKNEY A/D	PIRODELB	POLECATB
PERICOB	PICKTON A	PISCASAWB	POLETAC
PERIDAB	PICKWICKB	PISCOEB	POLETADB
PERIDGEB	PICOSAC	PISGAHC	POLICHC
PERILD	PICTURED	PISMO D	POLKINGD
PERINGC	PIDCOKED	PISTOLC	POLLARD, High RainfallB
PERINOSC	PIDINEEND	PISTOLRIVERB	POLLARDC
PERITSAC	PIE CREEKD	PITCHERB	POLLASKYB
PERKINSD	PIEDAWNB	PITCOD	POLLUXC
PERKS A	PIEDMONTD	PITNEYC	POLO, Moderate PermB
PERLORD	PIEGONB	PITTSGROVEB	POLO, Moderately Slow Perm C
PERNB	PIERCEPARKB	PITTVILLEB	POLSONB
PERNITASC	PIERIVERC	PITVARD	POLUMB
PERQUIMANSD	PIERKINGD	PITZERC	POLUMARB
PERREAUB	PIERPONTC	PIUMPSHAB	POLVADEROC
PERRINB	PIERRED	PIVOTA	POMANC
PERRINE B/D	PIERROND	PIXLEYD	POMAT, DryB
PERRYD	PIERSONTEA	PIZENEB	POMATC
PERRYGULCHD	PIERZ B	PLACEDOD	POMERENEC
PERSANTIC	PIETOWNB	PLACERB	POMERENINGA
PERSAYOC	PIEZONB	PLACIDB/D	POMMEB
PERSISB	PIGEONROOSTB	PLACKD	POMOB
PERSONVILLE B	PIGTAILD	PLAINBO A PLAINS A	POMONAB/D
PERT D PERVINA B	PIKADEN A PIKE B	PLAINSA	POMPONIO
PESCADO D	PIKEVILLEB	PLAINTIEW A	PONCENA D
PESCADO	PILABOB	PLAINVIEW A	PONCENA A
PESHTIGOC	PILCHUCK A	PLANKINTON D	PONCIANOC
PESKAHB	PILEUPB	PLANTATION B/D	POND CREEKB
PESOC	PILGRIMS B	PLASKETTD	PONDERD
PESOWYOC	PILLERYB	PLATEAC	PONDEROSAB
PETACAD	PILLIKENB	PLATO	PONEB/D
PETALC	PILLOTB	PLATSHERC	PONINAD
PETAND	PILONI	PLATTVILLEB	PONTOTOCB
PETCANC	PILOT PEAKD	PLAYMOOR	PONYCREEK
PETERMAN, Sandy Substratum,	PILOT ROCKC	PLAZAC	PONZERD
AlkaliC	PILOTWELL	PLEASANTC	POOBAAC
PETERMAND	PILTZC	PLEDGERD	POOCHAM B
PETERSD	PINALD	PLEINED	POOKALOOD
PETERSONB	PINBITB	PLEIOVILLEC	POOKUB
PETESCREEK, Stony B	PINCHERC	PLEITOB	POOLEVILLEC
PETESCREEK, Gravelly	PINCHOTB	PLEMONSB	POORCALB
PETRIEC	PINE FLATB	PLEVB	POORHOUSED
PETROFB	PINEALD	PLEVNA D	POORMAB
PETROSD	PINEDAD	PLINCOB	POORMANB
PETSPRINGD	PINEGAPB	PLOVERC	POORMAND
PETTIGREWD	PINEGUESTB	PLUCKC	POOSED
PETTIJOHNB	PINEHILLB	PLUMBROOKB	POPASHD

POPHERS	С	PRESAB	PUROB D	QUITTER	В
POPLE		PRESHERB	PURSLEYB	QUIVER	
POPSON		PRESNALB	PUSHMATAHAC	QUIVERA	
POQUITA		PRESTOB	PUSTOIB	QUOMUS	
PORONTO	C	PREUSSC	PUTCOB	QUONAL	B
PORRETT	D	PREUSSRANGEC	PUTNAMD	QUOPANT	D
PORRONE		PRICEB	PUTNEYB	QUOSATANA	
PORTAGEVILLE		PRICECREEKD	PUTTC	RABBS	
PORTAL		PRICETOWNB	PUU LAID	RACE	
PORTALES		PRIDHAMD	PUU MOIWIB	RACING	
PORTALTO		PRIESTLAKEB	PUU 00 A	RACKER	
PORTDICK		PRILLD	PUU OPAEB	RADER	
PORTER		PRIMD	PUUKALAD PUUONEC	RADFORD	
PORTERSPRINGS		PRIMEAUXB	PUYEC	RADIUM	
PORTGRAHAM		PRINCETONB	PUZZLECREEKB	RADNOR	
PORTHILL		PRINEVILLEC	PYBURND	RAFTRIVER	
PORTIA		PRINSBURGB/D	PYEATTB	RAFTVILLE	
PORTILLO		PRISONEARC	PYLEB	RAGAMUFFIN	
PORTINO		PRISSEL A	PYLOND	RAGGULCH	
PORTLAND		PRITCHARDC	PYOTEA	RAGNAR	
PORTMOUNT		PROBERTB	PYRADYC	RAGPIE	
PORTSMOUTHE	3/D	PROMONTORY D	PYRAMIDD	RAHAL	C
PORTVILLE	C	PRONGC	PYRENEESC	RAHM	C
PORUM		PROPERA	PYRMONT, Bedrock Substratum . C	RAHWORTH	
POSEY		PROPHETSTOWNB/D	PYRMONTD	RAIL	
POSEYVILLE		PROTIVINC	PYSHTC	RAILCITY	
POSKIN		PROUTC	QENIC	RAILROAD	
POSO		PROVIDENCEC	QUADRIAD	RAINBOLT	
POSOS		PROVIGC	QUAFENOC	RAINEY	
POSSUMTROT		PRUCREEC	QUAGLEB	RAINIER	
POST POTAGANNISSING		PRUDYB	QUAILPRAIRIEC QUAILRIDGEB	RAINO	
POTAMUS		PRUEB	QUAKERTOWNC	RAINS, Flooded	
POTATOLAKE		PRUITTON B	QUAKINGB	RAINSBORO	
POTAWATOMI		PRUNIED	QUALLA, DryB	RAINSVILLE	
POTCHUB		PRYORC	QUALLA	RAINTUF	
POTEET		PSAMMAQUENTSD	QUAMB/D	RAISIO	
POTELL		PSAMMENTS A	QUANAHB	RAKANE	
POTH		PSUGA B	QUANTICOB	RALDRIDGE	
POTLATCH	C	PSUYAAHC	QUARDERERB	RALORE	D
POTOSI	D	PTARMIGANC	QUARLESD	RALPH	B
POTRATZ		PUAPUAD	QUARTELESD	RALPHSTON	
POTRERO		PUAULU A	QUARTERBACKB	RALSEN	
POTRILLO		PUCKUMD	QUARTERMASTERC	RAMADERO	
POTRMOUND		PUEBLOB	QUARTZVILLEB	RAMAH	
POTTER		PUELZMINED	QUATAMAC	RAMBLA	
POTTERSVILLE		PUERCOD	QUAYB	RAMMEL	
POTTINGER		PUGETC	QUEALMANB/C	RAMONA	
POTTSBURG POUDRE		PUGSLEY, DryB PUGSLEYC	QUEALY D QUEBRADA C	RAMOTH	
POUJADE		PUHIB	QUEENYD	RAMSDELL	
POULSBO		PUHIMAUD	QUEETSB	RANA	
POUNCEY		PUICE	QUEMADOC	RANACKER	
POVERTY		PULAC	QUENCHEROOB	RANCE	
POVERTYFLAT		PULANTATC	QUENZERD	RANCHOSECO	
POVIRT		PULASKIB	QUERCC	RANCO	
POWDERHORN	C	PULCANC	QUETICOD	RANDADO	C
POWDERWASH		PULEXASB	QUEZCANC	RANDALL	D
POWEEN		PULLMAND	QUIBURIB	RANDCORE	D
POWELL		PULLUPA	QUICKSELLC	RANDMAN	
POWER		PULPITC	QUICKSILVERD	RANDOLPH	
POWLEY		PULSIPHERD	QUIDENB	RANDS	
POWLOW		PULTNEYC	QUIENSABEC	RANDSBURG	
POWMENT		PUMEL, Nongravelly C PUMELD	QUIETUS	RANGEE	
POWWAHKEE		PUMPHOUSEB	QUIGG	RANKOR	
POWWATKA		PUMPHOUSE, Clayey Subsoil C	QUIHI	RANRUFF	
POYGAN		PUMPKINB	QUILCENEC	RANSECT	
POZEGA		PUNA A	QUILLAMOOKB	RANSLO	
POZO BLANCO		PUNALUUD	QUILLAYUTEB	RANSOM	B
PRADE		PUNGC	QUILLIANC	RANSTEIN	B
PRAIRIE	A	PUNOHU A	QUIMAB	RANTOUL	D
PRAIRIECREEK	C	PUNSITC	QUIMERAC	RAPADO	
PRAIRIEVILLE		PUNTA B/D	QUINAULTD	RAPATEE	
PRAMISS		PUNTILLAB	QUINBINSC	RAPELJE	
PRATHER		PURCELLVILLEB	QUINCREEKC	RAPH	
PRATLEY		PURCHASEC	QUINCYB	RAPHO	
PRATT		PURCHESC	QUINLIVENC	RAPIDAN	
PREAKNESS		PURDINC	QUINNB/D	RAPPAHANNOCK	
PREATORSON PREGO		PURETT B PURGATORYC	QUINNEY C QUINTO D	RAPSON	
PRELO		PURGATORYD	QUIRKC	RARICK	
PREMIER		PURNELLD	QUITERIAB	RARITAN	
PRENTISS		PURNERD	QUITMANC	RASSER	

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RASSETB	REDO A	RENTZELC	RINCONC
RASTER A	REDPEAKB	RENVERSD	RINCONFLATB
RASTUSC	REDPENB	RENWASHB	RINDGE, DrainedC
RATIOPEAKB	REDPORTB	RENWICKB	RINEARSONB
RATLAKED	REDRIDGEB	REPARADAD	RINEYB
RATLEFLATB	REDRIMB	REPKIEB	RINGLEB
RATLIFFB	REDROBC	REPMISC	RINGO D
RATROOTD	REDSLIDEB	REPP B	RINGWOODB
RATSNESTD	REDSPEARD	REPPARTB	RINKERC
RATSOWC	REDSPOONC	RESOOTC	RINQUINC
RATTLERD	REDSPRINGSB	RESOTA A	RIO ARRIBAD
RATTOC	REDSPRINGS, GradedD	RESTOND	RIO DIABLOC
RAUBC	REDSTOEB	RET, High ElevationC	RIO FRIOB
RAUSC	REDSUND	RETD	RIO GRANDEB
RAUSTERC	REDTHAYNEB	RETAWD	RIO KINGC
RAUZIB	REDUNB	RETEPB	RIO LAJAS A
RAVALLI, Bedrock Substratum B	REDVALEC	RETSOVERC	RIO PIEDRASB
RAVALLID	REDVIEWC	RETTIBB	RIOBLANCHOC
RAVEENWASHA	REDVINEC	RETTIB LOAMB	RIOLINDAC
RAVEN A	REDWASHD	REUTERC	RIOLOMASB
RAVENELLD	REDWATERB	REVAD	RIONUTRIAC
RAVENNAC	REEDD	REVELC	RIOVISTAA
RAVENSROOSTB	REEDERC	REVERE B/D	RIPGUTC
RAVIAC	REEDPOINTD	REVITC	RIPLEYC
RAWAHC	REEDSBURGC	REVLINGB	RIPON B
RAWLES B	REEDSCREEKB	REVORD	RIPPLEB
RAWSON B	REEDSLAKEB	REWARDB	RISBECK B
RAYBURND	REEDWESTC	REXFORDC	RISLEYC
RAYCREEKB	REEDYC	REXORB	RISUED
RAYFORDC	REEFRIDGED	REYABB	RISWOLDB
RAYLAKED	REELFOOTC	REYCREEKC	RITAD
RAYNALC	REEPOC	RHEA B	RITCHEYD
RAYNOLDSON B	REESEC	RHOAMETTD	RITIDIAND
RAYOHILLC	REESERC	RHYLOWB	RITNERC
RAYPOLC	REESVILLEC	RHYMESA	RITOB
RAZORBAB	REEUPC	RIB B/D	RITTELC
RAZORBACK D	REFLECTIONB	RIBERAC	RITTERB
RAZSUND	REGAL B/D	RIBHILLB	RITZ
READLYNB	REGER B	RIBRIVERB	RITZCALB
REALLISB	REGGADA	RICCOD	RIVALIER B
REAMB	REGNAPSC	RICEBOROB/D	RIVERBY A
REAPD	REGRACICD	RICELAKEB	RIVERDALEA
REARDANC	REHBURGC	RICESC	RIVERLOSTB
REAVILLEC	REHFIELDB	RICETON, Sandy Substratum A	RIVEROADC
REAVISB	REHMC	RICETONB	RIVERSIDE A
REBAC	REHOBETHD	RICEVILLEC	RIVERTONB
REBECCAB	REICESSB	RICHC	RIVERVIEWB
RECKD	REILLY A	RICH, WetD	RIVERWASH A
RECKLORC	REINACHB	RICHARDVILLEB	RIVIERA, Limestone Substratum B/
RED BAYB	REINECKEB	RICHFIELDC	D
			RIVIERAD
RED BLUFFB	REINER B	RICHFORDA	
RED HILLB	REINHARTD	RICHSUMB	RIXONC
RED HOOKC	REISD	RICHVIEWC	RIZD
RED SPURB	REKC	RICHWOODB	RIZNO A
REDARROWD	REKIMA D	RICKETTS, Nonstony B	ROACHAC
REDBELLB	RELANB	RICKETTSC	ROADMASTERD
REDBIRDB	RELEEPB	RICKMANC	ROANEC
REDBOWC	RELFEA	RICKMOREC	ROANHIDEC
REDBUDC	RELIZD	RICKREALLD	ROARINGB
REDCAMEROND	RELYEAB	RICKSA	ROATCAPB
REDCANYONB	REMBERTD	RICOTC	ROBAGOB
REDCAPB	REMEDIOSC	RIDENBAUGHD	ROBANAB
REDCHIEFC	REMLAPC	RIDGEB	ROBBSD
REDCLOUDB	REMMELB	RIDGELANDB/D	ROBBSCREEKC
REDCOD	REMMITB	RIDGELAWN, wetD	ROBCOC
REDCREEKC	REMOUNT A	RIDGELITED	ROBERC
REDDALED	REMSEND	RIDGEVIEWD	ROBERTSDALEC
REDDIESB	REMUSB	RIDGEWOODC	ROBERTSVILLED
REDFIELDB			
	REND	RIDITC	ROBINETTEB
REDFIELD, WetC	RENCALSONC	RIDLEYC	ROBINLEEC
REDFISTC	RENDB	RIEDELC	ROBOLATAC
REDFLAMEB	RENDOVYB	RIEDTOWNC	ROCHELLEC
REDFLATB	RENEGADED	RIESELC	ROCHEPORTB
REDHOOK A	RENFROWD	RIFTC	ROCHER B
REDIGB	RENHAC	RIGAD	ROCHPAHD
		RIGDONC	
REDLAKED	RENICKD		ROCK OUTCROPD
REDLEVELC	RENNERB	RIGGSVILLEC	ROCKABINC
REDLOCKB	RENNIED	RIGOLETTEC	ROCKBLUFF A
REDLODGED	RENOXB	RILEYB	ROCKCASTLED
REDMANSONB	RENSHIGHB	RILLA B	ROCKCUTB
REDMOREC	RENSSELAERC	RILLOSO A	ROCKDALEA
REDMOUNTB	RENTHIND	RIMINI A	ROCKDAM A
REDNIKB	RENTILLB	RIMROCKD	ROCKERSC
REDNIK, NonstonyC	RENTON	RIMTONC	ROCKFIELDB
REDNUŃC	RENTSACC	RINB	ROCKFORDB
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DOOK!!!!!	_	BOOK!! F	nunce n	24.554.6
ROCKHILL		ROSELLEC	RUNGEB	SALERNOB/D
ROCKHOUSE		ROSENBROCKD	RUNLETTB	SALGAC
ROCKLIN		ROSENDALEC	RUPLEC	SALINASD
ROCKO		ROSENWALL D ROSESPRINGB	RUPLEY A RUPRECHT D	SALINE=SODIC
ROCKOA		ROSEWOODD	RUSBACH A	SALISBURY, High Elevation D SALIX B
ROCKPENS		ROSHE SPRINGS	RUSHCREEK B	SALKUMB
ROCKRUN		ROSHOLTB	RUSHFORDB	SALLYANNC
ROCKSAN		ROSINEB	RUSHLAKE A	SALMONB
ROCKY FORD		ROSLYNB	RUSHMORE B/D	SALONIE, Moderately wetC
ROCKYBAR		ROSMANB	RUSHRIVER B/D	SALT CHUCKA
ROCKYBROOK		ROSSB	RUSHTOWNA	SALT FLATD
RODAD		ROSSMOORB	RUSHVILLE D	SALTCREEK
RODELL		ROSSMOYNEC	RUSKTOWNB	SALTERYD
RODEN		ROSSPEAKB	RUSOB	SALTILLOC
RODEO	D	ROSSVILLEB	RUSSLERC	SALTINEC
RODESSA	D	ROSWELL A	RUSTIGATEC	SALTOND
RODIE	B	ROSYB	RUSTLERPEAKC	SALUDAC
RODNEY	D	ROTAMERB	RUSTYB	SALVISAC
RODROF	D	ROTANC	RUSTYBUTTEB	SALZER, ProtectedC
ROELLEN	D	ROTHICANB	RUTERSVILLEC	SAMARIAB
ROEMER	C	ROTHSAYB	RUTHERFORDC	SAMBAD
ROGAN	B	ROTINOMB	RUTLANDC	SAMBRITOB
ROGERSON	D	ROTTULEEC	RYALLEND	SAMINIEGOC
ROGGER		ROTURAB	RYAND	SAMOISTD
ROGRUBE		ROUEN B	RYARKB	SAMORD
ROHAN		ROUGHCREEKD	RYCOD	SAMSILD
ROHNERVILLE		ROUND BUTTED	RYDOLPHC	SAN ANDREASB
ROHONDA		ROUNDABOUTC	RYEGATEC	SAN ANTONB
ROHRBECK		ROUNDBARNB	RYELLD	SAN ANTONIOC
ROHRERSVILLE		ROUNDHEADB/D	RYERC	SAN BENITOB
ROJO		ROUNDORC	RYKERB	SAN GERMAND
ROLETTE		ROUNDUPC	RYORPC	SAN ISABEL, Stony A
ROLFE		ROVALD	RYUS B	SAN ISABEL, Cobbly B
ROLIE		ROWDENC	SAARC	SAN MIGUELD
ROLLA		ROWDYB	SABANAD	SAN RAFAEL B
ROLLAWAY		ROWED	SABANA SECAD	SAN SEBASTIANB
ROLLINGSTONE		ROWELD	SABENYOB	SAN SIMEOND
ROLLINS		ROWENAC	SABIESC	SAN YSIDROD
ROLO		ROWLANDC	SABINAC	SANBEE, Thin A
ROMAN		ROWLEYC	SABINEA	SANBEEB
ROMANOSE		ROXALD	SACATARB	SANBORGD
ROMBERG		ROXANAB	SACHC	SANBORNC
ROMBO		ROXERB	SACKETTB	SANBURNB
ROME		ROXTOND	SACOD	SANCAJOC
ROMEO		ROYCEC	SACTUSD	SANDBERG A
ROMGAN		ROYERTONB	SACVILLED	SANDBRANCH B
ROMINE		ROZARAD	SADDLEBUNCHD	SANDEREA
ROMNELL		ROZELLVILLEB	SADDLEBUTTE D SADDLEPEAK B	SANDCREEK D SANDERSON B
ROMONA		ROZLEEC	SADIEC	SANDHILL B
ROMOUND		RUBBLE LAND A	SADLERC	SANDIA B
ROMSTOCK		RUBICITYB	SADORUSD	SANDOSE A
RONAN		RUBIO	SAEMOB	SANDOVER A
ROND		RUBSONB	SAFETYB	SANDOWC
RONDELL		RUBYB	SAGANINGA/D	SANDRIDGE, Alkali A
RONEY		RUBYCREEKB	SAGASERB	SANDSPRINGB
RONNEBY		RUBYLAKE, Strongly Saline C	SAGED	SANDUNB
RONSON		RUBYLAKED	SAGECREEKB	SANDUSKYD
ROOKS		RUCHEZC	SAGEDALEC	SANDVIEWB
ROONEY		RUCKERB	SAGEHEND	SANDWASHC
ROOP		RUDDLEYD	SAGERTONC	SANDWICK
ROOSET		RUDEENC	SAGEVALLEYB	SANDY POINT
ROOSTERCOMB		RUDOB	SAGLEC	SANFECOC
ROOT		RUDYARDD	SAGLEY B	SANFELIPEB
ROOTEL	C	RUEDLOFFB	SAGOD	SANGOC
ROPER	B/D	RUELLAB	SAGOUSPEB/C	SANHEDRINB
ROQUES	D	RUESH B	SAHALIEB	SANHUD B
ROSALIE	B	RUGARC	SAHAPTIND	SANILAC B
ROSAMOND		RUGLESB	SAHKAHTAYB	SANJE B
ROSARIO		RUINS, Thick Surface A	SAHUARITAB	SANKEYC
ROSCED		RUINSC	SAIDB	SANKLUNAB
ROSCHENE		RUIZ A	SAILBOAT B/C	SANLORENB
ROSE VALLEY		RUMAB	SAILESB	SANOSTEEC
ROSEBERRY, Sandy Substratu		RUMBOC	SAINB	SANPITCHC
ROSEBERRY, Drained		RUMFORDB	SAKAKAWEAB	SANSARCD
ROSEBRIAR		RUMLEYB	SALD	SANTAC
ROSEBURG		RUMNEYC	SALADARD	SANTA CLARAC
ROSEDALE		RUMPAHD	SALALC	SANTA ISABELD
ROSEDHU		RUMPELTEASERD	SALAMANCAB	SANTA LUCIAC
ROSEGLEN		RUMPLEC	SALAMATOFD	SANTA MARTAC
ROSEHAVEN		RUMSEYB	SALANDERB	SANTANELA, AlkaliD
ROSEHILL		RUMUNGC	SALCOB	SANTAQUIN A
ROSELAND		RUNCLINTA	SALCREEKC	SANTAROSA. Flooded B
ROSELLA	U	RUNEC	SALEMB	SANTEED
		ı		I .

04447557444	0.1.4155		
SANTEETLAHB	SAYNER		SHADELEAFC
SANTIAGO, Moderate Perm B	SCALEROCK		SHADEVILLEB
SANTIAMC	SCALLEY		SHADILTOD
SANTOB	SCALPCREEK		SHADOVALD
SANTONID	SCANDARD		SHADYB
SANTOPB	SCANDARD		SHADYGROVEC
SANTUCC	SCAPONIA		SHADYPASSA
SANWELLB	SCAREDMAN		SHAFFTONB
SANYOND	SCAREDMAN		
SAPEHAB SAPINERO, CoolB	SCARFACE		SHAGD
SAPKINC	SCARPER		SHAGNASTYC SHAKAMAKC
SAPPHOB	SCATLAKE		SHAKANC
SARAD	SCATTERSVILLE		SHAKESPEAREC
SARAGOSAB	SCHAFER		SHAKOPEEC
SARAGOTEC	SCHAFFER		SHALAKEC
SARAHSVILLED	SCHALLER		SHALBAD
SARAZANB	SCHALOW		SHALCLEAVD
SARBOB	SCHATTEL		SHALONAB
SARCILLOD	SCHEINER		SHALPERD
SARDINIAC	SCHERRARD		SHAMD
SARDISC	SCHIEFFLIN		SHAMELB
SARGEANTD	SCHILLER		SHAMIZO A
SARILDAC	SCHISLER		SHAMOCKC
SARITAA	SCHLOMER		SHANDEPB/D
SARKARD	SCHNEBLY		SHANED
SARNOSAB	SCHNOORSON, Drained		SHANGHAIB/C
SARTELL A	SCHNORBUSH		SHANGLANDB
SARUCHED	SCHODSON		SHANKBAD
SASALAGUANC	SCHOER		SHANKLER A
SASPAMCOB	SCHOLTEN		SHANKSC
SASSER B	SCHOODIC		SHANLEYB
SATAGOD	SCHOOLCRAFT		SHANNONDALEC
SATANKAC	SCHOOLER		SHANTOWN A
SATATTON D	SCHOOLEY	SEKILB	SHANTYD
SATELLITEC	SCHOOLHOUSE		SHARC
SATILLA D	SCHOONER	SELBITB	SHARATINB
SATINC	SCHRIEVER	SELDENC	SHARESNOUTC
SATSOP B	SCHROCKE	SELDOVIAB	SHARLANDB
SATSUMAC	SCHULENBURG	SELFRIDGEB	SHARON B
SATTC	SCHULINEE	SELIAC	SHARPSC
SATURDAYB	SCHUTZ E		SHARPSHOOTERB
SATURN B	SCHWACHEIM		SHARPTOWNC
SAUCEL D	SCHWALBE E	B SELMANB	SHARROTTD
SAUCIERC	SCIOTAC		SHARVANAC
SAUCITOD	SCIOTOVILLEC		SHASERB
SAUCONB	SCIPIO		SHASKITC
SAUGATUCKC	SCITICOC		SHASTAB
SAUGUSB	SCLOME		SHASTACOSTAC
SAUKB	SCOAP		SHASTINAB
SAUMB	SCOBA		SHATTAC
SAURINC	SCOGGIN		SHATTUCKB
SAUTER B	SCONSIN		SHAVASHC
SAUVIE, Protected B	SCOTAL		SHAVERB
SAUVIE, Moderately WetC	SCOTCH		SHAWAC
SAUVIED	SCOTCO		SHAWANOA
SAUVOLAC	SCOTMONT		SHAWAVEB
SAUXHEAD, Very StonyD	SCOTT LAKE		SHAWMOUNTB
SAVACETON B	SCOTTCAS		SHAWTOWNB
SAVANNAL D	SCOTTSUILE		SHAYLAD
SAVANNAHC	SCRANTON A/F		SHEBANGD
SAVARB SAVENACC	SCRANTON A/E		SHEBEONC
SAVENACC	SCROGGIN		SHEDD
SAVOIAB	SCHOGGIN		SHEEKB
SAVONAC	SCUPPERNONG		SHEEPCANB
SAWB	SEABOARD		SHEEPSKINB
SAWABASHB/D	SEABROOK		SHEFFLEINB
SAWABED	SEAFIELD		SHELBYVILLEB
SAWATCH, Gravelly B/D	SEAFORTH		SHELDB
SAWBUCK, Shale Substratum C	SEAGATEA/D		SHELLBLUFFB
SAWCREEKC	SEAGOVILLE		SHELLCREEKC
SAWDUSTB	SEAGRAVES		SHELLDRAKE A
SAWLITC	SEALY		SHELLROCKA
SAWPEAKB	SEAQUEST		SHELLWOOD
SAWTELLC	SEAR		SHELTERD
SAWTELPEAKD	SEARCH		SHELTONC
SAWTOWNC	SEARCHLIGHT		SHENAD
SAWYERC	SEARCY		SHENANDOAH
SAXD	SEARING		SHENANGOC
SAXONC	SEARVAR		SHENONB
SAYB	SEASIDE		SHEPB
SAYDABC	SEATTLE		SHEPANC
SAYERS A	SEAVERSON		SHERARC
SAYLESD	SEAWILLOW		SHERBURNEC
		1	

SHERLOCKB	SHULLSBURGC	SIRRETTAC	SLOCUM, MoistD
SHERMD	SHUMBEGAYB	SISKIYOUB	SLOCUM, WOIST
SHERMOREB	SHUMLAC	SISLEYB	SLUICEC
SHERMOUNTD	SHURLEY A	SISSABAGAMAA	SLUKAC
SHERODC	SHUSHUSKINC	SISSETONB	SLYB
SHERRYB/D	SIC	SITARB	SMACKOUT
SHERRY, StonyD	SIBANNACD	SITKAB	SMALLCONED
SHERRYLB	SIBELIAB	SIWASHD	SMEDLEYD
SHERVALC	SIBLEYB	SIWELLC	SMELTERC
SHERWIND	SIBLEYVILLE B	SIXES B	SMESTADC
SHERWOOD B	SIBOLDC	SIXMILE. Loamy B	SMIDALEB
SHEVAC	SICKLES B/D	SIXMILE, StonyC	SMILEYVILLED
SHEZAC	SICKLESTEETSB	SKAGENC	SMINAC
SHIAWASSEEC	SIEBERELLB	SKAGITD	SMITH B
SHIELDSC	SIEBERT A	SKAGWAYC	SMITHBOROD
SHIFFERB	SIECHEC	SKAMANIAB	SMITHDALEB
SHILLAB	SIEGELB	SKAMOC	SMITHLANDB/D
SHILLINGB	SIERRAB	SKEELB	SMITHNECK B/C
SHILLYC	SIERRAVILLE B	SKEIND	SMITHTOND
SHIMAC	SIERRAVISTAB	SKELIDAB	SMITHVILLE B
SHIMMONC	SIESTAD	SKELLOCKB	SMITHWICKD
SHINAKUD	SIEVERSC	SKELTERB	SMOKEY B SMOKYHILLC
SHINANDOD	SIGBIRDD	SKELTONB	
SHINBONEB SHINDLERC	SIKESTONB/D SILAWAB	SKIBOB	SMOLANC
SHINDLERC	SILCATD	SKIDMOREB	SMOTHERSB
SHINGLEMILLD	SILCOXB	SKILAKB	SMYRNAB/D
SHINGLETOWNB	SILENTD	SKIMEA	SNACREEKC
SHINGLETOWNC	SILER B	SKINNERB	SNAG B
SHINKEEC	SILERTONB	SKINWOODB	SNAHOPISHB
SHINNPEAKD	SILESCAC	SKIPANONB	SNAKEC
SHIOYA A	SILETZB	SKIPEAKB	SNAKEJOHNB
SHIPLEYC	SILEXD	SKIPOPAD	SNAKELUMB
SHIPPAD	SILHOUETTEB	SKIYOU B	SNAKERD
SHIPSD	SILICOD	SKOKOMISHC/D	SNAPEEDC
SHIPSHEB	SILKIED	SKOLYB	SNAPILLB
SHIRCLIFFC	SILSBEEB	SKOOKERB	SNAVEE B
SHIREDD	SILSTID A	SKOOKUMC	SNEFFELSC
SHIRKC	SILVAC	SKOOKUMHOUSEB	SNELLBYC
SHIRLEYB	SILVER CREEKD	SKOVEND	SNELLMANB
SHIRLEYBASINB	SILVERBELLC	SKOWHEGANB	SNETTISHAMD
SHIROC	SILVERCITYB	SKRANKAB	SNIDERC
SHIRTSC	SILVERDALE A	SKULL CREEKC	SNIDERPEAKB
SHIRTTAILB	SILVERHILLB	SKULLGULCHC	SNILECB
SHIVAB	SILVERHORNC	SKULLWAKD	SNILLOCB
SHIVLUMB	SILVERKINGB	SKUNKFARMD	SNOOKD
SHOATC SHOBAD	SILVERLAKE C	SKYBERGC SKYHAVENC	SNOPOC B SNOQUALMIE
SHOBANB	SILVERN C	SKYHAWKC	SNOTOWN B
SHODDYD	SILVERTONC	SKYLIGHTD	SNOVBRIERC
SHOEBENDB	SIMANNIB	SKYLINED	SNOWCREEKB
SHOEGAMEB	SIMCOE	SKYMORC	SNOWDANCE, Moderately Wet C
SHOEMAKERB	SIMEONA	SKYROCKD	SNOWDANCED
SHOEPACC	SIMESCREEKA	SKYTOPB	SNOWDONC
SHOEPEGC	SIMITARQD	SKYUKAB	SNOWLAKE B
SHOHOLAC	SIMMONTC	SKYVIEWC	SNOWPLOWB
SHOKEND	SIMONAD	SLABD	SNOWSHOE B
SHONGOC	SIMONINB	SLABTOWNB	SNOWVILLED
SHONKIND	SIMPARKD	SLACREEKB	SOAKPAKB
SHONTIKC	SIMPATICOB	SLACWATER B/D	SOAPCREEKC
SHOOFLIND	SIMPERC	SLAPJACKB	SOBEGAC
SHOOFLYD	SIMSFIELDC	SLATEGOATB	SOBSONC
SHOOKERC	SINAMOXB	SLATERYC	SOCAGEED
SHOREB	SINBADD	SLATTERD	SOCOB
SHOREEKC SHORT CREEK	SINCLAIR C SINDION B	SLAUGHTERC SLAUGHTERVILLEB	SODA LAKE C SODABAY B
SHORTBREADA	SINGERTONB	SLAWHAC	SODACREEKB
SHORTCUTC	SINGENTONB	SLAYTOND	SODACHEEK
SHORTHAIRD	SINGLETON	SLEEPERC	SODERVILLE A
SHORTHORND	SINGLETREEC	SLEETHB	SOELBERGB
SHOSHONEC	SINKERC	SLICKEARB	SOENC
SHOTGUNC	SINONAB	SLICKLOGB	SOFIAC
SHOWALTERB	SINTONB	SLICKPOOB	SOFTBACKB
SHOWLOWD	SINUKD	SLICKSPOTSD	SOGIC
SHREEB	SIONB	SLIDEB	SOJOURND
SHREWDER B	SIOUXCREEKC	SLIDECAMPC	SOJURD
SHREWSBURYC/D	SIOUXONB	SLIDECREEKB	SOKOLOF A
SHROEC	SIPAPUD	SLIDELLD	SOLARVIEWD
SHROUTSD	SIPHONCAND	SLIDYMTND	SOLDATNAB
SHROYTON A	SIPHONLAKEB	SLIGHTSC	SOLDIERC
SHRUBCREEKB	SIPPLEB	SLIMBUTTEB	SOLDIERCREEK B
SHUBUTAC	SIPSEYB	SLIMLAKEB	SOLDUCB
SHUEC	SIRDRAKA	SLINGERB	SOLIERD
SHUKSANC	SIRENC	SLOCAVED	SOLISC
SHULEC	SIRREFD	SLOCUMC	SOLITEB/D

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SOLITUDED	SPIKEB	STAINKYB	STIVERSVILLE B
SOLLEKSC	SPILLCOB	STAKEC	STOCKDRIVEC
SOLLERD	SPILLERC	STALEYB	STOCKELD
SOLNESSC	SPILOCKD	STALLARD D	STOCKHOLMC
SOLOC	SPILYAYC	STALLINGSC	STOCKLANDB
SOLSBERRYC	SPINDLETOPD	STAMFORDD	STOCKPEND
SOLVAYD	SPIRES B	STANDISHC	STOHLMAND
SOMAD	SPIRESD	STANDISHD	STOKESD
SOMBORDOROD	SPIROB	STANDUPB	STOKLYB
SOMBREROC	SPLANODD	STANEYD	STONEBERGERD
SONAHNPILB	SPLAWNC	STANFLOWC	STONEBURGB
SONNETT D	SPLENDORAC	STANHOPEC	STONEBONGC
SONOCANC	SPLITC	STANISLAUSC	STONEHILLC
SONOMA, Stratified Substratum D	SPLITBUTTEC	STANISLAUS, WetD	STONELAKEA
SONORAB	SPLITROCKB	STANRODC	STONERB
SONSELAB	SPLITTOPC	STAPALOOPB	STONEVILLE B
SONTAGD	SPLOTTERD	STARGULCHB	STONEWALLC
SONYOKD	SPOKELB	STARHOPE, Low Elevation C	STONEWELL A
SOO	SPONIKER B	STARHOPED	STONO B/D
SOOLAKE B	SPONIKER, WarmC	STARICHKOFD	STONYBROOKB
SOONAHBE B	SPONSORB	STARKED	STOOKMOORC
SOONAKERC	SPOOLC	STARKEYC	STOPATOEC
SOONERB	SPOONER	STARLAKED	STORMKINGB
SOOPERD	SPOONERHILL A	STARLITEB	STORNETTAD
SOOSAPC	SPORLEYB	STARRC	STOTTC
SOPELAD			
	SPOTA/D	STARVEOUTB	STOUGHC
SOPERC	SPOTSYLVANIAC	STASERB	STOVALLB
SOPERTONB	SPOTTEDHORSEC	STASHD	STOVEPIPED
SOPHERC	SPOTVILLEB	STATE B	STOVHOC
SOQUELB	SPRABATB	STATELINED	STOWELLD
SORENSENB	SPRAUERC	STATEMEADOWB	STOYC
SORFC	SPRAYB	STATIOND	STRABERC
SORTERD	SPRECKELSC	STATLER	STRADDLEBUGC
		STATEND	STRAHLED
SORUMD	SPRINGC		
SOSAC	SPRINGCOVEC	STAVELYB	STRAIGHTC
SOSTIEND	SPRINGCREEKC	STAYTOND	STRANDLINEB
SOUDANC	SPRINGERTON B/D	STEADMANC	STRANDQUIST B/D
SOURDOUGHB	SPRINGFIELDD	STEAMBOATB	STRAWBCREK B
SOUTHAMD	SPRINGGULCHB	STEAMBURGB	STRAYHOSSB
SOUTHFORKD	SPRINGHILLB	STEARNSD	STREATOR B/D
SOUTHGATED	SPRINGHOLLOWC	STECOAHB	STRELLD
SOUTHHAVENB	SPRINGLAKEA	STECUMC	STRELNAC
SOUTHMOUNTB	SPRINGSTEENC	STEEDB	STREULINGD
SOUTHPACB	SPRINGWARMC	STEEDMANC	STRICKERB
SOUTHPLAINSD	SPRINGWATERC	STEEKEE	STRICKLANDC
SOUTHRIDGEB	SPRINGWOODB	STEELE	STRINGLEY B
SOUTHWELLS A	SPRINKLERC	STEESEB	STRINGTOWNB
SOUTHWEST	SPRIPARD	STEEVERB	STRINGTOWN, GradedC
SOUTINB	SPROULD	STEFFC	STROLEC
SOWARDB	SPRUCEDALED	STEGALLC	STROMC
SOWCANC	SPUDC	STEILACOOMC	STROMALB
SPADEB	SPUKWUSHB	STEINC	STRONGHOLDC
SPADRA B	SPUR B	STEINHATCHEE B/D	STRONGHURSTB
SPAINHOWERC	SPURGERC	STEINSBURG B	STROUPEC
SPANAD	SPURLOCKB	STEIWERC	STROUTC
SPANG B	SQUALICUMB	STELLA	STROZIC
SPANGLERC	SQUALLYB	STEMLEYC	STRUGGLE A
SPANPEAKB	SQUAMSCOTTC	STENGEL B/D	STRYKERC
SPANTARAB	SQUAWCAVEB	STEPHENC	STUC
SPARGUSB	SQUAWCREEKD	STERLING A	STUBBSC
SPARKSC	SQUAWTIPC	STERLINGTONB	STUBENVILLEB
SPARTAB	SQUAWVALC	STERRETTD	STUCKC
SPASSKID	SQUIRESC	1 -	STUDEBAKERB
		STETTER B	
SPEAKER, High Rainfall B	SREDNICC	STETTERD	STUKEL, CobblyB
SPEAKERC	ST. ANDREWSC	STEUBENB	STUKEL, SandyC
SPEARC	ST. ANTHONYB	STEVENSONB	STUKELD
SPEARHEADB	ST. AUGUSTINEB	STEVIEB	STULTZC
SPEARMANB	ST. ELMO A	STEWART D	STUMOUNT D
SPEARVILLEC	ST. HELENSB	STICESB	STUMPPD
SPECTACLEC	ST. IGNACED	STIDHAMB	STUNTZC
SPECTERC	ST. JOHNSD	STIENB	STURGEONB
SPEEDC	ST. LUCIE A	STIGLERD	STURGESD
			STURGILL
SPEEDWELLB	ST. MARTIND	STILESC	
SPEELYAID	ST. NICHOLASD	STILGARB	STURKIEB
SPEERB	ST. ONGEB	STILLWELLB	STUTTGARTD
SPEIGLEB	ST. PAULB	STILSKINC	STUTZMANC
SPELLACYB	ST.MARYS B	STILSON B	STUTZMAN, WetD
SPELVINB	STABBARTD	STIMSOND	STYERSD
SPERRY	STABLERB	STINED	STYLITEC
SPESSARDA	STACHERB	STINESVILLEB	STYXB
SPEXARTHC			
	STACKERB	STINGALB	SUAKC
SPICERTOND		STINGER B	SUBACOD
	STACKYARDSB		
SPICEWOODC	STACYB	STINKCREEKD	SUBLETTE, Elevation 7000-9000 A
SPICEWOODC SPICKERTC	STACYB STAFFORDC		SUBLETTE, Elevation 7000-9000 A SUBLETTEB
SPICEWOODC	STACYB	STINKCREEKD	SUBLETTE, Elevation 7000-9000 A

SUBRANC	SUTPHEND	TAFOYAC	TASCOSAB
SUBWELL B	SUTROC	TAFTC	TASSELCREEK A
SUCARNOOCHEED	SUTTLEA		TASSELOREERD
		TAFTOWNB	
SUCCORD	SUVERD	TAFUNA A	TASSID
SUCHESB	SVERDRUPB	TAGUMB	TASSO B
SUCKERFLAT B	SWAFFORDC	TAGUSB	TATAIC
SUDLEY B	SWAGER	TAHKENITCHB	TATERPAB
SUDPEAK, NonfloodedC	SWAHLENB	TAHOULAD	TATLUMD
SUDPEAK., FloodedD	SWAINTONB	TAHQUATSB	TATOUCHEB
SUEPERTC	SWALECREEKB	TAINED	TATTON
SUEYB	SWAMPCREEKD	TAINTOR	
			TAUMSAUKD
SUFFIELDC	SWAMPOODLEC	TAJOC	TAUNCALC
SUFFOLKB	SWAMPYDRAWB	TAKOTNAB	TAVERD
SUGAKOOLB	SWAND	TAKPOCHAOD	TAVERNIERD
SUGAR BEACHD	SWANBERGERD	TALAG D	TAWAHB
SUGARBOWLB	SWANLAKEB	TALANTED	TAWCAWC
SUGARBUSHB	SWANNERD	TALAPUSB	TAYLOR CREEKC
SUGARCREEKC	SWANPONDC	TALCOD	TAYLORSFLATC
SUGARDEEB	SWANSONC	TALLAC	TEAGARD
SUGARTOWND	SWANTON	TALLADEGAC	TEAGO A
SUGLOB	SWANTOWND	TALLCREEKB	TEAGULFC
SUILOTEMC	SWANWICKD	TALLEYVILLEB	TEAKEANB
SUISUND	SWARTZ D	TALLOWBOXC	TEALSON D
SUKOID	SWAYNEC	TALLULAB	TEALWHITD
SULA B	SWEAGERTB	TALMAGEB	TEAMONTD
SULLIVANB	SWEATBEEB	TALMAKSB	TEARNEYD
SULOAFB	SWEATBEE, WetC	TALMOONC	TEASDALEB
SULPHURAB	SWEATMANC	TALMOON, DepressionalD	TEBAY B
SULPHURAD	SWEDEB		TEBOB
		TALOKAD	
SULSAVARB	SWEDEGROVE B/D	TALQUIN B/D	TECHICKB
SULTZ A	SWEDEHEAVENB	TALUWIKB	TECHICKNOT B
SUMAN B/D	SWEDESBOROB	TAMAHAD	TECKLA B
SUMATRA B	SWEDNA D	TAMALCO	TECO B
SUMAVAB	SWEETAPPLEB	TAMALPAISC	TECOPA D
SUMMERFIELDD	SWEETBRIARB	TAMARAB	TECTAHB
SUMMERFORDC	SWEETBUTTEB	TAMARACKB	TECUMSEH
SUMMERMUTEB	SWEETGRASSB	TAMARACKCANYONC	TECZUNIC
	SWEETWATERD		
SUMMERS B		TAMARRONC	TEDDYC
SUMMERTONB	SWEITBERGC		TEEBARD
SUMMITC	SWENSOND	TAMELYB	TEEBONEC
SUMMITVILLEC	SWIFT CREEKB	TAMFLATD	TEEDOWN B
SUMPF D	SWIFTCURRENTB	TAMFORDD	TEEGARDENC
SUMPLEYC	SWIFTON B	TAMIAMID	TEEMAT B
SUMTERVILLEC	SWIMLEYC	TAMMANYB	TEETERS, ProtectedC
SUMYAD	SWIMSB	TAMMINGB	TEETERSD
SUNBURGB	SWINKD	TAMPB	TEFTONC
SUNBURY B	SWINOMISHC		TEHRAN A
		TAMREDC	
SUNCITYD	SWINTB	TANACROSSD	TEIGENC
SUNCOOKA	SWIPKINB		TEJAD
SUNDC	SWISBOBD	TANAMAD	TEJABED
SUNDANCEB	SWISSC	TANANA, ThawedB	TEJANA B
SUNDAY A	SWISSVALED	TANANA, Moderately WetC	TEKAPO D
SUNEV B	SWITCHBACKC	TANAZZAB	TEKENINKB
SUNKEND	SWITZERLANDB	TANDYD	TEKISONC
SUNLIGHTD	SWORMVILLEC	TANEUMC	TEKLANIKAA
SUNNYC	SWYGERTC	TANGIC	TEKOAB
SUNNYHAYD	SYBIL B	TANGLEC	TELAB
SUNNYSIDEB	SYBILLEB	TANGLENOOKD	TELAQUANAB
SUNRAYB	SYBLOND	TANKERVILLEC	TELAY B
SUNRIVERC	SYCANA	TANNAWASHAB	TELCHERB
SUNSTROKED	SYCLEB	C	TELECAN B
SUNSWEETC	SYCREEKC	TANNER, Low RainfallD	TELEFONOC
SUNTRANAD	SYKESB	TANOANB	TELEMOND
SUP B	SYLACAUGAD	TANOBB	TELESCOPE A
SUPOSOC	SYLVA B/D	TANSEMB	TELFAIRC
SUPPAHA	SYLVANIAC	TANTALUSA	TELFERNER D
SURC	SYLVANIAMC	TANTILE	TELL
SURFSIDED	SYLVESTERB	TANTILE	TELLER B
SURGEMC			
	SYLVIAC	TANYARDC	TELLICOB
SURPLUSC	SYMCOC	TAOPIB	TEMBLORD
SURRETTC	SYNAREPB	TAPAWINGOC	TEMDILLEA
SURVEYORSB	SYRETTB	TAPICITOESD	TEMESCALD
SURVYAC	SYRUPCREEKC	TAPPAN B/D	TEMVIK B
SURYONB	TABECHEDINGC	TARAB	TENAHA B
SUSANNAC/D	TABERNASHB	TARALB	TENASC
SUSANNABERGD	TABLERD	TARHOLLOWC	TENDOYD
SUSANVILLED	TABLEROCKD	TARKIOD	TENEBD
SUSIVARC	TABOOSE A	TARLOCB	TENEXB
SUSQUEHANNAD	TABOOSE, Gravelly Substratum . B	TARLTONC	TENINOC
SUTAB	TABORD	TARNAV B	TENMILEC
SUTHERC	TACHID	TARRETED	TENNCOC
SUTHERLAND, GravellyC	TACODAC	TARRYALLC	TENNECOB
SUTHERLANDD	TACOOSHB/D	TARRYTOWNC	TENOTC
SUTHERLINC		TASAJALB	TENPIND
	TADLOCK B		
SUTLEY B	TAFFOMB	TASAYAC	TENRAGB
SUTLEYB			

TENOAC	TUDEEK		TINITON	TOMOVA	. / D
TENSAS D			TINTON A	TOMOKA E	
TENSLEEP			TINYTOWNB	TOMS	
TENVORRD			TIOGAB	TOMSHERRY	
TENWALTERC			TIONESTA A	TOMTY	
TENWELL			TIPLERB	TONATA	
TEOCULLI			TIPNAT B	TONEY	
TEQUESTA B/D			TIPPAHC	TONIO	
TERADA			TIPPECANOEB	TONKAVAR	
TERBIES			TIPPERC	TONKAWA	
TERCA			TIPPIPAHB	TONKIN	
TERESA			TIPPOC	TONKIN, Moderately Wet	
TERLINGUAD	THURLOW	. В	TIPSAWC	TONKS	
TERMO	THWOOP	.C	TIPTONB	TONOR	
TEROMOTE			TIPTONVILLE B	TONOWEK	B
TEROUGE	TIAK	.C	TIPTOPB	TONRA	B
TERRA CEIAB/D		.C	TIROC	TONSINA	B
TERRABELLAC		.В	TIRODB	TONUCO	
TERRACECREEKC			TISBURY B	TOOLES E	
TERRADC			TISDALEC	TOOLESBORO	
TERRAROSSA			TISHARB	TOONE	
TERRETONC			TISMIDC	TOOTERVILLE	
TERRO			TISONIAD	TOPAWA	
TERT			TITCHENALB	TOPAWA, Very Gravelly	
TESSFIVE			TITIACKB	TOPEMAN	
TETHEROW			TITUSVILLEC	TOPETAUL	
TETILLA			TIVOLIA	TOPIA	
TETLIN			TIVYC	TOPKNOT	
TETONIA			TOAB	TOPO	
TETONVILLE, Gravelly			TOADLAKEB	TOPOCK	
TETONVILLE			TOADLENAD	TOPPENISH	
TETOTUM			TOBA B	TOPPER	
TEVAL E			TOBINSPORTB	TOPSEY	
TEVISE			TOBOSAB	TOQUIMA	
TEWFELC			TOBYB	TOREX	
TEX E TEXANA C			TOCALOMAC		
			TOCANB	TORNEY	
TEXASCREEK E TEXLA D			TOCITOB	TORNILLO	
TEXLA E			TOCKC	TORODA	
TEXROY			TOCOI B/D	TORONTO	
THADERC			TODACHEENEB	TOROX	
THAGEC			TODDSTAVD	TORPEDO LAKE	
THATCHERFLATS			TODDSTAVB	TORREON	
THAYNEE			TODOSC	TORRES	
THEBES			TOECANEB	TORRY	
THEBO			TOEFOOTB	TORULL	
THEECAN			TOGCHAB	TOSP	
THENARROWS			TOGUS	TOTAVI	
THENASC			TOHATINB	TOTEM	
THENIPEL			TOHOBITC	TOTIER	
THEODOR			TOIMIC	TOTNESS	
THERESAC			TOINE B	TOTO	
THERMO			TOISNOT B/D	TOTTEN	
THETFORD			TOISNOT, PondedD	TOTTLES	
THETIS			TOKAYB	TOTZ	
THIBAUT			TOKEENC	TOUCHET	
THIEFRIVER B/D			TOKIOB	TOULA	
THIKE			TOKLATD	TOURN	
THIMBLEC	TIMHUS	в	TOKOC	TOURNQUIST	
THIRST			TOKOSITNAB	TOUTLE	
THIRSTYGULCH			TOKULC	TOWAVE	
THISTLEBURN E			TOLANYB	TOWERVILLE	
THISTLEDEW			TOLERC	TOWNSEND	
THOENY			TOLFORKB	TOWNSHIP	
THOMAS B/D	I	- 1	TOLICHAD	TOWOSAHGY	
THOMASFORKC			TOLIUSB	TOXAWAY E	
THOMHILL			TOLKEB	TOY	
THOMS			TOLLGATEB	TOZE	
THOR			TOLMAN C	TRACE	
THORN			TOLNAB	TRACKC	
THORNCREEK			TOLONIERB	TRACKLER	
THORNDALE			TOLOVANAB	TRACOSA	
THORNOCK			TOLSONAD	TRACTUFF	
THORNTON			TOLUCAB	TRACYLEE	
THOUT, Gravelly Surface E			TOMAHAWKA	TRADELAKE	
THOUTC			TOMALESD	TRAER E	
THOWE			TOMARIZOD	TRAHAM	
THRASH E THREADGILL E			TOMASAKI C	TRAHERN	
THREADGILLC			TOMBEALLD	TRAIL	
THREEBUCKC			TOMEKB	TRAILCREEK	
THREECHOP			TOMERC	TRAILCHEEK	
THREECREEKSC			TOMERA, Cemented Substratum D	TRAINER	
THREEFORKS			TOMODOB	TRAITORS	
		-			

TRAMWAY B TSCHICOMA B TWEEDY	TRALEY B	TSCHAMMAND	TWERA Drained	LIDODEEK
TRANSPER D TSERTA			TWEBA, DrainedC	UPCREEKC
THANSCUARRING				
TRAPPER			TWENTY DAY B	
THAPERCREEK				
THANK				
THANNIK. B TUCKERDOWNS B TWINSELMAN C C C C C C C C C				
THAVER				
TRADUNAL C TUCHMARI B TWOCABIN B URICH C/D				
THAZUN				
THEATY				
THEBIOC				
TREEDOR				
TREEKOR DESCRIPTION DESC				
TREEKOF D	TREEBUTTED	TUKUHNIKC		URSAC
TREEN				
TREED				
TREGON				
TREGONING				
TRELANN C TULE				
TRELONA				
TREMENTINA B TULIA B TYSON B USTIDUR D	TRELONA, MoistC			USTARENTS, Loamy B
TREMONT				
TREMONA				
THEMPONT				
TREMPELEAU				
TREMPICIAL B				
TRENDIOM				
TREOFF				
TREON				
TRESTIE				
TRESTIE				
TRETITEN				
TREV				
TREY				
TRIBBEY				
TRICCART	TRIANGLED	TUOMIB		VADAHOD
TRICERA				
TRICON				
TRID Nonstony				
TRID				
TRIGGER				
TRIGO				
TRINDOT				
TRINIDAD				
TRIO				
TRIOMAS				
TRIPIT				
TRIPLEN				
TRIPOLI				
TRISTAN			ULYB	VALKARIA, DeppressionalD
TRITON				
TRIVAR				
TRIX				
TROMP				
TRONSON				
TROSKY B/D TUSCOSSO B UNAKA B VALPAC C TROUP A TUSCUMBIA D UNAKWIK D VALTON B TROUTER C TUSIP B UNCAS D VALTON, Severely Eroded C TROUTLAKE B TUSIP B UNCOMPAHGRE D VALVERDE B TROUTMEADOWS B TUSLER A UNDERWOOD B VAMER B TROVE B TUSSY D UNDUSK B VAMONT D TRUCKEE B/C TUSTEL C UNGENE A VAN HORN B TRUEFISSURE B TUSUNE C UNICOI C VANBRUNT, Warm B TRUHOY D TUTKA D UNION C VANCE C TRUMBULL D TUTNI B UNION C VANCECREEK B/D TRUMP D TUTNI, Loamy				
TROUP		TUSCAWILLAD		
TROUTER				
TROUTLAKE				
TROUTMEADOWS B TUSLER				
TROVE				
TRUCKEE B/C TUSTELL C UNGENE A VAN HORN B TRUEFISSURE B TUSUNE C UNICOI C VANBRUNT B TRUHOY D TUTE B UNICORN B VANDRUNT C TRULAE D TUTKA D UNION C VANCECE C TRUMBULL D TUTNI B UNIONGROVE B/D VANCECREEK B/D TRUSCREEK B TUTVII, Loamy Substratum C UNIONVILLE B VANDAMINE B TRUSSUM C/D TUTUILLA C UNIQUE B VANDAMME B TRUSTON B TUTWILER B UNIVEGA D VANDERBILT B TSADAKA B TUWEEP B UNIVERSITY A VANDERBILT, Moderaterly Wet C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRUHOY D TUTE B UNICORN B VANBRUNT C TRULAE D TUTKA D UNION C VANCE C TRUMBULL D TUTNI B UNIONGROVE B/D VANCECREEK B/D TRUMP D TUTNI, Loamy Substratum C UNIONVILLE B VANDAMINE B TRUSCREEK B TUTTLE C UNIQUE B VANDAMME B TRUSSUM C/D TUTUILLA C UNIUS D VANDAMORE B TRUXTON B TUTWILER B UNIVEGA D VANDERBILT, Moderaterly Wet C TSADAKA B TUWEEP B UNIVERSITY A VANDERBILT, Moderaterly Wet C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRULAE D TUTKA D UNION C VANCE C TRUMBULL D TUTNI B UNIONGROVE B/D VANCECREEK B/D TRUMP D TUTNI, Loamy Substratum C UNIONVILLE B VANDAMINE B TRUSCREEK B TUTVILE C UNIQUE B VANDAMME B TRUSSUM C/D TUTUILLA C UNIUS D VANDAMORE B TRUXTON B TUTWILER B UNIVEGA D VANDERBILT B TSADAKA B TUWEEP B UNIVERSITY A VANDERBILT, Moderaterly Wet C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRUMBULL D TUTNI B UNIONGROVE B/D VANCECREEK B/D TRUMP D TUTNI, Loamy Substratum C UNIONVILLE B VANDAMINE B TRUSCREK B TUTLE C UNIQUE B VANDAMME B TRUSSUM C/D TUTUILLA C UNIUS D VANDAMORE B TRUXTON B TUTWILER B UNIVEGA D VANDERBILT B TSADAKA B TUWEEP B UNIVERSITY A VANDERBILT, Moderaterly Wet C TSALI C TUXEKAN B UNKEE B VANDERGIFT C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRUMP D TUTNI, Loamy Substratum C UNIONVILLE B VANDAMINE B TRUSCREEK B TUTTLE C UNIQUE B VANDAMME B TRUSSUM C/D TUTUILLA C UNIUS D VANDAMORE B TRUXTON B TUTWILER B UNIVEGA D VANDERBIT B TSADAKA B TUWEEP B UNIVERSITY A VANDERBIT, Moderaterly Wet C TSALI C TUXEKAN B UNKEE B VANDERGRIFT C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRUSCREEK B TUTTLE C UNIQUE B VANDAMME B TRUSSUM C/D TUTUILLA C UNIUS D VANDAMORE B TRUXTON B TUTWILER B UNIVEGA D VANDERBILT B TSADAKA B TUWEEP B UNIVERSITY A VANDERBILT, Moderaterly Wet C TSALI C TUXEKAN B UNKEE B VANDERGIFT C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRUSSUM C/D TUTUILLA C UNIÚS D VANDAMORE B TRUXTON B TUTWILER B UNIVEGA D VANDERBILT B TSADAKA B B UNIVERSITY A A VANDERBILT, Moderaterly Wet C TSALI C TUXEKAN B UNKEE B VANDERGRIFT C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TRUXTON B TUTWILER B UNIVEGA D VANDERBILT B TSADAKA B TUWEEP B UNIVERSITY A VANDERBILT, Moderaterly Wet C TSALI C TUXEKAN B UNKEE B VANDERGRIFT C TSANA B TUZIGOOT C UNLIC B VANDERPOOL B				
TSADAKA				
TSALI C TUXEKAN B UNKEE B VANDERGRIFT C TSANA C UNLIC B VANDERPOOL B	TSADAKAB	TUWEEPB	UNIVERSITYA	VANDERBILT, Moderaterly Wet C
				VANDERGRIFTC
TOATAB VANEPPS				
	10A1AD	I WEDA, WOULEALERY WETB	UNOUNB	VANEFFSC

		_			_
VANGOEC	VIBO		WAAS B	WALLUSKI	
VANGUARDC	VIBORAS		WABANICAC	WALNETT	
VANLUEC	VICK		WABASSO D	WALNUT	
VANMETERC	VICKSBURG		WABEDO	WALONG	B
VANNOYC	VICTORVILLE	B	WABUN A/D	WALPOLE	C
VANOCKERB	VICTORY	B	WACAHOOTAD	WALREES	B
VANOSSB	VICU	C	WACCASASSAD	WALSEY	B
VANPETTENB	VIDA	В	WADDINGTON A	WALTERS	
VANSICKLED	VIDAURI		WADDOUPSB	WALTHAM	
VANSTEL B	VIDRINE		WADECREEKC	WALUM	
VANWYPERD	VIEJA		WADELL B	WALVAN	
VANZANDTC	VIENNA		WADENILL B	WALVILLE	
VANZILE B	VIEQUES		WADESPRINGSC	WAMBA	
VAQUEROD	VIEWPOINT		WADLEIGHD	WAMBOLT	
VARELUM B	VIGAR	C	WADLEY A	WAMEGO	C
VARELUM, Clay Loam Substratum	VIGIA	D	WADMALAW D	WAMIC	B
C	VIGILANTE		WADSWORTHC	WAMPEE	
VARGASC	VIGNOLO		WAELDERB	WAMPOO	
VARICKD	VIGO		WAFLAB	WAMPSVILLE	
VARROB	VILLA		WAGNERD	WANAGAN	
VARWASHA	VILLARD		WAGONBEDB	WANDO	
VARYSBURGB	VILLEDRY		WAGONBOWD	WANETTA	
VASA B	VILLEGREEN	C	WAGONBOXD	WANILLA	C
VASSETT B	VILLMEAGHER	C	WAGONHOUNDB	WANNACOTT	B
VASTINE, Map>16B	VILLSPRINGS		WAGONJACKETC	WANOGA, Elevation>4000	
VASTINED	VILLY		WAGONTIRED	WANOGA	
VAUGHAND	VILOT		WAGONTOWNB	WANOMIE	
VAUGHNSVILLEC	VIMVILLE		WAGOREB	WANSER, Drained	
VAYASD	VINCOM		WAGRAMA	WAPAHANI	
VEAL B	VINDICATOR		WAGSTAFFC	WAPAL	
VEATCHC	VINEGARROON		WAHEED	WAPELLO	B
VECONTC	VINELAND	A	WAHGUYHED	WAPI	D
VEEDUMD	VINELAND, Wet	В	WAHIAWAB	WAPINITIA	
VEGA ALTAB	VINGO		WAHKEENAB	WAPITI	
VEGA BAJAC	VINITA		WAHLSTENC	WAPPINGER	
VELASCOD	VINLAND		WAHLUKEB	WAPPO	
VELDA B	VINSAD		WAHOOD	WAPSHILLA	
VELDKAMPB	VINSON	B	WAHPETONC	WAPTUS	C
VELOW B	VINTON	A	WAHREKDAMC	WARDA	B
VENAC	VIOLA	D	WAHSTALD	WARDBAY	B
VENAGROB	VIPONT		WAHTUMD	WARDBORO	
VENAPASSD	VIRDEN		WAHWEAPD	WARDELL	
	VIRGIN RIVER				
VENATOR, ChanneryB			WAI HONUB	WARDWELL	
VENATORC	VIRKULA		WAIALEALED	WARE	
VENETAD	VIRTUE		WAIAWAD	WAREAGLE	
VENEZIAD	VISE	B	WAIHUNA D	WARHORSE	
VENICEC	VISTA	B	WAIKALOAB	WARM SPRINGS	D
VENLO A/D	VISTULA	A	WAIKANEB	WARMAN	
VENNOBD	VITERBO		WAIKAPU B	WARMINSTER	
VENSONB	VITRINA		WAIKOMOD	WARNOCK	
VENSORAC	VITROFF		WAILUKUB	WARNUT	
VENUMD	VITZTHUM		WAINEEB	WARRENTON	
VERBOORTD	VIUM		WAINOLAB	WARRIOR	
VERCLIFFC	VIVES		WAIPAHUC	WARROAD	
VERDELD	VIVI	B	WAITS B	WARSING	B
VERDIGREC	VIVIAN	B	WAITSFIELDB	WARWICK	A
VERDUND	VIXEN		WAKAMOC	WASA	
VERENDRYE B/D	VIZCAINO		WAKE	WASDA	
VERGENNESC	VIZCAPOINT		WAKEEN	WASHINGTON	
VERHARTB	VIZCAYA		WAKELEYD	WASHPASS	
VERICKC	VLASATY		WAKEMANC	WASKISH	
VERIDGEB	VOCA		WAKENDAB	WASKOM	
VERJELESD	VOCK		WAKEPISHB	WASNOT	
VERLOT D	VODA		WAKETICKEHD	WASSON	
VERMILLIONC	VODERMAIER	B	WAKEVILLEB	WATAB	
VERNADO D	VOELKER	B	WAKITAD	WATAHALA	A
VERNALB	VOIGHT	В	WAKONDAB	WATAUGA	В
VERNDALE B	VOLADORA		WAKONDA, Till Substratum C	WATCHABOB	
VERNIA A	VOLASH		WAKULLAA	WATCHES	
VERNONIAB	VOLCO		WAROLLA C	WATERFALL	
VEROD	VOLENTE		WALCOB	WATERFLAT	
VERSHALD	VOLINIA		WALCOTTB	WATERFORD	
VERSONC	VOLLMER		WALDECKC	WATERGATE	
VERSTOVIAD	VOLMONT		WALDEND	WATERTOWN	B
VERTEL D	VOLNEY	B	WALDOD	WATHENA	B
VERTINED	VOLSTEAD		WALDORFC/D	WATKINS	
VERTREESB	VONALF		WALDROUPD	WATNE	
VESEYB	VONASON		WALKERSVILLEB	WATONGA	
VESPERD	VONDERGREEN		WALKINSHAWD	WATOODALL	
VESTAB	VOORHIES		WALKONC	WATOOPAH	
VETAGRANDEB	VOSSET		WALKOVERB	WATROUS	
VETEADOC	VOTAW		WALL B	WATSEKA	
VIA B	VOYAGER		WALLKILL B/D	WATSONIA	
VIAN B	VULCAN		WALLOWAC	WATTON	
VIBLEA	VYCKYL		WALLROCKC	WATUSI	
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WAUBERG	D	WENOTA D	WHITE STORED	WILLIAMSVILLEC
WAUCHULA		WENZEL B	WHITE SWAND	WILLIMANB/D
WAUCHULA, Depressional		WEOGUFKAC	WHITEARTHC	WILLISTONC
WAUCOBA		WEOTTD	WHITEBIRDD	WILLOSIPPIC
WAUCONDA		WEPOC	WHITECAPD	WILLOW CREEKB
WAUKENA		WERELDB	WHITECLOUDB	WILLOWDALEB
WAUKENABO		WERITOC	WHITEDEERB	WILLOWFORKD
WAULD		WERNOCKB	WHITEFACED	WILLSPRINGSC
WAURIKA		WESFILD	WHITEFIELDD	WILLYNATB
WAUTOMA		WESIXD	WHITEFORDB	WILMAC
WAVELAND		WESKAD	WHITEHALLB	WILMERC
WAVELAND		WESLEYB	WHITEHORND	WILMONTB
WAWAKA	B	WESPAC, Sandy Substratum Alkali	WHITEHORSEB	WILMONTONB
WAWASEE	B	c	WHITEKNOBB	WILPARC
WAWINA	A	WESPAC, AlkaliD	WHITEMARSHC/D	WILPOINTD
WAX	C	WESSEL	WHITEOAKB	WILSALL D
WAXPOOL	D	WESTBENDB	WHITEPEAKD	WILSHIRE A
WAYCUP	B	WESTBOROD	WHITEPINED	WILSON D
WAYLAND		WESTBROOKD	WHITERIVERC	WILSONGULCHB
WAYMET		WESTBUTTEB	WHITEROCKD	WILSONVILLED
WAYMOR		WESTERVILLE B	WHITESBOROC	WILSOR B
WEA		WESTFORKD	WHITESBURGC	WILSPRINGC
WEALTHWOOD		WESTGATEC	WHITESIDEB	WILSTC
WEASH		WESTINDIANC	WHITESOND	WILT B
WEATHERFORD		WESTLAKE, Thin SurfaceC	WHITETHORNB	WILTONB
WEATHERWAX		WESTLAKED	WHITEWATERD	WIMPEYC
WEAVER		WESTMIOND	WHITEWOOD, Nonflooded B/D	WINADAC
WEAVERVILLE		WESTMOREC	WHITEWOODC/D	WINBERRYC
WEBB		WESTOLAB	WHITEWRIGHTC	WINBLOWC
WEBBRIDGE		WESTOND	WHITEYED	WINCHUCKC
WEBBTOWN		WESTOVERB	WHITINGB	WIND RIVERB
WEBFOOT		WESTPHALIAB	WHITINGERC	WINDCOATD
WEBILE		WESTPLAIND	WHITLEYB	WINDCOMBD
WECHECH		WESTPORT A	WHITNEYC	WINDEGOB
WEDDERBURN		WESTPORT, Thin Surface B	WHITSOND	WINDERD
WEDGE		WESTSHORED	WHITTEMOREC/D	WINDERE B
WEDGEMONT		WESTSIDEC	WHITVIND	WINDERNOTB
WEEDING		WESTSUMD	WHITWELLC	WINDICREEK A
WEEDMARK		WESTVACOC	WHORLEDC	WINDLASSC
WEEDPATCH		WESTVIEWB	WICHITAC	WINDMILL B
WEEDZUNIT		WESTVILLEB	WICKAHONEYD	WINDRYD
WEEKIWACHEE		WESTWEGOD	WICKENBURGD	WINDTHORSTC
WEEKS		WESWINDC	WICKERSHAMB	WINDWHISTLE B
WEENA		WESWOODB	WICKETTC	WINDYBUTTEB
WEEPAH		WETAD	WICKIUPC	WINDYHOLLOWC
WEESATCHE		WETBETHC	WICKSBURGB	WINDYPOINTB
WEETOWN		WETHEY A/C	WICKWAREB	WINEDALED
WEEZWEED		WETHEYC	WICUPC	WINEGB
WEGERT		WETSAWC	WIDENC	WINEGARC
WEGLIKE		WETTERDONB	WIDOWSPRINGB	WINEVADAC
WEIDER WEINBACH		WETZEL D WEWELA B	WIERGATED	WINFALL B
			WIFFOB	WINFIELDB
WEIR WEIRMAN		WEWOKA C WEYANOKE C	WIFTONB	WINGD
WEISBURG		WEYERS	WILAHAB	WINGATE B
WEISSENFELS		WEYMOUTHB	WILBANKSD	WINGDALEB
WEITAS		WHAKANAB	WILBURB	WINGINAWD
WEITCHPEC		WHALESHEADB	WILCOC	WINGROCK
WELAKA		WHALEYD	WILCOXD	WINGVILLE D
WELCH		WHATCOMC	WILCOXSONC	WINKLEMAND
WELCHLAND		WHATELYD	WILDALEC	WINKLER B
WELCOME		WHEATBELTD	WILDCATD	WINKLO
WELDA		WHEATONB	WILDERA	WINLERD
WELEETKA		WHEATWOODB	WILDGENB	WINLO
WELLESLEY		WHEELERB	WILDHILLC	WINNC
WELLIE		WHEELERPEKD	WILDHORSE A	WINNEBAGOB
WELLINGTON		WHEELERVILLEB	WILDMESAC	WINNEMUCCAC
WELLMAN		WHEELON, Cool B	WILDORSC	WINNETTC
WELLROCK	B	WHEELOND	WILDROSEC	WINNETTD
WELLS	B	WHEELRIDGE A	WILE	WINNIPEGB
WELLSBENCH	B	WHEELS D	WILHOITB	WINNSBOROC
WELLSCREEK	B	WHERRYD	WILKESONB	WINOM D
WELLSDAM		WHETSOONC	WILL B/D	WINOOSKIB
WELLSED		WHETSTONEC	WILLABYC	WINOPEEB
WELLSFORD		WHICHMANB	WILLAKENZIEC	WINRIDGED
WELOY		WHIDBEYC	WILLAMETTEC	WINSANDB
WELSUM		WHILPHANGD	WILLANCHD	WINSTONB
WELTER		WHIPPD	WILLAPAC	WINTD
WEMPLE		WHIPPANYC	WILLARDB	WINTERCANYONC
WENAS		WHISKD	WILLETTE A/D	WINTERIMC
WENATCHEE		WHISKEY B	WILLHILLC	WINTERMUTEC
WENDANE		WHISKEYCREEKC	WILLHO D	WINTERSC
WENDELL		WHISKLAKEC	WILLIAMSBURGB	WINTERSBURGB
WENGLER		WHISPERINGC	WILLIAMSPORTC	WINTERSETC
WENONAH	B	WHISTLEB	WILLIAMSTOWNC	WINTLEY B
		I .	I .	I .

MINTON	_	W000VIII.E	_		Venu
WINTON		WOODVILLE		YADD	YORK
WINTONER		WOODWARD		YAGGY, ProtectedB	YORKSHIREC
WINU WINWELL		WOODWEST		YAGGY C	YORKTOWND YORKTREEC
WINWELL		WOOLLY		YAHARAC	
WISBY		WOOLPER		YAHMOREB	YOSEMITE B YOST C/D
WISCOW		WOOLFER		YAHNEC	YOTESB
WISCOY		WOOLSEY		YAHOOD	YOUGA, Sandy SubstratumD
WISE		WOOLSTALF		YAINAXB	YOUJAYD
WISEMAN		WOOLWICH		YAKOBI	YOUMANC
WISFLAT		WOOLWICH		YAKUSD	YOUNGSTON, WetC
WISHARD		WORCESTER		YAKUTAT A YALELAKE B	YOURAMEB
WISHBONE					YOUTLKUEB
WISHEYLU		WORKMAN		YALESVILLEC	YOVIMPAD
WISHKAH C		WORLAND		YALLANIB	YPSI
WISKAN		WORLEY		YAMHILLC	YRIBARREND
WISKISPRINGS		WORMCREEK		YAMSAYD	YTURBIDEA
WISNER B		WORMET		YANAB	YTURRIA A
WISTER		WORMSER		YANCYD	YUCCAB
WISTONA		WORSHAM		YANKEED	YUKON D
WITCHER		WORSWICK		YANKEEFORKB	YUNESD
WITHAM		WORTHENTON		YANKTONB	YURMD
WITHEE		WORTMAN		YAPB	YUTANB
WITHERBEE A		WORWOOD		YAPOAHA	YUTRUED
WITHERELL		WOVOKA		YAQUIB	YUZARRAB
WITHERS		WRANGELL		YAQUICAND	ZAARD
WITTEN		WRAYHA		YAQUINAC/D	ZABAB
WITTENBERG		WRAYS		YATAC	ZABOROSKYB
WIVILLE		WREDAH		YATAHONEYC	ZACAD
WIX		WREFORD		YATAHONEY, StonyD	ZACHARYC
WIXOM		WRENCOE		YATAMA B	ZADEC
WIZARD	.С	WRENGART		YATESD	ZADOG A/D
WOCKLEY	.С	WRENMAN	C	YAUCO	ZADVAR D
WOCKUM	. B	WRENTHAM	C	YAUHANNAHB	ZAFOD B
WODA	.D	WRIGHTMAN	C	YAUPOND	ZAGGC
WODAVAR	.D	WRIGHTSBORO	C	YAWHEEB	ZAIDYC
WODEN	. B	WRIGHTSVILLE	D	YAWKEYB	ZAKMED
WODOMONT		WRIGHTWOOD		YAWKOLAC	ZALCOA
WODSKOWB		WUKOKI		YAXINGB	ZALEAB
WOHLY		WUKSI		YEAGERA	ZALESKAD
WOLCO		WULFERT		YEARIAND	ZALLAA
WOLDALEC		WUNABUNAC		YEARYC	ZALVIDEAB
WOLFCREEK		WUNJEY		YEATONC	ZAMORAB
WOLFER		WUPATKI		YECROSS A	ZANBURB
WOLFESON		WURTSMITH		YEDLICKB	ZANEB
WOLFESON, Wet		WUTCHUMNA		YEGUASC	ZANGO
WOLFEY		WYALUSING		YELLOW HORSED	ZAPAC
WOLFET		WYALOSING		YELLOW HORSED	ZAPATAC
WOLFPEN		WYANDOTTE		YELLOWBANKB	ZAQUAD
WOLFFEN		WYARD		YELLOWDOG A	ZARKC
WOLLARD		WYARNO WYATT		YELLOWHILLSB	ZASTERC
WOLLARD					
WOLLENT		WYCOLO		YELLOWMULEC	ZAVALAB
WOLOT		WYEAST		YELLOWRIVERB	ZAVCOC
WOLVERTON		WYECREEK		YELLOWROCKB	ZAYANTEA
WOMACK		WYETH		YELLOWSTONED	ZBARTD
WOODBINE		WYEVILLE		YELLOWWASHD	ZEALEB
WOODBINE		WYICK		YELMC	ZEBB
WOODBURN		WYKOFF		YELTONC	ZEEB
WOODCANYON		WYLO		YENNICKB	ZEEBARB
WOODCHOPPER		WYNHOFF, Moist		YENSUSB	ZEEGEED
WOODCHTER		WYNHOFF		YEOPIMB	ZEEKAC
WOODCUTTERS Stand		WYNN		YERBAD	ZEELANDC
WOODCUTTERS, Stony		WYNNVILLE		YERINGTONA	ZEELNOTB
WOODFORD		WYNONA		YESUMB	ZEEMALD
WOODHURST		WYNOOSE		YIGOB	ZEGROC
WOODIN		WYNTOON		YIKESA	ZEIBRIGHTB
WOODINGTONB		WYOMINGCREEK		YLIGC	ZEKIAHD
WOODINVILLEC		WYOTITE		YNOTB	ZELAD
WOODLAWN		WYRICK		YOAKRANA	ZELDAD
WOODLEAF		WYSOCKINGC		YOCHUMC	ZENDAC
WOODLY		WYVA		YODALB	ZENIFFB
WOODMANSIE		XANA		YODERB	ZENITHB
WOODMERE		XANADU		YODYC	ZENOBIAB
WOODMONT		XANKEY		YOGAVILLED	ZENORIAC
WOODPASS		XAVIER		YOHNB	ZEOMONTA
WOODROCK		XERTA		YOKAYOD	ZEPHD
WOODS		XERXES		YOKUTB	ZEPHYRD
WOODSFIELD		XICA		YOLLABOLLYD	ZEPOLB
WOODSIDE		XINE		YOLOGOD	ZERKELB
WOODSLAKE		XIPE		YOMONTB	ZERKERB
WOODSON		XMAN		YONCALLAC	ZEUGIRDORB
WOODSPOINT		XOBOBO		YONNAD	ZIBATED
WOODSTOCK		YABAMAR		YORBAD	ZIBETODD
WOODTEX	.D	YACHATS	B	YORELB	ZIEGENFUSSD

ZIEGLERC		
ZIGGYB		
ZILABOY D ZILLAH C/D		
ZILWAUKEED		
ZIMMERD		
ZIMWALAC		
ZINGC		
ZIPPEL B/D ZIRAM D		
ZITA B		
ZITTAUC		
ZITZIANAB		
ZOARC		
ZOATED		
ZODA C ZOE D		
ZOLFOC		
ZOMAX B		
ZONOA		
ZORRAD		
ZOZOBRAB ZUBERC		
ZUFELTC		
ZULCHD		
ZUMAN. Protected C/D		
ZUMAND		
ZUMBRO A ZUMMO D		
ZUNALEIB		
ZUNDELLC		
ZUNHALLC		
ZUNI, Gravelly C ZUNI D		
ZUNIVENB		
ZUNKERB		
ZWAGGB		
ZWICKERC		
ZWIEFEL C ZWINGLE D		
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ZYNBAR Till SubstratumC		
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Appendix B

Synthetic Rainfall Distributions and Rainfall Data Sources

The highest peak discharges from small watersheds in the United States are usually caused by intense, brief rainfalls that may occur as distinct events or as part of a longer storm. These intense rainstorms do not usually extended over a large area and intensities vary greatly. One common practice in rainfall-runoff analysis is to develop a synthetic rainfall distribution to use in lieu of actual storm events. This distribution includes maximum rainfall intensities for the selected design frequency arranged in a sequence that is critical for producing peak runoff.

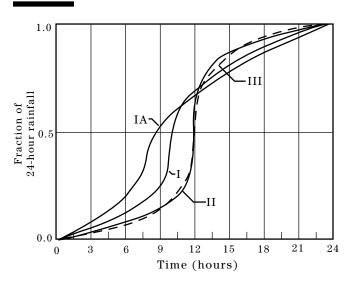
Synthetic rainfall distributions

The length of the most intense rainfall period contributing to the peak runoff rate is related to the time of concentration ($T_{\rm c}$) for the watershed. In a hydrograph created with NRCS procedures, the duration of rainfall that directly contributes to the peak is about 170 percent of the $T_{\rm c}.$ For example, the most intense 8.5-minute rainfall period would contribute to the peak discharge for a watershed with a $T_{\rm c}$ of 5 minutes. The most intense 8.5-hour period would contribute to the peak for a watershed with a 5-hour $T_{\rm c}.$

Different rainfall distributions can be developed for each of these watersheds to emphasize the critical rainfall duration for the peak discharges. However, to avoid the use of a different set of rainfall intensities for each drainage area size, a set of synthetic rainfall distributions having "nested" rainfall intensities was developed. The set "maximizes" the rainfall intensities by incorporating selected short duration intensities within those needed for longer durations at the same probability level.

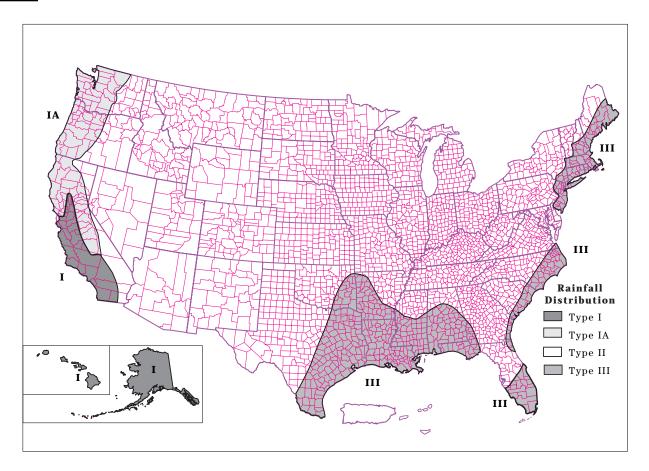
For the size of the drainage areas for which NRCS usually provides assistance, a storm period of 24 hours was chosen the synthetic rainfall distributions. The 24-hour storm, while longer than that needed to determine peaks for these drainage areas, is appropriate for determining runoff volumes. Therefore, a single storm duration and associated synthetic rainfall distribution can be used to represent not only the peak discharges but also the runoff volumes for a range of drainage area sizes.

Figure B-1 SCS 24-hour rainfall distributions



The intensity of rainfall varies considerably during a storm as well as geographic regions. To represent various regions of the United States, NRCS developed four synthetic 24-hour rainfall distributions (I, IA, II, and III) from available National Weather Service (NWS) duration-frequency data (Hershfield 1061; Frederick et al., 1977) or local storm data. Type IA is the least intense and type II the most intense short duration rainfall. The four distributions are shown in figure B-1, and figure B-2 shows their approximate geographic boundaries.

Types I and IA represent the Pacific maritime climate with wet winters and dry summers. Type III represents Gulf of Mexico and Atlantic coastal areas where tropical storms bring large 24-hour rainfall amounts. Type II represents the rest of the country. For more precise distribution boundaries in a state having more than one type, contact the NRCS State Conservation Engineer.



Rainfall data sources

This section lists the most current 24-hour rainfall data published by the National Weather Service (NWS) for various parts of the country. Because NWS Technical Paper 40 (TP-40) is out of print, the 24-hour rainfall maps for areas east of the 105th meridian are included here as figures B-3 through B-8. For the area generally west of the 105th meridian, TP-40 has been superseded by NOAA Atlas 2, the Precipitation-Frequency Atlas of the Western United States, published by the National Ocean and Atmospheric Administration.

East of 105th meridian

Hershfield, D.M. 1961. Rainfall frequency atlas of the United States for durations from 30 minutes to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 40. Washington, DC. 155 p.

West of 105th meridian

Miller, J.F., R.H. Frederick, and R.J. Tracey. 1973. Precipitation-frequency atlas of the Western United States. Vol. I Montana; Vol. II, Wyoming; Vol III, Colorado; Vol. IV, New Mexico; Vol V, Idaho; Vol. VI, Utah; Vol. VII, Nevada; Vol. VIII, Arizona; Vol. IX, Washington; Vol. X, Oregon; Vol. XI, California. U.S. Dept. of

Commerce, National Weather Service, NOAA Atlas 2. Silver Spring, MD.

Alaska

Miller, John F. 1963. Probable maximum precipitation and rainfall-frequency data for Alaska for areas to 400 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. of Commerce, Weather Bur. Tech. Pap. No. 47. Washington, DC. 69 p.

Hawaii

Weather Bureau. 1962. Rainfall-frequency atlas of the Hawaiian Islands for areas to 200 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 43. Washington, DC. 60 p.

Puerto Rico and Virgin Islands

Weather Bureau. 1961. Generalized estimates of probable maximum precipitation and rainfall-frequency data for Puerto Rico and Virgin Islands for areas to 400 square miles, durations to 24 hours, and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 42. Washington, DC. 94 P.

Figure B-3 2-year, 24-hr rainfall

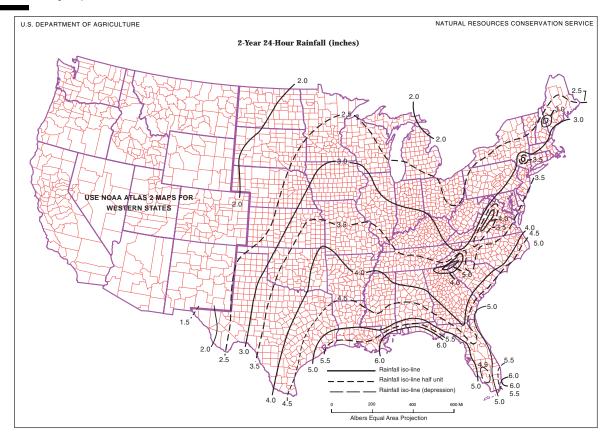


Figure B-4 5-year, 24-hour rainfall

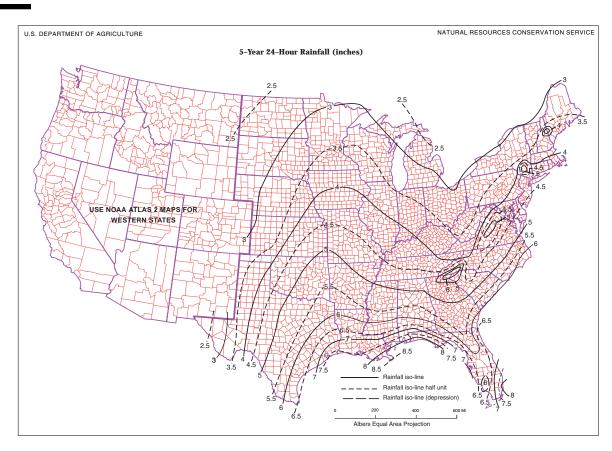


Figure B-5 10-year, 24-hour rainfall

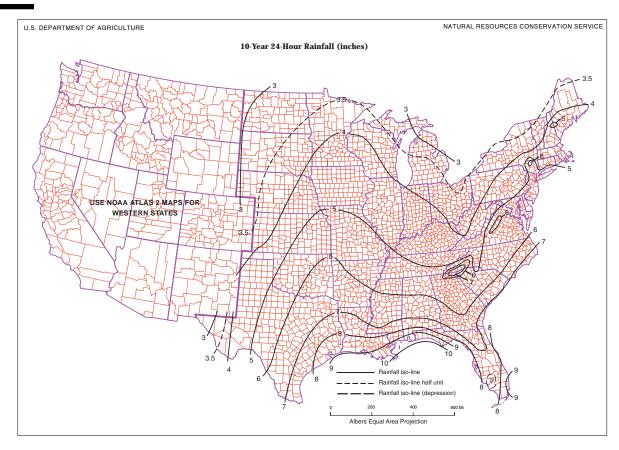


Figure B-6 25-year, 24-hour rainfall

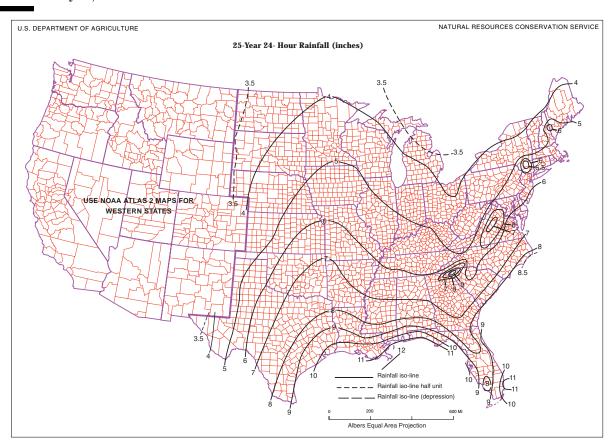


Figure B-7 50-year, 24-hour rainfall

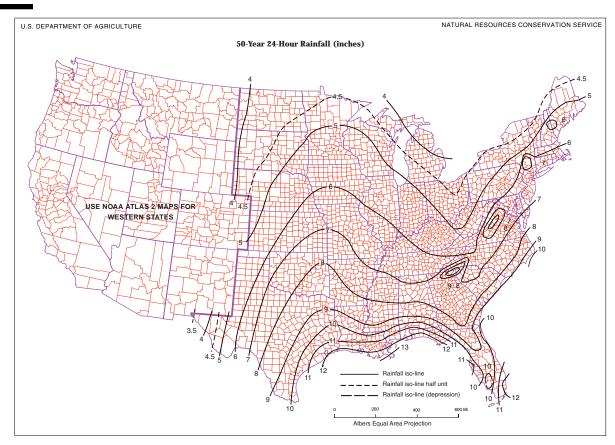
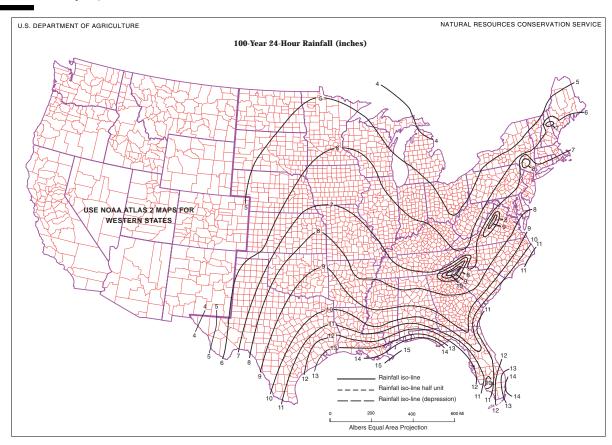


Figure B-8 100-year, 24-hour rainfall



Appendix C

Computer Program

The TR-55 procedures have been incorporated in a computer program. The program, written in BASIC, requires less than 256K memory to operate and was developed for MS-DOS operating system. Users of the program, however, still need to be familiar with the procedures in this TR. Features of the program include the following:

- The full screen (24 lines, 80 columns) is used to enter data. Flexibility of coding allows movement about the screen for quick data modifications.
- Function keys provide menu power to different modules (TR-55 chapters) within the program. Some keys are permanently defined while others vary by module.
- Help screens provide pertinent information to the program. Two types of information are included:
 (1) define system operation and (2) describe input parameters.
- User files provide for optional entry of local data, such as rainfall-frequency. graphic peak discharge equation coefficients, and tabular hydrographs for other rainfall distributions.

Copies of the program can be obtained from-

National Technical Information Service U.S. Department of Commerce 5285 Port Royal Road Springfield, VA 22161 Telephone (703) 487-4650

Appendix D

Worksheets

This appendix contains seven worksheets that can be reproduced for use with chapters 2 through 6. There is no worksheet for chapter 1.

Chapter	Worksheet	
2	2	
3	3	
4	4	
5	5a, 5b	
6	6a, 6b	

Worksheet 2: Runoff curve number and runoff

Project		Ву				Date		
Location		Checked		Date				
Check one: Prese	nt Developed							
1. Runoff curve n	umber							
Soil name and	Cover description		CN ^{1/}			Area	Product of	
hydrologic group	,		5-5	2-3	2-4	□acres	CN x area	
(appendix A)	(cover type, treatment, and hydrologic condi impervious; unconnected/connected impervi	tion; percent ous area ratio)	Table 2-2	Figure 2-3	Figure 2-4	□mi ² □%		
1/ Use only one CN source	e per line		7	Totals	s 📦			
	product = =	;	Use	CN	• [
2. Runoff	_							
		Storm #1		Storr	m #2		Storm #3	
	yr							
	(24-hour) in							
(Use P and	in In CN with table 2-1, figure 2-1, or 2-3 and 2-4)							

Worksheet 3: Time of Concentration (T_c) or travel time (T_t)

	` •	` •
Project	Ву	Date
Location	Checked	Date
Check one: Present Developed Check one: T _C T _t through subarea Notes: Space for as many as two segments per flow tyles include a map, schematic, or description of flow	•	
Sheet flow (Applicable to Tc only)		
$Segment \ ID \\ 1. \ Surface \ description \ (table 3-1)$		
Shallow concentrated flow		
$Segment \ ID$ 7. Surface description (paved or unpaved)	+	
Channel flow		
$Segment \ ID$ $12. \ Cross \ sectional \ flow \ area, \ a \qquad \qquad ft^2$ $13. \ Wetted \ perimeter, \ p_W \qquad \qquad ft$ $14. \ Hydraulic \ radius, \ r=\frac{a}{-} \ Compute \ r \qquad \qquad ft$ $15 \ Channel \ slope, \ s \qquad \qquad ft/ft$ $16. \ Manning's \ roughness \ coefficient, \ n \qquad \qquad ft/ft$ $17. \ \ V = \underbrace{\frac{1.49 \ r^{2/3}}{1.49} \ s^{1/2} \qquad Compute \ V \qquad \qquad ft/s}_{n}$ $18. \ Flow \ length, \ L \qquad \qquad ft$ $19. \ \ T_t = \underbrace{L \qquad Compute \ T_t \qquad hr}_{3600 \ V}$ $20. \ Watershed \ or \ subarea \ T_c \ or \ T_t \ (add \ T_t \ in \ steps \ 6, \ 11, \ argentation \ declaration $	+	=

Worksheet 4: Graphical Peak Discharge method

Project		Ву		Da	ate
Location		Checked		Da	ate
Check one: Present Developed	-			'	
1. Data					
Drainage areaA _r	m =	mi ² (a	acres/640)		
Runoff curve numberCI	N =	(From	worksheet 2	2)	
Time of concentrationT	c =	hr (Fr	om workshe	et 3)	
Rainfall distribution=	=	(I, IA, I	l III)		
Pond and swamp areas sprea throughout watershed	=	percent o	of A _m (acres	or mi ² covered)
		[Storm #1	Storm #2	Storm #3
2. Frequency		vr			
3. Rainfall, P (24-hour)					
4. Initial abstraction, I _a (Use CN with table 4-1)		in			
(OSE ON WITH TABLE 4-1)					
5. Compute I _a /P					
6. Unit peak discharge, q _u (Use T _C and I _a / P with exhibit 4–)		csm/in			
- D					
7. Runoff, Q(From worksheet 2) Figure 2-6		in			
8. Pond and swamp adjustment factor, F _p . (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond ans swamp area.)					
9. Peak discharge, q _p		ft ³ /s			
(Where $q_p = q_u A_m QF_p$)					

(210-VI-TR-55, Second Ed., June 1986)

Worksheet 5a: Basic watershed data

Project				Location				Ву		Date	
Check on	ne: Pres	sent Dev	/eloped	Frequency (yr)				Checked		Date	
Subarea name	Drainage area	Time of concentration	Travel time through subarea	Downstream subarea names	Travel time summation to outlet	24-hr rain- fall	Runoff curve number	Runoff		Initial abstraction	
	A _m	T _C	Tt		ΣT_{t}	Р	CN	Q	A _m Q	la	I _a /P
	(mi ²)	(hr)	(hr)		(hr)	(in)		(in)	(mi ² —in)	(in)	
	<u> </u>	From work	sheet 3				From wor	rksheet 2		From table 5-1	

Ţ

Worksheet 5b: Basic watershed data

Project				Location				Ву	Ву			Date	Date			
Check	one: \square P	resent 🔲	Developed	Frequency	Frequency (yr)				Chec	Checked			Date	е		
Subarea	Ва	sic watershed data used 1/ Select and enter hydrograph times in hours from exhibit 5-II							5-II <u>2</u> /							
name	Subarea T _c	ΣΤ _t to outlet	I _a /P	A _m Q												
	(hr)	(hr)		(mi ² —in)		-	1	Dis	charges	at select	t selected hydrograph times 3/					-
Compo	site hydrogr	aph at outlet	t													

- 1/ Worksheet 5a. Rounded as needed for use with exhibit 5.
- Enter rainfall distribution type used.
 Hydrograph discharge for selected times is A_mQ multiplied by tabular discharge from appropriate exhibit 5.

Worksheet 6a: Detention basin storage, peak outflow discharge (qo) known

	3 / 1	5 \ 10'					
Project	Ву	Date					
Location	Checked	Date					
Check one: Present Developed							
Elevation or 🗆 Elevation or latage							
Detention basin storage (acre feet) 1. Data: Drainage area							
2. Frequency	8. Runoff volume						
4. Peak outflow discharge q _u ft ³ /s	$(V_S = V_r \left(\frac{V_S}{V_r} \right))$						
5. Compute $\frac{q_0}{q_i}$	10. Maximum storage E _{max} (from plot)						
1/ 2nd stage q _o includes 1st stage q _o .							

Worksheet 6b: Detention basin storage, storage volume (V_s) known

Project	Ву	Date					
Location	Checked	Date					
Check one: Present Developed							
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □							
Detention bas	sin storage						
1. Data: Drainage area A _m = mi ² Rainfall distribution type (I, IA, II, III) =	-						
1st 2nd Stage Stage	7. $\frac{q_o}{q_i}$ in $\left[\begin{array}{c} \\ \end{array}\right]$ (Use $\frac{V_S}{}$ with figure 6-1						
2. Frequency yr	V _r 8. Peak inflow discharge						
3. Storage volume V _s ac-ft	q _i in L)					
4. Runoff, Q in (from worksheet 2) 9. Peak outflow discharge q_0 ft^3/s q_0 $q_0 = q_i \left(\frac{q_0}{q_i}\right)$							
5. Runoff volume ac-ft (V _r = QA _m 53.33)	q _i 10. Maximum storage E _{max} [(from plot)						
೨/ 2nd stage q _o includes 1st stage q _o .							

Appendix E

References

Brakensiek, D.L. and W.J. Rawls. 1983. Green-Ampt infiltration model parameters for hydrologic classification of soils. *In* John Borrelli, Victor R. Hasfurther, and Robert D. Burman (ed.) Advances in irrigation and drainage surviving external pressures. Proceedings of Am. Soc. Civ. Eng. specialty conference. New York, NY. p.226-233.

Chow, V.T. 1959. Open channel hydraulics. McGraw-Hill Book Company, Inc. New York, NY. p. 109-113.

Comer, G.H., F.D. Theurer, and H.H. Richardson. 1981. The Modified Attenuation-Kinematic (Att-Kin) routing model. *In* V.P. Singh (ed.) Rainfall-Runoff Relationships: Proceedings, International Symposium on Rainfall-Runoff Modeling. Mississippi State University. p. 553-564.

Engman, E.T. 1986. Roughness coefficients for routing surface runoff. Journal of Irrigation and Drainage Engineering 112 (1): 39-53.

Frederick, R.H., V.A. Myers, and E.P. Auciello. 1977. Five to 60 minute precipitation frequency for the Eastern and Central United States. U.S. Dep. Commerce, National Weather Service, National Oceanic and Atmospheric Administration Tech. Memo NWS HYDRO 35. Silver Spring, MD. 36 p.

Hershfield, D.M. 1961. Rainfall frequency atlas of the United States for durations from 30 minutes to 24 hours and return periods from 1 to 100 years. U.S. Dep. Commerce, Weather Bur. Tech. Pap. No. 40. Washington, DC. 115 p.

Linsley, R.K., M.A. Kohier, and J.L.H. Paulhus. 1982. Hydrology for engineers. Third Edition. McGraw-Hill Book Company, Inc. New York, NY. p. 484.

Musgrave, G.W. 1955. How much of the rain enters the soil? *In* Water. The Yearbook of Agriculture 1955. U.S. Dep. Agric. U.S. Gov. Print. Off. Washington, DC. p. 151-159.

Overton, D.E. and M.E. Meadows. 1976. Storm water modeling. Academic Press. New York, NY. p. 58-88.

Rallison, R.E. and N. Miller. 1981. Past, present, and future SCS runoff procedure. *In* V.P. Singh (ed.) Rainfall-Runoff Relationships: Proceedings, International Symposium on Rainfall-Runoff Modeling. Mississippi State University. p. 353-364.

Rawls, W.J., A. Shalaby, and R.H. McCuen. 1981. Evaluation of methods for determining urban runoff curve numbers. Transactions of the American Society of Agricultural Engineers 24 (6):1562-1566.

Soil Conservation Service. 1982 [Draft]. Structure site analysis computer program DAMS2 (interim version). SCS Technical Release 48. Washington, DC.

_.1983 [Draft]. Computer program for project formulation-hydrology. SCS Technical Release 20. Washington, DC.

_.1985. National engineering handbook. Section 4-Hydrology. Washington, DC.

Appendix F

Equations for figures and exhibits

This appendix presents the equations used in procedure applications to generate figures and exhibits in TR-55.

Figure 2-1 (runoff equation):

$$Q = \frac{\left[P - .2\left(\frac{1000}{CN} - 10\right)\right]^2}{P + 0.8\left(\frac{1000}{CN} - 10\right)}$$

where

Q = runoff(in)

P = rainfall (in)

CN = runoff curve number

Figure 2-3 (composite CN with connected impervious area):

$$CN_{c} = CN_{p} + \left(\frac{P_{imp}}{100}\right)(98 - CN_{p})$$

where

 CN_{c} = composite runoff curve number

CN_p = pervious runoff curve number

 P_{imp} = percent imperviousness.

Figure 2-4 (composite CN with unconnected impervious areas and total impervious area less than 30%):

$$CN_c = CN_p + \left(\frac{P_{imp}}{100}\right)(98 - CN_p)(1 - 0.5R)$$

where

R = ratio of unconnected impervious area to total impervious area.

Figure 3-1 (average velocities for estimating travel time for shallow concentrated flow):

Unpaved $V = 16.1345 (s)^{0.5}$

Paved $V = 20.3282 (s)^{0.5}$

where

V= average velocity (ft/s) s = slope of hydraulic grade line (watercourse slope, ft/ft)

These two equations are based on the solution of Manning's equation (eq. 3-4) with different assumptions for n (Manning's roughness coefficient) and r (hydraulic radius, ft). For unpaved areas, n is 0.05 and r is 0.4; for paved areas, n is 0.025 and r is 0.2.

Exhibit 4 (unit peak discharges for SCS type I, IA, II, and III distributions):

$$\log(q_u) = C_o + C_1 \log(T_c) + C_2 \left[\log(T_c)\right]^2$$

where

 q_u = unit peak discharge (csm/in)

 T_c = time of concentration (hr)

 $(minimum,\,0.1;\,maximum,\,10.0)$

 C_0 , C_1 , C_2 = coefficients from table F-1

Figure 6-1 (approximate detention basin routing through single- and multiple-stage structures for 24-hour rainfalls of the indicated type):

$$\frac{V_{S}}{V_{r}} = C_{o} + C_{1} \left(\frac{q_{o}}{q_{1}}\right) + C_{2} \left(\frac{q_{o}}{q_{1}}\right)^{2} + C_{3} \left(\frac{q_{o}}{q_{1}}\right)^{3}$$

where

 V_s/V_r = ratio of storage volume (V_s) to runoff volume (V_r)

 q_o/q_i = ratio of peak outflow discharge (q_o) to peak inflow discharge (q_i)

 C_0 , C_1 , C_2 , C_3 = coefficients from table F-2

Table F-1 Coefficients for the equation used to generate exhibits 4-I through 4-Ill

Rainfall				
type	I _a /P	C_0	C_1	C_2
I	0.10	2.30550	-0.51429	-0.11750
	0.20	2.23537	-0.50387	-0.08929
	0.25	2.18219	-0.48488	-0.06589
	0.30	2.10624	-0.45695	-0.02835
	0.35	2.00303	-0.40769	0.01983
	0.40	1.87733	-0.32274	0.05754
	0.45	1.76312	-0.15644	0.00453
	0.50	1.67889	-0.06930	0.0
IA	0.10	2.03250	-0.31583	-0.13748
	0.20	1.91978	-0.28215	-0.07020
	0.25	1.83842	-0.25543	-0.02597
	0.30	1.72657	-0.19826	0.02633
	0.50	1.63417	-0.09100	0.0
II	0.10	2.55323	-0.61512	-0.16403
	0.30	2.46532	-0.62257	-0.11657
	0.35	2.41896	-0.61594	-0.08820
	0.40	2.36409	-0.59857	-0.05621
	0.45	2.29238	-0.57005	-0.02281
	0.50	2.20282	-0.51599	-0.01259
III	0.10	2.47317	-0.51848	-0.17083
	0.30	2.39628	-0.51202	-0.13245
	0.35	2.35477	-0.49735	- 0.11985
	0.40	2.30726	-0.46541	-0.11094
	0.45	2.24876	-0.41314	-0.11508
	0.50	2.17772	- 0.36803	- 0.09525

Coefficients for the equation used to generate figure 6-1Table F-2 Rainfall distribution C_0 C_1 C_2 C_3 (appendix B) I, IA 0.660-1.761.96 -0.730 II, III 0.682 -1.43 1.64 -0.804