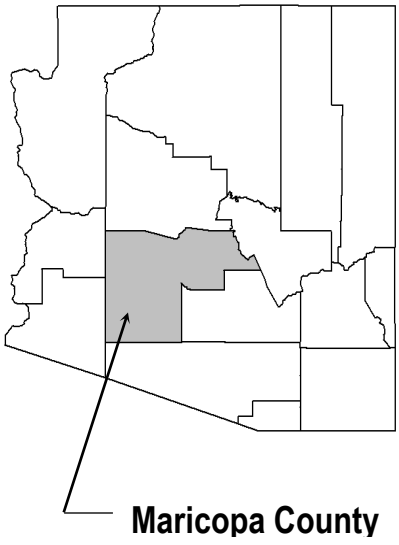
FLOOD INSURANCE STUDY

VOLUME 1 OF 31

MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
AVONDALE, CITY OF	040038
BUCKEYE, TOWN OF	040039
CAREFREE, TOWN OF	040126
CAVE CREEK, TOWN OF	040129
CHANDLER, CITY OF	040040
EL MIRAGE, CITY OF	040041
FOUNTAIN HILLS, TOWN OF	040135
GILA BEND, TOWN OF	040043
GILBERT, TOWN OF	040044
GLENDALE, CITY OF	040045
GOODYEAR, CITY OF	040046
GUADALUPE, TOWN OF	040111
LITCHFIELD PARK, CITY OF	040128
MARICOPA COUNTY (UNINCORPORATED AREAS)	040037
MESA, CITY OF	040048
PARADISE VALLEY, TOWN OF	040049
PEORIA, CITY OF	040050
PHOENIX, CITY OF	040051
QUEEN CREEK, TOWN OF	040132
SCOTTSDALE, CITY OF	045012
SURPRISE, CITY OF	040053
TEMPE, CITY OF	040054
TOLLESON, CITY OF	040055
WICKENBURG, TOWN OF	040056
YOUNGTOWN, TOWN OF	040057



NOTICE
This Preliminary FIS Report includes only revised flood profiles and Floodway Data Tables. See Notice to Flood Insurance Study Users page for additional details.

PRELIMINARY

FEBRUARY 26, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
04013CV001D

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult community officials and check the Community Map Repository to obtain the most current FIS report components.

Users should refer to Section 10.0, Revisions Description, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of the FIS report.

Initial Countywide FIS Effective Date: April 15, 1988

Revised Countywide Dates: September 29, 1989
September 4, 1991
December 3, 1993
September 30, 1995
July 19, 2001
September 30, 2005
October 16, 2013
November 4, 2015

This preliminary FIS report does not include unrevised Floodway Data Tables or unrevised Flood Profiles, and therefore does not include any additional report volumes. These Floodway Data Tables and Flood Profiles will appear in Volumes 3-7 and 9-31 of the final FIS report.

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*Panel 1765P not printed

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VOLUME 31 (Continued)

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PUBLISHED SEPARATELY

FLOOD INSURANCE STUDY
MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Maricopa County, Arizona, including the Cities of Apache Junction, Avondale, Chandler, El Mirage, Glendale, Goodyear, Litchfield Park, Mesa, Peoria, Phoenix, Scottsdale, Surprise, Tempe, and Tolleson; the Towns of Buckeye, Carefree, Cave Creek, Fountain Hills, Gila Bend, Gilbert, Guadalupe, Paradise Valley, Queen Creek, Wickenburg, and Youngtown; and the unincorporated areas of Maricopa County (hereinafter referred to collectively as Maricopa County). This information will be used to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

The Town of Apache Junction is geographically located in Maricopa and Pinal Counties. The Town of Apache Junction is not included in the FIS report. See the separately published FIS report and Flood Insurance Rate Map (FIRM) for Pinal County, Arizona and Incorporated Areas for flood hazard information.

The City of Peoria is geographically located in Maricopa and Yavapai Counties. The City of Peoria is included in its entirety in this FIS report.

The Town of Queen Creek is geographically located in Maricopa and Pinal Counties. The Town of Queen Creek is included in both the Maricopa County and Pinal County FIS reports.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS is based on previous FISs for the various incorporated communities and unincorporated areas within Maricopa County. Detailed information on the contractors who studied each area is provided below.

The original hydrologic and hydraulic analyses for this study were performed by the U.S. Army Corps of Engineers (USACE), Los Angeles District, for the Federal Emergency Management Agency (FEMA), under Interagency Agreement Nos. IAA-H-15-72 an IAA-H-15-73. This study was completed in 1973.

Additional hydrologic and hydraulic analyses for many streams within the county were performed by Harris-Toups Associates under Contract No. H-4008. This work was

completed in February 1978 and January 1979.

Hydrologic and hydraulic analyses for Cave Creek (downstream of Cave Creek Dam) and for East Fork of Cave Creek were revised by Cella, Barr, Evans, and Associates, under Contract No. H-4607. This work was completed in October 1980.

Additional hydrologic and hydraulic analyses for portions of the Agua Fria and New Rivers, and Skunk Creek were performed by the USACE under contract to the Flood Control District of Maricopa County (FCDMC) Hydrologic and hydraulic analyses for portions of the Salt and Gila Rivers were performed by Harris-Toups Associates in October 1977. The 1-percent-annual-chance flood for portions of the above streams, as well as the 0.2-percent-annual-chance flood for the Agua Fria River, was computed by Dames & Moore using data provided by the USACE, Los Angeles District. Approximate floodplain boundaries and boundaries for areas subject to sheet flow were delineated by Dames & Moore.

Hydraulic analyses for portions of the following streams were taken from the effective Flood Insurance Studies for the incorporated communities (FEMA, September 30, 1982; FEMA, August 3, 1982; FEMA, February 15, 1980; FEMA, unpublished; FEMA, July 16, 1980; U.S. Department of Housing and Urban Development, December 1, 1978; FEMA, 1979; FEMA, September 30, 1983; FEMA, September 22, 1981; FEMA, October 18, 1983; FEMA, May 15, 1980; FEMA, 1986; FEMA, January 16, 1981; FEMA, June 1, 1984; FEMA, December 4, 1984; FEMA, March 1, 1983; FEMA, December 14, 1982; FEMA, January 16, 1980; FEMA, March 24, 1983; U.S. Department of Housing and Urban Development, November 15, 1978): Agua Fria River, Gila River, Hassayampa River, New River, Salt River, Skunk Creek, Scatter Wash, Aguila Farm Channel, Andora Hills Wash, Atchison, Topeka & Santa Fe Railway Channel, Casandro Wash, South Branch, Casandro Wash, Cave Creek, East Fork of Cave Creek, Dreamy Draw Wash East, Echo Canyon Wash, Flynn Lane Wash, Flying E Wash, Galloway Wash, Granite Reef Wash, Grapevine Wash, Grass Wash, Hospital Wash, Indian Bend Wash, Indian Bend Wash-Low Flow Channel, Little San Domingo Wash, Lower El Mirage Wash, Martinez Wash, Mockingbird Wash, Moon Valley Wash, Myrtle Avenue Wash, Ocotillo Wash, Powder House Wash, Rowe Wash, Tenth Street Wash, Wash B, Willow Springs Wash, and Weekes Wash.

The hydrologic and hydraulic analyses for portions of the Agua Fria, New, Gila, and Salt Rivers, Skunk Creek, and Scatter Wash included in the restudy were performed by the USACE, Los Angeles District, for FEMA, under Interagency Agreement No. EMW-E-094l, Project Order No. 10. This work was completed in March 1986.

Revised hydrologic and hydraulic analyses for Sols Wash, which passes through the Town of Wickenburg and extends to the county boundary between Maricopa and Yavapai Counties, were performed by Cella Barr Associates (CBA), for FEMA, under Contract No. EMW-85-C-1909. This restudy was completed in December 1986.

Revised hydraulic analyses for a portion of Consolidated Canal were performed by Greiner Engineering Sciences, Inc. for the City of Mesa in 1984 (Greiner Engineering Sciences, 1984).

Revised hydraulic analyses for a portion of the Agua Fria River in El Mirage were performed by Engineering and Surveying of Arizona, Inc., in November 1984

(Engineering and Surveying of Arizona, Inc., 1986).

Revised hydraulic analyses for flooding along a portion of the Atchison, Topeka & Santa Fe Railway in the City of Chandler were performed in July 1980 (Harris-Toups Associates, 1984).

Revised hydraulic analyses for a portion of East Fork of Cave Creek in the City of Phoenix were performed by Erie and Associates, Inc., for the Coral Gables Estates Unit Six Subdivision in November 1985 (Erie and Associates, Inc., 1985).

This study was revised in 1986 to incorporate either new or revised hydrologic and hydraulic analyses for several flooding sources throughout the county. FEMA decided to include flooding information through the incorporated communities to provide the county with a more usable FIRM.

The hydraulic analyses for Stagecoach Pass Wash from a point approximately 1,350 feet downstream of North 84th Street to a point approximately 600 feet downstream of North 84th Street were performed by Map-IX Mainland, for FEMA, under Contract No. EMF-2003-CO-0047, Task Order 009. The work was in February 2007.

The hydraulic analyses for Stagecoach Pass Wash Overflow from the confluence with Stagecoach Pass Wash to a point approximately 200 feet downstream of North Indian Camp Trail were performed by Map-IX Mainland, for FEMA, under Contract No. EMF-2003-CO-0047, Task Order 009. The work was completed in February 2007.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by the Maricopa County Department of Public Works, Flood Control District. Orthophoto images were produced at a scale of 1:6,000 using HARN for control. Aerial photography is dated December 2000 to December 2007.

1.3 Coordination

The FCDMC assisted in the selection of the areas that were studied by detailed methods and the selection of preliminary floodway limits. The Arizona Department of Transportation provided highway maps used for the preparation of base maps covering undeveloped areas studied only by approximate methods. This study was also coordinated with the Special Studies Section of the Water Resources Division of the U.S. Geological Survey (USGS), Tucson, Arizona (U.S. Department of the Interior, 1982). On May 31, 1977, results of the study were reviewed at the final consultation and coordination meeting, which was attended by residents of the county and representatives of the FCDMC and FEMA.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Maricopa County, Arizona.

The flooding sources studied by detailed methods are shown in Table 1. The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction.

Portions of some flooding sources were studied by approximate methods and are shown in Table 2. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Maricopa County.

The Stagecoach Pass Wash Overflow for the levee failure scenario was studied by approximate methods.

Table 1. Detailed Study Flooding Sources

16 East (McMicken Wash)
191st Avenue Wash
ADOT U.S. 60 Channel
Agua Fria River
Agua Fria River Dike Ponding Areas-West Side
Aguila Farm Channel
Amir Wash
Andora Hills Wash
Andora Hills Wash Split 1
Andora Hills Wash Split 2
Apache Creek
Apache Wash
Apache Wash Split Flow Area
Apache Wash Tributary 1
Apache Wash Tributary 2
Apache Wash Tributary 3
Apache Wash Tributary 4
Apache Wash Tributary 5
Apache Wash Tributary 6
Apache Wash Tributary 7
Apache Wash West Fork
Apache Wash West Fork Tributary 1
Apache Wash West Fork Tributary 2
Arrow Wash
Ashbrook Wash
Atchison Topeka & Santa Fe Railroad Channel
Atchison Topeka & Santa Fe Railroad Ponding
Balboa Wash
Basins 1 through 6 - Alluvial Fan
Beardsley Canal Wash
Beardsley Wash North
Beardsley Wash South
Beardsley Wash South Breakout
Bedrock Wash
Bedrock Wash North Fork
Bender Wash
Bender Wash North Tributary
Black Wash
Blue Tank Wash
Bonita Dike Channel
Buchanan Wash
Buckeye Feeder Canal
Bullard Wash
Bullard Wash West Tributary
Bulldozer Wash
Calamity Wash
Caliente Wash
Camelback Wash
Camp Creek Tributary A
Camp Creek Tributary A1
Camp Creek Tributary A2
Camp Creek Tributary B
Camp Creek Tributary B1
Camp Creek Tributary B2
Camp Creek Tributary C
Camp Creek Tributary C1
Camp Creek Tributary C2
Camp Creek Tributary C3
Camp Creek Tributary D
Casandro Wash
Casandro Wash South Branch
Caterpillar Tank Wash
Cave Creek
Cave Creek Tributary
Cave Creek Tributary Tributary
Cave Creek Tributary 1
Cave Creek Tributary 1A
Cave Creek Tributary 1B
Cave Creek Tributary 1C
Cave Creek Tributary 1D
Cave Creek Unnamed Central Tributary
Cave Creek Wash
Cemetery Wash
Cemetery Wash Tributary R-1
Cemetery Wash Tributary R-2
Cemetery Wash Tributary R-3
Centennial Wash
Centennial Wash Left Overbank

Table 1. Detailed Study Flooding Sources (Continued)

Centennial Wash North Branch
Cereus Wash
Cholla Wash
Cholla Wash North Fork
Chukar Wash
Circle City Area Wash 1
Circle City Area Wash 2
Circle City Area Wash 2 Along Atchison, Topeka & Santa Fe Railway
Circle City Area Wash 3
Circle City Area Wash 4
Circle City Area Wash 4 Along Atchison, Topeka & Santa Fe Railway
Circle City Area Wash 5
Circle City Area Wash 6
Circle City Area Wash 7
Citrus Valley Wash
Cline Creek
Cline Creek Split 3
Colony Wash
Consolidated Canal, Ponding
Consolidated Canal (Watershed 2)
Consolidated Canal (Watershed 3) (Including overflow from Watersheds 1 & 4)
Cottonwood Creek
Cottonwood Creek Tributary 1
Cottonwood Creek Tributary 2
Coyote Pass Wash
Cyprus Point Wash
Daggs Wash
Daggs Wash East Split Flow
Daggs Wash West Breakout
Dale Creek Wash
Deadman Wash
Deadman Wash Stream No. 4
Deadman Wash Stream No. 7
Deadman Wash Stream No. 12
Delaney Wash
Delaney Wash North Split
Delaney Wash South Split
Desert Hills Wash
Desert Hills Wash Tributary
Desert Hills Wash Tributary 1
Desert Hills Wash Tributary 2
Desert Hills Wash Tributary 3
Desert Hills Wash Tributary 4
Desert Hills Wash Tributary 5
Desert Hills Wash Tributary 6
Desert Lake Wash
Desert Lake Wash East Fork
Desert Lake Wash Tributary 2
Dickey Wash
Diversion Dike Wash
Doe Peak Wash
Doe Peak Wash East Fork
Doe Peak Wash South Fork
Dreamy Draw Wash East
Dreamy Draw Wash West
East Fork of Cave Creek
East Garambullo Wash
East Maricopa Floodway
East Maricopa Floodway, Ponding
Eastern Canal East Embankment Flooding
Eastern Canal, Ponding
Eastern Canal (Watershed 1)
Eastern Pima Wash
Echo Canyon Wash
Emerald Wash
Escalante Wash
Evans Wash
Fan 6A
Fan 6A North
Fan 6A South
Fan 6C
Fan 6C North Branch
Flemming Springs Wash
Flying E Wash
Flynn Lane Wash
Fountain Channel
Four Mile Wash
Four Mile Wash – W1
Four Mile Wash – W2
Galloway Wash
Galloway Wash Middle Branch
Galloway Wash Middle Branch Tributary
Galloway Wash North Tributary
Galloway Wash South Branch
Galloway Wash South Branch Split 1
Galloway Wash Split 1
Galloway Wash Split 2
Galloway Wash Tributary 2
Galloway Wash Tributary 2A
Galloway Wash Tributary 2B
Galloway Wash Unnamed Tributary
Garambullo Wash
Gavilan Peak Wash
Gila Bend Canal
Gila Bend Canal Wash

Table 1. Detailed Study Flooding Sources (Continued)

Gila River
Granite Falls Wash
Grapevine Wash
Grass Wash
Greystone Wash
Hacker Wash
Hacker Wash Diversion
Happy Valley Wash
Hartman Wash
Hartman Wash Unnamed Tributary
Hassayampa River
Hassayampa River Tributary 1E
Hassayampa River Tributary 1E1
Hassayampa River Tributary 3E
Hassayampa River Tributary 4E
Hassayampa River Tributary 4E Tributary
Hassayampa River Tributary 4E West Fork
Hesperus Wash
Holly Wash
Hospital Wash
I-8 Wash East
I-8 Wash West
Indian Bend Wash
Indian Bend Wash Low Flow Channel
Interstate 10 Wash
Iona Wash
Iona Wash East
Iona Wash East Split 1
Iona Wash East Split 2
Iona Wash North
Iona Wash North West Split
Iona Wash West
Iona Wash (Zone AO)
Jacklin Wash
Jackrabbit Trail Wash
Jackrabbit Wash
Jackrabbit Wash Unnamed Tributary
Jenny Lin Wash
Kelley Road Wash
Kingstree Wash
Laser Drain
Lazy G Wash
Legend Wash
Litchfield Park Detention Facility
Little San Domingo Wash
Local Urban Runoff (City of Tempe)
Logan Wash
Lower El Mirage Wash
Lower El Mirage Wash Tributary
Luke Wash
Luke Wash East Main Split
Luke Wash East Main Tributary
Luke Wash East Sub Tributary
Luke Wash Minor Tributary
Malta Drain
Mangrum Wash
Martinez Wash
McCormick Ranch Lakes East Branch
McCormick Ranch Lakes West Branch
McMicken Dam Outlet Channel
McMicken Dam Outlet Wash
Mesquite Tank Wash
Mockingbird Wash
Monarch Wash
Moon Valley Wash
Moon Valley Wash Diversion Channel
Moon Valley Wash North Branch
Moon Valley Wash North Split
Moon Valley Wash South Branch
Morgan City Wash
Mountain Wash
Myrtle Avenue Wash
New River
New River East Split
New River Middle Split
New River West Split
New River West Tributary 5
New River West Tributary 10
New River West Tributary 15
New River West Tributary 20
New River West Tributary 20 Tributary 5
New River West Tributary 20 Tributary 10
New River West Tributary 25
New River West Tributary 30
New River West Tributary 35
New River West Tributary 40
New River West Tributary 45
New River West Tributary 50
New River West Tributary 50 Tributary 5
New River West Tributary 55
New River West Tributary 55 Tributary 5
New River West Tributary 55 Tributary 10
New River West Tributary 55 Tributary 15
New River West Tributary 55 Tributary 20
New River West Tributary 55 Tributary 30
North Colony Wash
North Inlet Canal
Northeast Side of Southern Pacific Railroad

Table 1. Detailed Study Flooding Sources (Continued)

Ocotillo Wash
Ocotillo Wash Split 1
Ocotillo Wash Tributary 1
Ocotillo Wash Tributary 1A
Ocotillo Wash Tributary 2
Ocotillo Wash Tributary 3
Ocotillo Wash Tributary 4
Ocotillo Wash Tributary 5
Ocotillo Wash Tributary 6
Osborn Road Wash
Ox Wash
Oxford Wash
Padelford Wash
Padelford Wash Split 1
Padelford Wash Split 2
Padelford Wash Split 3
Padelford Wash Split 4
Padelford Wash Split 5
Padelford Wash Tributary A
Padelford Wash Tributary B
Padelford Wash Tributary C
Paradise Wash
Paradise Wash West Fork
Perryville Road Wash
Phillips Wash
Photo View Wash
Photo View Wash Breakout 1
Photo View Wash Breakout 2
Photo View Wash Breakout 3
Pioneer Cemetery Wash
Powder House Wash
Powder House Wash Tributary 1
Powder House Wash Tributary 2
Powder Wash
Powerline Wash
Prospect Wash
Pyrite Wash
Queen Creek Wash
Quilotosa Wash
Quilotosa Wash East Split
Rainbow Wash
Rainbow Wash Tributary
Ranieri Tank Wash
Ranieri Tank Wash Tributary 1
Ranieri Tank Wash Tributary 2
Ranieri Tank Wash Tributary 3
Rattler Wash
Rawhide Wash
Rawhide Wash Tributary 1
Rawhide Wash Tributary 2
Rawhide Wash Tributary 3
Rawhide Wash Tributary 4
Rio Verde Wash A
Rio Verde Wash A Split 1
Rio Verde Wash A Split 3
Rio Verde Wash A Split 4
Rio Verde Wash A Split 8
Rio Verde Wash A Split 9
Rio Verde Wash A Tank Spillway
Rio Verde Wash A Tributary 1
Rio Verde Wash A Tributary 2
Rio Verde Wash D
Rio Verde Wash F
Rio Verde Wash F Split 6
Rio Verde Wash F Tributary 2
Rio Verde Wash I
Rio Verde Wash I Split 4
Rio Verde Wash I Tributary 1
Rio Verde Wash I Tributary 3
Rio Verde Wash J
Rio Verde Wash K
Rio Verde Wash K Split 1
Rio Verde Wash K Split 3
Rio Verde Wash K Split 3A
Rio Verde Wash K Split 4
Rio Verde Wash K Tributary 1
Rio Verde Wash K Tributary 4
Rio Verde Wash K Tributary 4A
Rio Verde Wash K Tributary 6
Rio Verde Wash K Tributary 6 Split 1
Rio Verde Wash K Tributary 6 Split 2
Rio Verde Wash K Tributary 6 Split 3
Rio Verde Wash K Tributary 6A
Rio Verde Wash K Tributary 6A1
Rio Verde Wash K Tributary 6A2
Rio Verde Wash K Tributary 6A3
Rio Verde Wash K Tributary 6B
Rio Verde Wash K Tributary 6C
Rio Verde Wash K Tributary 6D
Rio Verde Wash K Tributary 6D1
Rio Verde Wash K Tributary 7
Rio Verde Wash K Tributary 8
Rio Verde Wash K Tributary 9
Rio Verde Wash K Tributary 10
Rio Verde Wash K Tributary 11
Rio Verde Wash K Tributary 11A
Rio Verde Wash K Tributary 11B
Rio Verde Wash K Tributary 12
Rio Verde Wash K Tributary 13
Rio Verde Wash L

Table 1. Detailed Study Flooding Sources (Continued)

Rio Verde Wash P
Rio Verde Wash P Tributary 1
Rio Verde Wash P Tributary 2
Rio Verde Wash 7
Rio Verde Wash 10
Rio Verde Wash 10 Split 4
Rio Verde Wash 10 Split 7
Rio Verde Wash 10 Split 7 Tributary 1
Rio Verde Wash 10 Tributary 1
Rio Verde Wash 10 Tributary 2
Rio Verde Wash 10 Tributary 2 Split 1
Rio Verde Wash 10 Tributary 3
Rio Verde Wash 10 Tributary 4
Rio Verde Wash 11
Rio Verde Wash 11 Split 1
Rio Verde Wash 11 Split 2
Rio Verde Wash 11 Split 8
Rio Verde Wash 12
Rio Verde Wash 12 Split 3
Rio Verde Wash 12 Split 6
River Creek
Rock Springs Creek
Rodeo Wash
Rodeo Wash Tributary
Rodger Creek
Roosevelt Canal
Roosevelt Irrigation District Canal Split Flow
Rough Rider Wash
Rowe Wash
Salt River
Salt River South Split
San Domingo Wash
Sand Tank Wash
Sauceda Wash
Scatter Wash
Scatter Wash South Branch
Scott Avenue Wash
Sharman Wash
Skunk Creek
Skunk Creek Breakout
Skunk Creek Tributary 6B
Skunk Creek Tributary 6B North
Skunk Creek Tributary 6C
Skunk Creek Tributary 10A
Skunk Creek Tributary 10B
Skunk Creek Tributary 12
Skunk Creek Tributary 27.161
Skunk Tank Wash
Skyline Wash
Soda Springs Wash
Sols Wash
Sols Wash Tributary AH2
Sols Wash Tributary AH3
Sols Wash Tributary AH3 Unnamed Tributary
Sols Wash Tributary AH4
Sols Wash Tributary AH5
Sonoqui Wash
Sonoran Wash
Southwest Side of Southern Pacific Railroad
Stagecoach Pass Wash
Stagecoach Pass Wash Unnamed Tributary
Star Wash
Star Wash Tributary A
Star Wash Tributary B
Star Wash Tributary C
Star Wash Tributary D
Star Wash Tributary E
Sunburst Wash
Sunland Avenue Tributary
Sunny Cove Wash
Sunny Cove Wash (Upper Reach)
Sunset Wash (Lower and Upper Reaches)
Sweat Canyon Wash
Sycamore Wash
Table Mountain Wash
Table Mountain Wash Tributary 6
Tank Wash
Tank Wash South Branch
Tenth Street Wash
Tractor Wash
Tributary C-6
Tributary C-8
Tributary X1
Tributary X1 Overflow
Tributary X1 Splitflow
Tributary X2
Tributary X3
Tributary X4A
Tributary X4B
Tributary X5
Trilby Wash
Trilby Wash Middle Channel
Trilby Wash West Channel
Tulip Wash
Turtleback Wash
Tuthill Dike Wash
Twin Buttes Wash
Twin Peaks Lane Wash
Twin Peaks Wash

Table 1. Detailed Study Flooding Sources (Continued)

Unnamed Channel
Unnamed Wash No. 1
Unnamed Wash No. 2
Upper Boulders Wash
Upper Fan 5
Union Pacific Railroad
Union Pacific Railroad Ditch
Union Pacific Railroad Spur
Union Pacific Railroad (Watershed 4)
Valley Wash
Wagner Wash
Wagon Wash
Wash 1 East
Wash 1 West
Wash 2 East
Wash 2 East (North and South of the Central Arizona Project Canal)
Wash 2 East Tributary
Wash 2 West
Wash 2 West (North of the Central Arizona Project Canal)
Wash 2 West Tributary 1
Wash 2 West Tributary 2
Wash 3 East
Wash 3 West
Wash 4 East
Wash 5 East
Wash 6 East
Wash 6 East South
Wash 7 East
Wash 7 East East Split
Wash 7 East Tributary
Wash 7 East West Split
Wash 8 East
Wash 9 (Rio Verde Wash 9)
Wash 9 East
Wash 9 East-split
Wash 10 East
Wash 10 East Split 1
Wash 10 East Split 2
Wash 11 East
Wash 12 East
Wash 12 East Split
Wash 13 East
Wash 14 East
Wash AG
Wash B
Wash B Tributary
Wash E2
Wash F
Wash G
Wash H
Wash I
Wash K
Wash K1
Wash L
Wash O
Wash P
Wash Q
Wash S2
Wash T1N-R5W-S04
Wash T1N-R5W-S04 Split
Wash T1N-R5W-S10
Wash T1N-R5W-S04 Split
Wash T1N-R5W-S10
Wash T1N-R5W-S15
Wash T1N-R5W-S18
Wash T1N-R5W-S22
Wash T1N-R5W-S28E
Wash T1N-R5W-S32
Wash T1N-R5W-S33E
Wash T1N-R5W-S33N
Wash T1N-R5W-S33W
Wash T1N-R6W-S1
Wash T1N-R6W-S11
Wash T1N-R6W-S12
Wash T1N-R6W-S17
Wash T1N-R6W-S18
Wash T1S-R2W-S32A (I63)
Wash T1S-R5W-S09W
Wash T1S-R5W-S17
Wash T1S-R5W-S22N
Wash T1S-R5W-S22S
Wash T1S-R5W-S29
Wash T1S-R5W-S29W
Wash T1S-R6W-S05S
Wash T1S-R6W-S08
Wash T2N-R5W-S27
Wash T2N-R5W-S27N
Wash T2N-R5W-S27S
Wash T2N-R5W-S28
Wash T2N-R5W-S32
Wash T2N-R5W-S33E
Wash T2N-R5W-S33W
Wash T2N-R6W-S02
Wash T2N-R6W-S05E
Wash T2N-R6W-S05N
Wash T2N-R6W-S05S
Wash T2N-R6W-S05W
Wash T2N-R6W-S22

Table 1. Detailed Study Flooding Sources (Continued)

Wash T2N-R6W-S28N
Wash T2N-R6W-S36
Wash T2N-R6W-S36W
Wash T2N-R7W-S20W
Wash T2N-R7W-S32E
Wash T2N-R7W-S35W
Wash T3N-R6W-S27W
Wash T3N-R6W-S32
Wash T3N-R6W-S33
Wash T3N-R6W-S35
Wash T4N-R2W-S9N
Wash T4N-R2W-S15N
Wash T4N-R3W-S07W
Wash T4N-R3W-S08E
Wash T4N-R3W-S08W
Wash T4N-R3W-S09W
Wash T4N-R3W-S10N
Wash T4N-R3W-S10W Reach 1
Wash T4N-R3W-S10W Reach 2
Wash T4N-R3W-S16
Wash T4N-R3W-S17
Wash T4N-R3W-S18E
Wash T4N-R3W-S18W
Wash T5N-R2W-S07
Wash T5N-R2W-S11
Wash T5N-R2W-S14N
Wash T5N-R2W-S14S
Wash T5N-R2W-S14W
Wash T5N-R2W-S19E
Wash T5N-R2W-S19W
Wash T5N-R3W-S01S
Wash T5N-R3W-S07
Wash T5N-R3W-S15-1E (Trilby Wash Tributary 1 East)
Wash T5N-R3W-S15-1-1E (West Fork Trilby Wash Tributary 1 East)
Wash T5N-R3W-S19
Wash T5N-R3W-S24E
Wash T5N-R3W-S28-3W (Iona Tributary 3 West)
Wash T5N-R4W-S3
Wash T5N-R4W-S7A
Wash T5N-R4W-S7B
Wash T5N-R4W-S7C
Wash T5N-R4W-S19
Wash T5N-R4W-S20A
Wash T5N-R4W-S20B
Wash T5N-R4W-S21
Wash T5N-R4W-S30
Wash T5N-R5W-S1
Wash T5N-R5W-S3A
Wash T5N-R5W-S3B
Wash T5N-R5W-S10A
Wash T5N-R5W-S11
Wash T5N-R5W-S12
Wash T5N-R5W-S13A
Wash T5N-R5W-S13B
Wash T5N-R5W-S14
Wash T5N-R5W-S14B
Wash T5N-R5W-S22
Wash T5N-R5W-S23A
Wash T5N-R5W-S23B
Wash T5N-R5W-S23C
Wash T5N-R5W-S23D
Wash T5N-R5W-S23E
Wash T5N-R5W-S23F
Wash T5N-R5W-S25A
Wash T5N-R5W-S25B
Wash T5N-R5W-S25C
Wash T5N-R5W-S34C
Wash T5N-R5W-S35
Wash T6N-R4W-S33
Wash T6N-R4W-S33A
Wash T6N-R5W-S36
Wash T6N-R5W-S36A
Wash T6N-R5W-S36B
Waterfall Wash
Waterman Wash
West Fork White Peak Wash
West Garambullo Wash
West Prong of Waterman Wash
West Quilotosa Wash
West Split Flow Through El Mirage
White Granite Wash
White Granite Wash North Fork
White Peak Wash
White Spar Wash
White Tanks Wash
White Tanks Wash No. 3
White Tanks Wash Tributary 1
Willow Springs Wash
Willow Springs Wash Tributary 1
Willow Springs Wash Tributary 1A
Willow Springs Wash Tributary 2
Willow Springs Wash Tributary 2A
Willow Springs Wash Tributary 4
Willow Springs Wash Tributary 5
Willow Springs Wash Tributary 5A
Willow Springs Wash Tributary 6
Willow Springs Wash Tributary 6A
Willow Springs Wash Tributary 6B

Table 1. Detailed Study Flooding Sources (Continued)

Willow Springs Wash Tributary 6C
Windmill Wash
Windmill Wash North Branch
Windmill Wash South Branch
Winters Wash
Wittmann Wash
Wittmann Wash North Split
Wittmann Wash South Split
Wittmann Wash Tributary
Wittmann Wash Tributary 1
Wittmann Wash Tributary 1 Breakout 1
Wittmann Wash Tributary 1 Breakout 1 of Breakout 3
Wittmann Wash Tributary 1 Breakout 2
Wittmann Wash Tributary 1 Breakout 3
Wittmann Wash Tributary 1 Breakout 4
Yucca Flat Wash

Table 2. Approximate Study Flooding Sources

16 East (McMicken Wash)
191st Avenue Wash
Agua Fria River
Aguila Farm Channel
Airline Canal
Amir Wash
Amir Wash Tributary
Apache Wash
Arrow Wash
Atchison, Topeka & Santa Fe Railroads Spur
Beardsley Canal Wash
Bedrock Wash
Bonita Dike Channel
Buckeye Feeder Canal
Bullard Wash
Bullard Wash West Tributary
Camp Creek Tributary C1
Camp Creek Tributary C3
Camp Creek Tributary D
CAP Wash East
CAP Wash West
Castle Creek Wash
Caterpillar Tank Wash
Cave Buttes Detention Dike
Cave Creek
Cave Creek Tributary
Cave Creek Wash
Cemetery Wash
Circle City Area Wash 1
Circle City Area Wash 4 Along Atchison Topeka & Santa Fe Railway
Circle City Area Wash 6
Circle City Area Wash 7
Citrus Valley Wash
Cline Creek
Coles Wash
Colony Wash
Columbus Wash
Consolidated Canal
Cooper Creek
Copper Wash
Copper Wash Tributary 1
Corgett Wash
Cotton Lane Wash
Cottonwood Creek
Cross Cut Canal
Daggs Wash
Dave Buttes Detention Dike
Deadman Wash Tributary 1
Deadman Wash Tributary 1 Lower Split
Deadman Wash Tributary 1 Upper Split
Deadman Wash Tributary 2
Deadman Wash Tributary 2A
Delaney Wash Stock Pond Split
Desert Lake Wash
Desert Lake Wash Tributary 2
Dreamy Draw Detention Dike
Dreamy Draw Wash West
Dysart Drain
East Fork of Cave Creek
Eastern Canal
Echo Canyon Canal

Table 2. Approximate Study Flooding Sources (Continued)

Fan 6C
Flooding along East Embankment of Eastern Canal
Flying E Wash
Fourth Of July Wash
Fourth Of July Wash Tributary 1
Fourth Of July Wash Tributary 3
Gibson Wash
Gibson Wash Tributary 1
Gibson Wash Tributary 1A
Gibson Wash Tributary 3
Gibson Wash Tributary 5
Gibson Wash Tributary 5A
Gila Bend Canal
Gila River
Grand Canal
Granite Reef Aqueduct
Grass Wash
Hambug Creek
Harquahala Detention Dike
Hartman Wash
Hartman Wash Unnamed Tributary
Highline Canal
Holly Wash
Interstate 10 Wash
Interstate Highway 10
Iona Wash
Iona Wash East Split 1
Iona Wash Tributary
Jackrabbit Trail Channel
Jackrabbit Trail Wash
Jackrabbit Wash
Jimmie Wash
Kaiser-Aetna McCormick Ranch Drainage
Kyrene Branch Canal
Little San Domingo Wash
Little San Domingo Wash Tributary
Little Squaw Creek
Little Squaw Creek Tributary 1
Little Squaw Creek Tributary 2
Little Squaw Creek Tributary 3
Little Squaw Creek Tributary 4
Little Squaw Creek Tributary 5
Loudermilk Wash
Loudermilk Wash Tributary 1
Lower El Mirage Wash
Lower El Mirage Wash Tributary
Lower Painted Rock Wash 100A
Lower Painted Rock Wash 135A
Lower Painted Rock Wash 140A
Lower Painted Rock Wash 145A
Lower Painted Rock Wash 150A
Lower Painted Rock Wash 150B
Lower Painted Rock Wash 155C
Lower Painted Rock Wash 510A
Lower Painted Rock Wash 520A
Lower Painted Rock Wash 525A
Lower Painted Rock Wash 525B
Lower Painted Rock Wash 525C
Lower Painted Rock Wash 525D
Lower Painted Rock Wash 525E
Lower Painted Rock Wash 530A
Lower Painted Rock Wash 530B
Lower Painted Rock Wash 530C
Lower Painted Rock Wash 545A
Lower Painted Rock Wash 551A
Lower Painted Rock Wash 585A
Lower Painted Rock Wash 615A
Lower Painted Rock Wash 615B
Lower Painted Rock Wash 646A
Lower Painted Rock Wash 650A
Lower Painted Rock Wash 650C
Lower Painted Rock Wash 651A
Lower Painted Rock Wash 790A
Lower Painted Rock Wash 790B
Lower Painted Rock Wash 790C
Lower Painted Rock Wash 831A
Lower Painted Rock Wash 833A
Lower Painted Rock Wash 835A
Luke Wash
Luke Wash East Main Tributary
Luke Wash East Sub Tributary
Luke Wash Minor Tributary
Lum Wash Tributary T1S-R2W-S22 (J20)
McMicken Dam Outlet Wash
Mesquite Tank Wash
Mockingbird Wash Tributary
Monarch Wash
Monarch Wash Tributary
Montezuma Wash
Montezuma Wash Tributary 1
Montezuma Wash Tributary 1A
Montezuma Wash Tributary 2
Montezuma Wash Tributary 3
Moore Gulch
Moores Gulch Tributary 1
Moores Gulch Tributary 2
Moores Gulch Tributary 3
Moores Gulch Tributary 5
Moores Gulch Tributary 6

Table 2. Approximate Study Flooding Sources (Continued)

NCAP Iona Wash East Split 1
NCAP Iona Wash North
NCAP Wash 7 East
NCAP Wash T4N-R3WS08E
NCAP Wash T5N-R2W-S19E
New River
New River West Tributary 55 Tributary 20
New River West Tributary 55 Tributary 25 A1
New River West Tributary 55 Tributary 25 A2
New River West Tributary 55 Tributary 25 A3
Notbusch Wash
Notbusch Wash Tributary 1
Notbusch Wash Tributary 1A
Notbusch Wash Tributary 1B
Ocotillo Wash
Ocotillo Wash Tributary 1
Ox Wash
Padelford Wash
Padelford Wash Split 2
Padelford Wash Split 3
Padelford Wash Split 4
Padelford Wash Tributary A
Padelford Wash Tributary B
Padelford Wash Tributary C
Phillips Wash
Picacho Wash
Powerline Wash
Prospect Wash
Quale Spring Wash
Quale Spring Wash Tributary 1
Quale Spring Wash Tributary 1A
Queen Creek
Rattler Wash
Reach SenA05
Reach SenB05
Reach SenB10
Reach SenB20
Reach SenB25
Reach SenC05
Reach SenC10
Reach SenC15
Reach SenC20
Reach SenC25
Reach SenC35
Reach SenC40
Reach SenC45
Reach SenD05
Reach SenE10
Reach SenE15
Reach SenE20
Reach SenE25
Reach SenE30
Reach SenE35
Reach SenF03
Reach SenF05
Reach SenF06
Reach SenF07
Reach SenF10
Reach SenF15
Reach SenF20
Reach SenF25
Reach SenF30
Reach SenG05
Reach SenH03
Reach SenH05
Reach SenI05
Reach SenI10
Reach SenI15
Reach SenJ05
Reach SenJ10
Reach SenJ15
Reach SenK05
Reach SenK15
Reach SenK20
Reach SenK25
Reach SenK30
Reach SenK35
Reems Road
Rio Verde North Wash A
Rio Verde North Wash F
Rock Springs Creek
Roosevelt Canal
Rowe Wash
Rowe Wash Tributary 1
Rowe Wash Tributary 2
Saddle Back Mountain Detention Dike
Saddleback Outlet Channel
Salt River
San Domingo Wash
Sand Tank Wash
Sauceda Wash
SCAP Bonita Dike Channel
SCAP Wash 1 East
SCAP Wash 1 West
SCAP Wash 10 East
SCAP Wash 11 East (Padelford Wash)
SCAP Wash 13 East
SCAP Wash 14 East
SCAP Wash 2 East
SCAP Wash 2 West

Table 2. Approximate Study Flooding Sources (Continued)

SCAP Wash 3 East
SCAP Wash 9 East
Scatter Wash
Scatter Wash North Branch
Sentinel Wash
Signal Butte Detention Dike
Skunk Creek
Skunk Creek Tributary 28.839
Skyline Wash
Sols Wash
Sols Wash Tributary
Sols Wash Tributary AH2
Sols Wash Tributary AH3
Sols Wash Tributary AH4
Sols Wash Tributary Tributary
Sonoqui Wash
Southern Pacific Railroad
Spook Hill Detention Dike
Star Wash
Star Wash Tributary A
Star Wash Tributary C
Star Wash Tributary D
Stream 2B
Sunny Cove Wash
Sunset Wash
Sycamore Creek
Tank Wash South Branch
Tempe Canal
ThebaA05
ThebaB05
ThebaC05
ThebaC10
ThebaC20
ThebaC25
ThebaC30
ThebaD05
ThebaE05
ThebaE10
ThebaE15
ThebaE20
ThebaE25
ThebaF05
ThebaG05
ThebaH05
ThebaI05
ThebaJ05
Tiger Wash
Tiger Wash Detention Dike
Tributary 1
Trilby Wash
Trilby Wash Detention Basin
Tub Spring Wash
Turtleback Wash
Tuthill Dike Wash
Twin Buttes Wash
Unnamed Stream
Unnamed Tributary to Cave Creek
Unnamed Wash
Unnamed Wash No. 1
Unnamed Wash No. 2
Unnamed Wash No. 3
Unnamed Wash No. 4
Unnamed Wash No. 5
Unnamed Wash No. 6
Unnamed Wash No. 7
Unnamed Wash No. 8
Unnamed Wash No. 9
Upper Buchanan Wash
Verde River
Verde River Tributaries (Washes 9, 10, and 11)
Wash S05N East Split
Wash S05N Split 1
Wash S27 North Split
Wash S27 Southwest Salome
Wash S32 Split East
Wash T1S-R6W-S29 Reach 1
Wash T1S-R6W-S29 Reach 2
Wash T1S-R6W-S29-1 Reach 1
Wash T1S-R6W-S29-2 Reach 1
Wash T1S-R6W-S29-2 Reach 2
Wash T1S-R6W-S29-2 Tributary 1 Reach 1
Wash T1S-R6W-S33 Reach 1
Wash T1S-R6W-S33 Reach 2
Wash T1S-R6W-S33 Reach 3
Wash T1S-R6W-S33 Tributary 1 Reach 1
Wash T1S-R6W-S33 Tributary 2 Reach 1
Wash T1S-R7W-S19-1 Reach 1
Wash T1S-R7W-S19-2 Reach 1
Wash T1S-R7W-S25 Reach 1
Wash T1S-R7W-S25 Reach 2
Wash T1S-R7W-S25 Reach 3
Wash T1S-R7W-S25 Reach 4
Wash T1S-R7W-S25 Reach 5
Wash T1S-R7W-S25 Tributary 1 Reach 1
Wash T1S-R7W-S25 Tributary 1 Reach 2
Wash T1S-R7W-S25 Tributary 1 Reach 3
Wash T1S-R7W-S25 Tributary 2 Reach 1
Wash T1S-R7W-S25 Tributary 2 Reach 3

Table 2. Approximate Study Flooding Sources (Continued)

Wash T1S-R7W-S25 Tributary 3 Reach 1
Wash T1S-R7W-S25 Tributary 4 Reach 1
Wash T1S-R7W-S26 Reach 1
Wash T1S-R7W-S27-1 Reach 1
Wash T1S-R7W-S27-2 Reach 1
Wash T1S-R7W-S27-3 Reach 1
Wash T1S-R7W-S27-3 Reach 2
Wash T1S-R7W-S27-3 Reach 3
Wash T1S-R7W-S27-3 Reach 4
Wash T1S-R7W-S27-3 Reach 5
Wash T1S-R7W-S27-3 Reach 6
Wash T1S-R7W-S27-3 Reach 7
Wash T1S-R7W-S27-3 Tributary 1 Reach 1
Wash T1S-R7W-S27-3 Tributary 2 Reach 1
Wash T1S-R7W-S27-3 Tributary 2 Reach 10
Wash T1S-R7W-S27-3 Tributary 2 Reach 11
Wash T1S-R7W-S27-3 Tributary 2 Reach 12
Wash T1S-R7W-S27-3 Tributary 2 Reach 13
Wash T1S-R7W-S27-3 Tributary 2 Reach 14
Wash T1S-R7W-S27-3 Tributary 2 Reach 15
Wash T1S-R7W-S27-3 Tributary 2 Reach 16
Wash T1S-R7W-S27-3 Tributary 2 Reach 17
Wash T1S-R7W-S27-3 Tributary 2 Reach 18
Wash T1S-R7W-S27-3 Tributary 2 Reach 2
Wash T1S-R7W-S27-3 Tributary 2 Reach 3
Wash T1S-R7W-S27-3 Tributary 2 Reach 4
Wash T1S-R7W-S27-3 Tributary 2 Reach 5
Wash T1S-R7W-S27-3 Tributary 2 Reach 6
Wash T1S-R7W-S27-3 Tributary 2 Reach 7
Wash T1S-R7W-S27-3 Tributary 2 Reach 8
Wash T1S-R7W-S27-3 Tributary 2 Reach 9
Wash T1S-R7W-S27-3 Tributary 3 Reach 1
Wash T1S-R7W-S27-3 Tributary 3 Reach 2
Wash T1S-R7W-S27-3 Tributary 3 Reach 3
Wash T1S-R7W-S27-3 Tributary 4 Reach 1
Wash T1S-R7W-S27-3 Tributary 5 Reach 1
Wash T1S-R7W-S27-3 Tributary 6 Reach 1
Wash T1S-R7W-S27-3 Tributary 7 Reach 1
Wash T1S-R7W-S28 Reach 1
Wash T1S-R8W-S24 Reach 1
Wash T1S-R8W-S24 Reach 2
Wash T1S-R8W-S24 Reach 3
Wash T1S-R8W-S24 Reach 4
Wash T1S-R8W-S24 Reach 5
Wash T1S-R8W-S24 Tributary 1 Reach 1
Wash T1S-R8W-S24 Tributary 2 Reach 1
Wash T1S-R8W-S24 Tributary 3 Reach 1
Wash T1S-R8W-S24 Tributary 4 Reach 1
Wash T1S-R8W-S9 Reach 1
Wash T1S-R8W-S9 Reach 2
Wash T1S-R8W-S9 Reach 3
Wash T1S-R8W-S9 Reach 4
Wash T1S-R8W-S9 Reach 5
Wash T1S-R8W-S9 Tributary 1 Reach 1
Wash T1S-R8W-S9 Tributary 2 Reach 1
Wash T1S-R8W-S9 Tributary 3 Reach 1
Wash T1S-R8W-S9 Tributary 3 Reach 2
Wash T1S-R8W-S9 Tributary 3 Reach 3
Wash T1S-R8W-S9 Tributary 4 Reach 1
Wash T2S-R5W-S17 Reach 1
Wash T2S-R5W-S17 Reach 2
Wash T2S-R5W-S17 Reach 3
Wash T2S-R5W-S17 Reach 4
Wash T2S-R5W-S17 Reach 5
Wash T2S-R5W-S17 Tributary 1 Reach 1
Wash T2S-R5W-S17 Tributary 1 Reach 2
Wash T2S-R5W-S17 Tributary 1 Reach 3
Wash T2S-R5W-S17 Tributary 1 Reach 4
Wash T2S-R5W-S17 Tributary 1 Reach 5
Wash T2S-R5W-S17 Tributary 2 Reach 1
Wash T2S-R5W-S17 Tributary 3 Reach 1
Wash T2S-R5W-S17 Tributary 4 Reach 1
Wash T2S-R5W-S17 Tributary 4 Reach 2
Wash T2S-R5W-S17 Tributary 4 Reach 3
Wash T2S-R5W-S7-1 Reach 1
Wash T2S-R5W-S7-2 Reach 1
Wash T2S-R5W-S7-2 Reach 2
Wash T2S-R5W-S7-2 Reach 3
Wash T2S-R5W-S7-2 Reach 4
Wash T2S-R5W-S7-2 Tributary 1 Reach 1
Wash T2S-R5W-S7-2 Tributary 2 Reach 1
Wash T2S-R5W-S7-2 Tributary 2 Reach 2
Wash T2S-R5W-S7-2 Tributary 2 Reach 3
Wash T2S-R5W-S7-2 Tributary 3 Reach 1
Wash T2S-R5W-S7-2 Tributary 3 Reach 2
Wash T2S-R5W-S7-2 Tributary 3 Reach 3
Wash T2S-R5W-S7-2 Tributary 3 Reach 4
Wash T2S-R5W-S7-2 Tributary 3 Reach 5
Wash T2S-R5W-S7-3 Reach 1
Wash T2S-R6W-S2 Reach 1
Wash T2S-R6W-S2 Reach 2
Wash T2S-R6W-S2 Reach 3
Wash T2S-R6W-S2 Reach 4
Wash T2S-R6W-S2 Reach 5
Wash T2S-R6W-S2 Reach 6
Wash T2S-R6W-S2 Reach 7
Wash T2S-R6W-S2 Reach 8
Wash T2S-R6W-S2 Tributary 1 Reach 1

Table 2. Approximate Study Flooding Sources (Continued)

Wash T2S-R6W-S2 Tributary 2 Reach 1	Wash K
Wash T2S-R6W-S2 Tributary 3 Reach 1	Wash K Tributary
Wash T2S-R6W-S2 Tributary 4 Reach 1	Wash LPR510A
Wash T2S-R6W-S2 Tributary 4 Reach 2	Wash LPR520A
Wash T2S-R6W-S2 Tributary 4 Reach 3	Wash LPR525A
Wash T2S-R6W-S2 Tributary 5 Reach 1	Wash LPR525B
Wash T2S-R6W-S2 Tributary 6 Reach 1	Wash LPR525C
Wash T2S-R6W-S2 Tributary 7 Reach 1	Wash LPR525D
Wash T2S-R6W-S3 Reach 1	Wash LPR525E
Wash 1	Wash LPR530A
Wash 1 East	Wash LPR530B
Wash 1 West	Wash LPR530C
Wash 10	Wash LPR545A
Wash 10 East	Wash LPR551A
Wash 10 East Split 2	Wash LPR585A
Wash 11	Wash LPR615A
Wash 11 East (Padelford Wash)	Wash LPR615B
Wash 12	Wash LPR646A
Wash 13 East	Wash LPR650A
Wash 14 East	Wash LPR650C
Wash 15 East	Wash LPR651A
Wash 16 East (McMichen Wash)	Wash LPR790A
Wash 17 East	Wash LPR790B
Wash 2	Wash LPR790C
Wash 2 East	Wash LPR831A
Wash 2 West	Wash LPR833A
Wash 2 West Tributary 1	Wash LPR835A
Wash 3	Wash M
Wash 3 EAST	Wash M-4 Tributary
Wash 4	Wash M-5 Tributary
Wash 5	Wash M-6B Tributary
Wash 5 East	Wash M-7 Tributary
Wash 5 East	Wash M-8 Tributary
Wash 5 West	Wash M-9 Tributary
Wash 6	Wash M-10 Tributary
Wash 6 East South	Wash M-11 Tributary
Wash 7	Wash M-12 Tributary
Wash 7 East	Wash M-13 Tributary
Wash 7 East Tributary 1	Wash N
Wash 8	Wash X02
Wash 9	Wash X02A
Wash 9 East	Wash X04
Wash AF	Wash X06
Wash B	Wash X07
Wash F	Wash T1N-R5W-S04
Wash F03	Wash T1N-R5W-S10
Wash F05	Wash T1N-R5W-S15
Wash F25	Wash T1N-R5W-S22
Wash G	Wash T1N-R5W-S30

Table 2. Approximate Study Flooding Sources (Continued)

Wash T1N-R6W-S03E
Wash T1N-R6W-S03W
Wash T1N-R6W-S04E
Wash T1N-R6W-S05 (Dickey Wash South)
Wash T1N-R6W-S05E
Wash T1N-R6W-S05W
Wash T1N-R6W-S07 (Delaney Wash)
Wash T1N-R6W-S09E
Wash T1N-R6W-S11
Wash T1N-R6W-S16
Wash T1N-R6W-S17E
Wash T1N-R6W-S17W
Wash T1N-R6W-S18
Wash T1N-R6W-S20E (Fourmile Wash)
Wash T1N-R6W-S20W
Wash T1N-R6W-S22E
Wash T1N-R6W-S22N
Wash T1N-R6W-S26
Wash T1N-R6W-S27S
Wash T1N-R6W-S29
Wash T1N-R6W-S30E
Wash T1N-R6W-S30W
Wash T1N-R7W-S01
Wash T1N-R7W-S02
Wash T1N-R7W-S05
Wash T1N-R7W-S17
Wash T1N-R7W-S21E
Wash T1N-R7W-S21W
Wash T1N-R7W-S26E
Wash T1N-R7W-S26W
Wash T1N-R7W-S28E
Wash T1N-R7W-S28W
Wash T1N-R7W-S35
Wash T1N-R7W-S36
Wash T1N-R8W-S17
Wash T1N-R8W-S20
Wash T1N-R8W-S20 Tributary 1
Wash T1N-R8W-S29-1
Wash T1N-R8W-S29-1 Tributary 1
Wash T1N-R8W-S29-2
Wash T1N-R8W-S34
Wash T1N-R8W-S8
Wash T1N-R8W-S8 Tributary 1
Wash T1S-R2W-S14(J14)
Wash T1S-R2W-S17(J38)
Wash T1S-R2W-S18A(J27)
Wash T1S-R2W-S18B(J37)
Wash T1S-R2W-S23(J14)
Wash T1S-R2W-S27(J16)
Wash T1S-R2W-S2A(J46)
Wash T1S-R2W-S2B(J48)
Wash T1S-R2W-S2C(J47)
Wash T1S-R2W-S31(A56)
Wash T1S-R2W-S31A(I71)
Wash T1S-R2W-S31B(I70)
Wash T1S-R2W-S32A(I67)
Wash T1S-R2W-S32B(I58)
Wash T1S-R2W-S33(I66)
Wash T1S-R2W-S34(I65)
Wash T1S-R2W-S9A(J39)
Wash T1S-R2W-S9B(J40)
Wash T1S-R3W-S24A(A60)
Wash T1S-R3W-S24B(A59)
Wash T1S-R5W-S08
Wash T1S-R5W-S09
Wash T1S-R5W-S09W
Wash T1S-R5W-S16
Wash T1S-R5W-S22S
Wash T1S-R5W-S28W
Wash T1S-R5W-S29
Wash T1S-R5W-S29E
Wash T1S-R5W-S29W
Wash T1S-R5W-S33E
Wash T1S-R5W-S33N
Wash T1S-R5W-S33W
Wash T1S-R6W-S29S
Wash T1S-R6W-S05E
Wash T1S-R6W-S05N
Wash T1S-R6W-S05S
Wash T1S-R6W-S08
Wash T1S-R6W-S13 (Phillips Wash South)
Wash T1S-R6W-S27
Wash T1S-R6W-S28
Wash T1S-R6W-S28N
Wash T1S-R6W-S29 Reach 1
Wash T1S-R6W-S29E (Winters Wash)
Wash T1S-R6W-S29S
Wash T1S-R6W-S29W
Wash T1S-R7W-S18
Wash T1S-R7W-S19-1 Reach 1
Wash T1S-R7W-S21
Wash T1S-R7W-S21 Tributary 1
Wash T1S-R7W-S21 Tributary 2
Wash T1S-R7W-S21 Tributary 3
Wash T1S-R7W-S22-1
Wash T1S-R7W-S22-2
Wash T1S-R7W-S22-2 Tributary 1
Wash T1S-R7W-S22-2 Tributary 2
Wash T1S-R7W-S25 Reach 1
Wash T1S-R7W-S26 Reach 1

Table 2. Approximate Study Flooding Sources (Continued)

Wash T1S-R7W-S27-3 Reach 1
Wash T1S-R7W-S28 Reach 1
Wash T1S-R8W-S13-1
Wash T1S-R8W-S13-1 Tributary 1
Wash T1S-R8W-S13-1 Tributary 1 Reach 2
Wash T1S-R8W-S13-1 Tributary 1 Reach 3
Wash T1S-R8W-S13-1 Tributary 1 Reach 4
Wash T1S-R8W-S13-1 Tributary 1 Reach 5
Wash T1S-R8W-S13-1 Tributary 1 Reach 6
Wash T1S-R8W-S13-1 Tributary 1 Reach 7
Wash T1S-R8W-S13-1 Tributary 2
Wash T1S-R8W-S13-1 Tributary 3
Wash T1S-R8W-S13-1 Tributary 4
Wash T1S-R8W-S13-2
Wash T1S-R8W-S13-2 Tributary 1
Wash T1S-R8W-S24 Reach 1
Wash T1S-R8W-S5
Wash T1S-R8W-S9 Reach 1
Wash T2N R6W-S36W
Wash T2N-R5W-S04
Wash T2N-R5W-S05E
Wash T2N-R5W-S05W
Wash T2N-R5W-S08
Wash T2N-R5W-S19
Wash T2N-R5W-S21
Wash T2N-R5W-S27S
Wash T2N-R5W-S28
Wash T2N-R5W-S31W (Phillips Wash North)
Wash T2N-R5W-S32
Wash T2N-R5W-S33E
Wash T2N-R5W-S33W
Wash T2N-R6W-S02
Wash T2N-R6W-S02 Split West 1
Wash T2N-R6W-S05E
Wash T2N-R6W-S05N
Wash T2N-R6W-S05S
Wash T2N-R6W-S05W
Wash T2N-R6W-S18E
Wash T2N-R6W-S18W (Old Camp Wash)
Wash T2N-R6W-S19
Wash T2N-R6W-S22
Wash T2N-R6W-S22 West 1
Wash T2N-R6W-S27
Wash T2N-R6W-S28
Wash T2N-R6W-S29W
Wash T2N-R6W-S30W
Wash T2N-R6W-S31N
Wash T2N-R6W-S31S
Wash T2N-R6W-S32E
Wash T2N-R6W-S32N
Wash T2N-R6W-S33E
Wash T2N-R6W-S33S
Wash T2N-R6W-S34
Wash T2N-R6W-S35
Wash T2N-R6W-S36
Wash T2N-R7W-S02
Wash T2N-R7W-S07E
Wash T2N-R7W-S07S
Wash T2N-R7W-S10
Wash T2N-R7W-S15E
Wash T2N-R7W-S15W
Wash T2N-R7W-S18E
Wash T2N-R7W-S18W
Wash T2N-R7W-S19E
Wash T2N-R7W-S19W
Wash T2N-R7W-S20E
Wash T2N-R7W-S20W
Wash T2N-R7W-S25E
Wash T2N-R7W-S25S
Wash T2N-R7W-S25W
Wash T2N-R7W-S26E
Wash T2N-R7W-S26W
Wash T2N-R7W-S27E
Wash T2N-R7W-S27W
Wash T2N-R7W-S29
Wash T2N-R8W-S01
Wash T2N-R7W-S30N
Wash T2N-R7W-S30S
Wash T2N-R7W-S32E
Wash T2N-R7W-S32N
Wash T2N-R7W-S32S
Wash T2N-R7W-S32W
Wash T2N-R7W-S33N
Wash T2N-R7W-S33S
Wash T2N-R7W-S34E
Wash T2N-R7W-S34N
Wash T2N-R7W-S34S
Wash T2N-R7W-S34W
Wash T2N-R7W-S36E
Wash T2N-R7W-S36W
Wash T2N-R8W-S01
Wash T2N-R8W-S02E
Wash T2N-R8W-S02W
Wash T2N-R8W-S8-2
Wash T2N-R8W-S9
Wash T2N-R9W-S12-1
Wash T2N-R9W-S12-2
Wash T2N-R9W-S2-1
Wash T2N-R9W-S2-2
Wash T2S-R1W-S31(B46)

Table 2. Approximate Study Flooding Sources (Continued)

Wash T2S-R2W-S15(A37)
Wash T2S-R2W-S16A(A35)
Wash T2S-R2W-S16B(A15)
Wash T2S-R2W-S17A(A17)
Wash T2S-R2W-S17B(A63)
Wash T2S-R2W-S20(A19)
Wash T2S-R2W-S26(A41)
Wash T2S-R2W-S35A(B58)
Wash T2S-R2W-S35B(B29)
Wash T2S-R2W-S6(A55)
Wash T2S-R2W-S7A(A52)
Wash T2S-R2W-S7B(A51)
Wash T2S-R2W-S7C(A32)
Wash T2S-R3W-S1(A54)
Wash T2S-R3W-S12A(A30)
Wash T2S-R3W-S12B(A27)
Wash T2S-R5W-S17 Reach 1
Wash T2S-R5W-S17 Reach 2
Wash T2S-R5W-S17 Reach 3
Wash T2S-R5W-S17 Reach 4
Wash T2S-R5W-S17 Reach 5
Wash T2S-R5W-S17 Tributary 1 Reach 1
Wash T2S-R5W-S17 Tributary 1 Reach 2
Wash T2S-R5W-S17 Tributary 1 Reach 3
Wash T2S-R5W-S17 Tributary 1 Reach 4
Wash T2S-R5W-S17 Tributary 1 Reach 5
Wash T2S-R5W-S17 Tributary 2 Reach 1
Wash T2S-R5W-S17 Tributary 3 Reach 1
Wash T2S-R5W-S17 Tributary 4 Reach 1
Wash T2S-R5W-S17 Tributary 4 Reach 2
Wash T2S-R5W-S17 Tributary 4 Reach 3
Wash T2S-R5W-S7-1 Reach 1
Wash T2S-R5W-S7-2 Reach 1
Wash T2S-R5W-S7-2 Reach 2
Wash T2S-R5W-S7-2 Reach 3
Wash T2S-R5W-S7-2 Reach 4
Wash T2S-R5W-S7-2 Tributary 1 Reach 1
Wash T2S-R5W-S7-2 Tributary 2 Reach 1
Wash T2S-R5W-S7-2 Tributary 2 Reach 2
Wash T2S-R5W-S7-2 Tributary 2 Reach 3
Wash T2S-R5W-S7-2 Tributary 3 Reach 1
Wash T2S-R5W-S7-2 Tributary 3 Reach 2
Wash T2S-R5W-S7-2 Tributary 3 Reach 3
Wash T2S-R5W-S7-2 Tributary 3 Reach 4
Wash T2S-R5W-S7-2 Tributary 3 Reach 5
Wash T2S-R5W-S7-3 Reach 1
Wash T2S-R6W-S2 Reach 1
Wash T2S-R6W-S2 Reach 2
Wash T2S-R6W-S2 Reach 3
Wash T2S-R6W-S2 Reach 4
Wash T2S-R6W-S2 Reach 5
Wash T2S-R6W-S2 Reach 6
Wash T2S-R6W-S2 Reach 7
Wash T2S-R6W-S2 Reach 8
Wash T2S-R6W-S2 Tributary 1 Reach 1
Wash T2S-R6W-S2 Tributary 2 Reach 1
Wash T2S-R6W-S2 Tributary 3 Reach 1
Wash T2S-R6W-S2 Tributary 4 Reach 1
Wash T2S-R6W-S2 Tributary 4 Reach 2
Wash T2S-R6W-S2 Tributary 4 Reach 3
Wash T2S-R6W-S2 Tributary 5 Reach 1
Wash T2S-R6W-S2 Tributary 6 Reach 1
Wash T2S-R6W-S2 Tributary 7 Reach 1
Wash T2S-R6W-S3 Reach 1
Wash T3N-R5W-S20
Wash T3N-R5W-S21N
Wash T3N-R5W-S21S
Wash T3N-R5W-S28N
Wash T3N-R5W-S28S
Wash T3N-R5W-S30
Wash T3N-R5W-S31
Wash T3N-R5W-S32E
Wash T3N-R6W-S14W
Wash T3N-R6W-S15N
Wash T3N-R6W-S16E
Wash T3N-R6W-S16S
Wash T3N-R6W-S16W
Wash T3N-R6W-S18W
Wash T3N-R6W-S19
Wash T3N-R6W-S20
Wash T3N-R6W-S21
Wash T3N-R6W-S21E
Wash T3N-R6W-S27S
Wash T3N-R6W-S27W
Wash T3N-R6W-S29
Wash T3N-R6W-S33
Wash T3N-R7W-S05
Wash T3N-R7W-S06
Wash T3N-R7W-S09E
Wash T3N-R7W-S09W
Wash T3N-R7W-S11
Wash T3N-R7W-S12
Wash T3N-R7W-S15
Wash T3N-R7W-S17
Wash T3N-R7W-S20
Wash T3N-R7W-S24
Wash T3N-R7W-S26
Wash T3N-R7W-S28E
Wash T3N-R7W-S28W
Wash T3N-R7W-S31E

Table 2. Approximate Study Flooding Sources (Continued)

Wash T3N-R7W-S31S
Wash T3N-R7W-S31W
Wash T3N-R8W-S05E
Wash T3N-R8W-S05W
Wash T3N-R8W-S10
Wash T3N-R8W-S11E
Wash T3N-R8W-S11W
Wash T3N-R8W-S12
Wash T3N-R8W-S13E
Wash T3N-R8W-S13S
Wash T3N-R8W-S13W
Wash T3S-R1W-S15A(G40)
Wash T3S-R1W-S15B(D39)
Wash T3S-R1W-S22A(D42)
Wash T3S-R1W-S22B(G39)
Wash T3S-R1W-S25A(D31)
Wash T3S-R1W-S25B(D32)
Wash T3S-R1W-S26(D33)
Wash T3S-R1W-S3(H29)
Wash T3S-R1W-S4A(H71)
Wash T3S-R1W-S4B(H73)
Wash T3S-R1W-S5(B45)
Wash T3S-R1W-S9(B12)
Wash T3S-R2W-S1(B54)
Wash T3S-R2W-S11(B37)
Wash T3S-R2W-S2A(B33)
Wash T3S-R2W-S2B(B65)
Wash T3S-R2W-S2C(B38)
Wash T3S-R2W-S2D(B35)
Wash T3S-R2W-S2E(B33)
Wash T3S-R2W-S6(B47)
Wash T4N-R3W-S08E
Wash T4N-R7W-S28S
Wash T4N-R7W-S28W
Wash T4N-R7W-S30
Wash T4N-R7W-S32
Wash T4N-R7W-S33N
Wash T4N-R8W-S28E
Wash T4N-R8W-S28W
Wash T4N-R8W-S29E
Wash T4N-R8W-S29W
Wash T4N-R8W-S31E
Wash T4N-R8W-S31N
Wash T4N-R8W-S31S
Wash T4N-R8W-S31W
Wash T4N-R8W-S33
Wash T4N-R8W-S35E
Wash T4N-R8W-S35N
Wash T4N-R8W-S35W
Wash T4S-R1E-S15A(F34)
Wash T4S-R1E-S20(E44)
Wash T4S-R1E-S21(E45)
Wash T4S-R1E-S23(F20)
Wash T4S-R1E-S9(E49)
Wash T5N-R2W-S14N
Wash T5N-R2W-S14S
Wash T5N-R2W-S14W
Wash T5N-R2W-S19E
Wash T5N-R3W-S24E
Wash T5N-R5W-S10A
Wash T5N-R5W-S16
Wash T5N-R5W-S33
Wash T5N-R5W-S23A
Wash T5N-R5W-S34A
Wash T5N-R6W-S30
Wash T5N-R7W-S09
Wash T5N-R8W-S13
Wash T6N-R4W-S15
Wash T6N-R4W-S3
Wash T6N-R8W-S35-B
Wash T7N-R10W-S13
Wash T7N-R1E-S26-2B
Wash T7N-R2E-S6N
Wash T7N-R2E-S6N Tributary 1
Wash T7N-R2E-S6S
Wash T7N-R2E-S7
Wash T7N-R4W-S20
Wash T7N-R4W-S28
Wash T7N-R8W-S12
Wash T7N-R8W-S18
Wash T7N-R8W-S1A
Wash T7N-R8W-S1B
Wash T7N-R8W-S1C
Wash T7N-R8W-S1D
Wash T7N-R8W-S1E
Wash T7N-R8W-S1F
Wash T7N-R8W-S2
Wash T7N-R8W-S7
Wash T7N-R8W-S9
Wash T7N-R8W-S30
Wash T7N-R9W-S17
Wash T7N-R9W-S22
Wash T7N-R9W-S25A
Wash T7N-R9W-S25B
Wash T7N-R9W-S25C
Wash T7N-R9W-S25D
Wash T7N-R9W-S25E
Wash T7N-R9W-S4
Wash T8N-R2E-S31
Wash T8N-R2E-S31 Tributary 1

Table 2. Approximate Study Flooding Sources (Continued)

Wash T8N-R2E-S31 Tributary 2	Willow Spring Wash
Wash T8N-R2E-S31 Tributary 3	Willow Spring Wash-Tributary 3
Wash T8N-R2E-S31 Tributary 4	Willow Springs Wash
Wash Tributary 2	Winters Wash East 4
Waterman Wash	Winters Wash West 1
West Castle Creek	Winters Wash West 2
West Prong Wash	Winters Wash West 3
Western Canal	Winters Wash West 4
White Tanks Flood Retarding Structure No. 3	Woolsey Wash
White Tanks Flood Retarding Structure No. 4	Yellow Medicine Wash
White Tanks Wash	Yellow Medicine Wash Tributary 1
White Tanks Wash No. 3	Yellow Medicine Wash Tributary 2
White Tanks Wash Tributary No. 2	Yucca Flat Wash

2.2 Community Description

Maricopa County, encompassing a total area of 9,238 square miles, is located in south-central Arizona. Adjacent counties are Yavapai County on the north, Gila County on the northeast, Pinal County on the east, Pima County on the south, Yuma County on the west, and La Paz County on the northwest. The incorporated communities within the county cover an area in excess of 100 square miles and an additional 3,330 square miles of the county are Government-owned lands. The 2008 population estimate for the county was 3,954,598 (U.S. Census Bureau, 2009).

The terrain throughout Maricopa County varies in character from numerous rugged mountain ranges to plains and deserts. An abundance of small intermittent streams and washes traverse the major portion of the county. Residential and agricultural development is concentrated along the major streams.

The climate in Maricopa County is mild, with short winters and long, hot summers.

The Gila River, which is the largest tributary to the lower Colorado River, flows southwesterly through the southern half of the county. The river basin includes the southern half of Arizona and part of southwestern New Mexico and contributes a drainage area of approximately 49,500 square miles at the Gillespie Dam, which is approximately 31 miles downstream from Goodyear.

The Agua Fria River, a tributary to the Gila River, rises in the Prescott National Forest and flows southerly for approximately 130 miles to its confluence with the Gila River. It drains an area of approximately 2,340 square miles. The river is usually dry because flows are regulated by the Carl Pleasant Dam and Lake Pleasant reservoir, approximately 18 miles north of El Mirage, in north-central Maricopa County (U.S. Department of the Army, 1968).

The New River, the major tributary of the Agua Fria River, rises in the Cook Mesa area of the New River Mountains and flows southerly to the Agua Fria River. It is approximately 48 miles long and has a drainage area of approximately 315 square miles (U.S. Department of the Army, 1967).

Skunk Creek flows southwesterly to its confluence with the New River, draining an area of approximately 110 square miles at its mouth.

Scatter Wash flows westerly through northern portion of the City of Phoenix to its confluence with Skunk Creek.

East Branch Scatter Wash is an overflow area from Scatter Wash. Floodwater flows along the southern Overbank of Scatter Wash just north of Black Canyon Highway, crosses the highway at the Deer Valley Road interchange, and rejoins Scatter Wash along Rose Garden Lane in the City of Phoenix.

The Salt River originates at the Theodore Roosevelt Lake in Gila County. The river flows westerly through east-central Maricopa County to its confluence with the Gila River. The Salt River has a wide, irregular, sandy streambed with several meandering channels throughout the study area. The river drains an area of 13,700 square miles at its mouth. The Salt River is regulated by four dams: Roosevelt, Horse Mesa, Mormon Flat,

and Stewart Mountain. The total capacity of the four reservoirs is 1.755 million acre-feet. Water from this system is used for irrigation of the Salt River Valley and for the generation of power (U.S. Department of the Interior, 1973). Granite Reef Dam, located on the Salt River 3.4 miles below its confluence with the Verde River, diverts water from the river to Arizona and Southern Canals. This water is for municipal use and irrigation.

Cave Creek and its numerous tributaries drain the mountainous areas of east-central Maricopa County. Cave Creek flows southwesterly to its confluence with the Salt River. Its tributaries include East Fork of Cave Creek and Andora Hills, Galloway, Rowe, Grapevine, Ocotillo, and Willow Springs Washes. Flows are regulated by Cave Creek Dam, located just north of Phoenix. East Fork of Cave Creek flows southwesterly to its confluence with Cave Creek, draining an area of approximately 14.4 square miles at its mouth. Andora Hills Wash flows westerly to its confluence with Cave Creek north of the City of Phoenix. Galloway Wash flows westerly to its confluence with Cave Creek north of the City of Phoenix. Rowe Wash and Grapevine Wash flow southwesterly to their confluences with Galloway Wash north of the City of Phoenix. Ocotillo and Willow Springs Washes flow southwesterly before joining Cave Creek north of the City of Phoenix.

The Hassayampa River flows southerly through northwestern Maricopa County before joining the Gila River 40 miles west of the City of Phoenix. The river, which drains an area in northwestern Maricopa County and southern Yavapai County, originates in the Bradshaw Mountains south of Prescott (U.S. Department of the Army, 1972). The terrain of the drainage basin consists of mountains with heavy forest cover in the northern one-third, rolling hills in the central one-third, and desert valley in the southern one-third. The stream gradient of the Hassayampa River ranges from an average of 20 feet per mile near River Mile 40 to approximately 400 feet per mile near Box Canyon in Yavapai County (U.S. Department of the Army, 1972).

Sols Wash originates in the Date Creek Mountains north of Wickenburg. It flows southeasterly, draining an area of 145 square miles at its confluence with the Hassayampa River. The basin is bounded by low, poorly defined ridges and hills extending to Twin Peaks. On the south and east, pronounced foothills and mountains distinguish the drainage divide. The Sols Wash basin is a mildly sloping desert plain. Tributaries to Sols Wash are Flying E, Hospital, Casandro, and Casandro Wash South Branch. Flying E Wash flows northeasterly, joining Sols Wash in western Wickenburg. Hospital Wash flows southerly to its confluence with Sols Wash within Wickenburg. Casandro Wash flows northeasterly to its confluence with Sols Wash in Wickenburg. Casandro Wash South Branch flows northeasterly to its confluence with Casandro Wash in southwestern Wickenburg.

Powder House Wash flows southwesterly in a well-defined channel, draining 2 square miles of desert highlands before discharging into the Hassayampa River at the Town of Wickenburg.

Martinez Wash flows southeasterly, joining the Hassayampa River at the Maricopa-Yavapai County line.

Mockingbird Wash is a tributary of the Hassayampa River approximately 2 miles southeast of the Town of Wickenburg. The wash is well defined, with steep sidewalls. Mockingbird Wash flows southwesterly, draining approximately 7 square miles of desert

highland.

Little San Domingo Wash is a small, well-defined wash near the unincorporated area of Morristown in northern Maricopa County. It flows southwesterly, draining 6.2 square miles of desert highlands at the U.S. Highways 60, 70, and 89 interchange.

Aguila Farm Channel collects flood flows north of the Atchison, Topeka & Santa Fe Railway in northwestern Maricopa County and conveys them westerly across Aguila Farm to Grass Wash.

Grass Wash flows northwesterly through Aguila to its confluence with Centennial Wash in northwestern Maricopa County.

Sand Tank and Bender Washes flow northwesterly through the center of Gila Bend. Sand Tank and Bender Washes approach Gila Bend from the south in two separate channels, but during periods of heavy runoff the washes overflow their banks and the flows are intermixed. The combined flows join the Gila River approximately 3 miles north of Gila Bend.

Rodeo Wash and Rodeo Wash Tributary flow northwesterly through eastern Gila Bend.

Airport Wash flows northwesterly through the northeastern corner of Gila Bend.

Scott Avenue Wash flows northerly through western Gila Bend.

Lower El Mirage Wash and Lower El Mirage Wash Tributary flow easterly to the Agua Fria River near El Mirage.

The Atchison, Topeka & Santa Fe Railway Channel flows easterly to the Agua Fria River through the northern part of the town.

The elevated embankments of the Atchison, Topeka & Santa Fe Railway and the Southern Pacific Railroad impede the movement of floodwaters from the east and northeast, resulting in ponding and shallow flooding along the embankments throughout the county.

Echo Canyon Wash flows southwesterly through the Town of Paradise Valley, and Cities of Phoenix and Scottsdale to its junction with Arizona Canal.

Apache Creek, near Apache Junction, is on an alluvial fan at the base of the Superstition Mountains in southeastern Maricopa County.

A system of irrigation canals crosses the southern one-half of the county nearly parallel to ground contours. The system consists of the Arizona, Grand, Western, Tempe, Highline, Kyrene Branch, Gila Bend, Southern, Buckeye, Consolidated, Roosevelt, and Eastern Canals, and the Granite Reef Aqueduct.

2.3 Principal Flood Problems

The flooding history of Maricopa County indicates that large portions of the county are subject to destructive floods.

The principal flood hazard results from overflow of the major rivers; the overflow results in the inundation of the wide, flat floodplains, including any residential, commercial, or agricultural developments located within them. Erosion, combined with the development of new channels, adds to the potential hazard from inundation.

Areas adjacent to the floodplains of the major rivers, but not subject to overflow from the rivers, may be flooded due to the failure of earthen dikes and other retarding or diverting structures (U.S. Department of the Interior, 1973).

The upland areas of Maricopa County are also subject to flooding. Throughout the county, broad alluvial slopes lie between the steep mountains and major watercourses. These slopes are formed by the intermingling of alluvial fans from several streams and are traversed by many small channels that divide and recon verge at many places.

These channels are usually lined with small amounts of brush. Flooding occurs as a direct result of rainfall on the slopes or is caused by streams that drain from the mountains. Floods originating in the mountains often carry substantial amounts of rock debris, which are deposited on the alluvial slope. The debris may plug old channels and cause new ones to develop. Many of the lower slopes receive runoff only from precipitation that falls directly on the area involved because mountain runoff is completely on the upper slopes.

Much of the flood low on the upland areas is unconfined and moves down slope as sheet flow. Generally, the sheet flow is less than 1.0 foot deep because the width of flow prevents water from building up to greater depths, except in depressions and where water ponds behind dikes, canals, and road fills that may divert the flow from its normal path. The concentrated flow may then break through at one spot, causing high velocities and deep flows immediately below the break or overflow area (U.S. Department of the Interior, 1974).

The type of sheet flow described above occurs on ground slopes of 1 to 5 percent. Slopes of less than 1 percent are too flat to carry water any significant distance. Ponding and rapid infiltration deplete the flood flows quickly. Slopes of more than 5 percent generally cause defined channels to form. Defined channels of minor tributaries may extend a considerable distance into slopes that are flatter than 5 percent, but will seldom reach slopes of less than 2 percent without distributaries channels forming. Water in these channels is generally 2.5 to 3 feet deep (U.S. Department of the Interior, 1974).

Floods have plagued the Gila River basin for many years. The flood of February 1891 produced a great flood on the Salt River; the estimated peak flood flow was approximately 300,000 cubic feet per second (cfs) at Arizona Dam (the present site of Granite Reef Dam). The largest flood involving the entire Gila River basin since that time was produced by the storms of January 1916. During that month, two Pacific storms occurring 10 days apart brought warm rain, which melted unusually heavy snow covers. The resultant flood ravaged the entire basin (U.S. Department of the Army, 1979).

Other large floods occurred in April 1905, February 1920, March 1938, August 1951, December 1965, December 1967, September 1970, and June 1972.

Heavy precipitation in the mountains north and east of the City of Phoenix caused five

floods in the Phoenix area from March 1978 to February 1980. The floods occurred in March 1978, December 1978, January 1979, March 1979, and February 1980 (approximately a 2-percent-annual-chance flood event) when the flows in the Salt, Verde, and Agua Fria Rivers exceeded the storage capacity of the reservoirs on the rivers. These floods made almost all river crossings on the Salt River impassable for weeks and cut Maricopa County practically in half. Because of major traffic delays, businesses suffered major income losses. The nuisance of traffic jams also affected the lives of residents in the Phoenix metropolitan area. There were major physical damages to roads and bridges that crossed the Salt and Agua Fria Rivers. The Sky Harbor International Airport runways were flooded, causing partial closure of operations. The other flood damages were to agricultural fields on the flat floodplain, to the sand-and-gravel-mining operations in the riverbed, and to commercial establishments in the river floodplains. Emergency assistance costs for local fire, police, and public services increased significantly. The overall flood damage estimate for March 1978 was approximately $33.2 million; for December 1978, $51.8 million; and for February 1980, $63.6 million.

Figures 1, 2, 3, and 4 depict flooding along the Salt River during December 1965. Figure 5 shows flooding on the Agua Fria River near the City of Goodyear during the December 1965 flood.

Figure 1. Looking downstream on the Salt River During the December 1965 flood (Sky Harbor International Airport runways are in the center.)

Figure 2. Salt River flooding in December 1965 (The 40th Street bridge railing is visible at lower right; flow is from right to left.)

Figure 3. The Salt River Bridges in the City of Tempe, looking upstream (The flooded area in the upper center is now developed into athletic fields and parking lots for Arizona State University. Photograph was taken on December 31, 1965.)

Figure 4. The Salt River in the City of Tempe looking southwest (The flow is left to right. The buildings in the upper center of the photo are the Arizona State University. Scottsdale Road crosses the photo from the upper left to the lower right. Photograph was taken on December 31, 1965.)

Figure 5. Agua Fria River Flooding at U.S. Highway 80 and Southern Pacific Railroad Bridge near the City of Goodyear on December 22, 1965 (Direction of flow is right to left.)

2.4 Flood Protection Measures

Several flood-control structures exist in Maricopa County. Painted Rock Dam, which is 20 miles northwest of Gila Bend on the Gila River, was completed in 1959. It provides flood protection for approximately 360,000 acres downstream of the dam (U.S. Department of the Army, 1979).

Runoff on the Salt River and its tributary, the Verde River, has been reduced over the years by the construction of several dams: Granite Reef Dam (1908); Roosevelt Dam (1911); Mormon Flat Dam (1925); Horse Mesa Dam (1927); Stewart Mountain Dam (1930) on the Salt River; Bartlett Dam (1939); and Horseshoe Dam (1945) on the Verde River.

Carl Pleasant Dam was constructed at the Frog Tanks gage on the Agua Fria River in 1927. It controls runoff from an area of 1,457 square miles (U.S. Department of the Army, 1974).

Cave Creek Dam, built in 1920, provides protection from a 4-percent-annual-chance flood to parts of the City of Phoenix.

The Paradise Valley detention dikes, which are a feature of the Central Arizona Project (CAP), provide flood protection for the northeastern part of Phoenix and Scottsdale in excess of the 1-percent-annual-chance flood. The Paradise Valley detention dikes have 14 feet of freeboard to provide protection from the 1-percent-annual-chance flood (FEMA, 1984). Also part of the CAP is the Granite Reef Aqueduct, which consists of a concrete-lined channel and a series of levees.

Dreamy Draw detention basin (1973) and Cave Buttes Dam (1980) provide additional flood protection for the City of Phoenix.

Trilby Wash detention basin (McMicken Dam) was completed in 1956. The detention basin has a capacity of approximately 19,300 acre-feet (U.S. Department of the Army, 1979). A levied outlet channel conveys flood releases from the detention basin to the Agua Fria River. The project provides some flood protection to Luke Air Force Base, Phoenix Litchfield Municipal Airport, and the Cities of Goodyear, Litchfield, Avondale, Surprise, and El Mirage.

Spook Hill Dam, Signal Butte Dam, Pass Mountain Dam, Powerline Dam, a diversion-structure to Powerline Dam, and Rittenhouse Dam control flooding in the southeastern part of the county (FEMA, 1980; FEMA, 1983).

Drainage structures in the I-8 embankment south of Gila Bend were designed, according to State criteria, for a 2-percent-annual-chance storm. This provides a shielding effect to Gila Bend because floodwaters from lower frequency storms will be detained by the highway, and flows exceeding the capacity of the highway structures will be diverted to the west (FEMA, 1979).

A storm water detention dike was built approximately 4 miles north of the Town of Buckeye under the auspices of FCDMC. This facility was designed and constructed to contain up to the 1-percent-annual-chance frequency storm runoff from the drainage areas north of the Roosevelt Canal. This facility provides some flood protection to the

Town of Buckeye (FEMA, 1981).

The channelization of portions of the Agua Fria, Gila, New, and Salt Rivers, Skunk Creek, and Scatter Wash has significantly reduced their respective floodplain areas. Adobe Dam was constructed in April 1982 on Skunk Creek across Deer Valley Drive, approximately 1 mile west of Black Canyon Highway. The embankment is a compacted-earth fill structure. The ungated outlet works are designed to release a discharge of 1,890 cfs when the water surface is at the spillway crest. The dam is designed to reduce the Standard Project Flood peak inflow of 66,000 cfs to an outflow of 1,890 cfs. The 1-percent-annual-chance base flood inflow of 39,000 cfs will be reduced to a 1,730-cfs outflow.

In addition, the construction of the New River Dam has reduced the peak flow downstream at the confluence with Skunk Creek from 58,000 cfs to 12,000 cfs.

Levees in the study area provide the community with some degree of protection from flooding. However, it has been ascertained that some of these levees may not provide 1-percent-annual-chance flood protection. The criteria used to evaluate 1-percent-annual-chance protection are: (1) adequate design, including freeboard; (2) structural stability; and (3) proper operation and maintenance. Levees that do not provide 1-percent flood protection are not considered in the hydraulic analyses of the 1-percent floodplain.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood, which equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the county at the time of completion of this study. Maps and flood elevations will be amended periodically to future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the county.

Peak discharges for the Hassayampa River were developed from discharge-frequency relationships of historic floods and gage records (U.S. Department of the Army, 1974).

In the absence of observed runoff data, present-condition, discharge-frequency values for Scatter Wash and the New River were used. Present-condition, discharge-frequency values for Scatter Wash and Skunk Creek below Adobe Dam were based on future

condition values modified to reflect present conditions (U.S. Department of the Army, 1982). Discharge-frequency values for the Agua Fria River were determined by routing balanced hydrographs, which were developed from Waddell Dam inflow-volume-frequency relationships, through the dam and downstream, and adding local flows as appropriate. Discharge-frequency relationships for the Salt River and Gila Rivers concentration points were determined by routing period-of-record flows through existing reservoirs using the HEC-5 computer model (U.S. Department of the Army, May 1982).

Peak discharge-frequency relationships for Cave Creek (below Cave Creek Dam), East Fork of Cave Creek, and Echo Canyon Wash were taken from the FIS for the City of Phoenix (FEMA, 1984).

Peak discharge-frequency relationships for Cave Creek (above Cave Creek Dam), Andora Hills Wash, Galloway Wash, Apache Creek, Rowe Wash, Grapevine Wash, Ocotillo Wash, Willow Springs Wash, Skunk Creek (above Carefree Highway), Mockingbird Wash, Little San Domingo Wash, Whitman Drainage, Aguila Farm Channel, Grass Wash, Sand Tank Wash, Bender Wash, Rodeo Wash and its tributary, Airport Wash, Scott Avenue Wash, and Martinez Wash were developed using the U.S. Soil Conservation Service (SCS) TR-20 program (U.S. Department of Agriculture, 1965). In addition, the SCS TR-55 computer program (U.S. Department of Agriculture, 1975) was used to determine flood peaks for Buckeye Feeder Canal; Atchison, Topeka & Santa Fe Railway Channel; Southern Pacific Railroad Spur at the City of Chandler; Southern Pacific Railroad at the Town of Buckeye and the Cities of Chandler, Gilbert, Goodyear, Tempe, and Tolleson; and Lower El Mirage Wash and its tributary.

The Town of Wickenburg requested a restudy for Sols Wash based upon studies performed by the SCS and PRC Toups Engineering (PRC) (U.S. Department of the Army, 1979). These studies yielded peak discharges significantly less than what had been assumed in the previous analysis for the effective FIS (FEMA, 1983).

The SCS computer model, TR-20, was selected to be used to estimate the 10-, 2-, 1- and 0.2-percent-annual-chance peak discharges for various concentration points along Sols Wash. The TR-20 model utilizes the method of analysis described in detail in the SCS National Engineering Handbook Section 4, Hydrology, 1972. This method allows for the prediction of surface water runoff, for an individual watershed, using rainfall-duration and intensity data. The TR-20 model provides a convenient means of predicting the results of storm runoff from multiple watersheds. The storm runoff for individual watersheds is computed and an outflow hydrograph simulated. Individual hydrographs may then be routed and combined to obtain the cumulative downstream effects (U.S. Department of Agriculture, 1965; U.S. Department of Agriculture, 1972; U.S. Department of Commerce, 1973; U.S. Department of Agriculture, July 1975; U.S. Department of Agriculture, December 1975; U.S. Department of Agriculture, 1974; U.S. Department of Agriculture, 1973; and U.S. Department of Agriculture, 1976).

The precipitation frequencies for the area were obtained from is pluvial maps prepared by the U.S. Weather Bureau. The SCS Type II rainfall distribution was used to model the rainfall, which was adjusted using an aerial reduction based upon the total drainage area. Such reduction is necessary to convert from the point aerial rainfall amount. Using soils maps of the area, prepared by the SCS, and from site investigation, runoff curve numbers were selected, based upon recent information developed by the SCS. Time of concentrations for steep and incised washes were computed using the Kirpich equation. For gently sloping alluvial plains, many of which occur on the upper northwest portion of the drainage basin, travel velocities were estimated assuming broad sheet flow and utilizing Manning's equation.

Because there is no gauging station on Sols Wash, and thus no accurate record of historic flooding, there is no means to provide calibration of the rainfall-runoff model, and therefore, only comparison with earlier studies can be made.

The discharge estimates obtained from the TR-20 analysis for this study correspond with the results from both the SCS and PRC analyses. The discharge-frequency curve developed by the USACE for the 1977 FIS has a steeper slope and results in a much larger 1-percent-annual-chance peak discharge than the other studies. The SCS, PRC, and CBA studies each employed the TR-20 model which might explain, in part, the consistency of the results, although the TR-20 is quite sensitive to changes in time of concentration, and each model employed different input parameters.

The calibration of the TR-20 model, by PRC, using streamflow data from the Hassayampa River, lends further credence to each of the study results. Therefore, results from the TR-20 model utilized in this restudy of Sols Wash have been employed in the hydraulic analysis.

Peak discharge-frequency relationships for Casandro, South Branch Cassandro, Flying E, Hospital, and Powder House Washes were taken from the FIS for the Town of Wickenburg (FEMA, 1983).

For the Stagecoach Pass Wash Overflow, 1-percent annual-chance flood discharge was previously developed in the North Scottsdale Floodplain Delineation Study (DEI Professional Services, 2005).

Peak discharge-drainage area relationships for flooding sources studied by detailed methods are shown in Table 3, “Summary of Discharges”.

Elevations for floods of the recurrence intervals for multiple flooding sources are shown in Table 4, “Summary of Stillwater Elevations”.