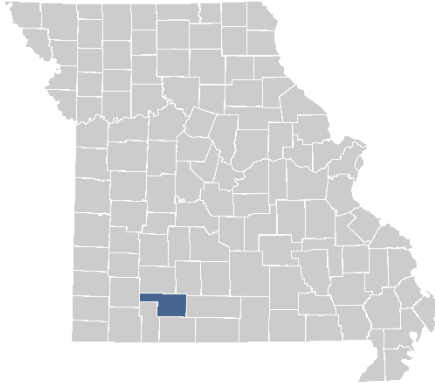


FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 2



CHRISTIAN COUNTY, MISSOURI AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BILLINGS, CITY OF	290757
CHRISTIAN COUNTY, UNINCORPORATED AREAS	290847
CLEVER, CITY OF	290600
FREMONT HILLS, CITY OF	290755
HIGHLANDVILLE, CITY OF	290773
NIXA, CITY OF	290078
OZARK, CITY OF	290079
SADDLEBROOK, VILLAGE OF	290993
SPARTA. CITY OF	290529



FEMA

Preliminary
09/20/2019

EFFECTIVE:

TBD

FLOOD INSURANCE STUDY NUMBER
29043CV001B

Version Number 2.4.3.5

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Volume 2
Exhibits

Flood Profiles

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Farmer Branch	01-04 P
Finely Creek	05-11 P
Garrison Branch North	12-14 P
Hall Branch	15-16 P
James River	17-25 P
Jonquil Creek	26-32 P
Luce Creek Tributary 2	33-38 P
McCracken Branch	39-40 P
Minnehaha Branch	41-51 P
Ozark Branch	52-59 P
Rabbit Run Branch	60-65 P
Richwood Branch	66-72 P
Robin Creek	73-75 P
Skyview Creek	76-78 P
Sparta Creek	79-88 P
Stone Ridge Creek	89-93 P
Wren Creek	94-98 P

Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT CHRISTIAN COUNTY, MISSOURI

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal

Government. Congress also recognized that most of these floodprone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community’s regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Christian County, Missouri.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC-8) sub-basins affecting each, are shown in Table 1. The FIRM panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

Jurisdictions that have no identified SFHAs as of the effective date of this study are indicated in the table. Changed conditions in these communities (such as urbanization or annexation) or the availability of new scientific or technical data about flood hazards could make it necessary to determine SFHAs in these jurisdictions in the future.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Billings, City of	290757	10290106 11010002	29043C0005D 29043C0010D 19043C0015D 29043C0020D	
Christian County, Unincorporated Areas	290847	10290106 11010002 11010003 11070207	29043C0005D 29043C0006D 29043C0007D ¹ 29043C0010D	

¹ Panel not printed

Table 1: Listing of NFIP Jurisdictions (continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Christian County, Unincorporated Areas (Continued)	290847	10290106 11010002 11010003 11070207	29043C0015D	
			29043C0020D	
			29043C0033D	
			29043C0034D	
			29043C0035D	
			29043C0041D	
			29043C0042D	
			29043C0043D	
			29043C0044D	
			29043C0050D	
			29043C0051D	
			29043C0052D	
			29043C0053D	
			29043C0054D	
			29043C0056D	
			29043C0057D	
			29043C0058D	
			29043C0059D	
			29043C0061D	
			29043C0062D	
			29043C0063D	
			29043C0064D	
			29043C0066D	
			29043C0067D	
			29043C0068D	
			29043C0069D	
			29043C0078D	
			29043C0079D	
			29043C0080D ¹	
			29043C0085D	
			29043C0086D	
			29043C0087D	
			29043C0088D	
			29043C0089D	
			29043C0091D	
			29043C0092D	
			29043C0093D	
			29043C0094D	
			29043C0105D	
			29043C0110D	
29043C0111D				
29043C0112D				
29043C0113D				
29043C0114D				
29043C0120D				
29043C0150D				
29043C0175D				
29043C0180D				
29043C0190D ¹				
29043C0200D				

¹ Panel not printed

Table 1: Listing of NFIP Jurisdictions (continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Christian County, Unincorporated Areas (Continued)	290847	10290106 11010002 11010003 11070207	29043C0201D 29043C0202D 29043C0205D 29043C0206D 29043C0210D 29043C0225D 29043C0230D 29043C0235D 29043C0250D 29043C0275D 29043C0300D 29043C0325D 29043C0350D 29043C0375D 29043C0400D	
Clever, City of	290600	11010002	29043C0050D	
Fremont Hills, City of	290755	11010002	29043C0059D 29043C0067D 29043C0078D 29043C0086D	
Highlandville, City of	290773	11010002 11010003	29043C0206D 29043C0210D 29043C0225D	
Nixa, City of	290078	11010002	29043C0058D 29043C0059D 29043C0062D 29043C0064D 29043C0066D 29043C0067D 29043C0068D 29043C0069D	
Ozark, City of	290079	11010002	29043C0067D 29043C0069D 29043C0078D 29043C0079D 29043C0080D ¹ 29043C0085D 29043C0086D 29043C0087D 29043C0088D 29043C0089D 29043C0093D 29043C0230D 29043C0235D	
Republic, City of	290148	11010002	N/A	Greene County, MO FIS Report, 2010

¹ Panel not printed

Table 1: Listing of NFIP Jurisdictions (continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Saddlebrooke, Village of	290993	11010003	29043C0350D	
Sparta, City of	290529	11010002 11010003	29043C0113D 29043C0114D 29043C0275D	
Springfield, City of	290149	11010002	N/A	Greene County, MO FIS Report, 2010

¹ Panel not printed

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

-) Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 30, "Map Repositories," within this FIS Report.

-) New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

The initial Countywide FIS Report for Christian County became effective on December 17, 2010. Refer to Table 27 for information about subsequent revisions to the FIRMs.

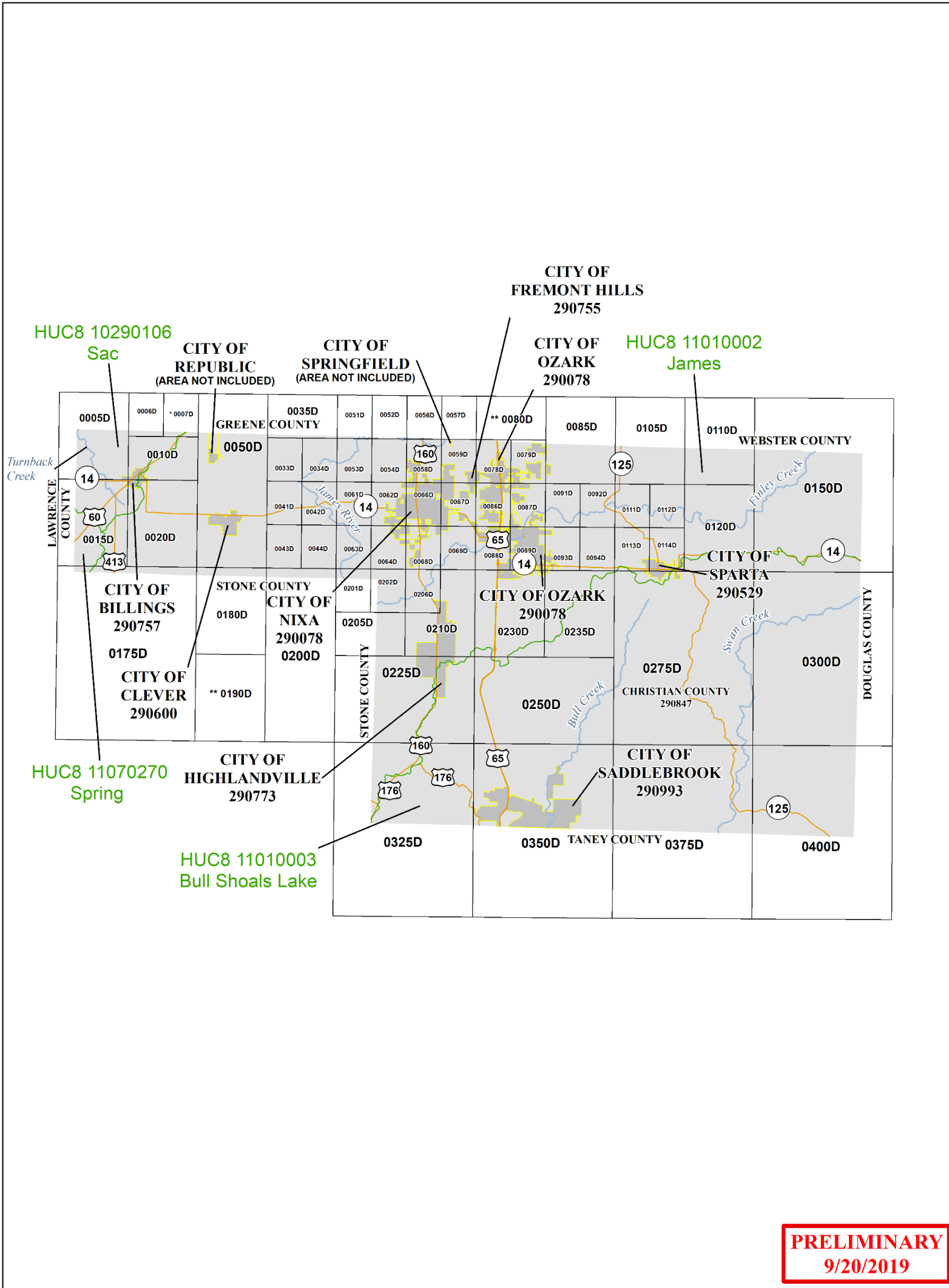
-) Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map (FBFM) panels. In addition, former flood hazard zone designations have been changed as follows:

<u>Old Zone</u>	<u>New Zone</u>
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

-) The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at www.fema.gov/national-flood-insurance-program-community-rating-system or contact your appropriate FEMA Regional Office for more information about this program.
-) FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at www.fema.gov/online-tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Christian County, and also displays the panel number and effective date for each FIRM panel in the county. Other information shown on the FIRM Index includes community boundaries, flooding sources, watershed boundaries, and USGS HUC-8 codes.

Figure 1: FIRM Index



1 inch = 25,000 feet 1:300,000
 0 7,500 15,000 30,000 45,000 60,000 Feet
 Map Projection:
 NAD 1983 StatePlane Missouri Central FIPS 2402 Feet;
 Western Hemisphere; Vertical Datum: NAVD 88
 THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
 DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)
 SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION
 * PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
 ** PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY



NATIONAL FLOOD INSURANCE PROGRAM
 FLOOD INSURANCE RATE MAP INDEX
 CHRISTIAN COUNTY, MISSOURI and Incorporated Areas

PANELS PRINTED:
 0005, 0006, 0010, 0015, 0020, 0033, 0034, 0035, 0041, 0042,
 0043, 0044, 0050, 0051, 0052, 0053, 0054, 0056, 0057, 0058,
 0059, 0061, 0062, 0063, 0064, 0066, 0067, 0068, 0069, 0078,
 0079, 0085, 0086, 0087, 0088, 0089, 0091, 0092, 0093, 0094,
 0105, 0110, 0111, 0112, 0113, 0114, 0120, 0150, 0175, 0180,
 0200, 0201, 0202, 0205, 0206, 0210, 0225, 0230, 0235, 0250,
 0275, 0300, 0325, 0350, 0375, 0400

FEMA
 U.S. DEPARTMENT OF
 HOMELAND SECURITY
 MAP NUMBER
 29043CINDOC
 EFFECTIVE DATE
 TBA

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 27 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

Figure 2: FIRM Notes to Users (continued)

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was Missouri State Plane Central Zone Feet (FIP 2402). The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at **Error! Hyperlink reference not valid.**

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 30 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by United States Department of Agriculture Farm Service Agency at scale of 1:12,000. For information about base maps, refer to Section 6.2 "Base Map" in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Christian County, MISSOURI, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 27 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Christian County, Missouri, effective TBD.

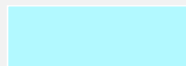
Figure 2: FIRM Notes to Users (continued)

FLOOD RISK REPORT: A Flood Risk Report (FRR) was not funded for the flooding sources and communities referenced in this FIS Report as part of this project. The FRR may sometimes be provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Christian County.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*



Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)

- Zone A The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
- Zone AE The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
- Zone AH The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
- Zone AO The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
- Zone AR The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

Figure 3: Map Legend for FIRM (continued)


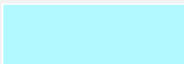






Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.
	Non-encroachment zone (see Section 2.4 of this FIS Report for more information)
	The Colorado River Floodway was established by Congress in the Colorado River Floodway Protection Act of 1986, Public Law 99-450 (100 Statute 1129). The Act imposes certain restrictions within the Floodway.
<p>FLOOD INSURANCE IS NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER APRIL 8, 1987, IN THE DESIGNATED COLORADO RIVER FLOODWAY</p>	
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.
	Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. See Notes to Users for important information.
	Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than the 1% annual chance flood.
OTHER AREAS	
	Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Figure 3: Map Legend for FIRM (continued)


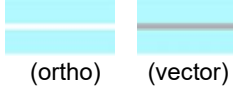






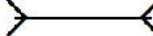

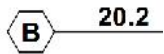





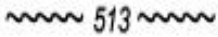






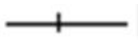
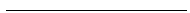


	Unshaded Zone X: Areas of minimal flood hazard.
FLOOD HAZARD AND OTHER BOUNDARY LINES	
	Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)
	Limit of Study
	Jurisdiction Boundary
	Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet
GENERAL STRUCTURES	
 <p data-bbox="391 821 509 919"><i>Aqueduct Channel Culvert Storm Sewer</i></p>	Channel, Culvert, Aqueduct, or Storm Sewer
 <p data-bbox="431 968 472 1045"><i>Dam Jetty Weir</i></p>	Dam, Jetty, Weir
	Levee, Dike, or Floodwall
 <p data-bbox="423 1209 480 1234"><i>Bridge</i></p>	Bridge
REFERENCE MARKERS	
	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.

Figure 3: Map Legend for FIRM (continued)

	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
	Base Flood Elevation Line
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity
BASE MAP FEATURES	
 <i>Missouri Creek</i>	River, Stream or Other Hydrographic Feature
	Interstate Highway
	U.S. Highway
	State Highway
	County Highway
MAPLE LANE 	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
 RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
4276^{000m}E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1% annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2% annual chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Christian County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1% annual chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1% and 0.2% annual chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1% annual chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Christian County, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 12. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1% annual chance floodplain corresponds to the SFHAs. The 0.2% annual chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Arrowhead Creek	Christian County, Unincorporated Areas; Nixa, City of	Confluence with Tanglewood Creek	Approximately 1.81 miles upstream of confluence with Tanglewood Creek	11010002	1.8	N/A	N	AE	2018
Bluestem Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Westwind Creek	Approximately 1.77 miles upstream of confluence with Westwind Creek	11010002	1.8	N/A	N	AE	2018
Farmer Branch	Christian County, Unincorporated Areas	Confluence with James River	Approximately 0.9 miles upstream from confluence with James River	11010002	0.9	N/A	Y	AE	2016
Finley Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with James River	Approximately 37.8 miles upstream from confluence With James River	11010002	37.8	N/A	Y	AE	2018
Freemont Hills Branch	Christian County, Unincorporated Areas; Nixa, City of	Confluence with Greenbriar Branch	Approximately 530 feet upstream of Confluence with Greenbriar Branch	11010002	0.1	N/A	N	AE	2018
Garrison Branch North	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 1.1 miles upstream from confluence With Finley Creek	11010002	1.1	N/A	Y	AE	2018
Greenbriar Branch	Christian County, Unincorporated Areas; Fremont Hills, City of	Confluence with Westwind Creek	Approximately 1.22 miles upstream of confluence with Westwind Creek	11010002	1.2	N/A	N	AE	2018

Table 2: Flooding Sources Included in this FIS Report (continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Hall Branch	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 0.7 miles upstream from confluence With Finley Creek	11010002	0.7	N/A	Y	AE	2018
James River	Christian County, Unincorporated Areas	Confluence with White River	Approximately 104.2 miles upstream from confluence With White River	11010002	104.2	N/A	Y	AE	2018
Jonquil Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 1.6 miles upstream from confluence With Finley Creek	11010002	1.6	N/A	Y	AE	2018
Luce Creek Tributary 2	Christian County, Unincorporated Areas; Clever, City of	Confluence with Luce Creek	Approximately 2.7 miles upstream from confluence with Luce Creek	11010002	2.7	N/A	Y	AE	2018
McCracken Branch	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 0.6 miles upstream from confluence With Finley Creek	11010002	0.6	N/A	Y	AE	2018
Minnehaha Branch	Christian County, Unincorporated Areas; Nixa, City of	Confluence with Finley Creek	Approximately 2.5 miles upstream from confluence With Finley Creek	11010002	2.5	N/A	Y	AE	2018
Nicholas Road Creek	Christian County, Unincorporated Areas; Nixa, City of	Confluence with James River	Approximately 5.9 miles upstream of confluence with James River	11010002	5.9	N/A	N	AE	2018
Ozark Branch	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 1.8 miles upstream from Confluence with Finley Creek	11010002	1.8	N/A	Y	AE	2018

Table 2: Flooding Sources Included in this FIS Report (continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Rabbit Run Branch	Christian County, Unincorporated Areas; Nixa, City of	Confluence with Finley Creek	Approximately 2.7 miles upstream from Confluence with Finley Creek	11010002	2.7	N/A	Y	AE	2018
Richwood Branch	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 3.1 miles upstream from Confluence with Finley Creek	11010002	3.1	N/A	Y	AE	2018
Robin Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Ozark Branch	Approximately 0.5 miles upstream from Confluence with Ozark Branch	11010002	0.5	N/A	Y	AE	2018
Sawgrass Branch	Christian County, Unincorporated Areas; Fremont Hills, City of; Ozark, City of	Confluence with Westwind Creek	Approximately 1.1 miles upstream from Westwind Creek	11010002	1.3	N/A	N	AE	2018
Skyview Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Richwood Branch	Approximately 1.2 miles upstream from Confluence with Richwood Branch	11010002	1.2	N/A	Y	AE	2018
Sparta Creek	Christian County, Unincorporated Areas; Sparta, City of	Confluence with Finley Creek	Approximately 4.9 miles upstream from Confluence with Finley Creek	11010002	4.9	N/A	Y	AE	2018
Stone Ridge Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 1.4 miles upstream from Confluence with Finley Creek	11010002	1.4	N/A	Y	AE	2018
Swallowtail Branch	Christian County, Unincorporated Areas	Confluence with Nicholas Road Creek	Approximately 1.3 miles upstream of Nicholas Road Creek	11010002	1.3	N/A	N	AE	2018

Table 2: Flooding Sources Included in this FIS Report (continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Tanglewood Creek	Christian County, Unincorporated Areas; Nixa, City of	Confluence with Westwind Creek	Approximately 580 feet upstream of N Old Castle Road	11010002	2.1	N/A	N	AE	2018
Westwind Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with James River	Approximately 1,480 feet upstream of N Brookshire Street	11010002	6.0	N/A	N	AE	2018
Wren Creek	Christian County, Unincorporated Areas; Ozark, City of	Confluence with Finley Creek	Approximately 1.3 miles upstream from Confluence with Finley Creek	11010002	1.3	N/A	Y	AE	2018
Bull Shoals Lake Zone A Tributaries	Christian County and Incorporated Areas	Varies	Varies	11010003	220.1	N/A	N	A	2018
James Watershed 1D Zone A Tributaries	Christian County and Incorporated Areas	Varies	Varies	11010002	281.4	N/A	N	A	2018
James Watershed 2D Zone A Tributaries	Christian County, Unincorporated Areas	Varies	Varies	11010002	27.7	N/A	N	A	2018
Sac Watershed Zone A Tributaries	Christian County and Incorporated Areas	Varies	Varies	11070207	22.1	N/A	N	A	2018
Spring Watershed Zone A Tributaries	Christian County and Incorporated Areas	Varies	Varies	10290106	5.7	N/A	N	A	2018

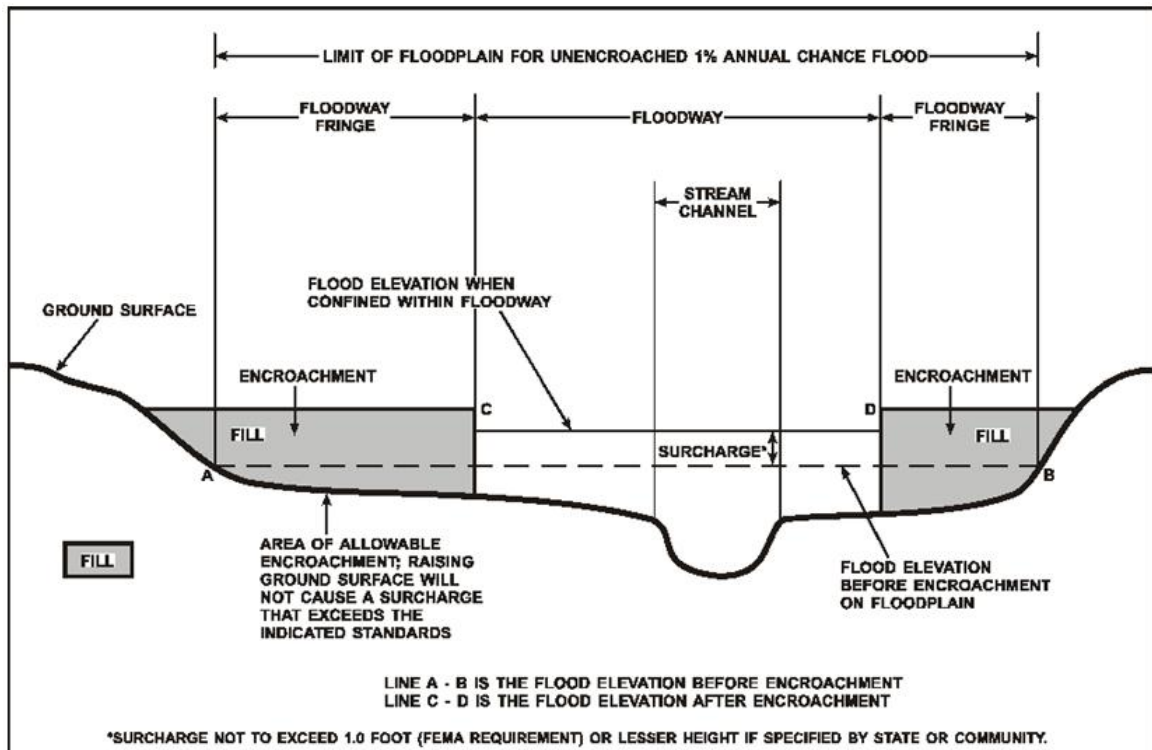
2.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1% annual chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1% annual chance flood. The floodway fringe is the area between the floodway and the 1% annual chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water surface elevation of the 1% annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 23, "Floodway Data."

All floodways that were developed for this Flood Risk Project are shown on the FIRM using the symbology described in Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Christian County. Figure 3. In cases where the floodway and 1% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The Base Flood Elevation (BFE) is the elevation of the 1% annual chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Project.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Project.

2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this Flood Risk Project.

Figure 5: Wave Runup Transect Schematic

[Not applicable to this Flood Risk Project]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this Flood Risk Project.

2.5.3 Coastal High Hazard Areas

This section is not applicable to this Flood Risk Project.

Figure 6: Coastal Transect Schematic

[Not applicable to this Flood Risk Project]

2.5.4 Limit of Moderate Wave Action

This section is not applicable to this Flood Risk Project.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Christian County.

Figure 3, “Map Legend for FIRM.” Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Christian County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Billings, City of	A, X
Christian County, Unincorporated Areas	A, AE, X
Clever, City of	AE, X
Fremont Hills, City of	AE, X
Highlandville, City of	A, X
Nixa, City of	A, AE, X
Ozark, City of	A, AE, X

Table 3: Flood Zone Designations by Community (continue)

Community	Flood Zone(s)
Saddlebrook, Village of	A, X
Sparta, City of	A, AE, X

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 4 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 4: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Bull Shoals Lake	11010003	Swan Creek	The Bull Shoals Lake watershed is the second largest watershed within the county. It extends from southeast to south of the county.	257.7
James	11010002	Finley Creek	The James watershed is the largest watershed within the county and encompasses the central portion of the county.	286.2
Sac	10290106	Turnback Creek	The Sac watershed is located in the northwest corner of the county.	16.3
Spring	11070207	Honey Creek Tributary 6	The Spring watershed is the smallest watershed.	3.6

4.2 Principal Flood Problems

Table 5 contains a description of the principal flood problems that have been noted for Christian County by flooding source.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Finley Creek	In September 2010, flooding forced evacuations and caused several road closures in Christian County. In April 2017, one was killed when their car was swept away near Clever in Christian County and several evacuations were reported.
James River	Potential flood problems in Christian County arise from intense thunderstorms associated with squall line activity. According to the National Oceanic and Atmospheric Administration (NOAA), 35 flood events were reported in the county between 1/1/1950 and 3/31/2007. These floods resulted in 4 deaths, 20.52 million dollars in property damage, and 5.2 million in crop damage.

Table 6 contains information about historic flood elevations in the communities within Christian County.

Table 6: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
James River	James River near Springfield, MO	22.2	6/19/2015	Unknown	USGS
James River	James River near Boaz, MO	25.10	4/30/17	Unknown	USGS

4.3 Non-Levee Flood Protection Measures

Table 7 contains information about non-levee flood protection measures within Christian County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Table 7: Non-Levee Flood Protection Measures

[Not applicable to this Flood Risk Project]

4.4 Levees

This section is not applicable to this Flood Risk Project.

Table 8: Levees

[Not applicable to this Flood Risk Project]

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, 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 at least once on the average during any 10-, 25-, 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-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2% annual 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 that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 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 community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

In addition to these flood events, the “1-percent-plus”, or “1%+”, annual chance flood elevation has been modeled and included on the flood profile for certain flooding sources in this FIS Report. While not used for regulatory or insurance purposes, this flood event has been calculated to help illustrate the variability range that exists between the regulatory 1% annual chance flood elevation and a 1% annual chance elevation that has taken into account an additional amount of uncertainty in the flood discharges (thus, the 1% “plus”). For flooding sources whose discharges were estimated using regression equations, the 1%+ flood elevations are derived by taking the 1% annual chance flood discharges and increasing the modeled discharges by a percentage equal to the average predictive error for the regression equation. For flooding sources with gage- or rainfall-runoff-based discharge estimates, the upper 84-percent confidence limit of the discharges is used to compute the 1%+ flood elevations.

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 9. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected

flooding sources. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 10. Stream gage information is provided in Table 11.

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Plus Annual Chance	0.2% Annual Chance
Arrowhead Creek	Above Confluence with Tanglewood Creek	0.78	320	420	520	620	760	950
Arrowhead Creek	At State Highway CC	0.51	190	280	380	470	630	810
Arrowhead Creek	At Arrowhead Drive	0.35	130	210	280	370	490	620
Bluestem Creek	At Highway 65	1.77	790	1,080	1,310	1,540	1,780	1,940
Bluestem Creek	At Farmer Branch Road	1.39	760	1,060	1,350	1,630	1,980	2,360
Bluestem Creek	At Bluestem Road	1.09	640	920	1,160	1,400	1,700	2,000
Farmer Branch	At confluence with James River	13.89	5,220	6,620	7,760	8,980	11,090	11,790
Farmer Branch	1700 feet downstream of S Farm Road 169	13.49	5,110	6,460	7,550	8,730	10,790	11,460
Farmer Branch	100 feet downstream of S Farm Road 175	12.85	4,940	6,220	7,250	8,400	10,360	11,000
Farmer Branch	2200 feet downstream of US 65	11.99	4,630	5,790	6,750	7,840	9,640	10,230
Farmer Branch	200 feet downstream of E Farm Road 194	10.94	4,200	5,230	6,120	7,110	8,710	9,240

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	Flooding Source
Farmer Branch	At confluence with Hunt branch	10.07	3,800	4,750	5,560	6,440	7,890	8,360
Farmer Branch	1800 feet upstream of confluence with Hunt Branch	1.86	770	980	1,150	1,320	1,620	1,720
Farmer Branch	120 feet downstream of S Molly Lane	0.98	370	470	550	640	780	820
Finely Creek	Above confluence with James River	266.39	20,650	28,420	34,720	41,320	51,360	60,660
Finely Creek	Below confluence with Richwood Branch	207.84	21,040	28,830	35,020	41,370	51,000	59,840
Finely Creek	Below confluence with Garrison Branch North	199.82	21,210	29,020	35,210	41,520	51,160	60,000
Finely Creek	Below Confluence with Parched Corn Creek	192.62	21,590	29,500	35,800	42,220	52,000	60,910
Finely Creek	Below Confluence with Sparta Creek	170.41	21,300	29,180	35,350	41,650	51,060	59,740
Fremont Hills Branch	Above Confluence with Greenbriar Branch	0.27	230	360	470	600	760	910
Garrison Branch North	Above Confluence with Finley Creek	1.04	920	1,190	1,400	1,590	1,870	2,110
Garrison Branch North	At Jackson Street	0.82	720	940	1,090	1,240	1,460	1,650
Greenbriar Branch	At State Highway CC	0.80	440	660	840	1,010	1,180	1,280

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	Flooding Source
Greenbriar Branch	Below confluence with Fremont Hills Branch	0.54	300	470	650	850	1,120	1,430
Greenbriar Branch	Above confluence with Fremont Hills Branch	0.27	70	140	210	290	400	510
Hall Branch	Above confluence with Finley Creek	1.12	700	890	1,030	1,160	1,360	1,530
James River	Just Downstream of confluence with Flat Creek	1366	58,680	77,350	91,780	106,490	125,060	142,000
James River	James River at Galena, MO	987	47,710	62,990	74,810	86,890	102,040	115,970
James River	Just downstream of confluence with Crane Creek	963	47,040	62,090	73,720	85,600	100,550	114,180
James River	Just downstream of confluence with Finley Creek	738	40,840	53,640	63,470	73,470	86,650	97,370
James River	Just downstream of Wilsons Creek	432	32,400	42,150	49,540	56,980	67,730	74,500
James River	Just downstream of County Boundary	330	28,740	36,690	42,440	48,030	54,480	60,440
Jonquil Creek	Above confluence with Finley Creek	0.78	540	690	790	890	1,040	1,170
Luce Creek Tributary 2	Above confluence with Luce Creek	1.37	860	1,120	1,340	1,570	1,870	2,170

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	Flooding Source
Luce Creek Tributary 2	At State Highway P	0.86	610	790	930	1,090	1,280	1,480
Luce Creek Tributary 2	At State Highway 14	0.36	320	410	480	550	650	740
Minnehaha Branch	Above confluence with Finley Creek	2.97	1,580	2,020	2,320	2,600	2,990	3,350
Minnehaha Branch	Below confluence with Finley Creek Tributary 5.1	2.03	930	1,160	1,330	1,500	1,740	1,950
Minnehaha Branch	Above confluence with Finley Creek Tributary 5.2	0.47	420	520	580	650	750	840
McCracken Branch	Above confluence with Finley Creek	0.34	420	530	610	680	790	890
Nicholas Road Creek	Above confluence with James River	7.04	440	680	950	1,250	1,620	2,020
Nicholas Road Creek	At Nicholas Road	6.05	130	250	360	480	610	750
Nicholas Road Creek	Below confluence with Swallowtail Branch	5.45	730	1,190	1,610	2,000	2,430	2,800
Nicholas Road Creek	At Owen Road	3.59	530	860	1,210	1,580	2,040	2,560
Nicholas Road Creek	At Tracker Road	1.57	370	550	720	910	1,160	1,440

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	Flooding Source
Nicholas Road Creek	At Northview Road	1.03	480	650	810	970	1,190	1,410
Ozark Branch	Above confluence with Finley Creek	0.74	600	770	890	1,000	1,170	1,320
Ozark Branch	At South Third Avenue	0.50	390	500	580	650	760	860
Rabbit Run Branch	Above confluence with Finley Creek	3.76	2,860	3,640	4,200	4,750	5,540	6,260
Rabbit Run Branch	1 mile upstream of McCauley Road	2.61	2,240	2,830	3,250	3,660	4,250	4,790
Rabbit Run Branch	At Mt. Vernon Street	1.80	1,600	2,010	2,300	2,580	2,990	3,360
Rabbit Run Branch	870 feet downstream of North Street	0.65	580	720	810	910	1,050	1,180
Richwood Branch	Above confluence with Finley Creek	2.61	1,340	1,700	1,960	2,220	2,590	2,920
Richwood Branch	Below confluence with Skyview Creek	1.72	930	1,180	1,350	1,520	1,770	2,000
Richwood Branch	Above confluence with Skyview Creek	0.96	610	770	890	1,000	1,160	1,310
Robin Creek	Above confluence with Ozark Branch	0.18	120	150	180	200	240	270
Sawgrass Branch	Above confluence with Westwind Creek	0.94	610	910	1,200	1,560	1,990	2,440
Sawgrass Branch	2,550 feet upstream of Fremont Road	0.42	310	430	550	690	900	1,120

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	Flooding Source
Skyview Creek	Above confluence with Richwood Branch	0.76	360	460	530	600	700	780
Sparta Creek	Above confluence with Finley Creek	6.23	2,950	3,930	4,750	5,620	6,770	7,820
Sparta Creek	3,250 feet downstream of Carter Road	4.96	2,500	3,340	4,040	4,830	5,840	6,770
Sparta Creek	1,260 feet downstream of Pippenville Road	3.03	1,430	2,100	2,570	3,260	4,220	5,050
Stone Ridge Creek	At North Riverside Road	1.46	820	1,060	1,220	1,390	1,630	1,830
Stone Ridge Creek	810 feet downstream of Hawkins Road	0.96	560	720	830	930	1,090	1,230
Swallowtail Branch	Above confluence with Nicholas Road Creek	1.80	230	350	490	630	850	1,080
Swallowtail Branch	At Tracker Road	1.33	230	350	460	590	780	990
Wren Creek	Above confluence with Finley Creek	0.38	200	260	310	350	420	480

Figure 7: Frequency Discharge-Drainage Area Curves

[Not applicable to this Flood Risk Project]

Table 10: Summary of Non-Coastal Stillwater Elevations

[Not applicable to this Flood Risk Project]

Table 11: Stream Gage Information used to Determine Discharges

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
James River	07050700	USGS	James River near Springfield, MO	246	1909	2017
James River	07052500	USGS	James River at Galena, MO	987	1922	2017

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 24, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 13. Roughness coefficients are provided in Table 14. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation

Table 12: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Arrowhead Creek	Confluence with Tanglewood Creek	Approximately 1.81 miles upstream of confluence with Tanglewood Creek	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Bluestem Creek	Confluence with Westwind Creek	Approximately 1.77 miles upstream of confluence with Westwind Creek	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Farmer Branch	Confluence with James River	Approximately 0.9 miles upstream of confluence with James River	HEC-HMS (Version 4.1)	Steady- State HEC-RAS (Version 4.1.0)	2016	AE w/ Floodway	
Finley Creek	Confluence with James River	Confluence with Sparta Creek	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Fremont Hills Branch	Confluence with Greenbriar Branch	Approximately 530 feet upstream of Confluence with Greenbriar Branch	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Garrison Branch North	Confluence with Finley Creek	Approximately 1,730 feet upstream of E Jackson Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Greenbriar Branch	Confluence with Westwind Creek	Approximately 1.22 miles upstream of confluence with Westwind Creek	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	

Table 12: Summary of Hydrologic and Hydraulics Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Hall Branch	Confluence with Finley Creek	Approximately 700 feet upstream of W Jackson Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
James River	Approximately 1.6 miles upstream of Confluence with Flat Creek	Christian/Green e County Line	Bulletin 17C Gage Analysis (HEC-SSP 2.1.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Jonquil Creek	Confluence with Finley Creek	Approximately 100 feet downstream of N 20th Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Luce Creek Tributary 2	Confluence with Luce Creek	Approximately 710 feet upstream of N Cherokee Trail	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
McCracken Branch	Confluence with Finley Creek	Approximately 2,090 feet upstream of State Highway NN	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Minnehaha Branch	Confluence with Finley Creek	Approximately 1,030 feet upstream of Main Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Nicholas Road Creek	Confluence with James River	Approximately 440 feet upstream of W Northview Road	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on- grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	

Table 12: Summary of Hydrologic and Hydraulics Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Ozark Branch	Confluence with Finley Creek	Approximately 890 feet upstream of S 14th Avenue	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Rabbit Run Branch	Confluence with Finley Creek	Approximately 570 feet downstream of North Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Richwood Branch	Confluence with Finley Creek	Approximately 1,570 feet upstream Longview Road	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Robin Creek	Confluence with Ozark Branch	Approximately 640 feet upstream of S 5th Avenue	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Sawgrass Branch	Confluence with Westwind Creek	Approximately 3,340 feet upstream of N Fremont Road	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on- grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Skyview Creek	Confluence with Richwood Branch	Approximately 1,020 feet upstream N 24th Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Sparta Creek	Confluence with Finley Creek	Approximately 490 feet upstream of Main Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulics Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Stone Ridge Creek	Confluence with Finley Creek	Approximately 1,530 feet upstream of E Country Crest Road	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Swallowtail Branch	Confluence with Nicholas Road Creek	Approximately 750 feet upstream of W Tracker Road	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on- grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Tanglewood Creek	Confluence with Westwind Creek	Approximately 580 feet upstream of N Old Castle Road	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on- grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Westwind Creek	Confluence with James River	Approximately 1,480 feet upstream of N Brookshire Street	Rain-on-grid HEC-RAS 2Dv (Version 5.0.5)	Rain-on- grid HEC-RAS 2D (Version 5.0.5)	2018	AE w/o Floodway	
Wren Creek	Confluence with Finley Creek	Approximately 990 feet downstream of W South Street	HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	AE w/ Floodway	
Bull Shoals Lake Zone A Tributaries	Various	Various	Regression Equations, HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	A	
James Watershed 1D Zone A Tributaries	Various	Various	Regression Equations, HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	A	

Table 12: Summary of Hydrologic and Hydraulics Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
James Watershed 2D Zone A Tributaries	Various	Various	Rain-on-grid HEC-RAS 2D (Version 5.0.5)	Rain-on- grid HEC-RAS 2D (Version 5.0.5)	2018	A	
Sac Watershed Zone A Tributaries	Various	Various	Regression Equations, HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	A	
Spring Watershed Zone A Tributaries	Various	Various	Regression Equations, HEC-HMS (Version 4.2.1)	Steady- State HEC-RAS (Version 5.0.3)	2018	A	

Table 13: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
Arrowhead Creek	0.03 – 0.05	0.03 - 0.16
Bluestem Creek	0.03 - 0.05	0.03 - 0.16
Farmer Branch	0.045	0.04 - 0.12
Finley Creek	0.045	0.04 - 0.5
Fremont Hills Branch	0.03 – 0.05	0.03 - 0.16
Garrison Branch North	0.04 - 0.06	0.05 - 0.1
Greenbriar Branch	0.03 - 0.05	0.03 - 0.16
Hall Branch	0.04 - 0.045	0.05 - 0.1
James River	0.035 - 0.04	0.03 - 0.16
Jonquil Creek	0.032 - 0.045	0.01 - 0.1
Luce Creek Tributary 2	0.013 - 0.045	0.015 -0.12
Minnehaha Branch	0.045 - 0.05	0.05 -0.16
McCracken Branch	0.013 - 0.080	0.013 - 0.1
Nicholas Road Creek	0.03 - 0.05	0.03 - 0.16
Ozark Branch	0.01 - 0.05	0.04 - 0.1
Rabbit Run Branch	0.04 - 0.047	0.04 - 0.1
Richwood Branch	0.04 - 0.045	0.01 - 0.12
Robin Creek	0.013 - 0.045	0.013 - 0.1
Sawgrass Branch	0.03 – 0.05	0.03 -0.16
Skyview Creek	0.02 - 0.05	0.01 - 0.1
Sparta Creek	0.045 - 0.05	0.04 - 0.12
Stone Ridge Creek	0.045	0.05 - 0.1
Swallowtail Branch	0.03 – 0.05	0.03 – 0.16
Tanglewood Creek	0.03 – 0.05	0.03 – 0.16
Westwind Creek	0.03 – 0.05	0.03 – 0.16
Wren Creek	0.013 - 0.045	0.013 -0.1
Bull Shoals Lake Zone A Tributaries	0.03 – 0.06	0.015 – 0.16
James Watershed 1D Zone A Tributaries	0.03 – 0.06	0.015 – 0.16
James Watershed 2D Zone A Tributaries	0.03 – 0.05	0.03 – 0.16

Table 13: Roughness Coefficients (continue)

Flooding Source	Channel “n”	Overbank “n”
Sac Watershed Zone A Tributaries	0.03 – 0.06	0.015 – 0.16
Spring Watershed Zone A Tributaries	0.03 – 0.05	0.03 – 0.16

5.3 Coastal Analyses

This section is not applicable to this Floss Risk Project.

Table 14: Summary of Coastal Analyses

[Not applicable to this Flood Risk Project]

5.3.1 Total Stillwater Elevations

This section is not applicable to this Floss Risk Project.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas

[Not applicable to this Flood Risk Project]

Table 15: Tide Gage Analysis Specifics

[Not applicable to this Flood Risk Project]

5.3.2 Waves

This section is not applicable to this Floss Risk Project.

5.3.3 Coastal Erosion

This section is not applicable to this Floss Risk Project.

5.3.4 Wave Hazard Analyses

This section is not applicable to this Floss Risk Project.

Table 16: Coastal Transect Parameters

[Not applicable to this Flood Risk Project]

Figure 9: Transect Location Map

[Not applicable to this Flood Risk Project]

5.4 Alluvial Fan Analyses

This section is not applicable to this Floss Risk Project.

Table 18: Results of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please visit the NGS website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Christian County are provided in Table 20.

Table 19: Countywide Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

Table 20: Stream-Based Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM Database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown

on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA’s *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping.

Base map information shown on the FIRM was derived from the sources described in Table 21.

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Community Layer	Federal Emergency Management Agency	12/10/2013	N/A	Spatial and attribute information for political boundaries in Christian County
Missouri Public Land Survey System	Missouri Department of Agriculture	12/31/2014	1:24,000	Spatial and attribute information for sections and land grants in Christian County
MoDOT Roads	Missouri Department of Transportation	8/24/2014	N/A	Spatial and attribute information of transportation features shown on the FIRM
NAIP Orthography	United States Department of Agriculture	10/13/2016	1:12,000	Location of roads, railroads, bridges, streams, and other physical features shown on the FIRM

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway

computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 23, "Floodway Data."

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Christian County and Incorporated Areas	Various	1 Meter Digital Elevation Model for Christian County, MO	0.2	0.6	Quantum Spatial Inc., 2017

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report.

Table 23: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A ²	1,441	368	1,496	5.6	1,132.8	1,132.8	1,133.2	0.4
B ²	1,675	275	1,760	4.6	1,134.3	1,134.3	1,134.7	0.4
C ²	2,276	221	1,587	5.1	1,136.0	1,136.0	1,136.6	0.6
D ²	3,514	191	1,323	6.2	1,140.0	1,140.0	1,141.0	1.0
E ²	4,626	233	1,918	4.0	1,144.9	1,144.9	1,145.8	0.9
F ²	5,995	160	1,212	6.4	1,148.2	1,148.2	1,149.0	0.8
G ²	6,365	227	1,600	4.8	1,151.7	1,151.7	1,151.8	0.1
H ²	7,005	209	1,685	4.6	1,152.8	1,152.8	1,153.5	0.7
I ²	7,642	131	1,060	7.3	1,155.5	1,155.5	1,155.8	0.3
J ²	8,460	143	1,295	6.0	1,158.8	1,158.8	1,159.6	0.8
K ²	9,071	125	1,147	6.8	1,160.7	1,160.7	1,161.6	0.9
L ²	9,762	184	1,524	5.1	1,163.8	1,163.8	1,164.3	0.5
M ²	10,063	249	2,019	3.5	1,164.5	1,164.5	1,165.4	0.9
N ²	10,613	152	1,076	6.6	1,165.5	1,165.5	1,166.2	0.7
O ²	11,197	184	1,302	5.4	1,168.3	1,168.3	1,169.1	0.8
P	12,162	195	1,292	5.5	1,171.6	1,171.6	1,172.4	0.8
Q	13,146	220/108 ³	1,468	4.2	1,176.6	1,176.6	1,176.9	0.3
R	14,112	190	1,516	4.1	1,177.7	1,177.7	1,178.5	0.8
S	14,625	181	1,887	3.3	1,182.1	1,182.1	1,182.1	0.0
T	14,694	201	2,048	3.0	1,182.2	1,182.2	1,182.2	0.0
U	14,971	161	2,207	2.8	1,186.5	1,186.5	1,187.1	0.6
V	15,748	364	3,601	1.7	1,186.8	1,186.8	1,187.5	0.7
W	16,292	206	1,430	4.3	1,187.2	1,187.2	1,187.8	0.6
X	16,683	204	1,803	3.0	1,190.4	1,190.4	1,191.2	0.8

¹Feet above confluence with James River

² This cross section lies outside the county. Floodway is not shown on the FIRM.

³Total floodway width / width within jurisdiction

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: FARMER BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Y ²	17,272	234	1,634	3.3	1,191.2	1,191.2	1,192.0	0.8
Z ²	17,569	119	645	2.1	1,193.1	1,193.1	1,194.0	0.9
AA ²	17,732	97	658	2.0	1,194.4	1,194.4	1,194.5	0.1
AB ²	18,046	78	260	5.1	1,195.0	1,195.0	1,195.1	0.1
AC ²	18,224	68	307	4.3	1,196.9	1,196.9	1,197.8	0.9
AD ²	18,750	32	205	6.5	1,201.8	1,201.8	1,202.5	0.7
AE ²	19,217	56	175	7.6	1,207.7	1,207.7	1,207.8	0.1
AF ²	19,825	20	73	8.7	1,215.5	1,215.5	1,215.6	0.1
AG ²	20,286	63	99	6.4	1,222.2	1,222.2	1,222.2	0.0
AH ²	20,682	19	77	8.3	1,227.0	1,227.0	1,227.1	0.1
AI ²	20,822	35	216	3.0	1,231.1	1,231.1	1,232.1	1.0
AJ ²	21,056	23	114	5.6	1,232.1	1,232.1	1,232.9	0.8

¹Feet above confluence with James River

² This cross section lies outside the county. Floodway is not shown on the FIRM

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHRISTIAN COUNTY, MISSOURI

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: FARMER BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
F	13,967	662	7,126	5.8	1,055.9	1,055.9	1,056.7	0.8
G	15,875	881	9,786	4.3	1,059.7	1,059.7	1,060.5	0.8
H	18,537	584	8,461	5.0	1,062.2	1,062.2	1,063.0	0.8
I	22,859	665	9,548	4.4	1,066.2	1,066.2	1,067.0	0.8
J	26,418	1063	13,314	3.2	1,070.0	1,070.0	1,071.0	1.0
K	28,952	467	5,723	7.4	1,071.8	1,071.8	1,072.6	0.8
L	32,462	703	9,902	4.2	1,077.6	1,077.6	1,078.6	1.0
M	32,654	689	8,020	5.2	1,077.9	1,077.9	1,078.9	1.0
N	34,163	594	7,078	5.9	1,080.5	1,080.5	1,081.4	0.9
P	42,635	974	8,423	4.9	1,089.6	1,089.6	1,090.4	0.8
Q	46,729	1500	14,414	2.8	1,092.3	1,092.3	1,093.3	1.0
R	51,556	770	8,463	4.9	1,098.7	1,098.7	1,099.4	0.7
S	56,746	737	9,994	4.1	1,103.8	1,103.8	1,104.8	1.0
T	58,392	283	4,986	8.3	1,105.3	1,105.3	1,106.1	0.8
U	58,536	334	6,067	6.8	1,106.8	1,106.8	1,107.5	0.7
V	62,518	858	9,949	4.2	1,110.8	1,110.8	1,111.7	0.9
W	65,924	493	7,808	5.3	1,115.7	1,115.6	1,116.0	0.4
X	66,638	602	8,985	4.6	1,116.9	1,116.9	1,117.4	0.5
Y	67,877	786	9,592	4.3	1,118.4	1,118.4	1,119.4	1.0
Z	70,597	637	8,721	4.8	1121.1	1121.1	1121.8	0.7
AA	77,714	927	6,803	6.2	1129.1	1129.1	1129.6	0.5
AB	82,624	585	7,273	5.7	1137.3	1137.3	1138.2	0.9
AC	84,751	445	7,579	5.5	1141.3	1141.3	1141.9	0.6

¹ Feet above confluence with James River

TABLE 23	FEDERAL EMERGENCY MANAGEMENT AGENCY CHRISTIAN COUNTY, MISSOURI AND INCORPORATED AREAS	FLOODWAY DATA
		FLOODING SOURCE: FINLEY CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AD	88,897	769	9,342	4.5	1145.0	1145.0	1145.8	0.8
AE	92,788	1,055	12,814	3.2	1148.9	1148.9	1149.7	0.8
AF	96,302	961	9,265	4.5	1151.8	1151.8	1152.8	1.0

¹ Feet above confluence with James River

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: FINLEY CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	311	70	312	5.1	1,116.4	1,105.7 ²	1,106.0	0.3
B	468	47	394	4.0	1,116.4	1,110.2 ²	1,111.0	0.8
C	787	37	250	6.2	1,116.4	1,110.6 ²	1,111.4	0.8
D	1,261	76	335	4.6	1,116.4	1,114.3 ²	1,114.7	0.4
E	1,738	37	161	9.6	1,117.5	1,117.5	1,117.6	0.1
F	2,099	54	476	3.0	1,127.5	1,127.5	1,128.0	0.5
G	2,369	66	445	3.2	1,128.0	1,128.0	1,128.5	0.5
H	2,625	78	383	3.8	1,130.1	1,130.1	1,130.1	0.0
I	3,152	54	252	5.7	1,133.2	1,133.2	1,134.0	0.8
J	3,556	51	174	7.1	1,137.7	1,137.7	1,138.1	0.4
K	3,696	67	315	3.9	1,141.7	1,141.7	1,141.8	0.1
L	4,070	62	319	3.9	1,144.9	1,144.9	1,145.7	0.8
M	4,574	33	130	7.5	1,152.4	1,152.4	1,153.2	0.8
N	4,898	45	172	5.7	1,157.8	1,157.8	1,157.8	0.0
O	5,195	23	139	7.1	1,162.7	1,162.7	1,162.8	0.1
P	5,455	25	75	8.3	1,166.6	1,166.6	1,166.9	0.3
Q	5,744	50	100	6.2	1,173.7	1,173.7	1,173.7	0.0

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: GARRISON BRANCH NORTH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ²	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,416	43	158	7.3	1,110.8	1,097.5 ²	1,097.5	0.0
B	1,532	93	205	5.7	1,110.8	1,100.4 ²	1,100.4	0.0
C	1,845	46	165	7.0	1,110.8	1,104.3 ²	1,104.4	0.1
D	2,154	37	140	8.3	1,110.8	1,107.8 ²	1,107.9	0.1
E	2,482	62	159	7.3	1,112.6	1,112.6	1,112.6	0.0
F	2,766	25	102	11.3	1,117.1	1,117.1	1,117.1	0.0
G	2,874	21	102	11.4	1,120.1	1,120.1	1,120.1	0.0
H	3,300	89	936	1.2	1,134.3	1,134.3	1,134.3	0.0
I	3,554	72	551	2.1	1,134.3	1,134.3	1,134.3	0.0
J	3,800	92	346	3.4	1,134.3	1,134.3	1,134.3	0.0

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: HALL BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AV	346,347	877	12,461	4.6	1057.3	1057.3	1058.2	0.9
AW	350,298	860	14,867	3.8	1060.2	1060.2	1060.9	0.7
AX	351,969	829	13,181	4.3	1061.0	1061.0	1061.9	0.9
AY	357,032	611	9,603	5.9	1064.4	1064.4	1065.1	0.6
AZ	362,296	881	12,526	4.6	1068.3	1068.3	1068.8	0.5
BA	367,652	926	14,860	3.8	1072.4	1072.4	1073.4	0.9
BB	374,166	524	7,717	7.4	1076.1	1076.1	1076.9	0.9
BC	375,412	1,216	18,296	3.1	1078.7	1078.7	1079.3	0.6
BD	380,628	1,062	13,088	4.4	1081.1	1081.1	1082.1	1.0
BE	385,893	1,978	23,716	2.4	1084.3	1084.3	1085.0	0.8
BF	392,978	924	9,220	5.2	1090.3	1090.3	1090.6	0.3
BG	397,892	813	9,759	4.9	1095.9	1095.9	1096.6	0.7
BH	398,296	724	8,704	5.5	1096.2	1096.2	1097.0	0.7
BI	403,505	1,095	13,189	3.6	1100.9	1100.9	1101.7	0.8
BJ	406,339	525	10,185	5.1	1104.5	1104.5	1105.1	0.6
BK	410,176	768	10,770	4.5	1109.2	1109.2	1109.5	0.3
BL	414,788	1,110	13,145	3.7	1061.1	1111	1111.4	0.4
BM	421,115	1,434	14,263	3.4	1113.4	1113.4	1113.8	0.4
BN	423,152	1,683	18,939	2.5	1115.5	1115.5	1116.1	0.5
BO	430,913	1,345	13,355	3.6	1072.4	1118.7	1119.6	0.9
BP	436,482	633	20,074	6.1	1076.1	1125.9	1126.4	0.5
BQ	437,538	1147	21,984	3.5	1078.7	1128.4	1128.9	0.5

¹ Feet above confluence with White River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHRISTIAN COUNTY, MISSOURI

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: JAMES RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	389	17	81	11.1	1,103.8	1,098.5 ²	1,098.5	0.0
B	908	27	84	10.1	1,107.3	1,107.3	1,107.3	0.0
C	1,919	40	125	6.3	1,129.3	1,129.3	1,129.3	0.0
D	2,434	54	177	4.5	1,141.8	1,141.8	1,142.0	0.2
E	2,901	34	93	7.6	1,145.8	1,145.8	1,145.8	0.0
F	3,525	26	88	7.9	1,153.9	1,153.9	1,153.9	0.0
G	4,107	39	97	7.3	1,164.9	1,164.9	1,164.9	0.0
H	4,515	26	165	3.9	1,172.4	1,172.4	1,172.5	0.1
I	5,098	29	75	8.7	1,178.1	1,178.1	1,178.1	0.0
J	5,668	43	80	6.9	1,186.8	1,186.8	1,186.8	0.0
K	6,002	32	80	6.5	1,191.2	1,191.2	1,191.2	0.0
L	6,197	60	185	2.8	1,194.9	1,194.9	1,195.5	0.6
M	6,400	36	85	6.1	1,197.9	1,197.9	1,197.9	0.0
N	6,708	50	299	1.7	1,206.1	1,206.1	1,206.1	0.0
O	7,064	55	167	2.7	1,206.1	1,206.1	1,206.1	0.0
P	7,358	34	62	7.3	1,214.3	1,214.3	1,214.3	0.0
Q	7,643	32	96	4.7	1,217.4	1,217.4	1,217.4	0.0
R	7,786	38	49	6.1	1,219.3	1,219.3	1,219.6	0.3
S	8,006	30	48	6.2	1,223.8	1,223.8	1,224.2	0.4
T	8,249	58	274	1.1	1,228.9	1,228.9	1,228.9	0.0
U	8,559	43	58	5.2	1,232.6	1,232.6	1,233.1	0.5

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: JONQUIL CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	160	53	25	7.7	1,216.4	1,216.4	1,216.5	0.1
B	596	45	169	9.3	1,220.6	1,220.6	1,220.6	0.0
C	967	87	271	5.8	1,226.7	1,226.7	1,226.8	0.1
D	1,217	107	775	2.0	1,234.9	1,234.9	1,235.8	0.9
E	1,809	100	293	5.4	1,236.3	1,236.3	1,236.9	0.6
F	2,525	67	234	6.7	1,245.0	1,245.0	1,245.7	0.7
G	3,249	65	196	7.7	1,253.3	1,253.3	1,253.9	0.6
H	4,025	73	242	4.5	1,261.6	1,261.6	1,262.4	0.8
I	4,693	65	193	5.7	1,268.7	1,268.7	1,269.2	0.5
J	5,384	102	322	3.4	1,277.8	1,277.8	1,278.7	0.9
K	6,119	106	204	5.4	1,284.4	1,284.4	1,284.8	0.4
L	6,462	88	687	1.6	1,292.8	1,292.8	1,293.8	1.0
M	6,887	77	202	5.4	1,295.2	1,295.2	1,295.7	0.5
N	7,367	26	110	9.9	1,302.5	1,302.5	1,302.9	0.4
O	7,667	74	280	3.9	1,307.8	1,307.8	1,308.2	0.4
P	7,904	131	308	3.5	1,310.0	1,310.0	1,310.3	0.3
Q	8,213	102	272	3.5	1,310.7	1,310.7	1,311.2	0.5
R	8,557	67	199	4.7	1,315.7	1,315.7	1,316.2	0.5
S	9,144	73	186	5.1	1,320.3	1,320.3	1,320.6	0.3
T	9,682	64	140	3.9	1,324.9	1,324.9	1,325.7	0.8
U	9,876	97	783	0.7	1,329.2	1,329.2	1,329.2	0.0

¹ Feet above confluence with Luce Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: LUCE CREEK TRIBUTARY 2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	10,384	43	213	2.6	1,329.1	1,329.1	1,329.1	0.0
W	10,657	36	86	6.4	1,331.3	1,331.3	1,331.4	0.1
X	11,000	43	127	4.3	1,334.7	1,334.7	1,334.7	0.0
Y	11,395	48	106	5.2	1,338.2	1,338.2	1,338.2	0.0
Z	11,758	30	114	1.4	1,341.4	1,341.4	1,341.5	0.1
AA	11,827	69	220	0.7	1,342.5	1,342.5	1,342.7	0.2
AB	11,855	64	98	1.6	1,342.5	1,342.5	1,342.7	0.2
AC	12,165	46	46	3.5	1,344.8	1,344.8	1,345.3	0.5
AD	12,718	30	43	3.7	1,348.7	1,348.7	1,348.7	0.0
AE	12,933	38	178	0.9	1,352.7	1,352.7	1,353.1	0.4
AF	13,004	42	101	1.6	1,352.8	1,352.8	1,353.3	0.5
AG	13,259	21	30	2.0	1,354.2	1,354.2	1,354.2	0.0
AH	13,525	19	13	4.5	1,356.3	1,356.3	1,356.3	0.0
AI	13,638	30	57	1.1	1,357.6	1,357.6	1,357.6	0.0
AJ	13,688	11	20	3.1	1,357.6	1,357.6	1,357.6	0.0
AK	13,990	14	11	5.3	1,359.2	1,359.2	1,359.3	0.1
AL	14,251	13	12	5.1	1,362.2	1,362.2	1,362.2	0.0
AM	14,400	40	47	1.3	1,363.7	1,363.7	1,363.9	0.2

¹ Feet above confluence with Luce Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: LUCE CREEK TRIBUTARY 2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	491	63	94	6.4	1115.6	1111.6	1111.6	0.0
B	837	49	88	6.8	1115.9	1115.9	1116.0	0.0
C	1104	34	71	8.5	1118.3	1118.3	1118.3	0.0
D	1224	30	140	4.3	1122.4	1122.4	1123.2	0.8
E	1493	23	62	9.2	1127.0	1127.0	1127.0	0.0
F	1614	24	121	4.7	1132.0	1132.0	1132.2	0.2
G	1870	20	59	9.7	1134.1	1134.1	1134.1	0.0
H	1959	32	132	4.3	1140.2	1140.2	1140.2	0.0
I	2259	34	93	4.3	1145.0	1145.0	1145.5	0.6
J	2559	20	47	8.5	1152.0	1152.0	1152.1	0.0
K	2935	31	85	4.7	1159.2	1159.2	1159.2	0.1
L	3158	26	60	6.6	1165.6	1165.6	1166.2	0.6
M	3276	28	93	4.3	1169.1	1169.1	1169.7	0.6

¹Feet above confluence with Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: MCCRACKEN BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	232	39	220	11.8	1,089.6	1,078.8 ²	1,078.8	0.0
B	914	78	312	8.4	1,089.6	1,087.2 ²	1,087.3	0.1
C	1,535	104	336	7.8	1,094.8	1,094.8	1,095.0	0.2
D	2,055	145	405	6.9	1,101.8	1,101.8	1,101.8	0.0
E	2,674	116	350	7.5	1,108.7	1,108.7	1,108.7	0.0
F	3,112	72	370	7.1	1,112.9	1,112.9	1,112.9	0.0
G	3,292	53	242	10.8	1,114.6	1,114.6	1,114.6	0.0
H	3,965	56	318	8.0	1,123.1	1,123.1	1,123.1	0.0
I	4,570	44	266	9.4	1,129.7	1,129.7	1,129.7	0.0
J	5,286	42	233	10.8	1,137.8	1,137.8	1,137.9	0.1
K	5,748	36	206	12.2	1,143.0	1,143.0	1,143.0	0.0
L	6,165	86	439	5.7	1,150.5	1,150.5	1,150.6	0.1
M	6,508	92	445	5.6	1,154.4	1,154.4	1,154.5	0.1
N	6,649	93	398	6.3	1,155.2	1,155.2	1,155.2	0.0
O	7,002	74	201	7.5	1,158.0	1,158.0	1,158.6	0.6
P	7,427	57	289	5.2	1,163.1	1,163.1	1,164.0	0.9
Q	7,738	49	182	8.3	1,166.1	1,166.1	1,166.1	0.0
R	8,079	84	235	6.4	1,169.9	1,169.9	1,169.9	0.0
S	8,195	68	211	7.1	1,171.6	1,171.6	1,172.0	0.4
T	8,699	32	142	7.8	1,176.8	1,176.8	1,177.5	0.7
U	9,152	52	161	6.8	1,182.5	1,182.5	1,182.9	0.4
V	9,414	56	160	6.1	1,186.1	1,186.1	1,186.1	0.0
W	9,791	50	179	5.4	1,191.6	1,191.6	1,191.8	0.2
X	10,096	72	287	3.4	1,195.0	1,195.0	1,196.0	1.0

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: MINNEHAHA BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Y	10,295	25	108	9.0	1,197.8	1,197.8	1,198.2	0.4
Z	10,719	32	124	7.8	1,201.6	1,201.6	1,202.1	0.5
AA	10,991	36	87	7.5	1,208.2	1,208.2	1,208.2	0.0
AB	11,317	39	124	5.3	1,211.4	1,211.4	1,212.1	0.7
AC	11,676	59	144	4.5	1,215.5	1,215.5	1,215.9	0.4
AD	11,860	45	177	3.7	1,220.9	1,220.9	1,221.9	1.0
AE	12,120	43	192	3.4	1,222.8	1,222.8	1,223.2	0.4
AF	12,291	43	257	2.5	1,225.3	1,225.3	1,225.4	0.1
AG	12,561	39	130	5.0	1,225.4	1,225.4	1,225.6	0.2
AH	12,753	24	71	9.1	1,232.3	1,232.3	1,232.3	0.0
AI	12,944	40	104	6.2	1,237.7	1,237.7	1,238.1	0.4

¹ Feet above confluence with Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: MINNEHAHA BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	218	25	98	10.2	1113.4	1104.5 ²	1104.5	0.0
B	506	26	123	6.0	1113.4	1109.0 ²	1109.0	0.0
C	792	19	71	10.4	1116.2	1116.2	1116.3	0.1
D	991	40	249	3.0	1129.2	1129.2	1129.2	0.0
E	1329	74	265	2.8	1129.5	1129.5	1129.5	0.0
F	1594	57	125	5.9	1131.8	1131.8	1131.8	0.0
G	1886	23	163	4.5	1140.5	1140.5	1140.5	0.0
H	2139	22	78	9.5	1142.1	1142.1	1142.1	0.0
I	2275	16	105	7.0	1149.8	1149.8	1150.3	0.5
J	2711	28	169	4.4	1153.9	1153.9	1154.3	0.4
K	3151	50	172	3.8	1157.1	1157.1	1158.1	1.0
L	3494	49	126	5.1	1162.3	1162.3	1162.7	0.4
M	3637	45	94	6.9	1167.8	1167.8	1167.8	0.0
N	3810	29	157	4.1	1175.1	1175.1	1175.8	0.7
O	4028	42	111	5.8	1175.8	1175.8	1176.3	0.5
P	4255	45	94	6.9	1181.7	1181.7	1181.7	0.0
Q	4441	48	71	6.2	1184.4	1184.4	1184.6	0.2
R	4732	37	91	4.8	1192.3	1192.3	1193.0	0.7
S	5067	71	251	1.8	1200.6	1200.6	1201.6	1.0
T	5390	43	228	1.9	1208.8	1208.8	1209.5	0.7
U	5851	31	53	6.4	1213.4	1213.4	1213.4	0.0
V	6149	29	53	6.5	1218.6	1218.6	1218.6	0.0

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: OZARK BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	6225	32	52	6.5	1221.4	1221.4	1221.6	0.2
X	6346	40	75	4.5	1225.5	1225.5	1226.1	0.6
Y	6400	47	70	4.9	1227.7	1227.7	1227.8	0.1
Z	6653	43	88	3.8	1232.8	1232.8	1233.4	0.6
AA	6802	46	207	1.6	1237.6	1237.6	1238.6	1.0
AB	7115	22	37	4.9	1242.1	1242.1	1242.7	0.6
AC	7395	25	33	5.5	1247.7	1247.7	1247.9	0.2
AD	7576	15	81	2.2	1253.7	1253.7	1254.0	0.3
AE	7810	24	30	6.0	1255.0	1255.0	1255.5	0.5
AF	8058	28	33	5.4	1261.8	1261.8	1261.9	0.1
AG	8314	27	34	5.3	1267.5	1267.5	1267.6	0.1
AH	8481	26	32	5.5	1273.2	1273.2	1273.3	0.1
AI	8690	45	131	1.4	1279.1	1279.1	1279.8	0.7
AJ	8927	19	28	6.4	1283.4	1283.4	1283.7	0.3
AK	9183	19	27	6.6	1289.9	1289.9	1290.5	0.6
AL	9398	29	40	4.5	1295.6	1295.6	1296.0	0.4

¹ Feet above confluence with Finley Creek

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: OZARK BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,116	162	831	5.7	1,092.3	1,087.4 ²	1,087.7	0.3
B	1,418	196	842	5.6	1,092.3	1,089.1 ²	1,089.6	0.5
C	2,374	315	1,152	4.1	1,094.1	1,094.1	1,094.8	0.7
D	2,956	234	702	6.8	1,100.7	1,100.7	1,100.7	0.0
E	3,869	161	777	5.6	1,107.4	1,107.4	1,107.4	0.0
F	4,532	156	690	6.3	1,111.6	1,111.6	1,112.0	0.4
G	5,040	96	447	9.8	1,115.2	1,115.2	1,115.4	0.2
H	5,649	96	476	9.2	1,120.3	1,120.3	1,120.8	0.5
I	6,149	118	568	6.5	1,123.9	1,123.9	1,124.9	1.0
J	6,870	80	408	8.4	1,130.3	1,130.3	1,130.5	0.2
K	7,301	138	704	4.8	1,133.8	1,133.8	1,134.6	0.8
L	7,737	168	552	6.2	1,137.2	1,137.2	1,137.2	0.0
M	8,182	75	373	9.2	1,139.8	1,139.8	1,139.9	0.1
N	8,947	119	826	3.1	1,150.4	1,150.4	1,151.3	0.9
O	9,588	116	735	3.5	1,158.2	1,158.2	1,158.9	0.7
P	10,483	47	242	10.7	1,165.8	1,165.8	1,165.8	0.0
Q	10,655	119	777	3.3	1,173.1	1,173.1	1,173.2	0.1
R	10,766	135	779	1.2	1,173.5	1,173.5	1,173.6	0.1
S	11,185	83	144	6.3	1,174.4	1,174.4	1,174.4	0.0
T	11,777	42	228	4.0	1,184.9	1,184.9	1,184.9	0.0
U	12,460	42	105	8.7	1,191.2	1,191.2	1,191.2	0.0
V	12,984	23	95	9.6	1,199.6	1,199.6	1,199.6	0.0
W	13,596	23	87	10.5	1,207.3	1,207.3	1,207.3	0.0

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: RABBIT RUN BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	527	47	259	8.1	1,101.3	1,089.4 ²	1,089.4	0.0
B	1,601	138	388	5.4	1,101.3	1,095.6 ²	1,095.9	0.3
C	2,358	70	251	8.4	1,101.3	1,101.0 ²	1,101.0	0.0
D	2,806	99	448	4.7	1,104.9	1,104.9	1,105.6	0.7
E	3,128	130	605	3.5	1,107.3	1,107.3	1,108.2	0.9
F	3,588	106	443	4.6	1,110.0	1,110.0	1,110.1	0.1
G	4,330	68	305	6.6	1,116.9	1,116.9	1,116.9	0.0
H	4,901	92	423	4.8	1,121.4	1,121.4	1,122.3	0.9
I	5,286	113	364	5.6	1,124.1	1,124.1	1,124.3	0.2
J	5,668	78	417	4.9	1,128.1	1,128.1	1,128.4	0.3
K	6,122	69	261	7.7	1,132.6	1,132.6	1,132.6	0.0
L	6,892	103	477	3.9	1,138.0	1,138.0	1,138.9	0.9
M	7,410	128	393	4.7	1,141.3	1,141.3	1,142.1	0.8
N	7,934	48	244	7.5	1,146.4	1,146.4	1,147.0	0.6
O	8,632	80	293	5.2	1,152.5	1,152.5	1,152.6	0.1
P	9,186	126	315	3.2	1,157.5	1,157.5	1,157.6	0.1
Q	9,683	64	207	4.7	1,162.0	1,162.0	1,162.7	0.7
R	9,793	69	274	3.6	1,163.6	1,163.6	1,164.3	0.7
S	9,881	48	150	6.5	1,164.7	1,164.7	1,164.7	0.0
T	10,156	66	156	6.2	1,167.1	1,167.1	1,167.1	0.0
U	10,439	74	170	5.7	1,169.9	1,169.9	1,170.0	0.1
V	10,573	85	343	2.8	1,173.6	1,173.6	1,174.1	0.5

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: RICHWOOD BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	10,943	37	139	6.8	1,175.2	1,175.2	1,175.6	0.4
X	11,313	36	105	9.0	1,179.5	1,179.5	1,179.5	0.0
Y	11,721	53	135	5.8	1,185.6	1,185.6	1,185.8	0.2
Z	12,014	39	149	5.3	1,189.6	1,189.6	1,189.6	0.0
AA	12,387	60	154	5.1	1,194.9	1,194.9	1,195.0	0.1
AB	12,667	60	122	6.5	1,198.4	1,198.4	1,198.4	0.0
AC	12,941	39	140	5.7	1,202.2	1,202.2	1,202.7	0.5
AD	13,318	32	89	8.2	1,207.5	1,207.5	1,207.5	0.0
AE	13,719	41	97	7.5	1,213.1	1,213.1	1,213.6	0.5
AF	14,047	45	115	6.4	1,217.7	1,217.7	1,217.8	0.1
AG	14,412	47	130	5.4	1,220.7	1,220.7	1,221.6	0.9
AH	14,697	52	164	4.3	1,224.6	1,224.6	1,224.8	0.2
AI	14,903	66	216	3.2	1,228.8	1,228.8	1,229.7	0.9
AJ	15,408	30	64	7.6	1,234.8	1,234.8	1,234.9	0.1
AK	15,774	42	54	4.8	1,241.6	1,241.6	1,241.6	0.0
AL	16,010	48	191	1.4	1,244.1	1,244.1	1,244.2	0.1
AM	16,181	29	40	6.5	1,245.9	1,245.9	1,245.9	0.0
AN	16,348	24	47	5.5	1,247.0	1,247.0	1,247.2	0.2
AN	16,348	24	47	5.5	1,247.0	1,247.0	1,247.2	0.2

¹Feet above confluence with Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: RICHWOOD BRANCH

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	17	22	31	6.5	1,181.1	1,177.1 ²	1,177.1	0.0
B	93	18	59	3.2	1,181.5	1,181.5	1,181.8	0.3
C	263	32	65	2.9	1,186.4	1,186.4	1,186.8	0.4
D	409	17	27	7.0	1,191.1	1,191.1	1,191.7	0.6
E	625	26	34	5.6	1,195.7	1,195.7	1,195.9	0.2
F	736	17	28	6.9	1,199.4	1,199.4	1,199.8	0.4
G	932	20	26	6.1	1,204.9	1,204.9	1,205.4	0.5
H	1,146	19	26	6.2	1,210.1	1,210.1	1,210.9	0.8
I	1,381	17	30	5.4	1,217.4	1,217.4	1,217.9	0.5
J	1,668	20	13	4.5	1,224.6	1,224.6	1,224.7	0.1
K	1,852	15	12	4.9	1,227.5	1,227.5	1,227.7	0.2
L	2,019	10	11	5.4	1,234.3	1,234.3	1,234.3	0.0
M	2,140	18	25	2.4	1,241.9	1,241.9	1,242.1	0.2
N	2,247	20	14	4.3	1,244.6	1,244.6	1,244.7	0.1
O	2,519	203	1,924	0.0	1,263.2	1,263.2	1,263.2	0.0

¹ Feet above confluence with Ozark Branch

² Elevations computed without consideration of backwater from Ozark Branch

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: ROBIN CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	74	56	109	5.5	1157.5	1156.6 ²	1156.9	0.2
B	176	77	291	2.1	1159.3	1159.3	1160.1	0.8
C	369	43	110	5.5	1160.1	1160.1	1160.8	0.7
D	509	66	174	3.5	1161.4	1161.4	1162.2	0.8
E	831	40	99	6.1	1166.4	1166.4	1166.8	0.4
F	1340	33	94	5.8	1173.1	1173.1	1173.5	0.4
G	1868	41	111	4.5	1179.2	1179.2	1180.2	1.0
H	2070	43	162	3.1	1182.3	1182.3	1183.0	0.7
I	2295	33	102	4.9	1187.0	1187.0	1187.2	0.2
J	2546	46	80	5.8	1190.7	1190.7	1191.1	0.4
K	2997	60	106	4.4	1195.5	1195.5	1196.3	0.8
L	3543	37	96	4.8	1201.8	1201.8	1202.3	0.5
M	3801	38	62	6.3	1206.6	1206.6	1206.9	0.3
N	4039	30	91	4.3	1207.4	1207.4	1208.0	0.6
O	4505	23	52	7.5	1213.1	1213.1	1213.1	0.0
P	4766	29	130	3.0	1219.5	1219.5	1220.3	0.7
Q	4980	44	101	3.5	1224.1	1224.1	1224.5	0.4
R	5180	42	80	4.4	1225.9	1225.9	1226.5	0.6
S	5512	34	192	1.8	1234.4	1234.4	1234.4	0.0
T	5806	34	31	4.8	1236.8	1236.8	1237.1	0.3
U	6040	23	26	5.7	1243.7	1243.7	1243.8	0.2
V	6263	31	68	2.2	1245.2	1245.2	1246.2	1.0
W	6497	31	33	4.5	1251.8	1251.8	1252.1	0.3

¹ Feet above confluence with Richwood Branch

² Elevations computed without consideration of backwater from Richwood Branch

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: SKYVIEW CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	739	266	1,112	5.1	1,152.7	1,145.6 ²	1,146.4	0.8
B	1,171	172	1,074	5.2	1,152.7	1,149.0 ²	1,150.0	1.0
C	1,347	138	1,052	5.3	1,152.7	1,152.6 ²	1,153.3	0.7
D	2,106	129	947	5.7	1,157.2	1,157.2	1,158.1	0.9
E	3,099	113	747	7.2	1,164.9	1,164.9	1,165.4	0.5
F	3,933	104	596	9.0	1,170.3	1,170.3	1,171.1	0.8
G	4,386	92	523	10.3	1,174.8	1,174.8	1,175.5	0.7
H	4,825	56	406	13.2	1,181.2	1,181.2	1,181.2	0.0
I	5,308	67	509	9.5	1,187.2	1,187.2	1,187.7	0.5
J	5,430	57	474	10.2	1,189.5	1,189.5	1,190.3	0.8
K	6,018	70	484	10.0	1,194.5	1,194.5	1,194.6	0.1
L	7,032	134	604	8.0	1,203.4	1,203.4	1,203.9	0.5
M	7,816	144	711	6.8	1,210.9	1,210.9	1,211.8	0.9
N	8,786	153	754	6.4	1,220.0	1,220.0	1,220.3	0.3
O	9,923	169	852	5.5	1,229.3	1,229.3	1,230.3	1.0
P	10,809	186	681	6.9	1,236.3	1,236.3	1,237.2	0.9
Q	11,522	147	715	6.0	1,244.0	1,244.0	1,244.2	0.2
R	12,532	99	562	7.7	1,250.9	1,250.9	1,251.2	0.3
S	12,739	114	496	8.7	1,253.1	1,253.1	1,253.3	0.2
T	13,174	191	742	5.8	1,257.1	1,257.1	1,258.0	0.9
U	14,276	154	380	8.6	1,266.5	1,266.5	1,267.5	1.0
V	15,214	168	493	6.6	1,276.1	1,276.1	1,276.5	0.4

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: SPARTA CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	15,956	140	750	4.2	1,282.8	1,282.8	1,283.3	0.5
X	16,282	140	633	5.0	1,286.6	1,286.6	1,287.5	0.9
Y	16,959	139	587	5.4	1,292.6	1,292.6	1,293.3	0.7
Z	17,852	156	540	5.9	1,299.5	1,299.5	1,300.3	0.8
AA	18,703	117	421	7.3	1,307.3	1,307.3	1,308.3	1.0
AB	19,853	153	413	5.9	1,318.3	1,318.3	1,318.9	0.6
AC	20,910	126	387	5.7	1,328.1	1,328.1	1,328.8	0.7
AD	21,723	120	403	4.8	1,337.9	1,337.9	1,338.6	0.7
AE	22,197	90	542	2.6	1,346.3	1,346.3	1,347.2	0.9
AF	22,714	88	290	4.9	1,347.3	1,347.3	1,348.1	0.8
AG	23,200	78	190	7.4	1,352.9	1,352.9	1,353.0	0.1
AH	23,454	90	450	2.9	1,354.9	1,354.9	1,355.5	0.6
AI	23,575	69	170	7.8	1,355.4	1,355.4	1,355.7	0.3
AJ	24,129	43	112	6.3	1,359.9	1,359.9	1,359.9	0.0
AK	24,462	70	333	2.1	1,366.3	1,366.3	1,366.9	0.6
AL	24,917	78	256	1.9	1,366.3	1,366.3	1,367.0	0.7
AM	25,180	49	264	4.1	1,368.2	1,368.2	1,368.2	0.0

¹Feet above confluence with Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: SPARTA CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,432	113	314	4.4	1,121.1	1,116.9 ²	1,117.4	0.5
B	1,570	67	368	3.7	1,121.1	1,118.2 ²	1,119.1	0.9
C	1,922	59	206	6.6	1,121.1	1,120.8 ²	1,121.2	0.4
D	2,346	50	169	8.0	1,126.0	1,126.0	1,126.1	0.1
E	2,540	63	352	3.8	1,131.1	1,131.1	1,131.1	0.0
F	2,769	65	220	6.1	1,132.2	1,132.2	1,132.2	0.0
G	3,255	45	143	8.7	1,137.9	1,137.9	1,137.9	0.0
H	3,628	40	139	9.0	1,143.0	1,143.0	1,143.0	0.0
I	4,023	61	165	7.6	1,148.6	1,148.6	1,148.7	0.1
J	4,396	48	152	8.2	1,154.1	1,154.1	1,154.1	0.0
K	4,611	49	171	7.3	1,157.7	1,157.7	1,157.7	0.0
L	4,983	44	157	8.0	1,163.5	1,163.5	1,163.5	0.0
M	5,494	43	152	8.2	1,173.0	1,173.0	1,173.0	0.0
N	5,681	78	302	4.1	1,178.1	1,178.1	1,178.9	0.8
O	5,956	40	111	8.4	1,180.1	1,180.1	1,180.1	0.0
P	6,314	30	127	7.3	1,185.5	1,185.5	1,185.5	0.0
Q	6,859	27	108	8.6	1,190.6	1,190.6	1,190.9	0.3
R	7,170	23	112	8.3	1,195.9	1,195.9	1,196.2	0.3

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: STONE RIDGE CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,297	34	66	5.2	1,112.3	1,106.9 ²	1,107.1	0.2
B	1,618	25	56	6.0	1,112.3	1,111.5 ²	1,111.6	0.1
C	1,761	52	166	2.1	1,114.8	1,114.8	1,115.7	0.9
D	2,031	42	64	4.7	1,116.7	1,116.7	1,117.2	0.5
E	2,175	21	41	7.3	1,120.2	1,120.2	1,120.2	0.0
F	2,435	44	115	2.6	1,127.2	1,127.2	1,127.4	0.2
G	2,553	54	77	3.9	1,127.3	1,127.3	1,127.7	0.4
H	2,671	40	64	4.7	1,128.8	1,128.8	1,129.3	0.5
I	2,917	42	84	3.6	1,132.9	1,132.9	1,133.8	0.9
J	3,173	26	42	6.4	1,136.6	1,136.6	1,136.6	0.0
K	3,369	80	160	1.7	1,141.1	1,141.1	1,141.1	0.0
L	3,584	25	100	2.7	1,146.1	1,146.1	1,146.8	0.7
M	3,773	22	37	6.2	1,147.9	1,147.9	1,148.0	0.1
N	3,867	18	46	5.0	1,149.3	1,149.3	1,149.7	0.4
O	4,019	35	114	2.0	1,155.2	1,155.2	1,155.9	0.7
P	4,306	28	40	5.8	1,161.9	1,161.9	1,161.9	0.0
Q	4,435	34	39	6.0	1,165.1	1,165.1	1,165.1	0.0
R	4,657	33	43	4.7	1,169.1	1,169.1	1,169.3	0.2
S	4,826	24	33	6.1	1,175.0	1,175.0	1,175.1	0.1
T	5,059	36	43	4.7	1,181.8	1,181.8	1,181.8	0.0
U	5,330	29	37	3.5	1,188.4	1,188.4	1,188.7	0.3
V	5,579	20	27	4.8	1,195.7	1,195.7	1,195.8	0.1
W	5,803	13	20	6.5	1,202.0	1,202.0	1,202.0	0.0
X	5,949	19	28	4.6	1,207.4	1,207.4	1,207.6	0.2
Y	6,134	20	26	5.1	1,212.7	1,212.7	1,212.9	0.2

¹ Feet above confluence with Finley Creek

² Elevations computed without consideration of backwater from Finley Creek

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WREN CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Z	6,302	17	18	4.6	1,219.5	1,219.5	1,219.7	0.2
AA	6,470	10	14	5.7	1,225.3	1,225.3	1,225.5	0.2
AB	6,630	12	15	5.4	1,230.5	1,230.5	1,230.7	0.2
AC	6,791	9	13	6.0	1,235.0	1,235.0	1,235.2	0.2
AD	6,947	15	15	5.4	1,241.1	1,241.1	1,241.1	0.0

¹ Feet above confluence with Finley Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
CHRISTIAN COUNTY, MISSOURI
 AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: WREN CREEK

Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable for this Flood Risk Project.

Table 25: Summary of Coastal Transect Mapping Considerations

[Not applicable to this Flood Risk Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 30, “Map Repositories”).

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA.

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill”. Visit the “Flood Map-Related Fees” section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loma for the “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill” or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the “Flood Map-Related Fees” section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/mt-2-application-forms-and-instructions and download the form “MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision”. Visit the “Flood Map-Related Fees” section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Christian County FIRM are listed in Table 26.

Table 26: Incorporated Letters of Map Change

[Not applicable to this Flood Risk Project]

6.5.4 Physical Map Revisions

A Physical Map Revisions (PMR) is an official republication of a community’s NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community’s chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if

warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the “Flood Map Revision Processes” section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Christian County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBM) and/or Flood Boundary and Floodway Maps (FBFM) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 27, “Community Map History.” A description of each of the column headings and the source of the date is also listed below.

-) *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.
-) *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or “pending” (for Preliminary FIS Reports) is shown. If the community is listed in Table 27 but not identified on the map, the community is treated as if it were unmapped.
-) *Initial FHBM Effective Date* is the effective date of the first FHBM. This date may be the same date as the Initial NFIP Map Date.
-) *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.

-) *Initial FIRM Effective Date* is the date of the first effective FIRM for the community.
-) *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as PMRs of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Christian County FIRMs in countywide format was 12/17/2010.

Table 27: Community Map History

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Billings, City of	12/17/2010	N/A	N/A	12/17/2010	TBD
Christian County, Unincorporated Areas	4/19/1983	4/19/1983	N/A	4/1/2004	12/17/2010 TBD
Clever, City of	12/17/2010	N/A	N/A	12/17/2010	TBD
Fremont Hills, City of	12/17/2010	N/A	N/A	12/17/2010	TBD
Highlandville, City of	12/17/2010	N/A	N/A	12/17/2010	TBD
Nixa, City of	12/17/2010	N/A	N/A	9/22/1999	12/17/2010 TBD
Ozark, City of	12/28/1973	12/28/1973	10/24/1975	2/1/1985	12/17/2010 TBD
Saddlebrooke, Village of	12/17/2010	N/A	N/A	12/17/2010	TBD
Sparta, City of	12/17/2010	N/A	N/A	12/17/2010	TBD

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 28 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 28: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Effective Flooding Sources	TBD	Missouri State Emergency Management Agency	EMK-2018-CA-00007	2018	Christian County (and Incorporated Areas)

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 29. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 29: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Billings, City of	TBA	11/08/2017	Kick-Off Meeting	Highlandville, Ozark, Saddlebrooke, Christian County, SEMA, Wood
		08/29/2018	Flood Study Review	Christian County, Ozark, Nixa, SEMA, Wood
		TBD	CCO Meeting	
Christian County Unincorporated Areas	TBA	11/08/2017	Kick-Off Meeting	Highlandville, Ozark, Saddlebrooke, Christian County, SEMA, Wood
		08/29/2018	Flood Study Review	Christian County, Ozark, Nixa, SEMA, Wood
		TBD	CCO Meeting	
Highlandville, City of	TBA	11/08/2017	Kick-Off Meeting	Highlandville, Ozark, Saddlebrooke, Christian County, SEMA, Wood
		08/29/2018	Flood Study Review	Christian County, Ozark, Nixa, SEMA, Wood
		TBD	CCO Meeting	
Nixa, City of	TBA	11/08/2017	Kick-Off Meeting	Highlandville, Ozark, Saddlebrooke, Christian County, SEMA, Wood
		08/29/2018	Flood Study Review	Christian County, Ozark, Nixa, SEMA, Wood
		TBD	CCO Meeting	
Ozark, City of	TBA	11/08/2017	Kick-Off Meeting	Highlandville, Ozark, Saddlebrooke, Christian County, SEMA, Wood
		08/29/2018	Flood Study Review	Christian County, Ozark, Nixa, SEMA, Wood
		TBD	CCO Meeting	

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Saddlebrook, Village of	TBA	11/08/2017	Kick-Off Meeting	Highlandville, Ozark, Saddlebrooke, Christian County, SEMA, Wood
		08/29/2018	Flood Study Review	Christian County, Ozark, Nixa, SEMA, Wood
		TBD	CCO Meeting	

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

Table 30 is a list of the locations where FIRMs for Christian County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 30: Map Repositories

Community	Address	City	State	Zip Code
Billings, City of	City Hall 202 US Highway 60	Billings	MO	65610
Christian County, Unincorporated Areas	County Courthouse 110 West Elm Street #202	Ozark	MO	65721
Clever, City of	City Hall 304 Clarke Avenue	Clever	MO	65631
Fremont Hills, City of	City Hall 1953 Fremont Hills Drive	Nixa	MO	65714
Highlandville, City of	City Office 216 Kentling Avenue	Highlandville	MO	65669
Nixa, City of	City Hall 715 West Mt. Vernon Street	Nixa	MO	65714
Ozark, City of	City Hall 205 North 1st Street	Ozark	MO	65721
Saddlebrook, Village of	County Courthouse 110 West Elm Street #202	Ozark	MO	65721
Sparta, City of	City Hall 131 North Avenue	Sparta	MO	65753

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM Databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 31.

Table 31 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that

State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of State and local GIS data in their state.

Table 31: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/engineering-library
NFIP website	www.fema.gov/national-flood-insurance-program
NFHL Dataset	msc.fema.gov
FEMA Region 7	Federal Regional Center 11224 Holmes Road Kansas City, MO 64131-3626 (816) 283-7004
Other Federal Agencies	
USGS website	www.usgs.gov
Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Karen McHugh, CFMM Missouri State Emergency Management Agency 2302 Militia Drive Jefferson City, MO 65101 Phone: (573) 526-9129 Karen.McHugh@sema.dps.mo.gov
State GIS Coordinator	Alexis Giesecker, GISP GIS Specialist State of Missouri Office of Administration Information Technology Services Division Office of Geospatial Information 2302 Militia Drive Jefferson City, MO 65101 Phone: (573) 418-7687 alexis.giesecker@oa.mo.gov

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 32 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 32: Bibliography and References

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Wood Environment & Infrastructure	FEMA	<i>Basemap Information for Christian County, Missouri</i>	FEMA	Washington D.C.	2018	https://msc.fema.gov/portal/advanceSearch
Hydrology Summary, 2018	FEMA	<i>Hydrology Summary Report, Christian County, MO</i>	Wood E&IS	Washington D.C.	2018	
Hydraulics Summary, 2018	FEMA	<i>James Watershed in Christian and Stone County, Missouri, January 2019</i>	Wood E&IS.; FTN Association Ltd.	Washington D.C.	2019	
US ACE, 2011	Hydrologic Engineering Center	<i>HEC-RAS River Analysis System, Version 5.0.3 and 5.0.5</i>	U.S Army Corps of Engineers	Davis, California	2011	
US ACE, 2011	Hydrologic Engineering Center	<i>HEC-HMS Modeling System, Version 4.2.1</i>	U.S Army Corps of Engineers	Davis California	2011	
MSDIS, 2014	Missouri Spatial Data Information Service	<i>Light Detection and Ranging Data (LiDAR)</i>	Missouri NRCS State Office	Columbia, Missouri	2017	http://msdis.missouri.edu
USDA, NAIP 2016	United States Department of Agriculture	<i>Orthography</i>	USDA	Washington, D.C.	2016	https://www.fsa.usda.gov/programs-and-services/aerialphotography/imagery-programs/naip-imagery/