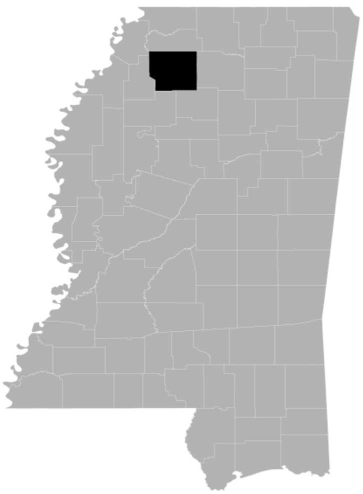
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 4



PANOLA COUNTY, MISSISSIPPI

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BATESVILLE, CITY OF	280126
COMO, TOWN OF*	280254
COURTLAND, TOWN OF	280255
CRENSHAW, TOWN OF	280127
PANOLA COUNTY, UNINCORPORATED AREAS	280125
POPE, VILLAGE OF	280256
SARDIS, CITY OF	280257

* No Special Flood Hazard Areas Identified

FEMA

PRELIMINARY
02/13/2019

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TBD

FLOOD INSURANCE STUDY NUMBER
28107CV001C

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FLOOD INSURANCE STUDY REPORT
PANOLA COUNTY, MISSISSIPPI

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 Panola County, Mississippi.

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.

The location of flood hazard data for participating communities in multiple jurisdictions is also indicated in the table.

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
Batesville, City of	280126	08030201 08030202 08030203	28107C0303E 28107C0304D 28107C0308D 28107C0309D[2] 28107C0310D 28107C0311E 28107C0312D 28107C0315E 28107C0316D 28107C0317D 28107C0320D	
Crowder, City of	280128	08030202	N/A	Quitman County, Mississippi and Incorporated Areas FIS Report; May 16, 2017
Como, Town of[1]	280254	08030204	28107C0075D[2]	
Courtland, Town of	280255	08030203	28107C0430D 28107C0435D	
Crenshaw, Town of	280127	08030204	28107C0014D 28107C0025D[2] 28107C0127E	
Panola County, Unincorporated Areas	280125	08030201 08030202 08030203 08030204	28107C0014D 28107C0015E[2] 28107C0025D[2] 28107C0050D[2] 28107C0075D[2] 28107C0100D[2] 28107C0125D 28107C0127E 28107C0130E 28107C0135F 28107C0150F 28107C0155E 28107C0160E 28107C0165E 28107C0170E 28107C0180E 28107C0185E 28107C0190E 28107C0195E 28107C0215D 28107C0225D 28107C0250D 28107C0275D 28107C0285E	

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
Panola County, Unincorporated Areas (continued)	280125	08030201 08030202 08030203 08030204	28107C0291E 28107C0292E 28107C0295E 28107C0300E 28107C0303E 28107C0304D 28107C0305E 28107C0308D 28107C0309D[2] 28107C0310D 28107C0311E 28107C0312D 28107C0315E 28107C0316D 28107C0317D 28107C0320D 28107C0330D 28107C0335D 28107C0340D 28107C0345D[2] 28107C0375D 28107C0400D 28107C0405D 28107C0410E 28107C0415D 28107C0420D 28107C0430D 28107C0435D 28107C0450D 28107C0455D 28107C0460D[2] 28107C0465D 28107C0470D 28107C0480D 28107C0490D	
Pope, Village of	280256	08030203	28107C0430D	
Sardis, City of	280257	08030201 08030202	28107C0185E 28107C0195E	

[1] No Special Flood Hazard Areas Identified

[2] 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 Panola County became effective on May 16, 2017. Refer to Table 27 for information about subsequent revisions to the FIRMs.

  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.

- Previous FIS Reports and FIRMs may have included levees that were accredited as reducing the risk associated with the 1% annual chance flood based on the information available and the mapping standards of the NFIP at that time. For

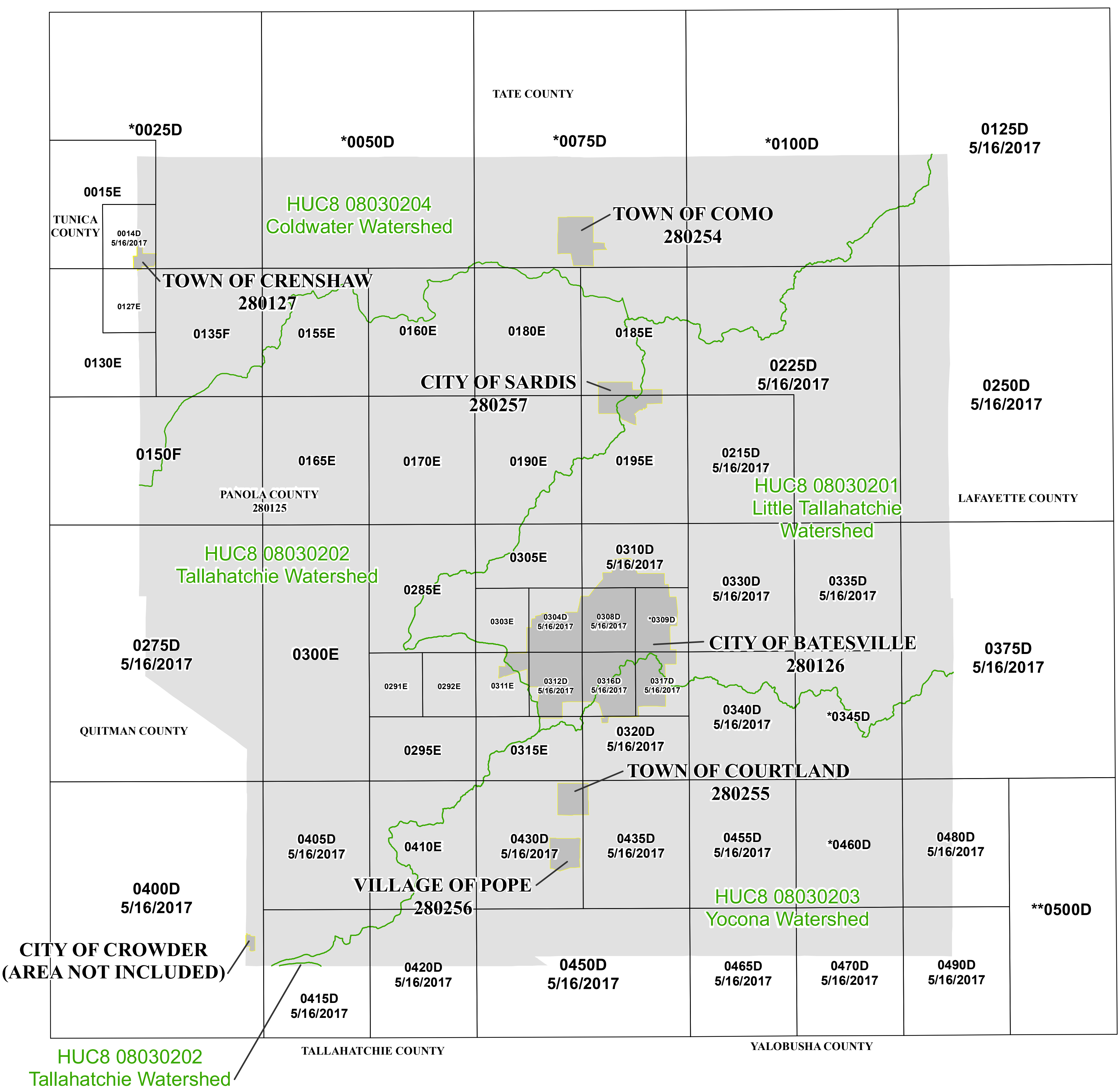
FEMA to continue to accredit the identified levees, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled "Mapping of Areas Protected by Levee Systems."

Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 8 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE National Levee Database (nld.usace.army.mil). For all other levees, the user is encouraged to contact the appropriate local community.

- 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 Panola 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, watershed boundaries, and USGS HUC-8 codes.

Figure 1: FIRM Panel Index



ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before MONTH DAY, YEAR.

N

1 inch = 4 miles 1:249,877

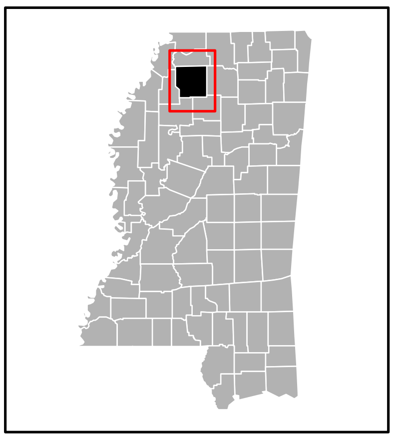
0 2 4 8 Miles

Map Projection:
State Plane Transverse Mercator, Mississippi West Zone;
North American Datum 1983; Western Hemisphere

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

*PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
**PANEL NOT PRINTED - AREA OUTSIDE OF COUNTY BOUNDARY



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP INDEX

PANOLA COUNTY, MISSISSIPPI and Incorporated Areas

PANELS PRINTED:

0014, 0015, 0125, 0127, 0130, 0135, 0150, 0155, 0160, 0165, 0170, 0180, 0185, 0190, 0195, 0215, 0225, 0250, 0275, 0285, 0291, 0292, 0295, 0300, 0303, 0304, 0305, 0308, 0310, 0311, 0312, 0315, 0316, 0317, 0320, 0330, 0335, 0340, 0375, 0400, 0405, 0410, 0415, 0420, 0430, 0435, 0450, 0455, 0465, 0470, 0480, 0490

FEMA
PRELIMINARY
MAP NUMBER
28107CIND0C
MAP REVISED

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.

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.

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.

Figure 2. FIRM Notes to Users

PROJECTION INFORMATION: The projection used in the preparation of the map was State Plane Transverse Mercator, Mississippi West Zone. The horizontal datum was the North American Datum 1983; Western Hemisphere. 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 www.ngs.noaa.gov.

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 this FIRM was provided in digital format by Mississippi Department of Transportation, Mississippi Automated Resource Information System, United States Geological Survey, and the United States Census Bureau. Ortho imagery was produced by Surdex Corporation in 2016 and has a 1 - foot ground sample distance, for the following panel: 0155, 0160, 0165, 0170, 0180, 0185, 0190, 0195, 0285, 0291, 0292, 0295, 0300, 0303, 0305, 0311, 0313, 0410.
Base map information shown on the FIRM was provided by Fugro Earthdata in 2006 at a scale of 2-foot pixel resolution. The following panels used base map information provided by the Mississippi Automated Resource Information System at a scale of 12-inch ground sample distance: 0015, 0127, 0130, and 0150. 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 Panola County, Mississippi, 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.

ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before TBD.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Panola County, Mississippi, effective TBD.

Figure 2. FIRM Notes to Users

ACCREDITED LEVEE: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit www.fema.gov/national-flood-insurance-program.
FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is 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 Panola 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.
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)

Figure 3: Map Legend for FIRM

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.
	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.
NO SCREEN	Unshaded Zone X: Areas of minimal flood hazard.
FLOOD HAZARD AND OTHER BOUNDARY LINES	
(ortho) (vector)	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	
Aqueduct *Channel* *Culvert* *Storm Sewer*	Channel, Culvert, Aqueduct, or Storm Sewer
Dam *Jetty* *Weir*	Dam, Jetty, Weir
	Levee, Dike, or Floodwall
Bridge	Bridge

Figure 3: Map Legend for FIRM

REFERENCE MARKERS	
22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	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.
	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.
513	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

Figure 3: Map Legend for FIRM

BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	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
$^{42}\mathbf{76}^{000m}\mathbf{E}$	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 Panola 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 Panola 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
Armstead Creek	Panola County, Unincorporated Areas	Confluence with McIvor Canal	Approximately 480 feet upstream of Barnacre Road	08030202	4.2	N/A	N	AE	07/10/2017
Belmont Creek	Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	At Kerry Lane	08030201	3.7	N/A	Y	AE	05/01/1978
Blacks Creek	Panola County, Unincorporated Areas	Confluence with McIvor Canal	Just upstream of Macedonia Road	08030202	2.2	N/A	Y	AE	05/01/1978
Blacks Creek	Panola County, Unincorporated Areas	Just upstream of Macedonia Road	Approximately 1.0 mile upstream of Private Drive	08030202	1.6	N/A	N	AE	07/10/2017
Bynum Creek	Panola County, Unincorporated Areas	Confluence with Enid Lake	Approximately 2,550 feet upstream of Robison Road	08030203	1.9	N/A	N	A	08/01/2010
Coldwater River	Panola County, Unincorporated Areas	Approximately 1,540 feet South of Quitman/Tunica County boundary	Approximately 350 feet north of Prichard Road	08030204	16.4	N/A	NA	A	02/23/2018
Cole Creek	Batesville, City of; Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	At U.S. Highway 278 / State Highway 6	08030201	2.3	N/A	Y	AE	11/06/2017
Cole Creek	Batesville, City of	At U.S. Highway 278 / State Highway 6	Approximately 550 feet upstream of State Highway 35	08030201	N/A	0.28	N	AO	05/01/1978
Cole Creek	Batesville, City of	Approximately 550 feet upstream of State Highway 35	Approximately 1.0 mile upstream of State Highway 35	08030201	1.0	N/A	N	A	08/01/2010

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
Crooked Creek	Panola County, Unincorporated Areas	Confluence with McIvor Canal	Approximately 2,100 feet upstream of the confluence of Taylor Creek	08030202	4.3	N/A	N	AE	07/10/2017
Davidson Creek	Panola County, Unincorporated Areas	Confluence with McIvor Canal	Approximately 1,380 feet upstream of Ballentine Road	08030202	6.0	N/A	N	AE	07/10/2017
Davis Creek	Panola County, Unincorporated Areas	Confluence with Peach Creek	Approximately 4,500 feet upstream of Sexton Road	08030202	4.1	N/A	N	AE	07/10/2017
East Floyd Creek	Panola County, Unincorporated Areas	Confluence with McIvor Canal	Approximately 4,580 feet upstream of Braham Road	08030202	5.8	N/A	N	AE	07/10/2017
Enid Lake	Panola County, Unincorporated Areas	At Enid Dam Road	Lafayette County boundary	08030203	N/A	19.8	N	AE	07/01/2009
Flowers Creek	Panola County, Unincorporated Areas	Approximately 1.1 miles upstream of the confluence with Enid Lake	Approximately 1.6 miles upstream of the confluence with Enid Lake	08030203	0.5	N/A	N	A	08/01/2010
Fowler Creek	Crenshaw, Town of, Panola / Quitman County; Panola County, Unincorporated Areas	Panola / Quitman County boundary	Just upstream of Old Crenshaw Road / Hillside Drive	08030204	0.6	N/A	N	AE	08/01/2010
Floyd Creek	Panola County, Unincorporated Areas	Approximately 1.7 miles downstream of Pumping Station Road	Approximately 1.6 miles upstream of Private Drive	08030202	4.1	N/A	N	AE	07/10/2017
Goodwin Creek	Panola County, Unincorporated Areas	Confluence with Long Creek	At Baker Road	08030203	3.6	N/A	Y	AE	05/01/1978

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
Hayne Creek	Panola County, Unincorporated Areas	Confluence with Panola-Quitman Floodway Channel	Approximately 3,530 feet upstream of Chapel Town Road	08030202	3.7	N/A	N	AE	07/10/2017
Hog Creek	Panola County, Unincorporated Areas	Approximately 2.9 miles downstream of Pumping Station Road	Approximately 1.2 miles upstream of Pumping Station Road	08030202	4.1	N/A	N	AE	07/10/2017
Hotophia Creek	Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	Approximately 5,050 feet upstream of State Highway 315	08030201	10.2	N/A	Y	AE	05/01/1978
Johnson Creek	Panola County, Unincorporated Areas	Confluence with Peters Creek	At Henderson Road	08030203	7.8	N/A	Y	AE	05/01/1978
Jones Creek	Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	Approximately 1.1 miles upstream of Central Academy Road	08030201	5.5	N/A	Y	AE	05/01/1978
Panola-Quitman Floodway Channel	Panola County, Unincorporated Areas	Yalobusha County boundary	At U.S. Highway 278 / State Highway 6	08030202	10.8	N/A	N	A	08/01/2010
Little Tallahatchie River	Batesville, City of; Panola County, Unincorporated Areas	At U.S. Highway 278 / State Highway 6	Approximately 3.7 miles upstream of the confluence of Jones Creek	08030201	22.1	N/A	Y	AE	05/01/1978
Long Creek	Panola County, Unincorporated Areas	Confluence with Johnson Creek / Peters Creek	At Eureka Road	08030203	5.6	N/A	Y	AE	05/01/1978
McIvor Canal	Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	Approximately 1.7 miles upstream of Old Panola Road	08030202	13.3	N/A	Y	AE	05/01/1978
McIvor Canal	Panola County, Unincorporated Areas	Approximately 1.7 miles upstream of Old Panola Road	Approximately 4,390 feet upstream of JQ West Road	08030202	2.5	N/A	N	AE	07/10/2017

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
North Fork Bear Creek	Panola County, Unincorporated Areas	Confluence with South Fork Bear Creek	Approximately 2,020 feet upstream of U.S. Highway 51	08030202	6.2	N/A	N	AE	07/10/2017
O'Brien Creek	Panola County, Unincorporated Areas	Confluence with Panola-Quitman Floodway Channel	Approximately 1,650 feet upstream of Dam	08030202	7.2	N/A	N	AE	07/10/2017
Peach Creek	Panola County, Unincorporated Areas	Approximately 1.5 miles downstream of Ballentine Road	Approximately 1.5 miles upstream of Pleasant Grove Road	08030202	8.9	N/A	N	AE	07/10/2017
Peters Creek	Panola County, Unincorporated Areas	Confluence with Yocona River	Approximately 4,000 feet upstream of confluence with Yocona River	08030203	0.8	N/A	N	A	08/01/2010
Peters Creek	Courtland, Town of; Panola County, Unincorporated Areas; Pope, Village of	Approximately 4,000 feet upstream of confluence with Yocona River	Confluence with Johnson Creek / Long Creek	08030203	6.6	N/A	Y	AE	05/01/1978
Peters Creek Tributary 1	Courtland, Town of; Panola County, Unincorporated Areas	Confluence with Peters Creek	Approximately 2,620 feet upstream of Main Street	08030203	1.4	N/A	N	A	08/01/2010
Peters Creek Tributary 2	Courtland, Town of; Panola County, Unincorporated Areas	Confluence with Peters Creek	Approximately 3,560 feet upstream of State Highway 718	08030203	1.7	N/A	N	A	08/01/2010
Peters Creek Tributary 3	Courtland, Town of; Panola County, Unincorporated Areas	Confluence with Peters Creek	Approximately 560 feet upstream of McNeely Road	08030203	1.1	N/A	N	A	08/01/2010
Peterson Creek	Panola County, Unincorporated Areas	Confluence with Davis Creek	Approximately 3,390 feet upstream of Sexton Road	08030202	2.2	N/A	N	AE	07/10/2017

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
Rocky Creek	Panola County, Unincorporated Areas	Confluence with Peach Creek	Approximately 1.6 miles upstream of State Highway 315	08030202	2.1	N/A	N	AE	07/10/2017
Running Slough Ditch	Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	Approximately 1.1 miles upstream of confluence of Stream C	08030202	3.2	N/A	Y	AE	05/01/1978
Sand Creek	Batesville, City of; Panola County, Unincorporated Areas	Confluence with Whitten Creek	Approximately 1.6 miles upstream of County Club Road	08030201	3.4	N/A	N	A	08/01/2010
Sardis Lake	Panola County, Unincorporated Areas	At dam	Lafayette County boundary	08030201	N/A	19.5	N	AE	07/01/2009
South Fork Bear Creek	Panola County, Unincorporated Areas	Confluence with McIvor Canal	Approximately 4,270 feet upstream of U.S. Highway 51	08030202	6.6	N/A	N	AE	07/10/2017
Stream A	Panola County, Unincorporated Areas	Confluence with Running Slough Ditch	Approximately 3,300 feet upstream of State Highway 6	08030202	1.6	N/A	Y	AE	05/01/1978
Stream A	Panola County, Unincorporated Areas	Approximately 3,300 feet upstream of State Highway 6	Approximately 1,170 feet upstream of Private Drive	08030202	1.1	N/A	N	AE	07/10/2017
Stream B	Panola County, Unincorporated Areas	Confluence with Running Slough Ditch	At U.S. Highway 278 / State Highway 6	08030202	1.2	N/A	Y	AE	05/01/1978
Stream B	Panola County, Unincorporated Areas	At U.S. Highway 278 / State Highway 6	Approximately 5,000 feet upstream of Dam	08030202	2.6	N/A	N	AE	07/10/2017
Stream C	Panola County, Unincorporated Areas	Confluence with Running Slough Ditch	At U.S. Highway 278 / State Highway 6	08030202	1.7	N/A	Y	AE	05/01/1978
Stream C	Panola County, Unincorporated Areas	At U.S. Highway 278 / State Highway 6	Approximately 1.1 miles upstream of Private Drive	08030202	3.1	N/A	N	AE	07/10/2017

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
Stream D	Panola County, Unincorporated Areas	Confluence with Little Tallahatchie River	Approximately 1,750 feet upstream of River Road	08030201	1.3	N/A	Y	AE	05/01/1978
Stream D	Panola County, Unincorporated Areas	Approximately 1,750 feet upstream of River Road	At U.S. Highway 51	08030201	0.1	N/A	N	A	08/01/2010
Stream E	Panola County, Unincorporated Areas	Confluence with Stream D	Approximately 2,355 feet upstream of River Road	08030201	0.9	N/A	Y	AE	05/01/1978
Stream E	Panola County, Unincorporated Areas	Approximately 2,355 feet upstream of River Road	At U.S. Highway 51	08030201	0.6	N/A	N	A	08/01/2010
Taylor Creek	Panola County, Unincorporated Areas	Confluence with Crooked Creek	Approximately 1.7 miles upstream of the confluence with Crooked Creek	08030202	1.8	N/A	N	AE	07/10/2017
Tributary to Cole Creek	Batesville, City of	Confluence with Little Tallahatchie River	At U.S. Highway 278 / State Highway 6	08030201	0.4	N/A	Y	AE	11/06/2017
Whitten Creek	Batesville, City of; Panola County, Unincorporated Areas	Approximately 3,020 feet downstream of U.S. Highway 51	At Oak Ridge Lane / Coon Road	08030201	1.8	N/A	Y	AE	05/01/1978
Whitten Creek	Batesville, City of	Approximately 50 feet upstream of State Highway 35	Approximately 300 feet upstream of Oak Ridge Lane / Coon Road	08030201	0.5	N/A	Y	AE	03/03/2006
Whitten Creek	Batesville, City of	Approximately 300 feet upstream of Oak Ridge Lane / Coon Road	Approximately 1,110 feet upstream of Shamrock Drive	08030201	1.1	N/A	Y	AE	08/01/2010

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
Yellow Lake Bayou	Panola County, Unincorporated Areas	Approximately 0.9 miles downstream of the Panola/Quitman County boundary	Approximately 0.6 miles upstream of Robert Holder Road	08030204	1.8	N/A	N	A	02/23/2018
Yellow Lake Bayou Tributary	Panola County, Unincorporated Areas	At confluence with Yellow Lake Bayou	Approximately 1.6 miles upstream of confluence with Yellow Lake Bayou	08030204	1.6	N/A	N	A	02/23/2018
Yocona River	Panola County, Unincorporated Areas	Yalobusha County boundary	Approximately 4.4 miles upstream of the confluence of Peters Creek	08030203	11.1	N/A	N	A	08/01/2010

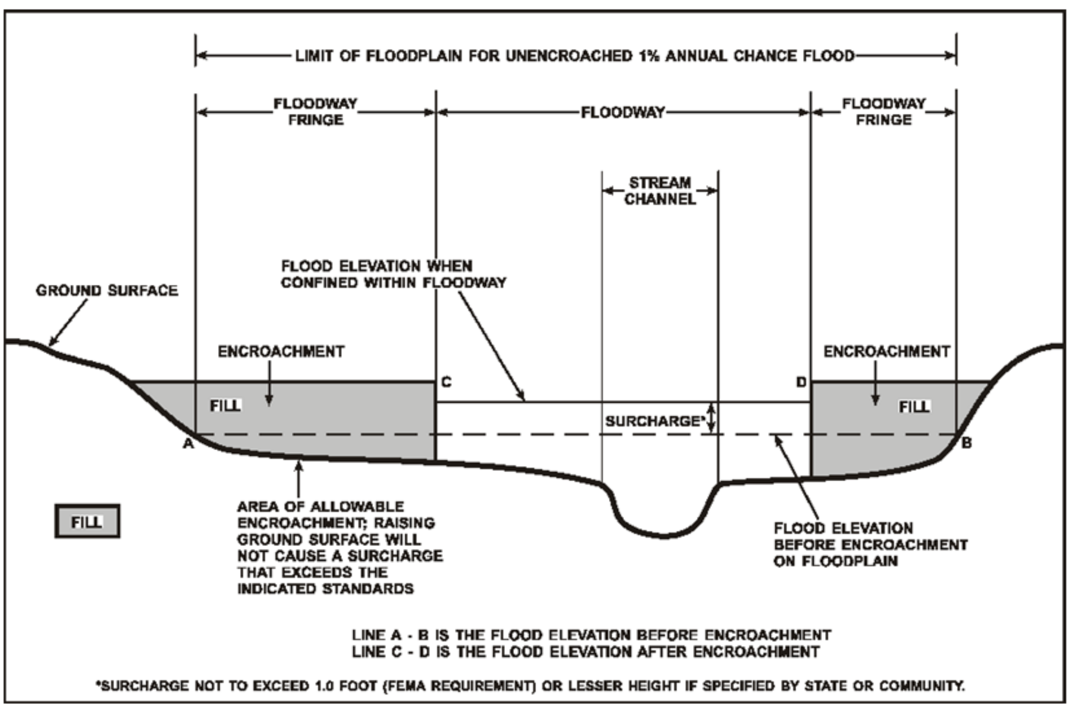
2.2 Floodways

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 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

Some States and communities use non-encroachment zones to manage floodplain development. For flooding sources with medium flood risk, field surveys are often not collected and surveyed bridge and culvert geometry is not developed. Standard hydrologic and hydraulic analyses are still performed to determine BFEs in these areas. However, floodways are not typically determined, since specific channel profiles are not developed. To assist communities with managing floodplain development in these areas, a "non-encroachment zone" may be provided. While not a FEMA designated floodway, the non-encroachment zone represents that area around the stream that should be reserved to convey the 1% annual chance flood event. As with a floodway, all surcharges must fall within the acceptable range in the non-encroachment zone.

General setbacks can be used in areas of lower risk (e.g. unnumbered Zone A), but these are not considered sufficient where unnumbered Zone A is replaced by Zone AE. The NFIP requires communities to ensure that any development in a non-encroachment area causes no increase in BFEs. Communities must generally prohibit development within the area defined by the non-encroachment width to meet the NFIP requirement. Regulations for Mississippi require communities in Panola County to limit increases caused by encroachment to 1.0 foot and several communities have adopted additional restrictions for non-encroachment areas.

Non-encroachment determinations may be delineated where it is not possible to delineate floodways because specific channel profiles with bridge and culvert geometry were not developed. Any non-encroachment determinations for this Flood Risk Project have been tabulated for selected cross sections and are shown in Table 24, "Flood Hazard and Non-Encroachment Data for Selected Streams." Areas for which non-encroachment zones are provided show BFEs and the 1% annual chance floodplain boundaries mapped as zone AE on the FIRM but no floodways.

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]

2.5.3 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]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is 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 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 Panola County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Batesville, City of	A, AE, AO, X
Como, Town of	X
Courtland, Town of	A, AE, X
Crenshaw, Town of	AE, X
Panola County, Unincorporated Areas	A, AE, AO, X
Pope, Village of	AE, X
Sardis, City of	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)
Coldwater	08030204	Coldwater River	Covers the northern part of the county.	1,920
Little Tallahatchie	08030201	Little Tallahatchie River	Covers the eastern part of the county.	1,640
Tallahatchie	08030202	Tallahatchie River	Covers the western part of the county.	1,010
Yocona	08030203	Yocona River	Covers the southern part of the county.	752

4.2 Principal Flood Problems

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

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
All sources	Widespread flooding across Mississippi, including Panola County, occurred between November 28 and 30, 2001, as the result of five to nine inches of rainfall. Numerous roads and some schools were closed and many homes and businesses were flooded (NOAA 2010). A similar event in June 19, 2007, caused flash flooding of 25 roads east-northeast of Batesville, including Highways 6 and 315. Heavy rain produced flash flooding in downtown Batesville on March 3, 2008 (FIS 2017).
Fowler Creek	Portions of the Crenshaw have been flooded periodically by Fowler Creek. In the early 1950s local interest constructed a levee on the creek to protect the town but the levee has broken several times, most recently in 1973. Flood damage, though severe, principally has been confined to the downtown business section along the east side of the Illinois Central Gulf Railroad and to the area extending approximately one block east of the downtown section. Generally the portion of Crenshaw lying east of the railroad has been protected from prior floods on Fowler Creek by the railroad embankment extending in a north-south direction through the town. Minor flooding occurs in the portion of the town lying west of the railroad due primarily to inadequate local drainage facilities. There are no known instances of property damage from this source (FIS 1979, Mar).
Little Tallahatchie River	Generally, major floods in Panola County have been associated with periods of high water on the Little Tallahatchie River and its tributaries (FIS 1979, Nov).
Sardis Lake	On April 29, 1973, Sardis Lake crested at an all time gage record high stage of 285.80 ft. NAVD or 65.80 ft. on the gage after unusually heavy rainfall during the month of April. The monthly rainfall recorded at Sardis was 11.37 inches, as compared with normal rainfall of 4.94 inches for the month. Most camping areas along the upper and lower lakes were flooded, but there were no reports of other damages. On November 26 and 27, 1973, 4.85 inches of rain fell in a 26-hour period with 1.60 inches recorded within a 30 minute period at Sardis Lake. State Highway 315 between the Town of Sardis and Sardis Lake again became impassable with portions of the highway washed out. Homes in low-lying areas were evacuated (FIS 1979, Nov).

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

Table 6: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Sardis Lake	At USGS Gage IDs 07272000 / 07272500	285.8	04/29/1973	*	FIS 1979, Nov
Sardis Lake	At Lake	*	11/26/1973-11/27/1973	*	FIS 1979, Nov

* Data not available

4.3 Non-Levee Flood Protection Measures

Table 7 contains information about non-levee flood protection measures within Panola 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

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
All Sources	N/A	Flood protection facilities	Panola County	Between 1973 and 1975, flood protection facilities were built in portions of western Panola County and eastern Quitman County under the Indian Creek-Bobo Bayou Drainage Improvement Project (SCS 1974). The primary purpose of the project was to help control runoff from the hill sections of Panola County and, as a consequence, to reduce flooding in the delta portion of the county (FIS 1979, Nov).
Fowler Creek	N/A	Floodwater retarding structures	Town of Crenshaw	In 1963, the SCS (now the Natural Resources Conservation Service) constructed four floodwater retarding structures in the Fowler Creek watershed in the hills east of the Town of Crenshaw (FIS 1979, Nov).
Fowler Creek	N/A	Levee	Town of Crenshaw	In 1973, the SCS built a levee protecting the Town of Crenshaw along the north bank of the reach of Fowler Creek extending from Mississippi State Highway 3 downstream past the corporate limits of the town. As a result of the 1973 flooding, the SCS rebuilt the levee in 1974 to protect the Town of Crenshaw along the north bank of the reach of Fowler Creek extending from Mississippi State Highway 3 upstream to the hills east of the town. This project was accomplished under the emergency program (FIS 1979, Nov).

Table 7: Non-Levee Flood Protection Measures (continued)

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Hotophia Creek	N/A	Earth embankment, outlet conduit, and emergency spillway	Located on small tributaries of Hotophia Creek in the upper part of the drainage basin	During the period 1959-1962, the Soil Conservation Service (SCS, now the Natural Resources Conservation Service) implemented a flood prevention project on Hotophia Creek. The project consisted of four floodwater retarding structures and stream channel improvements. The flood water retarding structures, all located on small tributaries of Hotophia Creek in the upper part of the drainage basin, consist of an earth embankment, an outlet conduit, and an emergency spillway. Stream channel improvements consist of channel enlargement, new channel, clearing and snagging, and streambank stabilization. The entire reach of Hotophia Creek included in this study was included in the flood prevention project (FIS 1979, Nov).
Little Tallahatchie River	N/A	Floodwater retarding structures	Northwest and west of the City of Batesville	The Lower Tallahatchie River Watershed Drainage Improvement Project was undertaken by the SCS in 1968-1969 to improve drainage on several tributaries of the Little Tallahatchie River immediately northwest and west of the City of Batesville. Seven floodwater retarding structures and five grade stabilization and sediment control structures were included in the project. Approximately 18 miles of channel construction and two miles of channel clearing were also included (FIS 1979, Nov).
Little Tallahatchie River / Panola-Quitman Floodway Channel	N/A	Levee	Panola County	Panola County is part of the USACE Yazoo Basin Headwaters Project. Levees existing along the Little Tallahatchie River as part of the Panola Quitman Floodway are accredited and mapped as sowing protection from the 1% annual chance flood (FIS 2017).
McIvor Canal	N/A	Channelized	Little Tallahatchie River to the Illinois Central Gulf Railroad, north of Sardis	McIvor Canal, extending from its mouth at the Little Tallahatchie River to the Illinois Central Gulf Railroad north of the City of Sardis, was constructed during the period 1917-1922. The work was done by the McIvor Canal Drainage District which recently was dissolved (FIS 1979, Nov).
Peach Creek	N/A	Channelized	Unspecified	In 1974-1975, a large number of channels were improved and five floodwater retarding structures were constructed on Peach Creek as part of the Indian Creek-Bobo Bayou Drainage Improvement Project (FIS 1979, Nov).
Peters Creek	N/A	Channelized	Upstream of Interstate 55	Peters Creek was canalized from its mouth to the mouth of Johnson Creek which is immediately upstream of the present location of the Interstate 55 crossing. This project was done by a local drainage district during the period 1927-1928 (FIS 1979, Nov).

Table 7: Non-Levee Flood Protection Measures (continued)

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Sardis Lake	Sardis Reservoir	Reservoir	Approximately 6.5 miles southeast of the City of Sardis	Sardis Reservoir was constructed by the U.S. Army Corps of Engineers (USACE) as one of several flood control facilities that provide a degree of protection for the delta reaches of the Yazoo River basin. The reservoir is located in Panola County approximately six and a half miles southeast of Sardis. Constructed between 1938 and 1940, the reservoir controls flow from 1,545 square miles of hill area (FIS 1979, Nov).
Yocona River	Enid Reservoir	Reservoir	Approximately three miles north of the Town of Enid, 26 miles north of the City of Grenada, and 0.8 mile east of U.S. Highway 51	The major flood protection facility on the Yocona River is the Enid Reservoir. Enid Reservoir lies approximately three miles north of the Town of Enid, 26 miles north of the City of Grenada, and 0.8 mile east of U.S. Highway 51. Most of the reservoir is located in Yalobusha County, with only a small portion falling in Panola County. The facility, which was placed in operation in 1952, controls flow from a watershed of 560 square miles (FIS 1979, Nov).

4.4 Levees

For purposes of the NFIP, FEMA only recognizes levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with comprehensive floodplain management criteria. The Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) describes the information needed for FEMA to determine if a levee system reduces the risk from the 1% annual chance flood. This information must be supplied to FEMA by the community or other party when a flood risk study or restudy is conducted, when FIRMs are revised, or upon FEMA request. FEMA reviews the information for the purpose of establishing the appropriate FIRM flood zone.

Levee systems that are determined to reduce the risk from the 1% annual chance flood are accredited by FEMA. FEMA can also grant provisional accreditation to a levee system that was previously accredited on an effective FIRM and for which FEMA is awaiting data and/or documentation to demonstrate compliance with Section 65.10. These levee systems are referred to as Provisionally Accredited Levees, or PALs. Provisional accreditation provides communities and levee owners with a specified timeframe to obtain the necessary data to confirm the levee's certification status. Accredited levee systems and PALs are shown on the FIRM using the symbology shown in Figure 3 and in Table 8. If the required information for a PAL is not submitted within the required timeframe, or if information indicates that a levee system not longer meets Section 65.10, FEMA will de-accredit the levee system and issue an effective FIRM showing the levee-impacted area as a SFHA.

FEMA coordinates its programs with USACE, who may inspect, maintain, and repair levee systems. The USACE has authority under Public Law 84-99 to supplement local efforts to repair flood control projects that are damaged by floods. Like FEMA, the USACE provides a program to allow public sponsors or operators to address levee system maintenance deficiencies. Failure to do so within the required timeframe results in the levee system being placed in an inactive status in the USACE Rehabilitation and Inspection Program. Levee systems in an inactive status are ineligible for rehabilitation assistance under Public Law 84-99.

FEMA coordinated with the USACE, the local communities, and other organizations to compile a list of levees that exist within Panola County. Table 8, "Levees," lists all accredited levees, PALs, and de-accredited levees shown on the FIRM for this FIS Report. Other categories of levees may also be included in the table. The Levee ID shown in this table may not match numbers based on other identification systems that were listed in previous FIS Reports. Levees identified as PALs in the table are labeled on the FIRM to indicate their provisional status.

Please note that the information presented in Table 8 is subject to change at any time. For that reason, the latest information regarding any USACE structure presented in the table should be obtained by contacting USACE and accessing the USACE National Levee Database. For levees owned and/or operated by someone other than the USACE, contact the local community shown in Table 30.

The levee system that is shown as providing protection from the 1-percent-annual-chance or greater flood hazard is located along the left bank of the Mississippi River as a functional part of the Mississippi River Levee System and is not physically located within Panola County. This levee was built and is maintained by the USACE.

Table 8: Levees

Community	Flooding Source / System Name	Levee Location	Levee Owner	USACE Levee	System ID Segment ID Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Panola County, Unincorporated Areas	Little Tallahatchie River / Panola-Quitman Floodway Levee System and McIvor Canal	The Panola-Quitman Floodway Levee System begins approximately 6 miles west-northwest of Batesville, MS and continues in a southeasterly direction to the Panola-Quitman-Tallahatchie County border, where the levee continues south along the Quitman County line for approximately 8.5 miles. The levee then tails into a south western direction where it ends at STA 1304+16. The Panola-Quitman Floodway Levee System was originally designed to provide protection for the 50-year frequency event. Right Bank.	USACE, Vicksburg District; USACE Federally Constructed and USACE Federally Operated	Yes	5905000043 5904000051 5901000083	Yes	28107C0300E 28107C0400D 28107C0405D 28107C0415D 28107C0285E 28107C0291E
Panola County, Unincorporated Areas	Coldwater River / Coldwater River Levee East Bank System	The Coldwater River Levee East Bank System extends from the vicinity of the town of Askew, Mississippi in Panola County to the vicinity of the town of Darling, Mississippi in Quitman County. Left Bank.	USACE Federally Constructed and USACE Federally Operated	Yes	5905000011 5904000078 5901000008	No	28107C0015D
Crenshaw, Town of	Fowler Creek	Northwestern part of the county.	SCS constructed and maintained by Panola County	No	N/A	No	28107C0014D

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.

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 26, "Incorporated Letters of Map Change", which include Letters of Map Revision (LOMRs). For more information about LOMRs, refer to Section 6.5, "FIRM Revisions."

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. 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	0.2% Annual Chance
Armstead Creek	At the confluence with McIvor Canal	3.55	1,516	1,848	2,048	2,349	2,828
Armstead Creek	Approximately 3,080 feet upstream of Will Stewart Road	2.44	1,200	1,464	1,622	1,852	2,221
Armstead Creek	Approximately 100 feet downstream of Wilson Road	0.99	642	777	857	971	1,154
Belmont Creek	Cross Section A	4.98	2,020	*	2,800	3,330	4,260
Belmont Creek	Cross Section D	3.81	1,740	*	2,370	2,790	3,560
Belmont Creek	Cross Section E	1.99	1,190	*	1,590	1,850	2,350
Blacks Creek[1]	Cross Section A	3.26	1,960	*	2,640	3,080	3,920
Blacks Creek[1]	Cross Section B	2.70	1,850	*	2,450	2,830	3,590
Blacks Creek[1]	Cross Section C	2.00	1,510	*	1,970	2,280	2,880
Blacks Creek	Approximately 1,800 feet downstream of Macedonia Road	2.29	1,463	1,807	2,003	2,270	2,692
Blacks Creek	Approximately 1,090 feet downstream of Private Drive	0.54	415	501	552	622	736
Cole Creek	At mouth	5.30	2,713	*	3,953	4,613	5,487
Cole Creek	At Hadorn Road	3.79	2,071	*	3,045	3,539	4,223
Cole Creek	At Tubbs Road	3.02	1,818	*	2,686	3,111	3,713
Crooked Creek	At the confluence with McIvor Canal	7.52	2,378	2,942	3,292	3,804	4,639
Crooked Creek	Approximately 2,440 feet upstream of the confluence with McIvor Canal	6.28	1,994	2,465	2,761	3,189	3,894
Crooked Creek	At Burdett Road	5.38	1,842	2,290	2,569	2,959	3,607

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Crooked Creek	Approximately 2,200 feet downstream of Pegram Road	4.22	1,715	2,126	2,377	2,725	3,297
Crooked Creek	Approximately 2,500 feet upstream of Pegram Road	3.29	1,608	2,002	2,236	2,550	3,064
Crooked Creek	At the confluence of Taylor Creek	1.17	943	1,242	1,418	1,584	1,890
Crooked Creek	Approximately 160 feet upstream of Pegram Road	3.77	1,677	2,083	2,328	2,662	3,209
Davidson Creek	At the confluence with McIvor Canal	4.85	1,784	2,163	2,396	2,762	3,340
Davidson Creek	Approximately 3,310 feet upstream of the confluence with McIvor Canal	4.52	1,712	2,083	2,310	2,659	3,215
Davidson Creek	Approximately 4,180 feet downstream of Lemaster Road	4.21	1,621	1,975	2,191	2,521	3,047
Davidson Creek	Approximately 2,640 feet downstream of Lemaster Road	4.02	1,558	1,901	2,112	2,428	2,937
Davidson Creek	Approximately 900 feet downstream of Lemaster Road	3.53	1,458	1,775	1,968	2,259	2,724
Davidson Creek	Approximately 740 feet upstream of Lemaster Road	3.26	1,336	1,630	1,811	2,078	2,510
Davidson Creek	Approximately 3,850 feet upstream of Lemaster Road	2.61	1,137	1,387	1,541	1,765	2,129
Davidson Creek	Approximately 1.2 miles upstream of Lemaster Road	2.39	1,088	1,335	1,486	1,699	2,049

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Davidson Creek	Approximately 1.3 miles downstream of Old Panola Road	1.93	969	1,190	1,324	1,509	1,814
Davidson Creek	Approximately 1.6 miles downstream of Old Panola Road	1.58	892	1,095	1,216	1,381	1,652
Davidson Creek	Approximately 4,910 feet downstream of Old Panola Road	1.22	770	943	1,045	1,184	1,410
Davis Creek	At the confluence with Peach Creek	3.99	1,631	2,003	2,225	2,546	3,060
Davis Creek	Approximately 150 feet upstream of Ward Road	3.58	1,631	2,003	2,225	2,546	3,060
Davis Creek	Approximately 2,530 feet upstream of Ward Road	2.88	1,511	1,850	2,049	2,336	2,790
Davis Creek	At the confluence of Peterson Creek	1.60	929	1,124	1,238	1,408	1,677
Davis Creek	Approximately 1,490 feet upstream of the confluence of Peterson Creek	1.46	891	1,081	1,192	1,353	1,609
Davis Creek	Approximately 1,950 feet upstream of the confluence of Peterson Creek	1.18	793	961	1,058	1,198	1,419
East Floyd Creek	Approximately 1,200 feet upstream of the confluence of McIvor Canal	7.43	2,781	3,421	3,805	4,381	5,290
East Floyd Creek	Approximately 3,950 feet upstream of the confluence of McIvor Canal	6.96	2,682	3,307	3,682	4,235	5,111

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
East Floyd Creek	Approximately 4,400 feet upstream of the confluence of McIvor Canal	6.42	2,519	3,108	3,457	3,966	4,772
East Floyd Creek	Approximately 4,020 feet downstream of State Highway 315	6.02	2,519	3,108	3,457	3,966	4,772
East Floyd Creek	At State Highway 315	5.41	2,485	3,077	3,424	3,917	4,697
East Floyd Creek	Approximately 1,400 feet downstream of Melrose Road	3.36	1,649	2,017	2,235	2,552	3,055
East Floyd Creek	Approximately 550 feet upstream of Melrose Road	2.48	1,312	1,597	1,765	2,012	2,402
East Floyd Creek	Approximately 1.1 miles upstream of Melrose Road	1.21	755	915	1,010	1,146	1,363
Floyd Creek	Approximately 1.6 miles downstream of Pumping Station Road	3.47	1,234	1,517	1,695	1,951	2,377
Floyd Creek	Approximately 4,500 feet downstream of Pumping Station Road	3.10	1,177	1,455	1,629	1,870	2,276
Floyd Creek	Approximately 2,760 feet upstream of Pumping Station Road	2.97	1,060	1,359	1,550	1,775	2,183
Floyd Creek	Approximately 2,940 feet upstream of Pumping Station Road	2.95	967	1,250	1,435	1,646	2,037
Floyd Creek	Approximately 4,380 feet upstream of Pumping Station Road	2.61	918	1,182	1,354	1,550	1,912

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Floyd Creek	Approximately 1.2 miles upstream of Pumping Station Road	2.22	845	1,103	1,269	1,448	1,785
Floyd Creek	Approximately 1.8 miles upstream of Pumping Station Road	1.98	612	831	981	1,120	1,408
Fowler Creek	At State Highway 3	7.11	1,534	*	2,598	3,142	4,672
Goodwin Creek	Cross Section A	8.93	3,300	*	4,650	5,420	6,950
Goodwin Creek	Cross Section D	6.72	3,120	*	4,340	5,030	6,440
Goodwin Creek	Cross Section E	3.22	1,610	*	2,200	2,590	3,300
Hayne Creek	At the confluence with McIvor Canal	2.28	1,010	1,221	1,349	1,546	1,861
Hayne Creek	Approximately 300 feet upstream of Dummy Line Road	1.76	884	1,076	1,192	1,359	1,631
Hayne Creek	Approximately 3,380 feet downstream of Chapel Town Road	1.22	760	943	1,052	1,190	1,422
Hog Creek	Approximately 1,150 feet downstream of Pumping Station Road	1.23	642	765	840	959	1,147
Hotophia Creek	At State Highway 35	34.80	8,630	*	12,200	13,500	17,500
Hotophia Creek	Cross Section G	27.80	7,790	*	9,910	11,100	14,200
Hotophia Creek	Cross Section I	24.60	6,440	*	9,140	10,300	13,200
Hotophia Creek	Cross Section J	21.60	5,750	*	8,130	9,140	11,700
Hotophia Creek	Cross Section K	17.90	4,950	*	6,940	7,800	10,000
Hotophia Creek	Cross Section M	10.20	3,900	*	5,380	5,980	7,650
Johnson Creek	Cross Section A	20.00	5,720	*	8,160	9,260	11,900

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Johnson Creek	Cross Section C	11.70	3,560	*	5,030	5,750	7,380
Johnson Creek	Cross Section F	8.09	2,880	*	4,050	4,730	6,070
Johnson Creek	Cross Section H	5.55	2,400	*	3,330	3,900	5,000
Johnson Creek	Cross Section I	4.48	2,300	*	3,150	3,650	4,670
Jones Creek	At State Highway 35	9.02	3,830	*	5,360	6,140	7,880
Jones Creek	Cross Section D	6.19	3,020	*	4,180	4,840	6,200
Jones Creek	Cross Section F	4.70	2,790	*	3,790	4,340	5,550
Jones Creek	Cross Section H	1.13	980	*	1,260	1,390	1,750
Little Tallahatchie River	At State Highway 6	1,802	23,600	*	29,000	31,100	35,600
Little Tallahatchie River	About 5.8 miles downstream of Old Panola Road (Cross Section C)	1,680	16,400	*	20,800	22,500	26,500
Little Tallahatchie River	Cross Section G	1,657	15,000	*	19,300	20,900	24,700
Little Tallahatchie River	At the Railroad	1,640	14,000	*	18,100	19,700	23,500
Little Tallahatchie River	At Belmont Road	1,595	11,350	*	15,100	16,500	20,100
Little Tallahatchie River	Cross Section N	1,561	9,300	*	12,800	14,100	17,500
Little Tallahatchie River	Cross Section O	1,557	9,130	*	12,600	13,900	17,300
Long Creek	Cross Section A	40.40	11,600	*	16,800	19,300	25,000
Long Creek	Cross Section B	30.70	9,130	*	13,200	15,200	19,600
Long Creek	Cross Section D	13.50	5,740	*	8,060	9,150	11,800
Long Creek	Cross Section F	10.10	5,090	*	7,090	7,690	10,200
McIvor Canal[1]	At mouth	73.10	14,600	*	21,400	24,700	32,000
McIvor Canal[1]	Cross Section E	53.40	14,100	*	20,600	23,800	30,900
McIvor Canal[1]	Cross Section G	32.60	10,300	*	15,000	17,400	22,500
McIvor Canal[1]	Cross Section H	26.30	9,300	*	13,400	15,700	20,300

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
McIvor Canal[1]	Cross Section I	18.20	7,340	*	10,400	12,100	15,700
McIvor Canal[1]	Cross Section J	11.80	5,200	*	7,320	8,610	11,100
McIvor Canal[1]	Cross Section K	7.65	4,040	*	5,580	6,470	8,300
McIvor Canal[1]	Cross Section L	6.36	3,820	*	5,220	6,030	7,710
McIvor Canal	Approximately 3,900 feet downstream of Goodnight Road	6.93	2,944	3,718	4,179	4,782	5,770
McIvor Canal	Approximately 600 feet downstream of Goodnight Road	5.03	2,456	3,097	3,474	3,960	4,754
McIvor Canal	Approximately 150 feet upstream of Goodnight Road	2.44	1,253	1,550	1,727	1,967	2,360
McIvor Canal	Approximately 400 feet downstream of J Q West Road	0.86	506	636	716	810	976
North Fork Bear Creek	At the confluence with South Fork Bear Creek	4.28	1,514	1,822	2,014	2,324	2,815
North Fork Bear Creek	Approximately 1.3 miles downstream of Old Panola Road	3.71	1,408	1,712	1,900	2,186	2,647
North Fork Bear Creek	Approximately 1.1 miles downstream of Old Panola Road	3.51	1,349	1,643	1,826	2,099	2,542
North Fork Bear Creek	Approximately 3,330 feet downstream of Old Panola Road	3.11	1,225	1,495	1,662	1,909	2,312
North Fork Bear Creek	Approximately 2,330 feet downstream of Old Panola Road	2.80	1,208	1,469	1,629	1,867	2,250

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
North Fork Bear Creek	Approximately 1,650 feet upstream of Old Panola Road	2.41	1,139	1,392	1,544	1,765	2,121
North Fork Bear Creek	Approximately 3,180 feet upstream of Old Panola Road	2.19	1,006	1,234	1,373	1,569	1,892
North Fork Bear Creek	Approximately 1.0 mile upstream of Old Panola Road	1.99	926	1,142	1,275	1,455	1,757
North Fork Bear Creek	Approximately 1.4 miles downstream of U.S. Highway 51	1.71	877	1,081	1,205	1,372	1,649
North Fork Bear Creek	Approximately 1.2 miles downstream of U.S. Highway 52	1.21	769	941	1,042	1,180	1,404
O'Brien Creek	At the confluence with Panola-Quitman Floodway Channel	8.69	2,726	3,362	3,748	4,321	5,235
O'Brien Creek	Approximately 3,840 feet upstream of Figg Road	7.72	2,726	3,362	3,748	4,321	5,235
O'Brien Creek	Approximately 1.5 miles upstream of Figg Road	7.18	2,443	3,039	3,406	3,926	4,777
O'Brien Creek	Approximately 1.3 miles downstream of Chapel Town Road	6.06	2,133	2,647	2,964	3,413	4,150
O'Brien Creek	Approximately 2,960 feet downstream of Chapel Town Road	3.41	1,337	1,642	1,831	2,102	2,548
O'Brien Creek	Approximately 2,560 feet upstream of Chapel Town Road	1.87	964	1,173	1,293	1,463	1,731

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
O’Brien Creek	Approximately 1.2 miles upstream of Chapel Town Road	1.42	964	1,173	1,293	1,463	1,731
O’Brien Creek	Approximately 4,318 feet northwest of State Highway 315	1.02	893	1,095	1,207	1,355	1,589
Peach Creek	Approximately 1.25 miles downstream of Ballentine Road	16.60	4,256	5,327	5,992	6,954	8,521
Peach Creek	At Ballentine Road	15.77	4,256	5,327	5,992	6,954	8,521
Peach Creek	At the confluence of Davis Creek	11.45	3,170	3,983	4,494	5,206	6,393
Peach Creek	Approximately 4,540 feet downstream of Ward Road	10.52	3,104	3,898	4,393	5,081	6,221
Peach Creek	At Ward Road	9.60	2,999	3,784	4,271	4,929	6,028
Peach Creek	At the confluence of Rocky Creek	6.30	2,213	2,822	3,192	3,652	4,433
Peach Creek	Approximately 1,050 feet upstream of State Highway 315	5.90	2,213	2,822	3,192	3,652	4,433
Peach Creek	Approximately 4,300 feet upstream of State Highway 315	5.45	2,213	2,822	3,192	3,652	4,433
Peach Creek	Approximately 2,340 feet downstream of Pleasant Grove Road	4.71	2,064	2,641	2,990	3,412	4,134
Peach Creek	Approximately 300 feet downstream of Pleasant Grove Road	2.32	1,109	1,404	1,585	1,804	2,183

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Peach Creek	Approximately 2,580 feet upstream of Pleasant Grove Road	1.34	729	937	1,059	1,188	1,419
Peach Creek	Approximately 1.0 mile upstream of Pleasant Grove Road	0.98	729	937	1,059	1,188	1,419
Peters Creek	Cross Section A	86.20	19,100	*	28,000	31,900	41,400
Peters Creek	At U.S. Highway 51	66.20	17,800	*	26,000	29,600	38,400
Peters Creek	At Interstate 55	60.90	17,400	*	25,400	29,000	37,500
Peters Creek Tributary 2	At the confluence with Peters Creek	1.60	*	*	*	1,243	*
Peters Creek Tributary 2	Approximately 2,575 feet downstream of Main Street / State Highway 718	1.51	*	*	*	1,204	*
Peters Creek Tributary 2	Approximately 2,750 feet upstream of Main Street / State Highway 718	1.01	*	*	*	1,188	*
Peterson Creek	At the confluence with Davis Creek	1.23	833	1,003	1,102	1,248	1,475
Rocky Creek	At the confluence with Peach Creek	2.80	1,504	1,875	2,093	2,380	2,849
Rocky Creek	At State Highway 315	2.31	1,300	1,635	1,833	2,079	2,491
Rocky Creek	Approximately 3,720 feet upstream of State Highway 315	1.64	1,051	1,347	1,523	1,717	2,058
Running Slough Ditch	Cross Section A	11.30	2,940	*	4,690	5,590	7,320
Running Slough Ditch	Cross Section B	9.25	2,530	*	4,020	4,780	6,250
Running Slough Ditch	Cross Section C	5.07	1,790	*	2,780	3,260	4,230

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Sand Creek	At the confluence with Whitten Creek	2.32	*	*	*	2,405	*
Sand Creek	Approximately 1,700 feet upstream of the confluence with Whitten Creek	2.18	*	*	*	2,371	*
Sand Creek	Approximate 30 feet downstream of U.S. Highway 278 / State Highway 6	1.68	*	*	*	1,771	
Sand Creek	Approximately 430 feet upstream of U.S. Highway 51	1.18	*	*	*	1,131	*
Sand Creek	Approximately 3,820 feet upstream of U.S. Highway 51	0.90	*	*	*	574	*
Sand Creek	Approximately 2,000 feet downstream of the Dam	0.38	*	*	*	574	*
South Fork Bear Creek	At the confluence of North Fork Bear Creek	5.89	1,904	2,317	2,575	2,978	3,623
South Fork Bear Creek	Approximately 1.3 miles downstream of Old Panola Road	4.99	1,894	2,312	2,566	2,953	3,569
South Fork Bear Creek	Approximately 1,800 feet downstream of Old Panola Road	3.09	1,269	1,540	1,706	1,958	2,364
South Fork Bear Creek	Approximately 3,000 feet upstream of Old Panola Road	2.69	1,240	1,514	1,679	1,920	2,308
South Fork Bear Creek	Approximately 600 feet downstream of Sanders Road	1.73	866	1,050	1,162	1,326	1,591

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
South Fork Bear Creek	Approximately 280 feet upstream of Sanders Road	1.55	804	975	1,079	1,230	1,474
South Fork Bear Creek	Approximately 2,770 feet downstream of Harris Road	1.25	732	891	986	1,119	1,336
Stream A[1]	Cross Section A	1.49	1,300	*	1,690	1,840	2,310
Stream A[1]	Cross Section B	1.31	1,210	*	1,560	1,690	2,130
Stream A[1]	Cross Section C	0.71	850	*	1,060	1,110	1,380
Stream A	Approximately 2,000 feet upstream of U.S. Highway 278 / State Highway 6	0.82	676	821	904	1,017	1,196
Stream B	Cross Section A	2.47	1,390	*	1,870	2,160	2,750
Stream B	At State Highway 6	2.17	1,330	*	1,780	2,040	2,590
Stream B	Approximately 1,080 feet downstream of U.S. Highway 278 / State Highway 6	1.65	807	978	1,083	1,236	1,486
Stream B	Approximately 1.4 miles downstream of U.S. Highway 278 / State Highway 6	0.65	519	622	681	767	903
Stream C	Cross Section A	4.03	2,100	*	2,870	3,360	4,290
Stream C	Approximately 830 feet downstream of U.S. Highway 278 / State Highway 6	1.66	866	1,053	1,160	1,311	1,550
Stream C	Approximately 1,500 feet upstream of Farrish Gravel Road	1.42	866	1,053	1,160	1,311	1,550

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Stream C	Approximately 4,820 feet upstream of Farrish Gravel Road	1.24	866	1,053	1,160	1,311	1,550
Stream C	Approximately 1.1 miles upstream of Farrish Gravel Road	1.06	690	845	937	1,060	1,262
Stream D	Cross Section A	7.42[2]	5,550	*	7,500	8,270	10,600
Stream D	Cross Section B	0.99	800	*	1,040	1,150	1,440
Stream E	Cross Section A	7.42[2]	5,550	*	7,500	8,270	10,600
Stream E	Cross Section B	1.06	1,010	*	1,300	1,400	1,760
Taylor Creek	At the confluence with Crooked Creek	1.70	1,008	1,246	1,387	1,572	1,877
Taylor Creek	Approximately 225 feet upstream of the confluence with Crooked Creek	1.68	973	1,206	1,345	1,525	1,825
Taylor Creek	Approximately 2,300 feet upstream of the confluence with Crooked Creek	1.27	864	1,070	1,191	1,344	1,598
Tributary to Cole Creek	At mouth	0.56	536	*	757	857	1,014
Whitten Creek	About 0.5 mile downstream of U.S. Highway 51 (Cross Section A)	2.08	1,990	*	2,660	2,920	3,590
Whitten Creek	At U.S. Highway 51	1.35	1,310	*	1,700	1,900	2,340
Whitten Creek	About 0.5 mile upstream of Railroad	0.82	740	*	950	1,040	1,250

* Not calculated for this Flood Risk Project

[1] Flows were used for the portion of stream studied in FIS 1979

[2] Drainage area includes both Streams D and E

Figure 7: Frequency Discharge-Drainage Area Curves

[Not Applicable to this Flood Risk Project]

Table 10: Summary of Non-Coastal Stillwater Elevations

Flooding Source	Location	Elevations (feet NAVD88)				
		10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Enid Lake	At Dam	*	*	*	273.5	*
Sardis Lake	At Dam	283.1	*	*	285.6	*

* Not calculated for 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
Little Tallahatchie River	07272500	USGS	Little Tallahatchie River at Sardis Dam, MS	1545	08/19/1940	02/25/1983
Long Creek	07275500	USGS	Long Creek at Courtland, MS	66.3	07/12/1960	04/12/2013
Peters Creek	07275530	USGS	Peters (Long) Creek near Pope, MS	79.2	03/18/1987	04/03/2017
Tallahatchie River	07273000	USGS	Tallahatchie River near Sardis, MS	1,595	03/26/1929	03/02/1960
Tallahatchie River	07273550	USGS	Tallahatchie River near Batesville, MS	1,802	01/09/1937	05/03/1984

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 in Table 23, “Floodway Data.”

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 12. Roughness coefficients are provided in Table 13. 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
Armstead Creek	Confluence with McIvor Canal	Approximately 480 feet upstream of Barnacre Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Belmont Creek	Confluence with Little Tallahatchie River	At Kerry Lane	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Blacks Creek	Confluence with McIvor Canal	Just upstream of Macedonia Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Blacks Creek	Just upstream of Macedonia Road	Approximately 1.0 mile upstream of Private Drive	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Bynum Creek	Confluence with Enid Lake	Approximately 2,550 feet upstream of Robison Road	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	
Coldwater River	Approximately 1,540 feet South of Quitman/Tunica County boundary	Approximately 350 feet north of Prichard Road	Regression Equations (USGS 1991)	HEC-RAS 5.0.3 (USACE 2016)	02/23/2018	A	
Cole Creek	Confluence with Little Tallahatchie River	At U.S. Highway 278 / State Highway 6	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	11/06/2017	AE w/ Floodway	For more information see LOMR Case Number 17-04-0231P.

Table 12: Summary of Hydrologic and Hydraulic 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
Cole Creek	At U.S. Highway 278 / State Highway 6	Approximately 550 feet upstream of State Highway 35	Other	Other	05/01/1978	AO	An area in Panola County immediately west of the City of Batesville and south of State Highway 6 was determined to be subject to shallow flooding. For purposes of the NFIP, shallow flooding is defined as flooding which is limited to 3.0 feet or less in depth and unrelated to or not readily associated with channel flooding and flood profiles, and where reliable determinations of depths, extent of flooding, and direction of flow by hydraulic backwater computations are extremely difficult, if not impossible. The type of shallow flooding occurring in this area of Panola County is sheet runoff. Sheet runoff is the broad, relatively unconfined downslope movement of water across gently sloping terrain that results from many sources including intense rainfall, overflow from a channel which crosses a drainage divide, and alluvial fan flow. Sheet runoff is typical in areas of low topographic relief. This area subject to shallow flooding in Panola County was identified from routings, field reconnaissance, local inquiries and examination of topographic maps (FIS 1979 Nov).
Cole Creek	Approximately 550 feet upstream of State Highway 35	Approximately 1.0 mile upstream of State Highway 35	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	
Crooked Creek	Confluence with McIvor Canal	Approximately 2,100 feet upstream of the confluence of Taylor Creek	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Davidson Creek	Confluence with McIvor Canal	Approximately 1,380 feet upstream of Ballentine Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	

Table 12: Summary of Hydrologic and Hydraulic 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
Davis Creek	Confluence with Peach Creek	Approximately 4,500 feet upstream of Sexton Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
East Floyd Creek	Confluence with McIvor Canal	Approximately 4,580 feet upstream of Braham Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Enid Lake	At Enid Dam Road	Lafayette County boundary	Other	Other	07/01/2009	AE	The 1% annual chance base flood elevations for Enid and Grenada Lakes were determined by analysis of USACE historical stage records from 1954-2008 (USACE 2009, FIS 2010).
Flowers Creek	Approximately 1.1 miles upstream of the confluence with Enid Lake	Approximately 1.6 miles upstream of the confluence with Enid Lake	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	
Fowler Creek	Panola / Quitman County boundary	Just upstream of Old Crenshaw Road / Hillside Drive	Regression Equations (USGS 1991)	FLO-2D v. 2009.06 (FLO-2D 2010)	08/01/2010	AE	Detailed information about Fowler Creek is provided in the narrative below.
Floyd Creek	Approximately 1.7 miles downstream of Pumping Station Road	Approximately 1.6 miles upstream of Private Drive	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Goodwin Creek	Confluence with Long Creek	At Baker Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Hayne Creek	Confluence with Panola-Quitman Floodway Channel	Approximately 3,530 feet upstream of Chapel Town Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Hog Creek	Approximately 2.9 miles downstream of Pumping Station Road	Approximately 1.2 miles upstream of Pumping Station Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	

Table 12: Summary of Hydrologic and Hydraulic 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
Hotophia Creek	Confluence with Little Tallahatchie River	Approximately 5,050 feet upstream of State Highway 315	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Final peak discharges were computed by adding the spillway outflow from the floodwater retarding structures to the peak flows computed for the uncontrolled drainage areas. Adjustments for urbanization effects, if required, were made according to the methodology presented by the USGS in *An Approach to Estimating Flood Frequency for Urban Areas in Oklahoma* (USGS 1974).
Johnson Creek	Confluence with Peters Creek	At Henderson Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Jones Creek	Confluence with Little Tallahatchie River	Approximately 1.1 miles upstream of Central Academy Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Panola-Quitman Floodway Channel	Yalobusha County boundary	At U.S. Highway 278 / State Highway 6	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	This section is also referred to as "Panola-Quitman Channel", "Panola-Quitman Floodway", and "Little Tallahatchie River". The approximate study performed for the 2017 FIS modeled the stream as "Little Tallahatchie River". The evaluation of the Panola-Quitman Floodway Levee was performed by USACE. Additional information can be found in "USACE Process for the National Flood Insurance Program Levee System Evaluation for the Panola-Quitman Floodway Levee" (USACE 2011).
Little Tallahatchie River	At U.S. Highway 278 / State Highway 6	Approximately 3.7 miles upstream of the confluence of Jones Creek	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Detailed information about Little Tallahatchie River is provided in the narrative below.

Table 12: Summary of Hydrologic and Hydraulic 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
Long Creek	Confluence with Johnson Creek / Peters Creek	At Eureka Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak flows computed from the regional relationships were adjusted for compatibility with streamflow records obtained from a gaging station on Peters Creek. Values for the 10, 2, 1, and 0.2% annual chance peak discharges at this location were obtained from a log-Pearson Type III distribution (NOAA 2010) of annual peak flow data for the 36-year period of record from 1940-1975 (USWRC 1976).
McIvor Canal	Confluence with Little Tallahatchie River	Approximately 1.7 miles upstream of Old Panola Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
McIvor Canal	Approximately 1.7 miles upstream of Old Panola Road	Approximately 4,390 feet upstream of JQ West Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
North Fork Bear Creek	Confluence with South Fork Bear Creek	Approximately 2,020 feet upstream of U.S. Highway 51	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
O'Brien Creek	Confluence with Panola-Quitman Floodway Channel	Approximately 1,650 feet upstream of Dam	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Peach Creek	Approximately 1.5 miles downstream of Ballentine Road	Approximately 1.5 miles upstream of Pleasant Grove Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Peters Creek	Confluence with Yocona River	Approximately 4,000 feet upstream of confluence with Yocona River	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	

Table 12: Summary of Hydrologic and Hydraulic 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
Peters Creek	Approximately 4,000 feet upstream of confluence with Yocona River	Confluence with Johnson Creek / Long Creek	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak flows computed from the regional relationships were adjusted for compatibility with streamflow records obtained from a gaging station on Peters Creek. Values for the 10, 2, 1, and 0.2% annual chance peak discharges at this location were obtained from a log-Pearson Type III distribution (NOAA 2010) of annual peak flow data for the 36-year period of record from 1940-1975 (USWRC 1976).
Peters Creek Tributary 1	Confluence with Peters Creek	Approximately 2,620 feet upstream of Main Street	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	
Peters Creek Tributary 2	Confluence with Peters Creek	Approximately 3,560 feet upstream of State Highway 718	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	Due to the use of the Digital Terrain Model that was used in the 2017 FIS as the basis for mapping, selected streams were analyzed using an enhanced approximate approach instead of limited detailed studies. The differences between enhanced approximate and limited detailed studies are that Zone A designation is applied, Base Flood Elevations and cross sections are not shown on the DFIRMs, and no flood profiles are included in the FIS report for the enhanced approximate streams. Limited detailed survey methods were still used and floodway analyses were performed for these streams. In the event newer topographic data becomes available, the streams studied by enhanced approximate methods can easily be converted back to a traditional limited detailed study (FIS 2017). This stream did not fall in the updated HUC-8 boundary for this Flood Risk Project, therefore it was not converted.

Table 12: Summary of Hydrologic and Hydraulic 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
Peters Creek Tributary 3	Confluence with Peters Creek	Approximately 560 feet upstream of McNeely Road	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	
Peterson Creek	Confluence with Davis Creek	Approximately 3,390 feet upstream of Sexton Road	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Rocky Creek	Confluence with Peach Creek	Approximately 1.6 miles upstream of State Highway 315	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Running Slough Ditch	Confluence with Little Tallahatchie River	Approximately 1.1 miles upstream of confluence of Stream C	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).

Table 12: Summary of Hydrologic and Hydraulic 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
Sand Creek	Confluence with Whitten Creek	Approximately 1.6 miles upstream of County Club Road	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	An approximate study on Sand Creek (modeled as Whitten Creek Tributary) was completed by Mendrop Engineering Services and included in the May 2017 FIS. Due to the use of the Digital Terrain Model that was used in the 2017 FIS as the basis for mapping, selected streams were analyzed using an enhanced approximate approach instead of limited detailed studies. The differences between enhanced approximate and limited detailed studies are that Zone A designation is applied, Base Flood Elevations and cross sections are not shown on the DFIRMs, and no flood profiles are included in the FIS report for the enhanced approximate streams. Limited detailed survey methods were still used and floodway analyses were performed for these streams. In the event newer topographic data becomes available, the streams studied by enhanced approximate methods can easily be converted back to a traditional limited detailed study (FIS 2017). This stream did not fall in the updated HUC-8 boundary for this Flood Risk Project, therefore it was not converted.
Sardis Lake	At dam	Lafayette County boundary	Other	Other	07/01/2009	AE	The 1% annual chance base flood elevations for by analysis of USACE historical stage records from 1954-2008 (USACE 2009, FIS 2010).
South Fork Bear Creek	Confluence with McIvor Canal	Approximately 4,270 feet upstream of U.S. Highway 51	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	

Table 12: Summary of Hydrologic and Hydraulic 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
Stream A	Confluence with Running Slough Ditch	Approximately 3,300 feet upstream of State Highway 6	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Stream A	Approximately 3,300 feet upstream of State Highway 6	Approximately 1,170 feet upstream of Private Drive	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Stream B	Confluence with Running Slough Ditch	At U.S. Highway 278 / State Highway 6	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	An area in Panola County immediately west of the City of Batesville and south of State Highway 6 was determined to be subject to shallow flooding. For purposes of the NFIP, shallow flooding is defined as flooding which is limited to 3.0 feet or less in depth and unrelated to or not readily associated with channel flooding and flood profiles, and where reliable determinations of depths, extent of flooding, and direction of flow by hydraulic backwater computations are extremely difficult, if not impossible. The type of shallow flooding occurring in this area of Panola County is sheet runoff. Sheet runoff is the broad, relatively unconfined downslope movement of water across gently sloping terrain that results from many sources including intense rainfall, overflow from a channel which crosses a drainage divide, and alluvial fan flow. Sheet runoff is typical in areas of low topographic relief. This area subject to shallow flooding in Panola County was identified from routings, field reconnaissance, local inquiries and examination of topographic maps (FIS 1979 Nov).
Stream B	At U.S. Highway 278 / State Highway 6	Approximately 5,000 feet upstream of Dam	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	

Table 12: Summary of Hydrologic and Hydraulic 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
Stream C	Confluence with Running Slough Ditch	At U.S. Highway 278 / State Highway 6	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	An area in Panola County immediately west of the City of Batesville and south of State Highway 6 was determined to be subject to shallow flooding. For purposes of the NFIP, shallow flooding is defined as flooding which is limited to 3.0 feet or less in depth and unrelated to or not readily associated with channel flooding and flood profiles, and where reliable determinations of depths, extent of flooding, and direction of flow by hydraulic backwater computations are extremely difficult, if not impossible. The type of shallow flooding occurring in this area of Panola County is sheet runoff. Sheet runoff is the broad, relatively unconfined downslope movement of water across gently sloping terrain that results from many sources including intense rainfall, overflow from a channel which crosses a drainage divide, and alluvial fan flow. Sheet runoff is typical in areas of low topographic relief. This area subject to shallow flooding in Panola County was identified from routings, field reconnaissance, local inquiries and examination of topographic maps (FIS 1979 Nov).
Stream C	At U.S. Highway 278 / State Highway 6	Approximately 1.1 miles upstream of Private Drive	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Stream D	Confluence with Little Tallahatchie River	Approximately 1,750 feet upstream of River Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Stream D	Approximately 1,750 feet upstream of River Road	At U.S. Highway 51	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	

Table 12: Summary of Hydrologic and Hydraulic 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
Stream E	Confluence with Stream D	Approximately 2,355 feet upstream of River Road	Other	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Peak discharge-frequency relationships were derived using USGS regional relationships developed for Mississippi (USGS 1976).
Stream E	Approximately 2,355 feet upstream of River Road	At U.S. Highway 51	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	
Taylor Creek	Confluence with Crooked Creek	Approximately 1.7 miles upstream of the confluence with Crooked Creek	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	07/10/2017	AE	
Tributary to Cole Creek	Confluence with Little Tallahatchie River	At U.S. Highway 278 / State Highway 6	Regression Equations (USGS 1991)	HEC-RAS 4.1.0 (USACE 2010)	11/06/2017	AE w/ Floodway	For more information see LOMR Case Number 17-04-0231P.
Whitten Creek	Approximately 3,020 feet downstream of U.S. Highway 51	At Oak Ridge Lane / Coon Road	Regression Equations (USGS 1976)	HEC-2 (USACE 1976)	05/01/1978	AE w/ Floodway	Note this study was only published, and not studied in the Flood Insurance Study for the City of Batesville, September 15, 1989. The hydrologic and hydraulic analyses for this study were obtained from the Flood Insurance Study for Panola County (FIS 1989).
Whitten Creek	Approximately 50 feet upstream of State Highway 35	Approximately 300 feet upstream of Oak Ridge Lane / Coon Road	Regression Equations (USGS 1976)	HEC-2 4.6.2 (USACE 1991)	03/03/2006	AE w/ Floodway	See LOMR 04-04-401P for more information.
Yellow Lake Bayou	Approximately 0.9 miles downstream of the Panola/Quitman County boundary	Approximately 0.6 miles upstream of Robert Holder Road	Regression Equations (USGS 1991)	HEC-RAS 5.0.3 (USACE 2016)	02/23/2018	A	
Yellow Lake Bayou Tributary	At confluence with Yellow Lake Bayou	Approximately 1.6 miles upstream of confluence with Yellow Lake Bayou	Regression Equations (USGS 1991)	HEC-RAS 5.0.3 (USACE 2016)	02/23/2018	A	

Table 12: Summary of Hydrologic and Hydraulic 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
Whitten Creek	Approximately 300 feet upstream of Oak Ridge Lane / Coon Road	Approximately 1,110 feet upstream of Shamrock Drive	Regression Equations (USGS 1991)	HEC-RAS 4.0.0 (USACE 2008)	08/01/2010	AE w/ Floodway	Discharges for the 10, 2, 1, and 0.2% percent annual chance recurrence interval for Whitten Creek were determined using Rural-West Region USGS regression equations for rural areas in Mississippi found in USGS Water-Resources Investigations Report 91-4037. Adjustments for urbanization effects were made according to the methodology presented by the USGS in “Flood Characteristics of Urban Watersheds in the United States” (USGS 1983).
Yocona River	Yalobusha County boundary	Approximately 4.4 miles upstream of the confluence of Peters Creek	Regression Equations (USGS 1991)	HEC-RAS 3.1.2 (USACE 2004)	08/01/2010	A	

Special Considerations (continued)

Fowler Creek

Floodplain boundaries for the detail study of Fowler Creek were delineated based on LIDAR data from the U.S. Army Corps of Engineers (Coldwater 2004).

Peak discharge-frequency data for the 1% annual chance flood for the uncontrolled drainage basin of Fowler Creek at Crenshaw were computed using regional relationships developed by the USGS (USGS 1976). To obtain final peak discharge-frequency data, the discharge rates from the four floodwater retarding structures within the basin were added to the discharges for the uncontrolled portion of the basin. This peak discharge was fit to a unit hydrograph which was incorporated into the hydraulic model.

The hydraulic analysis for Fowler Creek was conducted using FLO-2D (ESRI 2008), which is a two dimensional, dynamic flood routing model that simulates channel flow, unconfined flow and street flow. Two models were constructed for Fowler Creek: a with levee model and a without levee model. The only difference between the two models was the presence of the levees in the with levee model. Preparation of the hydraulic model was achieved through the use of the FLO-2D Grid Developer System (GDS) and ESRI's ArcMap program (FLO-2D 2010). GDS is a FLO-2D preprocessor developed by FLO-2D Software Inc. for use in developing FLO-2D models. ArcMap is a Geospatial Information System Platform developed by ESRI. Data including overland flow Manning's 'n' values, levee data, transportation lines, building footprints, location of inflowing hydrographs, model extents, and terrain elevation, were prepared in ArcMap and then imported into GDS. The channel geometry was improved through the incorporation of the previously effective study's structure survey and surveyed cross sections. The transportation lines, overland flow Manning's 'n' values, and building footprints were all obtained from aerial imagery (EDI 2007). The various data was not input into GDS all at once. The data was entered into GDS in stages. Once the data for a stage was entered it was checked for accuracy and completeness. Once verified, a FLO-2D model was built and run. Through several iterations, the data was slightly adjusted to increase model stability and speed. Once the model was stable and completing calculations in a reasonable time, the next stage of data was added to GDS and the process repeated, but this time including the next stage of data in the run. This process was repeated until all data was in the model and the model was running stable and at a reasonable calculation time.

Water surface profiles were developed for the 1% annual chance flood for Fowler Creek and the overbank flooding from the FLO-2D model results (FIS 2017).

Little Tallahatchie River

Peak discharge-frequency data for the Little Tallahatchie River were derived from streamflow records obtained from two gaging stations on the reach of the stream being studied.

A gage was established on the Little Tallahatchie River at Mississippi State Highway 6 by the USACE on February 23, 1940 (USGS Gage ID 07273550). For the 1979 FIS, values for the 10, 2, 1, and 0.2% annual chance peak discharges at this location were obtained from a log-Pearson Type III distribution of annual peak-flow data for the 35-year period from 1942 to 1976. The period of analysis was begun in 1942 because this was the first year in which the Sardis Dam was fully operational. The computations were performed using guidelines in Bulletin No. 17 (USWRC 1976).

The USACE also maintained a recording gage on the Little Tallahatchie River at the Belmont Bridge during the period 1929-1959. Belmont Bridge is located about five miles downstream from Sardis Lake. The gage was dis-continued on March 24, 1960. A unit hydrograph for the Little Tallahatchie River at this location was developed from rainfall-runoff records. Discharge records from another gaging station on the Little Tallahatchie River at the Sardis Lake outlet were used to separate the discharge basin downstream of the dam. Consequently, the unit hydrograph represents discharge only from the Little Tallahatchie River drainage basin below Sardis Lake. Values for the 10, 2, and 1% annual chance discharges at the Belmont Bridge location were obtained from the unit hydrograph and rainfall data derived from the U.S. Department of Commerce publication, Rainfall Frequency Atlas of the United States (USDC 1963). The 0.2% annual chance discharge was determined by straight-line extrapolation of a single-log graph of the 10, 2, and 1% annual chance discharges. Final discharge values at the Belmont Bridge locations were determined by adding 2,500 cfs to the values computed by the unit hydrograph. The 2,500 cfs was added to account for base flow in the stream and possible discharge from Sardis Lake. Discharges at intermediate locations on the Little Tallahatchie River were proportioned based on drainage area (FIS 1979, Nov).

Note this study was only published, and not studied in the Flood Insurance Study for the City of Batesville, September 15, 1989. The hydrologic and hydraulic analyses for this study were obtained from the Flood Insurance Study for Panola County (FIS 1989).

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Armstead Creek	0.038-0.050	0.035-0.160
Belmont Creek	0.040-0.060	0.080-0.150
Blacks Creek[1]	0.040-0.060	0.080-0.150
Blacks Creek[2]	0.035-0.045	0.035-0.160
Bynum Creek	0.045-0.050	0.130-0.150
Coldwater River	0.040	0.040-0.150
Cole Creek[2]	0.045-0.060	0.080-0.120
Cole Creek[1]	N/A	N/A
Cole Creek[3]	0.050	0.150
Crooked Creek	0.040-0.045	0.045-0.160
Davidson Creek	0.045	0.035-0.160
Davis Creek	0.04-0.045	0.045-0.160
East Floyd Creek	0.035-0.055	0.035-0.160
Enid Lake	N/A	N/A
Flowers Creek	0.050	0.150
Fowler Creek	0.050-0.055	0.060-0.150
Floyd Creek	0.035-0.045	0.035-0.150
Goodwin Creek	0.040-0.060	0.080-0.150
Hayne Creek	0.035-0.058	0.033-0.160
Hog Creek	0.03-0.055	0.035-0.150
Hotophia Creek	0.040-0.060	0.080-0.150
Johnson Creek	0.040-0.060	0.080-0.150
Jones Creek	0.040-0.060	0.080-0.150
Panola-Quitman Floodway Channel	0.040	0.110
Little Tallahatchie River	0.035	0.080-0.120
Long Creek	0.040-0.060	0.080-0.150
McIvor Canal[1]	0.040-0.060	0.080-0.150
McIvor Canal[2]	0.035-0.058	0.035-0.160
North Fork Bear Creek	0.040-0.058	0.033-0.160
O'Brien Creek	0.030-0.058	0.035-0.160
Peach Creek	0.045	0.045-0.160
Peters Creek[3]	0.043-0.055	0.122-0.155
Peters Creek[1]	0.040-0.060	0.080-0.150

Table 13: Roughness Coefficients (continued)

Flooding Source	Channel "n"	Overbank "n"
Peters Creek Tributary 1	0.050	0.150
Peters Creek Tributary 2	0.042-0.055	0.100-0.150
Peters Creek Tributary 3	0.050	0.150
Peterson Creek	0.030-0.0450	0.05-0.160
Rocky Creek	0.035-0.060	0.035-0.160
Running Slough Ditch	0.040-0.060	0.080-0.150
Sand Creek	0.042-0.045	0.070-0.150
Sardis Lake	N/A	N/A
South Fork Bear Creek	0.045	0.035-0.160
Stream A[1]	0.040-0.060	0.080-0.150
Stream A[2]	0.040-0.050	0.050-0.150
Stream B[1]	0.040-0.060	0.080-0.150
Stream B[2]	0.045	0.033-0.160
Stream C[1]	0.040-0.060	0.080-0.150
Stream C[2]	0.035-0.055	0.035-0.160
Stream D[1]	0.040-0.060	0.080-0.150
Stream D[3]	0.050	0.150
Stream E[1]	0.040-0.060	0.080-0.150
Stream E[3]	0.050	0.150
Taylor Creek	0.045-0.055	0.050-0.160
Tributary to Cole Creek	0.040	0.050
Whitten Creek[1]	0.040-0.060	0.080-0.150
Whitten Creek[3]	0.040-0.050	0.020-0.100
Whitten Creek[3]	0.042-0.045	0.070-0.150
Yellow Lake Bayou	0.060	0.030-0.060
Yellow Lake Bayou Tributary	0.060	0.030-0.060
Yocona River	0.040-0.060	0.110-0.180

[1] Studied during the November 4, 1979 FIS Report

[2] Studied during the TBD FIS Report

[3] Studied during the May 16, 2017 FIS Report

5.3 Coastal Analyses

This section is not applicable to this Flood 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 Flood 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 Flood Risk Project.

5.3.3 Coastal Erosion

This section is not applicable to this Flood Risk Project.

5.3.4 Wave Hazard Analyses

This section is not applicable to this Flood 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 Flood Risk Project.

Table 17: Summary of Alluvial Fan Analyses

[Not Applicable to this Flood 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 Panola County are provided in Table 19.

Table 19: Countywide Vertical Datum Conversion

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Average Conversion from NGVD29 to NAVD88 = -0.030 feet (FIS 2017)				

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
County Boundary	MARIS (Mississippi Automated Resource Information System)	01/01/2007	1:24,000	S_Pol_Ar. County boundary (MARIS 2007)
County Boundary	MARIS	05/20/2015	1:24,000	S_Pol_Ar. County boundary (MARIS 2015)
Digital Orthophoto	MARIS	02/26/2016	1:6,300	S_Base_Index Orthophotography. S_Base_Index table contains information about the raster data used as a base map for the study area. (Surdex 2016)
Digital Orthophoto	National Agriculture Imagery Program	07/14/2016	1:12,000	S_Base_Index Orthophotography. S_Base_Index table contains information about the raster data used as a base map for the study area. (NAIP)
Digital Orthophoto	State of Mississippi	03/04/2006	N/A	Ortho Imagery Base Index (MS 2006)
Municipal boundaries	MARIS	01/01/2010	1:5,000	S_Pol_Ar. Political Boundaries (MARIS 2010)
Political boundaries	U.S. Census Bureau	01/01/2010	N/A	S_Pol_Ar. Incorporated Cities (USCB 2010)
Political boundaries	MARIS	01/01/1990	N/A	S_Pol_Ar. Political Boundaries (MARIS 1990)
Political boundaries	City of Batesville	09/14/2010	N/A	S_Pol_Ar. Political Boundaries
Public Land Survey System (PLSS)	MARIS	01/01/2010	N/A	S_PLSS_Ar. Statewide Sections (MARIS 2010)
Public Land Survey System (PLSS)	MARIS	01/01/1990	N/A	PLSS Grid. Public Land Survey System (MARIS 1990_2)
Surface Water Features	United States Geological Survey	03/29/2016	N/A	S_Wtr_Ln. Waterlines (USGS)

Table 21: Base Map Sources (continued)

Data Type	Data Provider	Data Date	Data Scale	Data Description
Surface Water Features	National Hydrography Dataset	01/01/2008	N/A	S_Wtr_Ln. Hydrology (NHD 2008)
Transportation Features	Mississippi Department of Transportation	12/14/2015	N/A	S_Trnsport_Ln. Roads (MDOT 2015)
Transportation Features	U.S. Census Bureau	01/01/2008	N/A	S_Trnsport_Ln. Transportation (TIGER 2008)
Transportation Features	MARIS	01/01/2000	N/A	S_Trnsport_Ln. Railroads (MARIS 2000)
Transportation Features	Mississippi Department of Transportation	05/01/2017	1:100,000	Local Roads were collected by digitizing the linework from the MDEM 2006 Imagery. State Maintained routes were aligned and modified using the MDEM 2006 Imagery (MDOT 2017)

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."

Certain flooding sources may have been studied that do not have published BFEs on the FIRMs, or for which there is a need to report the 1% annual chance flood elevations at selected cross sections because a published Flood Profile does not exist in this FIS Report. These streams may have also been studied using methods to determine non-encroachment zones rather than floodways. For these flooding sources, the 1% annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22. All topographic data used for modeling or mapping has been converted as necessary to NAVD88. The 1% annual chance elevations for selected cross sections along these flooding sources, along with their non-encroachment widths, if calculated, are shown in Table 24, "Flood Hazard and Non-Encroachment Data for Selected Streams."

Table 22: Summary of Topographic Elevation Data used in Mapping

		Source for Topographic Elevation Data			
Community	Flooding Source	Description	Vertical Accuracy	Horizontal Accuracy	Citation
Batesville, City of; Panola County, Unincorporated Areas; Sardis, City of	All within HUC-8 08030202	Light Detection and Ranging data (LiDAR)	0.09 m RMSE	2 ft	LIDAR MS Delta 2010
Como, Town of; Courtland, Town of; Crenshaw, Town of; Panola County, Unincorporated Areas; Pope, Village of	All within HUC-8 08030201 08030203 08030204	Digital Terrain Model (DTM) and contours	N/A	N/A	FEI 2010
Panola County, Unincorporated Areas	Coldwater River, Yellow Lake Bayou, Yellow Lake Bayou Tributary	1 meter Resolution Light Detection and Ranging data (LiDAR)	0.09 m RMSE	1 m	USACE 2010 LIDAR

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.