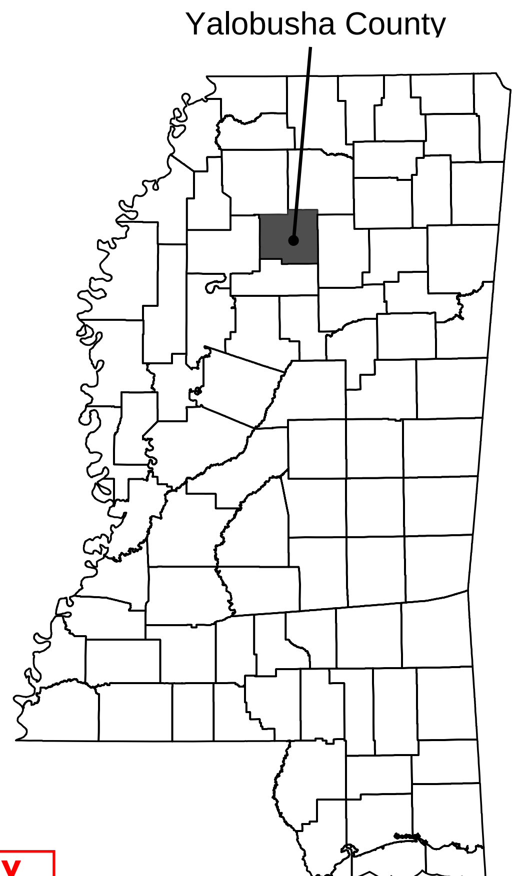
FLOOD INSURANCE STUDY



YALOBUSHA COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
COFFEEVILLE, TOWN OF	280186
OAKLAND, TOWN OF	280360
WATER VALLEY, CITY OF	280187
YALOBUSHA COUNTY (UNINCORPORATED AREAS)	280239

PRELIMINARY
JUL 17 2009

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28161CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective:

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FLOOD INSURANCE STUDY
YALOBUSHA COUNTY, MISSISSIPPI AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates information on the existence and severity of flood hazards in the geographic area of Yalobusha County, Mississippi, including the City of Water Valley; the Towns of Coffeeville and Oakland; and the unincorporated areas of Yalobusha County (referred to collectively herein as Yalobusha County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

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

1.2 Authority and Acknowledgments

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

This FIS was prepared to include the unincorporated areas of, and incorporated communities within, Yalobusha County in a countywide format.

For this countywide FIS, new hydrologic and hydraulic analyses were prepared by AECOM Water and the State of Mississippi for the Federal Emergency Management Agency (FEMA), under Contract No. EMA-2006-CA-5617. This study was completed in --- 2009.

Base map information shown on the FIRM was provided in digital format by the Mississippi automated Resource Information System. The digital orthoimagery was photogrammetrically compiled at a scale of 1:400 from aerial photography dated March 2006.

The digital FIRM was produced using the Mississippi State Plane Coordinate System, West Zone, FIPSZONE 2302. The horizontal datum was the North American Datum of 1983, GRS80 spheroid. Distance units were measured in U.S. feet.

1.3 Coordination

For this countywide FIS, an initial CCO meeting was held with the representatives from FEMA, the impacted communities, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods on _______________. A final meeting, the Preliminary DFIRM Community Coordination (PDCC) was held on _________________to review the results of this study.

For this countywide FIS, the Project Scoping Meeting was held on January 11, 2007 in Coffeeville, MS. Attendees for these meetings included representatives from the Mississippi Department of Environmental Quality, Mississippi Emergency Management Agency, FEM National Service Provider, Yalobusha County, and the Study Contractors. Coordination with county officials and Federal, State, and regional agencies produced a variety of information pertaining to floodplain regulations, available community maps, flood history, and other hydrologic data.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the geographic area of Yalobusha County, Mississippi, including the incorporated communities listed in Section 1.1.

No new detail studies have been performed for this countywide study.

An enhanced approximate study was performed along Durden Creek, Enid Lake, Grenada Lake, Johnson Creek, Otoucalofa Creek, Otoucalofa Creek Tributary 1, Skuna River, Town Creek and Turkey Creek.

For this countywide study, enhanced approximate study streams are shown in Table 1. "Scope of Study."

Table 1. Limits of New Detailed and Enhanced Approximate Studies

Stream	Limits of New Enhanced Approximate Study
Durden Creek	From the confluence with Turkey Creek to approximately 335 feet upstream of State Highway 7.
Grenada Lake	From the Grenada/Yalobusha countyline to the confluence with Skuna River.
Johnson Creek	From the confluence with Otoucalofa Creek to approximately 3.4miles upstream of the confluence with Otoucalofa Creek.
Otoucalofa Creek	From the confluence with Yocona River to approximately 880 feet upstream of South Main Street.
Otoucalofa Creek Tributary 1	From the confluence with Otoucalofa Creek to approximately 0.7 mile upstream of State Highway 7.
Skuna River	From the confluence with Grenada Lake to the Calhoun/Yalobusha countyline.

Table 1. Scope of Study

Town Creek	From the confluence with Otoucalofa Creek to approximately 690 feet upstream of North Court Street.
Turkey Creek	From the confluence with Skuna River to approximately 1.4 miles upstream of State Highway 330.
Yocona River	From approximately 0.7 mile downstream of Highway 51 to the Lafayette/Yalobusha countyline.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA, Yalobusha County, and the Study Contractor.

2.2 Community Description

Yalobusha County, and its county seats, the City of Water Valley and the Town of Coffeeville, are located in north-central Mississippi. The county is bounded on the north by Panola and Lafayette Counties; on the east Calhoun County, on the south by Grenada County, and on the west by Tallahatchie County. State Highways 7, 32, 315, and 330 along with the Highway 51 are the primary transportation routes serving the county. The land area of Yalobusha County covers approximately 467 square miles.

The population of Yalobusha County was estimated to be 13,645 (U.S. Census Bureau, 2008).

The climate of Yalobusha County is characterized by hot and humid summers, and short mild winters. Temperatures vary from a mean low of 50 degrees Fahrenheit (^{O}F) in January to a mean high of 73 degrees Fahrenheit (^{O}F) in July. Annual precipitation over the study area averages 56 inches (National Weather Service, 2009).

2.3 Principal Flood Problems

The principle flooding sources affecting Yalobusha County appear to be small stream flooding following intense, localized thunderstorms. Occasional backwater flooding from Enid and Grenada Lakes has occurred after more, steady, prolonged rain events. The highest stage recorded on Enid Lake was 271.7 on May 1, 1991. The highest stage recorded on Grenada Lake was 237.3 on May 29, 1991. Flooding along Town Creek in Water Valley has been alleviated since completion of the Railroad Street Culvert project in the mid-1990's.

2.4 Flood Protection Measures

Enid and Grenada Lakes are large flood control reservoirs located in the northwest and south portions of the county, respectively. They are part of the Yazoo Headwaters Flood Control Project, authorized in 1936. Enid Lake is a 17,000 acre flood control reservoir in Lafayette, Panola, and Yalobusha Counties. The lake was completed by the USACE in December 1952. Enid Lake was designed to control the floodwaters of the Yocona River to prevent flooding in the Mississippi Delta. The lake has a storage capacity of 602,400 acre-feet. Grenada Lake is a 36,000 acre flood control reservoir in Grenada and

Yalobusha Counties. The lake was completed by the USACE in January 1954 by the USACE and was designed to control flooding of the Mississippi Delta by the Yalobusha River. Neither Enid Lake nor Grenada Lake provides meaningful protection from the 1-percent-annual-chance flood upstream of the flood control structures.

Two smaller flood control reservoirs, built and maintained by USDA—Natural Resources Conservation Service, are located on tributaries of Town Creek, north of Water Valley. These structures reduce the magnitude of the 1-percent-annual-chance flood on Town Creek.

A levee is located along the southern edge of Coffeeville, and appears to be built for protect against backwater flooding from Grenada Lake. The USACE Vicksburg District constructed the levee, but the date of construction is not confirmed. The levee is not recognized on the FIRM dated September 4, 1986, and currently the levee has not been certified to provide protection from the 1-percent-annual-chance flood per 40 CFR 65.10.

3.0 ENGINEERING METHODS

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

3.1 Hydrologic Analyses

For this countywide study, hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by enhanced approximate and approximate methods affecting the community.

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by limited detail methods affecting the communities. Peak discharges were calculated based on USGS regional regression equations (U.S. Department of the Interior, 1991). For the discharges calculated based on regional regression equations, the rural regression values were modified to reflect stream gage weighting, flood control, and urbanization as necessary. The 1-percent-annual-chance discharge for the Yocona River downstream of Enid Lake was determined by averaging the results of Log-Pearson Type 3 analysis and stage-discharge analysis, based on the April, 1973 flood.

Drainage areas along streams were determined using a flow accumulation grid developed from the USGS 10 meter digital elevation models and corrected National Hydrologic Data (NHD) stream coverage. Flow points along stream centerlines were calculated using the regression equations in conjunction with accumulated area for every 10 percent increase in flow along a particular stream.

3.2 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. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. 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 in conjunction with the data shown on the FIRM.

Analyses of the hydraulic characteristics of flooding from the sources studied by enhanced approximate and approximates were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross section geometries were obtained from a combination of terrain data and field surveys. Bridges and culverts located within the enhanced approximate study limits were field surveyed to obtain elevation data and structural geometry.

Downstream boundary conditions for enhanced approximate hydraulic models were set to normal depth using a starting slope calculated from values taken from topographic data, or where applicable, derived from the water-surface elevations. All water-surface profiles were computed through the use of the USACE HEC-RAS version 3.1.3 computer program (USACE, 2003). The model was run for the 1-percent annual chance storm for the limited detail and approximate studies.

The 1-percent-annual-chance base flood elevations for Enid and Grenada Lakes were determined by analysis of USACE historical stage records from 1954-2008 (USACE, 2009). These elevations are presented in Table 2. “Summary of Stillwater Elevations”.

TABLE 2. Summary of Stillwater Elevations

	Elevation (Feet)			
Flooding Source and Location	10-percent	2-percent	1-percent	0.2-percent
Enid Lake				
At Dam	*	*	273.5	*
Grenada Lake				
At Dam	*	*	236.9	*

* Data Not Available

The approximate study methodology used Watershed Information SystEm (WISE) (AECOM Water, 2008) as a preprocessor to HEC-RAS. Tools within WISE allowed the engineer to verify that the cross-section data was acceptable. The WISE program was used to generate the input data file for HEC-RAS. Then HEC-RAS was used to determine the flood elevation at each cross section of the modeled stream. No floodway was calculated for streams studied by approximate methods.

The hydraulic analyses for this study are based only on the effect on unobstructed flow. The flood elevations as shown on the profiles are thus considered valid only if hydraulic structures in general remain unobstructed and do not fail.

Floodplains were mapped to include backwater effects that govern each flooding source near its downstream extent. Floodplains were reviewed for accuracy and adjusted as necessary.

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Benchmarks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)

- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)

- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monuments below frost line)

- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS benchmarks, the FIRM may also show vertical control monument established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for benchmarks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit its website at http://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 Technical Support Data Notebook associated with the FIS report and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Vertical Datum

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 in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum. Flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. It is important to note that adjacent counties may be referenced to NGVD 29. This may result in differences in base flood elevations across county lines.

The elevations shown in the FIS report and on the FIRM for Yalobusha County are referenced to NAVD88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD29, add 0.04 feet to the NAVD88 elevation. The 0.04 feet value is an average for the entire county. The adjustment value was determined using the USACE Corpscon 6.0.1 computer program (USACE, 2004) and topographic maps (U.S. Department of the Interior, 1983). The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 12.4 feet will appear as 12 feet on the FIRM and 12.6 feet as 13 feet. Users who wish to convert the elevations in this FIS report to NGVD29 should apply the stated conversion factor to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FI-20/June 1992, or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http: www.ngs.noaa.gov).

4.0 <u>FLOODPLAIN MANAGEMENT APPLICATIONS</u>

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance floodplain data. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes.

For this revision, for the streams studied by enhanced approximate and approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 1). Floodplain boundaries for these streams were generated using USGS 10-meter Digital Elevation Models (USGS), and then refined using detailed hydrographic data.

The 1-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 1). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A). 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.

4.2 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 this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage and heightens potential flood hazards by further increasing velocities. To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body.

Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause more than a 1.0-foot increase in the BFEs at any point within the community.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1, “Floodway Schematic.”

No floodways were computed for streams studied by approximate methods because of limitations in the approximate study methodology.

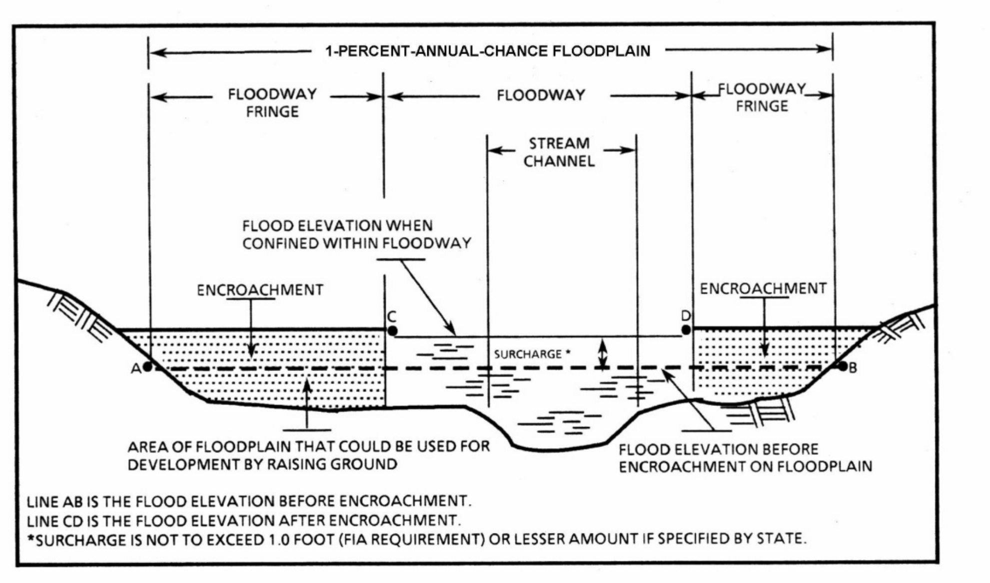

Figure 1. Floodway Schematic

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computation.

The countywide Flood Insurance Rate Map presents flooding information for the entire geographic area of Yalobusha County. Previously, Flood Insurance Rate Maps were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide Flood Insurance Rate Map also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 3, “Community Map History.”

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Coffeeville, Town of	June 7, 1974	October 17, 1975	September 4, 1986	---
Oakland, Town of	---	---	---	---
Water Valley, City of	February 1, 1974	October 24, 1975	September 27, 1985	---
Yalobusha County, Unincorporated Areas	September 16, 1988	---	September 16, 1988	---

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

YALOBUSHA COUNTY, MS

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

There is no previous FIS published for Yalobusha County or its communities. The Flood Insurance Rate Maps for Calhoun, Grenada, Lafayette, Panola, and Tallahatchie Counties are in agreement with this study.

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Yalobusha County has been compiled into this FIS. Therefore, this FIS report supersedes or is compatible with all previously printed FIS reports, FIRMs, and Flood Hazard Boundary Maps (FBFMs) for al jurisdictions within Yalobusha County, and should be considered authoritative for the purposed of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Administration, Koger Center - Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To ensure that any user is aware of all revisions, it is advisable to contact the map repository of flood hazard data located in the community.

9.0 BIBLIOGRAPHY AND REFERENCES

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