FLOOD INSURANCE STUDY

GEORGE COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

Community Name	Community Number
GEORGE COUNTY (UNINCORPORATED AREAS)	280223
LUCEDALE, CITY OF	280056

PRELIMINARY
JUL 08 2011

REVISED

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28039CV000B

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

This preliminary revised Flood Insurance Study contains profiles presented at a reduced scale to minimize reproduction costs. All profiles will be included and printed at full scale in the final published report.

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

Initial Countywide FIS Effective Date: October 16, 2008

First Revised Countywide FIS Date:

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FLOOD INSURANCE STUDY

GEORGE COUNTY, MISSISSIPPI AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of George County, including the City of Lucedale and the unincorporated areas of George County (referred to collectively herein as George 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.

The Digital Flood Insurance Rate Map (DFIRM) and FIS Report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and geographic information standards and is provided in a digital format so that it can be incorporated into a local Geographic Information System and be accessed more easily by the community.

1.2 Authority and Acknowledgments

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

For the August 16, 1988 FIS for George County, Unincorporated Areas, the hydrologic and hydraulic analyses were performed by the U.S. Geological Survey (USGS), Mississippi District, for FEMA, under Inter-Agency Agreement No. EMW-85-E-1823. The study was completed in February 1986.

For the October 16, 2008 countywide FIS for George County, the hydrologic and hydraulic analyses were performed by the State of Mississippi for FEMA, under contract No. EMA-2003-GR-5370.

For this revision of the countywide FIS, new hydrologic and hydraulic analyses were prepared by Mississippi Geographic Information, LLC (MGI, LLC), the Study

Contractor, for the Federal Emergency Management Agency (FEMA), under Contract No. EMA-2009-CA-5932. This revised study was completed in April 2011.

The following streams were included in the study:

- Black Creek
- Chickasawhay River
- Depot Creek
- Indian Creek
- Leaf River
- Pascagoula River
- Red Creek

Table 1, "Summary of Flooding Sources Presented in Current Study," provides a summary of the flooding sources within George County included in this current study, the contract number under which they were performed, and the communities affected by each.

Table 1: Summary of Flooding Sources Presented in Current Study

Flooding Source	Completion Date	Study Contractor(s)	Contract or Inter-Agency Agreement No.	Communities Affected
Black Creek	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	George County
Chickasawhay River	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	George County
Depot Creek	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	City of Lucedale
Indian Creek	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	George County
Escatawpa River	October 16, 2008	Mississippi Geographic Information, LLC	EMA-2003-GR-5370	George County
Leaf River	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	George County

Table 1: Summary of Flooding Sources Presented in Current Study

Flooding Source	Completion Date	Study Contractor(s)	Contract or Inter-Agency Agreement No.	Communities Affected
Pascagoula River	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	George County
Pascagoula River	October 16, 2008	Mississippi Geographic Information, LLC	EMA-2003-GR-5370	George County
Red Creek	April 2011	Mississippi Geographic Information, LLC	EMA-2009-CA-5932	George County

For the October 16, 2008 FIS for George County, the digital base map information was provided by the State of Mississippi. The aerial photography was obtained from the national Agriculture imagery program (NAIP) and was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated September 2004.

The digital FIRM panels were produced using the State Plane Coordinate System, Mississippi East, FIPS 2301. The horizontal datum was the North American Datum of 1983, GRS 80 Spheroid. Distance units were measured in U.S. feet.

Base map information for the revised panels of George County and all incorporated communities within George County was provided in digital format by the State of Mississippi. This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated July 2009.

The coordinate system used for producing these revised FIRM panels is NAD 1983 State Plane GRS1980 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the UTM projection, NAD 83. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

An initial Consultation Coordination Officer (CCO) meeting (also occasionally referred to as the Scoping meeting) is held with representatives of the communities, FEMA, and the study contractors to explain the nature and purpose of the FIS and to identify the streams to be studied by detailed methods. A final CCO (often referred to as the Preliminary DFIRM Community Coordination, or PDCC, meeting) is held with representatives of the communities, FEMA, and the study contractors to review the results of the study.

For this revision of the countywide FIS, the initial CCO meeting was held on September 16, 2009, and attended by representatives of FEMA, MGI, LLC, community officials, and the State NFIP Coordinator.

The final CCO meeting was held on _____ to review and accept the results of this FIS. Those who attended this meeting included representatives of George County, the Study Contractor, FEMA, and the communities. All problems raised at that meeting have been addressed in this study.

The dates of the historical initial and final CCO meetings held for the communities within the boundaries of George County are shown in Table 2, "Historical CCO Meeting Dates."

Table 2: Historical CCO Meeting Dates

Community Name	Initial CCO Date	Final CCO Date
George County (Unincorporated Areas)	January 27, 1985	September 22, 1987
George County (Unincorporated Areas)	April 5, 2005	September 18, 2007
City of Lucedale	April 5, 2005	September 18, 2007

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of George County, Mississippi, including the incorporated community listed in Section 1.1. The scope and methods of this study were proposed to, and agreed upon, by FEMA and George County.

For this revision, none of the streams that were previously studied by detailed methods were restudied. All the flooding sources listed in Table 3, "Flooding Sources Studied by Detailed Methods" therefore, represent streams whose analyses were performed as part of a previous study.

Table 3: Flooding Sources Studied by Detailed Methods

Flooding Source	Reach Length (miles)	Study Limits
Escatawpa River	4.6	From a point approximately 4,800 feet downstream of the confluence with Rocky Creek to a point approximately 4,400 feet upstream of confluence with Brushy Creek.

Table 3: Flooding Sources Studied by Detailed Methods

Flooding Source	Reach Length (miles)	Study Limits
Pascagoula River	3.8	From a point approximately 1.3 miles upstream of the confluence with Garnett Creek to a point approximately 1.1 miles upstream of Plum Bluff Cutoff.

The areas studied by limited detailed methods were selected for areas having low to moderate development potential or flood hazards. The flooding sources studied by limited detailed methods are presented in Table 4, "Flooding Sources Studied by Limited Detailed Methods."

Table 4: Flooding Sources Studied by Limited Detailed Methods

Flooding Source	Reach Length (miles)	Study Limits
Black Creek	2.9	From a point approximately 1 mile upstream of Smith Cutoff to a point approximately 1.2 miles upstream of State highway 57.
Chickasawhay River	3.8	From the confluence with Pascagoula River to a point approximately 1.7 miles upstream of the county boundary.
Depot Creek	1.9	From a point approximately 1,500 feet upstream of the confluence with Big Creek to a point approximately 270 feet downstream of State Highway 198.
Indian Creek	1.3	From a point approximately 3.2 miles upstream of the confluence with Pascagoula River to a point approximately 490 feet downstream of Ellis Hodges Road.
Leaf River	3.1	From the confluence with Pascagoula River to the county boundary.
Pascagoula River	24.3	From a point approximately 1.1 miles upstream of Plum Bluff Cutoff to the confluence of the Chickasawhay and Leaf Rivers.
Red Creek	4.7	From a point approximately 1.2 miles upstream of the confluence of Red Creek Tributary 1 (Jackson County) to a point approximately 1.4 miles downstream of the confluence of Indian Camp Branch.

Numerous streams were studied by approximate methods, as indicated in Table 5,

"Flooding Sources Studied by Approximate Methods." Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. A portion of the floodplain for Little Cedar Creek, listed separately below, was updated based on the new LiDAR at the request of George County officials.

Table 5: Flooding Sources Studied by Approximate Methods

Flooding Source	Reach Length (miles)	Study Limits
Little Cedar Creek	2.7	From a point approximately 1 mile upstream of Weeks Road to a point approximately 1.1 miles downstream of the Mississippi Export Railroad.
All other Zone A Streams in George County	408.4	Various Zone A streams within George County

2.2 Community Description

George County is located in southeastern Mississippi. The county is bordered by Greene County, Mississippi on the north; Perry County, Mississippi on the northwest; Stone County, Mississippi on the west; Jackson County, Mississippi on the south; and Mobile County, Alabama on the east. George County is served by U.S. Highway 98, State Highways 26, 57, 63, 612, and 613, the Illinois Central Gulf Railroad and the Mississippi Export Railroad. George County has an area of 478.29 square miles and an estimated 2009 population of 22,681 (Reference 1).

The topography is low, undulating hills with several tributaries to the meandering Pascagoula and Escatawpa Rivers.

2.3 Principal Flood Problems

The principal source of flooding in George County is the Pascagoula River, which begins with the confluence of the Leaf and Chickasawhay Rivers near the northern county boundary, and flows southward. Localized flooding also exists, caused by stormwater runoff filling depressions, with an area of extent ranging from a few acres to a square mile.

The U.S. Geological Survey (USGS) has operated a river gage on the Pascagoula River at Merrill, Mississippi, about 23 river miles upstream from the study reach, from April 1900, February 1905 to the current year. Note that the 1905 to 1929 period of record is based on information from the National Weather Service. For the period of record from 1930 to the present, the maximum flood at this site occurred in February 1961. At the dismantled railroad crossing, this flood crested at elevation 56.95 feet NAVD with an estimated discharge of 178,000 cubic feet per second (cfs). The crest elevation was determined from levels and the peak discharge was transferred from Merrill on the basis of drainage area. This flood had a 2-percent-annual-chance of being equaled or exceeded during any year. The Pascagoula River has a wide, densely vegetated floodplain, much of

which is inundated during large floods. However, the lack of development limits the potential for widespread flood damage.

2.4 Flood Protection Measures

No flood protection measures exist in the county.

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 is 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 1-percent-annual-chance 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

3.1.1 Methods for Flooding Sources with New or Revised Analyses in Current Study

For this countywide study, peak discharges for the streams studied by limited detailed methods were calculated based on USGS regional regression equations (Reference 2).

For the discharges calculated based on regional regression equations, the rural regression values were updated to reflect urbanization as necessary. There are six USGS stream gages located along newly limited detailed study streams. Gage data is used to adjust discharges. Gage weighted discharges are calculated following the guidelines set forth in USGS report 91-4037 (Reference 3).

A summary of the drainage area-peak discharge relationships for the incorporated detailed study streams is shown in Table 6, “Summary of Discharges for Detailed Study Streams”, and for limited detail study streams is shown in Table 7, “Summary of Discharges for Limited Detailed Study Streams.”

3.1.2 Methods for Flooding Sources Incorporated from Previous Studies

This section describes the methodology used in previous studies of flooding sources incorporated into this FIS that were not revised for this countywide study. The 1-percent-

annual-chance flood for the Pascagoula River at Merrill was determined in the USGS report *"Flood Frequency of Mississippi Streams"* (Reference 4). This discharge was transferred downstream using techniques described in the report on the basis of drainage area ratios. For the discharges calculated based on regional regression equations, the rural regression values were updated to reflect urbanization as necessary.

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.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1).

Roughness coefficients (Manning's "n") were chosen by engineering judgment and based on field observation of the channel and floodplain areas Table 8, "Summary of Roughness Coefficients," contains the channel and overbank "n" values for the streams studied by detailed methods.

Table 6: Summary of Discharges for Detailed Study Streams

Flooding Source and Location	Drainage Area (Square miles)	Peak Discharges (Cubic Feet per Second) 10-percent	2-percent	1-percent	0.2-percent
PASCAGOULA RIVER					
At Davis Fish Camp	6,772	*	*	225,000	*

* Data Not Available

Table 7: Summary of Discharges for Limited Detailed Study Streams

Flooding Source and Location	Drainage Area (Square miles)	Peak Discharges (Cubic Feet per Second) 10-percent	2-percent	1-percent	0.2-percent
BLACK CREEK					
At State Highway 57	7,534	*	*	54,460	*
CHICKASAWHAY RIVER					
At confluence with Leaf River	3,015.5	*	*	92,597	*
DEPOT CREEK					
At confluence with Big Creek	5.9	*	*	3,025	*
INDIAN CREEK					
Approximately 1.2 miles upstream of confluence with Pascagoula River	14.4	*	*	5,241	*
At Grain Elevator Road	9.2	*	*	3,805	*

* Data Not Available

Table 7: Summary of Discharges for Limited Detailed Study Streams

Flooding Source and Location	Drainage Area (Square miles)	Peak Discharges (Cubic Feet per Second) 10-percent	2-percent	1-percent	0.2-percent
LEAF RIVER					
At confluence with Chickasawhay River	3,576.5	*	*	134,117	*
PASCAGOULA RIVER					
At State Highway 26	6,683.4	*	*	219,183	*
At Merrill Salem Road	6,593.1	*	*	217,361	*
RED CREEK					
Approximately1,900 feet upstream from confluence with Flurry Mill Pond Branch	441.1	*	*	36,670	*

* Data Not Available

Table 8: Summary of Roughness Coefficients

Flooding Source	Channel	Overbanks
Black Creek	0.05	0.15
Chickasawhay River	0.04	0.15
Depot Creek	0.035 - 0.05	0.11 - 0.15
Indian Creek	0.04 - 0.05	0.12 - 0.15
Leaf River	0.04 – 0.05	0.15
Pascagoula River	0.05	0.15
Red Creek	0.03 – 0.05	0.15

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.2.1 Methods for Flooding Sources with New or Revised Analyses in Current Study

Cross section geometries were obtained from a combination of terrain data and field surveys. The computer program WISE was used as a preprocessor to extract cross section topographic data from the WISE terrain project. Structure data is based on Mississippi Department of Transportation (MDOT) as-built data and field surveys. Standard limited detailed survey method was used to collect elevation data and structural geometry for bridges and culverts located within the limited detail study limits where as-built data is not available.

Downstream boundary conditions for the hydraulics 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 of existing effective flood elevations or recalculated flood elevations. Water surface profiles were computed through the use of USACE HEC-RAS version 4.1 computer program (Reference 5). The model was run for the 1-percent-annual-chance storm for the limited detail and approximate studies.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.2.2 Methods for Flooding Sources Incorporated from Previous Studies

An estimated stage-discharge relation was developed for the Pascagoula River at Davis Fish Camp. This relation was developed using the stage and estimate discharge of the February 1961 flood and discharge conveyance ratios. Conveyance was computed using a channel section taken at this site in June 1959, an overbank section taken from topographic maps, and roughness coefficients selected by personnel of the USGS. Computed conveyance for the 1961 flood in the cross section compared favorably with

that for a surveyed cross section taken at Merrill. From the estimated stage-discharge relation, the 1% annual chance flood crest is 38.0 feet NGVD for the Pascagoula River at Davis Fish Camp. The slope of the 1% annual chance elevation profile data from the USGS report was determined using February 1961 flood profile data from the USGS report *"Floods of 1961 in Mississippi"* (Reference 6)

Tide effects at this site occur during combined high tides and low flows. It is assumed that large floods will not be tidally affected.

Downstream boundary conditions for the hydraulics 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 of existing effective flood elevations or recalculated flood elevations. Water surface profiles were computed through the use of USACE HEC-RAS version 3.1.2 computer program (Reference 7). The model was run for the 1-percent-annual-chance storm for the approximate studies.

Manning's "n" values used in the hydraulic computations for both channel and overbank areas were based on recent digital orthophotography and field investigations.

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 used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD). With the completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

Qualifying bench marks within a given jurisdiction that are catalogued 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.

Bench marks catalogued 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)

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum.

Ground, structure, and flood elevations may be compared and/or referenced to NGVD by adding -0.04 feet to the NAVD elevation. The 0.04 foot value is an average for the entire county. 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 NGVD 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.

To compare structure and ground elevations to 1-percent-annual-chance flood elevations shown in the FIS and on the FIRM, the subject structure and ground elevations must be referenced to datum values as NAVD. The BFE values shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 feet will appear as 102 feet on the FIRM and 102.6 feet will appear as 103 feet. Users who wish to convert the elevations in this FIS to NGVD should apply the stated conversion factor(s) 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 regarding conversion between the NGVD and NAVD, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (Reference 8), visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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 for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

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, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. 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. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed or limited detailed methods, the 1-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

For the October 16, 2008 countywide FIS, 10 meter Digital Elevation model (DEM) data from the USGS was used to delineate the floodplain boundaries (Reference 9)

For the revised panels of this update, between cross sections, the boundaries were interpolated using LiDAR data with a contour interval of 1 foot.

The 1-percent-annual-chance floodplain boundaries for streams studied by detailed methods are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). 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.

For streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

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 base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 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.

No floodways were computed for George County because of limitations in the limited detailed study methodology.

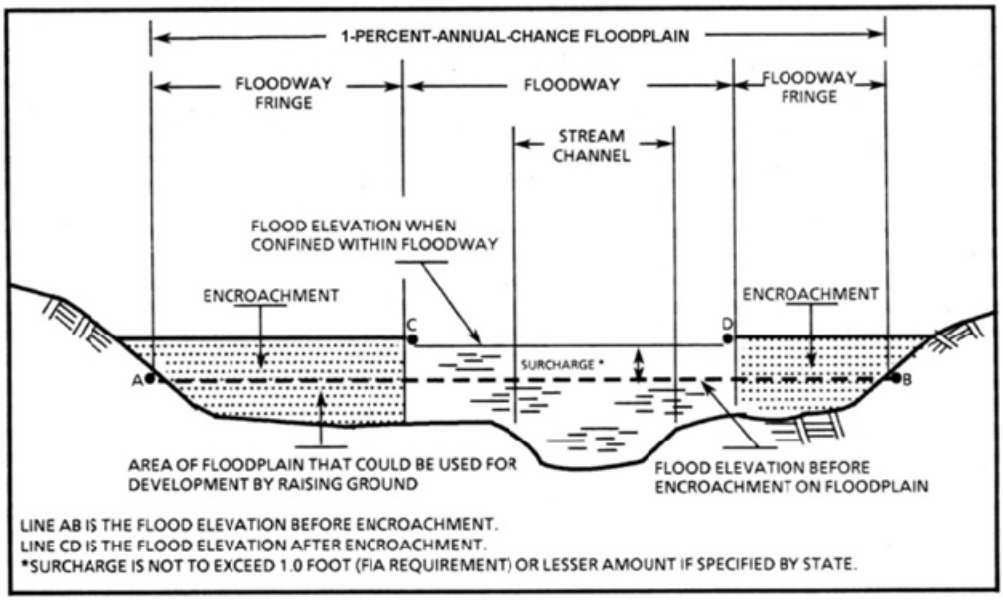

Figure 1: Floodway Schematic

5.0 INSURANCE APPLICATIONS

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 FIS report 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 rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by detailed methods. 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 rate 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 (sq. mi.), 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 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use 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 computations.

The current FIRM presents flooding information for the entire geographic area of George County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 9, “Community Map History.”

7.0 OTHER STUDIES

An FIS report was previously prepared for George County (Reference 10)

This FIS report supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region IV, Koger-Center — Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, GA 30341.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
George County (Unincorporated Areas)	September 16, 1977	--	August 16, 1988	October 16, 2008
Lucedale, City of	June 7, 1974	January 16, 1976 April 11, 1980	April 15, 1986	October 16, 2008

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

9.0 BIBLIOGRAPHY AND REFERENCES

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2. **U.S. Department of the Interior, Geological Survey.** *Flood Characteristics of Mississippi Streams.* Jackson, Mississippi : s.n., 1991.

3. —. *Flood Frequency of Mississippi Streams, Water-Resources Investigations Report 91-4037.* Jackson, Mississippi : s.n., 1991.

4. **Hudson, B.E. Colson and J.W.** *Flood Frequency of Mississippi Streams.* s.l. : Survey, U.S. Geological, 1976.

5. **Watershed Concepts, a Division of Hayes, Seay, Mattern & Mattern.** *Watershed Information System (WISE) Computer Software, v.4.1.0 beta.* 2008.

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7. **U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center.** *HEC-RAS River Analysis System, Version 3.1.2.* Davis, California : s.n., 2004.

8. **Federal Emergency Management Agency.** *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988 - Guidelines for Community Officals, Engineers, and Surveyors.* 6/1/1992. 3-0170.

9. **(MARIS), Mississippi Automated Resource information System.** *Countywide Elevation Grid for Mississippi, 10 meter.* 2004.

10. **Federal Emergency Management Agency.** *Flood Insurance Study.* October 16, 2008.

10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original FIS was printed. Future revisions may be made that do not result in the republishing of the FIS report. To assure that the user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data located at: George County Courthouse, 355 Cox Street, Lucedale, MS 39452.

10.1 First Revision (Revised Month Day, Year)

This xx/xx/xxxx revision was initiated in support of the FEMA Risk MAP Program.

This revision involved updating the mapping for portions of George Co, MS. The revision includes new limited detailed studies on Black Creek, Chickasawhay River, Depot Creek, Indian Creek, Leaf River, Pascagoula River and Red Creek as well as revising the Zone A floodplain for

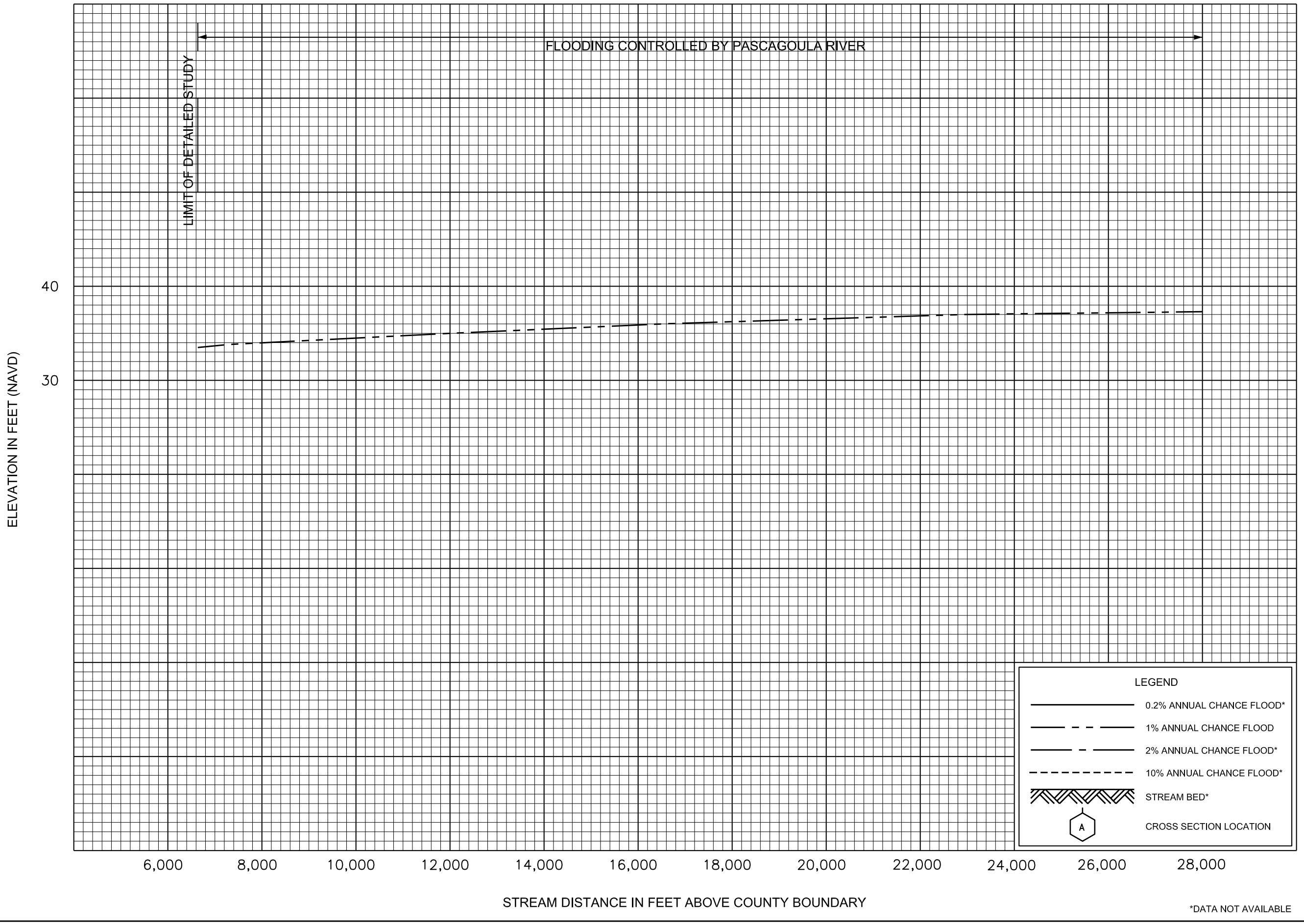
a portion of Little Cedar Creek. These revisions result in refined floodplain boundaries. Newly obtained LiDAR data was the basis for the revisions.

Floodplain boundaries for the previously mentioned streams were updated only. Therefore, only the panels affected by these floodplain boundaries have been updated. The following panels were updated in support of the Risk MAP Program:

28039C0050E	28039C0100E	28039C0200E	28039C0300E
28039C0075E	28039C0175E	28039C0225E	

The following panels were newly created by splitting effective panel 28039C0100D:

28039C0078E	28039C0080E	28039C0087E	28039C0090E
28039C0079E	28039C0086E		



FLOOD PROFILES

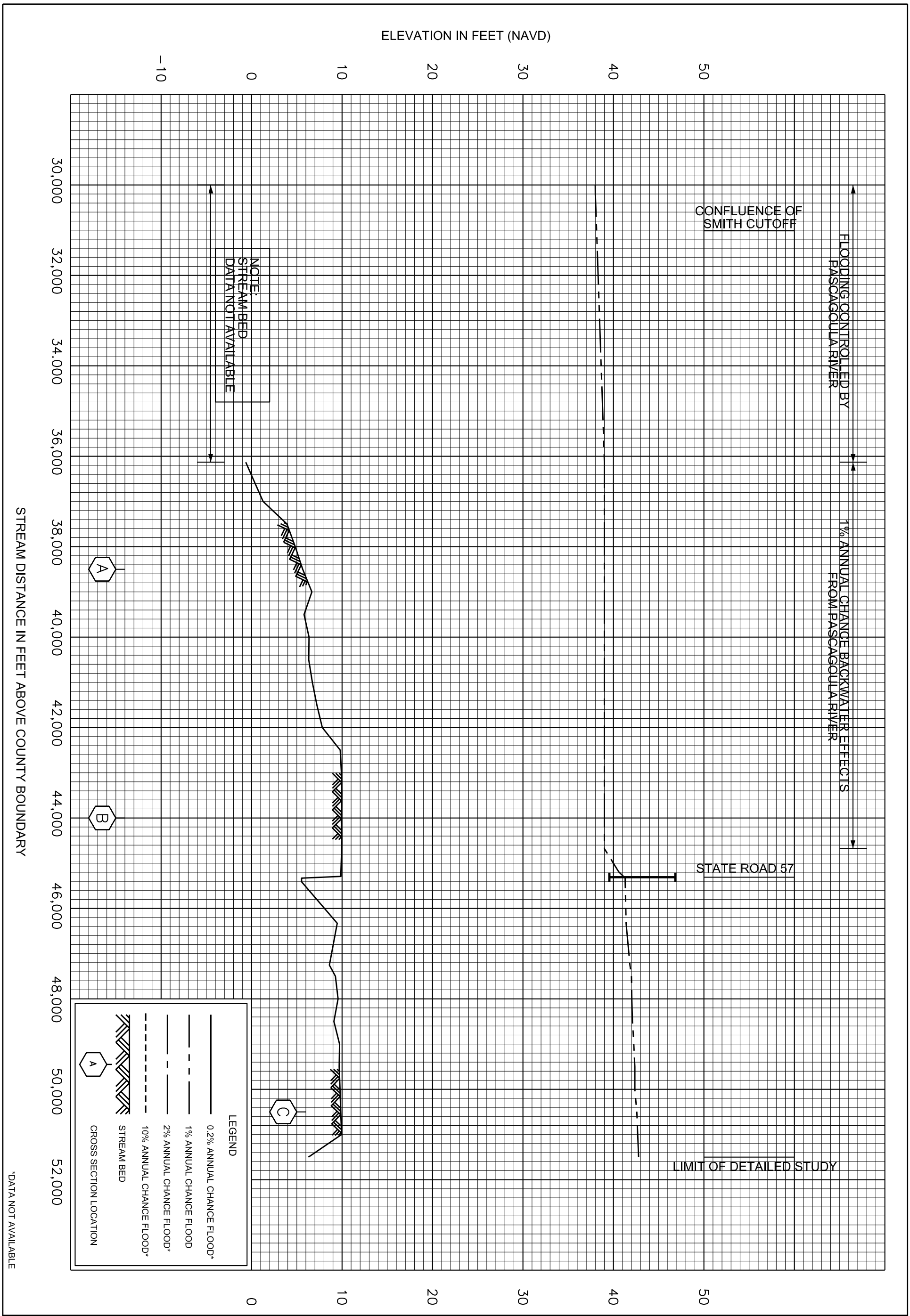
BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

01P



FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK

02P

FEDERAL EMERGENCY MANAGEMENT AGENCY

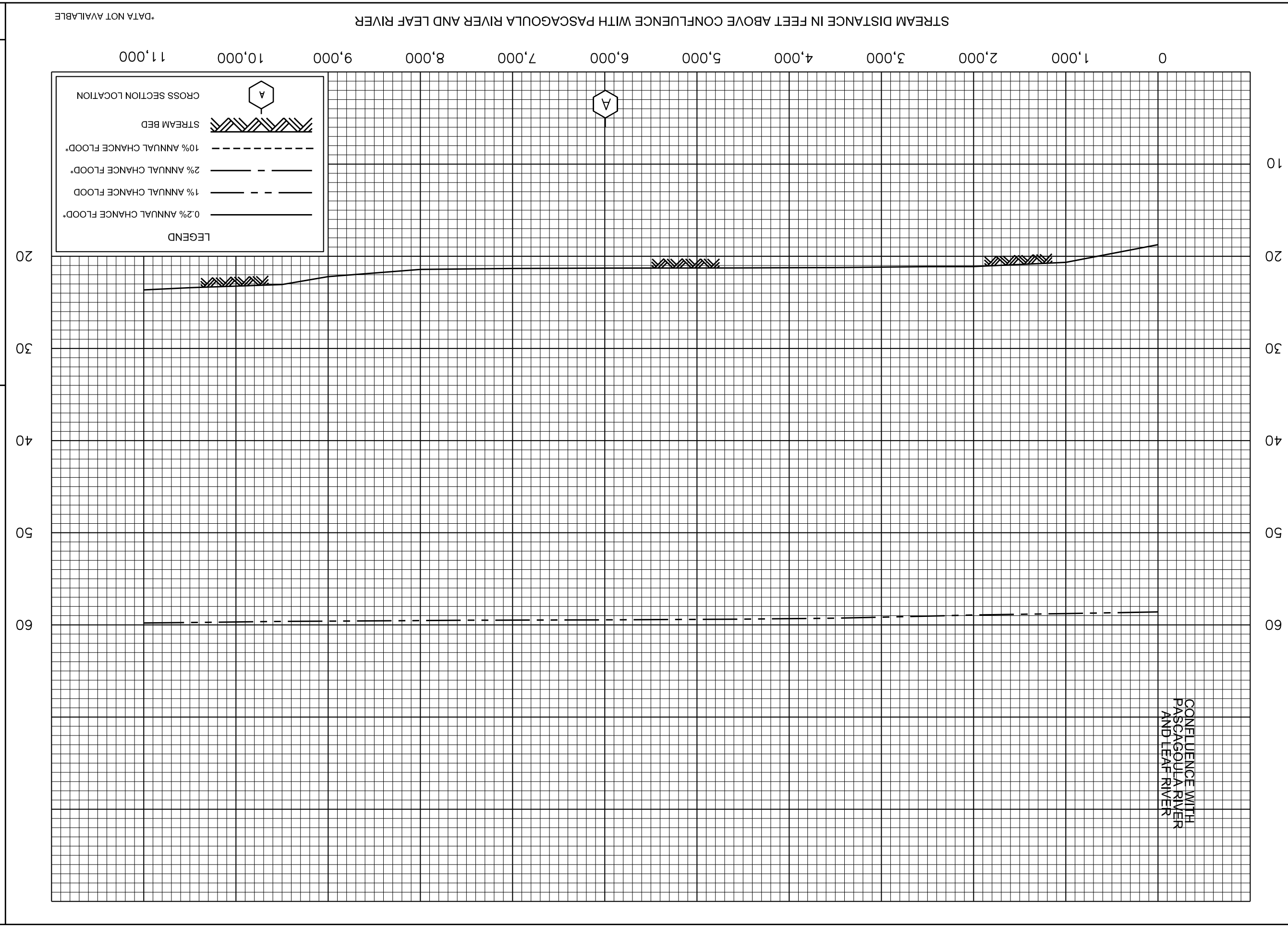
GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

CHICKASAWHAY RIVER

03P



FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

CHICKASAWHAY RIVER

04P

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH PASCAGOULA RIVER AND LEAF RIVER

11,000 12,000 13,000 14,000 15,000 16,000 17,000 18,000 19,000 20,000

ELEVATION IN FEET (NAVD)

20 30 40 50 60 70

LEGEND

- 0.2% ANNUAL CHANCE FLOOD*
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD*
- 10% ANNUAL CHANCE FLOOD*
- STREAM BED
- A CROSS SECTION LOCATION

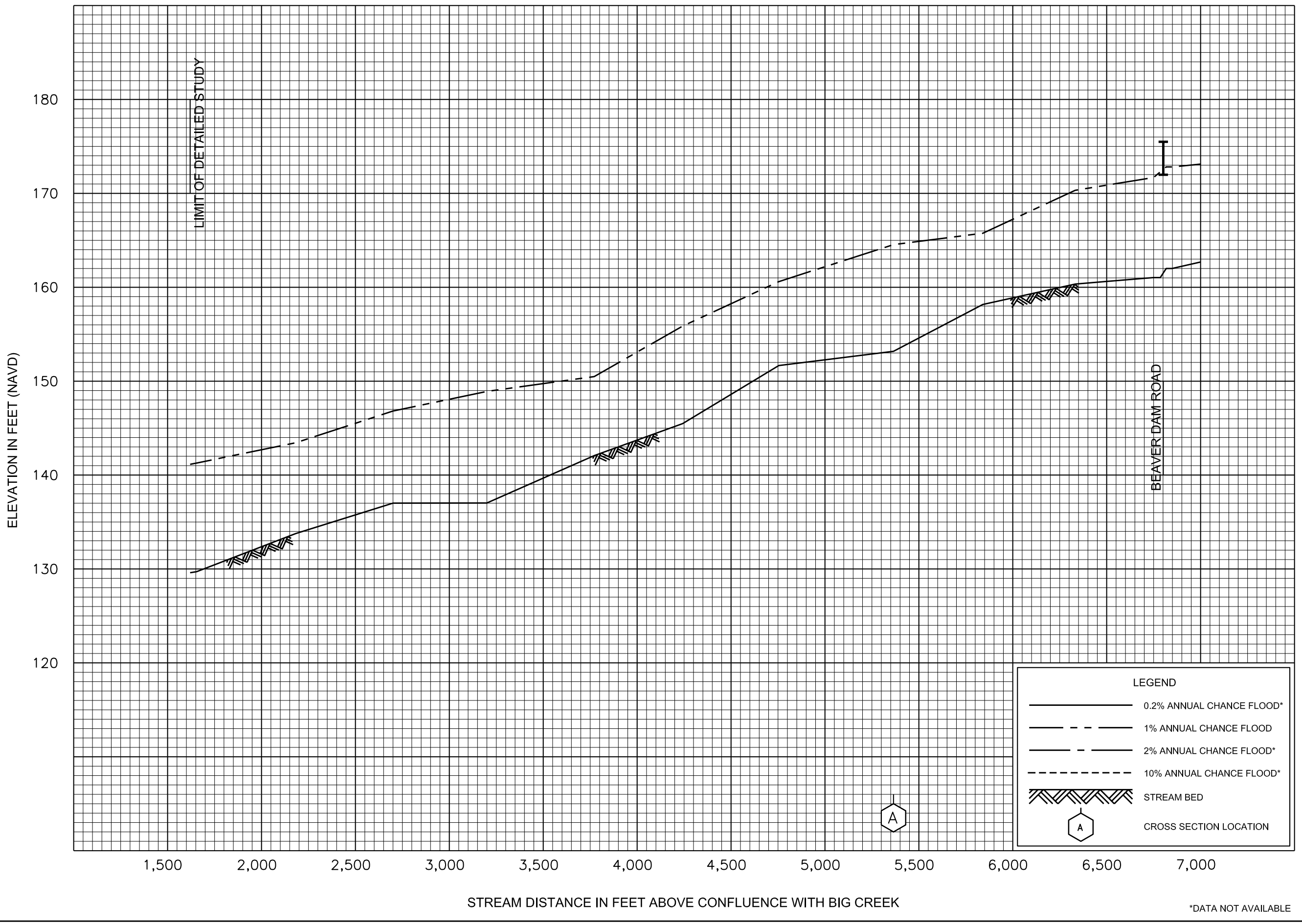
B

COUNTY BOUNDARY

CONFLUENCE OF MCINNIS CREEK

LIMIT OF FLOODING AFFECTING COMMUNITY

*DATA NOT AVAILABLE



*DATA NOT AVAILABLE

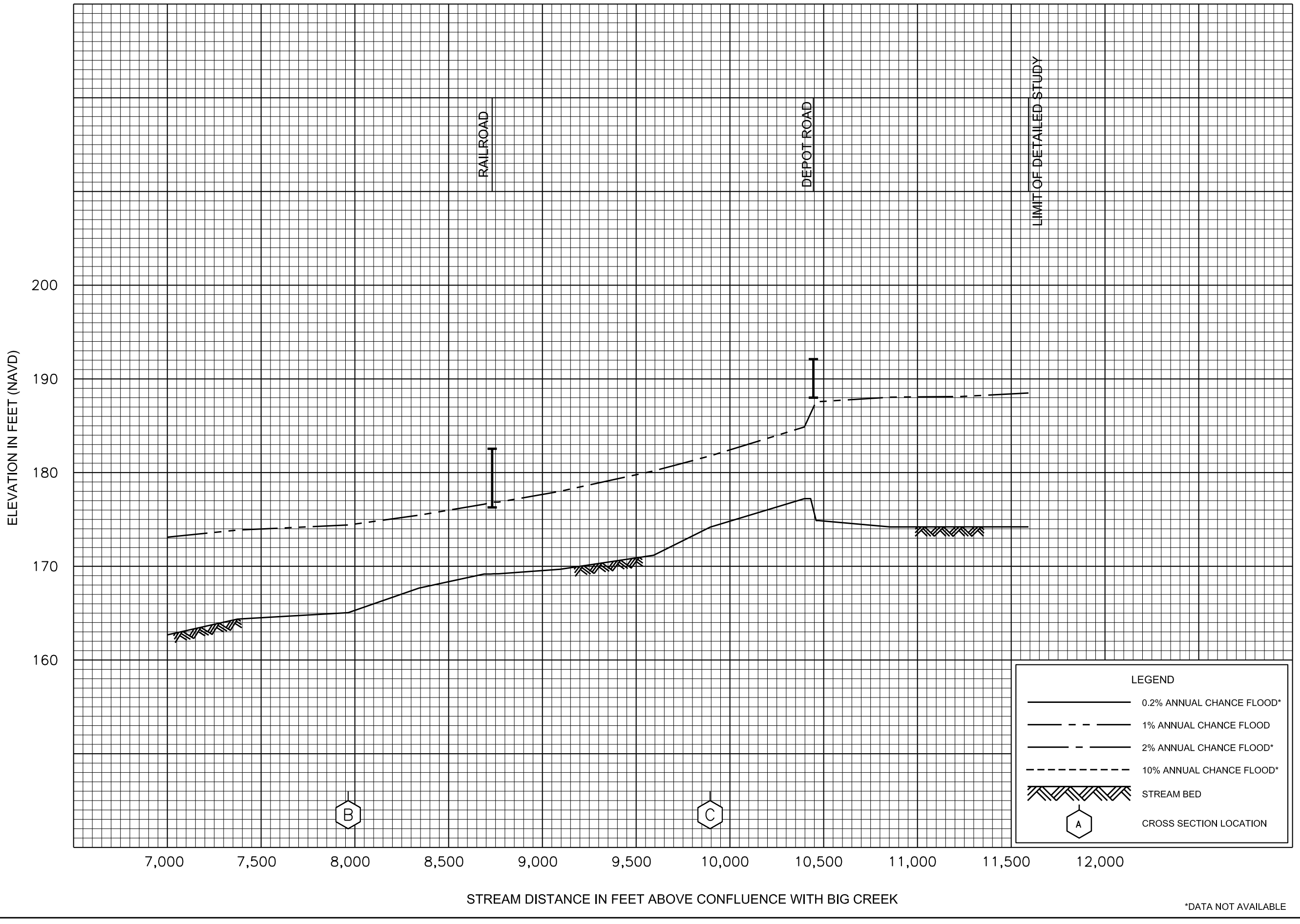
FLOOD PROFILES

DEPOT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEROGE COUNTY, MS
AND INCORPORATED AREAS

05P



*DATA NOT AVAILABLE

FLOOD PROFILES

DEPOT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEROGE COUNTY, MS

AND INCORPORATED AREAS

06P

07P

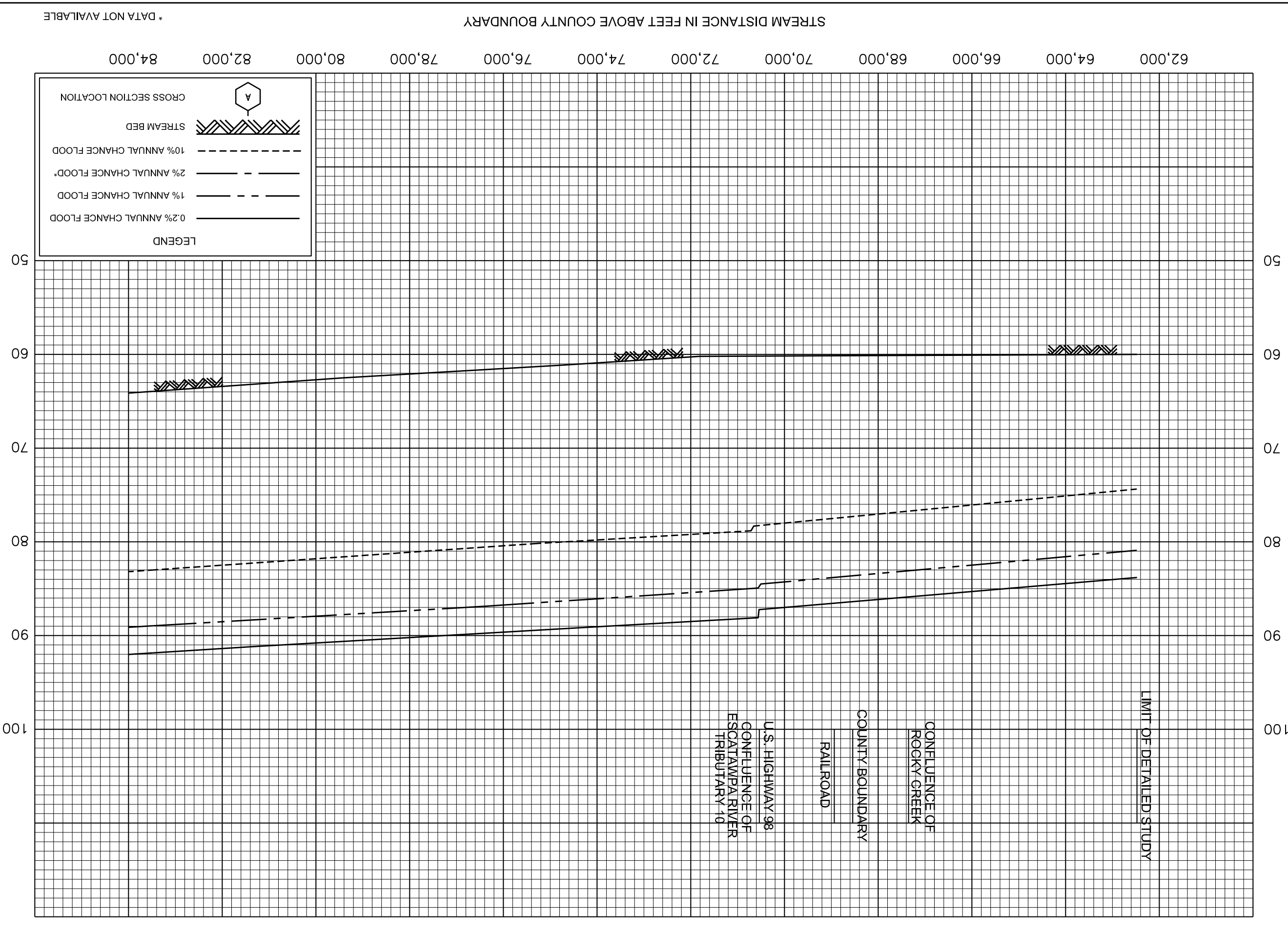
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

ESCATAWPA RIVER



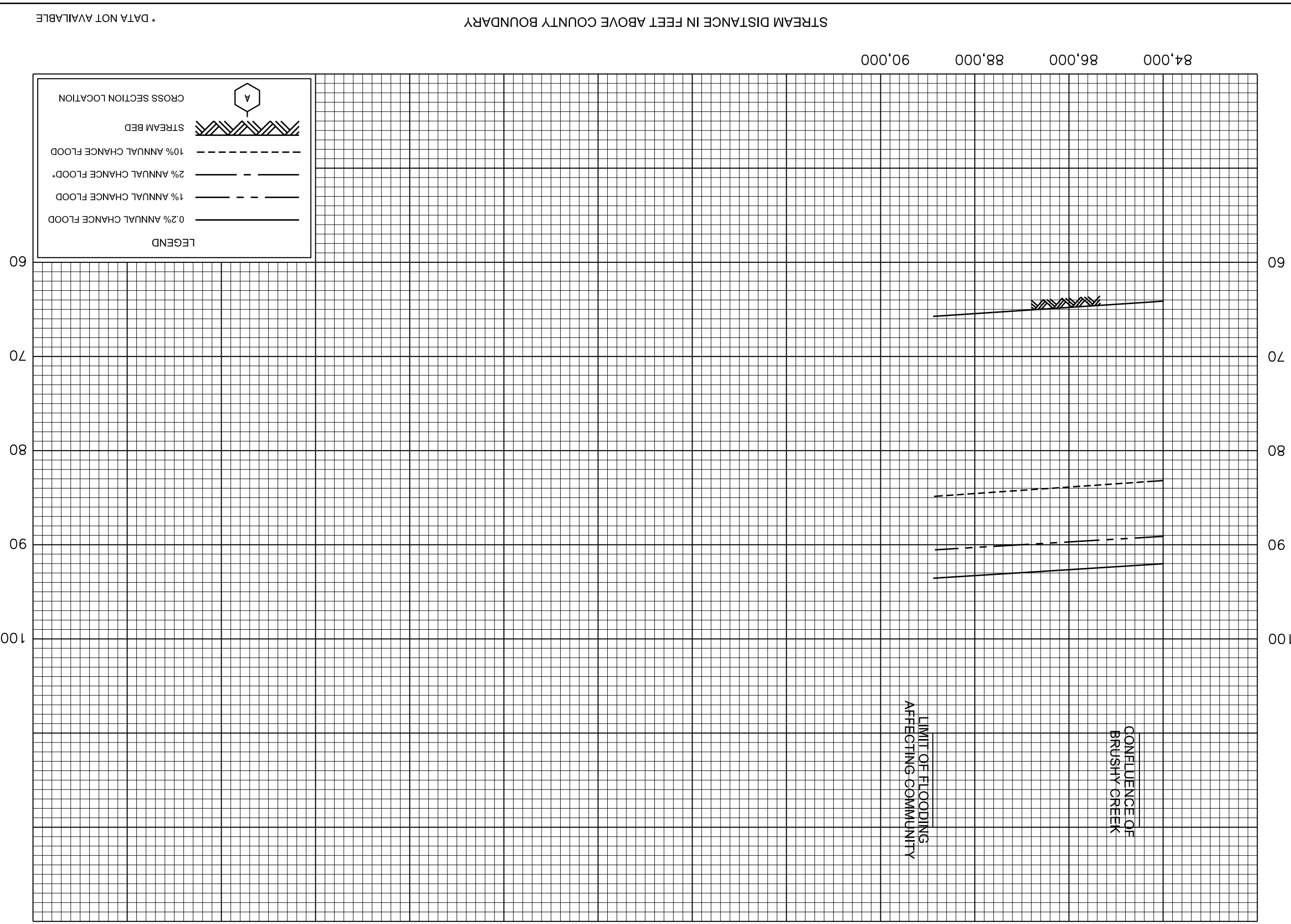
FEDERAL EMERGENCY MANAGEMENT AGENCY

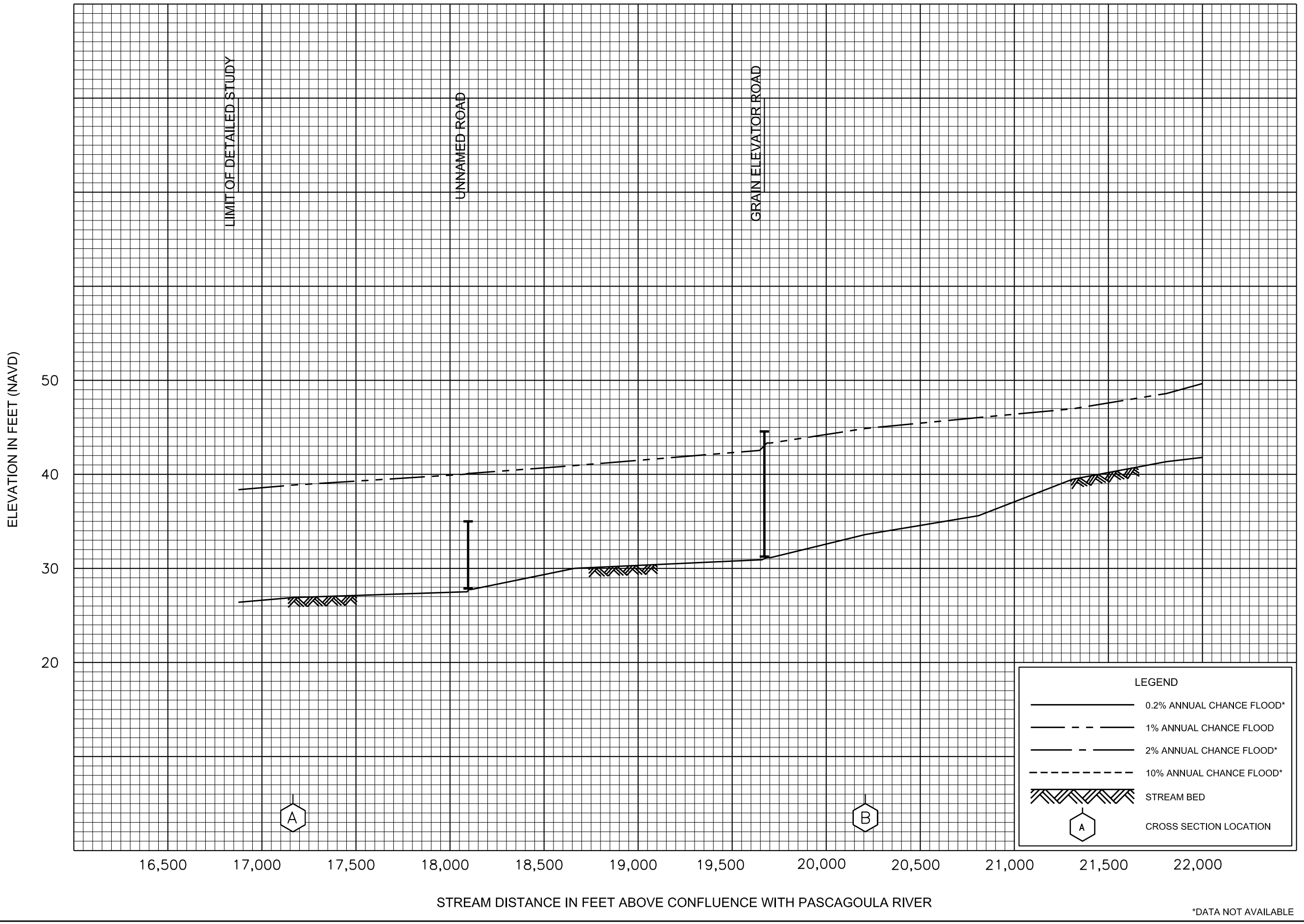
GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

ESCATAWPA RIVER





*DATA NOT AVAILABLE

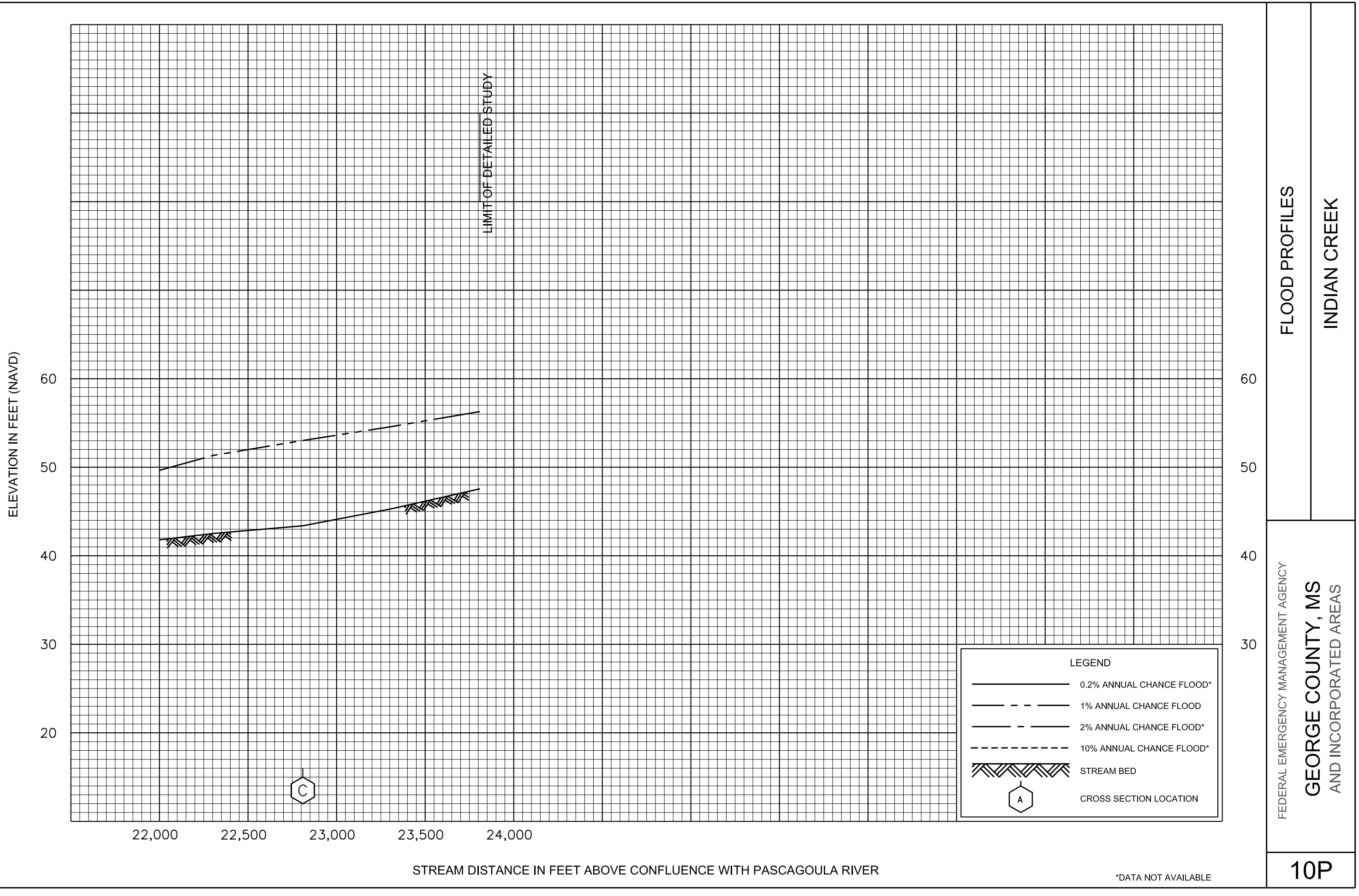
FLOOD PROFILES

INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS
AND INCORPORATED AREAS

09P



FLOOD PROFILES

INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

10P

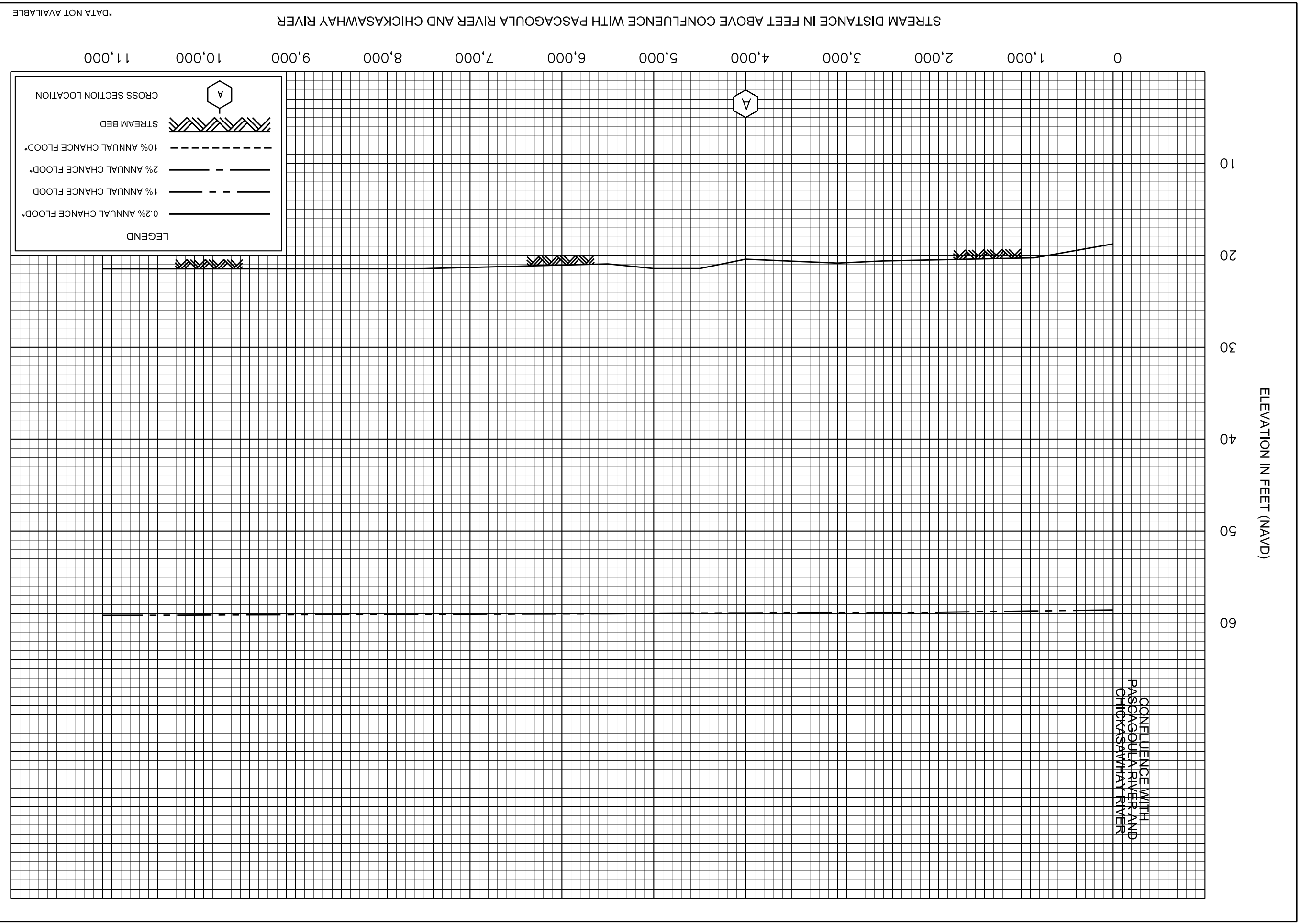
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

LEAF RIVER



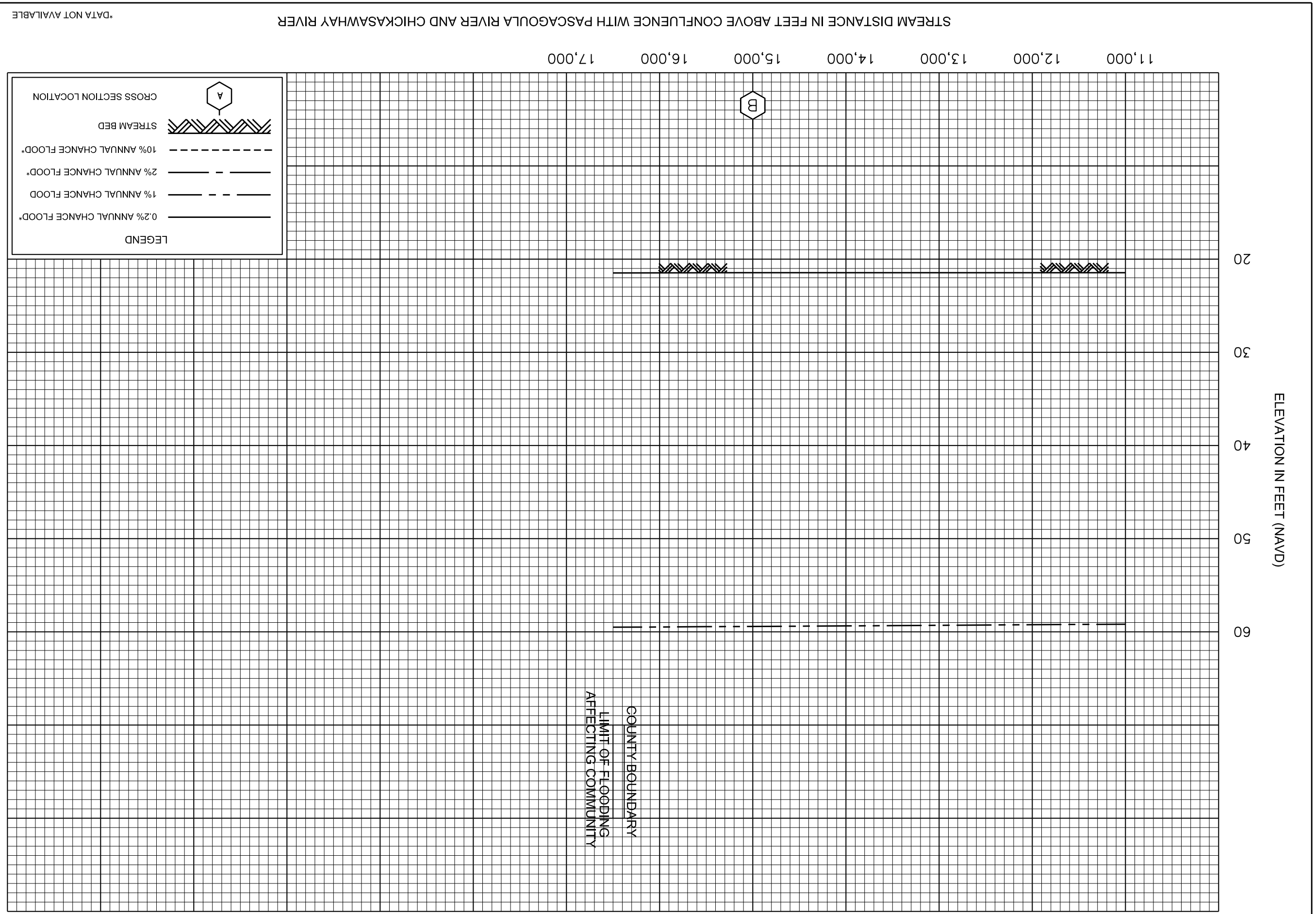
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

LEAF RIVER



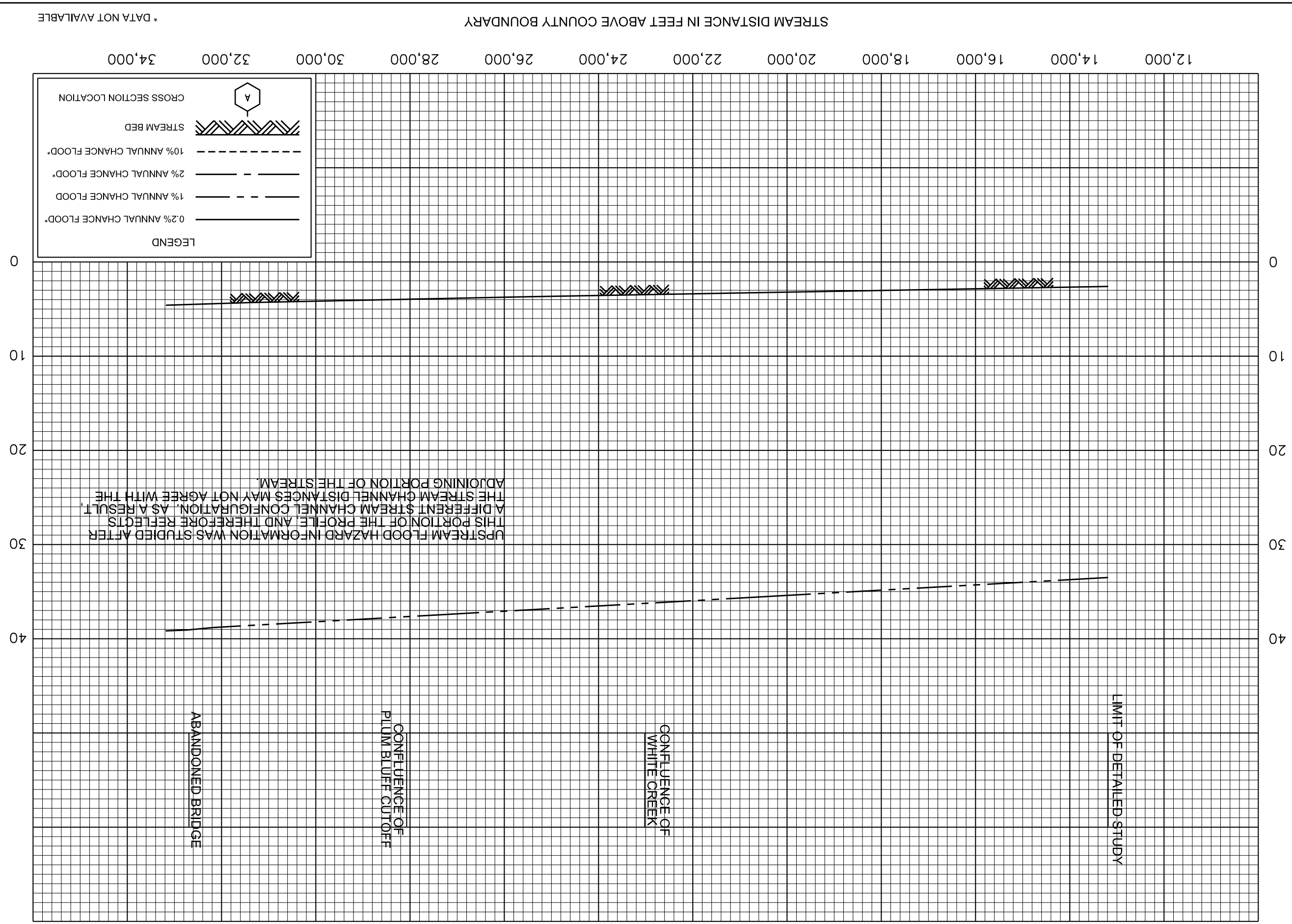
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER



13P

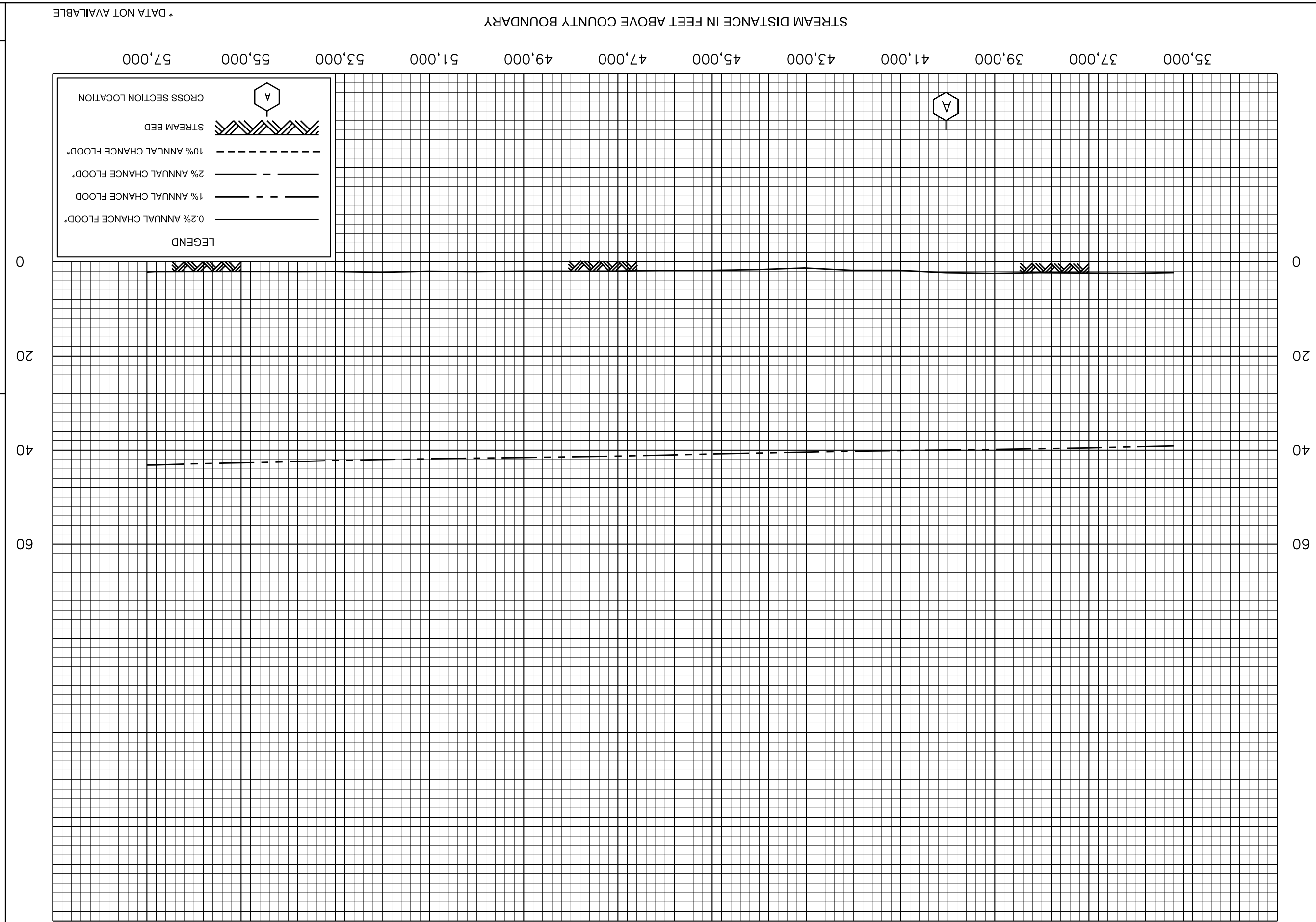
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER



FEDERAL EMERGENCY MANAGEMENT AGENCY

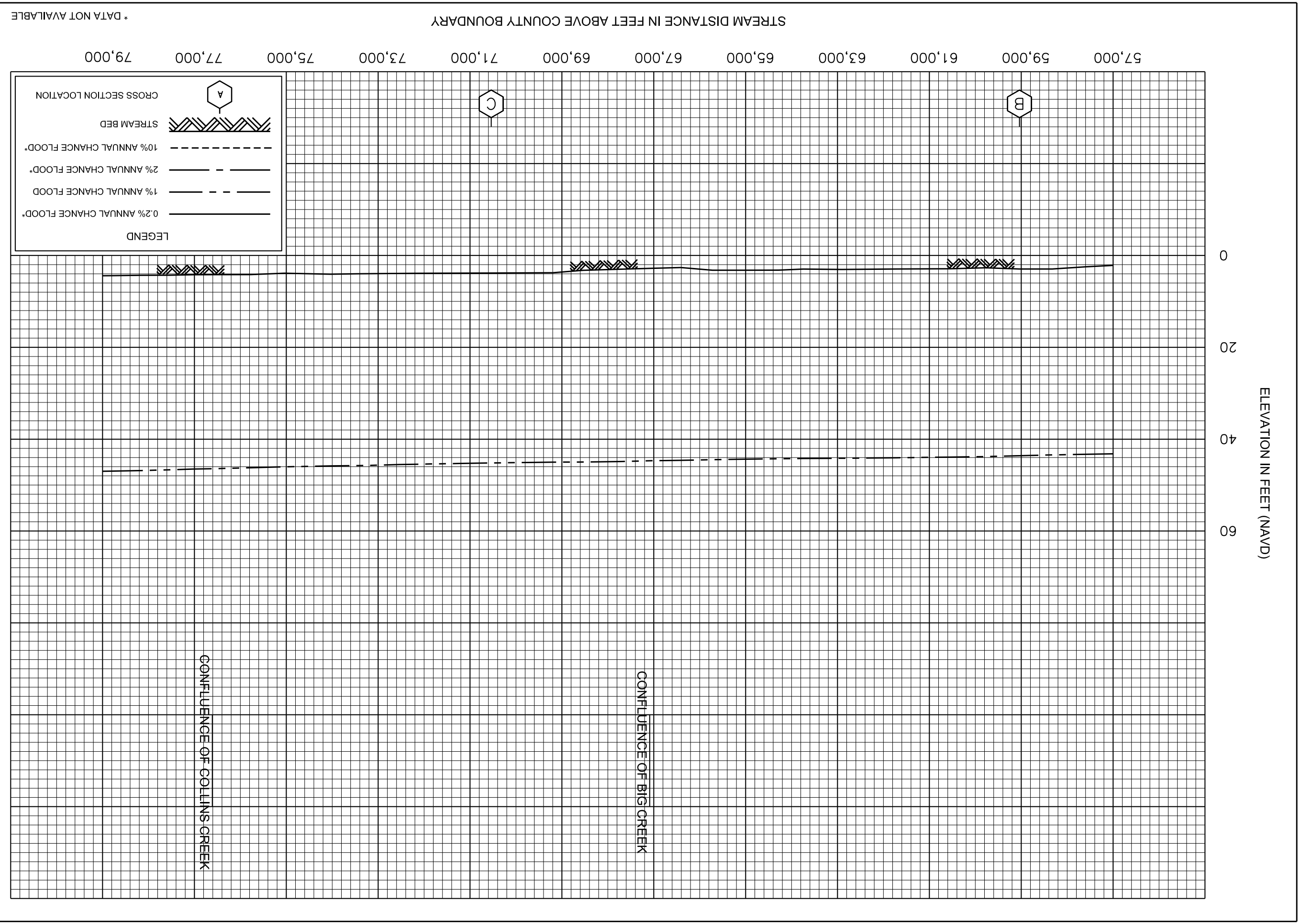
GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER

15P



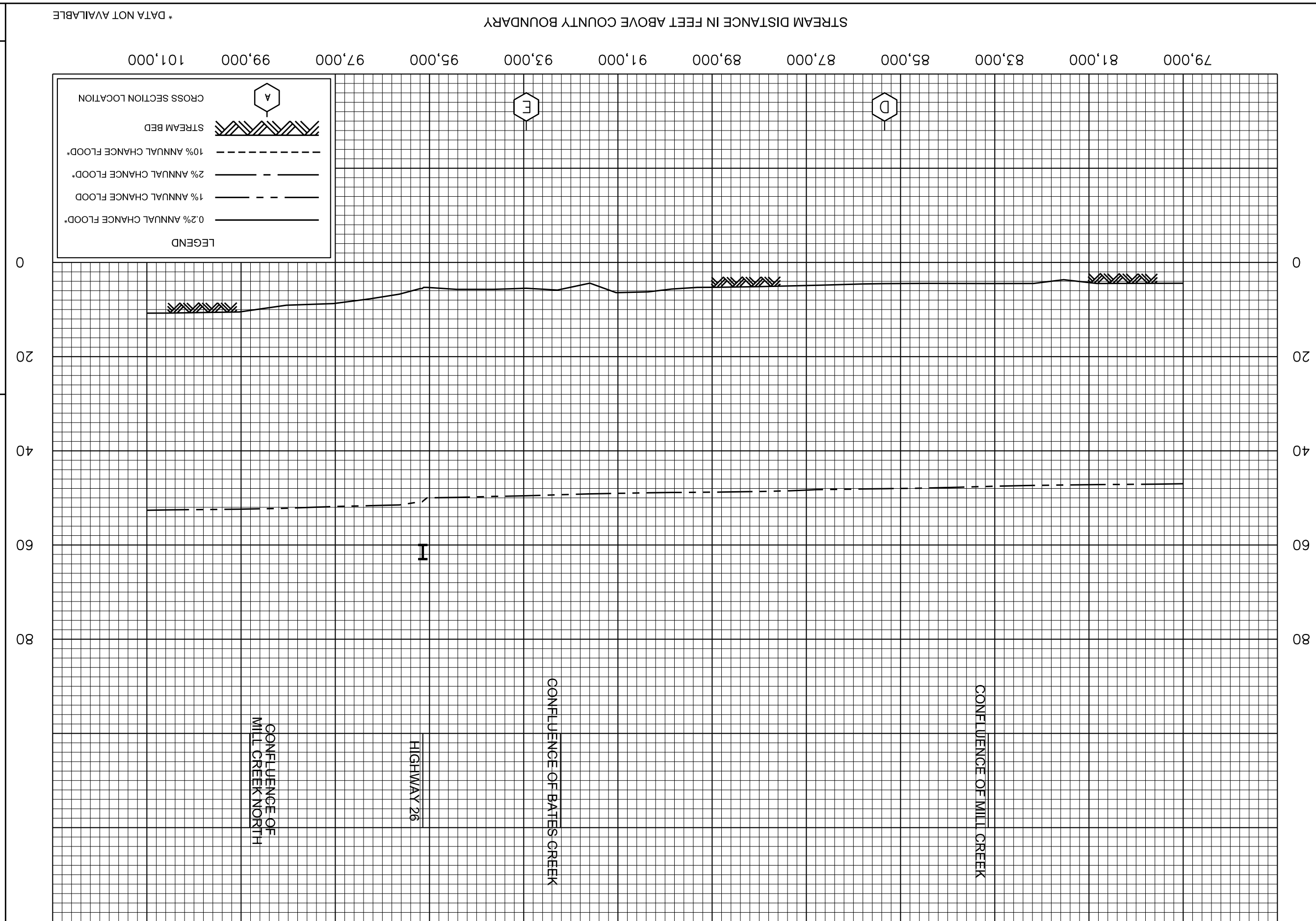
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER



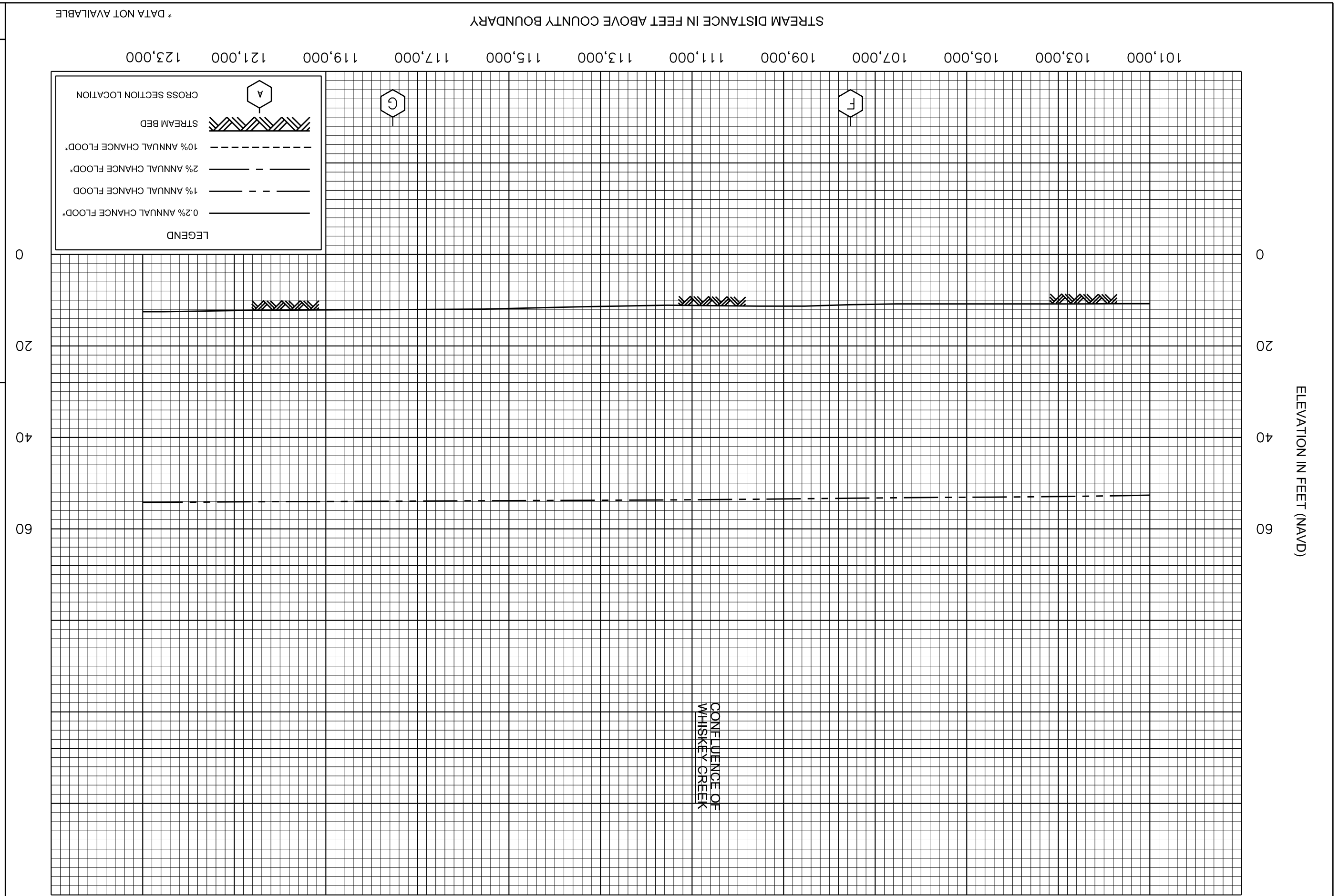
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER



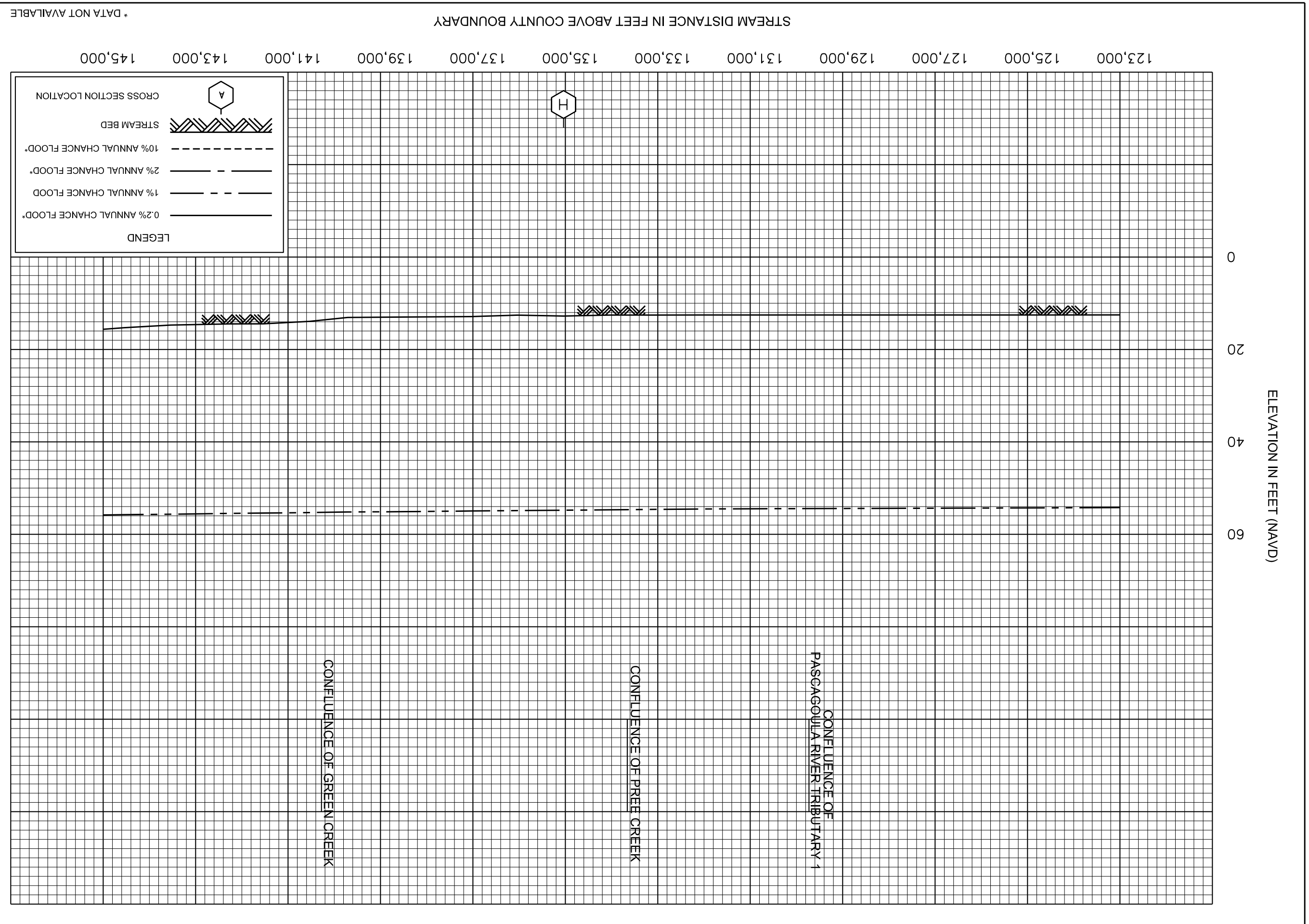
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER



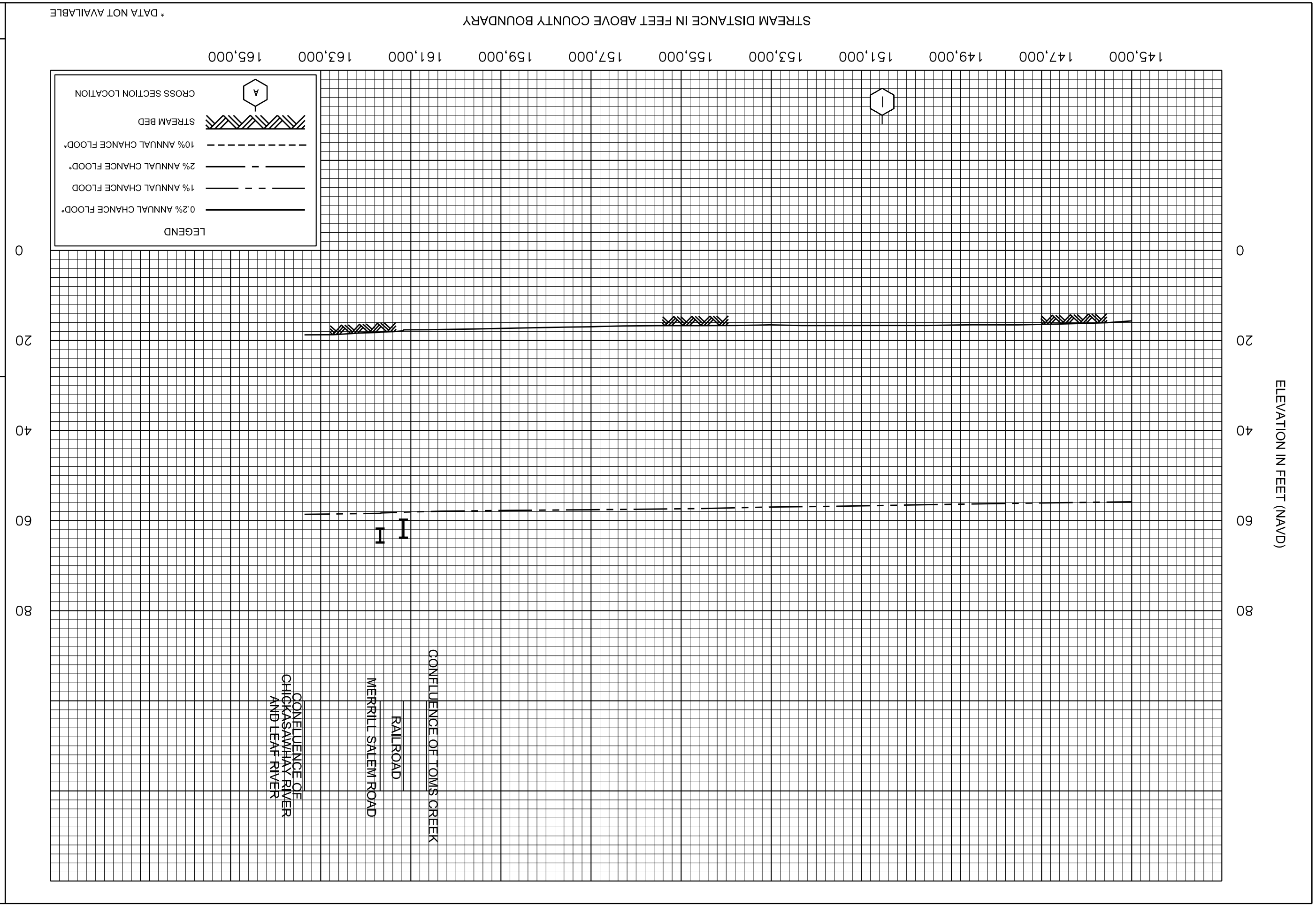
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

PASCAGOULA RIVER



ELEVATION IN FEET (NAVD)

10 20 30 40 50

6,000 7,000 8,000 9,000 10,000 11,000 12,000 13,000 14,000 15,000 16,000 17,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH RED CREEK TRIBUTARY 1 (JACKSON COUNTY)

A

COUNTY BOUNDARY

COUNTY BOUNDARY

COUNTY BOUNDARY

COUNTY BOUNDARY

COUNTY BOUNDARY

COUNTY BOUNDARY

RED CREEK ROAD

CONFLUENCE OF FLURRY MILL POND BRANCH

LEGEND

0.2% ANNUAL CHANCE FLOOD*

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD*

10% ANNUAL CHANCE FLOOD*

STREAM BED

A CROSS SECTION LOCATION

*DATA NOT AVAILABLE

10 20 30 40 50

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

RED CREEK

20P

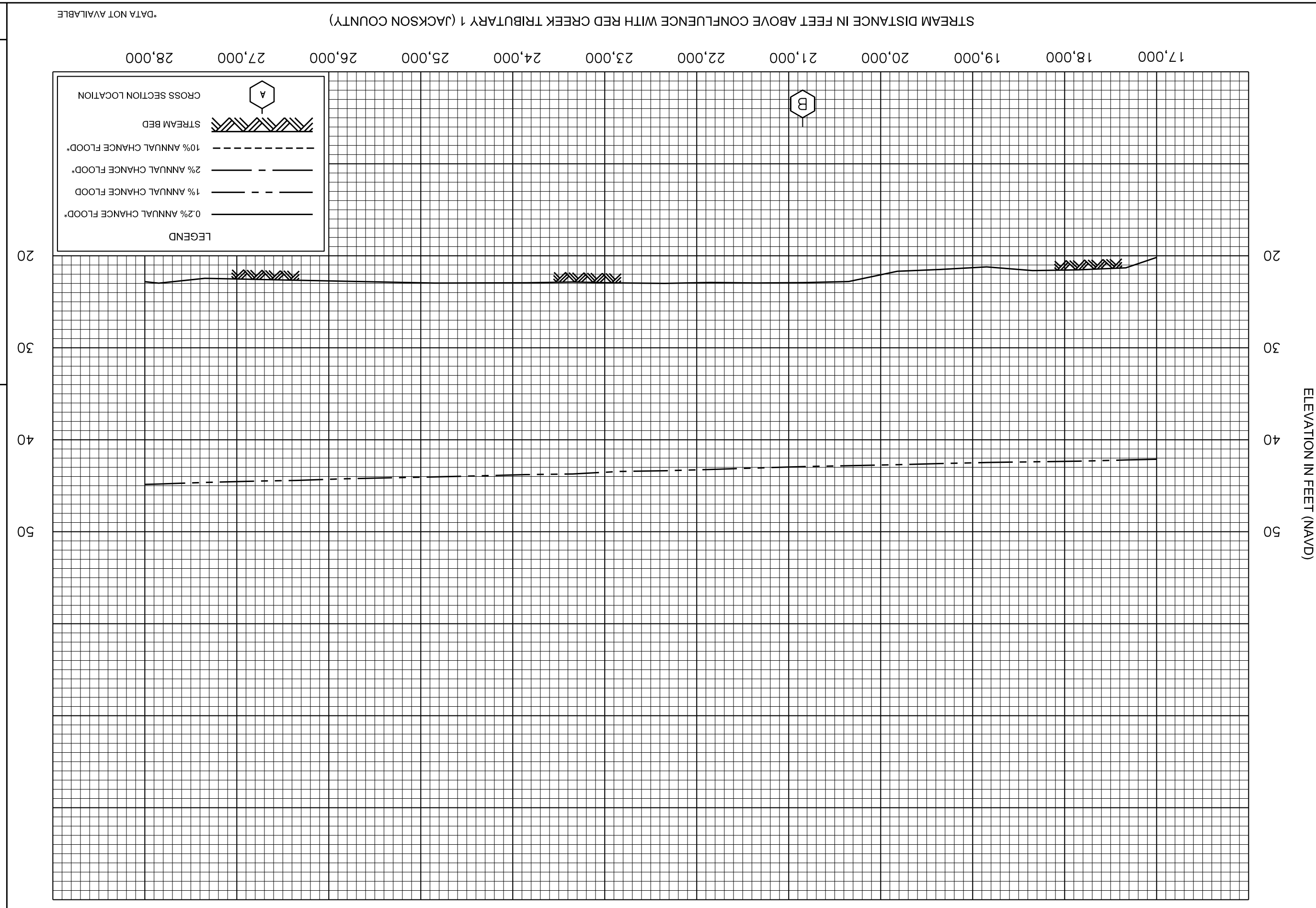
FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS

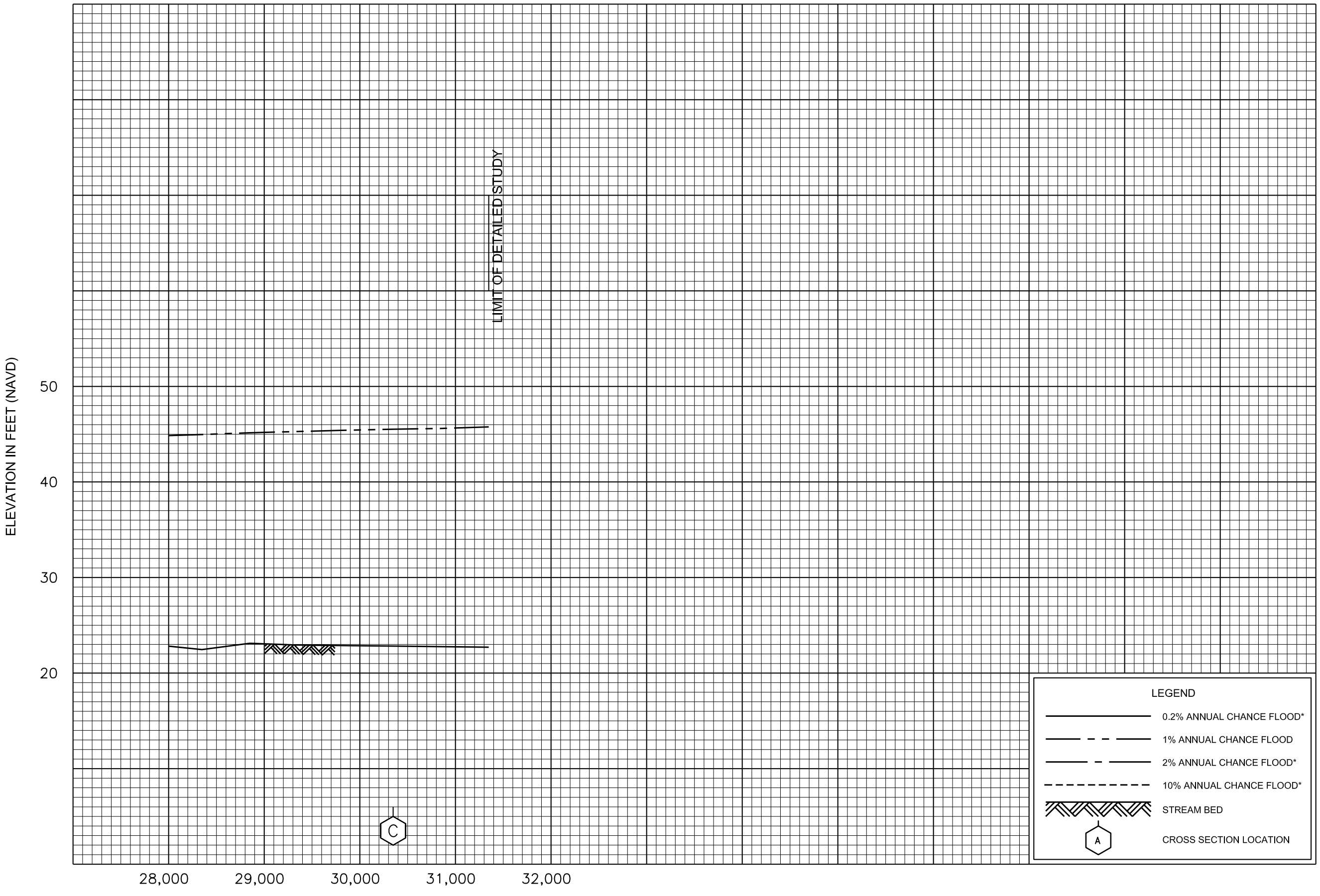
AND INCORPORATED AREAS

FLOOD PROFILES

RED CREEK



*DATA NOT AVAILABLE



STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH RED CREEK TRIBUTARY 1 (JACKSON COUNTY)

*DATA NOT AVAILABLE

FLOOD PROFILES

RED CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GEORGE COUNTY, MS
AND INCORPORATED AREAS

22P