FLOOD INSURANCE STUDY

FORREST COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
FORREST COUNTY, (UNINCORPORATED AREAS)	280052
HATTIESBURG, CITY OF	280053
PETAL, CITY OF	280260

REVISED:

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28035CV000A

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 report. 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 Date: April 2, 1990

Revised Countywide FIS Dates:

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FLOOD INSURANCE STUDY
FORREST COUNTY, MISSISSIPPI AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and/or Flood Insurance Rate Maps (FIRMs) in the geographic area of Forrest County, Mississippi, including the City of Hattiesburg, City of Petal, and unincorporated areas of Forrest County (hereinafter referred to collectively as Forrest County). The City of Hattiesburg is included in its entirety in Forrest County.

This FIS 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. This information will also be used by Forrest County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the 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.

The hydrologic and hydraulic analyses for the April 2, 1990 countywide FIS were performed by Neel-Schaffer, Inc. (the study contractor) for the Federal Emergency Management Agency (FEMA), under contract No. EMW-86-C-2246. This study was completed in October 1987.

The hydrologic and hydraulic analyses for this revision were performed by the State of Mississippi for FEMA. This study was completed in June 2008 under Contract No. EMA-2005-CA-5215.

Base map information shown on the FIRM was provided in digital format by the State of Mississippi. 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 State Plane Coordinate System, Mississippi East, FIPS ZONE 2301. The horizontal datum was the North American Datum of 1983, GRS 80 spheroid. Distance units were measured in U.S. feet.

1.3 Coordination

An initial Consultation Coordination Officer's (CCO) meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held with the same representatives to review the results of the study.

For the April 2, 1990 countywide FIS, the initial CCO meeting was held on February 10, 1986 at the County Courthouse in Hattiesburg, Mississippi. The final CCO meeting was held on April 5, 1989.

For this countywide FIS revision, an initial Pre-Scoping Meeting was held on July 27, 2005. A Project scoping meeting was held on September 1, 2005. Attendees for these meetings included representatives from the Mississippi Department of Environmental Quality, Mississippi Emergency Management Agency, FEMA National Service Provider, Forrest County, and the incorporated communities within Forrest County, and Mississippi Geographic Information, LLC, the State study contractor. 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. All problems raised in the meetings have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Forrest County, Mississippi, including the incorporated communities listed in Section 1.1.

April 2, 1990 Countywide Analyses

Flooding caused by overflow of the Leaf River, the Bowie River, Gordon's Creek, Gordon's Creek Tributary, Unnamed Tributary No. 1, and Greens Creek was studied in detail.

Areas having low development potential or minimal flood hazards were previously studied using approximate analysis. The results were shown in the Flood Insurance Studies of the Cities of Hattiesburg and Petal, and on the Flood Hazard Boundary Map for Forrest County (References 1-3) and are incorporated into this FIS.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through October 1992. The scope and methods of study were proposed to and agreed upon by FEMA and Forrest County.

This Countywide Revision Analyses

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Forrest County.

For this countywide FIS revision, Limited detailed analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the State of Mississippi. For this FIS, Table 1 lists the streams which were restudied and/or newly studied by Detailed and Limited Detailed methods:

TABLE 1. STREAMS STUDIED BY DETAILED/LIMITED DETAILED METHODS

Stream	Limits of Revision/New Detailed/Limited Detailed Study
Black Creek	From county boundary to county boundary
Boggy Branch	From the confluence with Greens Creek to approximately 0.5 mile upstream of Otis Lee Road
Bowie River	From the confluence with Leaf River to approximately 14 miles upstream of the confluence with Leaf River
Gordons Creek	From the confluence with Leaf River to approximately 2,000 feet upstream of the Interstate 59
Gordons Creek Tributary	From the confluence with Gordons Creek to Approximately 920 feet upstream of 34th Avenue
Greens Creek	From approximately 1.0 mile upstream of confluence With Leaf River to to approximately 4,000 feet upstream of Robertson Road
Leaf River	From Sims Road to Forrest County boundary
Little Beaver Creek	From confluence with Little Black Creek to the Forrest/Lamar county boundary
Mixons Creek	From approximately 0.4 mile upstream of the confluence with Bowie River to Gravel Pit Road
Mixons Creek Tributary 1	From the confluence with Mixons Creek to approximately .07 mile upstream of Dogwood Cove
Mixons Creek Tributary 2	From the confluence with Mixons Creek Tributary 1 to approximately 1,540 feet upstream of Bridges Circle
Mixons Creek Tributary 4	From the confluence with Mixons Creek to approximately 2.1 miles upstream of the confluence with Mixons Creek

TABLE 1. STREAMS STUDIED BY DETAILED/LIMITED DETAILED METHODS - continued

Stream	Limits of Revision/New Detailed/Limited Detailed Study
Unnamed Tributary No. 1	From confluence with Leaf River to approximately 145 feet downstream of East 5th Avenue
Unnamed Tributary No. 2	From the confluence with Unnamed Tributary No. 1 to approximately 400 feet upstream of Chandler Lane

Also, floodplain boundaries of streams that have been previously studied by Detailed methods were redelineated based on up-to-date topographic information.

Approximate analyses were used to study those areas having low developments potential or minimal flood hazards and are the basis of the revised Zone A mappings included on the FIRMs.

2.2 Community Description

Forrest County is in southern Mississippi, 83 miles southeast of Jackson, Mississippi, and 75 miles northeast of New Orleans, Louisiana. It is bordered by Covington and Jones Counties on the north, Perry County on the east, Stone County on the south, and Pearl River and Lamar Counties on the west. Major roads serving Forrest County include U.S. Highways 49 and 98, Interstate 59, the Illinois Central Railroad, and the Norfolk Southern Railway. The 2000 population of Forrest County was reported to be 72,604 (Reference 4).

2.3 Principal Flood Problems

The most severe flood problems in Forrest County generally results from overflow of the Leaf and Bowie Rivers into low-lying areas and have been increasing due to growth and development throughout the county. The severest flood on the Leaf and Bowie Rivers generally occurs in early spring as a result of rainfall from large frontal systems. The latest floods to occur in the Leaf River floodplain were in 1960, 1974, and 1980. In 1980, two separate floods occurred – one in March and one in April. The April flood was the most damaging and the communities affected were declared disaster areas. In Hattiesburg, other factors contributing to flood problems are bridges and culverts that have inadequate capacity and easily become constricted from debris at the structures.

2.4 Flood Protection Measures

Major structural flood protection measures were completed in June 1987 by the U.S. Army Corps of Engineers (USACE) on the Leaf River in the Hattiesburg area. The measures involved clearing and snagging in the channel and selective clearing in the overbank area from a point just upstream of U.S. Highway 11 at the confluence of the Leaf and Bowie Rivers to a point 12,500 feet downstream. Other flood protection measures included the removal of a sewage lagoon in the City of Hattiesburg and of other structural obstructions in the floodplain, and erosion protection by the placement of riprap and bedding material within the riverbank and on the river bottom at the

Norfolk Southern Railway and Hardy Street bridges. The USACE rechanneled the lower 2.5 miles of Gordons Creek in 1978.

A levee exists in the study area that provides the community with protection against the 1-percent-annual-chance flood. The criteria used to evaluate protection against the 1-percent-annual-chance flood are 1) adequate design, including freeboard, 2) structural stability, and 3) proper operation and maintenance.

A Provisionally Accredited Levee (PAL) is reflected on the FIRM panels. A PAL is a levee which is believed to meet the criteria to protect an area against a 1-percent-annual-chance flood event, but which has not been certified at the time in which the study is completed. An explanation of the impact on the area is located on the FIRM panel and a detailed description of the PAL is located in the Notes to Users section on the FIRM panel. The levee owner has agreed to submit required documentation within the 24 month FEMA mandated time period. If the levee receives accreditation, the notes on the FIRM are changed to provide appropriate explanations, if the levee does not receive accreditation, the levee notes are removed from the FIRM panel, the zone is changed to a Zone A or AE, and the levee itself remains on the FIRM panel.

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 FIS. 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 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

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

April 2, 1990 Countywide Analyses

A gaging station on the Leaf River, located at the U.S. Highway 11 bridge in Hattiesburg, was the principal source of data for that river. The stream gage has been operated continuously by the USGS since 1905. Values of peak discharges for floods of 10-, 2-, 1-, and 0.2-percent-annual-chance reoccurrence intervals were determined from a log-Pearson Type III distribution (Reference 5) of annual peak flow data from 1905-1985 using the Flood Flow Frequency Analysis computer program (Reference 6) for the

flood frequency analysis. The results of the analysis were coordinated with the USACE and the USGS.

Peak discharge-frequency relationships for the Bowie River were obtained from a previous study of that stream (Reference 7). The peak-discharge values from the previous study were compared with results using USGS regression equations (Reference 8) and with known distributions of flow measured during the floods of 1961 and 1974. Peak discharge-frequency data for Gordons Creek watershed were developed by the USACE (Reference 9) and extended to the 0.2-percent-annual-chance flood by the USGS after consultation with the USACE.

Peak discharge-drainage area relationships for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods of each flooding source studied in detail in the community are shown in Table 2."Summary of Discharges".

This Countywide Revision Analyses

Peak discharges for the streams studied by Detailed and Limited Detailed methods were calculated based on USGS regional regression equations (Reference 10).
For the discharges calculated based on regional regression equations, the rural regression values were updated to reflect urbanization as necessary.

A summary of the drainage area-peak discharge relationships for all the streams is shown in Table 2, "Summary of Discharges."

TABLE 2. SUMMARY OF DISCHARGES

Detailed Studied Streams

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mi.)	PEAK DISCHARGES (cfs) 10-percent	2-percent	1-percent	0.2-percent
BOWIE RIVER					
At Mouth	600	27,000	51,000	65,000	111,000
GORDONS CREEK					
At Mouth	10.24	5,229	6,685	7,887	10,318
Approximately 530 feet downstream of Broad Street	8.80	4,586	5,908	7,025	9,253
Approximately 1230 feet downstream of Park Avenue	8.19	4,254	5,481	6,526	8,589
Approximately 200 feet downstream of Highway 11	2.87	1,837	2,356	2,838	3,969

TABLE 2. SUMMARY OF DISCHARGES - continued

Detailed Studied Streams

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mi.)	PEAK DISCHARGES (cfs) 10-percent	2-percent	1-percent	0.2-percent
GORDONS CREEK					
Approximately 920 feet upstream of Adeline Street	4.72	2,687	3,498	4,192	5,524
LEAF RIVER					
Approximately 62 miles above mouth	1,824	58,000	101,000	125,000	195,000
At U.S. Highway 11	1,760	51,000	89,000	110,000	172,000
Just above confluence of the Bowie River	1,100	36,000	65,000	82,000	135,000
MIXONS CREEK					
At Mouth	12.08	4,917	6,398	7,669	9,954
MIXONS CREEK					
Approximately 0.6 mile downstream of Campbell Scenic Drive	11.07	4,511	5,851	7,042	9,196
Approximately 733 feet upstream of Campbell Scenic Drive	6.58	4,164	5,378	6,455	8,396
MIXONS CREEK TRIBUTARY 1					
At Mouth	3.52	1,648	2,120	2,553	3,353
Approximately 0.4 mile downstream of Westover Drive	3.14	1,508	1,945	2,330	3,034
Approximately 626 feet upstream of Westover Drive	2.25	1,368	1,764	2,111	2,738
Approximately 472 feet downstream of the County boundary	2.14	1,230	1,577	1,184	2,434
UNNAMED TRIBUTARY NO. 1					
At Mouth	1.7	730	1,100	1,320	1,800
At Fifth Avenue	0.7	580	810	890	1,050

TABLE 2. SUMMARY OF DISCHARGES- continued

Limited Detailed Studied Streams

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mi.)	PEAK DISCHARGES (cfs) 10-percent	2-percent	1-percent	0.2-percent
BLACK CREEK					
At the County Boundary	427.52	*	*	41,250	*
Approximately 2,400 feet downstream of Ashe Nursery Road	359.12	*	*	37,126	*
BLACK CREEK					
Approximately 0.6 mile downstream of the confluence of Big Creek	340.01	*	*	35,929	*
Approximately 30 feet downstream of Churchwell Road	205.41	*	*	29,862	*
Approximately 1.0 mile upstream of the confluence of Bufkins Branch	187.02	*	*	29,035	*
BOGGY BRANCH					
At Mouth	2.52	*	*	1,852	*
Approximately 1,500 feet upstream of Robinson Drive	2.04	*	*	1,229	*
Approximately 0.5 mile upstream of Otis Lee Road	1.44	*	*	1,060	*
GREENS CREEK					
At Mouth	10.6	2,540	4,040	4,730	6,500
At Chappell Hill Road	9.87	*	*	4,849	*
Approximately 1,200 feet upstream of Chappell Hill Road	6.42	*	*	3,397	*
Approximately 0.6 mile upstream of Kelly Rose Lane	4.76	*	*	2,797	*

* Data not available

TABLE 2. SUMMARY OF DISCHARGES-continued
Limited Detailed Studied Streams

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mi.)	PEAK DISCHARGES (cfs) 10-percent	2-percent	1-percent	0.2-percent
GREENS CREEK					
Approximately 1.0 mile upstream of Kelly Rose Lane	3.94	*	*	2,059	*
Approximately 1,100 feet upstream of Robertson Road	2.04	*	*	1,392	*
LITTLE BEAVER CREEK					
At Mouth	13.13	*	*	4,553	*
Approximately 200 feet upstream of Churchwell Road	12.35	*	*	4,321	*
Approximately 1.3 miles downstream of Browns Bridge Road	10.66	*	*	4,255	*
Approximately 0.4 mile downstream of Browns Bridge Road	9.25	*	*	3,998	*
MIXONS CREEK TRIBUTARY 2					
At mouth	0.33	*	*	405	*
MIXONS CREEK TRIBUTARY 4					
At mouth	0.99	*	*	835	*
Approximately 1.0 mile upstream of the Confluence with Mixons Creek	0.52	*	*	600	*
UNNAMMED TRIBUTARY NO. 2					
At Mouth	0.31	*	*	522	*

* Data not available

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 encouraged to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

April 2, 1990 Countywide Analyses

Cross-section data for the streams in the study area were obtained by field survey. All roads and bridges were field surveyed to obtain elevation data and structural geometry. The water-surface elevations were developed using the HEC-2 step-backwater computer program (Reference 11).

Roughness coefficients (Manning's "n") for the computations were estimated on the basis of field inspection and ranged from 0.035 to 0.04 for the channel and from 0.14 to 0.25 for the overbanks along rural areas of the Bowie and Leaf Rivers. Roughness coefficients within the Cities of Petel and Hattiesburg ranged from 0.035 to 0.07 in the channel and from 0.10 to 0.20 for the overbank areas for the Bowie and Leaf Rivers. Roughness coefficients for the Greens Creek and Unnamed Tributary No. 1 ranged from 0.05 to 0.06 in the channel and from 0.15 to 0.20 for the overbank areas.

The starting water-surface elevations were obtained using slope-conveyance methods and known cross-section profiles. The USACE developed HEC-2 computer models for segments of the Leaf and Bowie Rivers which were incorporated into the hydraulic models used in this study (Reference 12). The USACE models reflect the effects of flood protection measures completed in June 1987. The USACE hydraulic model on the Leaf River was used from stream mile 64.31 to stream mile 73.86. The USACE hydraulic model on the Bowie River was used for 4.23 miles upstream of the mouth.

For Unnamed Tributary No. 1 and Greens Creek below Chapel Hill Road, water-surface elevations of floods of the selected recurrence intervals were developed using the E431 step-backwater computer program (Reference 13). For Greens Creek above Chapel Hill Road, the 1-percent-annual-chance water-surface elevation was developed using flood mark information and floodplain depths. For Gordons Creek, the water-surface elevations were developed using the HEC-2 step-backwater computer program (Reference 11).

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. In cases where the 2- and 1-percent-annual-chance flood elevations are close together, due to limitations of the profile scale, only the 1-percent-annual-chance profile has been shown.

Areas of the community protected by levees are subject to potential risk due to possible failure or overtopping of the levee. These areas were delineated by applying the 0.2-percent-annual-chance elevation determined from the "without levee" analysis.

The hydraulic analyses for this study are based on the effects of 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.

This Countywide Revision Analyses

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

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 14). The model was run for the 1-percent-annual-chance storm for the Limited Detailed and Approximate studies.

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

Table 3, "Summary of Roughness coefficients," shows the ranges of the channel and overbank roughness factors used in the computations for all streams revised or newly studied by Detailed or Limited Detailed methods.

TABLE 3 - SUMMARY OF ROUGHNESS COEFFICIENTS

Stream	Channel "n"	Overbank "n"
Black Creek	0.038	0.035-0.120
Boggy Branch	0.040	0.040-0.140
Greens Creek	0.049-0.055	0.060-0.120
Gordons Creek	0.012-0.042	0.020-0.150
Little Beaver Creek	0.050	0.060-0.140
Mixons Creek	0.040-0.045	0.015-0.150
Mixons Creek Tributary 1	0.045	0.015-0.150
Mixons Creek Tributary 2	0.045-0.048	0.060-0.150
Mixons Creek Tributary 4	0.045	0.060-0.150
Unnamed Tributary No. 2	0.038-0.042	0.050-0.130

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 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

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.

Bench marks 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)

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

The elevations shown in the FIS report and on the FIRM for Forrest County are referenced to NAVD88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD29, add -0.05 feet to the NGVD29 elevation. The -0.05 feet 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 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.

To obtain current elevation, description, and/or location information for bench marks shown on the FIRM for this jurisdiction, or for information regarding conversion between the NGVD29 and NAVD88, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1998* (FEMA, 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).

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.

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 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-percent and 0.2-percent-annual-chance floodplains; and 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 Table, and Summary of Stillwater Elevations Table. 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 methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

For this study, LIDAR data from Earthdata International was used to delineate floodplain boundaries. The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). 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), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-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.

For the streams studied by Limited detailed and 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 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 FIS 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.

The floodway presented in this FIS report and on the FIRM was 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. The results of the floodway computations have been tabulated for selected cross sections of detailed study streams in Table 4. The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

April 2, 1990 Countywide Analyses

The floodways 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. The results of the floodway computations are tabulated for selected cross sections and are shown in Table 4, "Floodway Data." The computed floodways are shown on the FIRM. In cases where the floodway and 1-percent-annual-chance floodplain are either close together or collinear, only the floodway boundary is shown. Portions of the floodways for the Leaf River and Gordons Creek lie outside the county boundary.

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 1.0-foot increase in the base flood elevations at any point within the community.

This Countywide Revision Analyses

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.

The floodway presented in this FIS report and on the FIRM was 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. The results of the floodway computations have been tabulated for selected cross sections of detailed study streams (Table 4). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 4, "Floodway Data," for certain downstream cross sections are lower than the regulatory flood elevations in that area, which must take into account the 1-percent-annual-chance flooding due to backwater from other sources.

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. A listing of stream velocities at selected cross sections is provided in Table 4. In order to reduce the risk of property damage in areas where the stream velocities are high, the county may wish to restrict development in areas outside the floodway.

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.

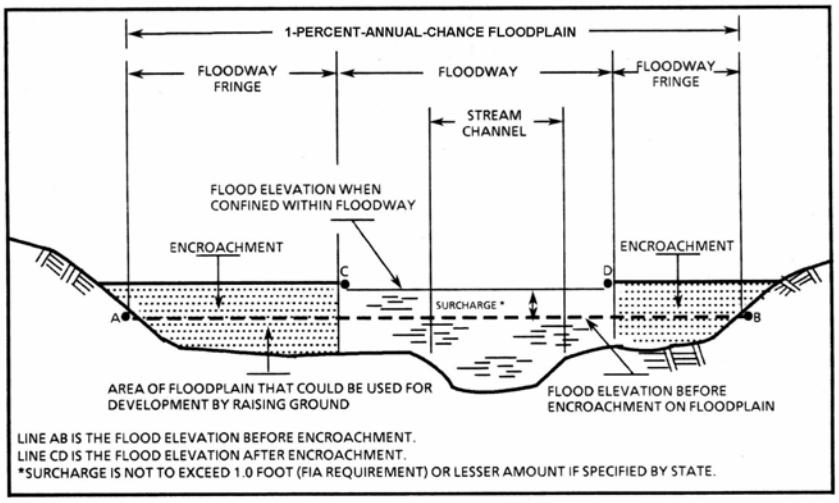


FIGURE 1. FLOODWAY SCHEMATIC

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BOWIE RIVER								
A	0.10	3,174[2]	24,417	3.4	149.8	149.4[3]	150.4	1.0
B	0.70	2,249	25,761	2.5	150.2	149.8[3]	150.7	0.9
C	1.41	1,293	9,962	6.5	150.8	150.8	151.7	0.9
D	1.81	1,952	17,224	3.8	155.0	155.0	155.9	0.9
E	3.19	2,900	29,950	2.2	159.3	159.3	160.2	0.9
F	4.23	2,614	22,928	2.1	162.0	162.0	162.9	0.9
G	7.38	2,968	30,898	2.1	171.2	171.2	172.2	1.0
H	9.57	1,229	16,444	4.0	177.4	177.4	177.7	0.3
I	10.42	3,106	37,982	1.7	179.3	179.3	179.8	0.5
J	12.01	3,253	43,344	1.5	181.4	181.4	182.4	1.0
K	14.04	1,583	20,795	3.1	185.4	185.4	186.4	1.0

[1] Miles above confluence with Leaf River.
[2] Combined floodway width of Bowie River and Leaf River.
[3] Elevation computed without consideration of backwater effects from Leaf River.

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

BOWIE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
GORDONS CREEK								
A	6,878	185	1,706	4.4	152.3	152.3	152.9	0.6
B	9,228	270	1,948	3.8	156.5	156.5	157.5	1.0
C	11,949	186	1,768	4.0	160.6	160.6	161.1	0.5
D	14,890	139	1,410	5.0	164.7	164.7	165.0	0.3
E	17,818	118	828	7.9	169.6	169.6	169.6	0.0
F	19,815	205	1,330	4.3	177.5	177.5	178.5	1.0
G	21,888	127	1,028	5.6	180.5	180.5	181.4	0.9
H	24,760	143	1,132	3.7	188.9	188.9	189.2	0.3
I	27,000	250	1,572	2.7	195.8	195.8	196.8	1.0
J	29,508	117	397	7.2	201.5	201.5	201.8	0.3
K	32,417	304	714	4.0	213.5	213.5	213.5	0.0
L	35,050	69	443	4.2	220.7	220.7	221.2	0.5
M	37,829	178	988	1.9	236.1	236.1	236.4	0.3

[1] Feet above confluence with Leaf River.

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

GORDONS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
GREENS CREEK								
A	1.38	261	2,306	2.1	155.3	155.3	155.3	0.0
B	2.05	250	2,260	2.1	160.8	160.8	161.4	0.6
C	2.25	200	838	5.7	163.1	163.1	163.4	0.3
D	2.59	249	1,239	3.8	168.2	168.2	169.2	1.0
E	2.82	425	2,621	1.8	171.3	171.3	172.3	1.0

[1] Miles above confluence with Leaf River.

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

GREENS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
LEAF RIVER								
A	61.99	3,658	50,343	2.5	130.8	130.8	131.8	1.0
B	63.96	5,899	69,128	1.8	134.7	134.7	134.7	0.0
C	66.67	6,345	70,000	1.8	139.1	139.1	140.1	1.0
D	67.88	3,037	33,971	3.7	140.8	140.8	141.8	1.0
E	68.81	1,872	19,527	6.4	143.5	143.5	144.5	1.0
F	69.36	1,756	18,906	6.6	144.3	144.3	145.3	1.0
G	69.58	2,187	23,392	5.3	144.7	144.7	145.7	1.0
H	69.80	2,985	25,103	5.0	145.2	145.2	146.2	1.0
I	70.02	2,455	22,382	5.6	145.4	145.4	146.3	0.9
J	70.66	2,517	29,703	4.0	147.1	147.1	178.0	0.9
K	70.90	1,769	23,975	4.9	147.8	147.8	148.5	0.7
L	71.38	3,174[2]	24,417	3.4	149.8	149.8	150.7	0.9
M	74.36	3,480	44,661	1.8	153.8	153.8	154.7	0.9
N	75.69	4,453	43,207	1.9	156.5	156.5	157.5	1.0
O	76.96	3,593	43,743	1.9	159.7	159.7	160.7	1.0
P	79.26	2,520	36,813	2.2	164.9	164.9	165.9	1.0
Q	80.88	3,622	40,882	2.0	168.4	168.4	169.4	1.0

[1] Miles above mouth.
[2] Combined floodway width of Leaf River and Bowie River.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
MIXONS CREEK								
A	5,649	422	2,974	2.6	163.0	157.7[2]	158.5	0.8
B	8,012	88	1,058	7.2	162.9	162.9	163.1	0.2
C	11,092	66	726	9.7	167.7	167.7	168.1	0.4
D[3]	13,800	280	2,157	3.1	175.8	175.8	176.8	1.0
E[3]	15,440	221	1,211	5.6	178.2	178.2	178.4	0.2
F[3]	17,100	176	1,332	2.8	183.7	183.7	184.3	0.6
G[3]	19,000	250	1,450	2.3	186.0	186.0	186.8	0.8
H[4]	20,500	130	1,028	3.2	193.2	193.2	193.3	0.1
I[4]	22,660	150	1,488	2.1	199.3	199.3	200.0	0.7
J[4]	28,100	200	625	2.9	216.8	216.8	217.1	0.3
K[4]	30,900	200	923	2.0	236.7	236.7	237.6	0.9
L[4]	33,600	200	702	2.6	252.7	252.7	253.4	0.7

[1] Feet above confluence with Bowie River.
[2] Elevation computed without consideration of backwater effects from Bowie River.
[3] Located within Lamar County, Mississippi Unincorporated Areas.
[4] Located within Lamar County, City of Hattiesburg, Mississippi.

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOODWAY DATA

MIXONS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
MIXONS CREEK TRIBUTARY 1								
A	5,118[1]	320	4,585	0.6	196.8	196.8	196.8	0.0
B	7,237[1]	265	3,539	0.7	196.8	196.8	196.8	0.0
C	10,050[1]	46	437	4.8	197.6	197.6	197.9	0.3
D	12,867[1]	222	1,106	1.7	203.5	203.5	204.2	0.7
UNNAMED TRIBUTARY NO. 1								
A	0.34[2]	47	292	4.5	146.2	145.1[3]	145.4	0.3
B	0.63[2]	423	1,441	0.9	150.6	150.6	150.7	0.1
C	1.03[2]	113	680	1.9	152.8	152.8	153.5	0.7
D	1.40[2]	327	2,956	0.4	153.8	153.8	154.7	0.9

[1] Feet above confluence with Mixons Creek.
[2] Miles above confluence with Leaf River.
[3] Elevation computed without consideration of backwater effects from Leaf River.

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

MIXONS CREEK TRIBUTARY 1 – UNNAMED TRIBUTARY NO. 1

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 FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs, or flood 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 by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of the 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone V

Zone V is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no BFEs are shown within this zone.

Zone VE

Zone VE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. 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, and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

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 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 computations.

The countywide FIRM presents flooding information for the entire geographic area of Forrest County. Historical data relating to the maps prepared for each community are presented in Table 5, “Community Map History”.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Hattiesburg, City of	April 3, 1970	NONE	April 3, 1970	July 1, 1974 November 12, 1976 August 2, 1982 April 2, 1990
Petal, City of	February 1, 1974	March 23, 1976	April 15, 1980	April 2, 1990
Forrest County (Unincorporated Areas)	September 6, 1974	September 2, 1977	April 2, 1990	

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Forrest County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS reports, FIRMs, and/or FBFMs for all of the incorporated and unincorporated jurisdictions within Forrest County.

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.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Study, City of Hattiesburg, Forrest County, Mississippi, August 1982.

2. Federal Emergency Management Agency, Flood Insurance Administration, Flood Insurance Study, City of Petal, Forrest County, Mississippi, April 1908.

3. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Forrest County, Unincorporated Areas, Mississippi, September 1977.

4. U.S. Department of Commerce, Bureau of the Census, 2000 Census of Population, Number of Inhabitants, Mississippi, Washington, D.C., April 1, 2000.

5. U.S. Department of the Interior, Geological Survey, Interagency Advisory Committee on the Water Data, Office of Water Data Coordination, Hydrology Subcommittee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee, Bulletin No. 17B, Guidelines for Determining Flood Flow Frequency, September 1981, revised March 1982.

6. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Flood Frequency Analysis, Computer Program 723-X6-L7550, Davis, California, December 1983.

7. U.S. Army Corps of Engineers, Mobile District, Leaf and Bowie Rivers, Hattiesburg and Petal, Mississippi, Detailed Project Report and Environmental Impact Statement, August 1983.

8. U.S. Department of the Interior, Geological Survey, Flood Frequency of Mississippi Streams, B.E. Colson and J.W. Hudson, 1976.

9. U.S. Army Corps of Engineers, Detailed Project Report on Gordons Creek, Hattiesburg, Mississippi, December, 1981.

10. U.S. Department of the Interior, Geological Survey, Flood Characteristics of Mississippi Streams, Water-Resources Investigations Report 91-4037, Jackson, Mississippi, 1991.

11. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Computer Program 723-X8-L202A, Davis, California, April 1984.

12. U.S. Army Corps of Engineers, Mobile District, Leaf and Bowie Rivers, HEC-2 Computer Model for Improved Conditions, April 1985.

13. U.S. Department of the Interior, Geological Survey, Open File Report 76-499, Computer Program E431, User's Manual, Computer Application for Step-Backwater and Floodway Analyses, J.O. Shearman, Washington, D.C., 1976.

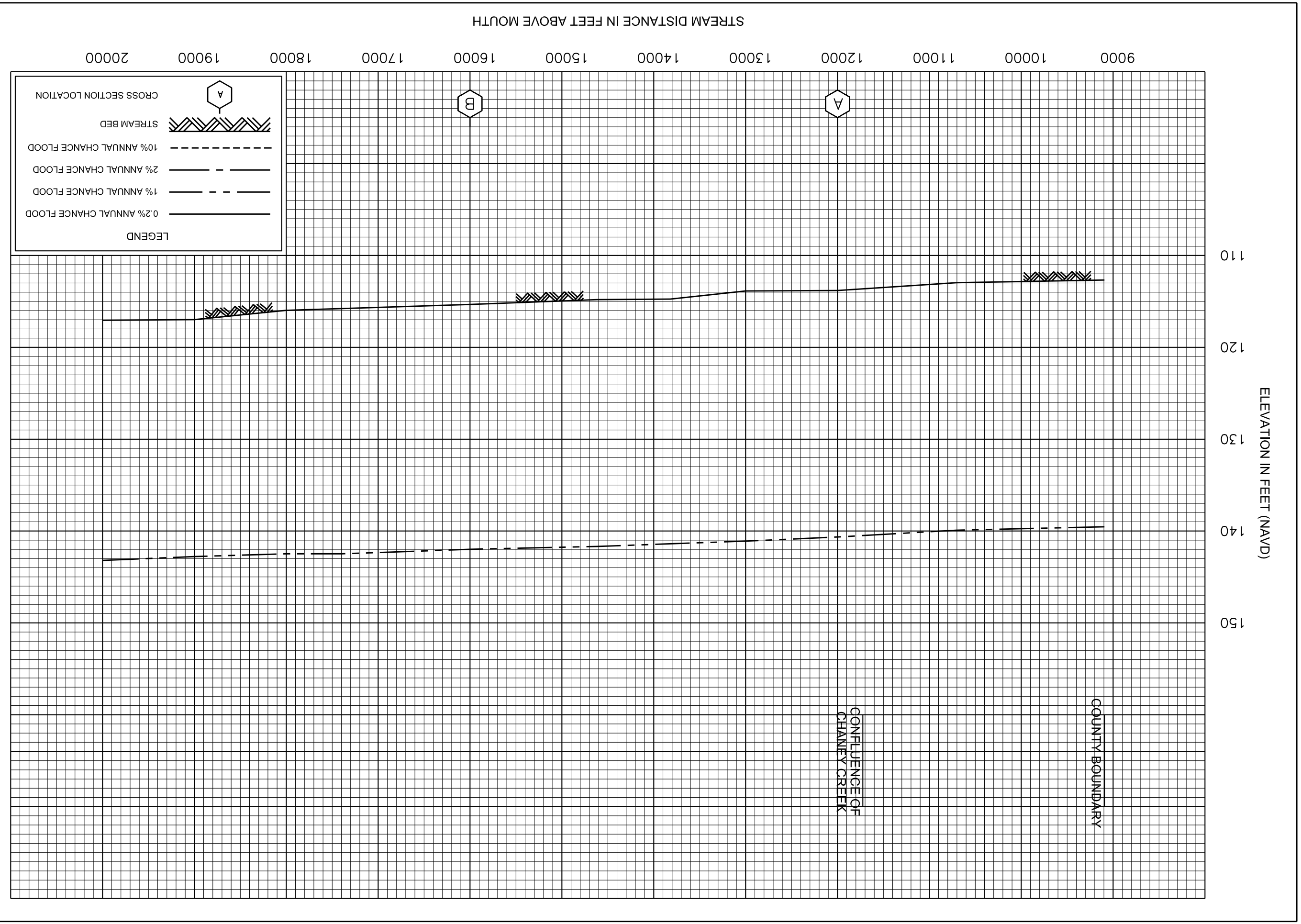
14. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS River Analysis System, User's Manual, Version 3.1, Davis, California, November 2002.

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



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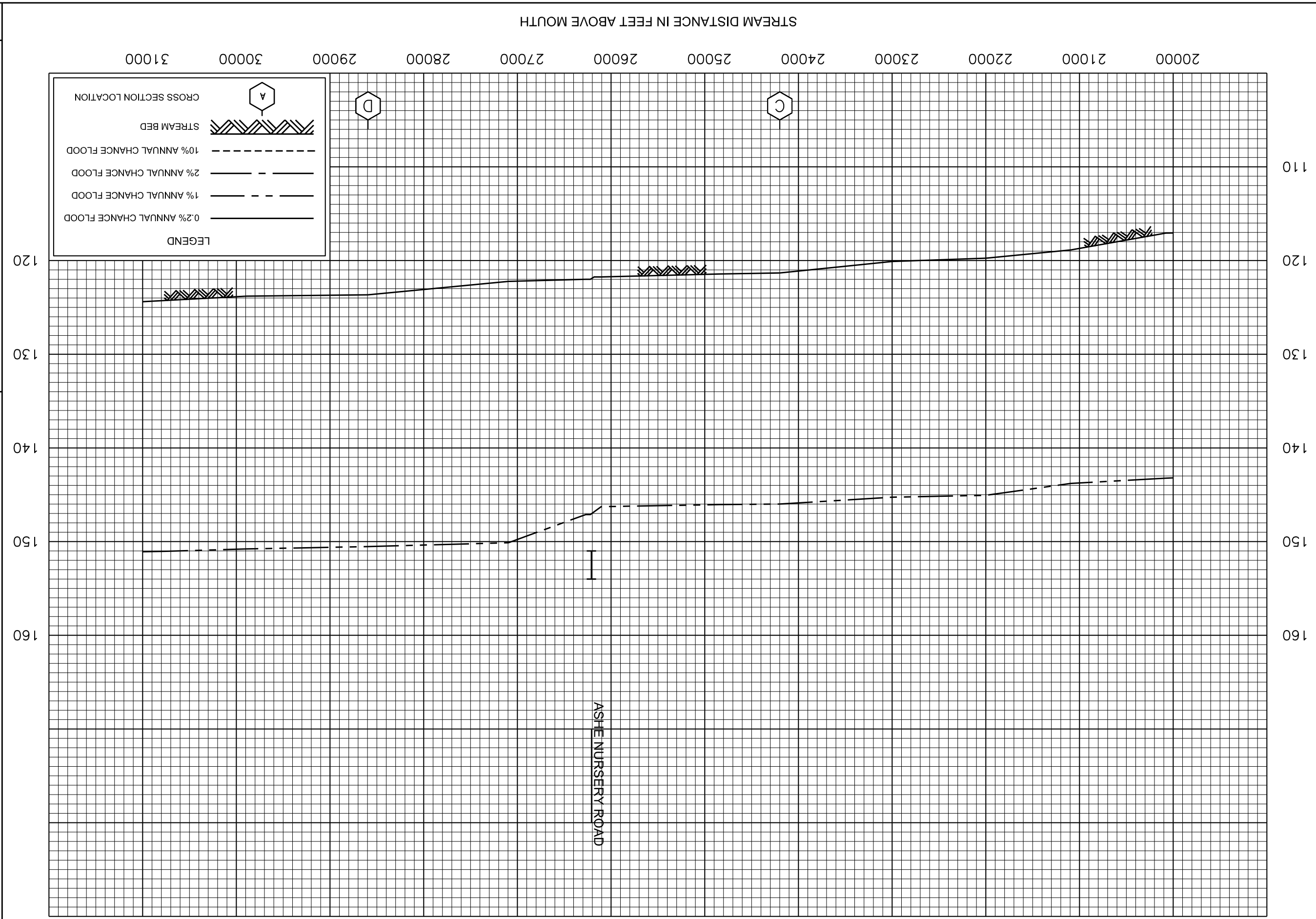
02P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK

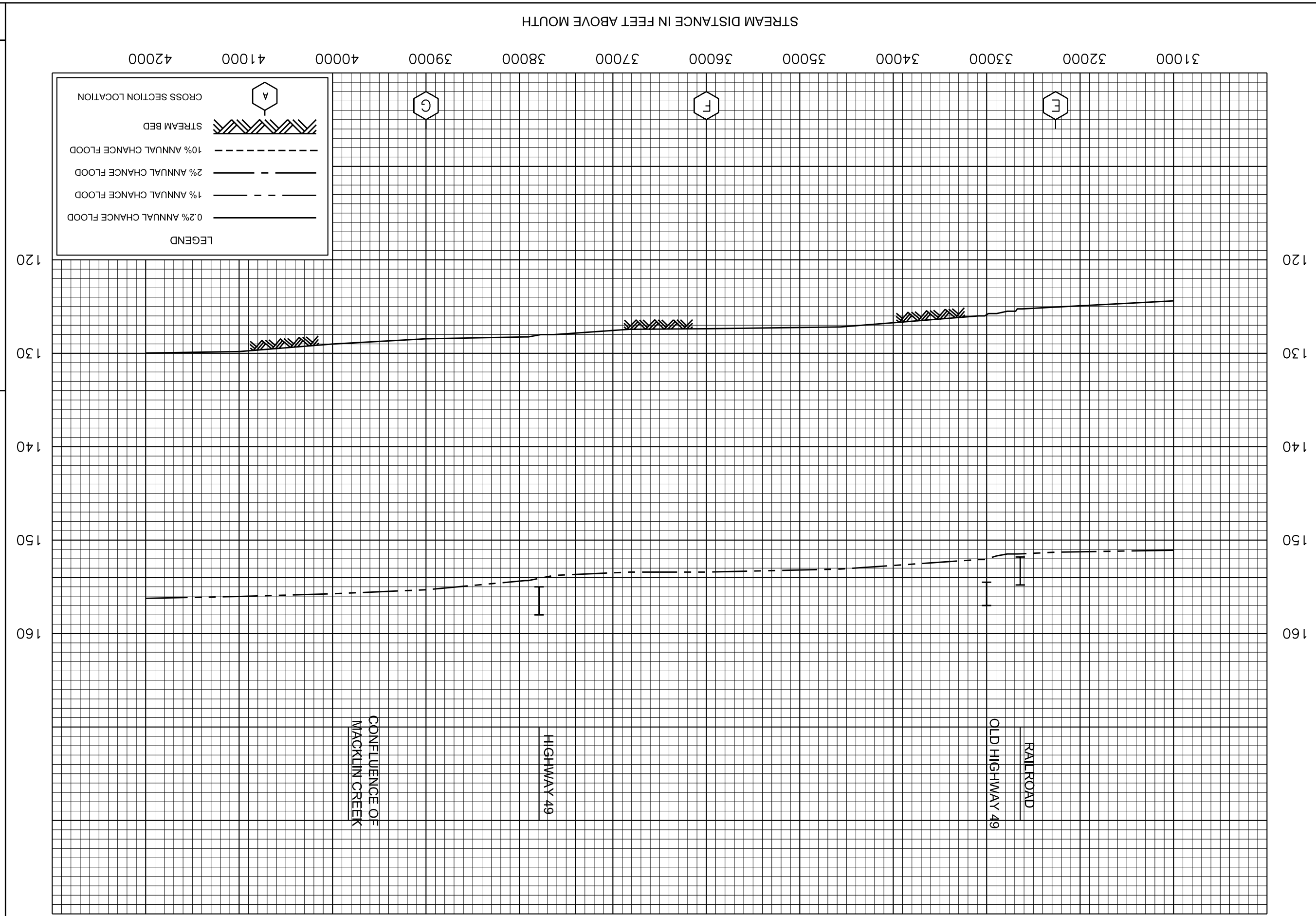


FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



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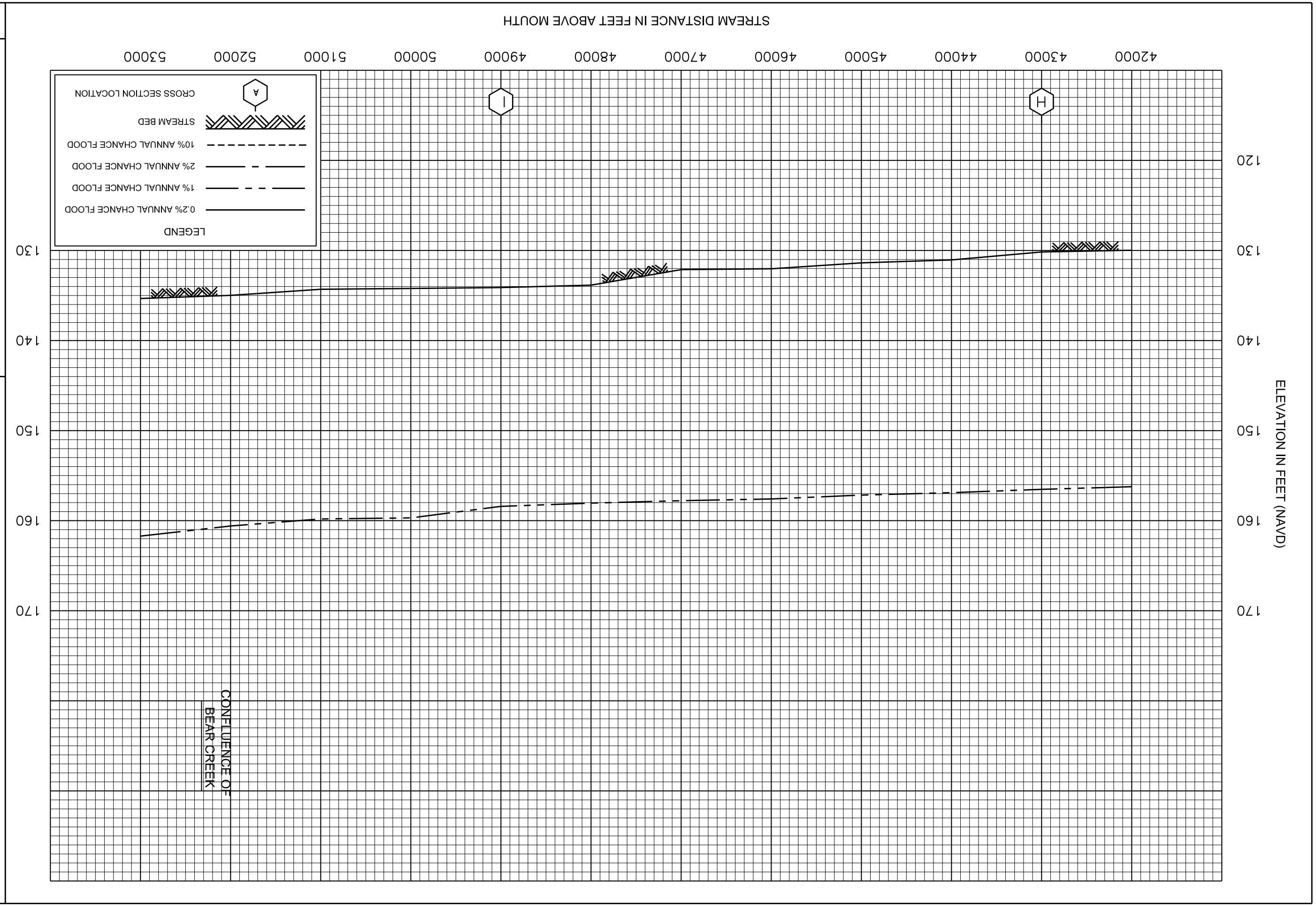


FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK

04P

05P

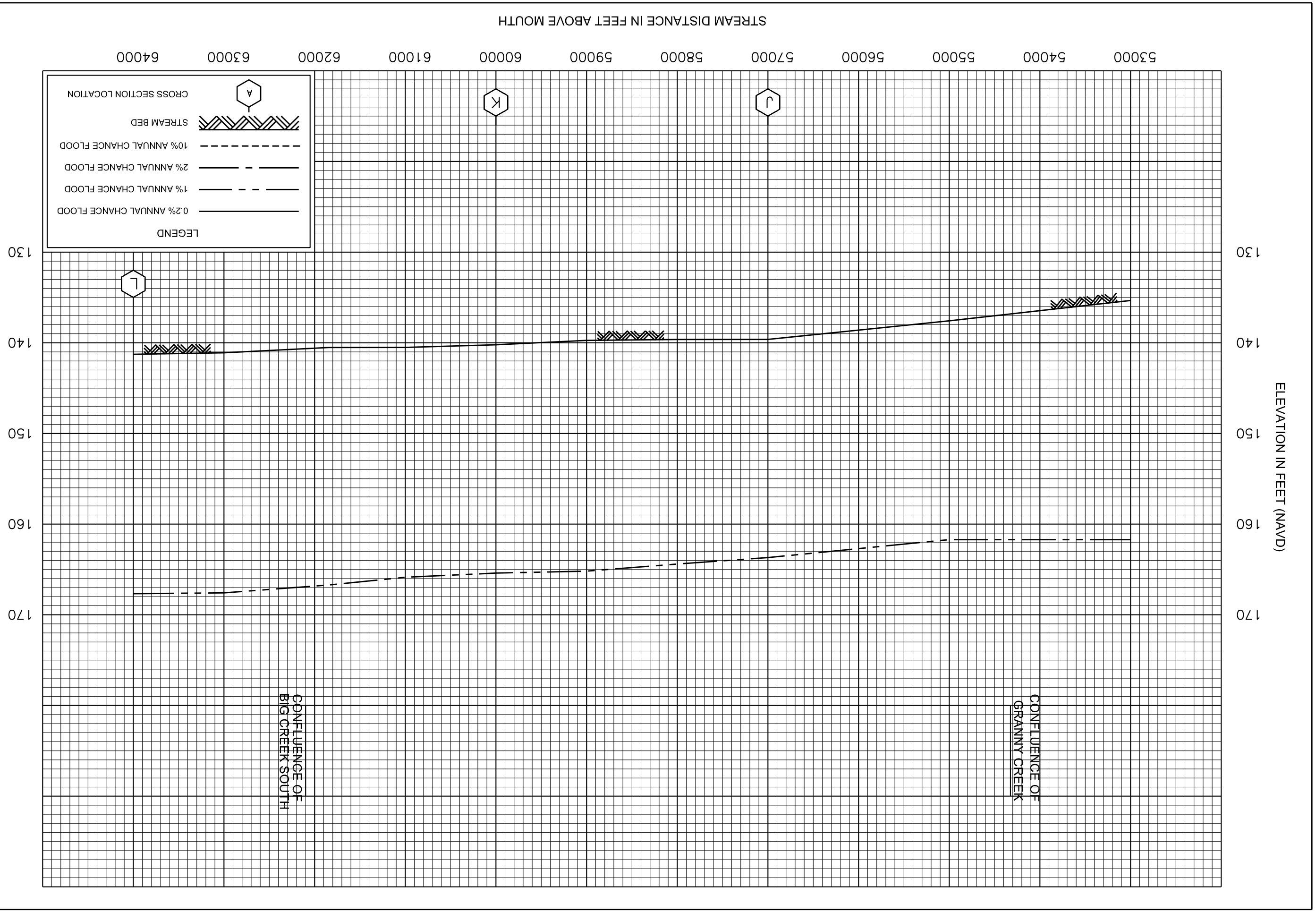
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



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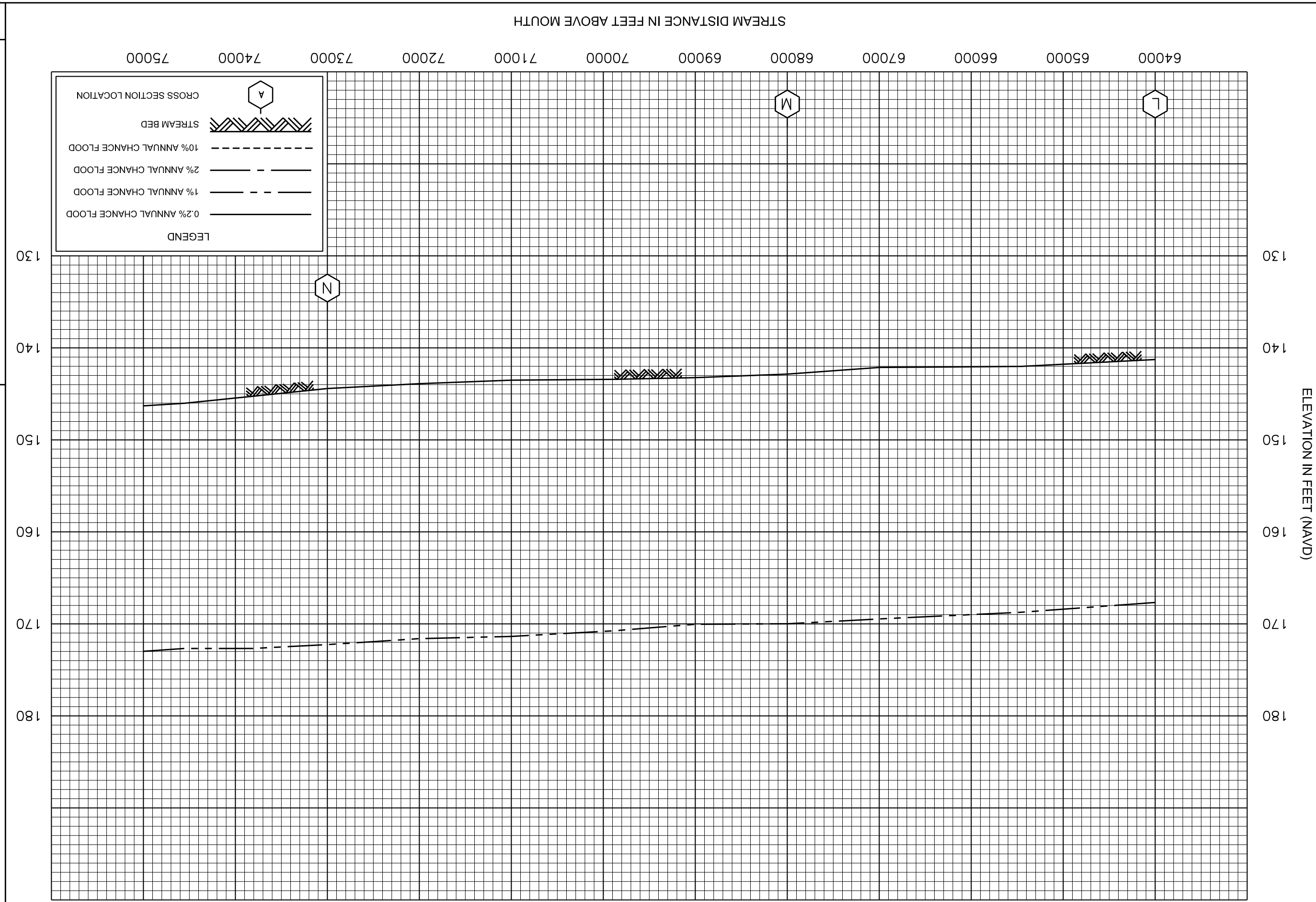
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



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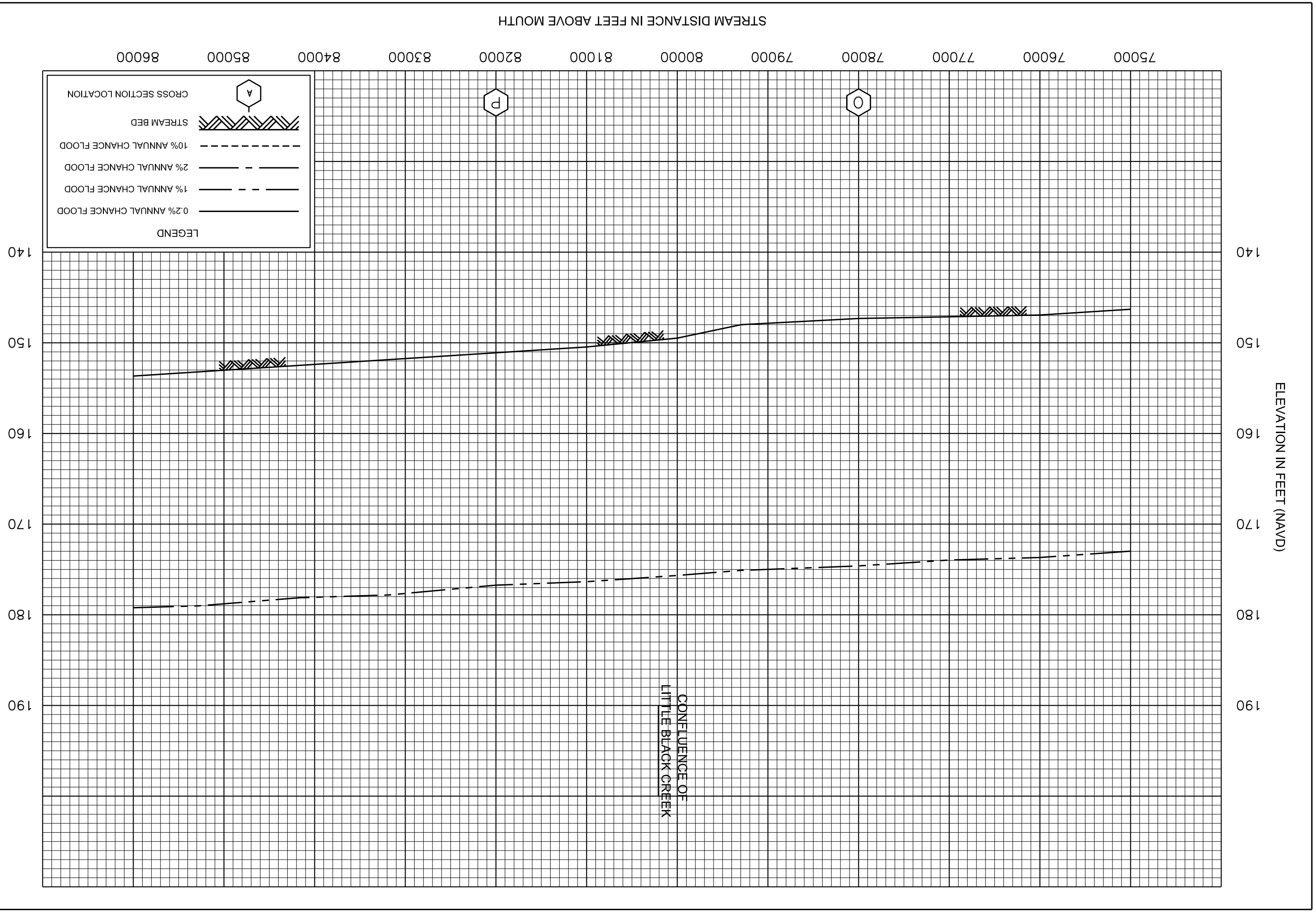
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



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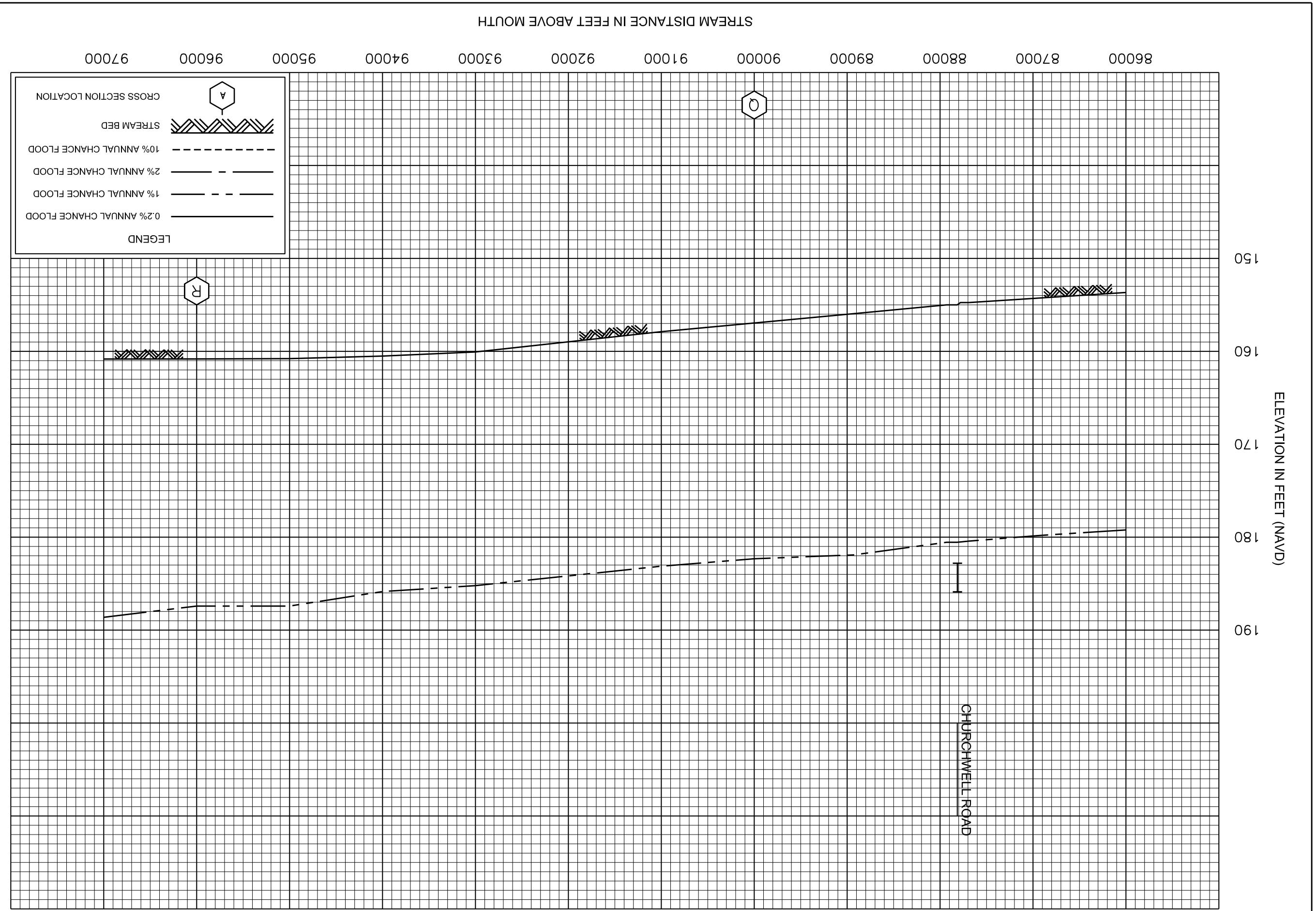
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



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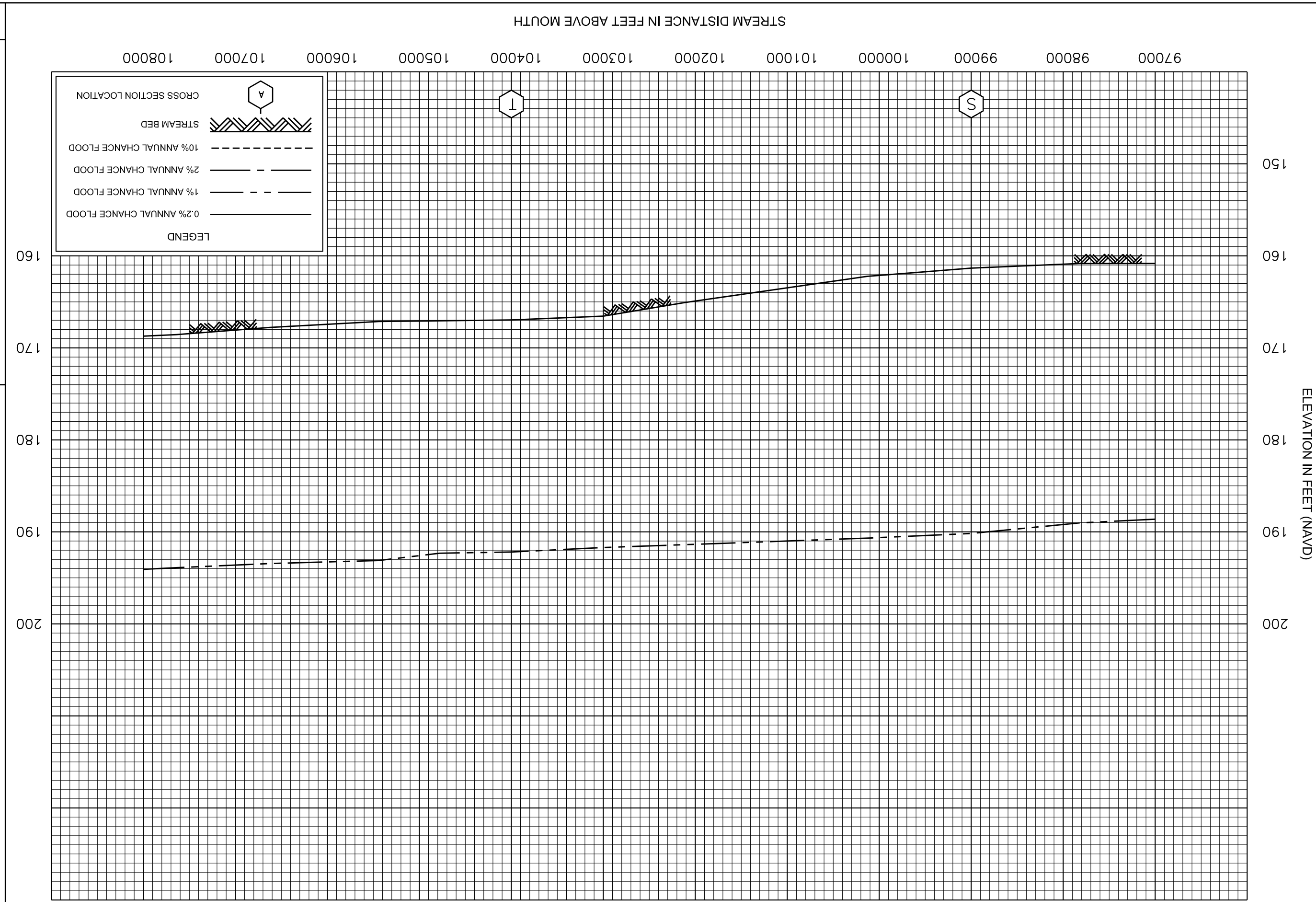
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK

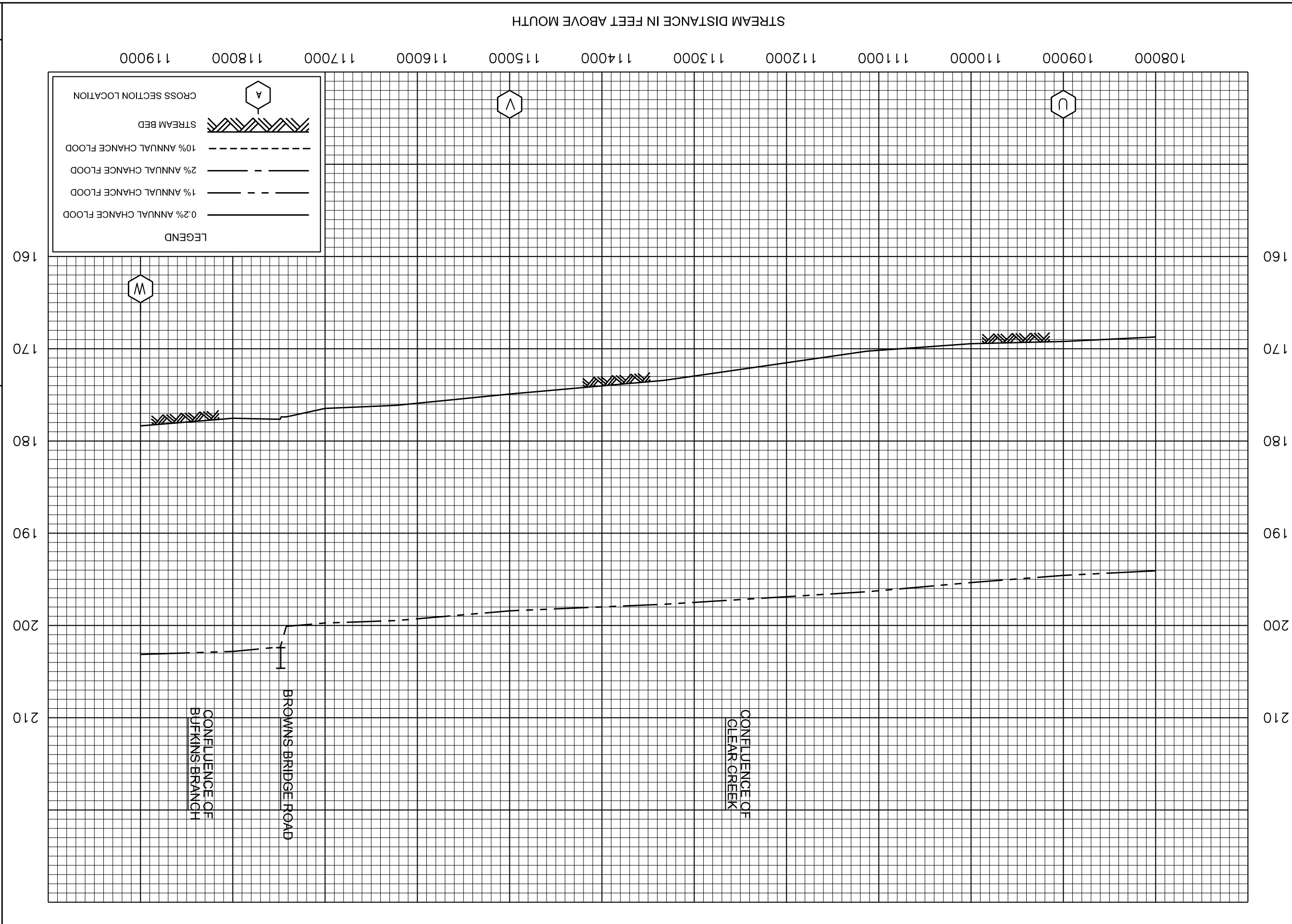


FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK

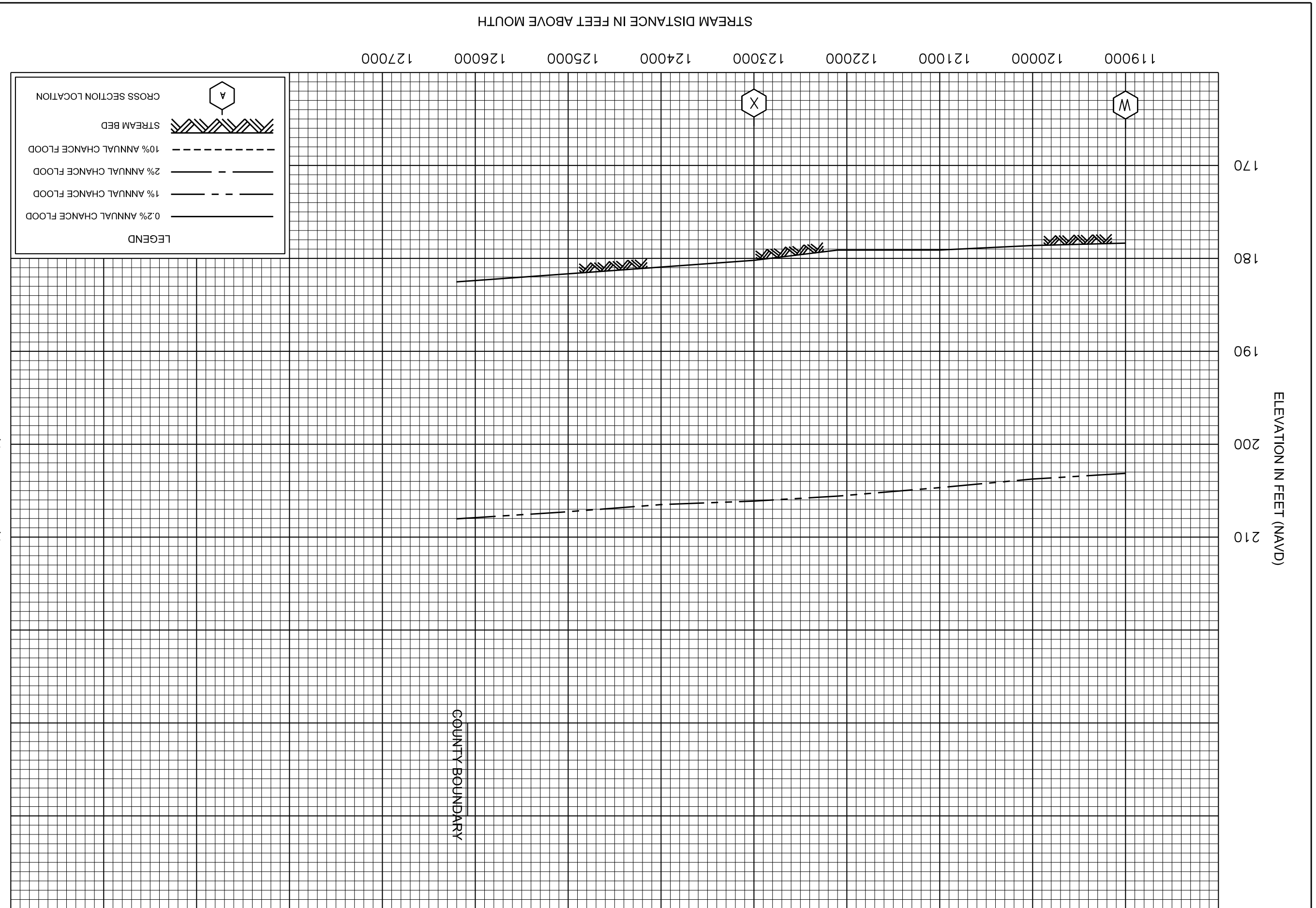


FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BLACK CREEK



ELEVATION IN FEET (NAVD)

150 160 170 180 190 200

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH GREENS CREEK

CONFLUENCE WITH GREENS CREEK

FLOODING CONTROLLED BY GREENS CREEK

LYNN RAY ROAD

PRIVATE DRIVE

ROBINSON DRIVE

CULVERT

A

B

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

CROSS SECTION LOCATION

150 160 170 180 190 200

FEDERAL EMERGENCY MANAGEMENT AGENCY

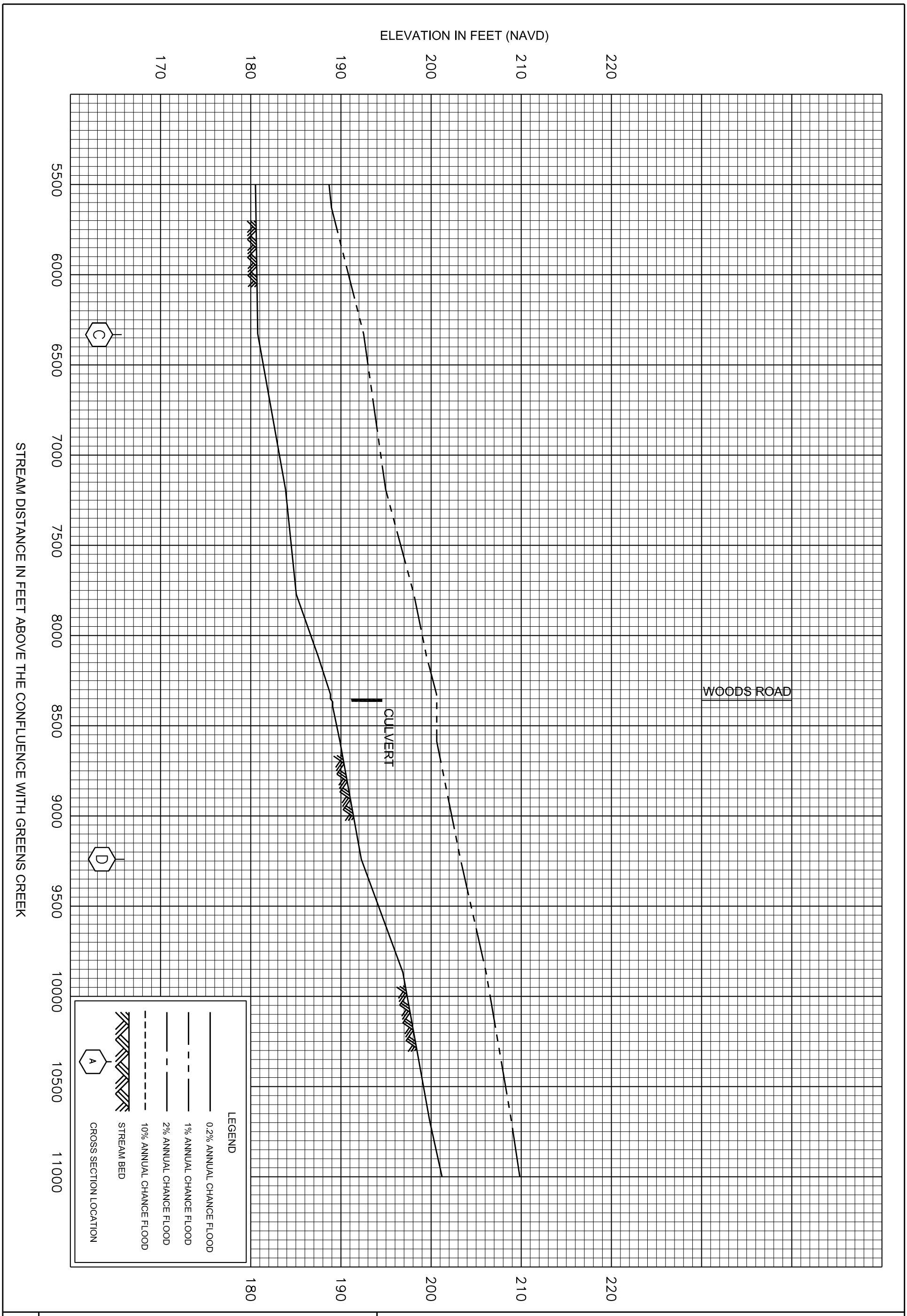
FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BOGGY BRANCH

12P



FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BOGGY BRANCH

13P

ELEVATION IN FEET (NAVD)

190 200 210 220 230

11000 11500 12000 12500 13000 13500 14000 14500 15000 15500 16000 16500

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH GREENS CREEK

E

F

H

OTIS LEE ROAD

LEGEND

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

200 210 220 230

14P

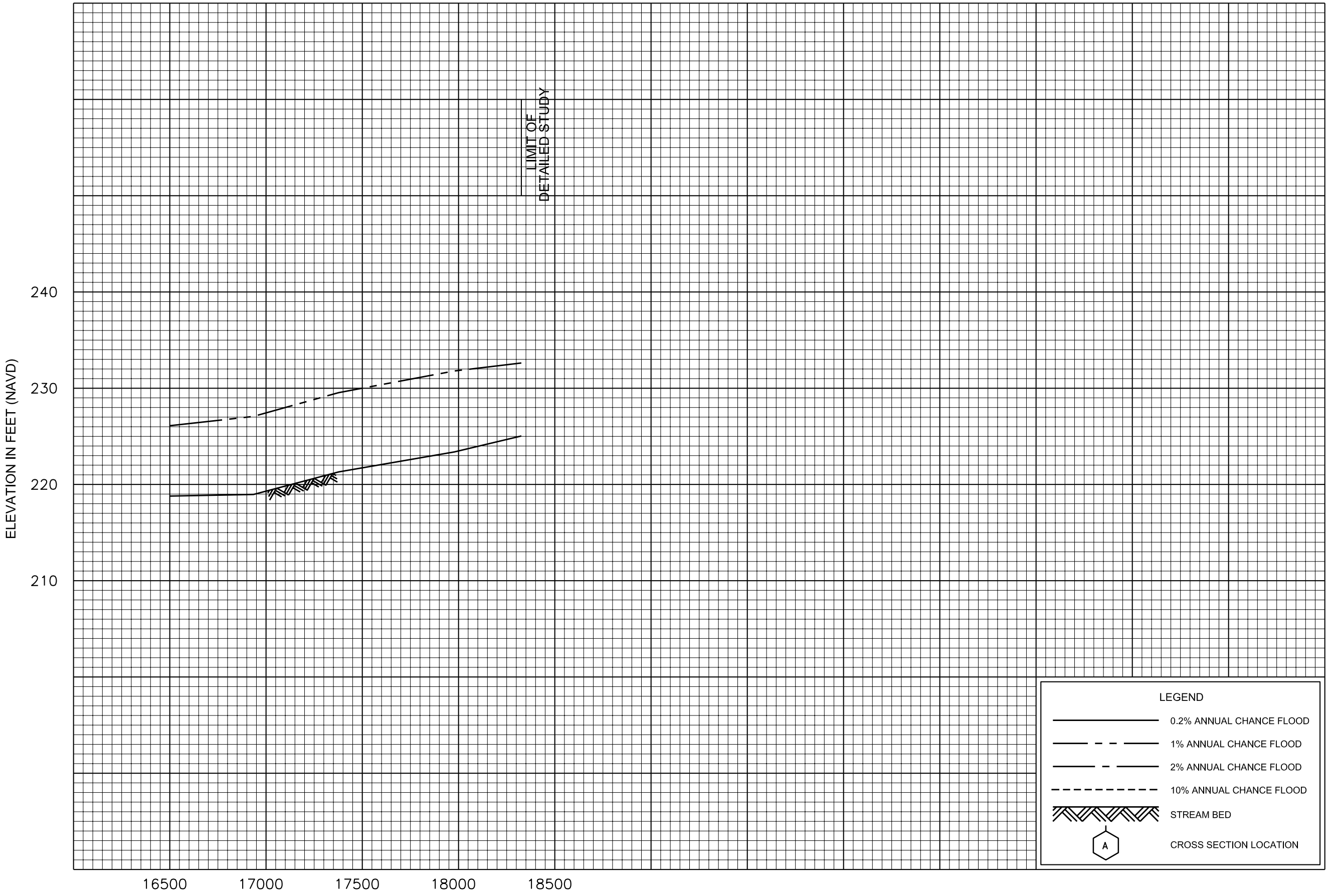
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

BOGGY BRANCH



FLOOD PROFILES

BOGGY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

15P

ELEVATION IN FEET (NAVD)

110 120 130 140 150 160 170 180 190

STREAM DISTANCE IN MILES ABOVE THE CONFLUENCE WITH LEAF RIVER

0 1 2 3 4 5 6 7 8 9 10 11

A B C D E F G H I

CONFLUENCE WITH LEAF RIVER

FLOODING CONTROLLED BY LEAF RIVER

RAILROAD

GLENDALE AVENUE

CONFLUENCE OF GREENS CREEK (WEST)

CONFLUENCE OF BAY CREEK

CONFLUENCE OF MIXONS CREEK

I-59

CONFLUENCE OF MINERAL CREEK

CONFLUENCE OF BIG CREEK NORTH

PEPS POINT ROAD

RAILROAD

CONFLUENCE OF PROVIDENCE CREEK

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

A CROSS SECTION LOCATION

110 120 130 140 150 160 170 180 190

16P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

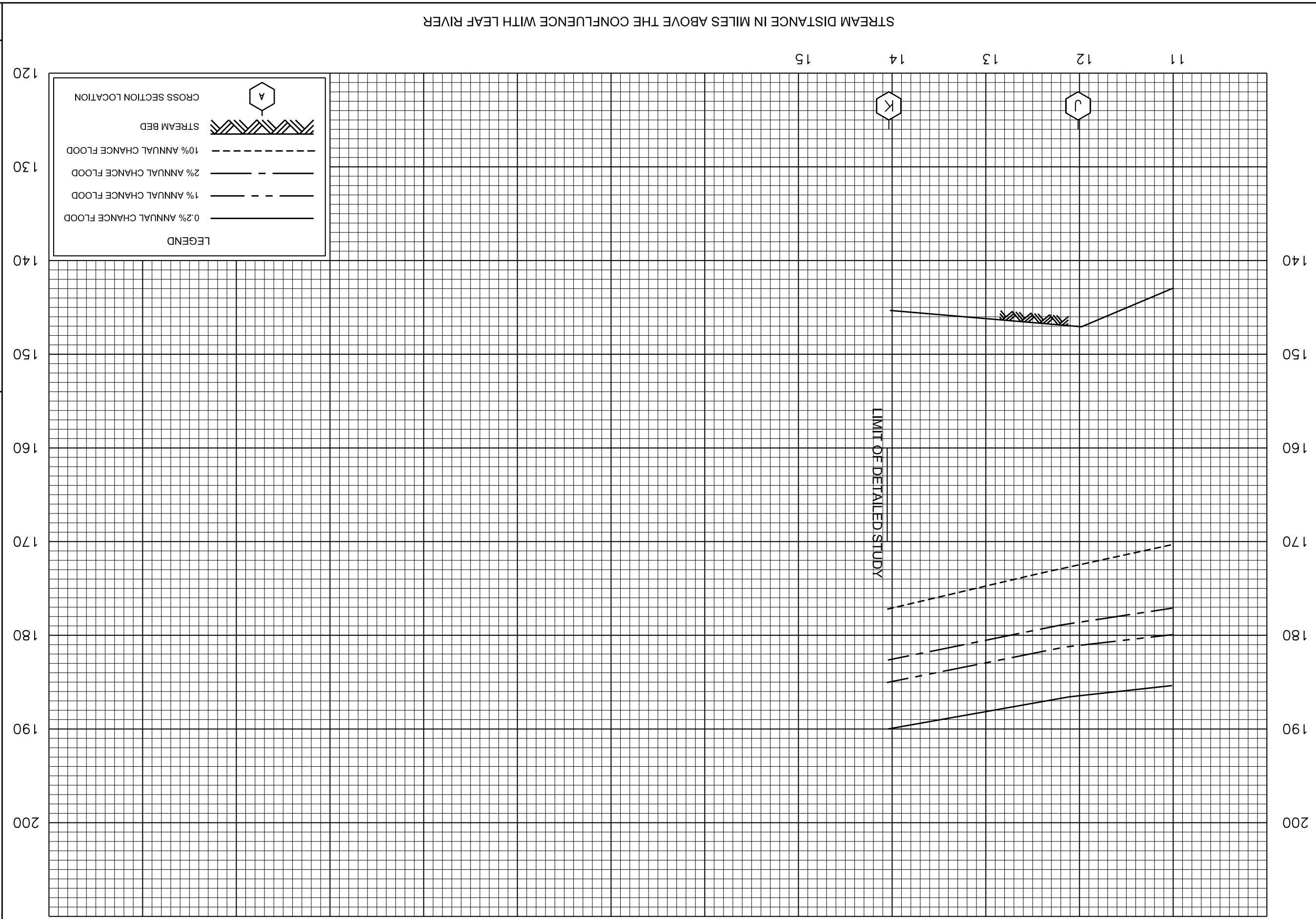
BOWIE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

BOWIE RIVER



17P

ELEVATION IN FEET (NAVD)

110 120 130 140 150 160 170

2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH LEAF RIVER

120 130 140 150 160 170

DOWNSTREAM FLOOD ELEVATIONS CONTROLLED BY LEAF RIVER

FLOODING CONTROLLED BY LEAF RIVER

RAILROAD

UNETTA STREET

RIVER AVENUE

RAILROAD
NORTH MAIN STREET

CULVERT

BUSCHMAN STREET

WALNUT STREET

RAILROAD

RONIE STREET

A

LEGEND

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

GORDONS CREEK

18P

ELEVATION IN FEET (NAVD)

130 140 150 160 170

7500 8000 8500 9000 9500 10000 10500 11000 11500 12000 12500 13000

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH LEAF RIVER

HARDY STREET

WEST PINE STREET

MCLEOD STREET

FORREST STREET

GREEN STREET

WEST STREET

BROAD STREET

CULVERT

CULVERT

CULVERT

A

B

C

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

CROSS SECTION LOCATION

130 140 150 160 170

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

GORDONS CREEK

19P

ELEVATION IN FEET (NAVD)

130 140 150 160 170 180 190 200

13000 13500 14000 14500 15000 15500 16000 16500 17000 17500 18000 18500

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH LEAF RIVER

NORTH 12TH AVENUE

NORTH HUTCHISON AVENUE

HARDY STREET

PARK AVENUE

CONFLUENCE OF
GORDONS CREEK TRIBUTARY 1

D

E

A

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

CROSS SECTION LOCATION

130 140 150 160 170 180 190 200

20P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

GORDONS CREEK

ELEVATION IN FEET (NAVD)

150 160 170 180 190 200

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH LEAF RIVER

18500 19000 19500 20000 20500 21000 21500 22000 22500 23000 23500 24000

CONFLUENCE OF
GORDONS CREEK TRIBUTARY

FOOTBRIDGE

MAMIE STREET

CULVERT

ADELINE STREET

CULVERT

BROADWAY DRIVE
HIGHWAY 11

CULVERT

F

G

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

A

CROSS SECTION LOCATION

150 160 170 180 190 200

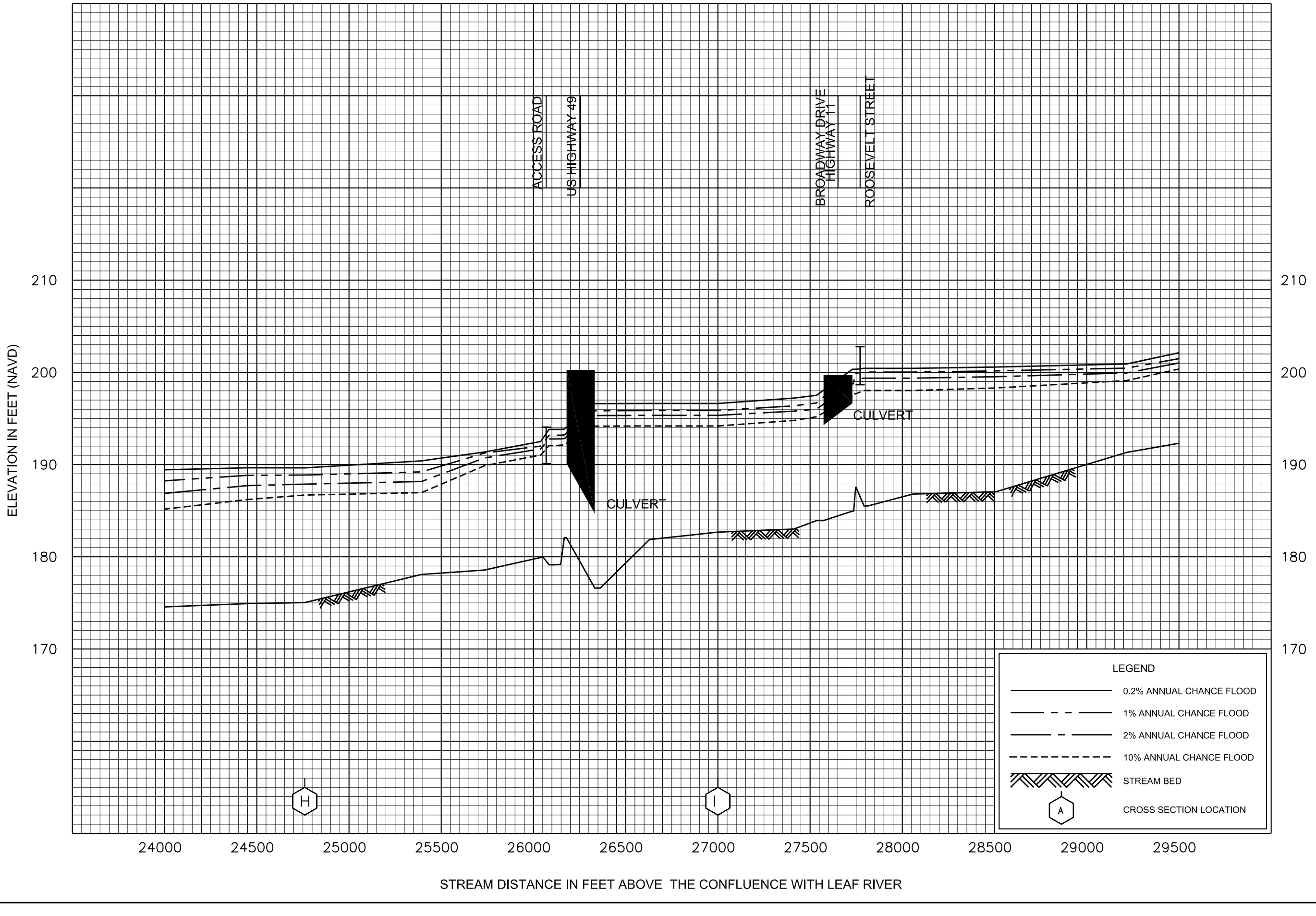
21P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

GORDONS CREEK



FLOOD PROFILES

GORDONS CREEK

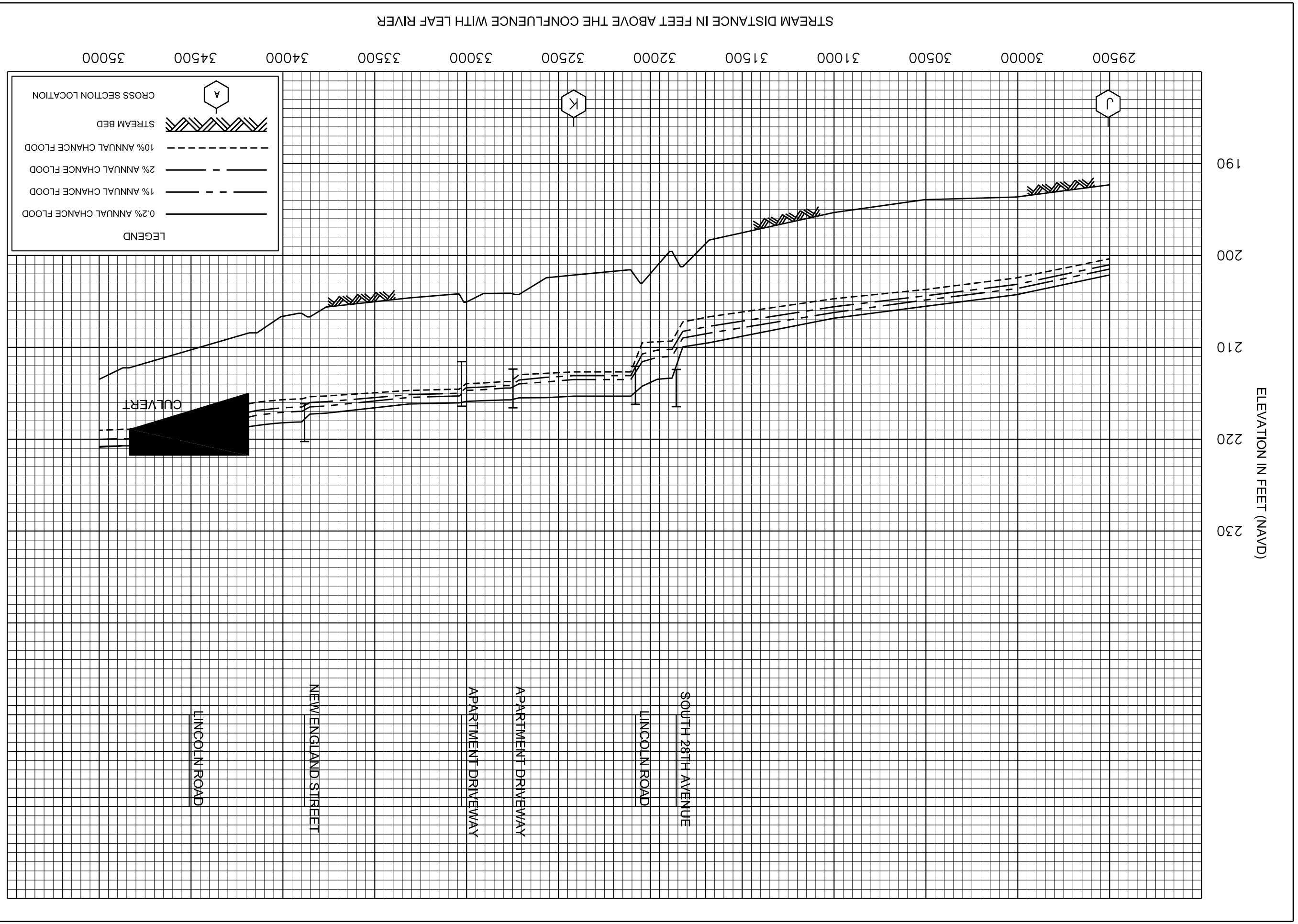
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

22P

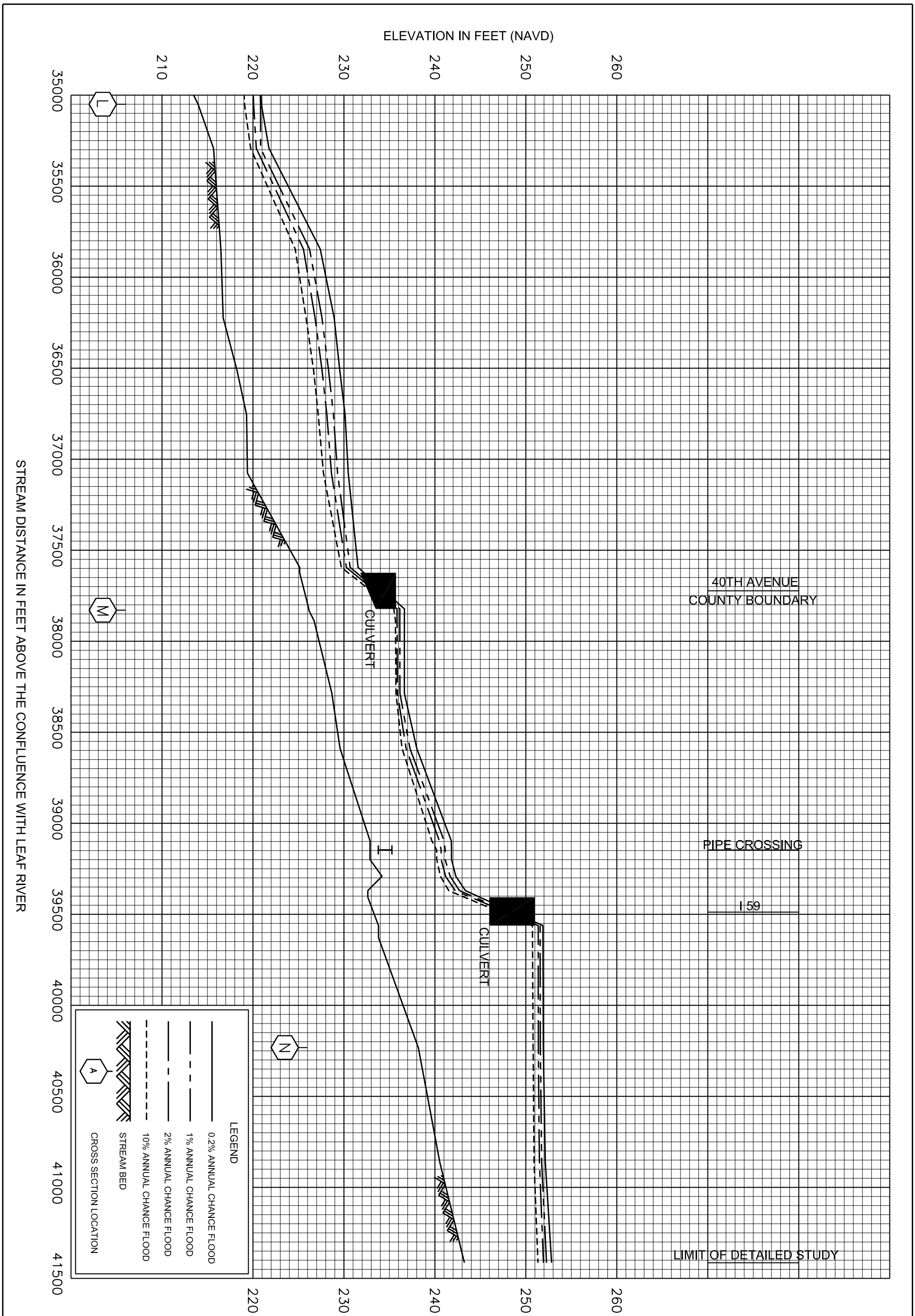
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS



FLOOD PROFILES

GORDONS CREEK



24P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

GORDONS CREEK

ELEVATION IN FEET (NAVD)

160 165 170 175 180 185 190 195 200

0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE OF GORDONS CREEK

CONFLUENCE WITH GORDONS CREEK

19TH AVENUE

MAMIE STREET

BROOKLANE DRIVE

21ST AVENUE

ADELINE STREET

US HIGHWAY 49

28TH AVENUE

CONFLUENCE OF UNNAMED TRIBUTARY NO. 3

34TH AVENUE

LIMIT OF DETAILED STUDY

FLOODING CONTROLLED BY GORDONS CREEK

LEGEND

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

160 165 170 175 180 185 190 195 200

25P

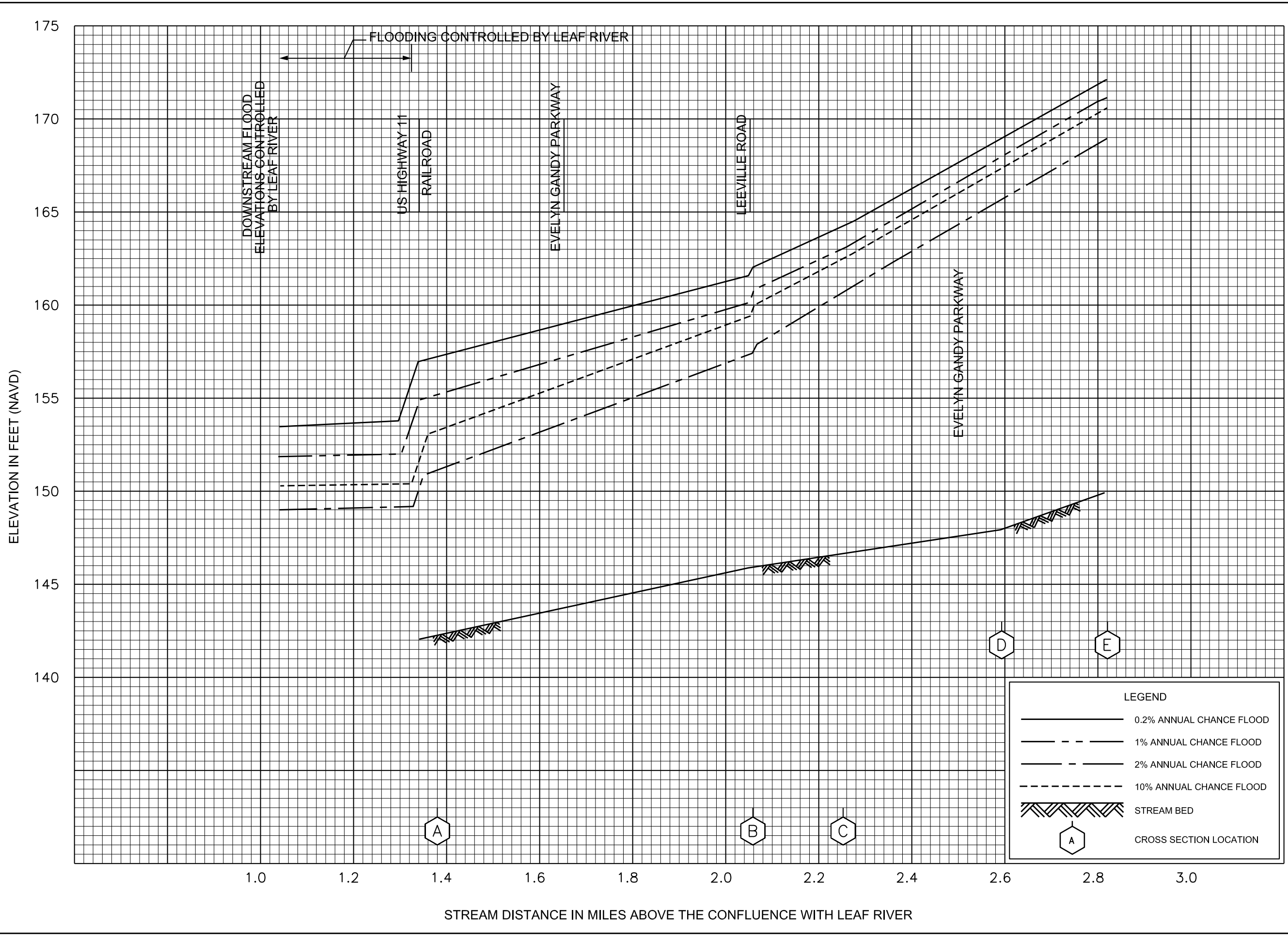
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

GORDONS CREEK TRIBUTARY



FLOOD PROFILES

GREENS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

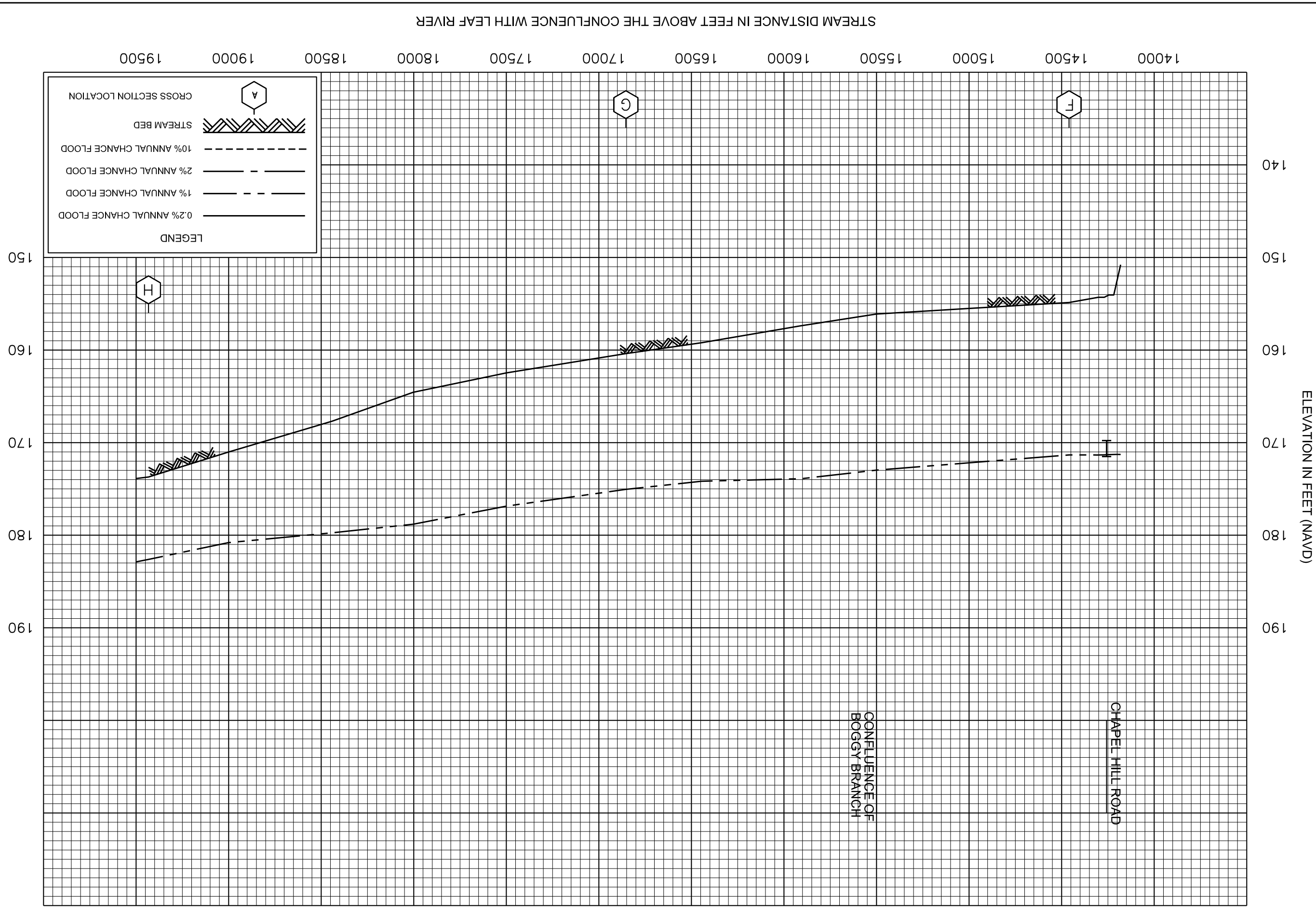
26P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

GREENS CREEK

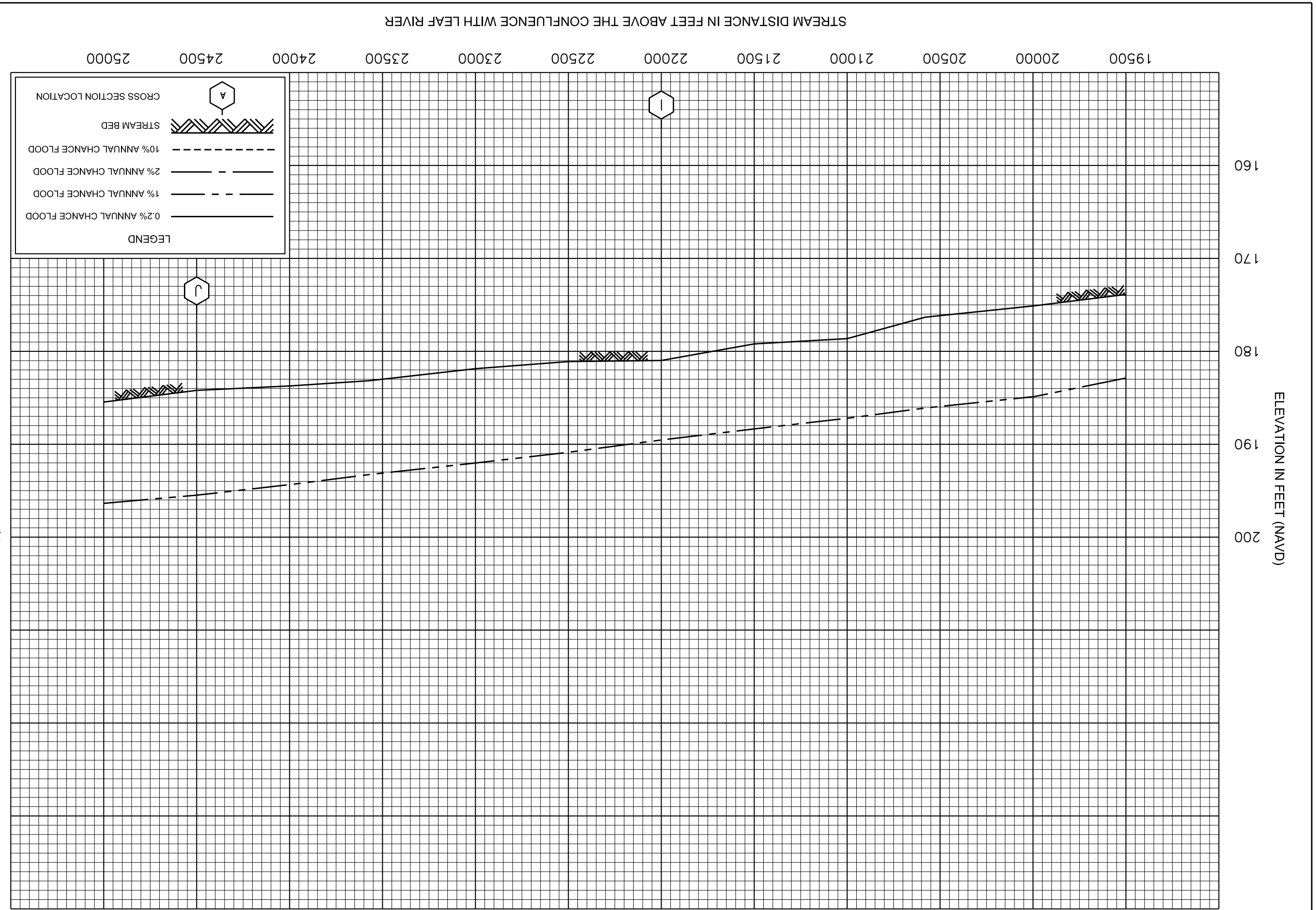


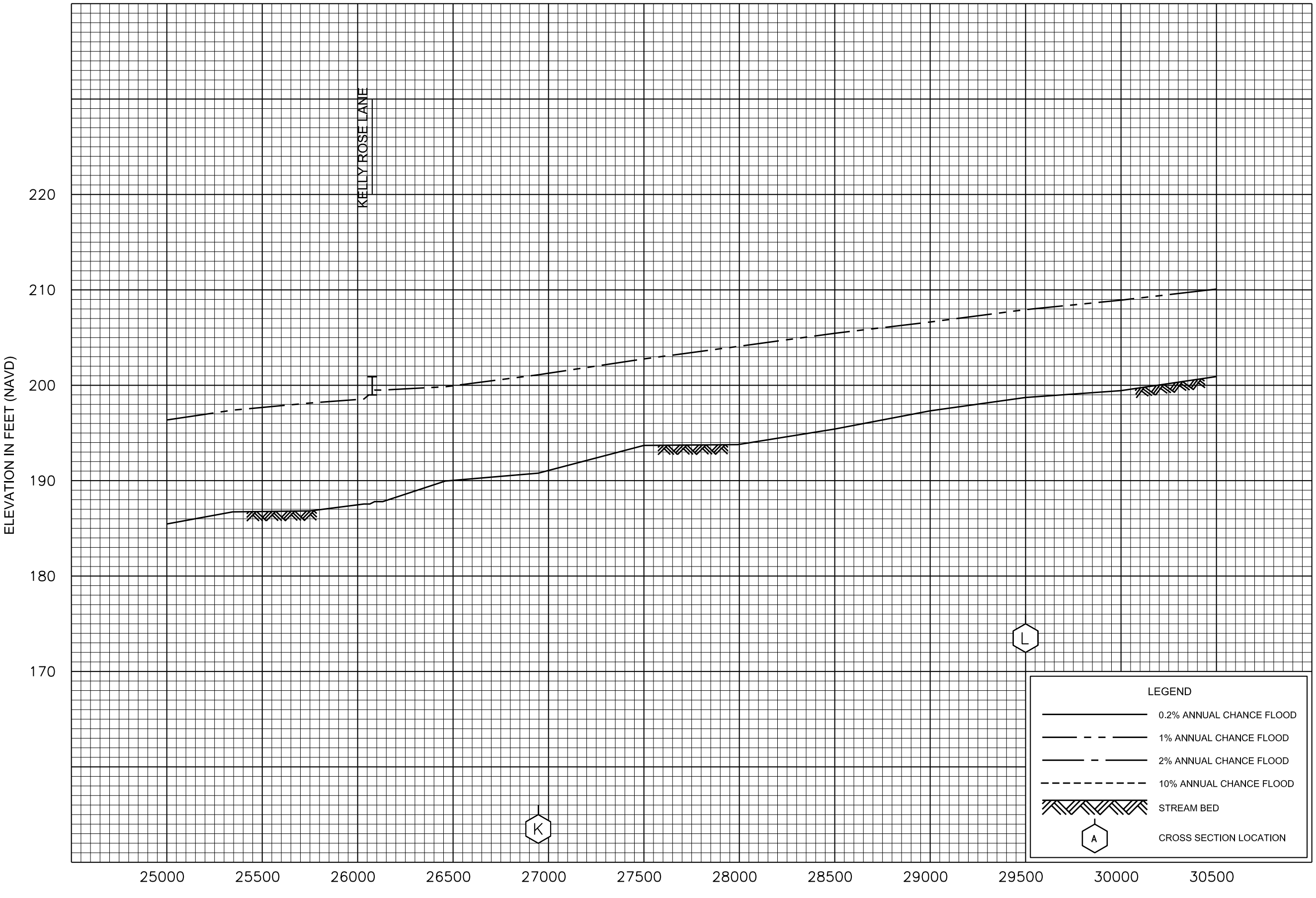
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

GREENS CREEK





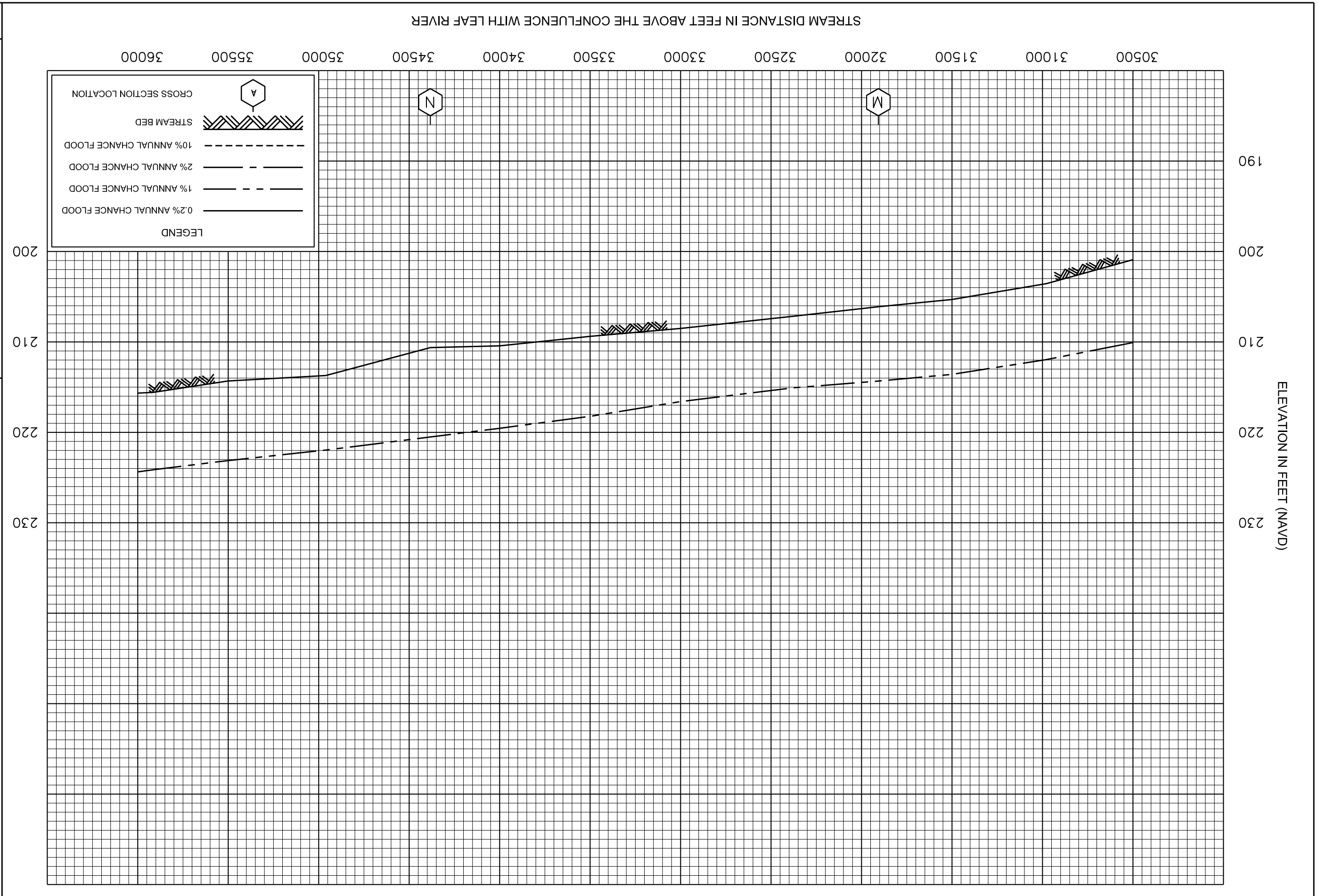
FLOOD PROFILES

GREENS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

29P



FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

GREENS CREEK

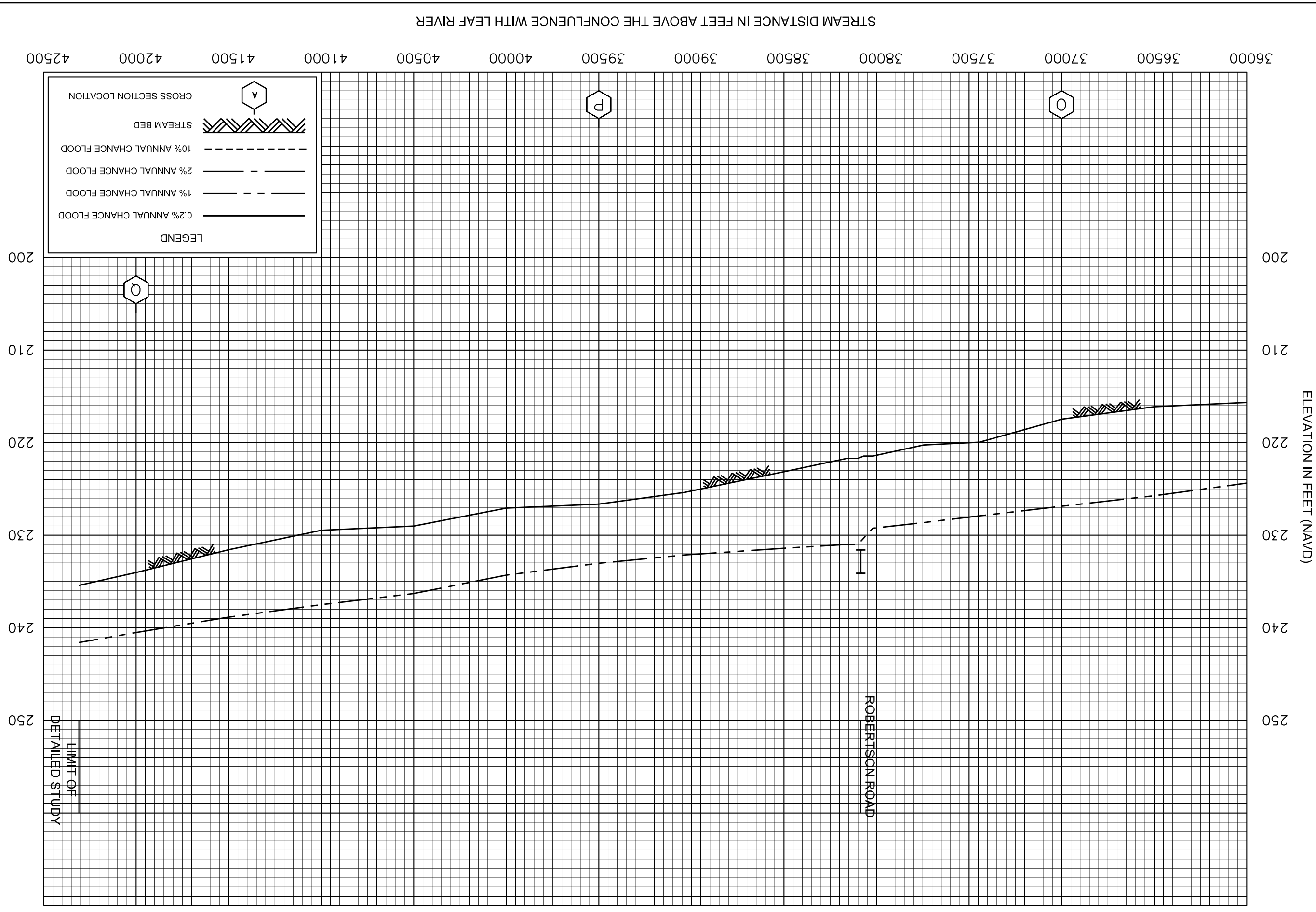
30P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

GREENS CREEK



ELEVATION IN FEET (NAVD)

90 100 110 120 130 140 150 160

61 62 63 64 65 66 67 68 69 70 71 72 73

STREAM DISTANCE IN MILES ABOVE MOUTH

SIMS RD

LIMIT OF DETAILED STUDY

CONFLUENCE OF PRIESTS CREEK

CONFLUENCE OF LOTTS CREEK

CONFLUENCE OF LEAF RIVER TRIBUTARY 1

CONFLUENCE OF BURKETTS CREEK

SOUTH MAIN STEET

CONFLUENCE OF UNNAMED TRIBUTARY NO. 1

RAILROAD

CONFLUENCE OF GORDONS CREEK

US HIGHWAY 11

CONFLUENCE OF BOWIE RIVER

CONFLUENCE OF GREENS CREEK

A B C D E F G H I J K L

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

A CROSS SECTION LOCATION

90 100 110 120 130 140 150 160

32P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

LEAF RIVER

ELEVATION IN FEET (NAVD)

120 130 140 150 160 170 180

73 74 75 76 77 78 79 80 81 82

STREAM DISTANCE IN MILES ABOVE MOUTH

M N O P Q

CONFLUENCE OF LEAF RIVER TRIBUTARY 2

COUNTY BOUNDARY

LEGEND

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

120 130 140 150 160 170 180

33P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

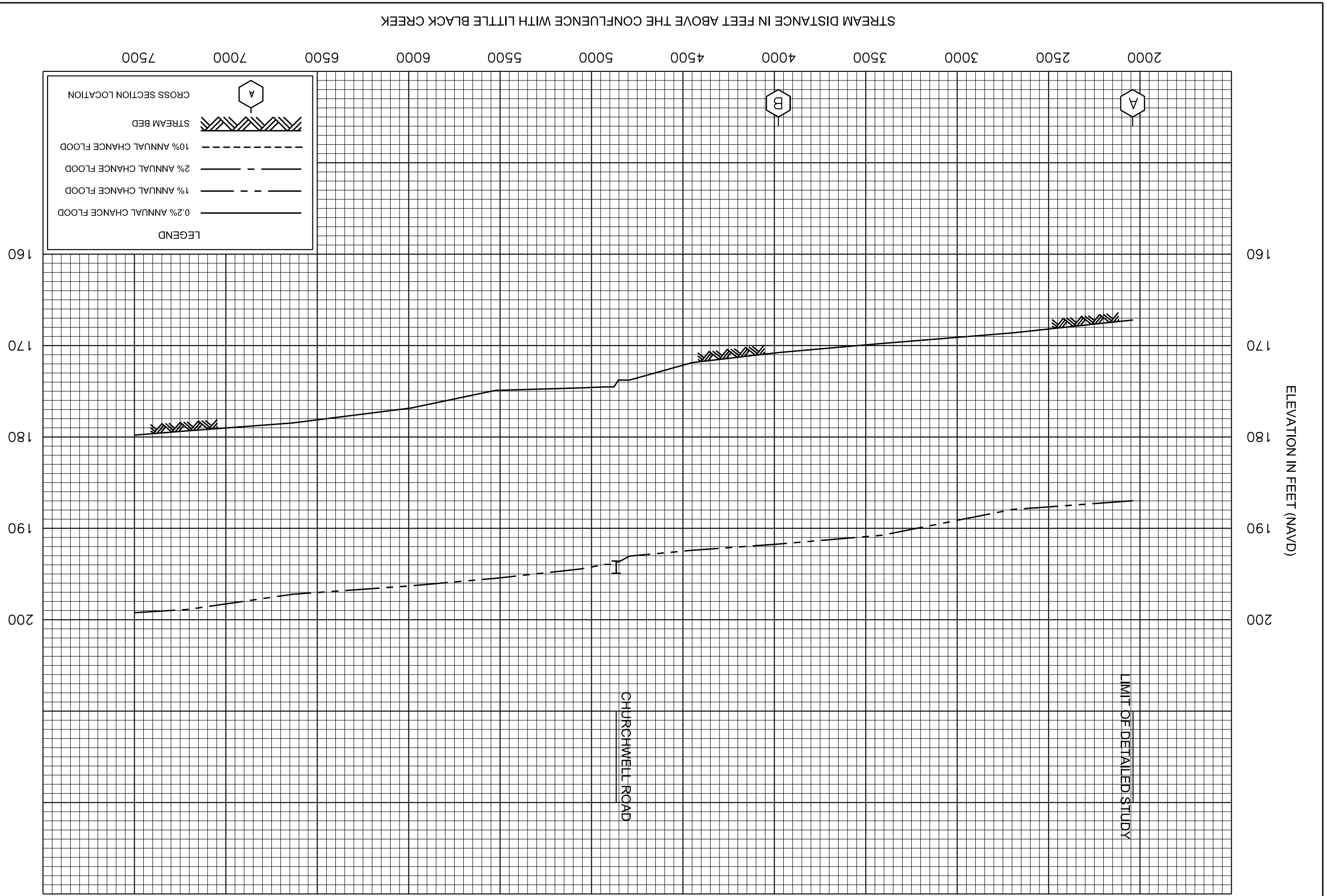
LEAF RIVER

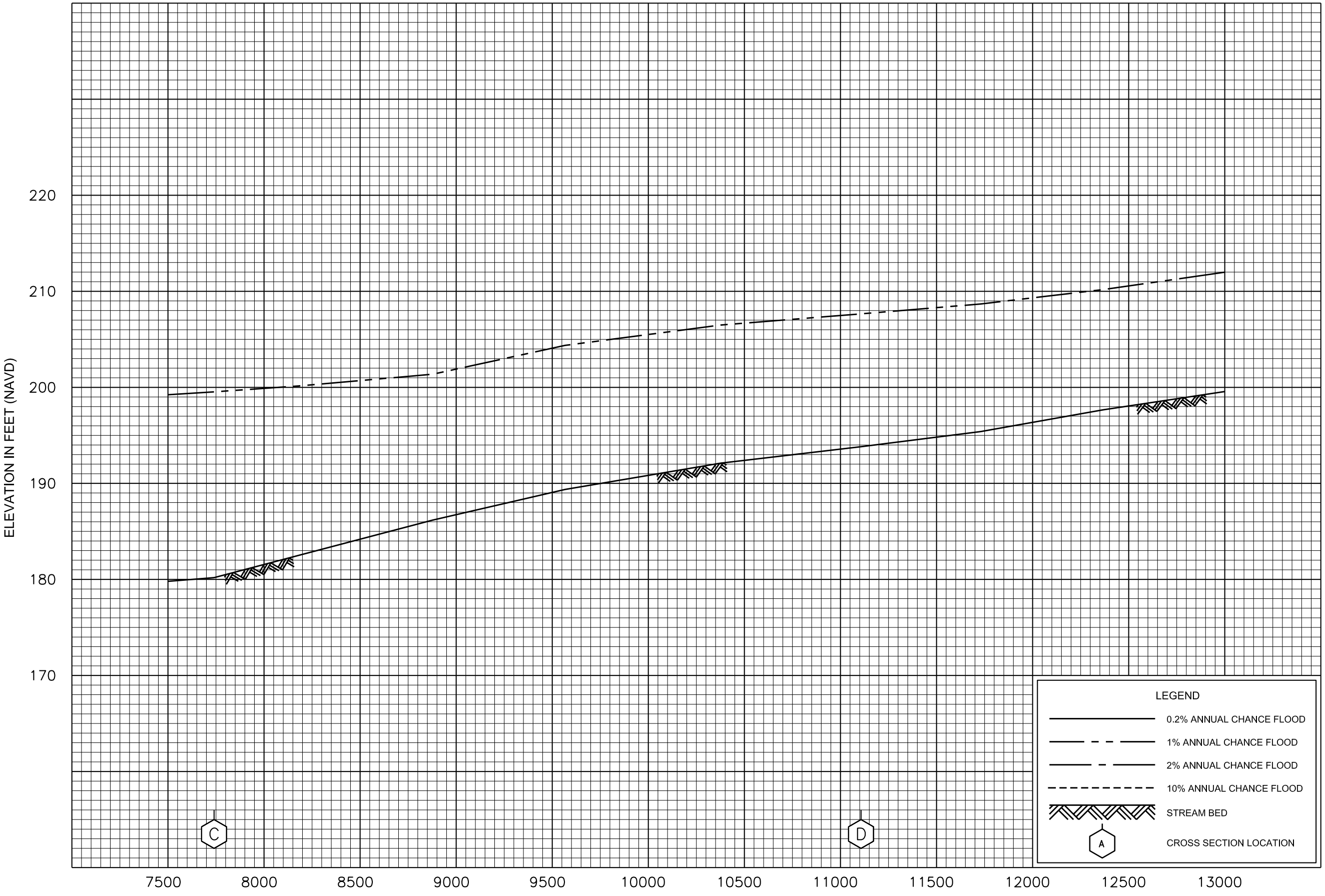
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

LITTLE BEAVER CREEK





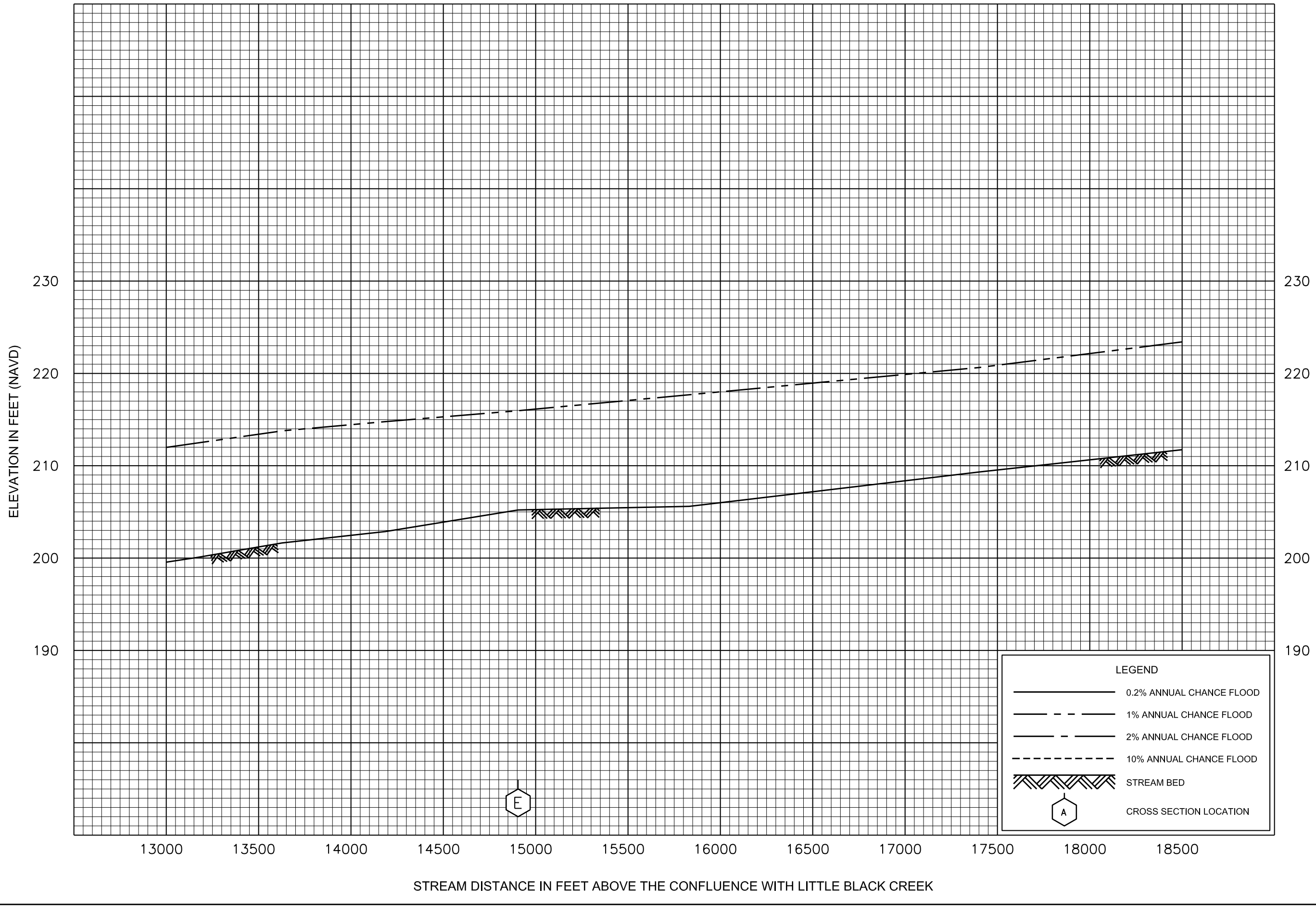
FLOOD PROFILES

LITTLE BEAVER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

35P



FLOOD PROFILES

LITTLE BEAVER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

36P

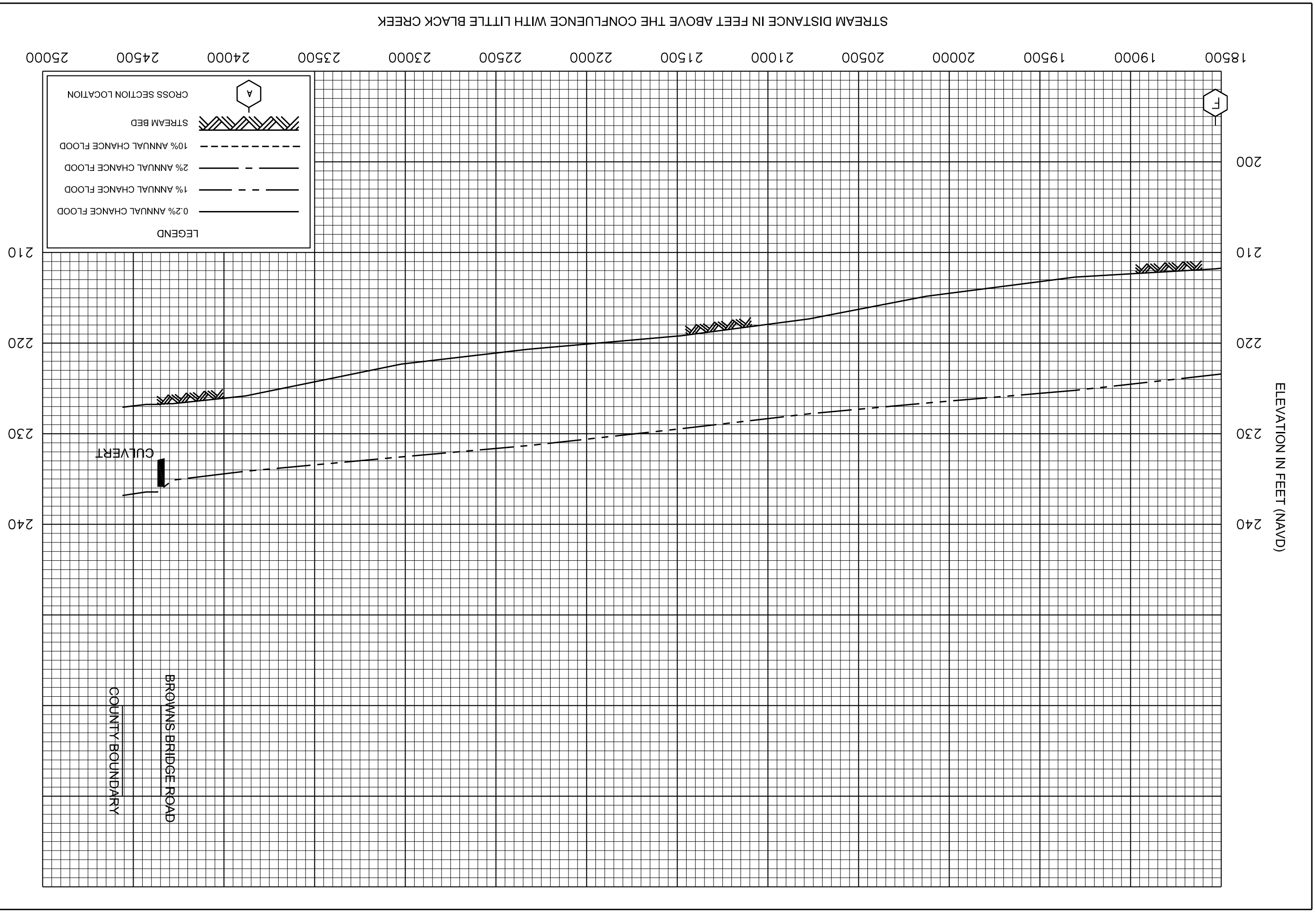
FEDERAL EMERGENCY MANAGEMENT AGENCY

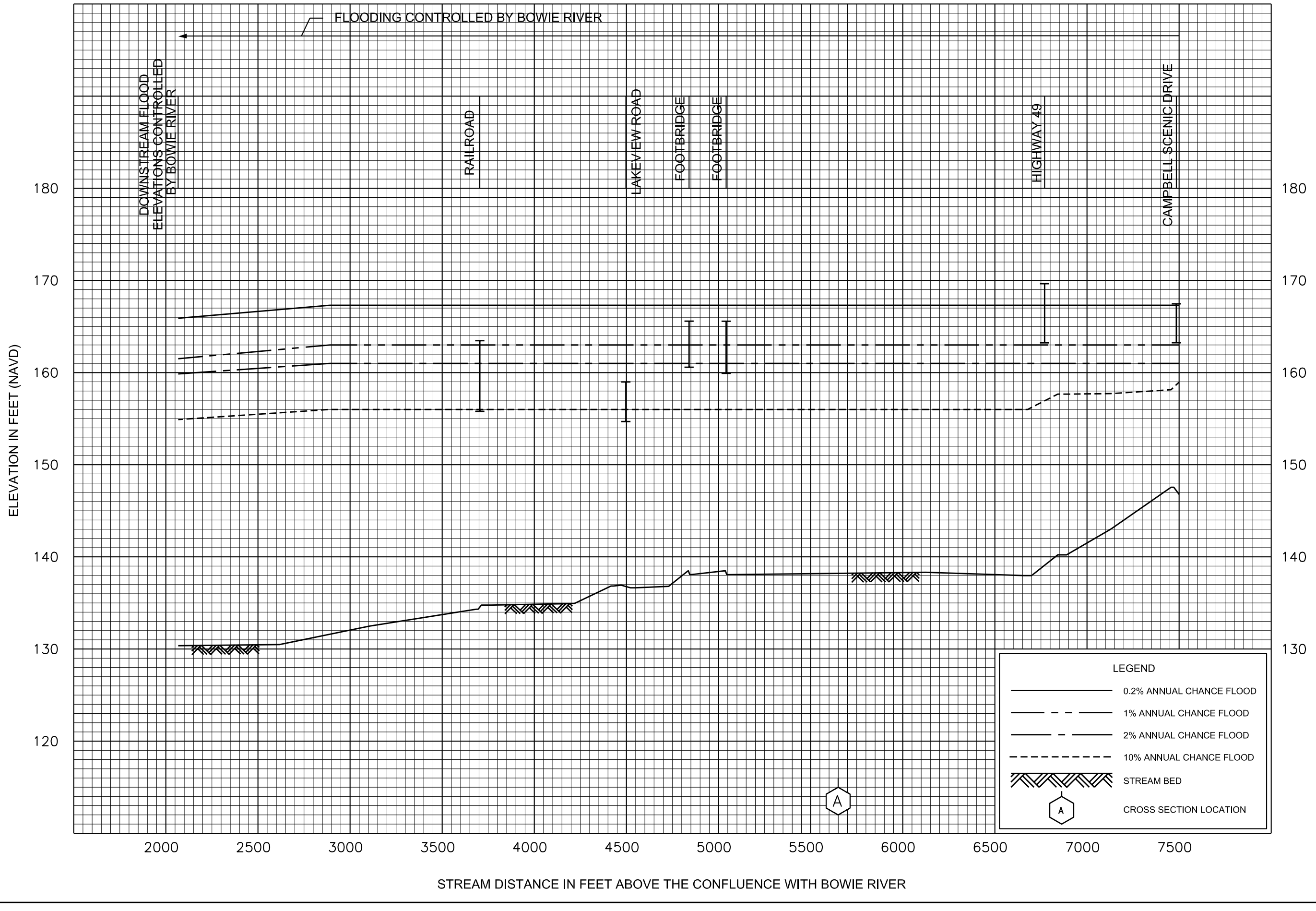
FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

LITTLE BEAVER CREEK





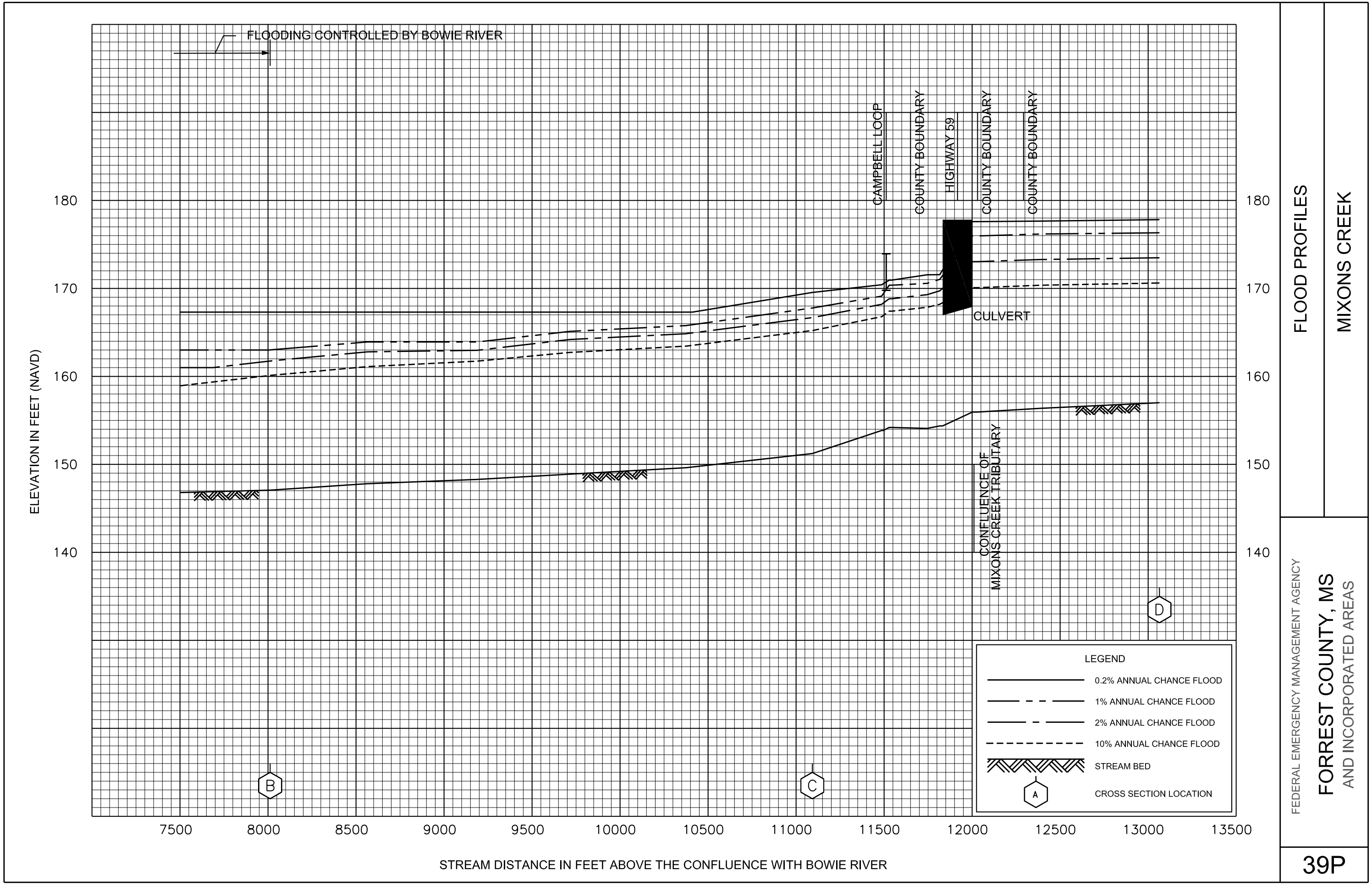
FLOOD PROFILES

MIXONS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

38P



FLOOD PROFILES

MIXONS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

39P

ELEVATION IN FEET (NAVD)

150 160 170 180 190 200 210 220

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH BOWIE RIVER

13,000 14,000 15,000 16,000 17,000 18,000 19,000 20,000 21,000 22,000 23,000 24,000

D E F G H

WEST HILL DRIVE

CONFLUENCE OF MIXONS CREEK TRIBUTARY 3

RAILROAD

CONFLUENCE OF MIXONS CREEK TRIBUTARY 4

WEST 4TH STREET

LEGEND

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

150 160 170 180 190 200 210 220

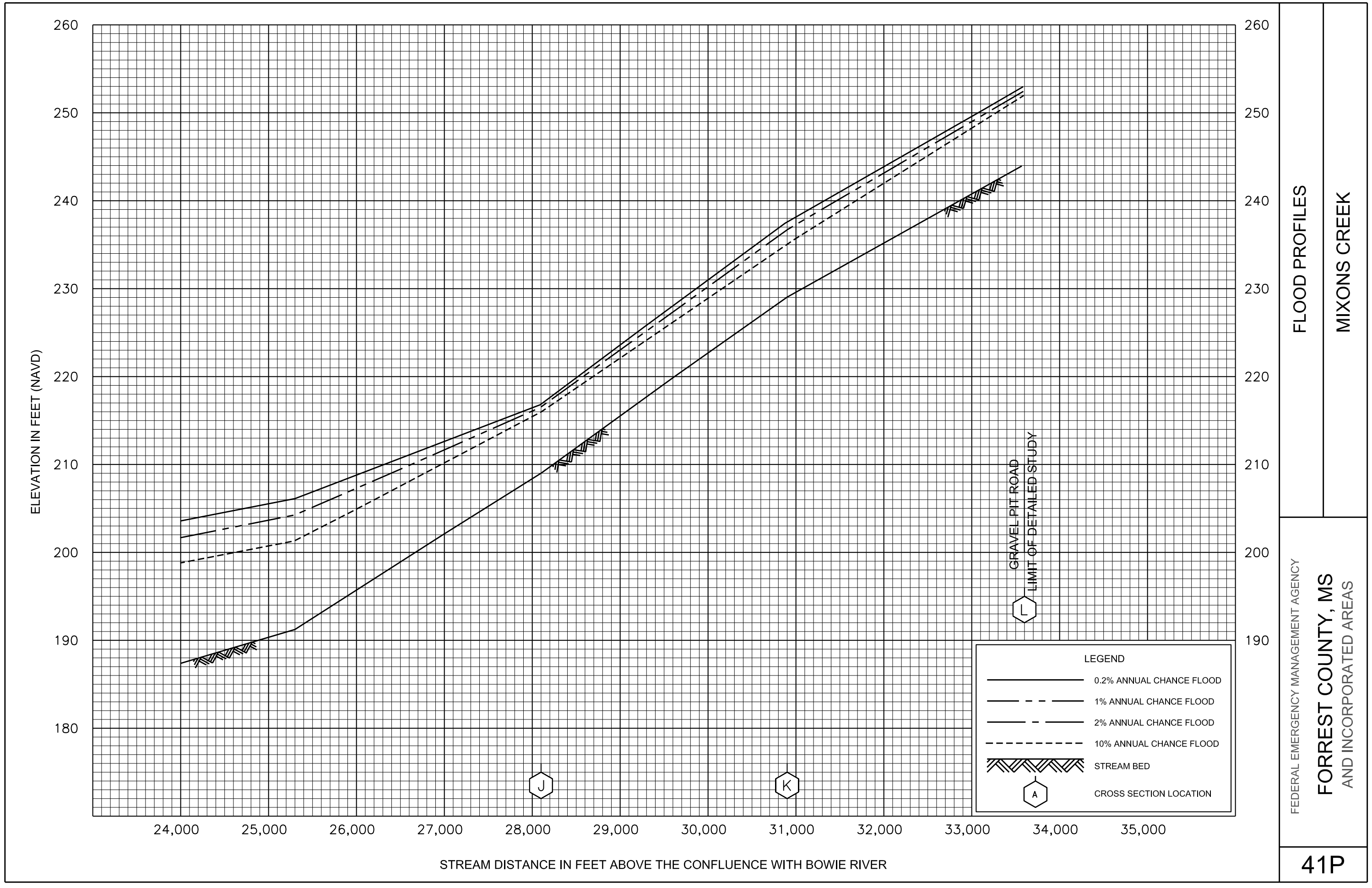
FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

MIXONS CREEK

40P



FLOOD PROFILES

MIXONS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

41P

FLOODING CONTROLLED BY MIXONS CREEK

CONFLUENCE WITH MIXONS CREEK

CULVERT

RAILROAD

A

WEST 4TH STREET

LEGEND

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

ELEVATION IN FEET (NAVD)

210
200
190
180
170
160
150

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500

STREAM DISTANCE IN FEET ABOVE THE CONFLUENCE WITH MIXONS CREEK

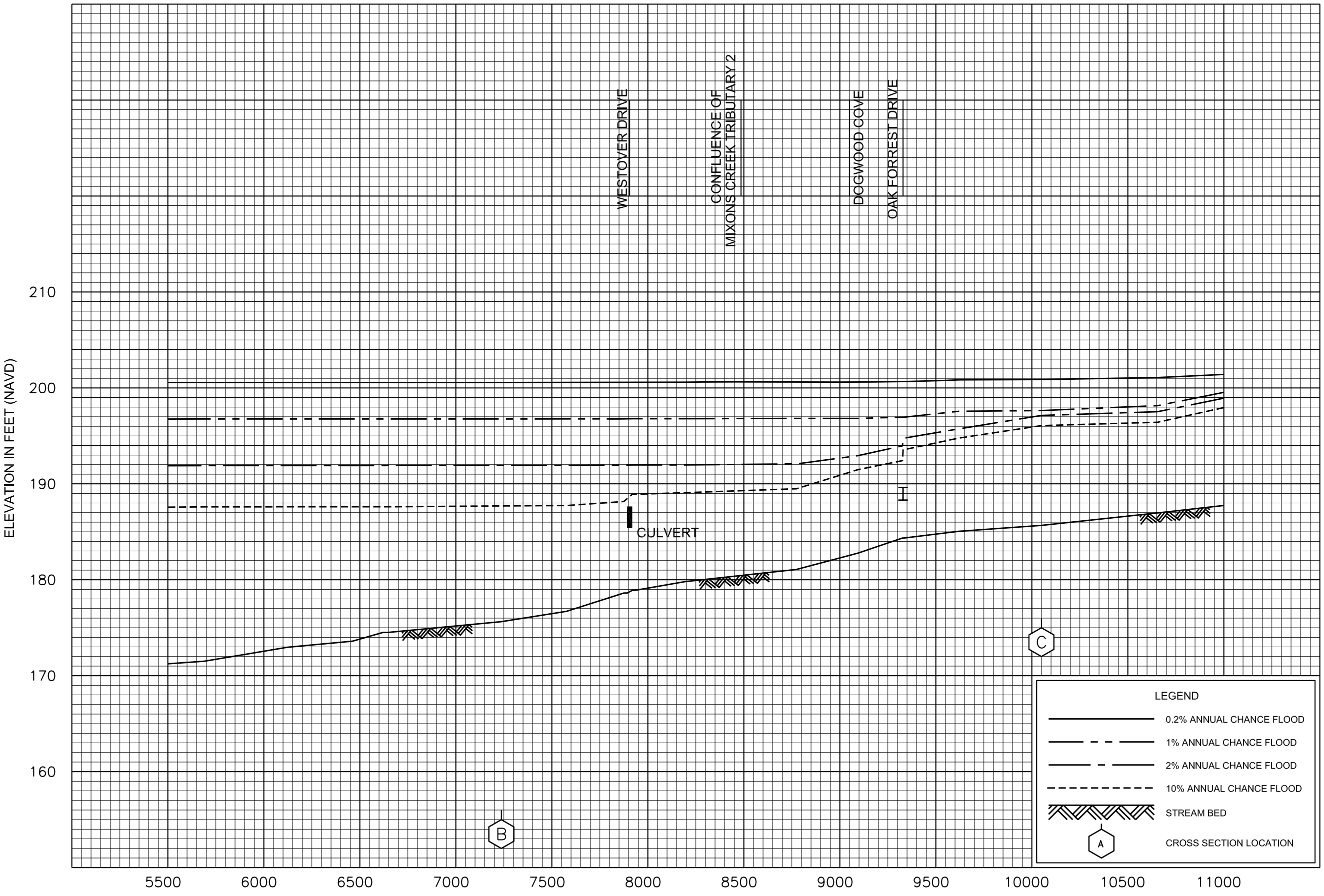
FLOOD PROFILES

MIXONS CREEK TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

42P



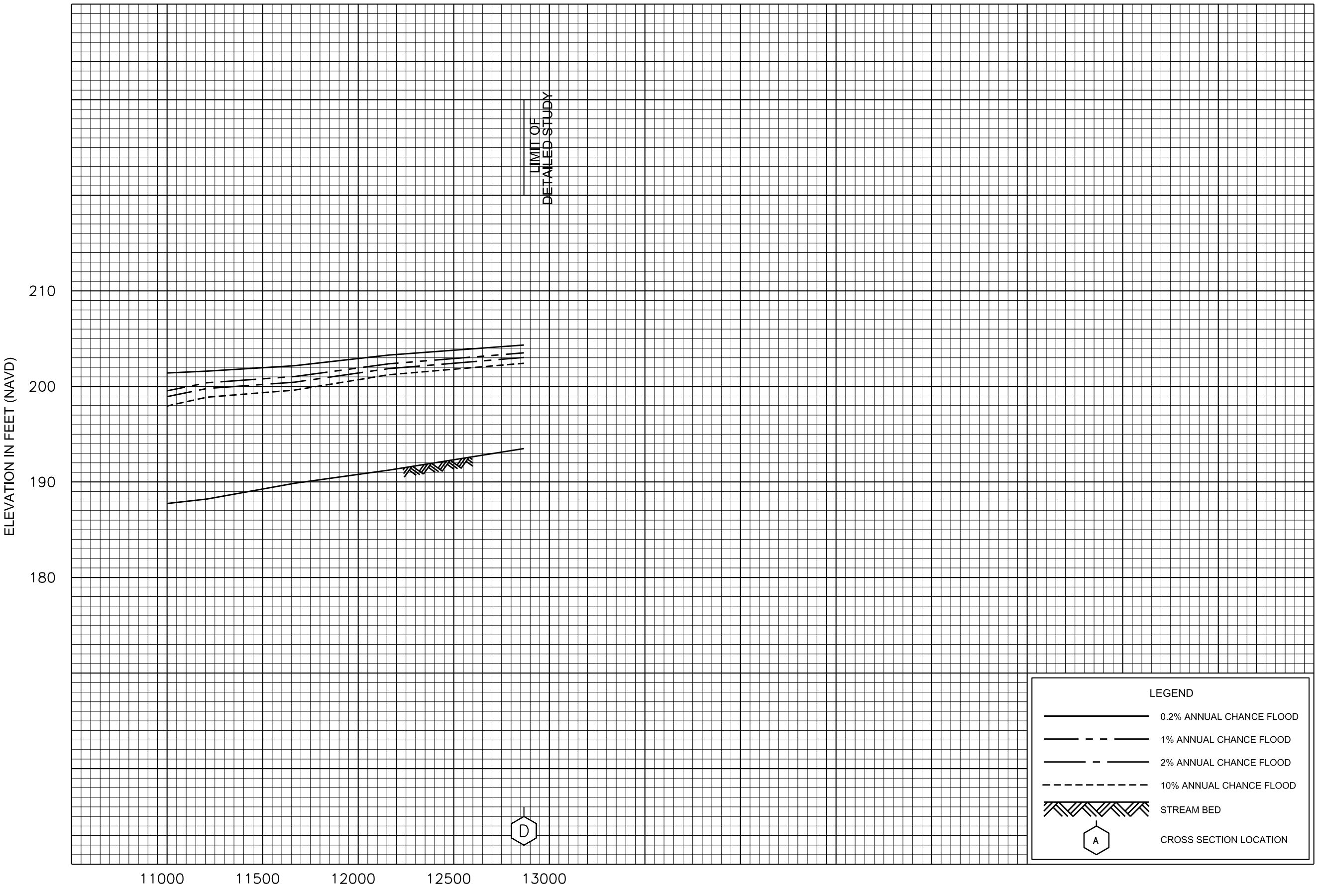
FLOOD PROFILES

MIXONS CREEK TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

43P



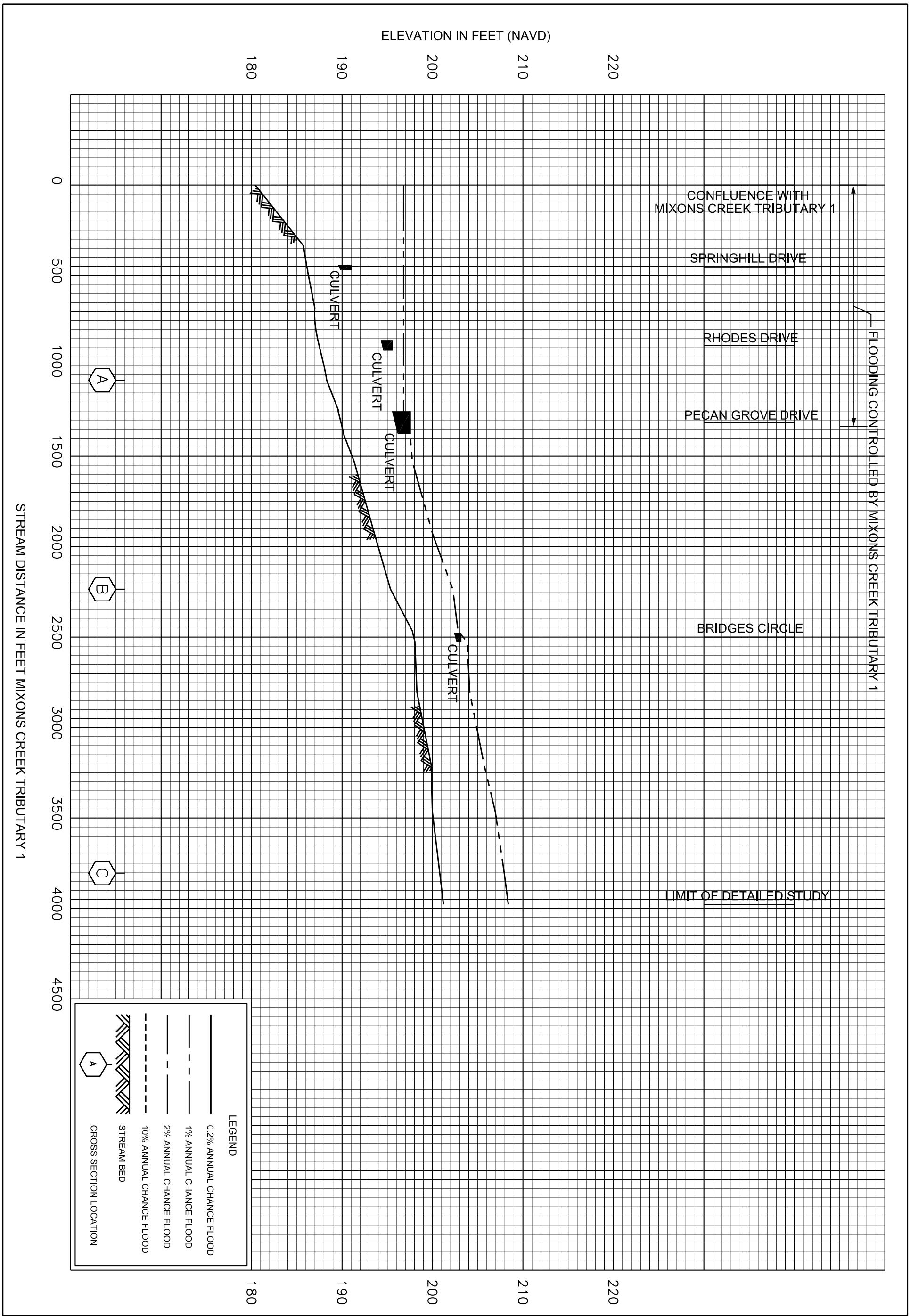
FLOOD PROFILES

MIXONS CREEK TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

44P



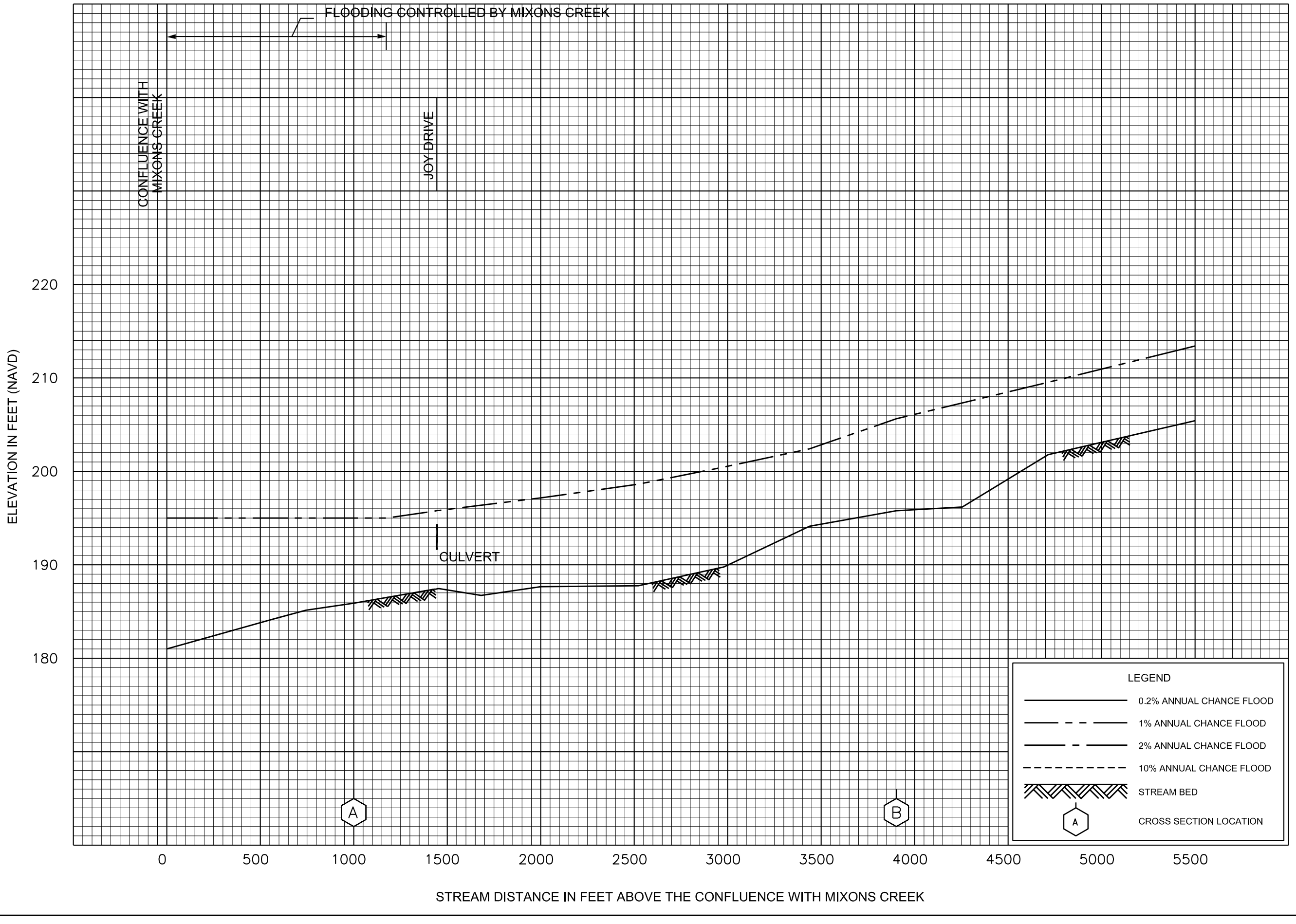
45P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LAMAR COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

MIXONS CREEK TRIBUTARY 2



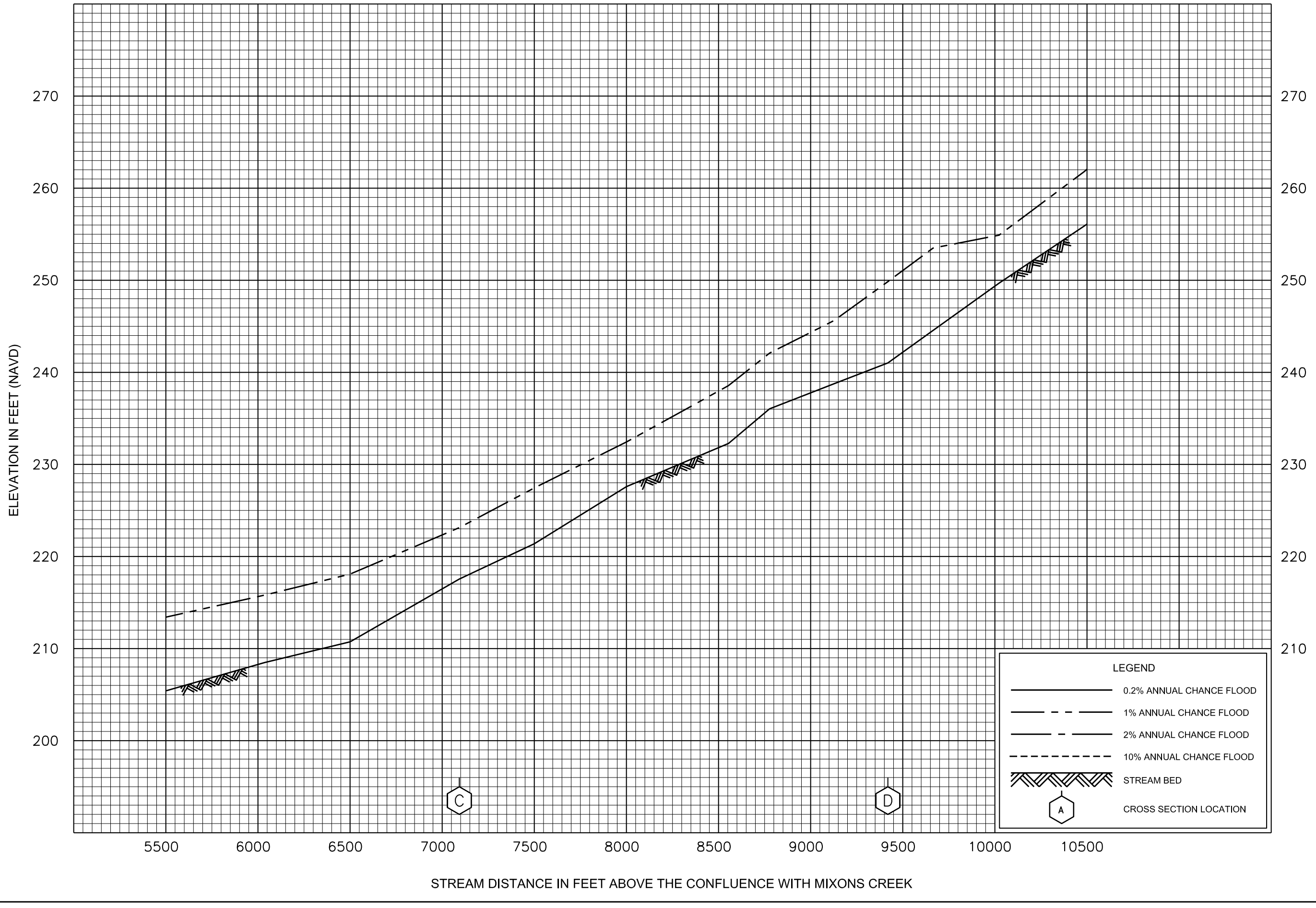
FLOOD PROFILES

MIXONS CREEK TRIBUTARY 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LAMAR COUNTY, MS
AND INCORPORATED AREAS

46P



FLOOD PROFILES

MIXONS CREEK TRIBUTARY 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LAMAR COUNTY, MS
AND INCORPORATED AREAS

47P

FLOOD PROFILES

MIXONS CREEK TRIBUTARY 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LAMAR COUNTY, MS
AND INCORPORATED AREAS

48P

ELEVATION IN FEET (NAVD)

115 120 125 130 135 140 145 150 155

STREAM DISTANCE IN MILES ABOVE THE CONFLUENCE WITH LEAF RIVER

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6

CONFLUENCE WITH LEAF RIVER

SOUTH GEORGE STREET

SOUTH MAIN STREET

EAST 8TH AVENUE

CONFLUENCE OF UNNAMED TRIBUTARY NO. 2

LIMIT OF DETAILED STUDY

A B C D

FLOODING CONTROLLED BY LEAF RIVER

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

A CROSS SECTION LOCATION

115 120 125 130 135 140 145 150 155

49P

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

UNNAMED TRIBUTARY NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

FORREST COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

UNNAMED TRIBUTARY NO. 2