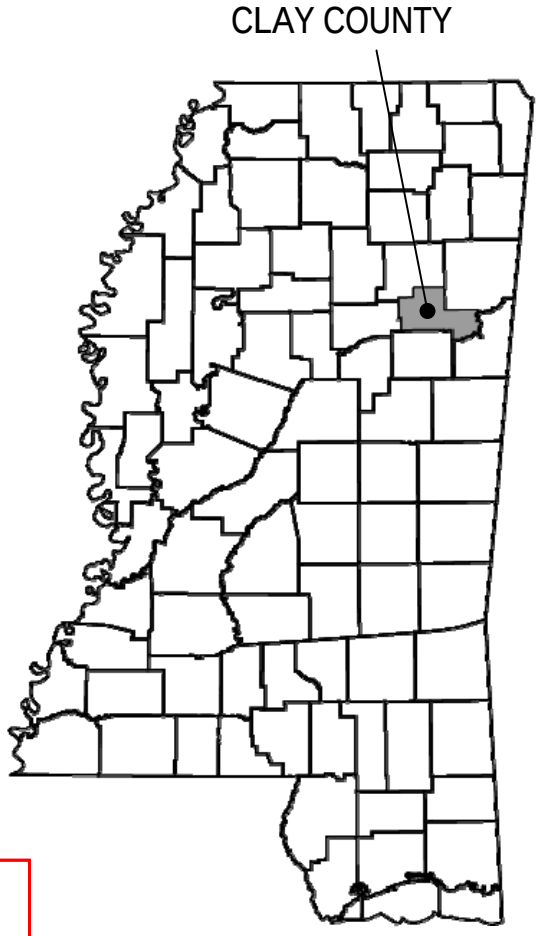
FLOOD INSURANCE STUDY



CLAY COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
CLAY COUNTY (UNINCORPORATED AREAS)	280036
WEST POINT, CITY OF	280037

PRELIMINARY

NOV 17 2009

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28025CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

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

Initial Countywide FIS Effective: July 16, 1990

First Revised Countywide FIS Revision Date:

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FLOOD INSURANCE STUDY
CLAY COUNTY 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 Clay County, including the City of West Point; and the unincorporated areas of Clay County (referred to collectively herein as Clay County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

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

1.2 Authority and Acknowledgments

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

The hydrologic and hydraulic analyses for the July 16, 1990 study were performed by the U.S. Geological Survey (USGS) (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823, Project Order No.1. This study was completed in November 1987.

For this countywide FIS, new hydrologic and hydraulic analyses were prepared by AECOM and the State of Mississippi for the Federal Emergency Management Agency (FEMA), under Contract No. EMA-2007-CA-5774. This study was completed in October 2009.

The hydrologic and hydraulic analyses for the downstream portion of Tombigbee River and Tibbee Creek were taken from the Flood Insurance Study for Lowndes County, Mississippi (FEMA, 1989).

Base map information shown on the FIRM was provided in digital format by the State of Mississippi and the U.S. Census Bureau. The digital orthoimagery was photogrammetrically compiled at a scale of 1:400 from aerial photography dated March 2006.

The digital FIRM was produced using the Mississippi State Plane Coordinate System, East Zone, FIPSZONE 2301, The horizontal datum was the North American Datum of 1983, GRS80 spheroid. Distance units were measured in U.S. feet.

1.3 Coordination

On August 29, 1989, the results of the July 16, 1990 Flood Insurance Study were reviewed

and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

In this countywide FIS revision, an initial Consultation Coordination Officer (CCO) meeting was held on April 16, 2008, and attended by representatives of FEMA, the impacted communities, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final meeting, the preliminary DFIRM Community Coordination (PDCC) was held on December xx, 2009 to review the results of this study.

For this countywide FIS revision, the Project Scoping Meeting was held on April 16, 2008 in Clay County, MS. Attendees for these included representatives from the Mississippi Department of Environmental Quality, Mississippi Emergency Management Agency, FEM National Service Provider, Clay County, and Study Contractors. Coordination with county officials and Federal, State, and regional agencies produced a variety of information pertaining to floodplain regulations, available community maps, flood history, and other hydrologic data.

2.0 AREA STUDIED

2.1 Scope of Study

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

The upstream portion of the Tombigbee River was analyzed by detail methods for this restudy. Flooding caused by overflow of Chuquatonchee Creek Tributary, Town Creek, Town Creek Tributary No. 1, Town Creek Tributary No. 2, Town Creek Tributary No. 3, Tibbee Creek, and the downstream portion of the Tombigbee River were redelineated.

Enhanced approximate studies were performed along Chuquatonchee Creek Tributary 4, McGee Creek, and McGee Creek Tributary 1.

Table 1. Scope of Study

Stream	Limits of New Detail Study
Tombigbee River	From approximately 1,950 feet upstream of the confluence of Cane Creek to approximately 1.8 miles upstream of the confluence of Cane Creek
Stream	**Limits of New Enhanced Approximate Study**
Chuquatonchee Creek Tributary 4	From the confluence with Chuquatonchee Creek to approximately 980 feet upstream of Crepe Myrtle Loop
McGee Creek	Approximately 2.9 miles downstream of Hazelwood Road to approximately 1,425 feet upstream of Hazelwood Road
McGee Creek Tributary 1	From the confluence with McGee Creek to approximately 350 feet upstream of Old Vinton Road

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, Clay County, and the Study Contractor.

2.2 Community Description

Clay County is in northeastern Mississippi and is bordered by Chickasaw County on the north, Webster County on the west, Oktibbeha County on the south, and Monroe and Lowndes Counties on the east. Clay County is served by State Highways 46, 47, and 50, the Illinois Central Railroad, and the Columbus and Greenville Railway. The 2000 population of Clay County was reported to be 21,979 (U.S. Census Bureau, 2009).

Agricultural activities in the county include the production of beef and dairy cattle, cotton, corn, soybeans, hay, poultry, vegetables, and an increasing amount of farm-raised catfish. Widely diversified manufacturing continues to grow in the community.

The climate is influenced by the County's sub-tropical latitude, the extensive land mass on the north, and the Gulf of Mexico on the south. Average annual rainfall is 47 inches and the annual mean temperature is 63 degrees Fahrenheit (National Weather Service, 2009).

2.3 Principal Flood Problems

Intense seasonal rains and occasional tropical storms or hurricanes are the major cause of floods on larger streams in Mississippi. Floods on smaller streams are usually the result of convectional thunderstorms, which most often occur in summer. West Point suffered flooding on March 15-16, 1973, caused by 5.5 inches of rain that fell in a 24-hour period (Daily Times Leader, 1973). The elevations of that flood were comparable to those calculated for a 10-percent annual chance event flood based on Federal Insurance administration criteria. However, a storm that occurred on March 13, 1975, produced the largest flood of record, with flood elevations approximately equivalent to a 1-percent-annual-chance flood (NOAA, 1975).

The USGS has operated a stream gage on Tibbee Creek approximately 2 miles upstream of the mouth of Town Creek from 1928 to 1930 and since October 1939. The largest known flood at this site occurred on March 17, 1973, and had a peak discharge of about 81,600 cubic feet per second (cfs) at the gage and a recurrence interval of about 70 years.

A discharge measurement was taken by the USGS for Chuquantonchee Creek Tributary at State Highway 50 during a flood on April 5, 1983. The measured discharge was 1,000 cfs and the estimated recurrence interval was about 5 years.

2.4 Flood Protection Measures

Flood protection measures consist of channel improvement including realignment and paving along Town Creek north of Main Street in the city of West Point. These improvements protect the overbanks from floods of up to 10-percent annual chance recurrence interval. Other flood protection measures are not known to exist within the study area.

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

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

The magnitude of the 1-percent-annual-chance peak discharges on Chuquatonchee Creek Tributary, Town Creek, and Town Creek Tributary Nos. 1 and 2 were estimated using USGS regional methods (U.S. Geological Survey, 1976). Adjustments for urbanization were made to the estimated 1-percent-annual-chance peak discharge for Town Creek downstream of the city limits and for Town Creek Tributary No. 2 using USGS procedures (U.S. Department of Interior, 1983). Independent hydrologic analyses were carried out to verify that the 1-percent-annual-chance peaks for Town Creek Tributary No. 2 used in the Flood Insurance Study for City of West Point (U.S. Department of HUD, 1978) were in agreement with those computed using USGS methods.

Peak discharge-drainage area relationships for the 10-, 2-, 1-, and 0.2 percent annual chance floods of Tibbee Creek and the Tombigbee River and the 1-percent-annual-chance floods of Chuquatonchee Creek Tributary, Town Creek, Town Creek Tributary No. 1, and Town Creek Tributary No.2 are shown in Table 2, Summary of Discharges. The data for Town Creek Tributary No. 3 is not available.

For the newly studied reach of the Tombigbee River, a flood frequency analysis was conducted using USGS stream gage data from stations 2437500 and 2437100 at Aberdeen and 2441500 at Columbus, Mississippi. PeakFQ Ver. 5.0 (USGS, 2005) was used to perform the analysis.

Table 2. Summary of Discharges

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharge 10% (CFS)	Peak Discharge 2% (CFS)	Peak Discharge 1% (CFS)	Peak Discharge 0.2% (CFS)
CHUQUATONCHEE CREEK TRIBUTARY					
Approximately 2,100 feet downstream of State Highway 50	4.94	N/A	N/A	2,570	N/A
At U.S. Highway 45 Alternate	2.50	N/A	N/A	1,760	N/A
At County Highway about 1,800 feet upstream of U.S. Highway 45 Alternate	1.66	N/A	N/A	1,230	N/A
At County Highway about 4,900 feet upstream of U.S. Highway 45 Alternate	0.82	*	*	665	*
TIBBEE CREEK					
At mouth	1,100	68,327	89,146	96,344	109,889
TOMBIGBEE RIVER					
Just upstream of confluence of Tibbee Creek	N/A	96,100	159,100	192,700	290,000
Just downstream of confluence of Buttahatchee River	N/A	93,600	155,000	187,400	282,300
Just upstream of confluence of Buttahatchee River	N/A	75,707	120,290	141,579	196,681
TOWN CREEK					
At County Highway about 7,000 feet downstream of U.S. Highway 45 Alternate	7.52	*	*	4,280	*
At U.S. Highway 45 Alternate	4.56	*	*	2,990	*
At Church Hill Road	4.01	*	*	2,990	*
At City of West Point northern corporate limits	1.33	*	*	1,020	*
About 0.84 mile upstream of Illinois Central Railroad	0.86	*	*	775	*

* Data Not Available

Table 2. Summary of Discharges

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharge 10% (CFS)	Peak Discharge 2% (CFS)	Peak Discharge 1% (CFS)	Peak Discharge 0.2% (CFS)
TOWN CREEK TRIBUTARY NO.1					
At Dunlap Road	0.76	*	*	650	*
At County Highway about 1,900 feet upstream of Dunlap Road	0.54	*	*	497	*
At County Highway about 3,900 feet upstream of Dunlap Road	0.34	*	*	342	*
TOWN CREEK TRIBUTARY NO. 2					
At mouth	3.59	*	*	2,120	*
About 2.58 miles above mouth	1.86	*	*	1,460	*
At State highway 50	1.17	*	*	1,050	*
At Colony Drive	0.63	*	*	759	*

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

Cross-section data for the streams studied by detailed methods were field surveyed. In lieu of field survey, the channel dimensions for upstream portion of the Tombigbee River were derived from bathymetry data collected by the USACE (USACE, 2005). All bridges and culverts in the study area were field surveyed for structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and on the Flood Insurance Rate Map.

Roughness coefficients (Manning's "n") for the streams studied in detail were estimated by field observation of the channel and floodplain areas. These values are listed in the below Table 3, Roughness Coefficients.

Table 3. Roughness Coefficients

FLOODING SOURCE AND LOCATION	ROUGHNESS COEFFICIENTS (Manning's "n")	
	Channel	Overbank
CHUQUANTONCHEE CREEK TRIBUTARY	0.06-0.10	0.14-0.23
TIBBEE CREEK	0.027-0.07	0.045-0.18
TOMBIGBEE RIVER	0.027-0.07	0.045-0.18
TOWN CREEK		
Downstream of City of West Point southern corporate limits	0.055-0.065	0.14-0.22
Within the City of West Point downstream of Dunlap Road	0.04-0.09	0.04-0.09
Upstream of Industrial Access Road	0.16-0.24	0.12-0.14
TOWN CREEK TRIBUTARY NO.1		
Downstream of Dunlap Road	0.04-0.09	0.04-0.09
Upstream of Dunlap Road	0.10-0.12	0.12-0.14
TOWN CREEK TRIBUTARY NO. 2	0.05-0.065	0.10-0.20
TOWN CREEK TRIBUTARY NO. 3	0.04-0.09	0.04-0.09

Water-surface elevations for the 1-percent-annual-chance discharges of Chuquantonchee Creek Tributary, Town Creek Tributary No. 2 and those portions of Town Creek and Town Creek Tributary No. 1, and Town Creek Tributary No. 3 that are within the City of West Point were computed using the WSPRO (U.S. DOT, 1986) and the USGS culvert program A526 (U.S. Department of the Interior, 1983)

Water-surface elevations for the 1-percent-annual-chance discharge for downstream portions of the Tombigee River and Tibbee creek, as well as for those portions of Town Creek, Town Creek Tributary No. 1 and Town Creek Tributary No. 3 that are within the City of West Point were computed using the HEC-2 step-backwater computer program (USACE, 1973). The upstream water surface elevations for Tombigbee River were computed with HEC-RAS 3.1.3 (USACE, May 2005).

The WSPRO-computer water-surface elevation at the downstream end of the culverts at State Highway 50 was used to route the 1-percent-annual-chance peak discharge of Chuquatonchee Creek Tributary through the culverts to determine the elevation of the water surface at the upstream end of the culvert. The 1-percent-annual-chance peak discharge was routed through the culverts using the USGS culvert program A356. The upstream water-surface elevation computed using the USGS culvert program was the starting water-surface elevation used for the continuation of WSPRO computations of the 1-percent-annual-chance flood profile upstream of State Highway 50. Where culvert computations were required, the 1-percent-annual-chance elevation of culvert crossings was determined as described for the State highway 50 crossing.

The 1-percent-annual-chance flood elevation for Tibbee Creek near Tibbee gage was estimated from gage records to be 186.92 feet North American Vertical Datum of 1988 (NAVD). The Town Creek floodplain is almost parallel to Tibbee Creek upstream from the mouth of Town Creek. From the mouth of Town Creek to a point about 1 mile upstream, the 1-percent-annual-chance headwater flood profile is less than the 1-percent-annual-chance backwater flood elevation on Tibbee Creek. The 1-percent-annual-chance flood elevation on Tibbee Creek at the mouth of Town Creek is about 184.92 feet NAVD. The Tibbee Creek 1-percent-annual-chance flood elevation was transferred downstream from the Tibbee Creek gage based on the slope of the March 1973 flood profile. If large flood peaks occurred simultaneously on the two streams, slightly higher flood elevations could occur at the lower reaches of Town Creek near its mouth. However, due to the large difference in drainage area size, it is unlikely that large flood peaks will occur simultaneously on Town Creek and Tibbee Creek.

Starting water-surface elevations for Chuqantonchee Creek Tributary, Town Creek Tributary No.2 and the porting of Town Creek downstream of the City of West Point southern corporate limits were obtained using the slope-conveyance method.

Starting water-surface elevations for those portions of Town Creek and Town Creek Tributary No.1 upstream of the City of West Point northern corporate limits were taken from the Flood Insurance Study for the City of West Point (U.S. HUD, 1978)

Starting water-surface elevations for the Tombigbee River and Tibbee Creek were developed using either the slope-area method or coincidental flow analyses in backwater areas where peak discharges occur at approximately the same time.

The starting water-surface elevation of Town Creek Tributary No. 2 was compared to the 1-percent-annual-chance backwater flood elevation from Tibbee Creek. The 1-percent-annual-chance flood elevation for Tibbee Creek near Tibbee gage was estimated from gage records to be 186.92 feet NAVD. From the mouth of Town Creek Tributary No. 2 to a point about 0.7 mile upstream, the 1-percent-annual-chance headwater flood profile is less than the 1-percent-annual-chance backwater flood elevation on Tibbee Creek. The 1-percent-annual-chance backwater flood elevation from Tibbee Creek at the mouth of Town Creek Tributary No. 2 is about 186.52 feet NAVD. If large flood peaks occurred simultaneously on the two streams, slightly higher flood elevations could occur at the lower reaches of Town Creek Tributary No. 2 near its mouth. However, due to the large difference in drainage area size, it is unlikely that large flood peaks will occur simultaneously on Town Creek Tributary No. 2 and Tibbee Creek.

Flood profiles were drawn showing the computer water-surface elevations for floods of the selected recurrence intervals.

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.

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

Water-surface profiles were computed for enhanced approximate and approximate study streams through the use of the U.S. Army Corps of Engineers HEC-RAS version 3.1.2 computer program (USACE, 2003). Water surface profiles were produced for the 1-percent-annual-chance storms for enhanced approximate and approximate studies.

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

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

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

All qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (SRS) 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 monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the

appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

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

It is important to note that 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 this FIS and FIRM. Interested individuals mat contact FEMA to access this data.

3.3 Vertical Datum

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

The elevations shown in the FIS report and on the FIRM for Clay County are referenced to NAVD88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD29, add 0.12 feet to the NAVD88 elevation. The 0.12 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.

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

4.0 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 and enhanced approximate methods, the 1- and/or 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the detail boundaries were interpolated using topographic maps at a scale of 1:2400, with a contour interval of 20 feet (U.S. Geological Survey, 1987). The enhanced approximate boundaries were interpolated using 5-foot interval topographic mapping developed from USGS 10 meter digital elevation models (DEM) which were acquired from the Mississippi Automated Resource Information System (MARIS) (MARIS, 2007).

For each streams studied by approximate methods, the 1-percent-annual-chance floodplain boundaries have been delineated using interpolation of 5-foot interval topographic mapping developed from USGS 10 meter digital elevation models (DEM).

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, AE and X), 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 approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM.

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.

The floodways presented in this study 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 in 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.

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 (WSEL) of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

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

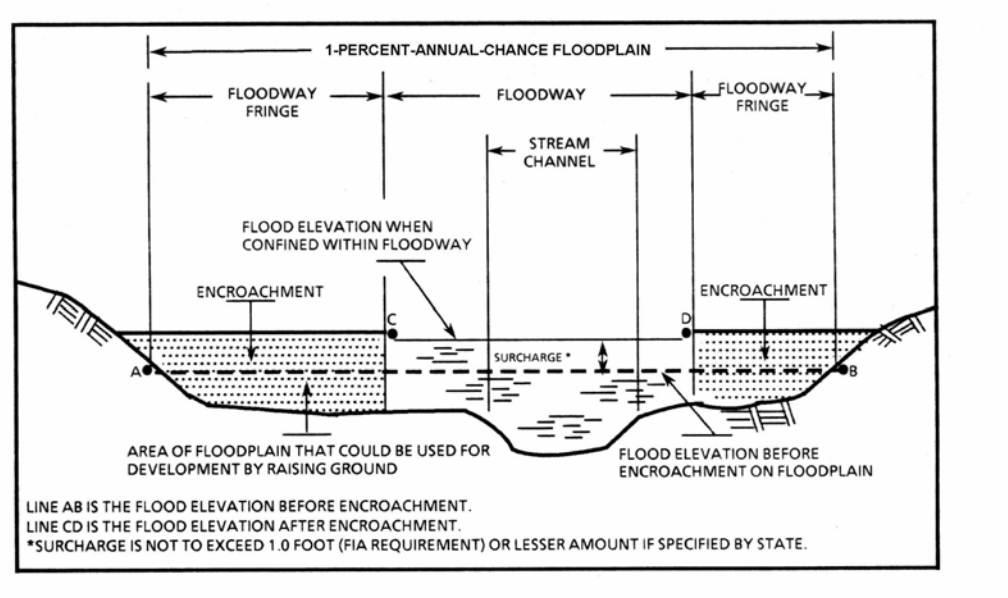

Figure 1. Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TIBBEE CREEK								
A	15,100	4,051[2]	48,941	2.0	176.9	170.7[3]	171.7	1.0
B	24,730	8,960[2]	69,897	1.4	176.9	176.1[3]	176.8	0.7
C	30,720	6,119[2]	70,657	1.4	179.7	179.7	180.7	1.0
D	36,080	8,949[2]	123,130	0.8	180.9	180.9	181.8	0.9

[1] Feet above confluence with Tombigbee River
[2] This width extends beyond county boundary
[3] Elevation computed without consideration of backwater effects from Tombigbee River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

TIBBEE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TOMBIGBEE RIVER (Downstream Reach)								
A	23.28	11,396[2]	245,001	0.8	176.5	176.5	177.5	1.0
B	25.49	10,379[2]	150,149	1.3	177.8	177.8	177.8	1.0
C	27.77	9,076[2]	119,062	1.6	179.8	179.8	180.8	1.0
D	28.34	8,801[2]	119,883	1.6	180.4	180.4	181.4	1.0
E	30.06	9,630[2]	131,493	1.5	183.7	183.7	184.7	1.0
F	30.80	5,974[2]	524,391	3.6	183.9	183.9	184.9	1.0
G	31.35	4,307[2]	46,683	4.0	184.6	184.6	185.6	1.0

[1] Miles above state boundary
[2] This width extends beyond county boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS
AND INCORPORATED AREAS

FLOODWAY DATA

TOMBIGBEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TOMBIGBEE RIVER (Upstream Reach)								
A	3	5,988[2]	65,607	2.9	186.2	186.2	186.6	0.4
B	3,108	3,864[2]	46,384	3.1	186.8	186.8	187.7	0.9

[1] Feet above Lowndes County boundary
[2] This width extends beyond county boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS
AND INCORPORATED AREAS

FLOODWAY DATA

TOMBIGBEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TOWN CREEK TRIBUTARY NO. 1								
A	1,715	64	255	4.3	225.1	225.1	225.5	0.4
B	2,615	84	280	3.9	229.2	229.2	230.2	1.0
C-F*								

[1] Feet above confluence with Town Creek
*Floodway data not computed

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

TOWN CREEK TRIBUTARY NO. 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TOWN CREEK TRIBUTARY NO. 3								
A	7,913	262	2,129	0.5	214.0	214.0	215.0	1.0
B	8,643	289	1,188	0.8	214.7	214.7	215.7	1.0
C	8,943	523	2,261	0.3	214.7	214.7	215.7	1.0
D	9,753	35	195	3.8	215.4	215.4	216.3	0.9
E	10,653	44	208	2.6	219.5	219.5	219.6	0.1
F	12,253	22	88	3.4	224.6	224.6	225.6	1.0

[1] Feet above mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

TOWN CREEK TRIBUTARY NO. 3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TOWN CREEK								
A*								
B	19,187	289	559	5.9	207.1	207.1	207.1	0.0
C	20,387	574	1,187	2.8	208.1	208.1	209.0	0.9
D	22,042	172	480	6.7	211.0	211.0	211.4	0.4
E	22,242	256	1,067	3.0	212.2	212.2	212.5	0.3
F	23,364	310	1,211	2.3	214.8	214.8	215.4	0.6
G	24,514	213	506	5.4	215.7	215.7	216.7	1.0
H	25,115	62	564	4.8	217.6	217.6	218.5	0.9
I	26,165	178	810	3.2	220.7	220.7	221.1	0.4
J	27,105	741	3,250	0.8	221.1	221.1	221.7	0.6
K	28,605	513	1,453	1.8	221.8	221.8	222.5	0.7
L	29,917	40	244	5.7	223.2	223.2	224.0	0.8
M	31,067	168	547	2.5	228.2	228.2	228.9	0.7
N*								
O*								

[1] Feet above confluence of Town Creek Tributary No. 2

* Floodway data not computed

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOODWAY DATA

TOWN CREEK

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 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 countywide FIRM presents flooding information for the entire geographic area of Clay 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 5, "Community Map History."

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Clay County (Unincorporated	September 16, 1977	None	July 16, 1990	--
West Point, City of	June 21, 1974	December 19, 1975	January 5, 1978	July 16, 1990

TABLE

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY , MS

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

The Flood Insurance Studies published for Lowndes, Monroe, and Webster Counties are in agreement with this study.

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

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this 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.

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

9.0 BIBLIOGRAPHY AND REFERENCES

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ELEVATION IN FEET (NAVD)

170 180 190 200 210 220 230 240 250 260

8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000 30,000

STREAM DISTANCE IN FEET ABOVE MOUTH

* DATA NOT AVAILABLE

LIMIT OF DETAILED STUDY

MS HIGHWAY 50

LONE OAK RD

U.S. HIGHWAY 45

TVA RD

HAZELWOOD RD

A

B

C

D

E

F

LEGEND

0.2% ANNUAL CHANCE FLOOD*

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD*

10% ANNUAL CHANCE FLOOD*

STREAM BED

CROSS SECTION LOCATION

FEDERAL EMERGENCY MANAGEMENT AGENCY

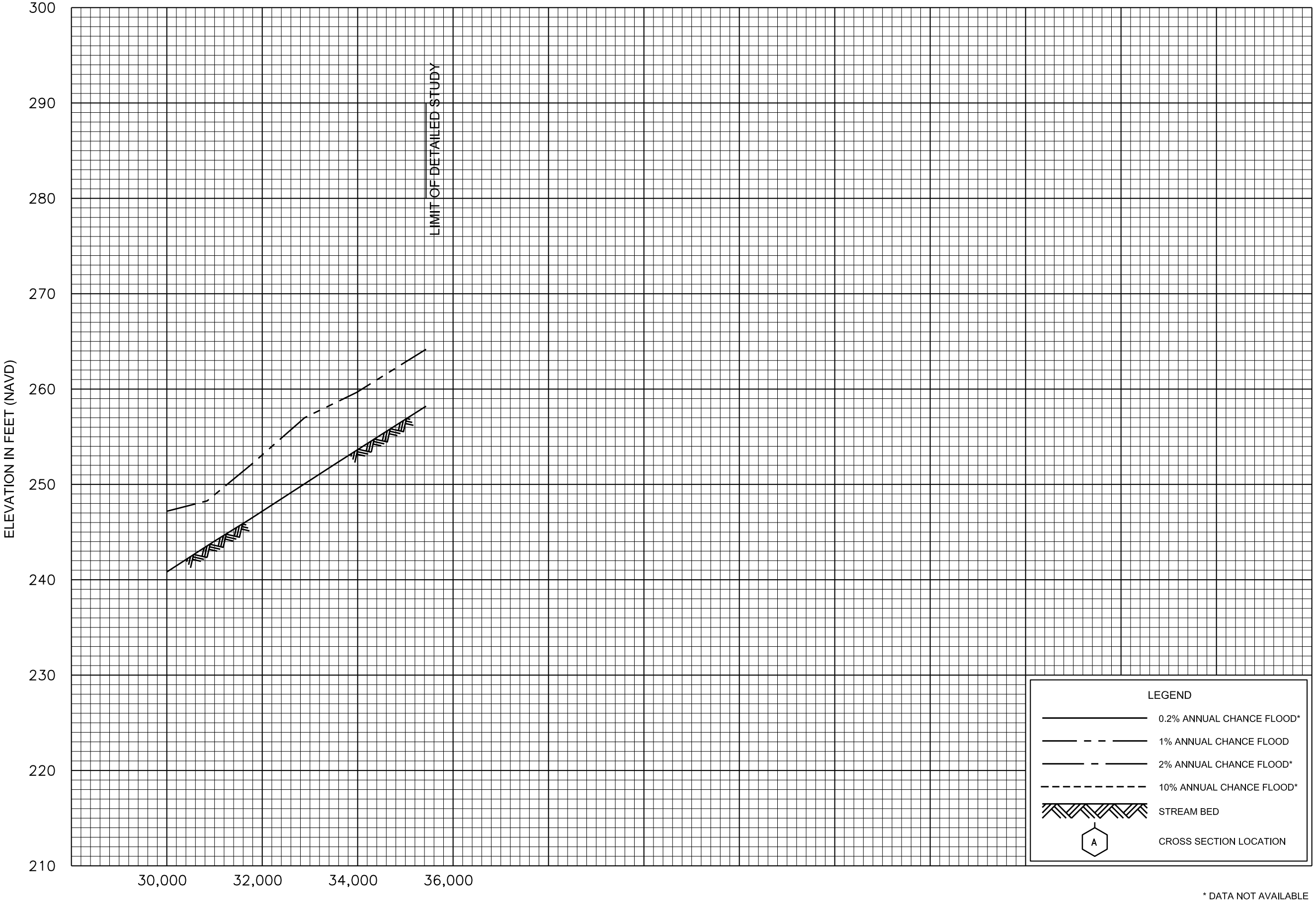
CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

CHUQUATONCHEE CREEK TRIBUTARY

01P



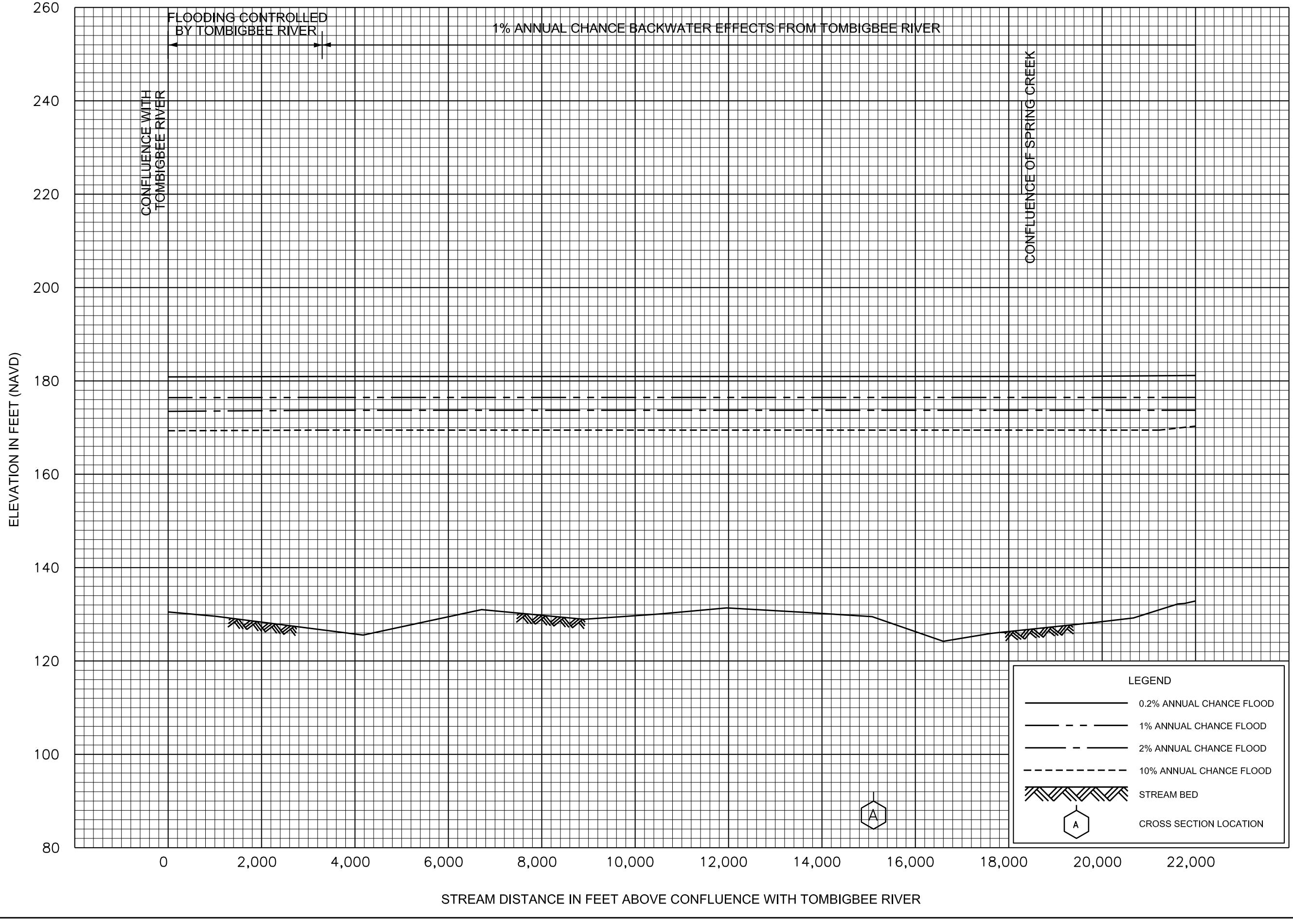
FLOOD PROFILES

CHUQUATONCHEE CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS
AND INCORPORATED AREAS

02P



FLOOD PROFILES

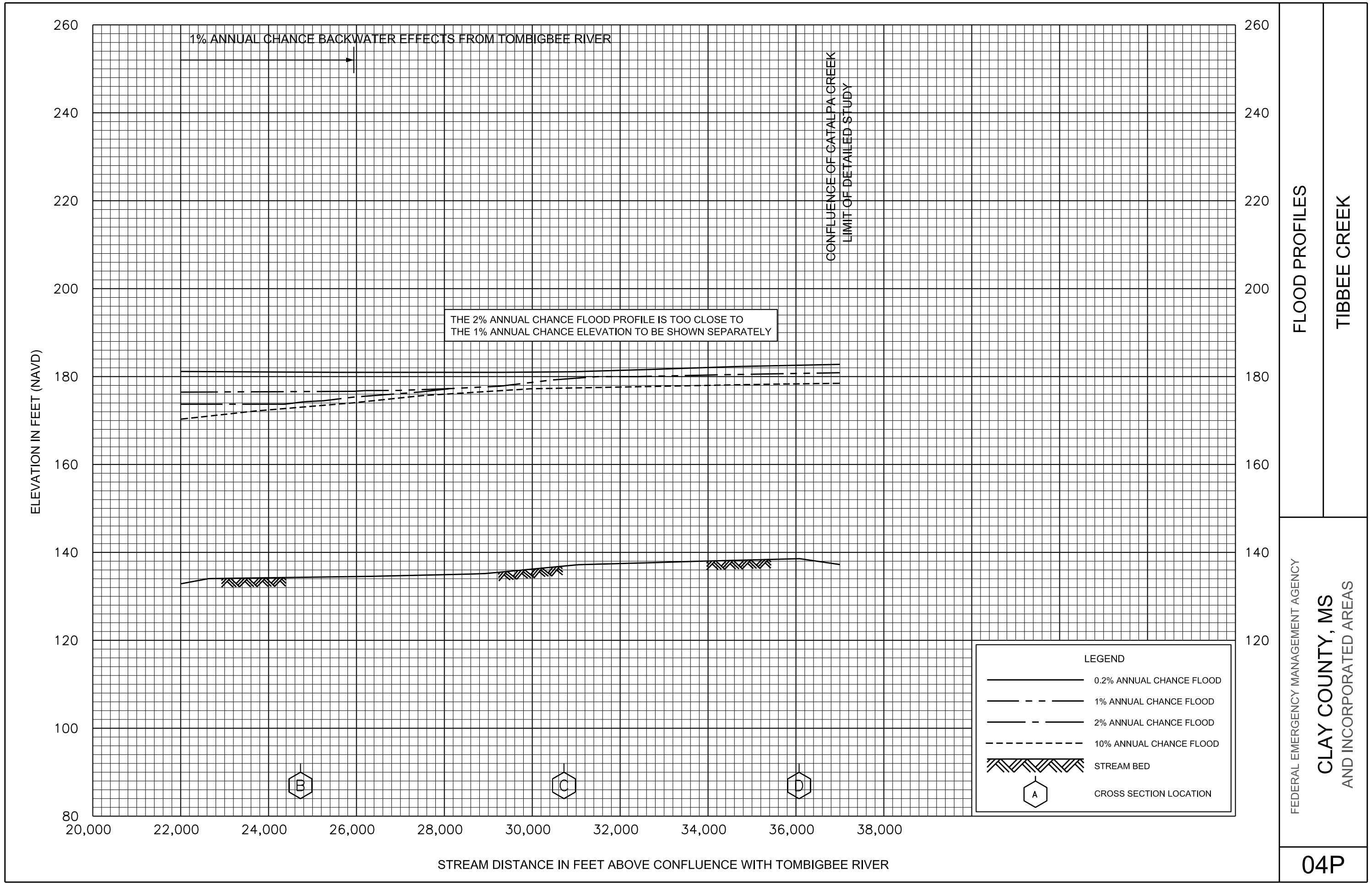
TIBBEE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

03P



FLOOD PROFILES

TIBBEE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

04P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

TOMBIGBEE RIVER (DOWNSTREAM REACH)

FLOOD PROFILES

05P

STREAM DISTANCE IN MILES ABOVE STATE BOUNDARY

22 23 24 25 26 27 28 29 30 31 32 33

ELEVATION IN FEET (NAVD)

60 80 100 120 140 160 180 200 220 240

LEGEND

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

UPSTREAM FLOOD HAZARD INFORMATION IS STUDIED BY NEW DETAILED METHODS. THESE METHODS REFLECT MORE DETAILED AND UP-TO-DATE STREAM CHANNEL CONFIGURATIONS. AS A RESULT, THE STREAM CHANNEL DISTANCES MAY NOT AGREE WITH THE ADJOINING REDELINEATED PORTION OF THE STREAM.

A B C D E F G H I

COLUMBUS LOCK AND DAM

LIMIT OF FLOODING AFFECTING COMMUNITY

CONFLUENCE OF TIBBEE CREEK

CLAY/LOWNDES COUNTY BOUNDARY

RAILROAD

MS HIGHWAY 50

CONFLUENCE OF TOWN CREEK EAST

CLAY/MONROE COUNTY BOUNDARY/ UNNAMED RD

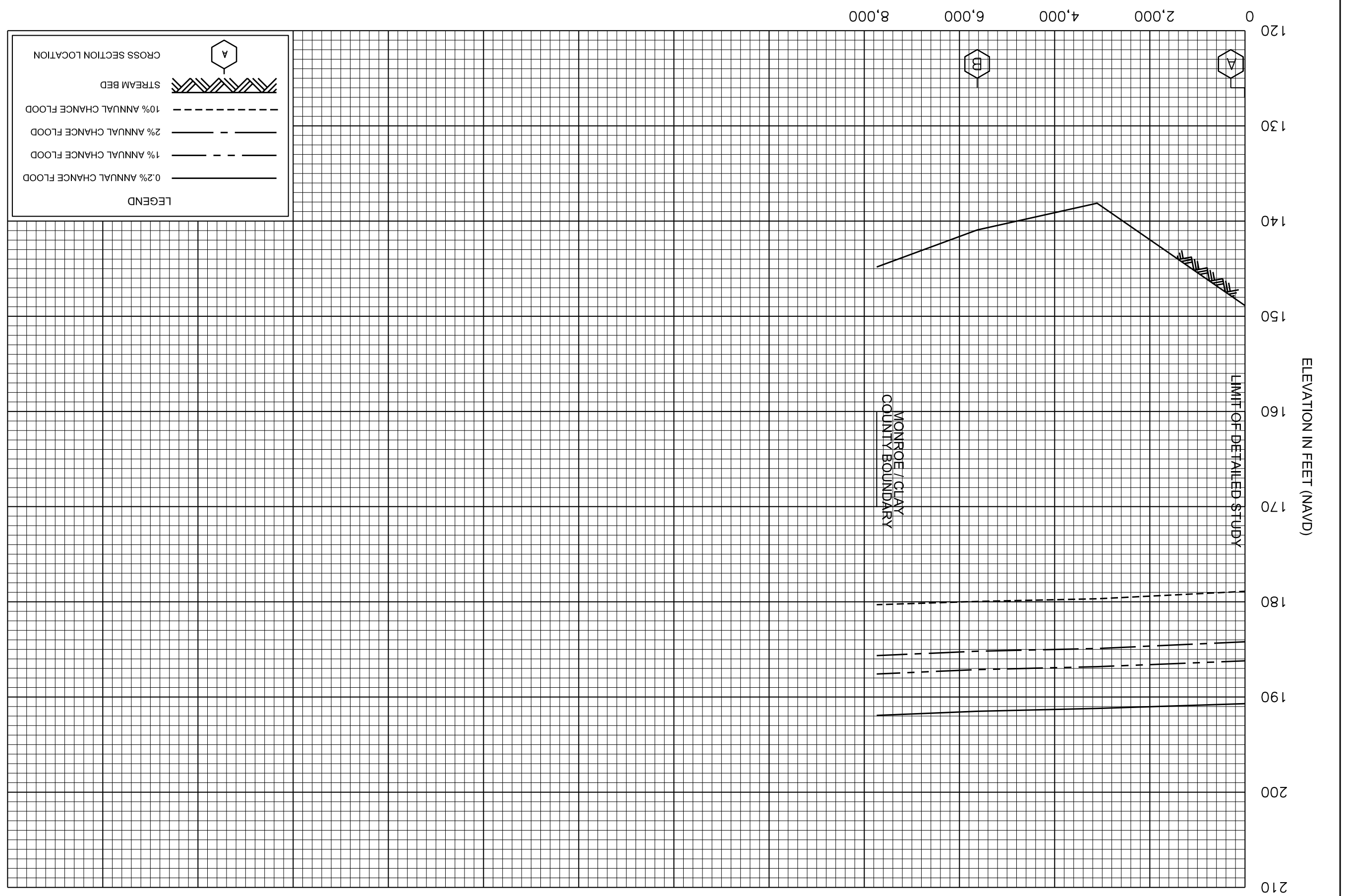
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

TOMBIGBEE RIVER (UPSTREAM REACH)



ELEVATION IN FEET (NAVD)

165 170 175 180 185 190 195 200 205 210

4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000

LIMIT OF DETAILED STUDY

OLD TIBBEE RD

NOTE: 0.2%, 2% AND 10% FLOOD DATA NOT AVAILABLE

CONFLUENCE OF TOWN CREEK TRIBUTARY NO. 3

U.S. HIGHWAY 45

PRIVATE RD

AIRPORT RD

RAILROAD

W CHURCH HILL RD

A

B

165 170 175 180 185 190 195 200 205 210 215 220

175 180 185 190 195 200 205 210 215 220

20,000 22,000 24,000

U.S. HIGHWAY 45

MAYHEW ST

C

D

E

F

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

A CROSS SECTION LOCATION

STREAM DISTANCE IN FEET ABOVE CONFLUENCE OF TOWN CREEK TRIBUTARY NO. 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

TOWN CREEK

07P

ELEVATION IN FEET (NAVD)

190 195 200 205 210 215 220 225 230 235

STREAM DISTANCE IN FEET ABOVE CONFLUENCE OF TOWN CREEK TRIBUTARY NO. 2

23,000 23,500 24,000 24,500 25,000 25,500 26,000 26,500 27,000 27,500 28,000 28,500

RAILROAD
RAILROAD
W BROAD ST
W MAIN ST
BUGG ST
W HALF MILE ST

F G H I J

LEGEND

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

200 205 210 215 220 225 230 235

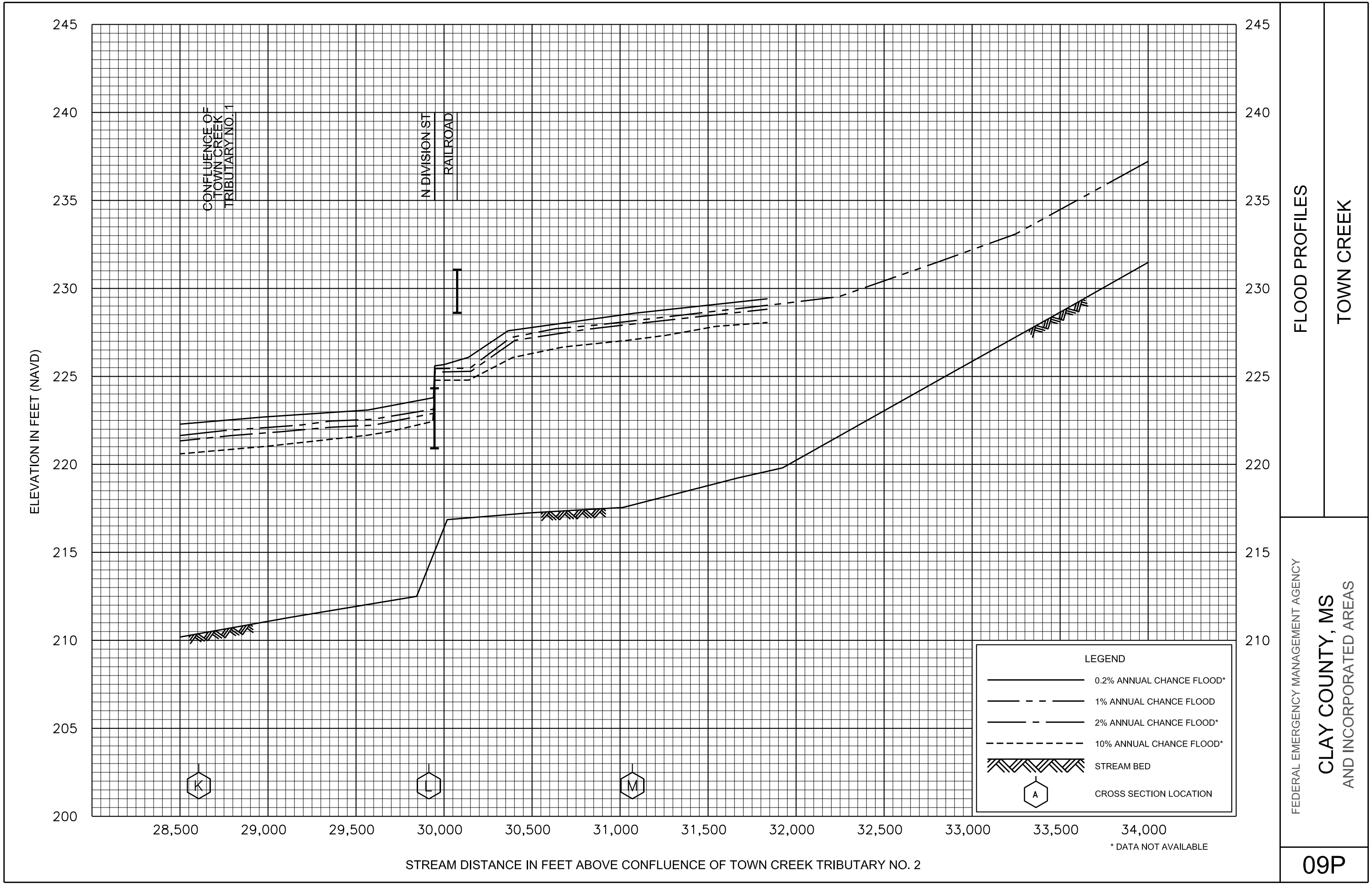
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

TOWN CREEK

08P



FLOOD PROFILES

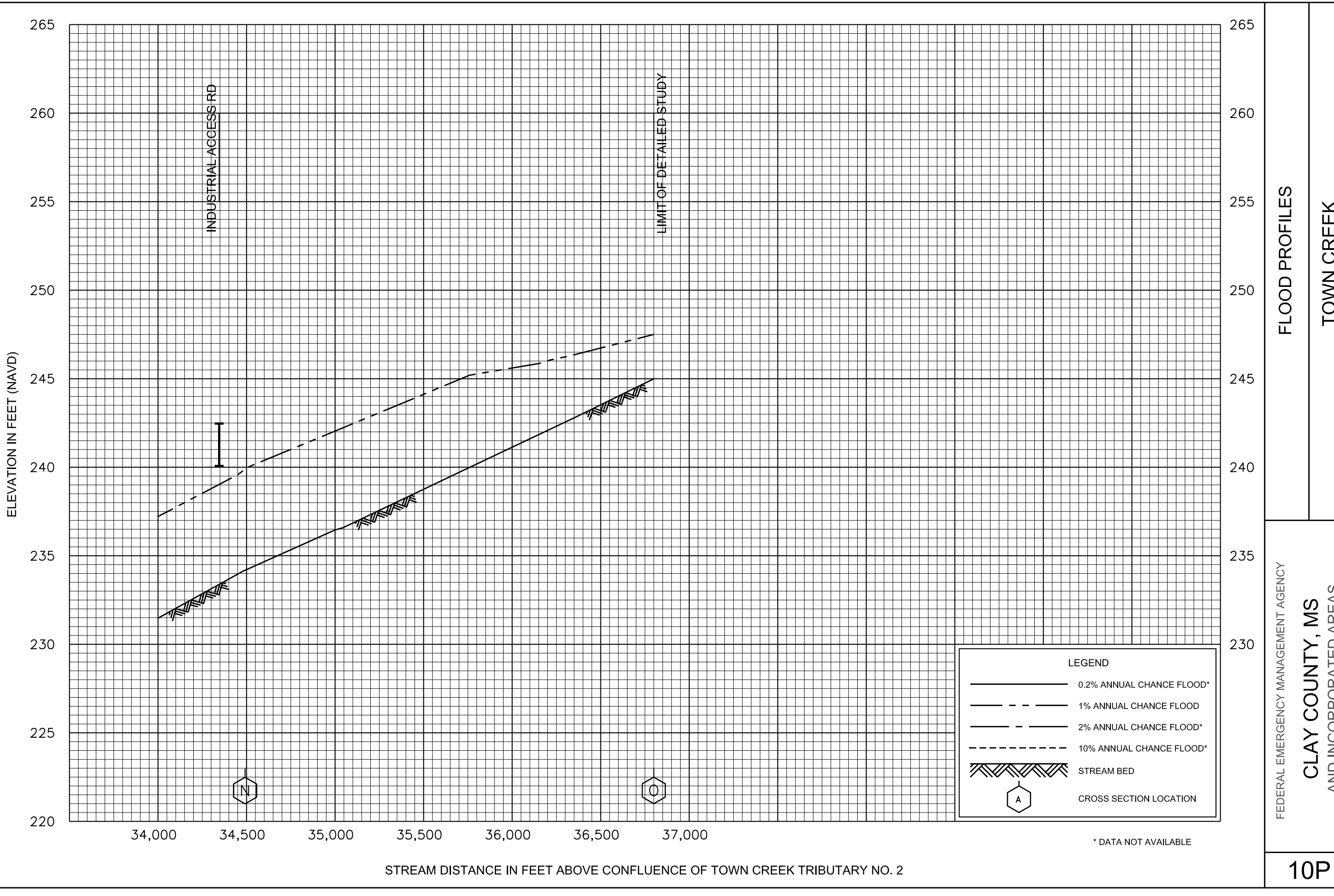
TOWN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

09P



FLOOD PROFILES

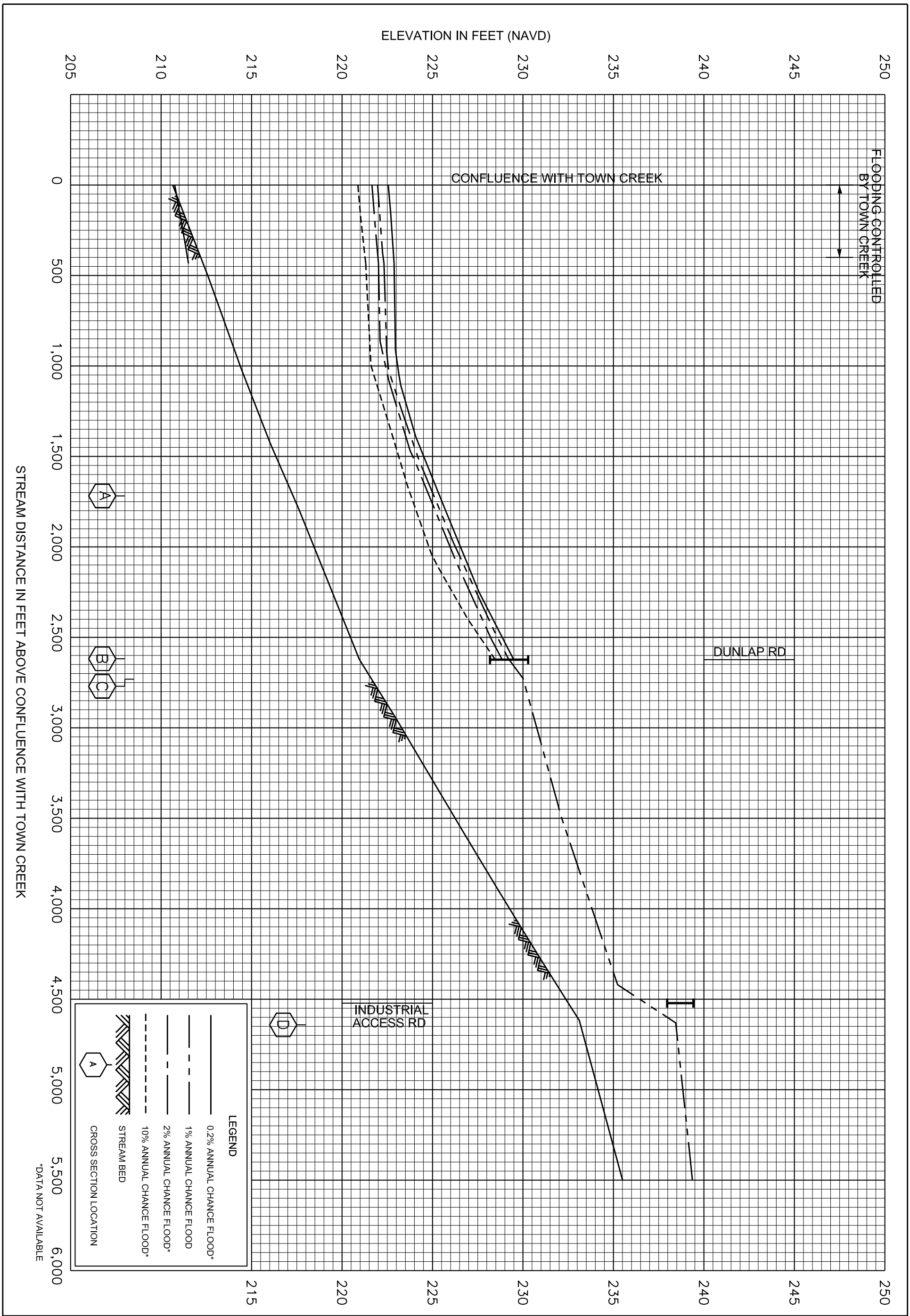
TOWN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

10P



11P

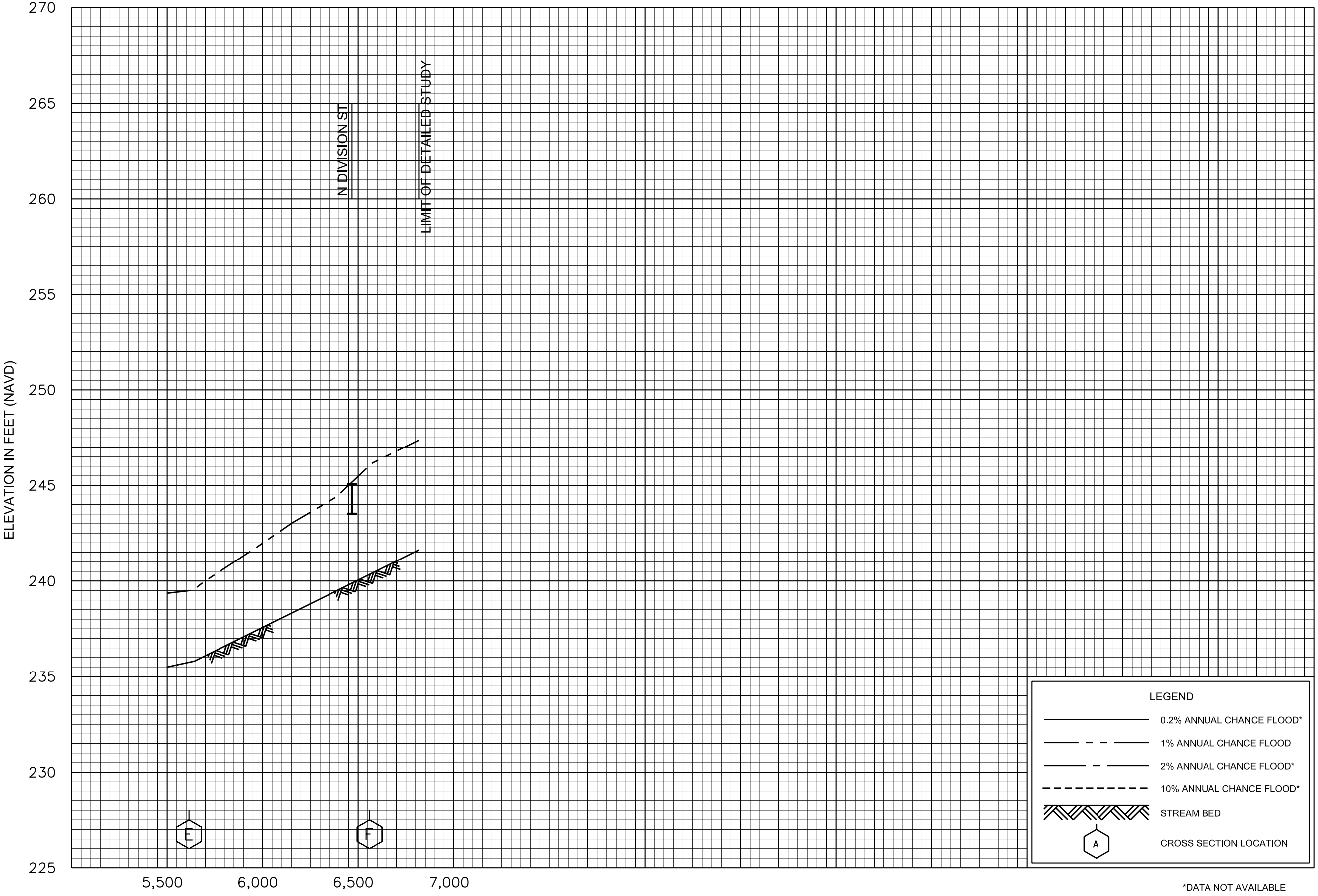
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

TOWN CREEK TRIBUTARY NO. 1



FLOOD PROFILES

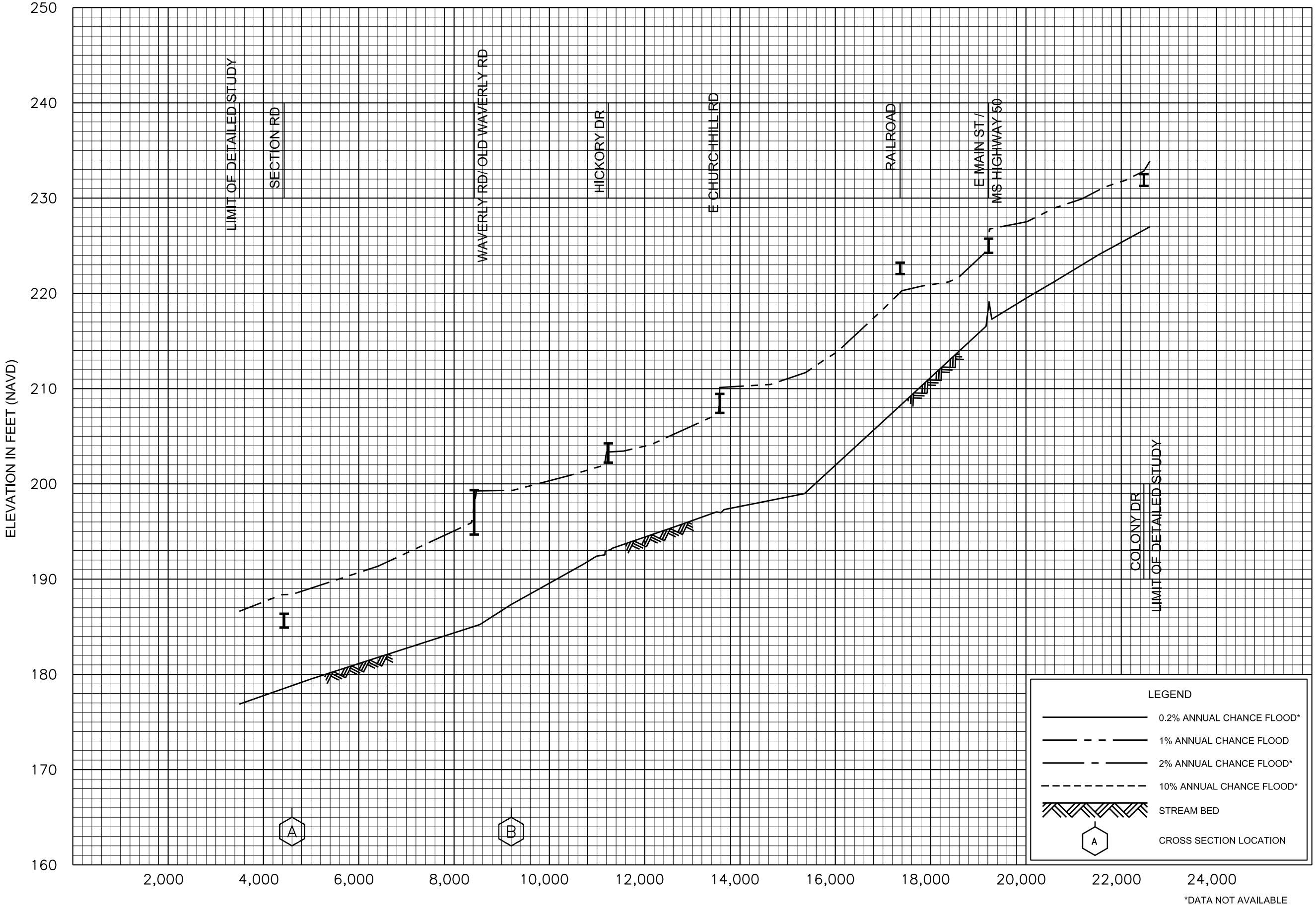
TOWN CREEK TRIBUTARY NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

12P



FLOOD PROFILES

TOWN CREEK TRIBUTARY NO. 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

13P

ELEVATION IN FEET (NAVD)

190 195 200 205 210 215 220 225 230 235

STREAM DISTANCE IN FEET ABOVE MOUTH

7,000 7,500 8,000 8,500 9,000 9,500 10,000 10,500 11,000 11,500 12,000 12,500 13,000

LIMIT OF DETAILED STUDY

RAILROAD

CHURCH HILL RD

MEADOWBROOK CIR

MEADOWBROOK CIR

E BRAME AVE

CHICKASAW DR

MILLER AVE

LIMIT OF DETAILED STUDY

A B C D E F H

LEGEND

0.2% ANNUAL CHANCE FLOOD

1% ANNUAL CHANCE FLOOD

2% ANNUAL CHANCE FLOOD

10% ANNUAL CHANCE FLOOD

STREAM BED

CROSS SECTION LOCATION

14P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLAY COUNTY, MS

AND INCORPORATED AREAS

FLOOD PROFILES

TOWN CREEK TRIBUTARY NO. 3