FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TEXAS

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
NEWTON, CITY OF	480500
NEWTON COUNTY, UNINCORPORATED AREAS	480499

FEMA

REVISED:

November 16, 2018

FLOOD INSURANCE STUDY NUMBER
48351CV000A

Version Number 2.3.3.2

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FLOOD INSURANCE STUDY REPORT
NEWTON COUNTY, TEXAS

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60.3, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as "Post-FIRM" buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community's regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Newton County, Texas.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the 8-digit Hydrologic Unit Codes (HUC-8) sub-basins affecting each, are shown in Table 1. The Flood Insurance Rate Map (FIRM) panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Newton, City of	480500	12010005	48351C0275D, 48351C0310D, 48351C0330D, 48351C0350D	
Newton County, Unincorporated Areas	480499	12010004, 12010005, 12020005	48351C0025D, 48351C0050D, 48351C0075D, 48351C0100D, 48351C0125D, 48351C0150D, 48351C0175D, 48351C0200D, 48351C0225D, 48351C0250D, 48351C0275D, 48351C0300D, 48351C0310D, 48351C0325D, 48351C0330D, 48351C0350D, 48351C0375D, 48351C0400D, 48351C0425D, 48351C0450D, 48351C0475D, 48351C0500D, 48351C0525D, 48351C0550D, 48351C0575D, 48351C0600D, 48351C0625D, 48351C0650D, 48351C0675D, 48351C0700D, 48351C0725D, 48351C0750D, 48351C0775D	

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation

(BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

  It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 31, "Map Repositories," within this FIS Report.

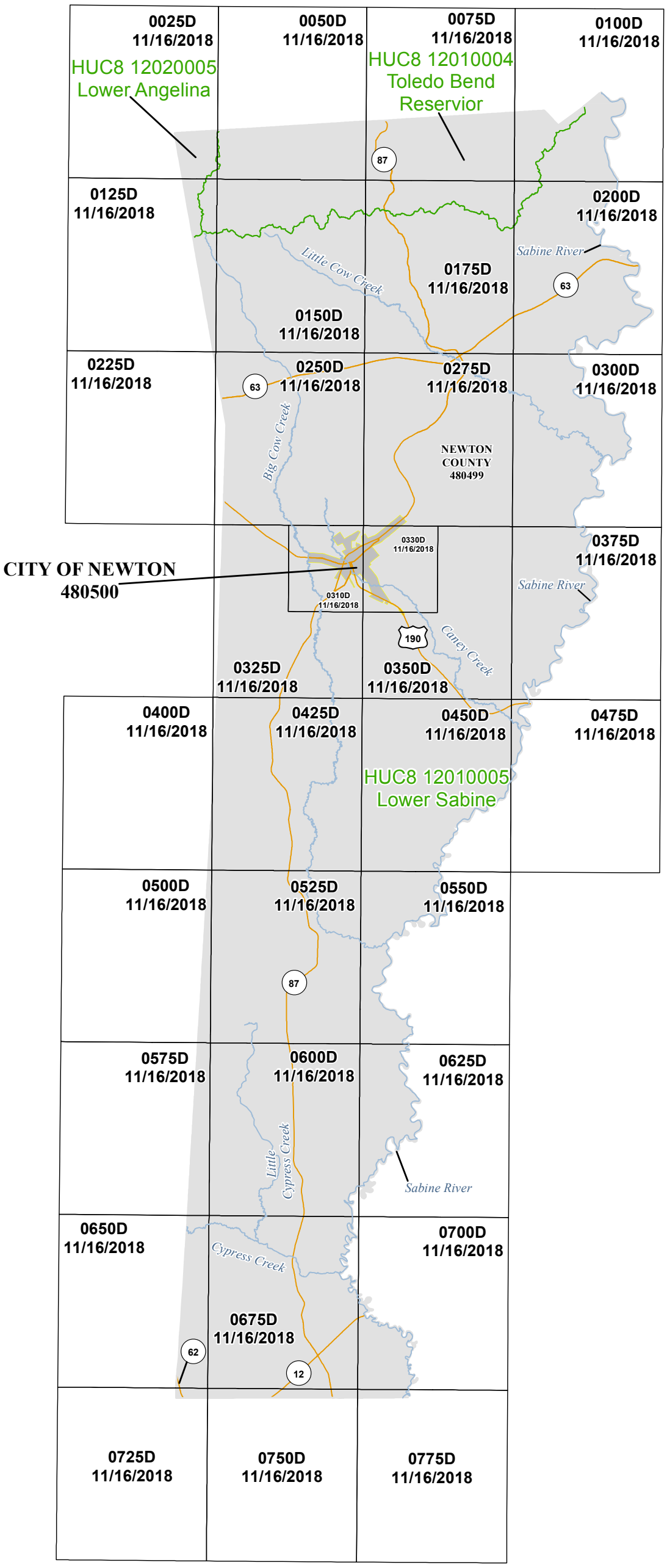
- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

  The initial Countywide FIS Report for Newton County became effective on September 21, 1998. Refer to Table 28 for information about subsequent revisions to the FIRMs.

- FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at www.fema.gov/online-tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Newton County, and also displays the panel number and effective date for each FIRM panel in the county. Other information shown on the FIRM Index includes community boundaries, flooding sources, watershed boundaries, and United States Geological Survey (USGS) Hydrologic Unit Code – 8 (HUC-8) codes.

Figure 1: FIRM Panel Index



N

1 inch = 30,833 feet 1:370,000

feet
0 8,750 17,500 35,000 52,500 70,000

Map Projection:
Universal Transverse Mercator (UTM) Zone 15N;
North American Datum 1983; Vertical Datum: NAVD 88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

COUNTY LOCATOR

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

NEWTON COUNTY, TEXAS and Incorporated Areas

PANELS PRINTED: 0025, 0050, 0075, 0100, 0125, 0150, 0175, 0200, 0225, 0250, 0275, 0300, 0310, 0325, 0330, 0350, 0375, 0400, 0425, 0450, 0475, 0500, 0525, 0550, 0575, 0600, 0625, 0650, 0675, 0700, 0725, 0750, 0775

FEMA

MAP NUMBER
48351CIND0A

MAP REVISED
NOVEMBER 16, 2018

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 28 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator (UTM) Zone 15N. The horizontal datum was NAD83. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Figure 2: FIRM Notes to Users

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

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

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 31 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided in digital format from the US Census Bureau dated 2006 and 2015; and from the U.S. Department of Agriculture Orthoimagery dated 2015. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Newton County, Texas, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 28 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Newton County, Texas, effective November 16, 2018.

Figure 2: FIRM Notes to Users

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Newton County.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*

Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)

Zone A — The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE — The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.

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

Zone AO — The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.

Zone AR — The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

Zone A99 — The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.

Zone V — The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.

Zone VE — Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.

Regulatory Floodway determined in Zone AE.

Figure 3: FIRM Notes to Users

OTHER AREAS OF FLOOD HAZARD

Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.

Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.

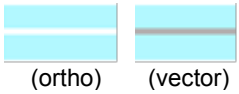
Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood.

OTHER AREAS

Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Unshaded Zone X: Areas of minimal flood hazard.

FLOOD HAZARD AND OTHER BOUNDARY LINES



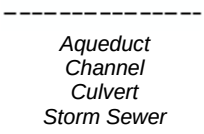
Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)

Limit of Study

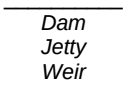
Jurisdiction Boundary

Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

GENERAL STRUCTURES

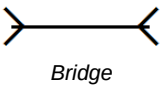


Channel, Culvert, Aqueduct, or Storm Sewer



Dam, Jetty, Weir

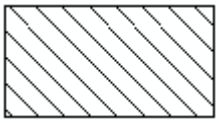
Levee, Dike, or Floodwall



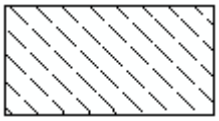
Bridge

Figure 3: FIRM Notes to Users

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.*



Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.

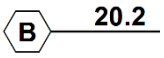


Otherwise Protected Area

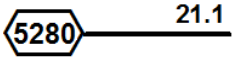
REFERENCE MARKERS

River mile Markers

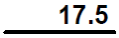
CROSS SECTION & TRANSECT INFORMATION



Lettered Cross Section with Regulatory Water Surface Elevation (BFE)



Numbered Cross Section with Regulatory Water Surface Elevation (BFE)

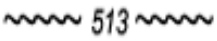


Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)

Coastal Transect

Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.

Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.



Base Flood Elevation Line

ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity

Figure 3: FIRM Notes to Users

BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1% annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2% annual chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Newton County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1% annual chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 23), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1% and 0.2% annual chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1% annual chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary is shown on the FIRM.

Table 2, "Flooding Sources Included in this FIS Report," lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 13. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1% annual chance floodplain corresponds to the SFHAs. The 0.2% annual chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ^{2}) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Big Cow Creek	Newton County, Unincorporated Areas	Approximately 1.8 miles downstream of FM 2460	Approximately 1.8 miles upstream of State Highway 363	12010005	11.8		N	AE	2014
Big Cow Creek and Zone A Tributaries	Newton County, Unincorporated Areas	Confluence with Sabine River	1 square mile drainage area of all Zone A streams / Newton County Boundary	12010005	182.1		N	A	2014
Caney Creek	Newton, City of; Newton County, Unincorporated Areas	Approximately 3.3 miles upstream of confluence with Caney Creek Tributary N1	Approximately 3.2 miles upstream of State Highway 87	12010005	7.9		N	AE	2014
Caney Creek and Zone A Tributaries	Newton County, Unincorporated Areas	Confluence with Sabine River	1 square mile drainage area of all Zone A streams	12010005	55.3		N	A	2014
Cypress Creek	Newton County, Unincorporated Areas	State Highway 87	Newton County Boundary	12010005	6.9		N	A	2015
Sabine River	Newton County, Unincorporated Areas	Newton / Orange County, Texas Boundary	Toledo Bend Reservoir	12010005	126.7		Y	AE	1998
All other Zone A Streams in Newton County	Newton County, Unincorporated Areas	Confluence with Sabine River or Newton County Boundary	1 square mile drainage area of all Zone A streams	12010004, 12010005	514.5		N	A	2015

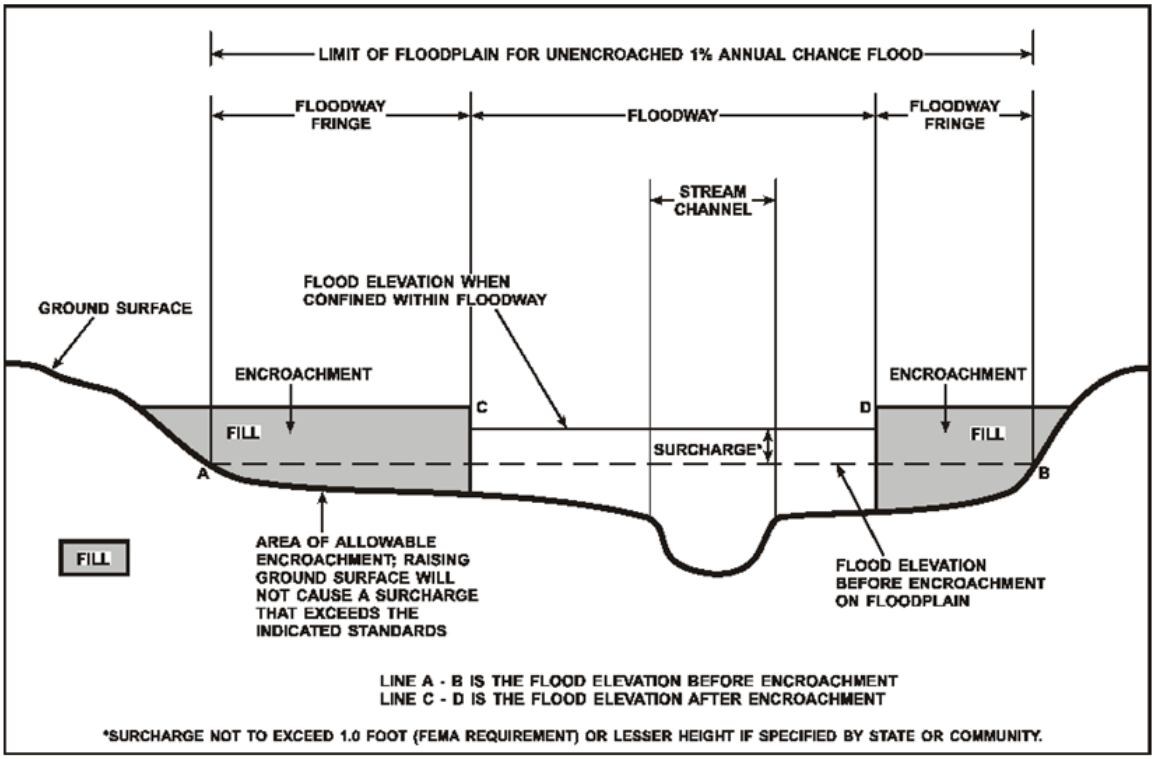
2.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1% annual chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1% annual chance flood. The floodway fringe is the area between the floodway and the 1% annual chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water surface elevation of the 1% annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

All floodways that were developed for this Flood Risk Project are shown on the FIRM using the symbology described in Figure 3. In cases where the floodway and l% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The Base Flood Elevation (BFE) is the elevation of the 1% annual chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Project.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Project.

2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this Flood Risk Project.

Figure 5: Wave Runup Transect Schematic

[Not Applicable to this Flood Risk Project]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this Flood Risk Project.

2.5.3 Coastal High Hazard Areas

This section is not applicable to this Flood Risk Project.

Figure 6: Coastal Transect Schematic

[Not Applicable to this Flood Risk Project]

2.5.4 Limit of Moderate Wave Action

This section is not applicable to this Flood Risk Project.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3. Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Newton County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Newton, City of	A, AE, X
Newton County, Unincorporated Areas	A, AE, X

3.2 Coastal Barrier Resources System

This section is not applicable to this Flood Risk Project.

Table 4: Coastal Barrier Resources System Information

[Not Applicable to this Flood Risk Project]

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 5 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 5: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Toledo Bend Reservoir	12010004	Sabine River / Toledo Bend Reservoir	Approximately northern eighth of county (roughly north of State Highway 255). These streams flow north and east into Sabine County and Toledo Bend Reservoir.	2,368
Lower Sabine	12010005	Sabine River	Largest Watershed in County, Sabine River is the eastern boundary of Newton County and Texas. Most streams in Newton County generally flow south and east into Sabine River.	2,641
Lower Angelina	12020005	Angelina River	A small portion of northwest Newton County, west of County Road 1118. Includes Dinkhorse Branch and East Prong McKim Creek. Streams flow northwest into Jasper County, TX.	1,947

4.2 Principal Flood Problems

Table 6 contains a description of the principal flood problems that have been noted for Newton County by flooding source.

Table 6: Principal Flood Problems

Flooding Source	Description of Flood Problems
Sabine River	Low lying areas adjacent to the Sabine River are subject to periodic flooding. Official records of past floods show that damaging floods occurred during 1884, 1913, 1945, 1953, 1989, 1991, 1999, 2001 and 2016. Flooding in in the spring of 2016 is one of the highest events on record (WEATHER, 2016).

Table 7 contains information about historic flood elevations in the communities within Newton County. Please note this table does not include information from the record flooding that occurred in 2016, as this data had not yet been collected or published when this study was issued preliminary.

Table 7: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NGVD29)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Big Cow Creek	State Highway 87, 2.5 Miles southwest of Newton	153.2	1953	*	Texas Water Commission Bulletin 6311
Big Cow Creek	State Highway 87, 2.5 Miles southwest of Newton	150.9	1961	*	Texas Water Commission Bulletin 6311
Sabine River	County Road 2147	118.5	1999	*	Sabine River Authority
Sabine River	State Highway 190, 2.1 miles northeast of Bon Wier	69.2	1932	*	Texas Water Commission Bulletin 6311
Sabine River	State Highway 12, just east of Camp House Road	17.2	2005	*	FEMA Hurricane Rita Rapid Response-1606-Dr-TX
Sabine River	State Highway 12, Just north of Deweyville on Texas/Louisiana border	20.4	1944	*	Texas Water Commission Bulletin 6311
Sabine River	State Highway 12, Just north of Deweyville on Texas/Louisiana border	20.4	1957	*	Texas Water Commission Bulletin 6311
Sabine River	State Highway 12, Just north of Deweyville on Texas/Louisiana border	21.4	1950	*	Texas Water Commission Bulletin 6311
Sabine River	State Highway 12, Just north of Deweyville on Texas/Louisiana border	19.9	1950	*	Texas Water Commission Bulletin 6311
Sabine River	Railroad, 2.4 miles southeast of Deweyville	21.6	1913	*	Texas Water Commission Bulletin 6311
Sabine River	Railroad, 2.4 miles southeast of Deweyville	15.9	1922	*	Texas Water Commission Bulletin 6311

Flooding Source	Location	Historic Peak (Feet NGVD29)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Sabine River	Railroad, 2.4 miles southeast of Deweyville	17.2	1932	*	Texas Water Commission Bulletin 6311
Sabine River	Railroad, 2.4 miles southeast of Deweyville	16.4	1938	*	Texas Water Commission Bulletin 6311

* Data not calculated

4.3 Non-Levee Flood Protection Measures

Table 8 contains information about non-levee flood protection measures within Newton County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Table 8: Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Sabine River	Toledo Bend Reservoir	Dam	At the head of the watershed on the Sabine River	Reservoir provides some degree of protection against lower flows, but does not mitigate major floods such as the 1% annual chance and larger.

4.4 Levees

This section is not applicable to this Flood Risk Project.

Table 9: Levees

[Not Applicable to this Flood Risk Project]

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2% annual chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of

annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 13. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges on all detailed study streams and some approximate streams is provided in Table 10. Please refer to the hydrologic TSDN for additional information on discharges for streams not listed in Table 10. Stream gage information is provided in Table 12.

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Big Cow Creek	750 meters downstream of confluence with Big Cow Creek Trib 1	345	15,649	21,943	27,419	33,845	*	51,651
Big Cow Creek	At Confluence of Big Cow Creek Trib 1	336	15,373	21,584	26,993	33,347	*	50,986
Big Cow Creek	At confluence of Big Cow Creek Trib 2	333	15,373	21,584	26,993	33,347	*	50,986
Big Cow Creek	At confluence of Trout Creek (N)	252	13,143	18,467	23,100	28,549	*	43,697
Big Cow Creek	At approximately 5 kilometers downstream of FM 2460	247	12,906	18,160	22,736	28,125	*	43,134
Big Cow Creek	Zone Break	247	13,143	18,467	23,100	28,549	*	43,697
Big Cow Creek	At approximately 1.5 kilometers upstream of FM 2460	153	9,437	14,257	18,688	23,867	*	39,232
Big Cow Creek	At approximately 3 kilometers upstream of FM 246	152	9,349	14,257	18,688	23,867	*	39,232
Big Cow Creek	At confluence of White Oak Creek	152	9,437	14,257	18,688	23,867	*	39,232
Big Cow Creek	At confluence of George Lewis Branch	145	9,339	14,257	18,688	23,867	*	39,232

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Big Cow Creek	At approximately 2.6 kilometers downstream of FM 363	142	9,339	14,257	18,688	23,867	*	39,232
Big Cow Creek	Zone Break	141	9,339	14,257	18,688	23,867	*	39,232
Big Cow Creek	At approximately 2 kilometers upstream of FM 363	141	9,339	14,257	18,688	23,867	*	39,232
Big Cow Creek	At approximately 1 kilometer upstream of FM 363	141	9,339	14,257	18,688	23,867	*	39,232
Big Cow Creek	At confluence of Walkers Lake Creek	133	9,338	14,257	18,688	23,867	*	29,232
Big Cow Creek	At confluence of Melhomes Creek	66	6,377	9,053	11,390	14,168	*	22,015
Big Cow Creek	At confluence of Hunter Creek	37	4,409	6,209	7,769	9,623	*	14,830
Big Cow Creek	At confluence of Lewis Gully	35	4,353	6,140	7,690	9,536	*	14,731
Big Cow Creek	At confluence of Dry Creek (Near Farrsville)	22	3,721	5,322	6,724	8,407	*	13,168
Big Cow Creek	At confluence of Crenshaw Branch	12	3,721	5,322	6,724	8,407	*	13,168
Caney Creek	At downstream side of US Highway 190	47	3,502	4,737	5,763	6,933	*	10,072

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Caney Creek	At approximately 2.5 kilometers upstream of FM 2626	29	2,529	3,396	4,109	4,920	*	7,085
Caney Creek	At confluence of Caney Creek Tributary N1	22	2,121	2,836	3,424	4,308	*	5,865
Caney Creek	At approximately 2 miles downstream of US Hwy 190 (Rusk Street)	21	2,137	2,866	3,465	4,308	*	5,968
Caney Creek	At approximately 800 meters downstream of US Hwy 190 (Rusk Street)	20	2,083	2,795	3,381	4,049	*	5,835
Caney Creek	Downstream of Court Street	19	2,018	2,708	3,277	3,925	*	5,660
Caney Creek	At approximately 2 miles upstream of Court Street	16	1,869	2,505	3,028	3,625	*	5,222
Caney Creek	At approximately 2 miles upstream of State Highway 87	15	1,749	2,341	2,827	3,382	*	4,863
Caney Creek	At confluence of Martin Creek	4.2	846	1,112	1,326	1,572	*	2,219
Caney Creek	At approximately 500 meters upstream of Private Road 5006	0.92	341	433	504	587	*	796

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Cypress Creek	At confluence of Blacks Marsh Creek	110	5,851	7,916	9,638	11,593	*	16,817
Cypress Creek	Upstream of State Highway 87	110	5,993	8,107	9,871	11,872	*	17,218
Cypress Creek	At confluence of Little Cypress Creek	94	5,308	7,171	8,721	10,479	*	15,172
Little Cow Creek	At approximately 7.5 kilometers downstream of confluence of Little Cow Creek Trib 1	130	10,017	14,313	18,101	22,934	*	35,511
Little Cow Creek	At approximately 600 meters downstream of FM 1414	120	10,051	14,420	18,286	22,934	*	36,190
Little Cow Creek	At confluence of Swindler Creek	110	9,685	13,898	17,626	22,110	*	34,906
Little Cow Creek	At confluence of Plum Creek	110	9,471	13,589	17,234	21,617	*	34,125
Little Cow Creek	At confluence of Yellow Bayou	69	7,081	10,112	12,778	15,977	*	25,073
Little Cow Creek	At confluence of McGraw Creek	38	4,667	6,603	8,288	12,723	*	15,983
Little Cow Creek	At approximately 1.4 kilometers upstream of Little Cow Creek	34	4,570	6,488	8,163	12,723	*	15,863
Little Cow Creek	At confluence of Wiergate Creek	30	4,290	6,088	7,658	12,723	*	14,880

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Little Cow Creek	At approximately 800 meters upstream of FM 1415	27	5,612	8,044	10,178	12,723	*	19,916
Little Cow Creek	At confluence of Bear Branch	20	4,722	6,754	8,535	10,661	*	16,663
Little Cow Creek	At confluence of Deep Creek	12	3,502	4,973	6,252	7,777	*	12,058
Little Cow Creek	Upstream of County Road 1090	5.6	2,188	3,071	3,832	4,739	*	7,261
Little Cypress Creek	At confluence with Cypress Creek	14	1,616	2,128	2,542	3,007	*	4,225
Sabine River	At State Highway 12	9,329	66,100	*	98,700	113,800	*	150,000
Sabine River	At U.S. Highway 190	8,229	61,000	*	94,000	110,000	*	148,000
Sabine River	At State Highway 63	7,482	57,000	*	90,000	105,000	*	144,000
Sabine River	At Toledo Bend Dam[1]	7,178	39,000	*	72,000	87,000	*	126,000

* Not calculated for this Flood Risk Project

[1] Adjusted for discharges from hydropower tailrace

Figure 7: Frequency Discharge-Drainage Area Curves

[Not Applicable to this Flood Risk Project]

Table 11: Summary of Non-Coastal Stillwater Elevations

[Not Applicable to this Flood Risk Project]

Table 12: Stream Gage Information used to Determine Discharges

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Big Cow Creek	08029500	USGS	Big Cow Creek near Newton, TX	128	4/1/1922	3/21/2012
Cypress Creek	08030000	USGS	Cypress Creek near Buna, TX	83.3	4/1/1952	10/5/1984
Sabine River	08025360	USGS	Sabine River at Toledo Bend near Burkeville, TX	7,178	1/6/1972	11/2/2009
Sabine River	08026000	USGS	Sabine River near Burkeville, TX	7,482	5/1/1884	11/3/2009
Sabine River	08030500	USGS	Sabine River near Bon Wier, TX	8,229	5/1/1884	11/4/2009
Sabine River	08028500	USGS	Sabine River near Ruliff, TX	9,329	5/1/1884	11/8/2009

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The

hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 24, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 13. Roughness coefficients are provided in Table 14. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Big Cow Creek	Approximately 1.8 miles downstream of FM 2460	Approximately 1.8 miles upstream of FM 363	PeakFQ	HEC-RAS 4.1	8/29/2014	AE	
Big Cow Creek	Approximately 1.8 miles upstream of FM 363	Approximately 1.8 miles upstream of State Highway 255	PeakFQ	HEC-RAS 4.1	2/27/2015	A	Effects of hydraulic structures were not considered in the model.
Big Cow Creek	Approximately 0.5 miles downstream of confluence of Big Cow Creek Tributary 1	Approximately 1.8 miles downstream of FM 2460	PeakFQ	HEC-RAS 4.1	2/27/2015	A	Effects of hydraulic structures were not considered in the model.
Big Cow Creek Zone A Tributaries	Confluence with Sabine River	1 square mile drainage area of all Zone A streams / Newton County Boundary	2009 USGS Texas State Regression Equations	HEC-RAS 4.1	2/27/2015	A	Effects of hydraulic structures were not considered in the model.
Caney Creek	Approximately 3.3 miles upstream of confluence with Caney Creek Tributary N1	Approximately 3.2 miles upstream of State Highway 87	2009 USGS Texas State Regression Equations	HEC-RAS 4.1	8/29/2014	AE	
Caney Creek and Zone A Tributaries	Confluence with Sabine River	1 square mile drainage area of all Zone A streams	2009 USGS Texas State Regression Equations	HEC-RAS 4.1	8/29/2014	A	Effects of hydraulic structures were not considered in the model.
Cypress Creek	State Highway 87	Newton County Boundary	PeakFQ	HEC-RAS 4.1	2/27/2015	A	Effects of hydraulic structures were not considered in the model.
Sabine River	Newton / Orange County, Texas Boundary	Toledo Bend Reservoir	Log Pearson Type III Frequency Analysis	HEC-2	9/21/1998	AE w/ Floodway	

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
All other Zone A Streams in Newton County	Confluence with Sabine River or Newton County Boundary	1 square mile drainage area of all Zone A streams	2009 USGS Texas State Regression Equations	HEC-RAS 4.1	2/27/2015	A	Effects of hydraulic structures were not considered in the model.

Table 14: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Sabine River	0.025-0.035	0.050-0.140
All Other Streams in Newton County	0.03-0.045	0.045-0.1

5.3 Coastal Analyses

This section is not applicable to this Flood Risk Project.

Table 15: Summary of Coastal Analyses

[Not Applicable to this Flood Risk Project]

5.3.1 Total Stillwater Elevations

This section is not applicable to this Flood Risk Project.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas

[Not Applicable to this Flood Risk Project]

Table 16: Tide Gage Analysis Specifics

[Not Applicable to this Flood Risk Project]

5.3.2 Waves

This section is not applicable to this Flood Risk Project.

5.3.3 Coastal Erosion

This section is not applicable to this Flood Risk Project.

5.3.4 Wave Hazard Analyses

This section is not applicable to this Flood Risk Project.

Table 17: Coastal Transect Parameters

[Not Applicable to this Flood Risk Project]

Figure 9: Transect Location Map

[Not Applicable to this Flood Risk Project]

5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Project.

Table 18: Summary of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

Table 19: Results of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey (NGS) at the following address:

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

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

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

The datum conversion locations and values that were calculated for Newton County are provided in Table 20.

Table 20: Countywide Vertical Datum Conversion

[Not Applicable to this Flood Risk Project]

A countywide conversion factor was not generated for Newton County. Instead the vertical datum conversion factor for the Sabine River was taken from the FIS for Vernon Parish, Louisiana. Calculations for the vertical offsets on a stream by stream basis are depicted in Table 21.

Table 21: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Sabine River	-0.27

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping.

Base map information shown on the FIRM was derived from the sources described in Table 22.

Table 22: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophoto	USDA	2015	1:12,000	Color orthoimagery was provided for the county
Political boundaries	U.S. Census Bureau	2006	1:12,000	TIGER Municipal and county boundaries
Transportation Features	U.S. Census Bureau	2015	1:12,000	TIGER Roads and railroads

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 23 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

Table 23: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data					
		Description	Scale	Contour Interval	$RMSE_z$	$Accuracy_z$	Citation
Newton County	All within HUC 12010004 and most within HUC 12010005	Light Detection and Ranging data (LiDAR)	N/A	N/A	7.4 cm	12.2 cm	Harden 2011
Newton County	Rest of Newton County	USGS 10 meter DEM	N/A	N/A	N/A	N/A	USGS 2013

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in areas of ponding, and other areas with static base flood elevations.

Table 24: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	172,010	16,400	124,040	0.9	18.2	18.2	19.0	0.8
B	201,590	11,688	89,011	1.3	22.8	22.8	23.7	0.9
C	216,638	16,133	127,750	0.9	24.0	24.0	24.9	0.9
D	228,488	12,843	124,052	0.9	24.8	24.8	25.8	1.0
E	251,038	10,029	81,172	1.0	26.8	26.8	27.7	0.9
F	273,838	12,400	108,133	1.1	32.3	32.3	33.2	0.9
G	306,438	12,635	120,096	0.9	36.7	36.7	37.4	0.7
H	339,488	8,388	101,090	1.1	42.5	42.5	43.3	0.8
I	377,438	12,699	126,882	0.9	46.2	46.2	47.1	0.9
J	406,238	8,952	77,974	1.5	51.9	51.9	52.6	0.7
K	428,238	11,285	95,337	1.2	55.9	55.9	56.8	0.9
L	459,738	16,794	151,302	0.8	60.2	60.2	61.0	0.8
M	478,238	13,650	116,361	1.0	63.1	63.1	63.7	0.6
N	497,038	16,660	92,950	1.2	66.2	66.2	67.0	0.8
O	512,748	16,200	28,321	3.9	71.6	71.6	72.1	0.5
P	521,248	15,076	106,989	1.0	73.0	73.0	73.7	0.7
Q	534,898	8,673	33,714	3.3	74.3	74.3	75.1	0.8
R	559,088	10,875	122,241	0.9	79.9	79.9	80.9	1.0
S	593,608	15,200	112,839	1.0	85.5	85.5	86.4	0.9
T	617,288	8,300	83,741	1.3	88.5	88.5	89.5	1.0
U	641,668	7,986	42,303	2.6	91.7	91.7	92.6	0.9

[1] Feet above mouth

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	670,108	7,487	67,682	16.0	96.4	96.4	97.3	0.9
W	699,238	8,785	91,745	1.2	99.9	99.9	100.9	1.0
X	718,208	8,625	82,251	1.3	104.9	104.9	105.6	0.7
Y	736,606	2,300	26,746	3.9	106.9	106.9	107.5	0.6
Z	768,126	7,286	68,868	1.5	111.1	111.1	111.9	0.8
AA	783,886	7,885	69,479	1.3	112.9	112.9	113.7	0.8
AB	804,286	3,192	24,486	3.6	115.2	115.2	116.2	1.0
AC	816,500	*	*	*	119.7	*	*	*

[1] Feet above mouth

* Data unavailable

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TEXAS

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: SABINE RIVER

Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not Applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable to this Flood Risk Project.

Table 26: Summary of Coastal Transect Mapping Considerations

[Not Applicable to this Flood Risk Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 31, "Map Repositories").

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA.

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill". Visit the "Flood Map-Related Fees" section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA's determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loma for the "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill" or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the "Flood Map-Related Fees" section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/mt-2-application-forms-and-instructions and download the form "MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision". Visit the "Flood Map-Related Fees" section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Newton County FIRM are listed in Table 27.

Table 27: Incorporated Letters of Map Change

[Not Applicable to this Flood Risk Project]

6.5.4 Physical Map Revisions

A PMR is an official republication of a community's NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community's chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the "Flood Map Revision Processes" section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA

to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Newton County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBMs) and/or Flood Boundary and Floodway Maps (FBFMs) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 28, "Community Map History." A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.

- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or "pending" (for Preliminary FIS Reports) is shown. If the community is listed in Table 28 but not identified on the map, the community is treated as if it were unmapped.

- *Initial FHBM Effective Date* is the effective date of the first Flood Hazard Boundary Map (FHBM). This date may be the same date as the Initial NFIP Map Date.

- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.

- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community.

- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as Physical Map Revisions (PMR) of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Newton County FIRMs in countywide format was September 21, 1998.

Table 28: Community Map History

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Newton, City of[1]	6/7/1974	6/7/1974	6/4/1976	9/21/1998	11/16/2018
Newton County, Unincorporated Areas	7/5/1977	7/5/1977	None	4/1/1987	9/21/1998 11/16/2018

[1] This community did not have a FIRM prior to the first countywide FIRM for Newton County

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 29 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 29: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Big Cow Creek (Zone AE)	11/16/2018	RAMPP	HSFEHQ-09-D-0369	August 2014	Newton County, Unincorporated Areas
Big Cow Creek and Zone A Tributaries	11/16/2018	RAMPP	HSFEHQ-09-D-0369	February 2015	City of Newton; Newton County, Unincorporated Areas
Caney Creek (Zone AE)	11/16/2018	RAMPP	HSFEHQ-09-D-0369	August 2014	City of Newton; Newton County, Unincorporated Areas
Caney Creek and Zone A Tributaries	11/16/2018	RAMPP	HSFEHQ-09-D-0369	August 2014	City of Newton; Newton County, Unincorporated Areas
Cypress Creek	11/16/2018	RAMPP	HSFEHQ-09-D-0369	February 2015	Newton County, Unincorporated Areas
Sabine River	9/21/1998	Turner Collie & Branden Inc.	EMW-93-C-4126	September 1998	Newton County, Unincorporated Areas
All other Zone A Streams in Newton County	11/16/2018	RAMPP	HSFEHQ-09-D-0369	February 2015	City of Newton; Newton County, Unincorporated Areas

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 30. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 30: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Newton, City of	9/21/1998	2/26/1996	CCO	FEMA, and the community
	3/16/2018	7/10/2012	Discovery	FEMA, the community, the study contractor, the Sabine River Authority (SRA) and the State NFIP office
		2/17/2017	CCO	FEMA, the community, and the study contractor
Newton County Unincorporated Areas	9/21/1998	2/26/1996	CCO	FEMA, the community, the study contractor, and USACE
	3/16/2018	7/10/2012	Discovery	FEMA, the community, the study contractor, SRA and the State NFIP office
		4/24/2013	Kick-Off	FEMA, the community, the study contractor, and SRA
		6/16/2015	Flood Risk Review	FEMA, the community, and the study contractor
		2/17/2017	CCO	FEMA, the community, and the study contractor

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

The additional data that was used for this project includes the FIS Report and FIRM that were previously prepared for Newton County and Incorporated Areas, (FEMA 1998). Technical data for more recent FEMA flood studies in Newton County can be found in the Technical Data Support Notebooks (FEMA 2014 and FEMA 2015). In addition the National Weather Service prepared reports regarding flooding on the Sabine River in 1999 and 2001 (NWS 1999 and 2001).

Table 31 is a list of the locations where FIRMs for Newton County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 31: Map Repositories

Community	Address	City	State	Zip Code
Newton, City of	City Hall, 101 West North Street	Newton	TX	75966
Newton County, Unincorporated Areas	County Court House 110 Court Street	Newton	TX	75966

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 32.

Table 32 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of State and local GIS data in their state.

Table 32: Additional Information

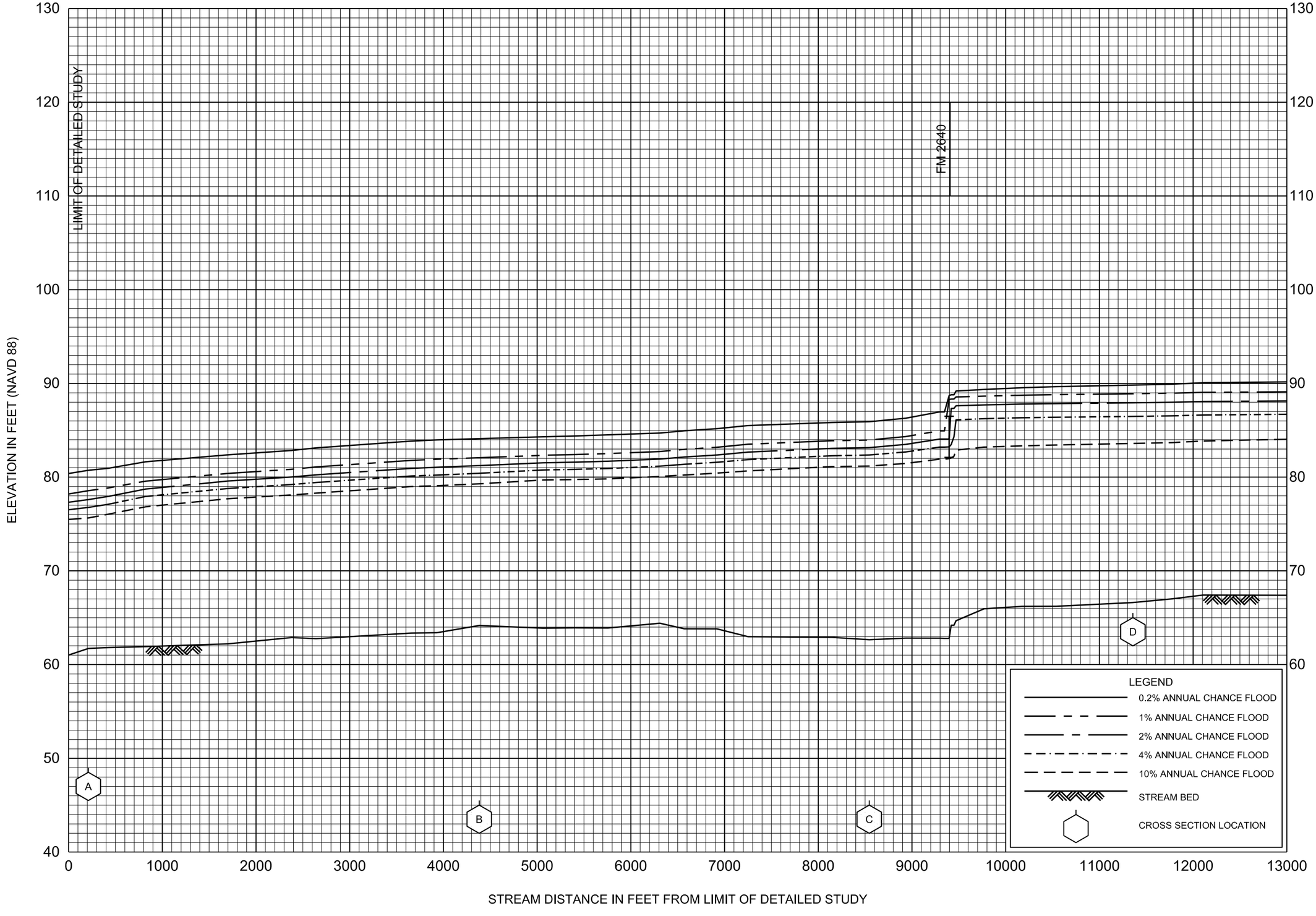
FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/engineering-library
NFIP website	www.fema.gov/national-flood-insurance-program
NFHL Dataset	msc.fema.gov
FEMA Region VI	RAMPP Regional Support Center 6, 723 S. Interstate 35E, Suite 230, Denton, TX 76205 (940) 735-3334
Other Federal Agencies	
USGS website	www.usgs.gov
Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Michael Segner Texas Water Development Board 1700 North Congress Avenue P.O. Box 13231 Austin, TX 78711-3231 512-463-3509 michael.segber@twdb.state.tx.us
State GIS Coordinator	Mike Ouimet Texas Division of Emergency Management 300 West 15th Street P.O. Box 13564 Austin, Texas 78711-3564 512-305-9076 mike.ouimet@dir.state.tx.us Rob Aanstoos Texas Division of Emergency Management 300 West 15th Street P.O. Box 13564 Austin, Texas 78711-3564 512-463-7314 rob.aanstoos@dir.state.tx.us

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 33 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 33: Bibliography and References

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
FEMA 1998	Federal Emergency Management Agency	*Flood Insurance Study, Newton County, Texas, and Incorporated Areas*		Washington, D.C.	September 1998	FEMA Flood Map Service Center msc.fema.gov
FEMA 2014	Federal Emergency Management Agency	*Lower Sabine Watershed Floodplain Mapping TSDN, Phase 2A*		Washington, D.C.	August 2014	FEMA Engineering Library hazards.fema.gov
FEMA 2015	Federal Emergency Management Agency	*Lower Sabine Watershed Floodplain Mapping TSDN, Phase 2B*		Washington, D.C.	August 2014	FEMA Engineering Library hazards.fema.gov
HARDIN 2011	M.J. Harden Associates	*LiDAR Data for Newton, Sabine and Shelby Counties, TX*		Mission, KS	March 2011	
NWS, 1999	National Weather Service	*The February 1999 Sabine River Flood*		Lake Charles, LA	March 2001	srh.nooa.gov
NWS, 2001	National Weather Service	*Sabine River Flood, March 2001*		Lake Charles, LA	March 2001	srh.nooa.gov
USGS 2013	U.S. Department of Interior, Geological Survey	*National Elevation Dataset 1/3 Arc Second DEM*		Washington, D.C.	May 2013	nationalmap.gov/viewer.html
WEATHER 2016	The Weather Channel	*Sabine River Crests in Deweyville, Texas, But Problems Remain*		Atlanta, GE	March 2016	weather.com



FLOOD PROFILES

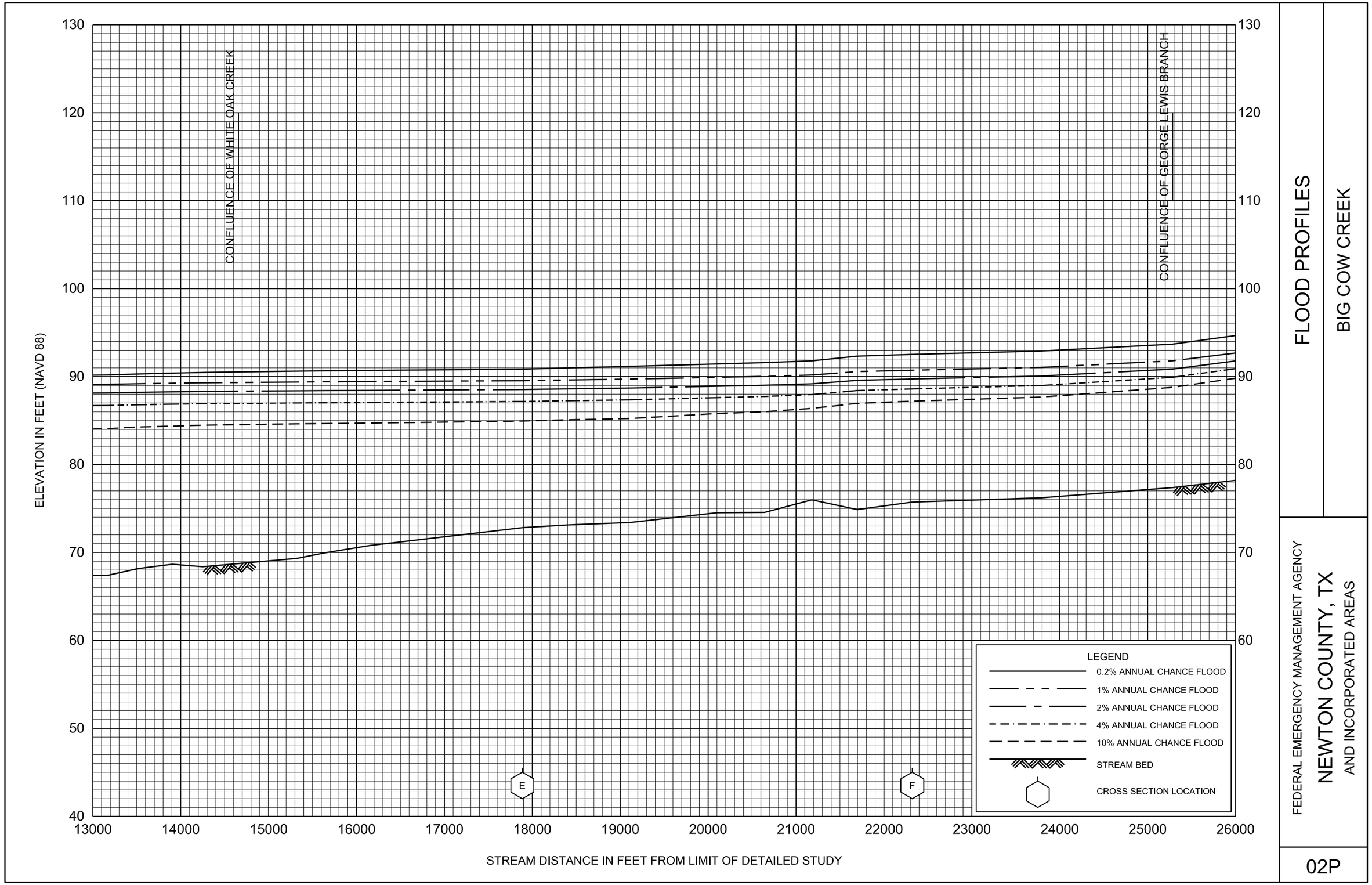
BIG COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

01P



FLOOD PROFILES

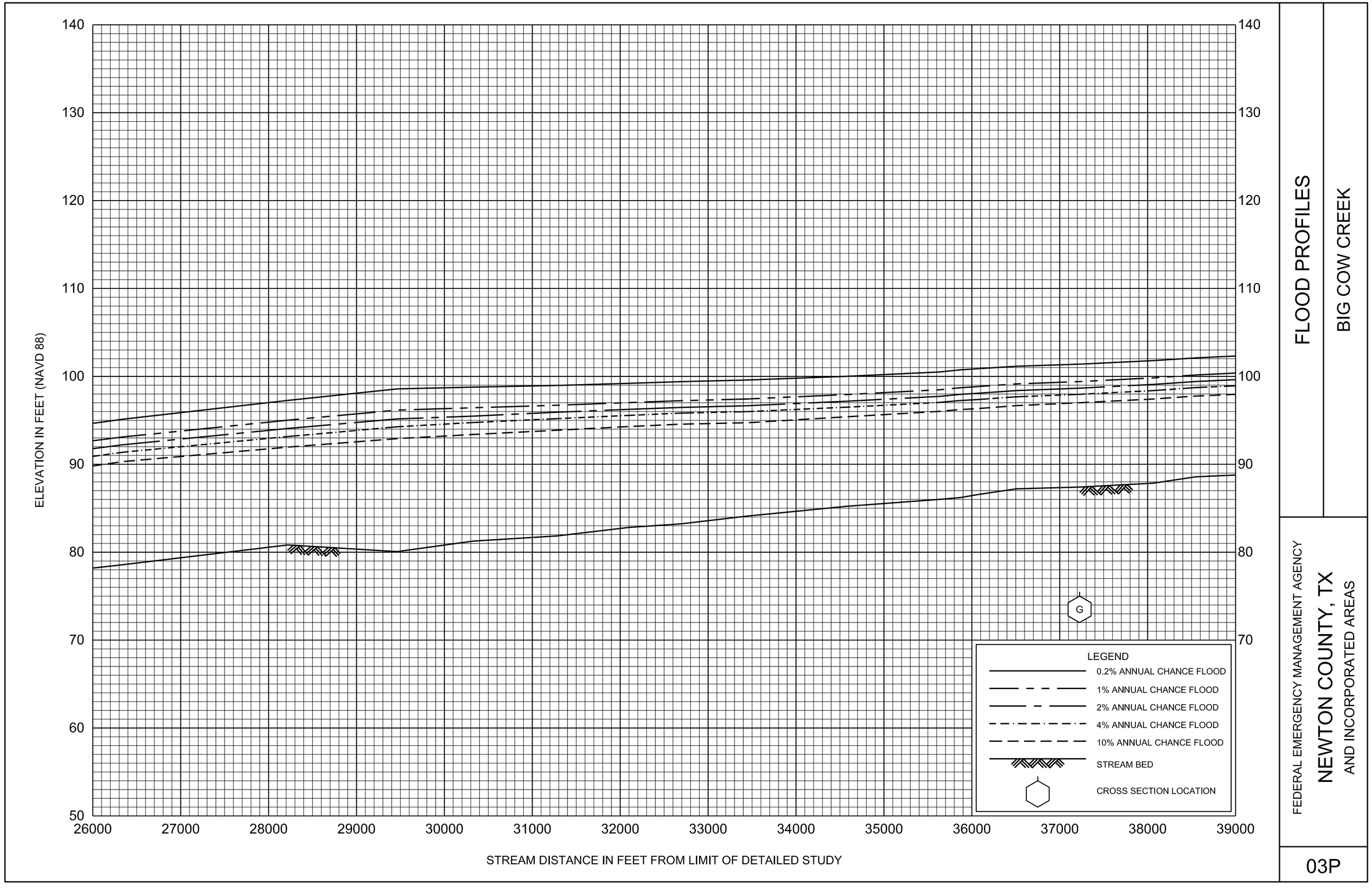
BIG COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

02P



FLOOD PROFILES

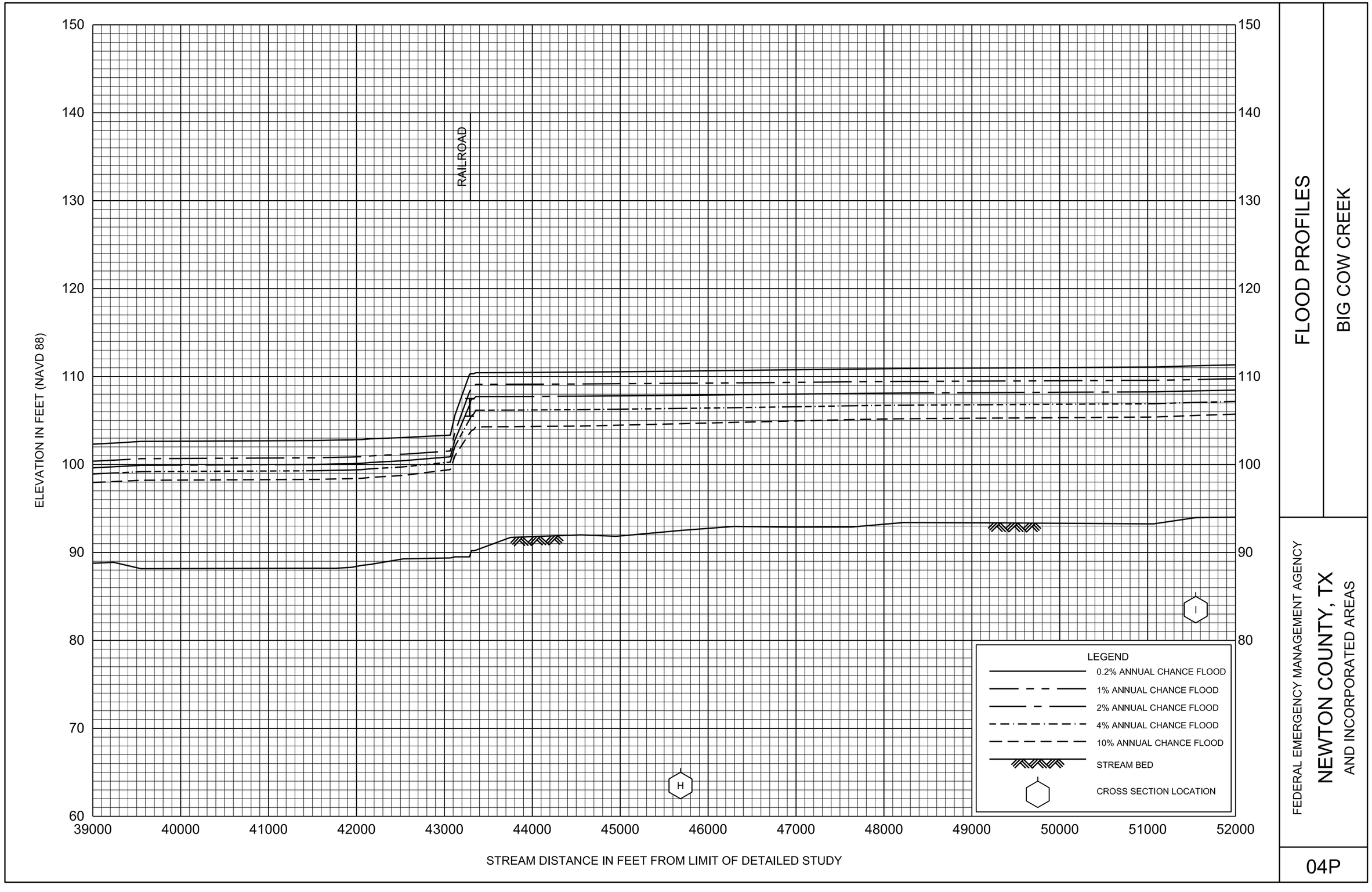
BIG COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

03P



FLOOD PROFILES

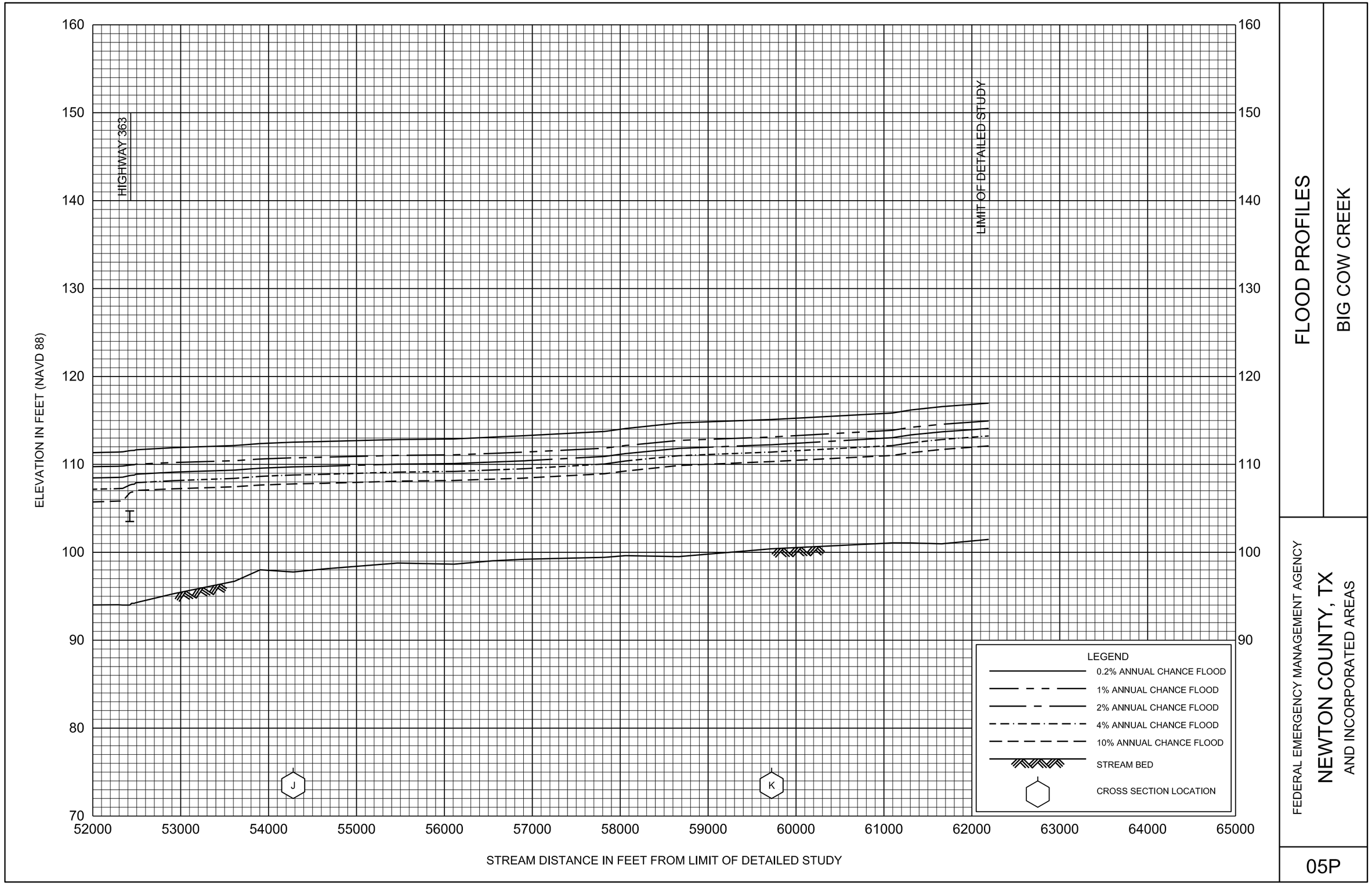
BIG COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

04P



FLOOD PROFILES

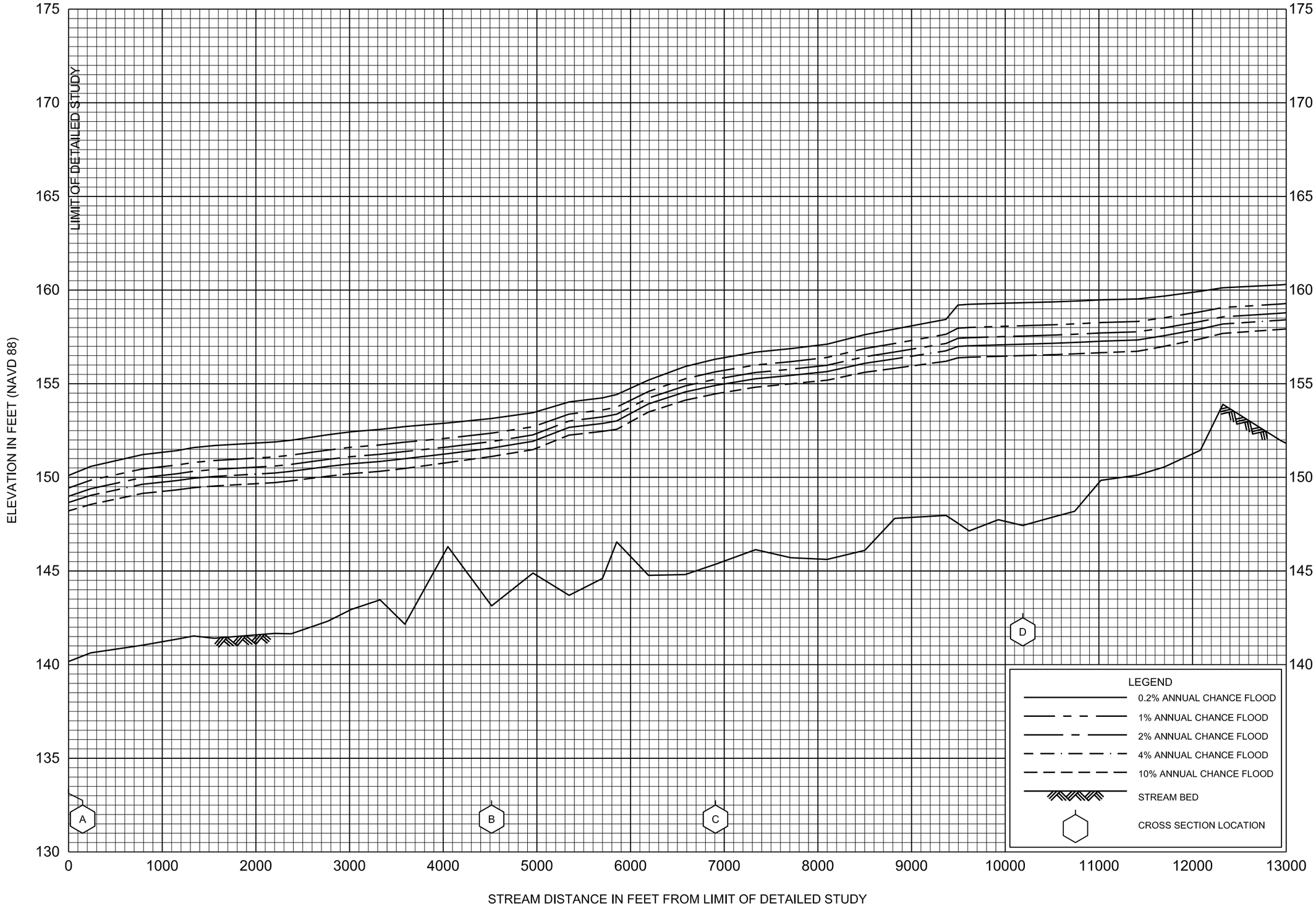
BIG COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

05P



FLOOD PROFILES

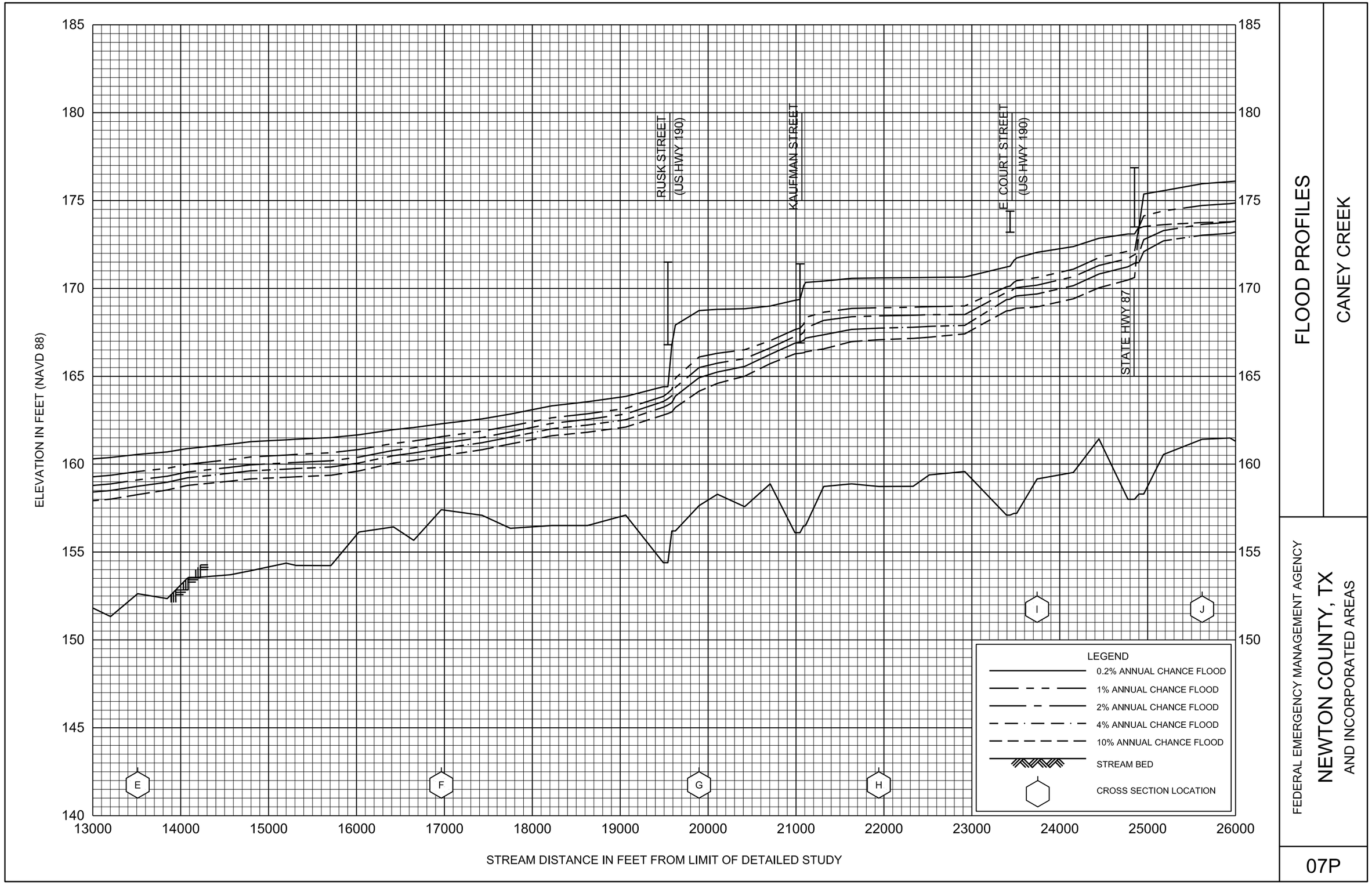
CANEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

06P



FLOOD PROFILES

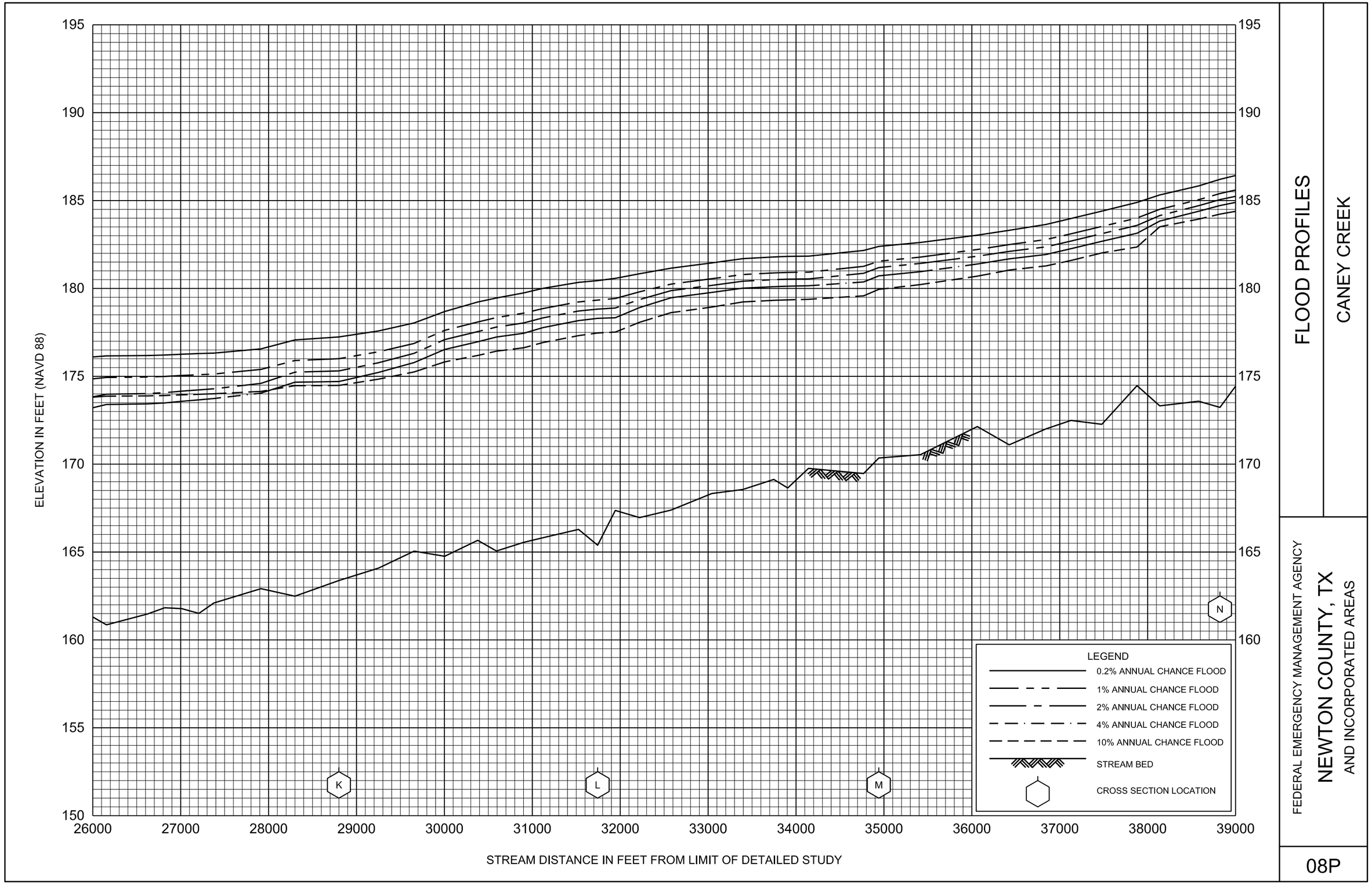
CANEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

07P



FLOOD PROFILES

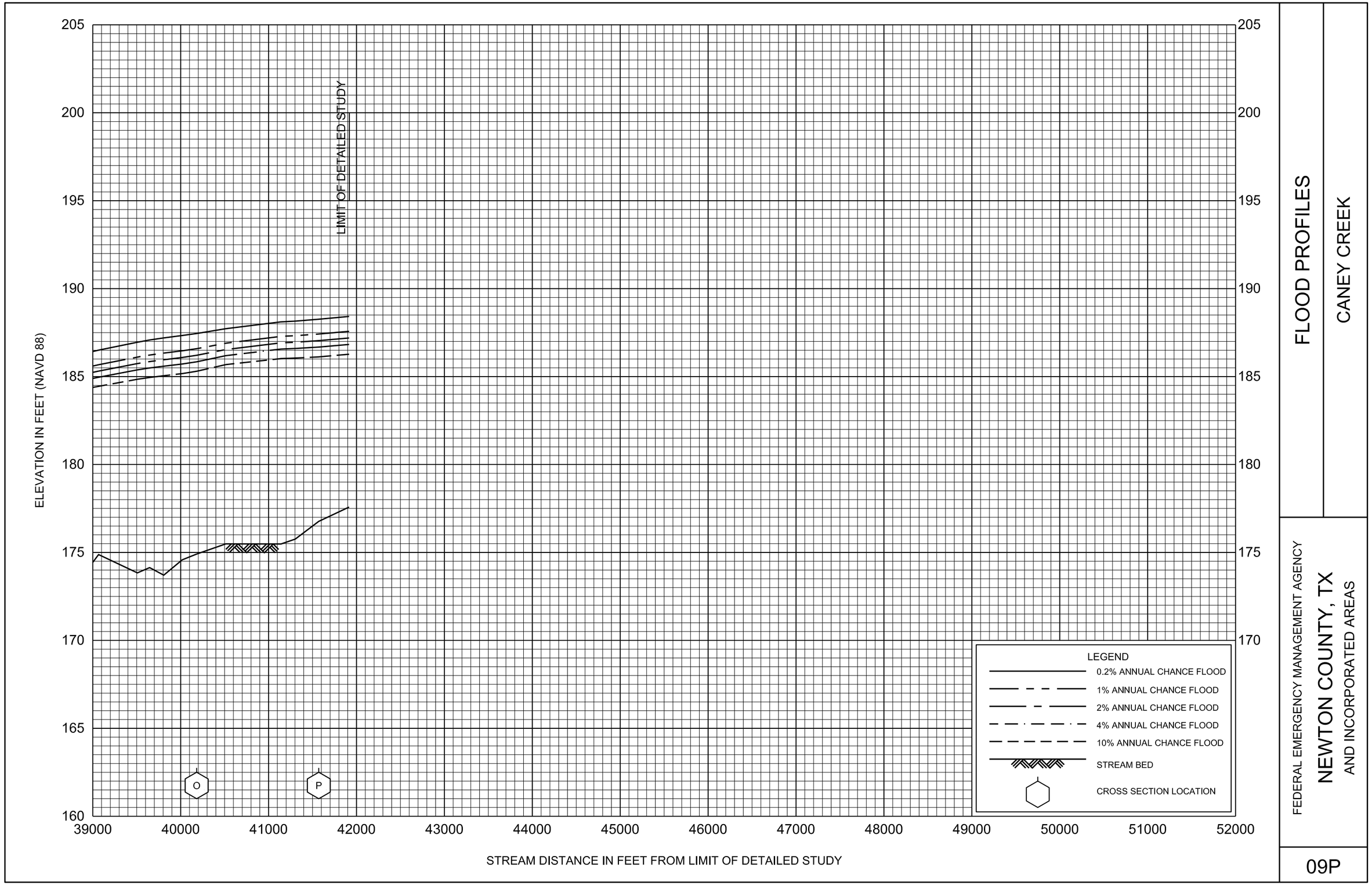
CANEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

08P



FLOOD PROFILES

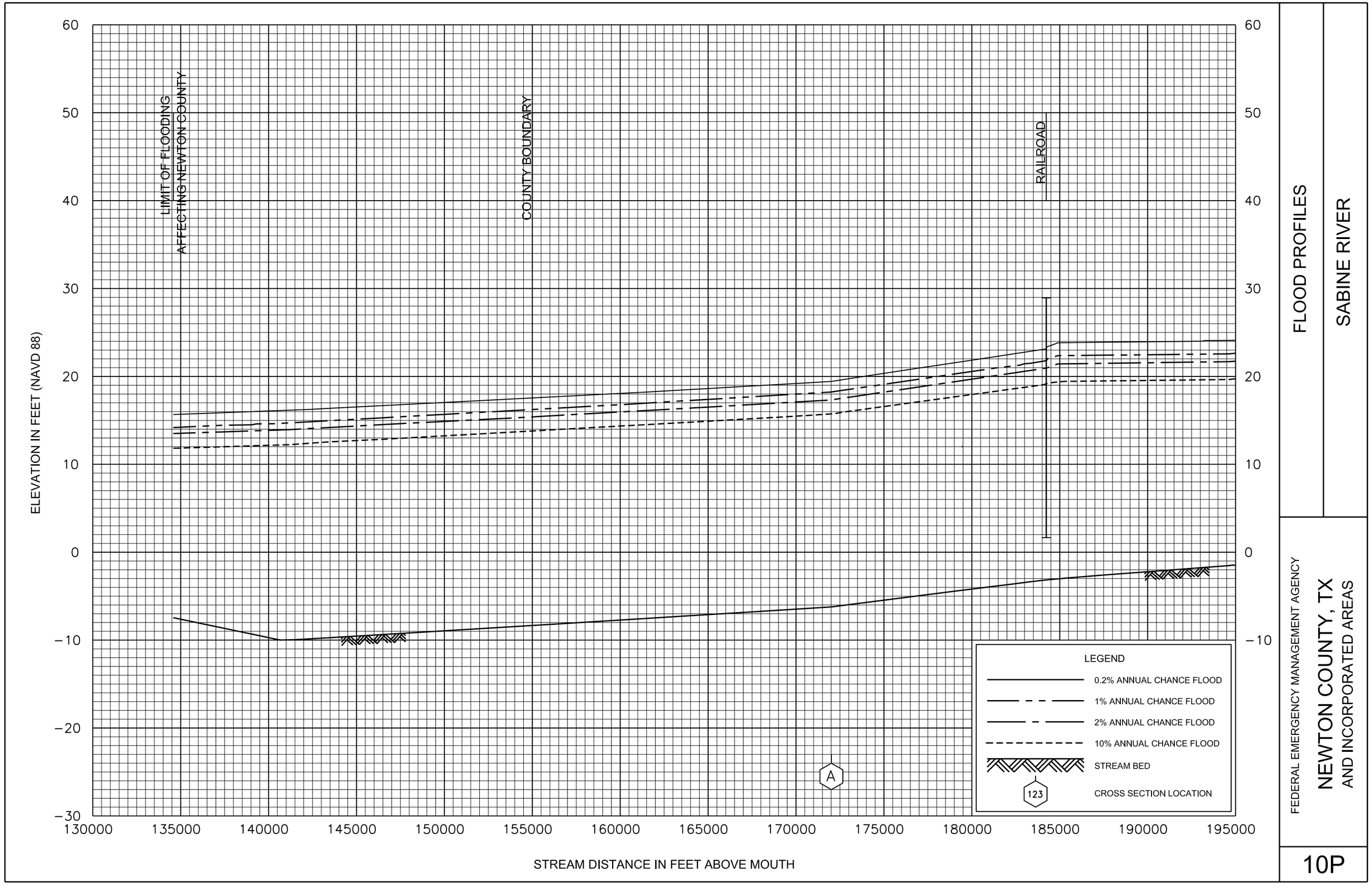
CANEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX

AND INCORPORATED AREAS

09P



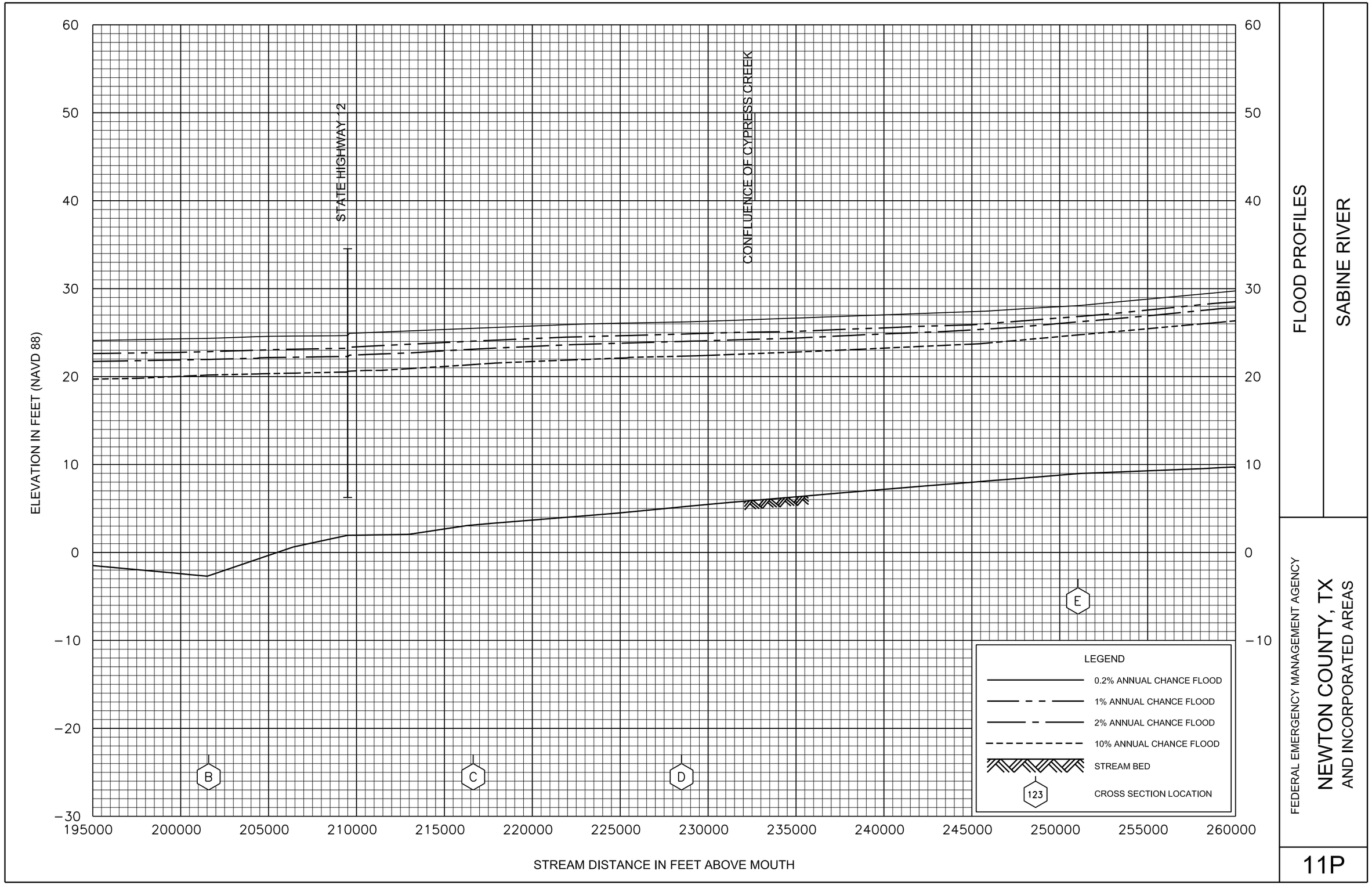
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

10P



FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

11P

ELEVATION IN FEET (NAVD 88)

70
60
50
40
30
20
10
0
−10
−20

260000 265000 270000 275000 280000 285000 290000 295000 300000 305000 310000 315000 320000 325000

STREAM DISTANCE IN FEET ABOVE MOUTH

F

G

LEGEND

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

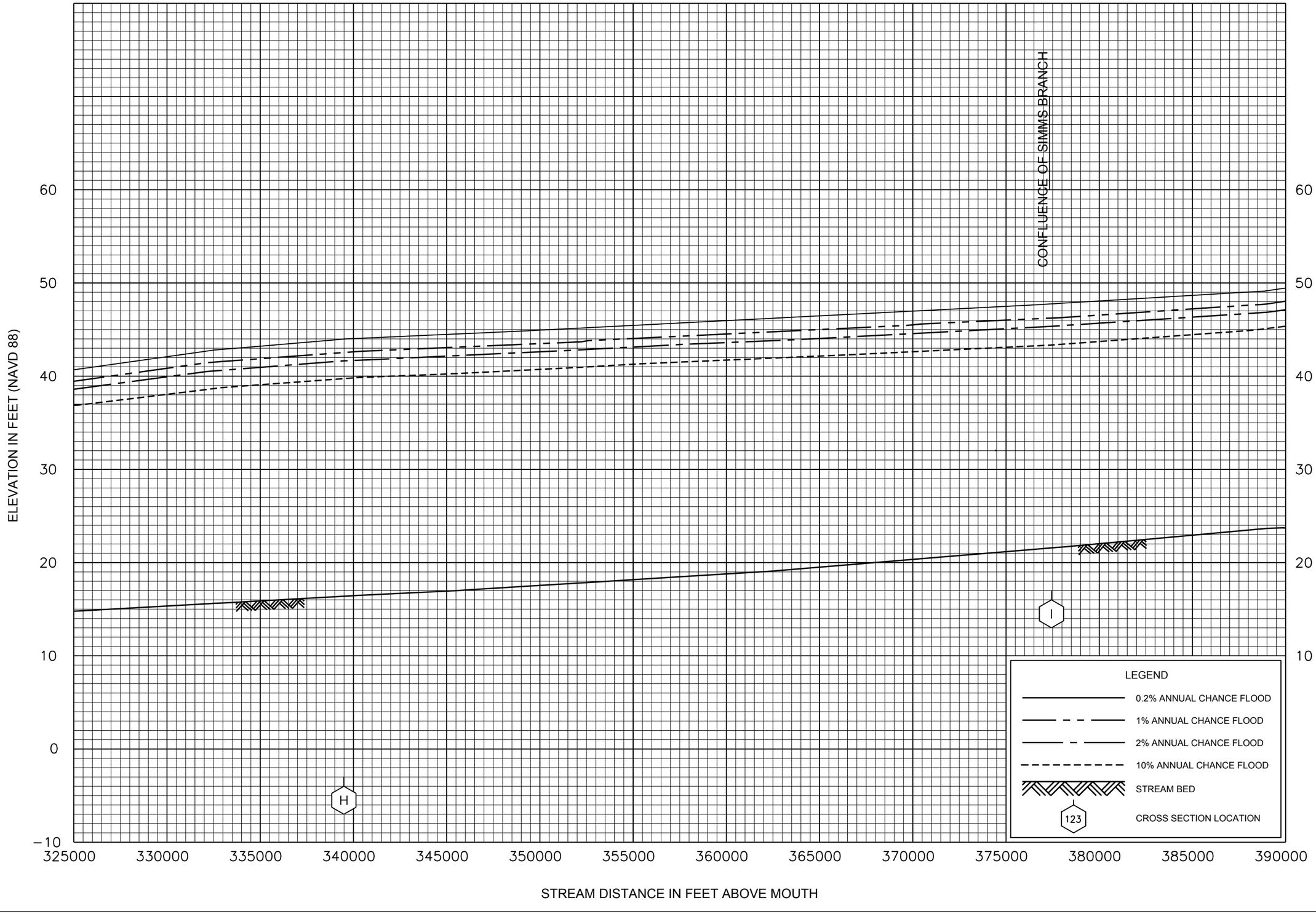
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

12P



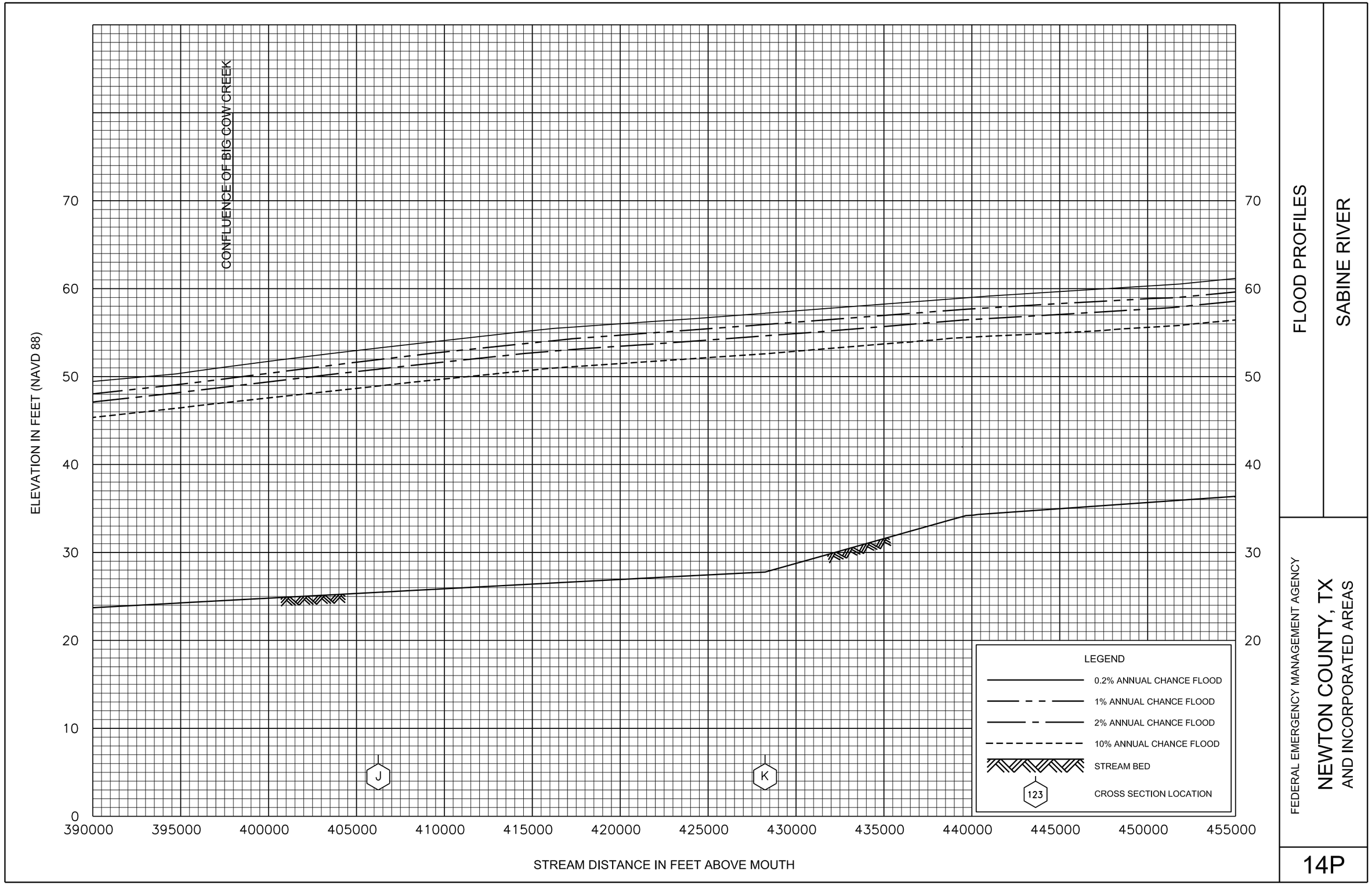
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

13P



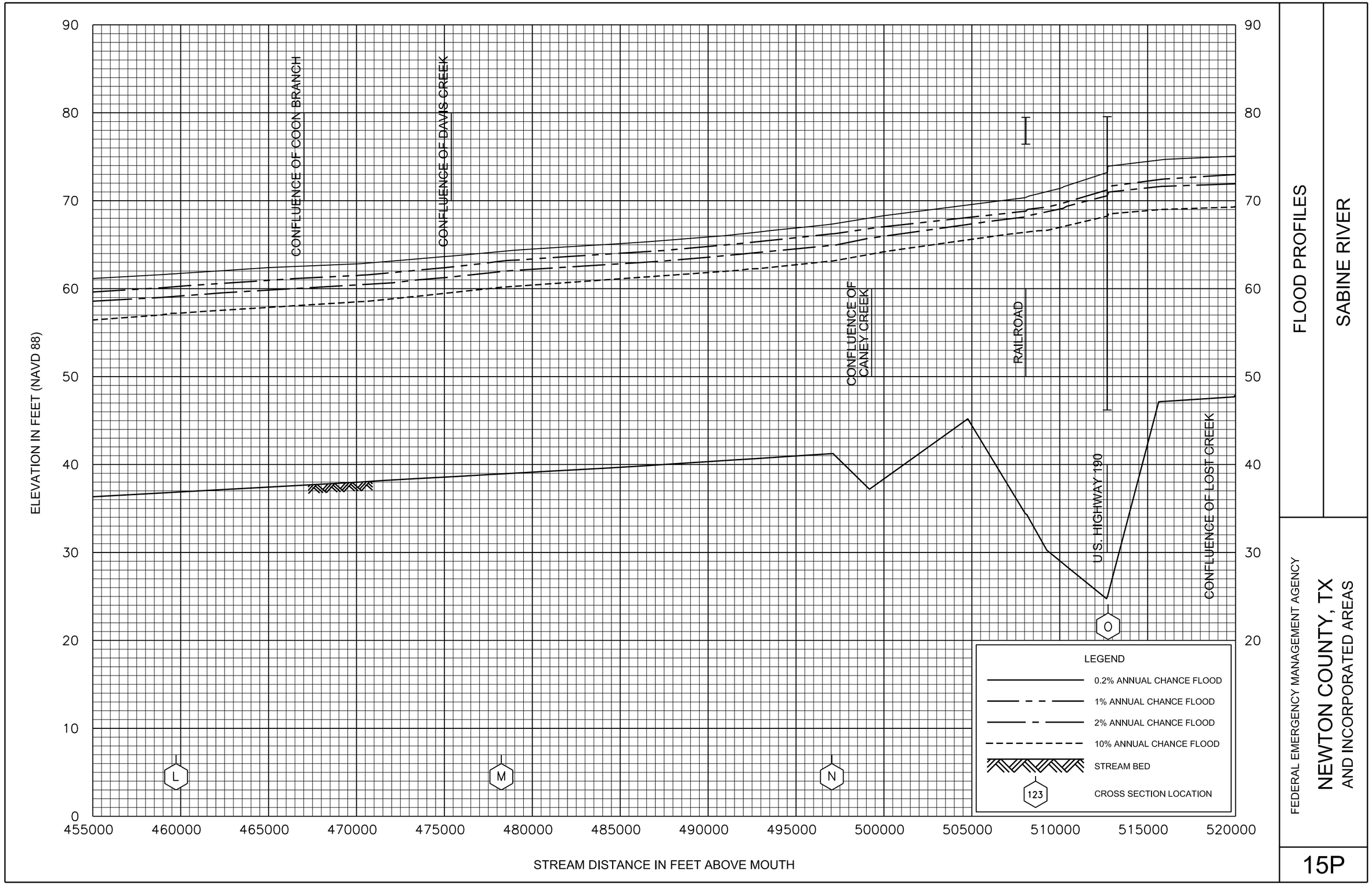
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

14P



FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

15P

ELEVATION IN FEET (NAVD 88)

90
80
70
60
50
40
30
20

520000 525000 530000 535000 540000 545000 550000 555000 560000 565000 570000 575000 580000 585000

STREAM DISTANCE IN FEET ABOVE MOUTH

P
Q
R

LEGEND

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

FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

16P

ELEVATION IN FEET (NAVD 88)

110
100
90
80
70
60
50
40
30
20

585000 590000 595000 600000 605000 610000 615000 620000 625000 630000 635000 640000 645000 650000

STREAM DISTANCE IN FEET ABOVE MOUTH

CONFLUENCE OF ROCKY CREEK

CONFLUENCE OF LITTLE COW CREEK

S

T

U

LEGEND

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

FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

17P

ELEVATION IN FEET (NAVD 88)

110
100
90
80
70
60
50
40
30

650000 655000 660000 665000 670000 675000 680000 685000 690000 695000 700000 705000 710000 715000

STREAM DISTANCE IN FEET ABOVE MOUTH

CONFLUENCE OF DETTY CREEK

V

W

LEGEND

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

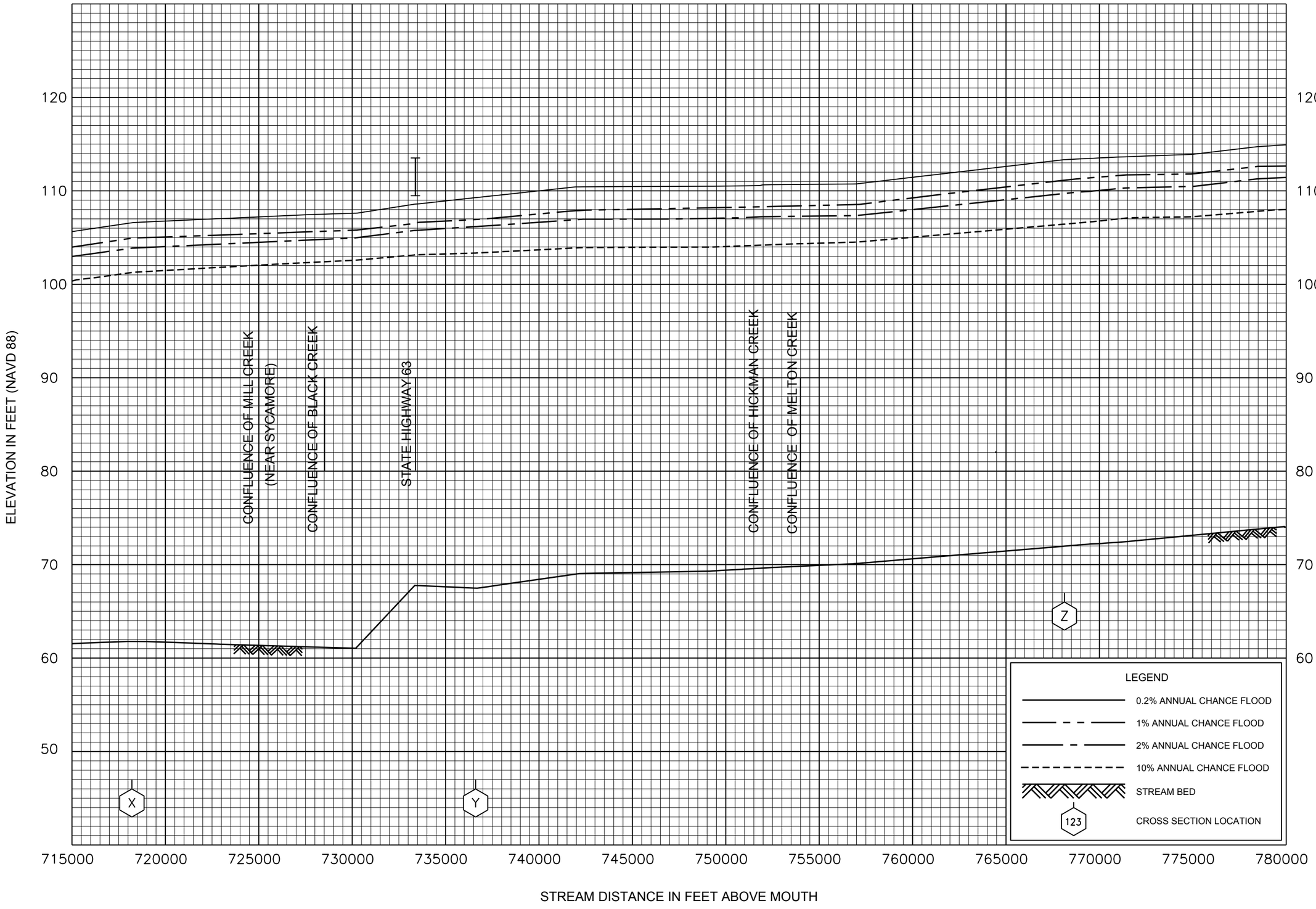
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

18P



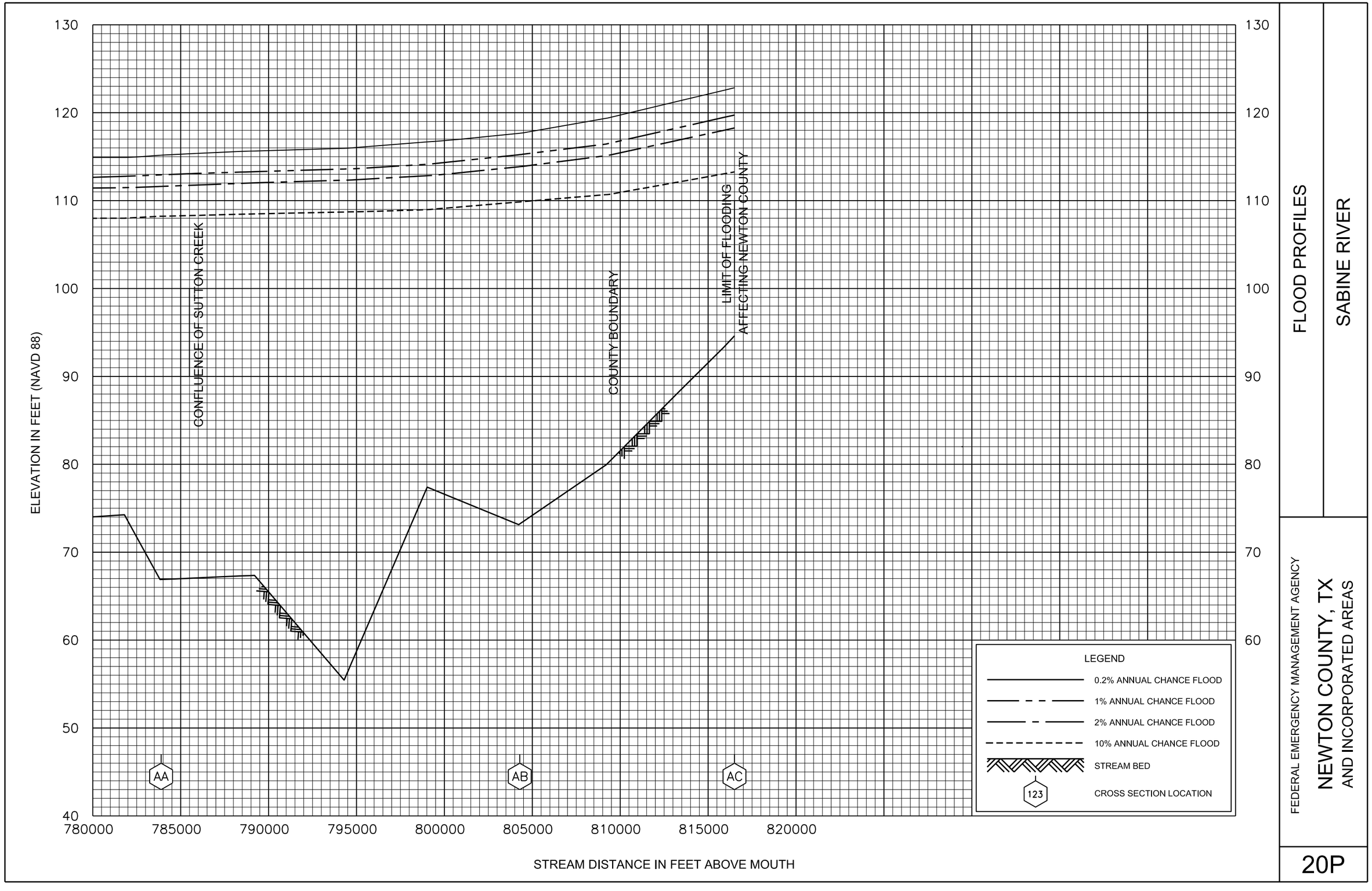
FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS

19P



FLOOD PROFILES

SABINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEWTON COUNTY, TX
AND INCORPORATED AREAS