

**CITY OF BASTROP, TEXAS
ORDINANCE NO. 2024-14**

AMENDING CODE OF ORDINANCES

**AN ORDINANCE OF THE CITY OF BASTROP, TEXAS,
AMENDING THE BASTROP CODE OF ORDINANCES
CHAPTER 3 BUILDING REGULATIONS, ARTICLE 3.17
FLOOD DAMAGE PREVENTION; AND PROVIDING FOR
FINDINGS OF FACT, REPEALER, SEVERABILITY,
CODIFICATION, EFFECTIVE DATE, PROPER NOTICE
AND MEETING.**

WHEREAS, pursuant to Texas Local Government Code Section 51.001, the City Council of the City of Bastrop ("City") has general authority to adopt an ordinance or police regulation that is for the good government, peace, or order of the City and is necessary or proper for carrying out a power granted by law to the City; and

WHEREAS, the City Council finds that there is a local need for flood insurance and desires to continue to participate in the National Flood Insurance Program ("NFIP"); and

WHEREAS, a Flood Insurance Study ("FIS") and Flood Insurance Rate Map ("FIRM") have been completed for the City and became effective on May 9, 2023; and

WHEREAS, the City Council intends to recognize and duly evaluate flood hazards in all official actions in the areas having special flood hazards and to take such other official action reasonably necessary to carry out the objectives of the program including enacting and enforcing local floodplain management standards consistent with NFIP minimum criteria; and

WHEREAS, the City Council finds certain amendments to the aforementioned codes are necessary to meet changing conditions and are in the best interest of the City; and

WHEREAS, the City Council finds the attached amendments reasonable and necessary.

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Bastrop, Texas:

1. FINDINGS OF FACT

The foregoing recitals are incorporated into this Ordinance by reference as findings of fact as if expressly set forth herein.

2. AMENDMENT

The Bastrop Code of Ordinances Chapter 3 Building Regulations, Article 3.17 Flood Damage Prevention is hereby amended, and after such amendment, shall read in accordance with *Attachment "A"*, which is attached hereto and incorporated into this Ordinance for all intents and purposes. The City Council hereby adopts and references the related Federal Emergency Management Agency ("FEMA") documents including, but not limited to, the Flood Insurance Rate Maps and Flood Insurance Study which is attached hereto as *Attachment "B"* and incorporated into this Ordinance for all intents and purposes.

3. REPEALER

To the extent reasonably possible, ordinances are to be read together in harmony. However, all ordinances, or parts thereof, that are in conflict or inconsistent with any provision of this Ordinance are hereby repealed to the extent of such conflict, and the provisions of this Ordinance shall be and remain controlling as to the matters regulated, herein.

4. SEVERABILITY

Should any of the clauses, sentences, paragraphs, sections, or parts of this Ordinance be deemed invalid, unconstitutional, or unenforceable by a court of law or administrative agency with jurisdiction over the matter, such action shall not be construed to affect any other valid portion of this Ordinance.

5. CODIFICATION

The City Secretary is hereby directed to record and publish the attached rules, regulations, and policies in the City's Code of Ordinances as authorized by Section 52.001 of the Texas Local Government Code.

6. EFFECTIVE DATE

This Ordinance shall take effect upon the date of final passage noted below, or when all applicable publication requirements, if any, are satisfied in accordance with the City's Charter, Code of Ordinances, and the laws of the State of Texas.

7. PROPER NOTICE AND MEETING

It is hereby officially found and determined that the meeting at which this Ordinance was passed was open to the public, and that public notice of the time, place, and purpose of said meeting was given as required by the Open Meetings Act, Texas Government Code, Chapter 551. Notice was also provided as required by Chapter 52 of the Texas Local Government Code.

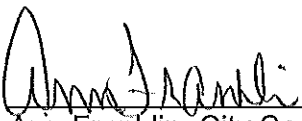
READ & ACKNOWLEDGED on First Reading on this, the 28th day of May 2024.

READ & APPROVED on the Second Reading on this, the 11th day of June 2024.

APPROVED:

by: 
Lyle Nelson, Mayor

ATTEST:


Ann Franklin, City Secretary

APPROVED AS TO FORM:


Alan Bojorquez, City Attorney

ATTACHMENT A

ARTICLE 3.17 FLOOD DAMAGE PREVENTION

Sec. 3.17.001 Statutory authorization.

The legislature of the state has in Civil Statutes delegated the responsibility to local governmental units to adopt regulations designed to minimize flood losses. Therefore, the City Council, of the City of Bastrop, Bastrop, Texas, does ordain as follows.

Sec. 3.17.002 Findings of fact.

- (a) The flood hazard areas of the city are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect the public health, safety and general welfare.
- (b) These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, floodproofed, or otherwise protected from flood damage.

Sec. 3.17.003 Statement of purpose.

It is the purpose of this article to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- (1) Protect human life and health;
- (2) Minimize expenditure of public money for costly flood control projects;
- (3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (4) Minimize prolonged business interruptions;
- (5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains;
- (6) Help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize future flood blight areas; and
- (7) Ensure that potential buyers are notified that property is in a flood area.

Sec. 3.17.004 Methods of reducing flood losses.

In order to accomplish its purposes, this article uses the following methods:

- (1) ~~Restrict or prohibit uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities;~~
- (2) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

-
- (3) Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
 - (4) Control filling, grading, dredging and other development which may increase flood damage;
 - (5) Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

Sec. 3.17.005 Definitions.

Unless specifically defined below, words or phrases used in this article shall be interpreted to give them the meaning they have in common usage and to give this article its most reasonable application.

Alluvial fan flooding. Flooding occurring on the surface of an alluvial fan or similar landform which originates at the apex and is characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flow paths.

Apex. A point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.

Appurtenant structure. A structure which is on the same parcel of property as the principal structure to be insured and the use of which is incidental to the use of the principal structure.

Area of future conditions flood hazard. The land area that would be inundated by the 1-percent-annual chance (100-year) flood based on future conditions hydrology.

Area of shallow flooding. A designated AO, AH, AR/AO, AR/AH or VO zone on a community's Flood Insurance Rate Map (FIRM) with a one-percent (1%) chance or greater annual chance of flooding to an average depth of one (1) to three (3) feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of special flood hazard. The land in the floodplain within a community subject to a one-percent (1%) or greater chance of flooding in any given year. The area may be designated as zone A on the Flood Hazard Boundary Map (FHBM). After detailed rate-making has been completed in preparation for publication of the FIRM, zone A usually is refined into Zones A, AE, AH, AO, A1-30, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE or V.

Base flood. The flood having a 1-percent chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE). The elevation shown on the Flood Insurance Rate Map (FIRM) and found in the accompanying Flood Insurance Study (FIS) for Zones A, AE, AH, A1-A30, AR, V1-V30, or VE that indicates the water surface elevation resulting from the flood that has a one percent (1%) chance of equaling or exceeding that level in any given year - also called the Base Flood.

Basement. Any area of the building having its floor subgrade (below ground level) on all sides.

Breakaway wall. A wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

Critical feature. An integral and readily identifiable part of a flood protection system, without which the flood protection provided by the entire system would be compromised.

Development. Any manmade change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations or storage of equipment or materials.

Elevated building. For insurance purposes, a non-basement building which has its lowest elevated floor, raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

Existing construction. For the purposes of determining rates, structures for which the "start of construction" commenced before the effective date of the FIRM or before January 1, 1975, for FIRMs effective before that date. "Existing construction" may also be referred to as "existing structures."

Existing manufactured home park or subdivision. A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.

Expansion to an existing manufactured home park or subdivision. The preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

Flood or Flooding. A general and temporary condition of partial or complete inundation of normally dry land areas from:

- (1) The overflow of inland or tidal waters;
- (2) The unusual and rapid accumulation of runoff or surface waters from any source.

Flood Elevation Study. An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

Flood Insurance Rate Map (FIRM). An official map of a community, on which the Federal Emergency Management Agency has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study (FIS). See Flood Elevation Study.

Floodplain or Flood-Prone Area. Any land area susceptible to being inundated by water from any source (see definition of Flooding).

Floodplain Management. The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood control works and floodplain management regulations.

Floodplain Management Regulations. Zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Flood Protection System. Those physical structural works for which funds have been authorized, appropriated, and expended and which have been constructed specifically to modify flooding in order to reduce the extent of the area within a community subject to a "special flood hazard" and the extent of the depths of associated flooding. Such a system typically includes hurricane tidal barriers, dams, reservoirs, levees or dikes. These specialized flood-modifying works are those constructed in conformance with sound engineering standards.

Flood Proofing. Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway. See Regulatory Floodway.

Functionally dependent use. A use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

Highest adjacent grade. The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure. Any structure that is:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of the Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary of the Interior to qualify as a registered historic district;
- (3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or
- (4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
 - (A) By an approved state program as determined by the Secretary of the Interior; or
 - (B) Directly by the Secretary of the Interior in states without approved programs.

Levee. A manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

Levee system. A flood protection system which consists of a levee or levees and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

Lowest floor. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking or vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirement of Section 60.3 of the National Flood Insurance Program regulations.

Manufactured home. A structure transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

Manufactured home park or subdivision. A parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

Market value. Market value is the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of value, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property. Market Value may be determined by a certified appraisal of the property or in accordance with the value determined by the appraisal district, amongst other things.

Mean sea level. For purposes of the National Flood Insurance Program, the North American Vertical Datum (NAVD) of 1988 or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.

New construction. For the purpose of determining insurance rates, structures for which the "start of construction" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes "new construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

New manufactured home park or subdivision. A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of the floodplain management regulations adopted by a community.

Recreational vehicle. A vehicle which is:

- (1) Built on a single chassis;
- (2) Four hundred (400) square feet or less when measured at the largest horizontal projections;
- (3) Designed to be self-propelled or permanently towable by a light duty truck; and
- (4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Regulatory floodway. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Riverine. Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Special Flood Hazard Area. See area of Special Flood Hazard.

Start of construction. (For other than new construction or substantial improvements under the Coastal Barrier Resources Act [Pub. L. 97-348]), includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Structure. For floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

Substantial damage. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred.

Substantial improvement. Any reconstruction, rehabilitation, addition or other improvement of a structure, the total cost of which equals or exceeds fifty (50) percent of the market value of the structure/building either before the improvement or repair is started, or, if the structure has been damaged and is being restored, before the damage occurred, whichever is greater. The owner of a structure in a Floodplain area shall not make any improvements to the structure without first obtaining approval from the City. For purposes of calculating the fifty (50) percent market value threshold, the City may consider the cumulative value of all improvements made by the current and present owner for the previous four years from the date of the application for the first permit for an initial improvement on the property. Notwithstanding any other provision in this Ordinance, if the current and present property owner must make a substantial improvement or the cumulative value of all improvements made by the current and present owner for the previous four years equals or exceeds fifty (50) percent, then the property shall fully comply with the provisions of this Floodplain Ordinance. Any reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds fifty (50) percent of the market value of the structure before "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either:

(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or

(2) Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

Variance. A grant of relief by a community from the terms of a floodplain management regulation. (For full requirements see Section 60.6 of the National Flood Insurance Program regulations.)

Violation. The failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Sections 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) of the National Flood Insurance Program regulations is presumed to be in violation until such time as that documentation is provided.

Water Surface Elevation. The height, in relation to the North American Vertical Datum (NAVD) of 1988 (or other datum, where specified), of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

Sec. 3.17.006 General provisions.

- (a) **Lands to which these provisions apply.** These provisions shall apply to all areas of special flood hazard within the jurisdiction of the city.
- (b) **Basis for establishing the areas of special flood hazard.** The areas of special flood hazard identified by the Federal Emergency Management Agency in the current scientific and engineering report entitled, "The Flood Insurance Study (FIS) for Bastrop County, Texas and incorporated areas", dated May 9, 2023, with the accompanying Flood Insurance Rate Maps (FIRMs) and Flood Boundary-Floodway Maps (FBFMs) dated May 9, 2023 and any revisions thereto are hereby adopted by reference and declared to be a part of this article.
- (c) **Establishment of development permit.** A floodplain development permit shall be required to ensure conformance with the provisions of this article.
- (d) **Compliance.** No structure or land shall hereafter be located, altered, or have its use changed without full compliance with the terms of this article and other applicable regulations.
- (e) **Abrogation and greater restrictions.** This article is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this article and another ordinance, easement,

covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

(f) *Interpretation.* In the interpretation and application of this article, all provisions shall be:

- (1) Considered as minimum requirements;
- (2) Liberally construed in favor of the governing body; and
- (3) Deemed neither to limit nor repeal any other powers granted under state statutes.

(g) *Warning and disclaimer of liability.* The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. On rare occasions greater floods can and will occur and flood heights may be increased by manmade or natural causes. This article does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This article shall not create liability on the part of the community or any official or employee thereof for any flood damages that result from reliance on these provisions or any administrative decision lawfully made thereunder.

Sec. 3.17.007 Administration.

(a) *Designation of the Floodplain Administrator.* The City Manager, or their designee, is hereby appointed the Floodplain Administrator to administer and implement the provisions of this article and other appropriate Sections of 44 CFR (Emergency Management and Assistance National Flood Insurance Program regulations) pertaining to floodplain management.

(b) *Duties and responsibilities of floodplain administrator.* Duties and responsibilities of the Floodplain Administrator shall include, but not be limited to, the following:

- (1) Maintain and hold open for public inspection all records pertaining to the provisions of this article.
- (2) Review permit application to determine whether to ensure that the proposed building site project, including the placement of manufactured homes, will be reasonably safe from flooding.
- (3) Review, approve or deny all applications for development permits required by adoption of this article.
- (4) Review permits for proposed development to assure that all necessary permits have been obtained from those Federal, State or local governmental agencies (including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334) from which prior approval is required.
- (5) Where interpretation is needed as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) the Floodplain Administrator shall make the necessary interpretation.
- (6) Notify, in riverine situations, adjacent communities and the state coordinating agency which is the Texas Water Development Board (TWDB) and also the Texas Commission on Environmental Quality (TCEQ), prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.
- (7) Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained.
- (8) When base flood elevation data has not been provided in accordance with Section 3.17.006(b), the Floodplain Administrator shall obtain, review, and reasonably utilize any base flood elevation data and floodway data available from a Federal, State, or other source, in order to administer the provisions of Section 3.17.008.

-
- (9) When a regulatory floodway has not been designated, the Floodplain Administrator must require that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.
- (10) Under the provisions of 44 CFR chapter 1, Section 65.12, of the National Flood Insurance Program regulations, a community may approve certain development in Zones A1-30, AE, AH, on the community's FIRM which increases the water surface elevation of the base flood by more than one foot, provided that the community first completes all of the provisions required by Section 65.12.
- (c) *Permit procedures.*
- (1) Application for a Floodplain Development Permit shall be presented to the Floodplain Administrator on forms furnished by him/her and may include, but not be limited to, plans in duplicate drawn to scale showing the locations, dimensions, and elevation of proposed landscape alterations, existing and proposed structures, including the placement of manufactured homes, and the location of the foregoing in relation to areas of special flood hazard. Additionally, the following information is required:
- (A) Elevation (in relation to mean sea level), of the lowest floor (including basement) of all new and substantially improved structures;
 - (B) Elevation in relation to mean sea level to which any nonresidential structure shall be floodproofed;
 - (C) A certificate from a registered professional engineer or architect that the nonresidential floodproofed structure shall meet the floodproofing criteria of Section 3.17.008(b)(2);
 - (D) Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development; and
 - (E) Maintain a record of all such information in accordance with subsection (b)(1).
- (2) Approval or denial of a Floodplain Development Permit by the Floodplain Administrator shall be based on all of the provisions of this article and the following relevant factors:
- (A) The danger to life and property due to flooding or erosion damage;
 - (B) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
 - (C) The danger that materials may be swept onto other lands to the injury of others;
 - (D) The compatibility of the proposed use with existing and anticipated development;
 - (E) The safety of access to the property in times of flood for ordinary and emergency vehicles;
 - (F) The costs of providing governmental services during and after flood conditions including maintenance and repair of streets and bridges, and public utilities and facilities such as sewer, gas, electrical, and water systems;
 - (G) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;
 - (H) The necessity to the facility of a waterfront location, where applicable;
 - (I) The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use;

(d) *Variance procedures.*

- (1) The Appeal Board, of the City Council, shall hear and render judgment on requests for variances from the requirements of this article.
- (2) The Appeal Board shall hear and render judgment on an appeal only when it is alleged there is an error in any requirement, decision, or determination made by the Floodplain Administrator in the enforcement or administration of this article.
- (3) Any person or persons aggrieved by the decision of the appeal board may appeal such decision in the courts of competent jurisdiction.
- (4) The Floodplain Administrator shall maintain a record of all actions involving an appeal and shall report variances to the Federal Emergency Management Agency upon request.
- (5) Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic places or the State Inventory of Historic Places, without regard to the procedures set forth in the remainder of this article.
- (6) Variances may be issued for new construction and substantial improvements to be erected on a lot of one-half (½) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing the relevant factors in subsection (c)(2) above, in this article, have been fully considered. As the lot size increases beyond the one-half (½) acre, the technical justification required for issuing the variance increases.
- (7) Upon consideration of the factors noted above and the intent of this article, the Appeal Board may attach such conditions to the granting of variances as it deems necessary to further the purpose and objectives of Section 3.17.003 of this article.
- (8) Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
- (9) Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- (10) Prerequisites for granting variances:
 - (A) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
 - (B) Variances shall only be issued upon:
 - (i) Showing a good and sufficient cause;
 - (ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 - (iii) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
 - (C) Any applicant to which a variance is granted shall be given written notice that the structure will be permitted to be built with the lowest floor elevation below the base flood elevation, and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

-
- (11) Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that:
- (A) The criteria outlined in subsections (1) through (10) are met; and
 - (B) The structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

(Ord. No. 2019-05 , § 1, 4-9-19)

Sec. 3.17.008 Provisions for flood hazard reduction.

- (a) *General standards.* In all areas of special flood hazards the following provisions are required for all new construction and substantial improvements:
- (1) All new construction or substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
 - (2) All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damage;
 - (3) All new construction or substantial improvements shall be constructed with materials resistant to flood damage;
 - (4) All new construction or substantial improvements shall be constructed with electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
 - (5) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
 - (6) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharges from the systems into flood waters; and
 - (7) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
- (b) *Specific standards.* In all areas of special flood hazards where base flood elevation data has been provided as set forth in Section 3.17.007(b)(8), and subsection (c)(3) of this section, the following provisions are required:
- (1) *Residential construction.* New construction and substantial improvement of any residential structure shall have the lowest floor (including basement) elevated to two (2) feet above the base flood elevation. A registered professional engineer, architect or land surveyor shall submit a certification to the Floodplain Administrator that these standards as proposed in Section 3.17.007(c)(1)(A) are satisfied.
 - (2) *Nonresidential construction.* New construction and substantial improvements of any commercial, industrial, or other nonresidential structure shall either have the lowest floor (including basement) elevated to two (2) feet above the base flood level or, together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall develop and/or review structural design, specifications and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice as outlined in this subsection. A record of such

-
- certification which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained by the Floodplain Administrator.
- (3) *Enclosures.* New construction and substantial improvements, with fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:
- (A) A minimum of two (2) openings on separate walls having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
 - (B) The bottom of all openings shall be no higher than one foot above grade.
 - (C) Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
- (4) *Manufactured homes.*
- (A) Require that all manufactured homes to be placed within Zone A on a community's FHB or FIRM shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.
 - (B) Require that all manufactured homes that are placed or substantially improved within Zones A1-30, AH and AE on the city's FIRM on sites:
 - (i) Outside of a manufactured home park or subdivision;
 - (ii) In a new manufactured home park or subdivision;
 - (iii) In an expansion to an existing manufactured home park or subdivision; or
 - (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as a result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to two (2) feet above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.
 - (C) Require that manufactured homes be placed or substantially improved on sites in an existing manufactured home park or subdivision with Zones A1-30, AH and AE on the community's FIRM that are not subject to the provisions of subsection (b)(4) of this section be elevated so that either:
 - (i) The lowest floor of the manufactured home is two (2) feet above the base flood elevation; or
 - (ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
- (5) *Recreational vehicles.* Require that recreational vehicles placed on sites within Zones A1-30, AH, and AE on the community's FIRM either:
- (A) Be on the site for fewer than one hundred eighty (180) consecutive days; or

-
- (B) Be fully licensed and ready for highway use; or
 - (C) Meet the permit requirements of Section 3.17.007(c)(1) of this article, and the elevation and anchoring requirements for "manufactured homes" in subsection (b)(4) of this section.

A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

(c) *Standards for subdivision proposals.*

- (1) All subdivision proposals including the placement of manufactured home parks and subdivisions shall be consistent with Sections 3.17.002, 3.17.003, and 3.17.004 of this article.
- (2) All proposals for the development of subdivisions including the placement of manufactured home parks and subdivisions shall meet Floodplain Development Permit requirements of Sections 3.17.006(c) and 3.17.007(c) and the provisions of this article.
- (3) Base flood elevation data shall be generated for subdivision proposals and other proposed development including the placement of manufactured home parks and subdivisions which is greater than fifty (50) lots or five (5) acres, whichever is lesser, if not otherwise provided pursuant to Section 3.17.006(b) or Section 3.17.007(b)(8) of this article.
- (4) All subdivision proposals including the placement of manufactured home parks and subdivisions shall have adequate drainage provided to reduce exposure to flood hazards.
- (5) All subdivision proposals including the placement of manufactured home parks and subdivisions shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage.

(d) *Standards for areas of shallow flooding (AO/AH zones).* Located within the areas of special flood hazard established in Section 3.17.006(b) of this article are areas designated as shallow flooding. These areas have special flood hazards associated with flood depths of one to three (3) feet where a clearly defined channel does not exist and where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow; therefore, the following provisions apply:

- (1) All new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated to two (2) feet above the base flood elevation or above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two (2) feet if no depth number is specified).
- (2) All new construction and substantial improvements of **non-residential** structures:
 - (A) Have the lowest floor (including basement) elevated to two (2) feet above the base flood elevation or above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two (2) feet if no depth number is specified); or
 - (B) Together with attendant utility and sanitary facilities be designed so that below the base specified flood depth in an AO zone, or below the Base Flood Elevation in an AH zone level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads or effects of buoyancy.
- (3) A registered professional engineer or architect shall submit a certification to the Floodplain Administrator that the standards of this section, as proposed in Section 3.17.007(c)(1)(A) are satisfied.
- (4) Require within Zones AH and AO, adequate drainage paths around structures on slopes, to guide flood waters around and away from proposed structures.

(e) *Floodways.* Floodways located within areas of special flood hazard established in Section 3.17.006(b) are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions shall apply:

- (1) Encroachments are prohibited, including fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.
- (2) If subsection (1) above is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of this section.
- (3) Under the provisions of 44 CFR chapter 1, Section 65.12, of the National Flood Insurance Program regulations, a community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the community **first** completes all of the provisions required by Section 65.12.

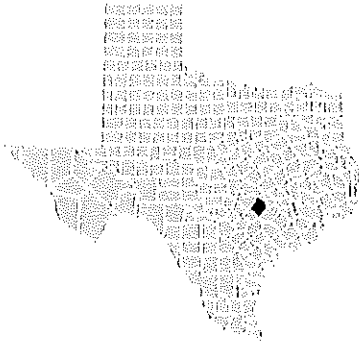
(Ord. No. 2005-45, 12-13-05)

ATTACHMENT B

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1



BASTROP COUNTY, TEXAS

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BASTROP, CITY OF	480022
BASTROP COUNTY, UNINCORPORATED AREAS	481193
ELGIN, CITY OF	480023
SMITHVILLE, CITY OF	480024



FEMA

REVISED:

May 9, 2023

FLOOD INSURANCE STUDY NUMBER

48021CV000C

Version Number 2.6.4.6

TABLE OF CONTENTS

	<u>Page</u>
SECTION 1.0 – INTRODUCTION	1
1.1 The National Flood Insurance Program	1
1.2 Purpose of this Flood Insurance Study Report	2
1.3 Jurisdictions Included in the Flood Insurance Study Project	2
1.4 Considerations for using this Flood Insurance Study Report	3
 SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS	 13
2.1 Floodplain Boundaries	13
2.2 Floodways	17
2.3 Base Flood Elevations	18
2.4 Non-Encroachment Zones	19
2.5 Coastal Flood Hazard Areas	19
2.5.1 Water Elevations and the Effects of Waves	19
2.5.2 Floodplain Boundaries and BFEs for Coastal Areas	19
2.5.3 Coastal High Hazard Areas	19
2.5.4 Limit of Moderate Wave Action	19
 SECTION 3.0 – INSURANCE APPLICATIONS	 19
3.1 National Flood Insurance Program Insurance Zones	19
 SECTION 4.0 – AREA STUDIED	 20
4.1 Basin Description	20
4.2 Principal Flood Problems	20
4.3 Non-Levee Flood Protection Measures	21
4.4 Levees	21
 SECTION 5.0 – ENGINEERING METHODS	 21
5.1 Hydrologic Analyses	22
5.2 Hydraulic Analyses	27
5.3 Coastal Analyses	31
5.3.1 Total Stillwater Elevations	31
5.3.2 Waves	31
5.3.3 Coastal Erosion	32
5.3.4 Wave Hazard Analyses	32
5.4 Alluvial Fan Analyses	32
 SECTION 6.0 – MAPPING METHODS	 32
6.1 Vertical and Horizontal Control	32
6.2 Base Map	33
6.3 Floodplain and Floodway Delineation	34
6.4 Coastal Flood Hazard Mapping	43
6.5 FIRM Revisions	43
6.5.1 Letters of Map Amendment	43

6.5.2	Letters of Map Revision Based on Fill	43
6.5.3	Letters of Map Revision	44
6.5.4	Physical Map Revisions	45
6.5.5	Contracted Restudies	45
6.5.6	Community Map History	45
SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION		47
7.1	Contracted Studies	47
7.2	Community Meetings	48
SECTION 8.0 – ADDITIONAL INFORMATION		50
SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES		51

Figures

	<u>Page</u>
Figure 1: FIRM Index	5
Figure 2: FIRM Notes to Users	6
Figure 3: Map Legend for FIRM	9
Figure 4: Floodway Schematic	18
Figure 5: Wave Runup Transect Schematic	19
Figure 6: Coastal Transect Schematic	19
Figure 7: Frequency Discharge-Drainage Area Curves	26
Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas	31
Figure 9: Transect Location Map	32

Tables

	<u>Page</u>
Table 1: Listing of NFIP Jurisdictions	2
Table 2: Flooding Sources Included in this FIS Report	14
Table 3: Flood Zone Designations by Community	20
Table 4: Basin Characteristics	20
Table 5: Principal Flood Problems	21
Table 6: Historic Flooding Elevations	21
Table 7: Non-Levee Flood Protection Measures	21
Table 8: Levees	21
Table 9: Summary of Discharges	23
Table 10: Summary of Non-Coastal Stillwater Elevations	27
Table 11: Stream Gage Information used to Determine Discharges	27
Table 12: Summary of Hydrologic and Hydraulic Analyses	28
Table 13: Roughness Coefficients	31
Table 14: Summary of Coastal Analyses	31
Table 15: Tide Gage Analysis Specifics	31

Table 16: Coastal Transect Parameters	32
Table 17: Summary of Alluvial Fan Analyses	32
Table 18: Results of Alluvial Fan Analyses	32
Table 19: Countywide Vertical Datum Conversion	33
Table 20: Stream-Based Vertical Datum Conversion	33
Table 21: Base Map Sources	33
Table 22: Summary of Topographic Elevation Data used in Mapping	34
Table 23: Floodway Data	36
Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams	43
Table 25: Summary of Coastal Transect Mapping Considerations	43
Table 26: Incorporated Letters of Map Change	44
Table 27: Community Map History	46
Table 28: Summary of Contracted Studies Included in this FIS Report	47
Table 29: Community Meetings	49
Table 30: Map Repositories	50
Table 31: Additional Information	50
Table 32: Bibliography and References	52

Exhibits

Flood Profiles	<u>Panel</u>	
Cedar Creek	01-08	P
Cedar Creek Tributary 2	09	P
Colorado River	10-25	P
Dry Creek East	26-27	P
Gazley Creek	28-29	P
Gills Branch	30-31	P
Greens Creek	32-34	P
Long Branch	35-40	P
Lytton Springs Creek	41-42	P
Maha Creek	43-47	P
Piney Creek	48-49	P
Piney Creek North	50-51	P
Sandy Creek	52-53	P
Unnamed Tributary to Colorado River	54-55	P
Willow Creek	56-57	P

Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT BASTROP 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, *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 Bastrop County, Texas.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC-8) sub-basins affecting each, are shown in Table 1. The 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
Bastrop, City of	480022	12090301	48021C0215F 48021C0220F 48021C0335F 48021C0355F 48021C0360F	
Bastrop County, Unincorporated Areas	481193	12070102, 12070205, 12090301, 12100202	48021C0025E 48021C0050E 48021C0075E 48021C0100E 48021C0125E 48021C0150E 48021C0175G 48021C0190G 48021C0195F 48021C0200F	

Table 1: Listing of NFIP Jurisdictions (continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Bastrop County, Unincorporated Areas (continued)	481193	12070102, 12070205, 12090301, 12100202	48021C0215F 48021C0220F 48021C0225E 48021C0250E 48021C0275E 48021C0300F 48021C0310F 48021C0325F 48021C0330F 48021C0335F 48021C0350F 48021C0355F 48021C0360F 48021C0375F 48021C0395F 48021C0400E 48021C0425F 48021C0450F 48021C0475F 48021C0500E 48021C0510F 48021C0525E 48021C0550F 48021C0575E 48021C0600E 48021C0625E	
Elgin, City of	480023	12090301	48021C0075E 48021C0100E	
Smithville, City of	480024	12090301	48021C0395F 48021C0425F 48021C0510F 48021C0550F	

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-percent-annual-chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-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 30, "Map Repositories," within this FIS Report.

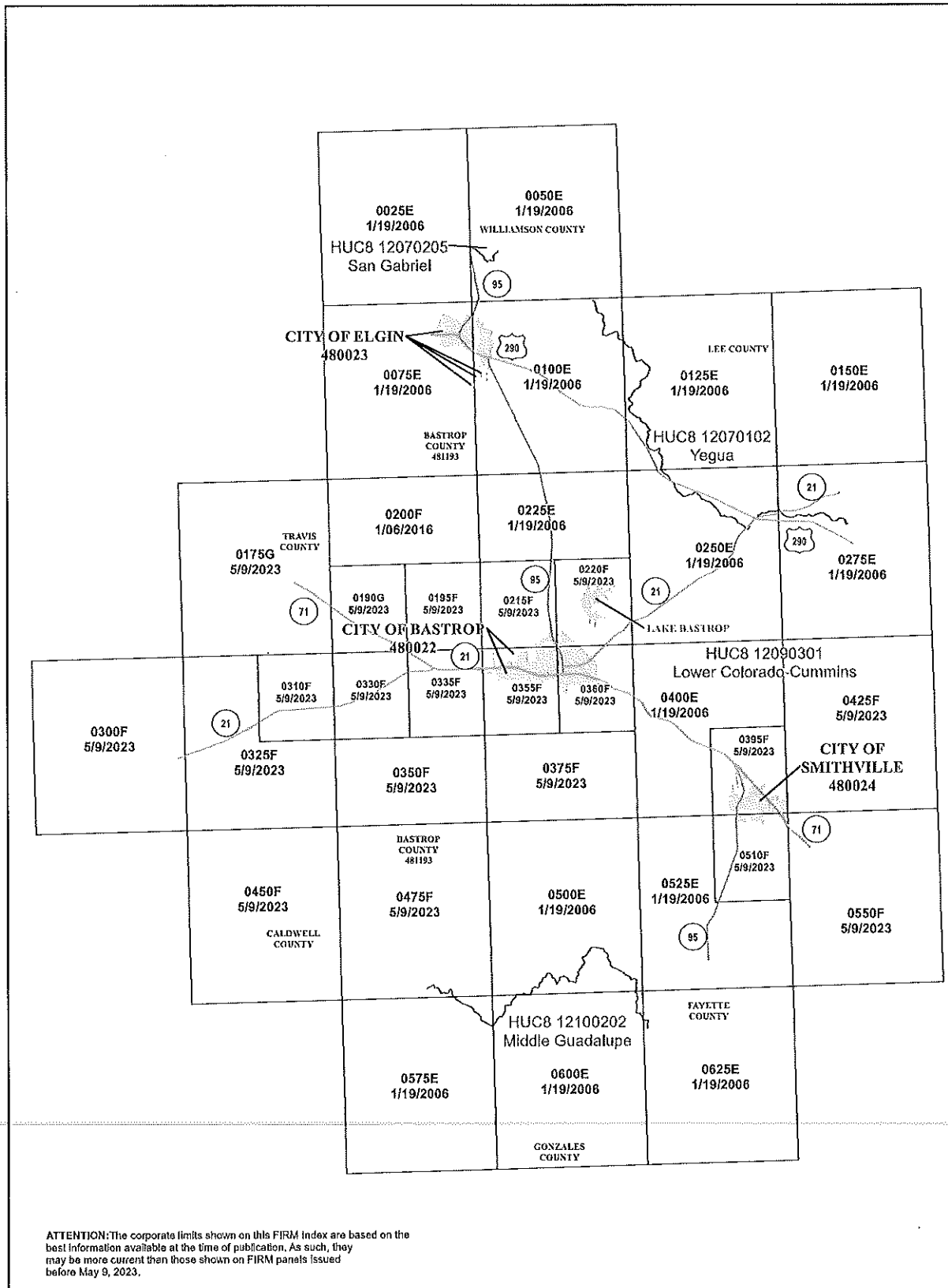
- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for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

The initial Countywide FIS Report for Bastrop County became effective on August 19, 1991. Refer to Table 27 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/flood-maps/tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Bastrop 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, military, and park boundaries; flooding sources; major roads; watershed boundaries; and USGS HUC-8 codes.

Figure 1: FIRM Index

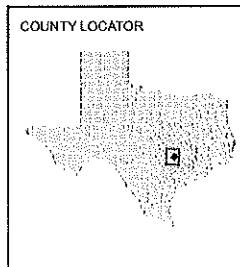


1 inch = 25,000 feet
1:300,000
0 7,000 14,000 28,000 42,000 56,000 feet

Map Projection:
State Plane Lambert Conformal Conic, Texas Central
Zone FIPS 4203; North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION



**NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP INDEX**

BASTROP COUNTY, TEXAS and Incorporated Areas

PANELS PRINTED:

0025, 0050, 0075, 0100, 0125, 0150, 0175, 0190, 0195, 0200, 0215,
0220, 0225, 0250, 0275, 0300, 0310, 0325, 0330, 0335, 0350, 0355,
0360, 0375, 0395, 0400, 0425, 0450, 0475, 0500, 0510, 0525, 0550,
0575, 0600, 0625



FEMA

MAP NUMBER
48021CND00C

MAP REVISED
May 9, 2023

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 Mapping and Insurance 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 Mapping and Insurance 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 27 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.

Figure 2. FIRM Notes to Users

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 State Plane Lambert Conformal Conic, Texas Central Zone FIPS 4203. The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. 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.

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.

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 panels with effective date May 9, 2023 was provided by the Texas Department of Transportation, dated 2016 and 2020; the Texas Parks and Wildlife Department, dated 2016; and the U.S. Geological Survey, dated 2020. Base map information shown on the FIRM panels with effective dates January 19, 2006 and January 6, 2016 was provided in digital format by Texas Department of Transportation. This information was digitized from USGS 7.5 minute quadrangle maps at a scale of 1:15840. For information about base maps, refer to Section 6.2 "Base Map" in this FIS Report.

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 Bastrop 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 27 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.

ATTENTION: The corporate limits shown are based on the best information available at the time of publication of this FIRM Index. As such, they may be more current than those shown on the FIRM panels issued before May 9, 2023.

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 Bastrop County.

Figure 3: Map Legend for FIRM



<p>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.</p>	
	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: Map Legend for FIRM

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.
	Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than 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	
 (ortho) (vector)	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	
 Aqueduct Channel Culvert Storm Sewer	Channel, Culvert, Aqueduct, or Storm Sewer
 Dam Jetty Weir	Dam, Jetty, Weir
	Levee, Dike, or Floodwall
 Bridge	Bridge

Figure 3: Map Legend for FIRM


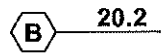

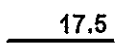
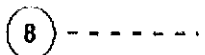



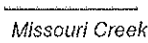









REFERENCE MARKERS	
 22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
 17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (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.
 513	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
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

Figure 3: Map Legend for FIRM

	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
$42^{\circ}76^{000m}E$	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
$80^{\circ}16'52.5''$	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-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 Bastrop 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-percent-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 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1-percent and 0.2-percent-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-percent-annual-chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM. Figure 3, "Map Legend for FIRM", describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Bastrop County, respectively.

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 12. 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-percent-annual-chance floodplain corresponds to the SFHAs. The 0.2-percent-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)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Cedar Creek	Bastrop County, Unincorporated Areas	Confluence with Colorado River	Bastrop / Caldwell County Line	12090301	36.9	Y	AE	2020
Cedar Creek Tributary 2	Bastrop County, Unincorporated Areas	Approximately 690 feet upstream of State Highway 71	Approximately 550 feet upstream of Steven F. Austin Boulevard	12090301	0.3	N	AE	*
Cedar Creek Zone A Tributaries	Bastrop County, Unincorporated Areas	Varies	Varies	12090301	21.8	N	A	2020
Colorado River	Bastrop, City of; Bastrop County, Unincorporated Areas; Smithville, City of	Bastrop / Fayette County Line	Bastrop / Travis County Line	12090301	61.0	Y	AE	2003
Diversion	Bastrop County, Unincorporated Areas; Smithville, City of	Confluence with Gazley Creek	Divergence from Willow Creek	12090301	1.3	N	A, AO	2020
Dry Creek East	Bastrop County, Unincorporated Areas	Confluence with Colorado River	Bastrop / Travis County Line	12090301	4.8	Y	AE	2013
Gazley Creek	Bastrop County, Unincorporated Areas; Smithville, City of	Confluence with Colorado River	Approximately 490 feet upstream of Railroad	12090301	1.6	N	AE	2020
Gills Branch	Bastrop, City of; Bastrop County, Unincorporated Area	Confluence with Colorado River	Approximately 4535 feet upstream of the confluence with Colorado River	12090301	1.0	Y	AE	2013
Gills Branch	Bastrop, City of; Bastrop County, Unincorporated Area	Approximately 4535 feet upstream of confluence with Colorado River	Approximately 200 feet upstream of State Highway 95	12090301	1.0	Y	AE, AO	2020

Table 2: Flooding Sources Included in the FIS Report (continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Greens Creek	Bastrop County, Unincorporated Areas	Confluence with Cedar Creek	Approximately 1,745 feet upstream of Lois Lane	12090301	6.7	N	AE	2020
Long Branch	Bastrop County, Unincorporated Areas	Confluence with Cedar Creek	Approximately 1.4 miles upstream of South Earl Callahan Road	12090301	6.8	N	AE	2020
Lytton Springs Creek	Bastrop County, Unincorporated Areas	Confluence with Cedar Creek	Approximately 1.2 miles upstream of the confluence with Cedar Creek	12090301	1.2	N	AE	2020
Maha Creek	Bastrop County, Unincorporated Areas	Confluence with Cedar Creek	Bastrop / Caldwell County Line	12090301	10.9	N	AE	2020
Piney Creek	Bastrop County, Unincorporated Areas	Approximately 4,000 feet upstream of the confluence of Sandy Creek	Approximately 4.0 miles upstream of the confluence of Sandy Creek	12090301	3.3	N	AE	2004
Piney Creek North	Bastrop, City of; Bastrop County, Unincorporated Areas	Confluence with Colorado River	Approximately 1.0 miles upstream of State Highway 95	12090301	3.3	N	AE, AO	2020
Railroad	Bastrop, City of	Confluence with Gills Branch	Approximately 1,390 feet upstream of Farm Street	12090301	0.7	N	A	2020
Sandy Creek	Bastrop County, Unincorporated Areas	Approximately 1.6 miles upstream of the confluence with Piney Creek	Approximately 4.3 miles upstream of the confluence with Piney Creek	12090301	2.3	N	AE	2004

Table 2: Flooding Sources Included in the FIS Report (continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Unnamed Tributary to Colorado River	Bastrop County, Unincorporated Areas	Confluence with Colorado River	Approximately 1.9 miles upstream of the confluence with Colorado River	12090301	1.9	N	AE	*
Walnut Creek and Zone A Tributaries	Bastrop County, Unincorporated Areas	Varies	Varies	12090301	83.8	N	A	2020
Willow Creek	Bastrop County, Unincorporated Areas; Smithville, City of	Confluence with Colorado River	Approximately 0.7 miles upstream of Bunte Road	12090301	6.9	N	AE	2020
ZONE A	Bastrop, City of; Bastrop County, Unincorporated Areas; Elgin, City of	All within Bastrop County	All within Bastrop County	12070102, 12070205, 12090301, 12100202	*	N	A	2004

*Data not available

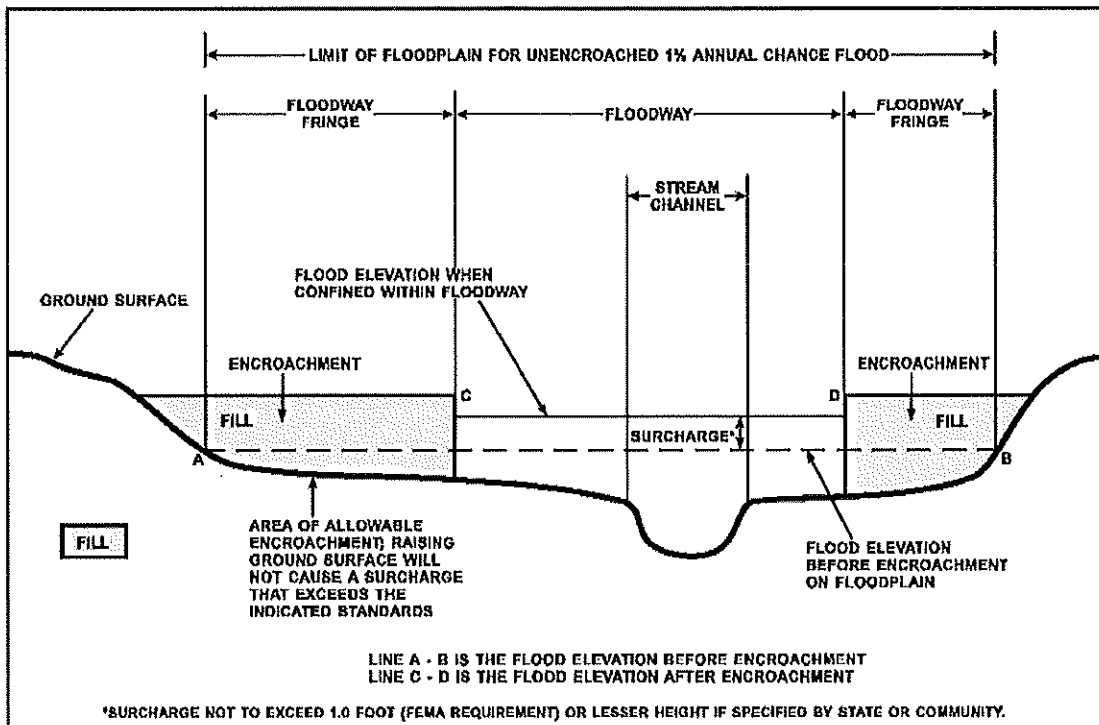
2.2 Floodways

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-percent-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-percent-annual-chance flood. The floodway fringe is the area between the floodway and the 1-percent-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-percent-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 23, "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 1-percent-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 BFE is the elevation of the 1-percent-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.

BFEs are primarily intended for flood insurance rating purposes. 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. 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. For example, the user may use the FIRM to determine the stream station of a location of interest and then use the profile to determine the 1-percent annual chance elevation at that location. Because only selected cross sections may be shown on the FIRM for riverine areas, the profile should be used to obtain the flood elevation between mapped cross sections. Additionally, for riverine areas, whole-foot elevations shown on the FIRM may not exactly reflect the elevations derived from the hydraulic analyses; therefore, elevations obtained from the profile may more accurately reflect the results of the hydraulic analysis.

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, "Map Legend for FIRM." 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-percent-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-percent-annual-chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Bastrop County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Bastrop, City of	A, AE, AO, X
Bastrop County, Unincorporated Areas	A, AE, AO, X
Elgin, City of	A, AE, X
Smithville, City of	A, AE, X

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 4 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 4: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Lower Colorado-Cummins	12090301	Colorado River	Largest watershed within Bastrop County, encompassing the central portion of the county	2,196
Middle Guadalupe	12100202	Guadalupe River	Encompasses the southern corner of the county	2,138
San Gabriel	12070205	San Gabriel River	Located in the southeastern portion of the county	1,367
Yegua	12070102	Yegua Creek	A small portion is located in the northernmost portion of the county	1,321

4.2 Principal Flood Problems

Table 5 contains a description of the principal flood problems that have been noted for Bastrop County by flooding source.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Colorado River	The Colorado River can experience significant increases in stage. Some of the more significant storms on record include those of May 1975, June 1981, and October 1961. These were approximately 10-year, 10-year, and 20-year storms, respectively. These storms have all occurred since the construction of Lake Travis, approximately 80 river miles upstream, in the early 1940's. Lake Travis, Buchanan, and other reservoirs in the Highland Lake System provide a significant amount of flood protection for the Colorado River near the City of Bastrop. Prior to the construction of Lake Travis, extremely large floods were experienced in July 1869, June 1935, and December 1913. These events exceeded the stage of the October 1961 flood of 34.4 feet by 25.9 feet, 22.6 feet, and 18.9 feet, respectively. If events such as these were to occur today, without the upstream control provided by the Highland Lakes as discussed above, widespread flooding and property damage would result.
Gills Branch, Piney Creek North	The City of Bastrop can experience some local flooding due to these streams. However, due to the lack of gage records, no frequency information is available.

Table 6 contains information about historic flood elevations in the communities within Bastrop County.

Table 6: Historic Flooding Elevations

[Not Applicable to this Flood Risk Project]

4.3 Non-Levee Flood Protection Measures

Table 7 contains information about non-levee flood protection measures within Bastrop County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Table 7: Non-Levee Flood Protection Measures

[Not Applicable to this Flood Risk Project]

4.4 Levees

This section is not applicable to this Flood Risk Project.

Table 8: 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-percent-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.

In addition to these flood events, the "1-percent-plus", or "1%+", annual chance flood elevation has been modeled and included on the flood profile for certain flooding sources in this FIS Report. While not used for regulatory or insurance purposes, this flood event has been calculated to help illustrate the variability range that exists between the regulatory 1-percent-annual-chance flood elevation and a 1-percent-annual-chance elevation that has taken into account an additional amount of uncertainty in the flood discharges (thus, the 1% "plus"). For flooding sources whose discharges were estimated using regression equations, the 1%+ flood elevations are derived by taking the 1-percent-annual-chance flood discharges and increasing the modeled discharges by a percentage equal to the average predictive error for the regression equation. For flooding sources with gage- or rainfall-runoff-based discharge estimates, the upper 84-percent confidence limit of the discharges is used to compute the 1%+ flood elevations.

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 26, "Incorporated Letters of Map Change", which include Letters of Map Revision (LOMRs). For more information about LOMRs, refer to Section 6.5, "FIRM Revisions."

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 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 9. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected flooding sources. Stream gage information is provided in Table 11.

Table 9: 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	0.2% Annual Chance
Cedar Creek	Confluence with Colorado River	352.3	60,100	94,240	125,480	164,790	268,880
	Confluence with Walnut Creek	280.6	49,510	77,820	103,110	134,21	219,910
	Confluence with Long Branch	136.8	19,420	28,450	36,070	49,720	89,900
	FM 20	130.4	19,330	27,600	35,100	49,420	88,630
	Confluence with Greens Creek	112.6	17,390	24,920	33,720	48,030	83,800
	Confluence with Maha Creek	92.5	14,950	22,290	32,620	45,750	77,310
	FM 812	37.4	11,480	17,490	23,020	29,880	47,660
Cedar Creek Tributary 2	Confluence with Lytton Springs Creek	25.9	11,390	15,960	20,090	25,520	38,570
	Caldwell Road	20.1	9,750	13,120	16,170	20,400	30,160
	State Highway 71	2.12	1,467	*	2,382	2,776	2,797
Colorado River	Bastrop Gage (USGS Gage No. 08159200)	39,980	71,975	*	120,920	142,020	319,352
	At confluence with Colorado River	55.7	11,200	14,100	15,900	19,200	28,900
Dry Creek East	Just downstream of confluence of Moss Branch	54.9	11,200	14,100	15,800	19,000	28,600
	Approximately 700 feet upstream of confluence of Moss Branch	52.7	11,100	13,900	15,700	17,900	27,300
	Just downstream of confluence of Red Gully Creek	52.1	11,100	13,900	15,700	17,500	26,800
	Approximately 0.35 miles upstream of confluence of Red Gully Creek	45.3	10,800	13,500	15,100	16,800	20,700
	Approximately 0.59 miles downstream of Empedrado Lane	44.4	10,800	13,500	15,100	16,800	20,600
	Approximately 0.28 miles downstream of Empedrado Lane	44.1	10,800	13,500	15,100	16,800	20,600
	Approximately 385 feet downstream of Travis/Bastrop County Line	43.8	10,800	13,500	15,100	16,700	20,600

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Dry Creek East (continued)	Approximately 0.57 miles upstream of Tucker Hill Lane	43.0	12,900	17,400	20,500	23,500	20,600
Gazley Creek	Confluence with Colorado River	5.9	6,200	7,800	9,000	10,000	12,500
	Railroad	5.5	6,200	7,800	8,900	9,900	12,500
Gills Branch	Confluence with Colorado River	2.9	3,860	4,850	5,550	6,230	8,040
	State Highway 71 / State Highway 21	1.9	2,930	3,530	3,970	4,420	5,840
	State Loop 150 / Chestnut Street	1.5	1,486	1,698	1,862	2,021	2,463
	State Highway 95	1.0	1,960	2,400	2,720	3,040	3,950
Greens Creek	Confluence with Cedar Creek	4.9	4,150	6,730	8,790	10,700	14,920
	State Highway 21	4.4	4,150	6,600	8,260	9,920	13,700
	Clear Springs Lake	2.9	3,510	5,260	6,370	7,440	9,950
	Confluence with Cedar Creek	5.6	4,960	6,670	7,730	9,220	13,470
Long Branch	Texas Independent Trail / FM 20	4.6	4,470	5,890	6,930	8,400	11,990
	Earl Callahan Road	1.2	1,890	2,370	2,770	3,170	4,280
	Confluence with Cedar Creek	4.7	3,730	4,700	5,500	6,650	10,060
Maha Creek	Confluence with Cedar Creek	39.8	6,450	9,280	11,820	14,960	24,420
	State Highway 21	39.7	6,450	9,280	11,820	14,960	24,420
	Thousand Oaks Drive	38.1	6,370	9,140	11,730	14,860	24,360
	At Bastrop / Travis County Line	24.8	5,400	8,610	11,470	14,790	23,410
Piney Creek	Confluence of Sandy Creek	17.7	8,499	*	12,821	16,360	19,599
	Approximately 4.0 miles upstream of the confluence of Sandy Creek	3.0	8,078	*	12,078	15,388	18,297
Piney Creek North	Confluence with Colorado River	38.1	18,430	25,640	31,970	38,250	51,330
	State Highway 95	33.9	17,670	24,560	31,070	37,170	52,220
	At the confluence with Piney Creek	39.9	20,650	*	30,916	39,539	46,887
Sandy Creek	Approximately 4.0 miles upstream of the confluence with Piney Creek	31.7	15,091	*	22,906	29,365	35,207

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Unnamed Tributary to Colorado River	At confluence with Colorado River	0.94	315	*	795	1,180	1,675
	Approximately 500 feet upstream of FM 969	0.84	355	*	750	1,085	1,675
	Approximately 1.4 miles upstream of FM 969	0.42	250	*	450	610	840
Willow Creek	Loop Road	6.2	1,950	2,500	3,400	4,600	7,900
	State Highway 71	4.9	1,350	2,300	3,100	4,000	6,600

*Not calculated for this Flood Risk Project

Figure 7: Frequency Discharge-Drainage Area Curves

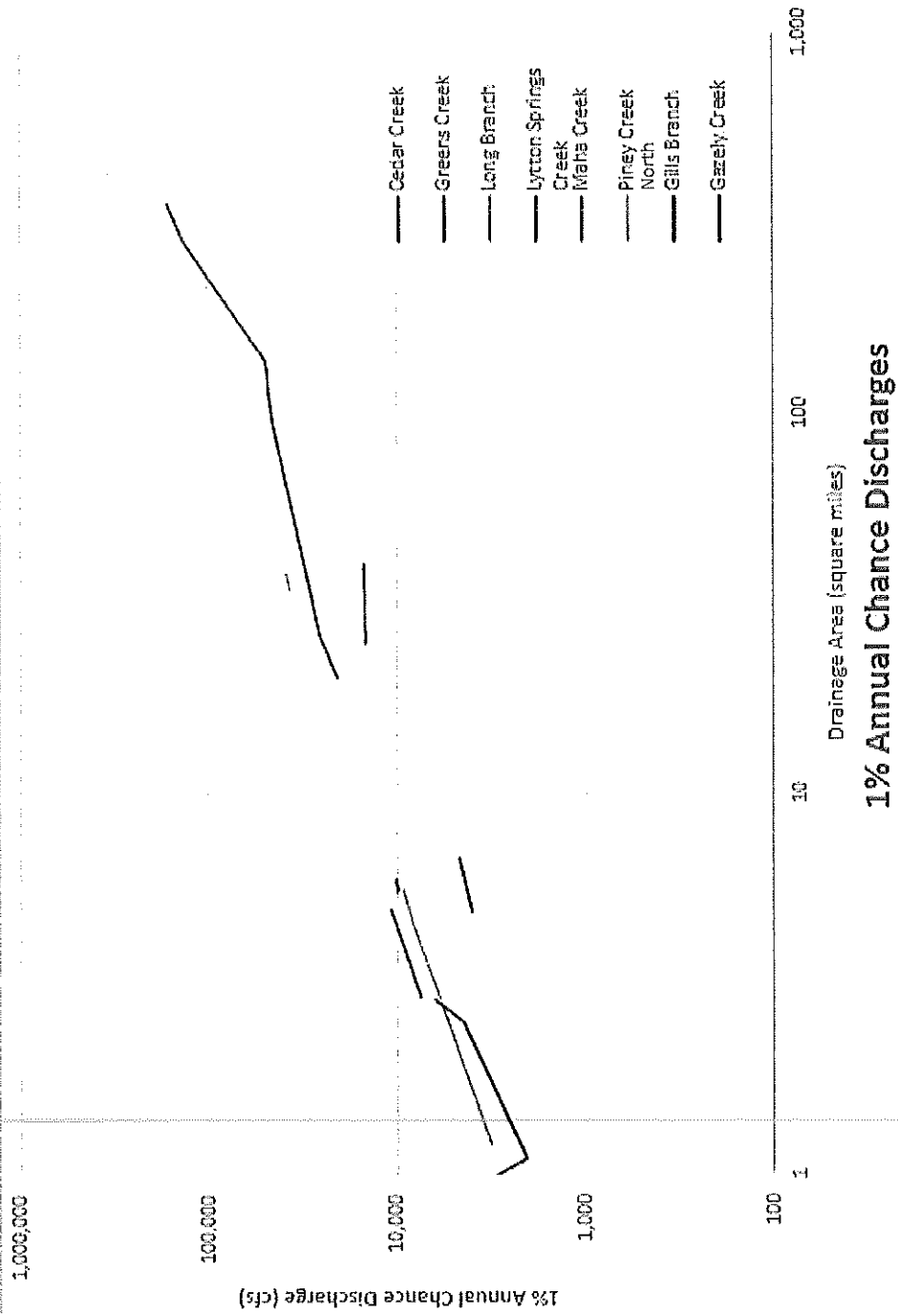


Table 10: Summary of Non-Coastal Stillwater Elevations

[Not Applicable to this Flood Risk Project]

Table 11: 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
Cedar Creek	5521	LCRA	Cedar Creek Below Bastrop	130	06/30/2000	04/10/2018

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 in Table 23, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 12. Roughness coefficients are provided in Table 13. 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 12: 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
Cedar Creek	Confluence with Colorado River	Bastrop / Caldwell County Line	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE w/ Floodway	Lateral structure used to represent overflow from Cedar Creek which will continue to Colorado River
Cedar Creek Tributary 2	Approximately 690 feet upstream of State Highway 71	Approximately 550 feet upstream of Steven F. Austin Boulevard	HEC-HMS 4.0	HEC-RAS 4.1.0	*	AE	Studied as part of LOMR 16-06-1114P
Cedar Creek Zone A Tributaries	Varies	Varies	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	A	
Colorado River	Bastrop / Fayette County Line	Bastrop / Travis County Line	HEC-HMS 2.0	HEC-RAS 3.1	04/2003	AE w/ Floodway	The peak discharges were developed by a flood frequency analysis of the annual peak floods for the stream flow data recorded over a 70-year period of record. Cross section data was taken from 2-foot contour interval topographic maps of Bastrop County and 1- foot-contour interval topographic maps for the City of Bastrop. The mapping was supplemented with field surveys conducted in the summer of 2001 as a part of the Lower Colorado River Basin-wide study as well as the Texas Department of Transportation roadway and bridge construction plans.
Diversion	Confluence with Gazley Creek	Divergence from Willow Creek	HEC-HMS 3.5	HEC-RAS 4.1.0	03/31/2020	A, AO	Represents the overflow from Willow Creek which is conveyed to Gazley Creek
Dry Creek East	Confluence with Colorado River	Bastrop / Travis County Line	HEC-RAS 3.1.3	Aerially Reduced Peak Discharges	03/31/2020	AE w/ Floodway	Flow data was based on aerially reduced peak discharges. Peak Discharges at key locations along the study streams were place approximately one-half to one-third upstream of the reach between the key flow break locations.
Gazley Creek	Confluence with Colorado River	Approximately 490 feet upstream of Railroad	HEC-HMS 3.5	HEC-RAS 4.1.0	03/31/2020	AE	

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

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
Gills Branch	Confluence with Colorado River	Approximately 4535 feet upstream of the confluence with Colorado River	HEC-HMS 2.0	HEC-RAS 3.1	4/17/2003	AE w/ Floodway	
Gills Branch	Approximately 4535 feet upstream of the confluence with Colorado River	Approximately 200 feet upstream of State Highway 95	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE w/ Floodway, AO	Lateral structure used to represent shallow overflow from Gills Branch to the Railroad tributary.
Greens Creek	Confluence with Cedar Creek	Approximately 1,745 feet upstream of Lois Lane	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE	
Long Branch	Confluence with Cedar Creek	Approximately 1.4 miles upstream of South Earl Callahan Road	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE	
Lytton Springs Creek	Confluence with Cedar Creek	Approximately 1.2 miles upstream of the confluence with Cedar Creek	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE	
Maha Creek	Confluence with Cedar Creek	Bastrop / Caldwell County Line	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE	
Piney Creek	Approximately 4,000 feet upstream of the confluence of Sandy Creek	Approximately 4.0 miles upstream of the confluence of Sandy Creek	Regional Regression Equations	HEC-RAS 3.0	08/03/2004	AE	
Piney Creek North	Confluence with Colorado River	Approximately 1.0 miles upstream of State Highway 95	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	AE, AO	Lateral structure used to represent shallow overflow near Pecan Street, re-entering Piney Creek near Juniper Street.
Railroad	Confluence with Gills Branch	Approximately 1,390 feet upstream of Farm Street	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	A	

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

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
Unnamed Tributary to Colorado River	Confluence with Colorado River	Approximately 1.9 miles upstream of the confluence with Colorado River	HEC-HMS 3.5	HEC-RAS 4.1.0	*	AE	Studied as part of LOMR 14-06-0986P
Walnut Creek and Zone A Tributaries	Varies	Varies	HEC-HMS 4.2	HEC-RAS 5.0.3	03/31/2020	A	
Willow Creek	Confluence with Colorado River	Approximately 0.7 miles upstream of Bunte Road	HEC-HMS 3.5	HEC-RAS 4.1.0	03/31/2020	AE	
Zone A	All within Bastrop County	All within Bastrop County	Regional Regression Equations	HEC-RAS 3.0	08/03/2004	A	

*Data not available

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Cedar Creek	0.030-0.075	0.040-0.100
Cedar Creek Tributary 2	*	*
Cedar Creek Zone A Tributaries	0.030-0.075	0.040-0.100
Colorado River	0.030-0.046	0.040-0.100
Diversion	0.040-0.045	0.030-0.120
Dry Creek East	0.050-0.070	0.040-0.150
Gazley Creek	0.050-0.065	0.030-0.120
Gills Branch	0.015-0.070	0.030-0.120
Greens Creek	0.030-0.075	0.040-0.100
Long Branch	0.030-0.075	0.040-0.100
Lytton Springs Creek	0.030-0.075	0.040-0.100
Maha Creek	0.030-0.075	0.040-0.100
Piney Creek	0.030-0.060	0.070-1.000
Piney Creek North	0.050-0.060	0.060-0.120
Railroad	0.060	0.030-0.120
Sandy Creek	0.030-0.060	0.070-1.000
Unnamed Tributary to Colorado River	*	*
Walnut Creek and Zone A Tributaries	0.050-0.055	0.040-0.100
Willow Creek	0.015-0.065	0.015-0.120
Zone A (2004)	0.030-0.060	0.070-1.000

*Data not available

5.3 Coastal Analyses

This section is not applicable to this Flood Risk Project.

Table 14: 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 15: 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 16: 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 17: Summary of Alluvial Fan Analyses

[Not Applicable to this Flood Risk Project]

Table 18: 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.

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 visit the NGS website at www.ngs.noaa.gov.

A countywide conversion factor from NGVD29 to NAVD88 in Bastrop County is +0.2 feet (FEMA 2006).

Table 19: Countywide Vertical Datum Conversion

[Not Applicable to this Flood Risk Project]

Table 20: Stream-Based Vertical Datum Conversion

[Not Applicable to this Flood Risk Project]

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/flood-maps/guidance-partners/guidelines-standards.

Base map information shown on the FIRM was derived from the sources described in Table 21.

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Base data from the 2006 and 2016 FIS Report and County boundary	Texas Department of Transportation	*	*	County boundary; municipal boundaries; state parks; roads; railroads; and streams, rivers, and lakes derived from NHD. The County boundary is also used for the May 9, 2023 FIS Report.
Political boundaries	Texas Department of Transportation	2020	1:12,000	Municipal boundaries
State Park boundaries	Texas Parks and Wildlife Department	2016	1:12,000	State Park boundaries
Transportation Features	Texas Department of Transportation	2020	1:12,000	Roads
Transportation Features	Texas Department of Transportation	2016	1:12,000	Railroads

Table 21: Base Map Sources (continued)

Data Type	Data Provider	Data Date	Data Scale	Data Description
Surface Water Features	U.S. Geological Survey	2020	1:12,000	Streams, rivers, and lakes derived from NHD

*Data not available

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 22.

In cases where the 1-percent 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.

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 2 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 23, "Floodway Data."

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Bastrop, City of; Bastrop County, Unincorporated Areas; Smithville, City of	All sources studied for the May 9, 2023 FIS Report	Light Detection and Ranging Data (LiDAR)	10 cm RMSEz	1 meter at 95% confidence level	TNRIS 2017
Bastrop, City of; Bastrop County, Unincorporated Areas; Elgin, City of	Piney Creek, Sandy Creek, Zone A	Topographic Maps with 10-foot contour interval	*	*	FEMA 2006

Table 22: Summary of Topographic Elevation Data used in Mapping (continued)

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Bastrop County, Unincorporated Areas	Dry Creek East	Light Detection and Ranging Data (LiDAR)	*	*	Sanborn 2003
Bastrop, City of; Bastrop County, Unincorporated Areas; Smithville, City of	Colorado River	Topographic Maps with 2-foot and 1-foot contour intervals and 30-meter Digital Elevation Model (DEM)	*	*	Half 2002

*Data not available

BFEs shown at cross sections on the FIRM represent the 1-percent-annual-chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report.

Table 23: 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
AD	109,806	2,129	19,011	2.4	414.0	414.0	414.0	0.0
AE	113,415	1,120	14,444	3.2	417.1	417.1	417.3	0.2
AF	117,011	1,400	13,378	3.4	419.9	419.9	420.8	1.0
AG	119,195	1,900	16,605	2.1	421.9	421.9	422.8	0.8
AH	121,663	1,745	11,325	3.0	424.1	424.1	424.6	0.5
AI	125,159	2,053	19,860	1.7	425.6	425.6	426.4	0.8
AJ	127,637	1,568	11,606	2.9	426.4	426.4	427.3	1.0
AK	130,684	1,397	12,073	2.8	429.2	429.2	430.2	1.0
AL	132,848	720	6,649	5.0	431.8	431.8	432.4	0.6
AM	136,654	809	7,869	4.2	437.2	437.2	438.1	0.9
AN	139,763	1,485	16,181	2.0	441.7	441.7	442.5	0.9
AO	143,248	1,551	13,549	2.3	443.4	443.4	444.1	0.8
AP	146,554	1,525	11,389	2.8	445.3	445.3	446.0	0.8
AQ	149,581	1,910	14,537	2.2	447.3	447.3	448.0	0.7
AR	152,008	1,900	11,610	2.7	449.1	449.1	449.8	0.7
AS	154,582	2,364	12,208	2.5	453.3	453.3	453.5	0.1

¹ Feet above confluence with Colorado River

FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA	
BASTROP COUNTY, TEXAS AND INCORPORATED AREAS	FLOODING SOURCE: CEDAR CREEK	

TABLE 23

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	1,085,903	1,679	33,099	4.38	297.7	297.7	398.2	0.5
B	1,087,867	2,098	40,747	3.55	298.5	298.5	299.0	0.5
C	1,091,987	1,304	36,949	3.92	299.4	299.4	300.0	0.6
D	1,097,080	2,600	54,564	2.65	300.4	300.4	301.2	0.8
E	1,101,892	2,500	52,867	2.74	301.1	301.1	301.9	0.8
F	1,106,195	5,900	96,112	1.51	301.6	301.6	302.4	0.9
G	1,110,142	6,300	73,119	1.98	301.9	301.9	302.8	0.9
H	1,115,026	1,600	35,142	4.15	302.9	302.9	303.8	0.8
I	1,117,254	2,500	37,910	3.86	303.8	303.8	304.6	1.0
J	1,118,198	1,175	26,744	5.47	304.1	304.1	305.1	1.0
K	1,118,345	1,175	26,992	5.43	304.2	304.2	305.2	0.8
L	1,119,744	925	21,899	6.69	304.6	304.6	305.4	0.9
M	1,120,708	840	21,494	6.83	305.2	305.2	306.1	0.9
N	1,121,886	750	20,423	7.20	305.9	305.9	306.8	0.9
O	1,123,511	1,060	29,466	5.00	307.4	307.4	308.3	0.8
P	1,127,754	2,380	45,287	3.25	309.0	309.0	309.8	0.8
Q	1,130,204	2,800	51,755	2.85	309.5	309.5	310.3	0.8
R	1,133,016	2,010	39,221	3.76	310.0	310.0	310.9	0.9
S	1,135,961	1,772	40,768	3.62	310.7	310.7	311.7	1.0
T	1,138,769	1,505	23,578	6.26	311.4	311.4	312.3	0.9
U	1,143,510	3,833	51,525	2.87	313.9	313.9	314.7	0.8
V	1,146,181	5,310	65,537	2.26	314.6	314.6	315.3	0.7
W	1,148,519	3,712	44,578	3.32	314.9	314.9	315.6	0.7
X	1,151,455	5,442	61,682	2.40	315.5	315.5	316.4	0.9
Y	1,154,267	6,275	57,531	2.58	316.3	316.3	317.2	0.9
Z	1,158,495	5,800	79,859	1.87	317.3	317.3	318.3	1.0

¹ Feet above mouth

TABLE 23	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA	
	BASTROP COUNTY, TEXAS AND INCORPORATED AREAS	FLOODING SOURCE: COLORADO RIVER	

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
AA	1,162,642	3,160	43,754	3.42	318.1	318.1	319.1	1.0
AB	1,167,120	3,739	53,262	2.83	319.4	319.4	320.4	1.0
AC	1,171,513	3,755	39,383	3.83	320.6	320.6	321.4	0.8
AD	1,176,755	4,550	72,538	2.09	322.1	322.1	322.9	0.8
AE	1,178,498	5,450	80,945	1.87	322.3	322.3	323.1	0.8
AF	1,181,045	5,400	75,519	2.01	322.5	322.5	323.4	0.9
AG	1,184,092	4,600	53,638	2.83	322.9	322.9	323.9	1.0
AH	1,186,865	4,310	49,004	3.11	323.6	323.6	324.7	1.1
AI	1,190,104	3,313	31,859	4.80	325.0	325.0	325.9	0.9
AJ	1,196,209	1,560	23,189	6.08	329.1	329.1	329.7	0.6
AK	1,203,862	646	22,116	6.38	333.4	333.4	334.1	0.7
AL	1,206,494	1,197	24,824	5.68	334.2	334.2	335.0	0.8
AM	1,211,260	1,124	31,796	4.44	336.4	336.4	337.1	0.7
AN	1,215,066	1,080	25,045	5.64	337.6	337.6	338.2	0.6
AO	1,219,159	818	25,750	5.49	339.4	339.4	339.9	0.5
AP	1,223,050	753	23,256	6.08	340.7	340.7	341.2	0.5
AQ	1,226,009	648	20,706	6.83	342.0	342.0	342.5	0.5
AR	1,227,473	898	23,341	6.06	342.6	342.6	343.2	0.6
AS	1,231,270	1,277	31,365	4.51	344.6	344.6	345.5	0.9
AT	1,234,977	618	19,910	7.11	345.6	345.6	346.4	0.8
AU	1,237,587	485	18,456	7.68	346.9	346.9	347.5	0.6
AV	1,240,160	612	20,708	6.84	347.8	347.8	348.5	0.7
AW	1,243,184	1,375	32,779	4.32	349.0	349.0	349.7	0.7
AX	1,246,200	1,336	34,501	4.11	349.6	349.6	350.2	0.6
AY	1,250,254	927	23,080	6.15	350.5	350.5	351.1	0.6
AZ	1,253,746	1,064	26,572	3.08	352.3	352.3	352.7	0.4

¹ Feet above mouth

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: COLORADO RIVER

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
BA	1,254,380	923	25,824	3.17	352.3	352.3	352.8	0.5
BB	1,254,927	984	26,218	3.12	352.4	352.4	352.9	0.5
BC	1,256,293	1,172	29,545	2.77	352.6	352.6	353.1	0.5
BD	1,256,462	1,083	29,658	2.76	352.6	352.6	353.1	0.5
BE	1,256,595	1,070	28,885	2.84	352.7	352.7	353.2	0.5
BF	1,259,200	1,720	51,553	1.70	353.0	353.0	353.4	0.4
BG	1,263,864	1,180	24,318	3.60	353.2	353.2	353.6	0.4
BH	1,267,038	860	23,264	3.76	353.6	353.6	353.9	0.3
BI	1,270,548	910	25,321	3.45	354.0	354.0	354.2	0.2
BJ	1,272,597	1,250	36,869	2.59	354.3	354.3	354.5	0.2
BK	1,275,058	715	18,649	5.11	354.4	354.4	354.6	0.2
BL	1,277,251	700	20,152	4.92	354.7	354.7	354.9	0.2
BM	1,282,305	1,615	23,965	5.71	355.5	355.5	356.1	0.6
BN	1,290,762	1,025	25,148	5.43	357.3	357.3	358.3	1.0
BO	1,295,024	645	18,482	7.38	358.4	358.4	359.3	0.9
BP	1,297,534	910	17,285	7.89	358.8	358.8	359.7	0.9
BQ	1,301,763	2,255	24,402	5.35	361.1	361.1	362.1	1.0
BR	1,304,422	965	20,183	6.47	361.6	361.6	362.6	1.0
BS	1,309,137	500	15,203	8.58	362.7	362.7	363.7	1.0
BT	1,311,372	675	18,675	6.99	363.8	363.8	364.8	1.0
BU	1,317,217	520	15,267	8.55	365.4	365.4	366.4	1.0
BV	1,321,274	6,050	47,265	2.36	367.6	367.6	368.6	1.0
BW	1,325,899	6,000	60,485	1.84	368.2	368.2	369.1	0.9
BX	1,328,438	5,950	49,640	2.24	368.3	368.3	369.2	0.9
BY	1,333,143	3,300	41,060	2.71	368.9	368.9	369.8	0.9
BZ	1,335,504	1,746	16,839	6.62	368.9	368.9	369.8	0.9

¹ Feet above mouth

TABLE 23	FEDERAL EMERGENCY MANAGEMENT AGENCY BASTROP COUNTY, TEXAS AND INCORPORATED AREAS	FLOODWAY DATA
		FLOODING SOURCE: COLORADO RIVER

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
CA	1,336,204	1,870	21,075	5.29	369.2	369.2	370.1	0.9
CB	1,337,188	2,075	22,355	5.00	369.6	369.6	370.5	0.9
CC	1,343,300	1,359	15,674	7.19	371.5	371.5	372.3	0.8
CD	1,346,839	705	18,876	6.01	373.7	373.7	374.6	0.9
CE	1,350,669	460	13,782	8.25	375.0	375.0	375.8	0.8
CF	1,352,843	695	19,165	5.94	375.9	375.9	376.8	0.9
CG	1,355,282	530	15,457	7.37	376.5	376.5	377.4	0.9
CH	1,357,639	740	19,315	5.90	377.3	377.3	378.2	0.9
CI	1,358,984	715	16,923	6.73	377.7	377.7	378.5	0.8
CJ	1,360,952	605	15,617	7.30	378.2	378.2	379.1	0.9
CK	1,362,079	640	16,244	7.02	378.9	378.9	379.8	0.9
CL	1,365,260	610	16,847	6.77	379.8	379.8	380.6	0.8
CM	1,367,983	785	16,894	6.75	381.1	381.1	382.0	0.9
CN	1,371,605	555	16,555	6.89	382.3	382.3	383.2	0.9
CO	1,374,089	550	13,548	8.42	382.7	382.7	383.7	1.0
CP	1,375,883	620	16,050	7.11	383.5	383.5	384.4	0.9
CQ	1,379,366	995	20,052	5.69	385.0	385.0	385.9	0.9
CR	1,381,622	1,368	15,150	7.53	385.3	385.3	386.2	0.9
CS	1,383,693	1,110	17,992	6.34	385.9	385.9	386.8	0.9
CT	1,386,708	1,243	19,181	5.95	386.9	386.9	387.9	1.0
CU	1,389,663	4,805	67,999	1.68	388.0	388.0	388.9	0.9
CV	1,393,376	4,980	69,757	1.57	388.2	388.2	389.1	0.9
CW	1,396,157	3,270	26,521	4.15	388.4	388.4	389.3	0.9
CX	1,399,205	2,786	25,943	4.26	389.3	389.3	390.1	0.8
CY	1,400,662	1,761	22,350	4.97	389.7	389.7	390.6	0.9
CZ	1,407,078	2,935	54,369	2.06	391.1	391.1	392.0	0.9

¹ Feet above mouth

FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: COLORADO RIVER

TABLE 23

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	11,556	340	5,266	3.3	396.8	396.8	397.6	0.8
B	15,679	275	4,042	4.2	400.2	400.2	401.1	0.9
C	20,325	290	2,702	6.2	402.1	402.1	403.1	1.0
Feet above confluence with Colorado River								
FEDERAL EMERGENCY MANAGEMENT AGENCY BASTROP COUNTY, TEXAS AND INCORPORATED AREAS					FLOODWAY DATA			
TABLE 23					FLOODING SOURCE: DRY CREEK EAST			

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	750	112	746	5.2	352.0	327.4 ²	327.5	0.1
B	1,550	53	427	9.1	352.0	331.9 ²	331.9	0.0
C	2,888	293	1,099	3.5	352.0	342.3 ²	342.3	0.0
D	3,274	284	34	5.3	352.0	344.4 ²	344.4	0.0
E	3,573	474	1,100	3.5	352.0	346.9 ²	346.9	0.0
F	3,888	50	285	13.6	352.0	349.4 ²	349.4	0.0
G	4,550	53	290	13.4	353.7	353.7	353.7	0.0
H	5,311	113	998	4.4	361.2	361.2	361.2	0.0
I	6,313	244	803	3.9	363.2	363.2	364.2	1.0
J	7,213	165	604	4.0	369.6	369.6	370.1	0.5
K	7,629	65	561	3.6	372.4	372.4	373.4	1.0
L	8,105	148	461	4.7	373.9	373.9	374.8	0.9
M	8,632	105	610	3.9	377.8	377.8	378.8	1.0
N	9,424	133	590	4.4	382.5	382.5	383.3	0.8
O	10,128	96	523	5.8	387.5	387.5	388.2	0.7
P	10,572	108	737	4.1	391.7	391.7	392.4	0.7

¹ Feet above confluence with Colorado River
² Elevation computed without consideration of backwater effects from Colorado River

TABLE 23	FEDERAL EMERGENCY MANAGEMENT AGENCY BASTROP COUNTY, TEXAS AND INCORPORATED AREAS	FLOODWAY DATA	
		FLOODING SOURCE: GILLS BRANCH	

Table 24: 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 25: 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 30, "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/flood-maps/change-your-flood-zone/paper-application-forms 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/flood-maps/tutorials.

For more information about how to apply for a LOMA, call the FEMA Mapping and Insurance 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/flood-maps/change-your-flood-zone/paper-application-forms 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 Mapping and Insurance 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/flood-maps/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/flood-maps/change-your-flood-zone/paper-application-forms 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 Mapping and Insurance 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 Bastrop County FIRM are listed in Table 26. Please note that this table only includes LOMCs that have been issued on the FIRM panels updated by this map revision. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.

Table 26: Incorporated Letters of Map Change

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
07-06-1049P	07/30/2007	Cedar Creek Tributary 11, Unnamed Tributary to Cedar Creek Tributary 11, Unnamed Tributary to Unnamed Tributary to Cedar Creek Tributary 11	48021C0325F
10-06-2245P	04/21/2011	Unnamed Tributary to Colorado River Tributary 6	48021C0355F
14-06-0986P	01/09/2015	Unnamed Tributary to Colorado River	48021C0215F 48021C0335F 48021C0355F
16-06-1114P	11/14/2016	Cedar Creek Tributary 2	48021C0335F
19-06-0976P	11/18/2019	Colorado River, Colorado River Tributary 6	48021C0355F 48021C0360F

Table 26: Incorporated Letters of Map Change (continued)

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
20-06-1063P	09/21/2020	Colorado River	48021C0355F

6.5.4 Physical Map Revisions

A Physical Map Revisions (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 Bastrop 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 27, "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 27 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 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 PMRs 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 Bastrop County FIRMs in countywide format was 08/19/1991.

Table 27: Community Map History

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Bastrop, City of	03/19/1976	03/19/1976	N/A	08/19/1991	05/09/2023 01/19/2006
Bastrop County, Unincorporated Areas	08/09/1977	08/09/1977	06/03/1980	08/19/1991	05/09/2023 01/06/2016 01/19/2006 12/08/1998
Elgin, City of	06/21/1974	06/21/1974	02/27/1976	07/01/1988	01/19/2006 08/19/1991
Smithville, City of	04/05/1974	04/05/1974	05/21/1976	01/16/1979	05/09/2023 01/19/2006 08/19/1991

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 28 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 28: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Cedar Creek	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Cedar Creek Tributary 2	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Cedar Creek Zone A Tributaries	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Colorado River	01/19/2006	Halff Associates, Inc.	EMT-2001-CO-0029	March 2003	Bastrop, City of; Bastrop County, Unincorporated Areas; Smithville, City of
Diversion	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas; Smithville, City of
Dry Creek East	01/06/2016	Halff Associates, Inc.	EMT-2010-CA-011	August 2013	Bastrop County, Unincorporated Areas
Gazley Creek	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas; Smithville, City of
Gills Branch	01/19/2006	Halff Associates, Inc.	EMT-2001-CO-0029	March 2003	Bastrop, City of; Bastrop County, Unincorporated Areas;
Gills Branch	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop, City of; Bastrop County, Unincorporated Areas
Greens Creek	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas

Table 28: Summary of Contracted Studies Included in this FIS Report (continued)

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Long Branch	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Lytton Springs Creek	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Maha Creek	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Piney Creek	01/19/2006	Watershed Concepts	TA-04, Task Order 1	August 2004	Bastrop County, Unincorporated Areas
Piney Creek North	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop, City of; Bastrop County, Unincorporated Areas
Railroad	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop, City of
Sandy Creek	01/19/2006	Watershed Concepts	TA-04, Task Order 1	August 2004	Bastrop County, Unincorporated Areas
Unnamed Tributary to Colorado River	01/06/2016	*	*	*	Bastrop County, Unincorporated Areas
Walnut Creek and Zone A Tributaries	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas
Willow Creek	05/09/2023	Halff Associates, Inc.	EMT-2017-CA-00021 MAS No. 14	March 2020	Bastrop County, Unincorporated Areas; Smithville, City of
Zone A	01/19/2006	Watershed Concepts	TA-04, Task Order 1	August 2004	Bastrop, City of; Bastrop County, Unincorporated Areas; Elgin, City of

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 . 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 29: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Bastrop, City of	05/09/2023	10/11/2019	Flood Risk Review	Texas Water Development Board, the community, and the study contractor
		3/25/2021	Final CCO Meeting	Texas Water Development Board, the community, and the study contractor
Bastrop County, Unincorporated Areas	05/09/2023	10/11/2019	Flood Risk Review	Texas Water Development Board, the community, and the study contractor
		3/25/2021	Final CCO Meeting	Texas Water Development Board, the community, and the study contractor
Elgin, City of	01/19/2006	06/20/2002	Initial CCO Meeting	Lower Colorado River Authority, the communities, the county, and the study contractors
		10/26/2004	Final CCO Meeting	FEMA, Lower Colorado River Authority, the communities, and the study contractors
Smithville, City of	05/09/2023	10/15/2019	Flood Risk Review	Texas Water Development Board, the community, and the study contractor
		3/25/2021	Final CCO Meeting	Texas Water Development Board, 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.

Table 30 is a list of the locations where FIRMs for Bastrop 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 30: Map Repositories

Community	Address	City	State	Zip Code
Bastrop, City of	City Hall 1311 Chestnut Street	Bastrop	TX	78602
Bastrop County, Unincorporated Areas	Development Services 211 Jackson Street	Bastrop	TX	78602
Elgin, City of	Development Services Department 310 North Main Street	Elgin	TX	78621
Smithville, City of	City Hall 317 Main Street	Smithville	TX	78957

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 31.

Table 31 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 31: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/flood-maps/products-tools/know-your-risk/engineers-surveyors-architects
NFIP website	www.fema.gov/flood-insurance
NFHL Dataset	msc.fema.gov

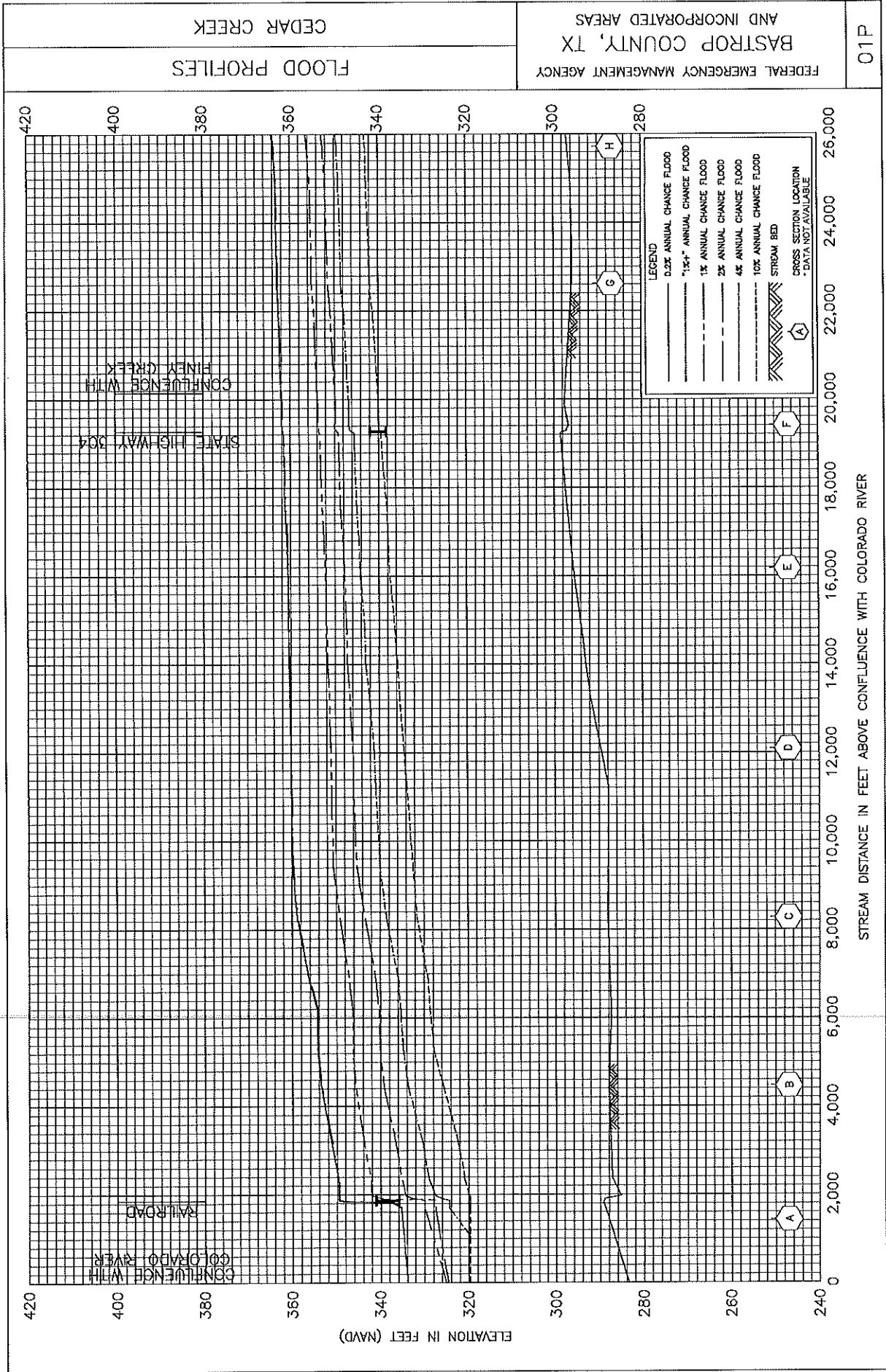
FEMA Region VI	Larry Voice 800 North Loop 288 Denton, TX 76209 (940) 898-5419 larry.voice@fema.dhs.gov
Other Federal Agencies	
USGS website	www.usgs.gov
Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Michael Segner Texas Water Development Board 1700 North Congress Avenue P.O. Box 13231 Austin, TX 78711-3231 (512) 463-3509 michael.segner@twdb.state.tx.us
State GIS Coordinator	Mike Ouimet State GIS Coordinator 300 West 15th Street P.O. Box 13564 Austin, TX 78711-3564 (512) 305-9076 mike.ouimet@dir.state.tx.us

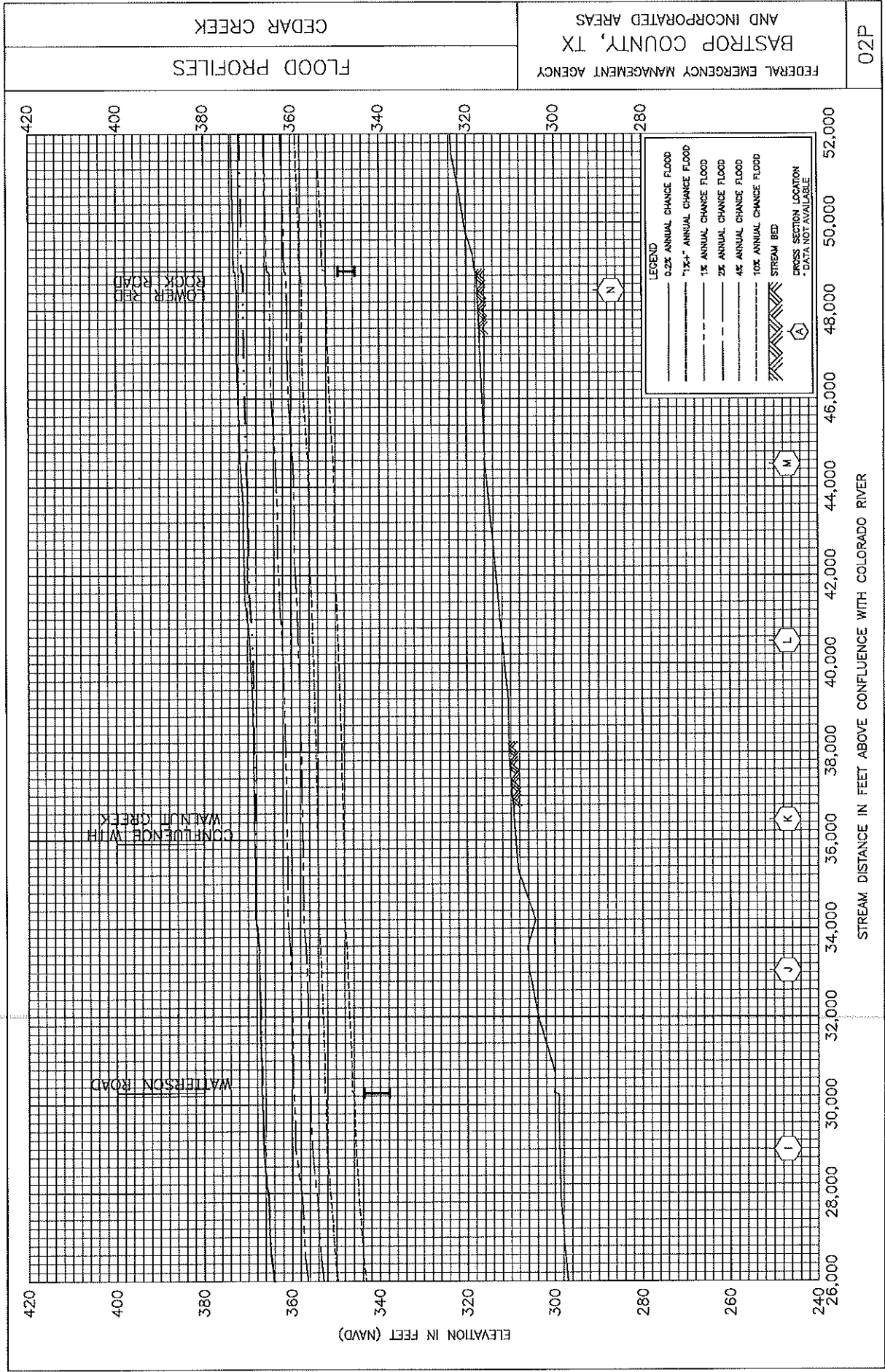
SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

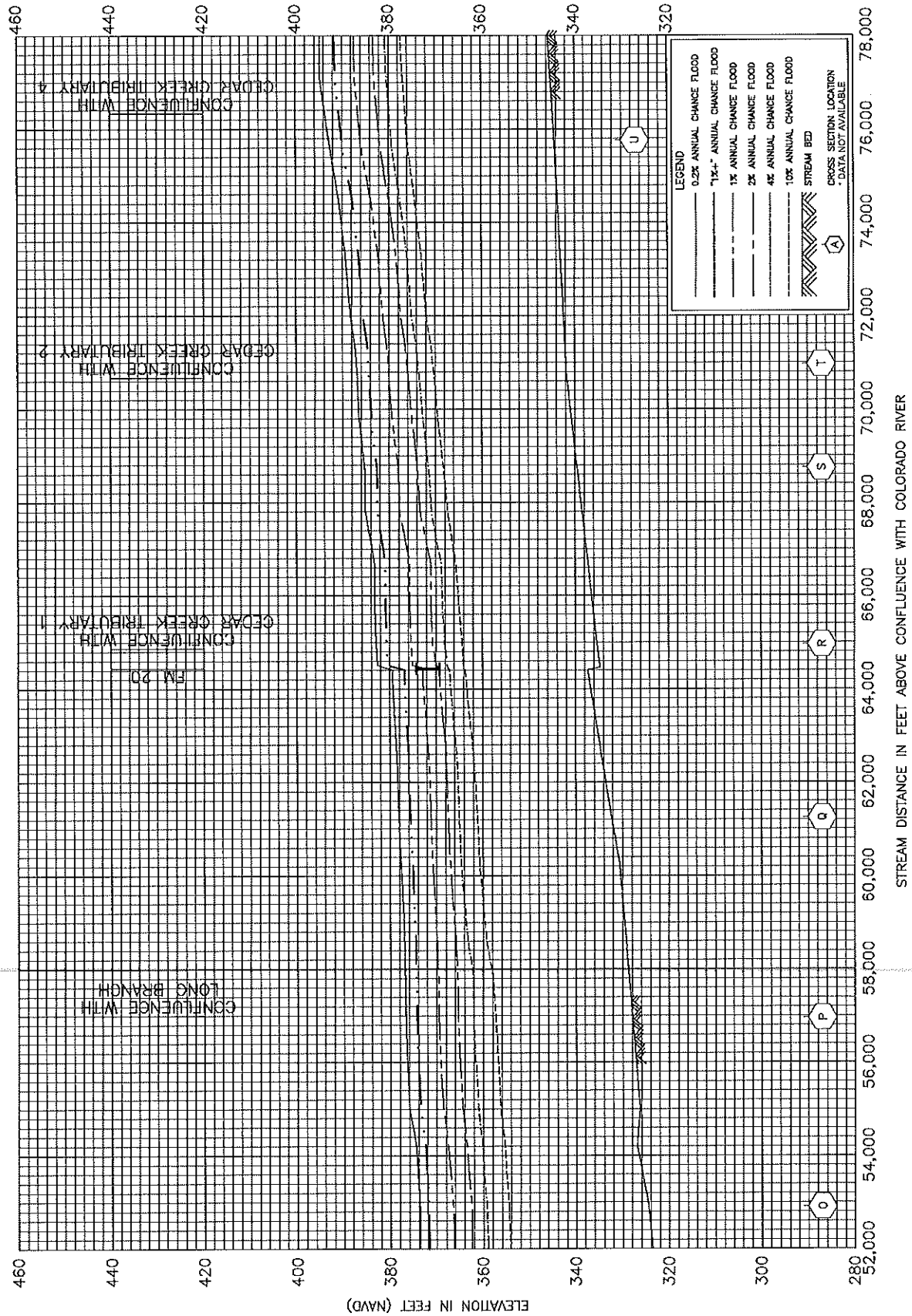
Table 32 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

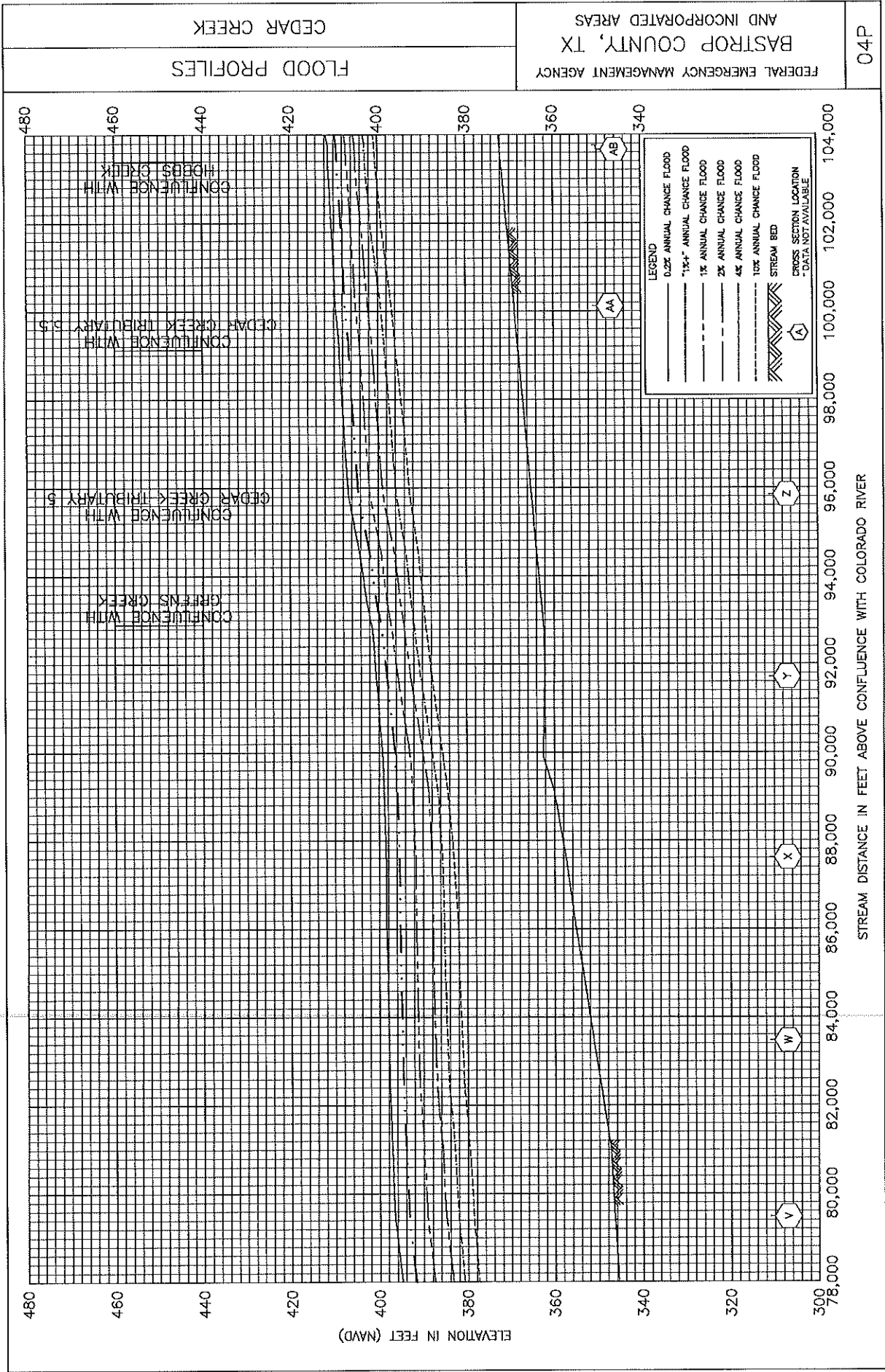
Table 32: Bibliography and References

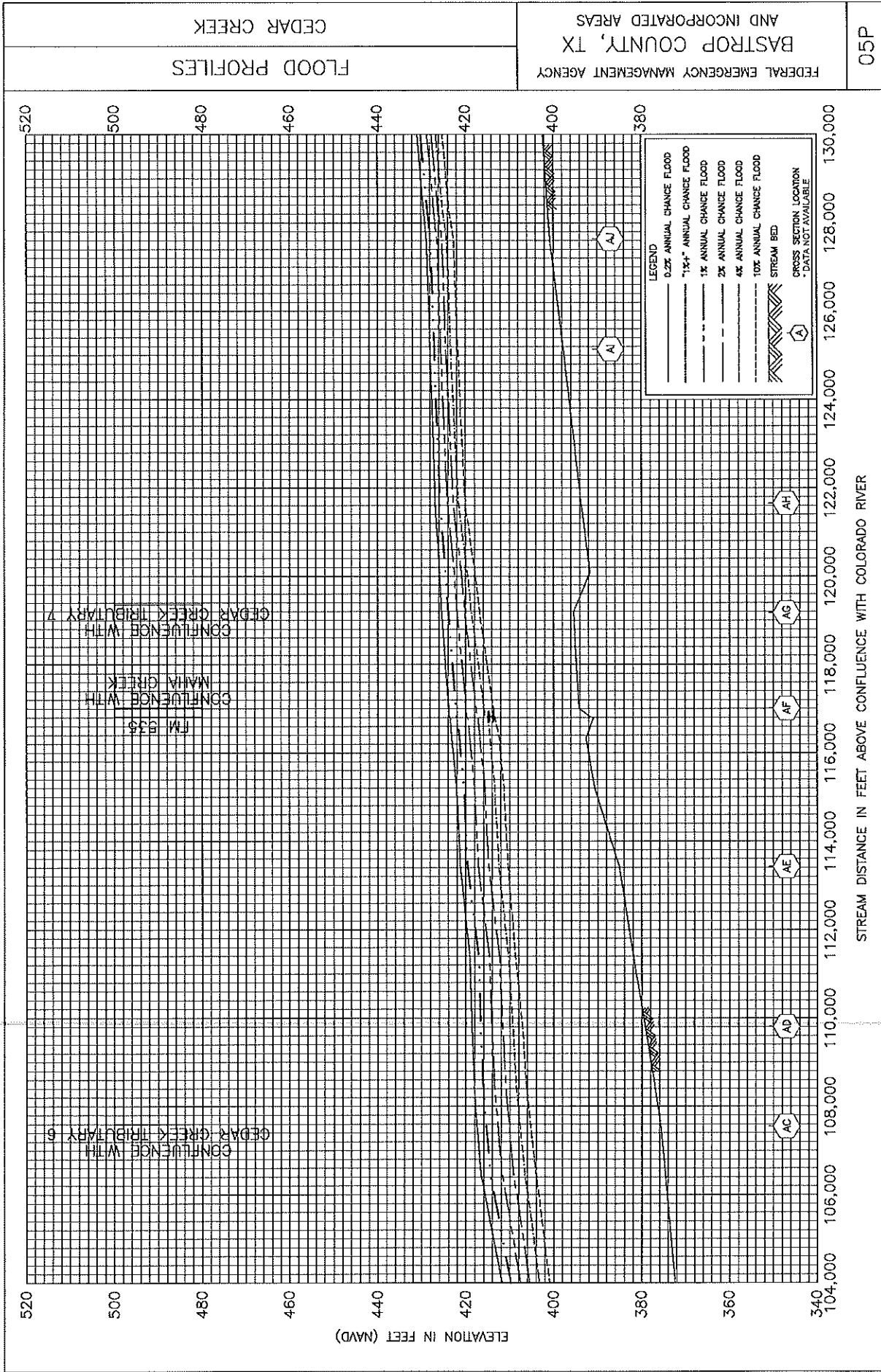
Citation in this FIS	Publisher/Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/Date of Issuance	Link
FEMA 2006	Federal Emergency Management Agency	<i>Flood Insurance Study, Bastrop County, Texas, and Incorporated Areas</i>		Washington, D.C.	January 19, 2006	FEMA Flood Map Service Center msc.fema.gov
FEMA 2016	Federal Emergency Management Agency	<i>Flood Insurance Study, Bastrop County, Texas, and Incorporated Areas</i>		Washington, D.C.	January 6, 2016	FEMA Flood Map Service Center msc.fema.gov
Halff 2002	Halff Associates, Inc.	<i>Mapping the Colorado River, Technical Support Data Notebook</i>	Halff Associates, Inc.	Forth Worth, Texas	September 2002	
Sanborn 2003	The Sanborn Map Company, Inc.	<i>Topographic Maps Compiled from LiDAR, Contour Interval 2-Feet</i>	The Sanborn Map Company, Inc.	City of Austin and Travis County, Texas	January 2003	
TNRIS 2017	Texas Natural Resources Information System	<i>Central Texas LiDAR 2017</i>	Texas Natural Resources Information System	Austin, Texas	2017	Texas Natural Resources Information System DataHub https://data.tnris.org/
TWDB 2020	Texas Water Development Board	<i>Texas Water Development Board CTP FY17 RiskMAP Project</i>	Texas Water Development Board	Austin, Texas	March 3, 2020	

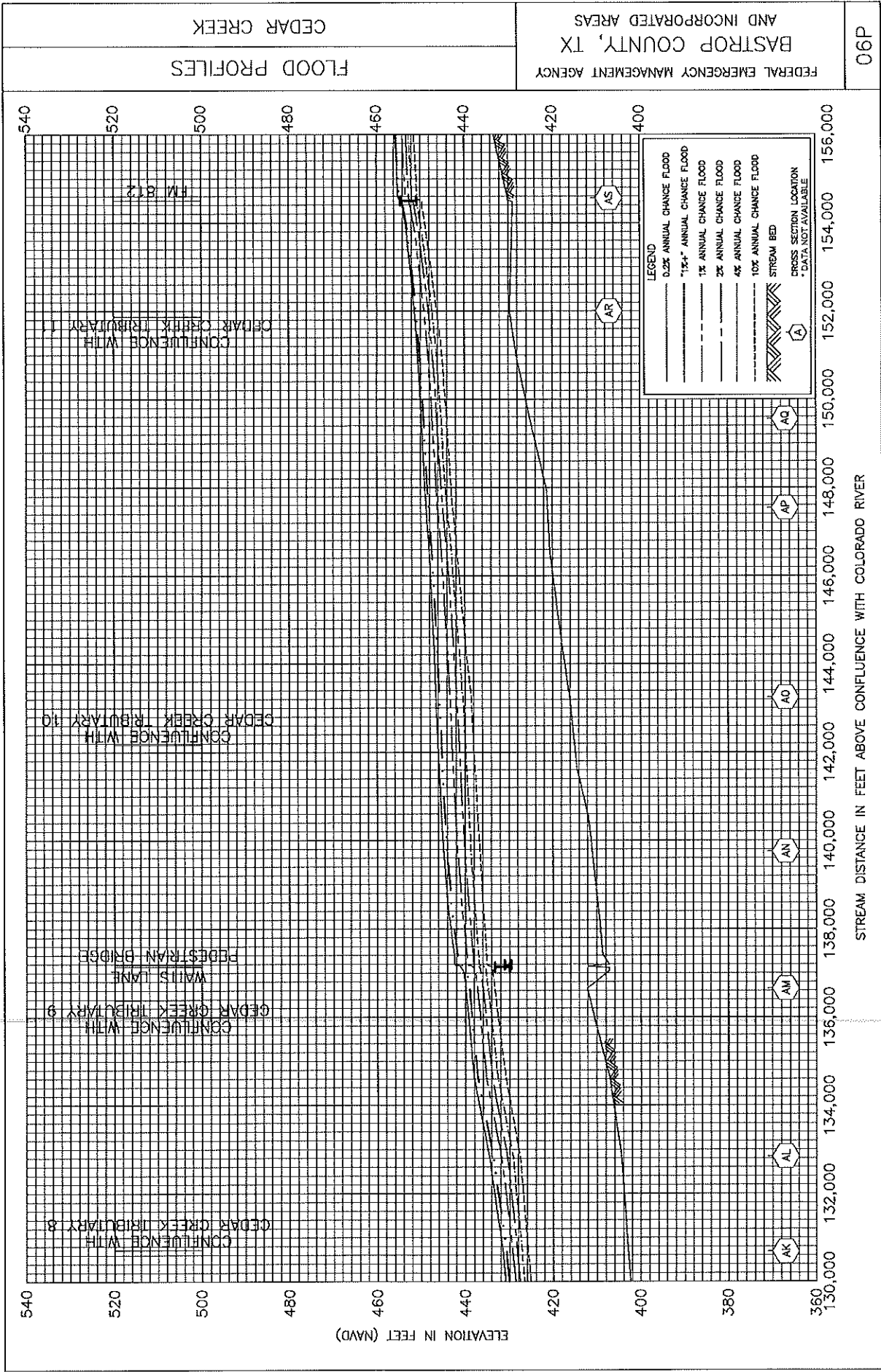


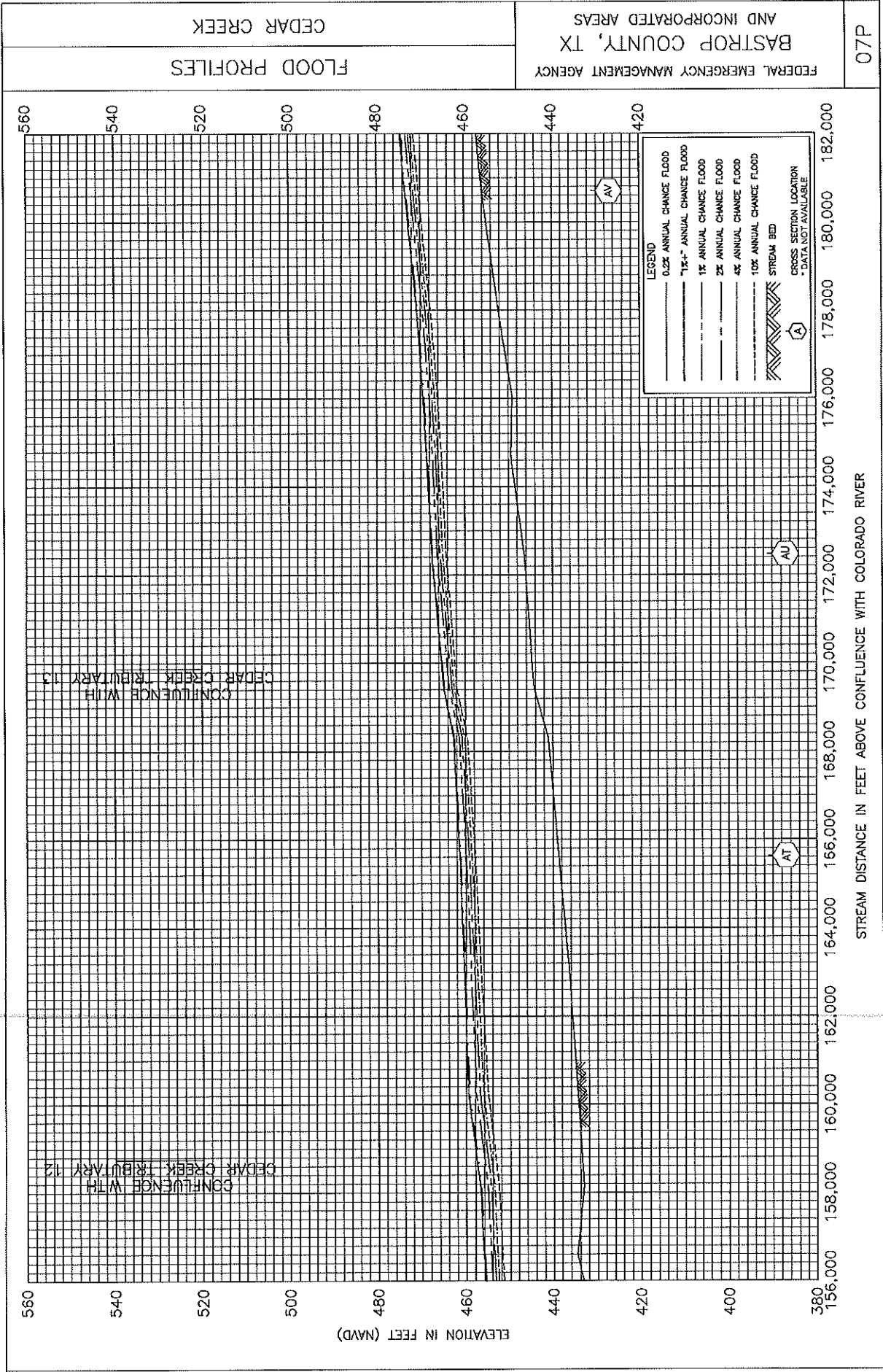


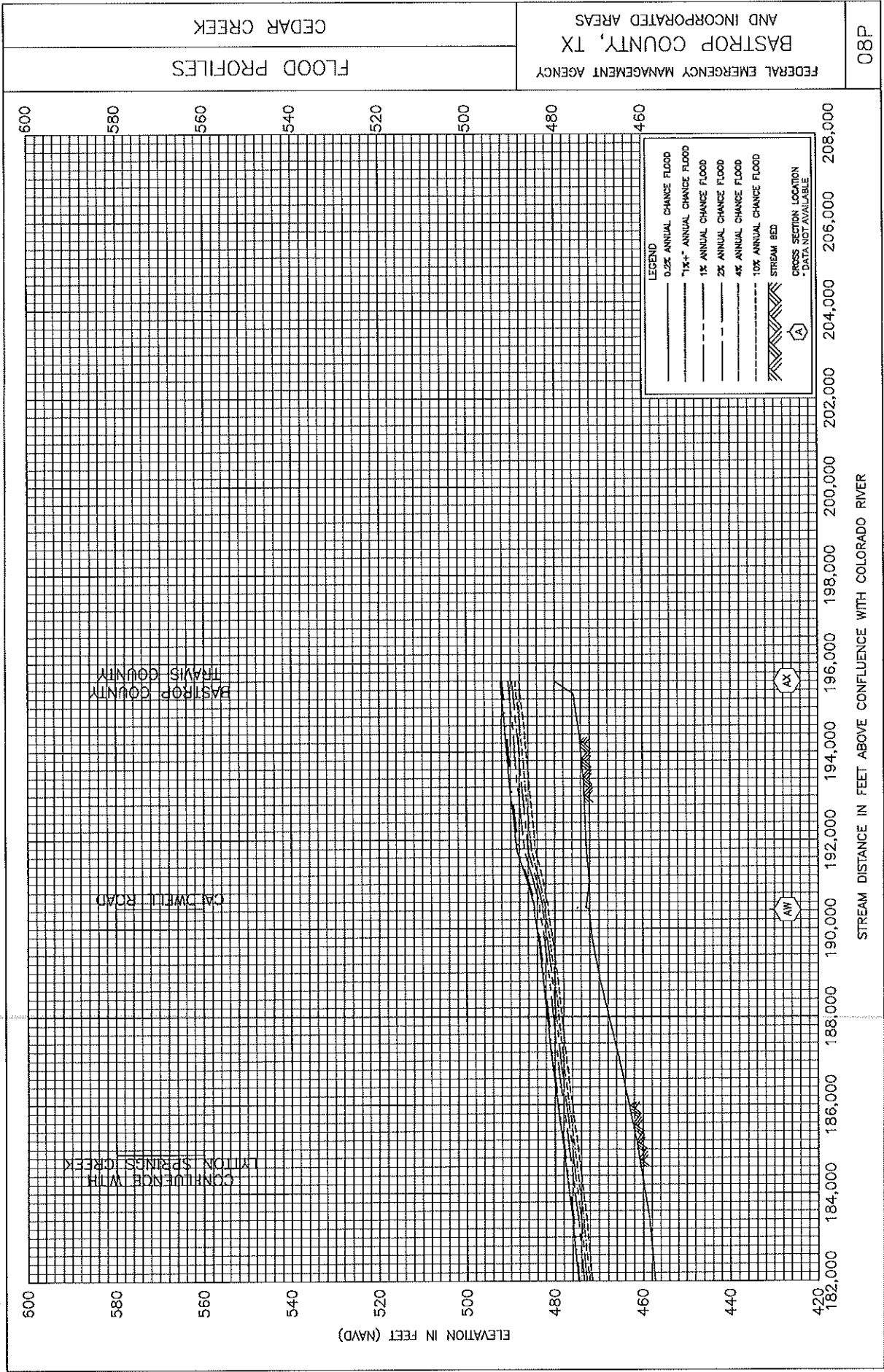


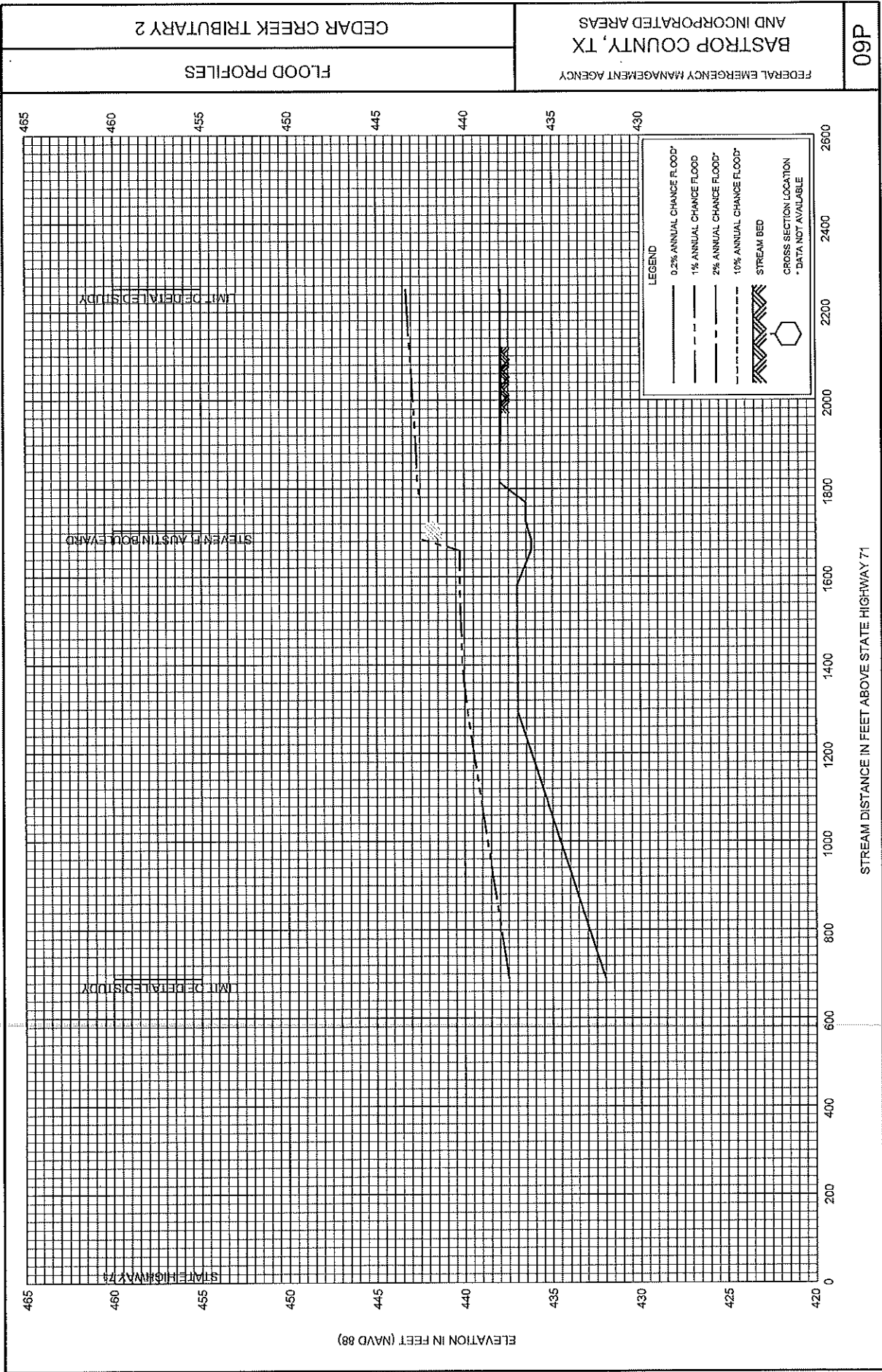






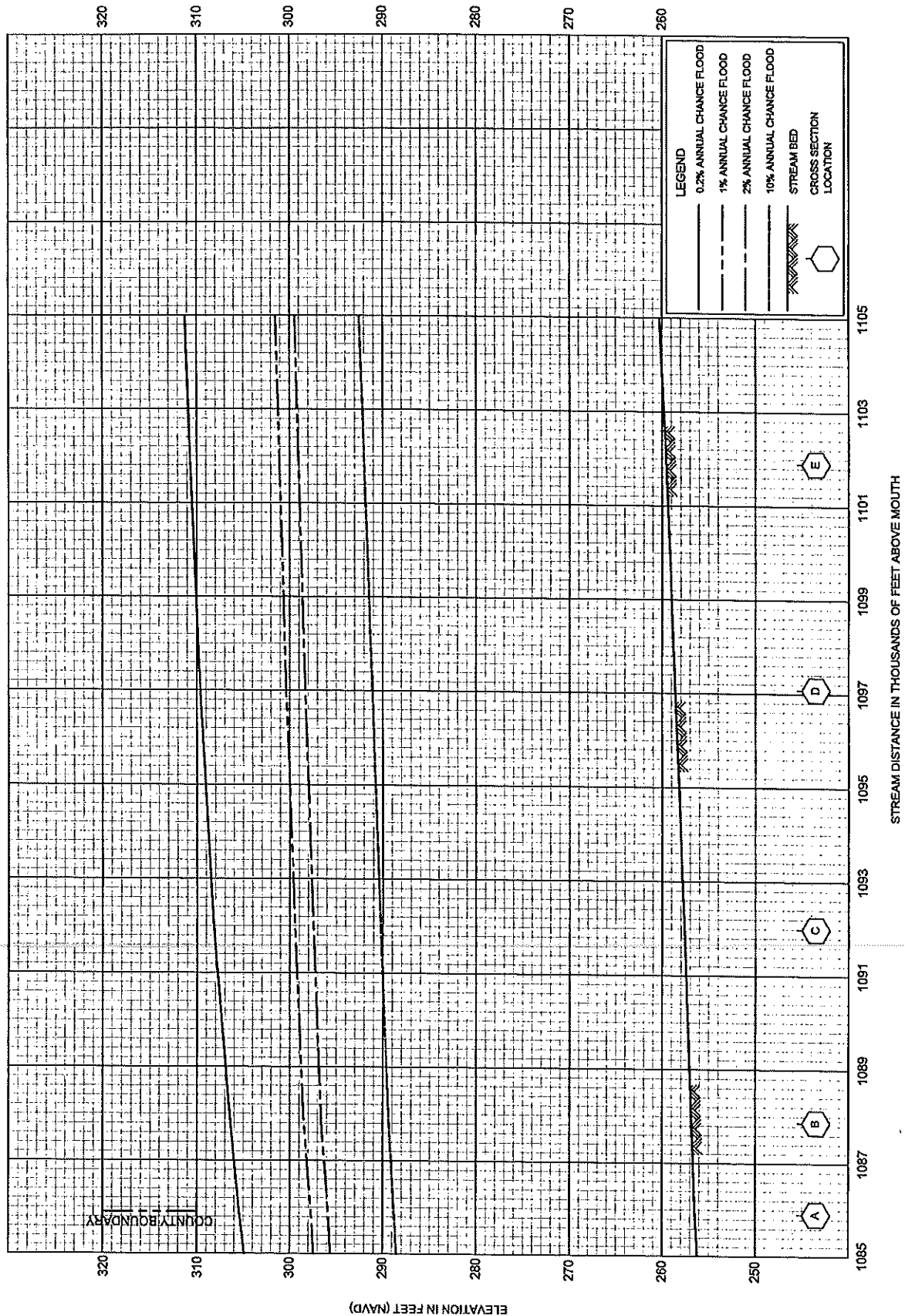






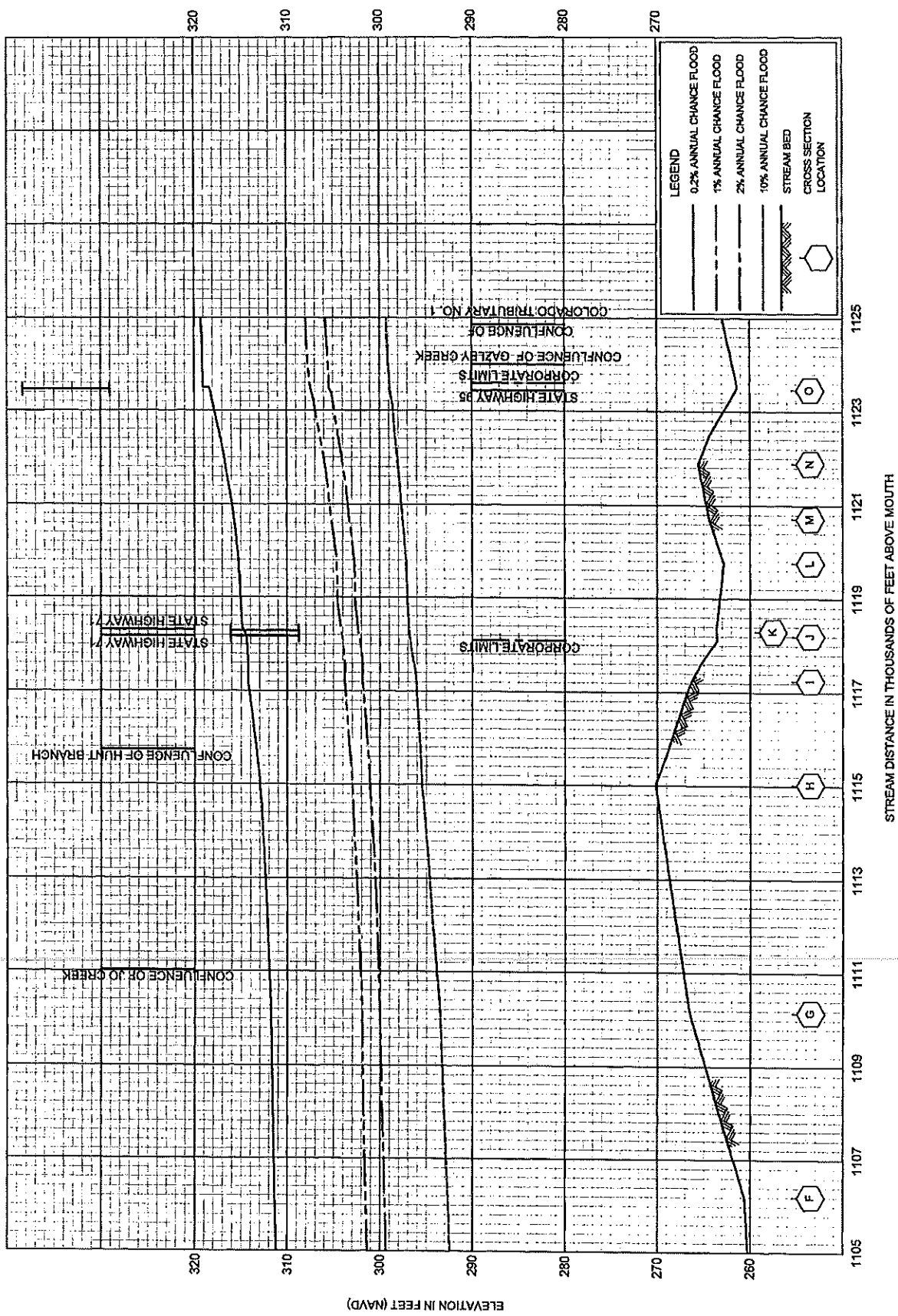
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

FLOOD PROFILES
 COLORADO RIVER



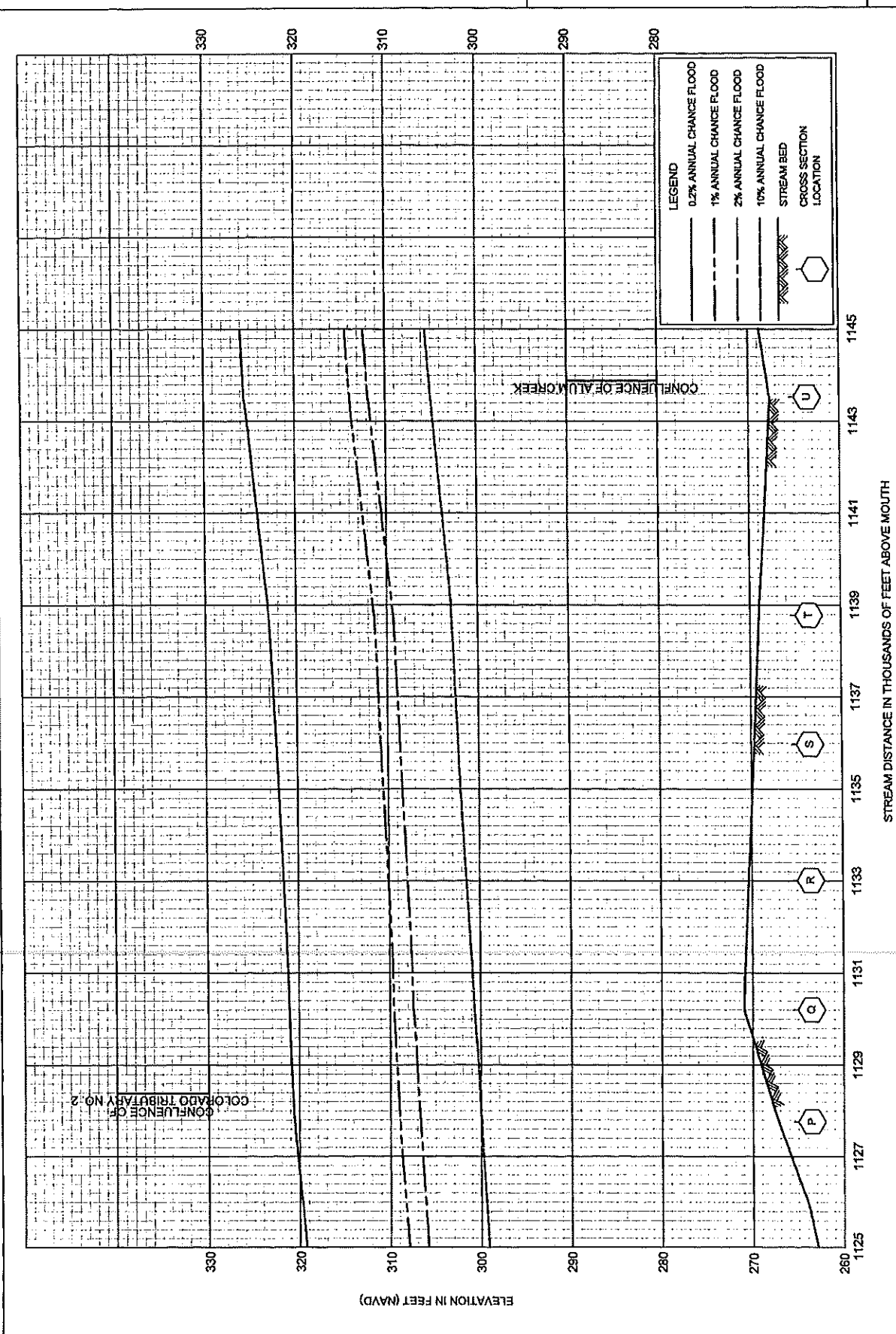
FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOOD PROFILES
COLORADO RIVER



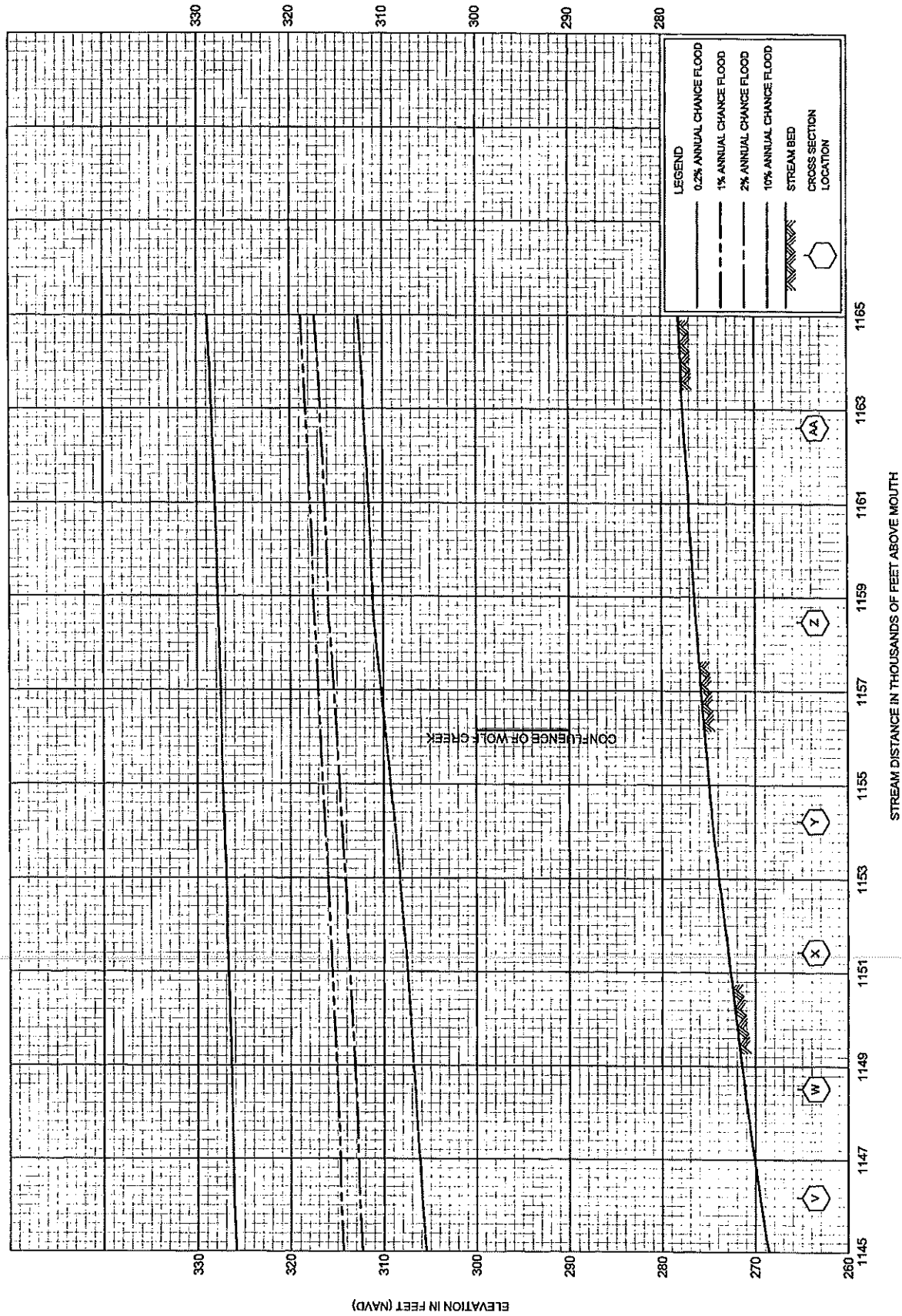
FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOOD PROFILES
COLORADO RIVER



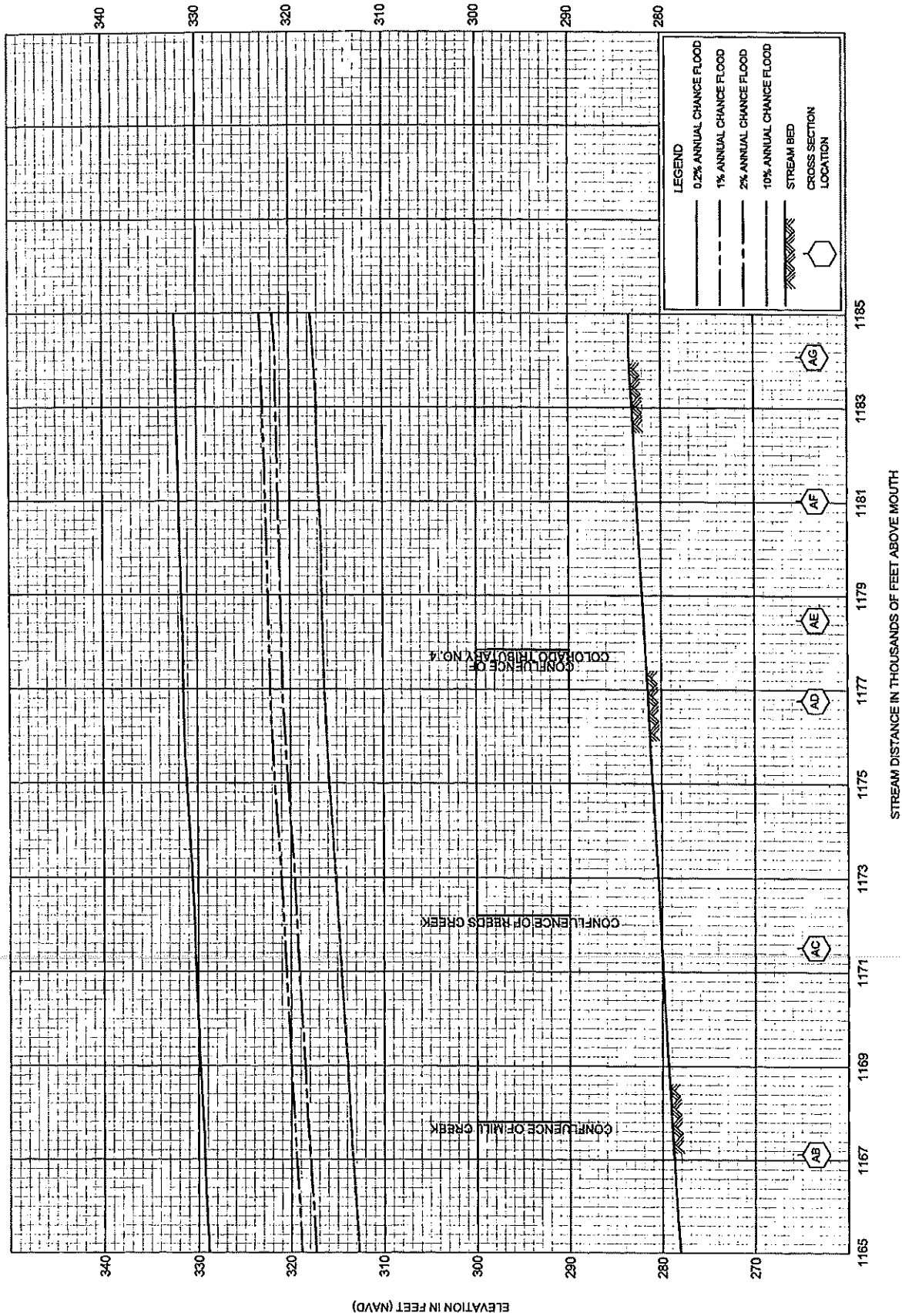
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

FLOOD PROFILES
 COLORADO RIVER



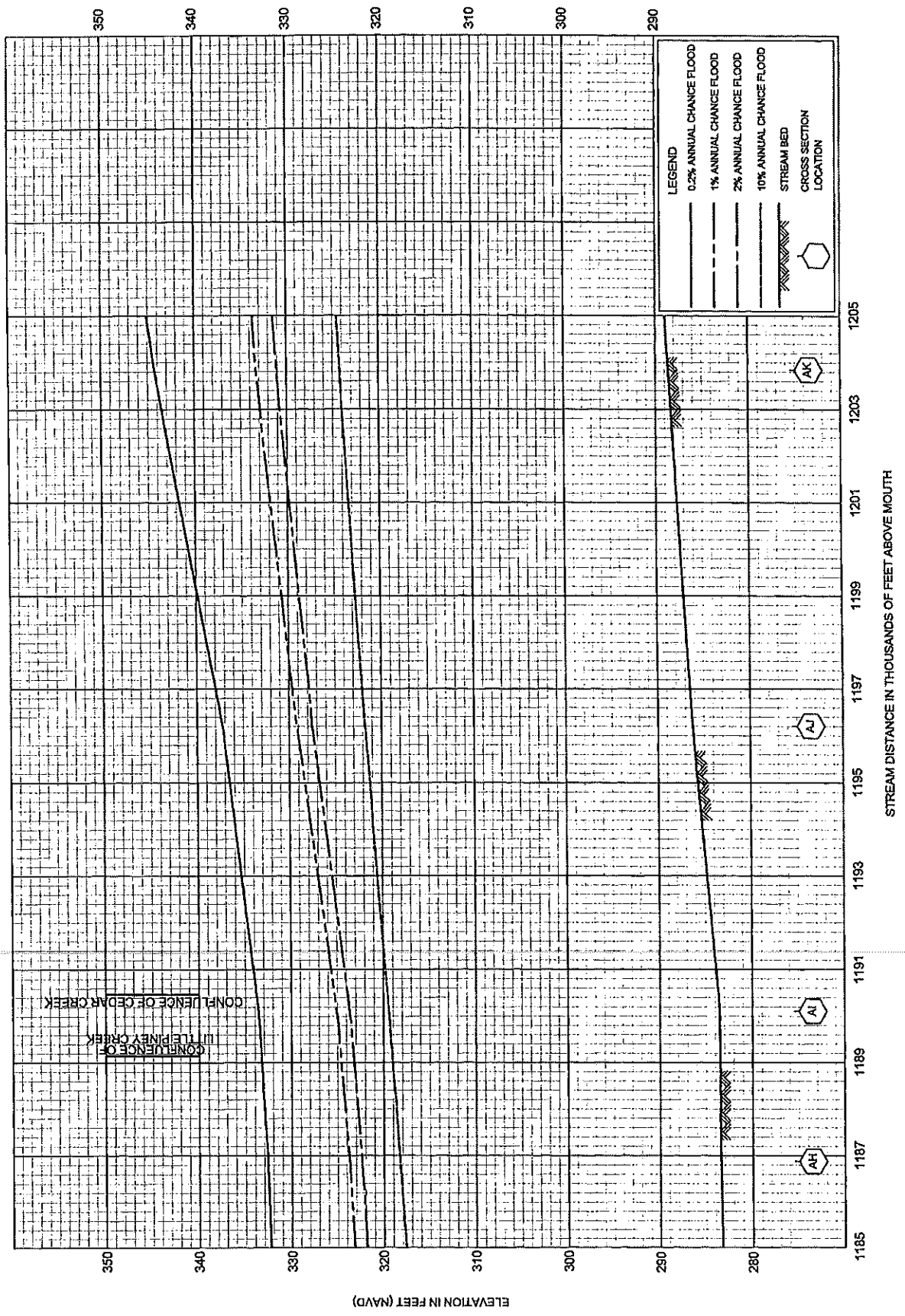
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

FLOOD PROFILES
 COLORADO RIVER



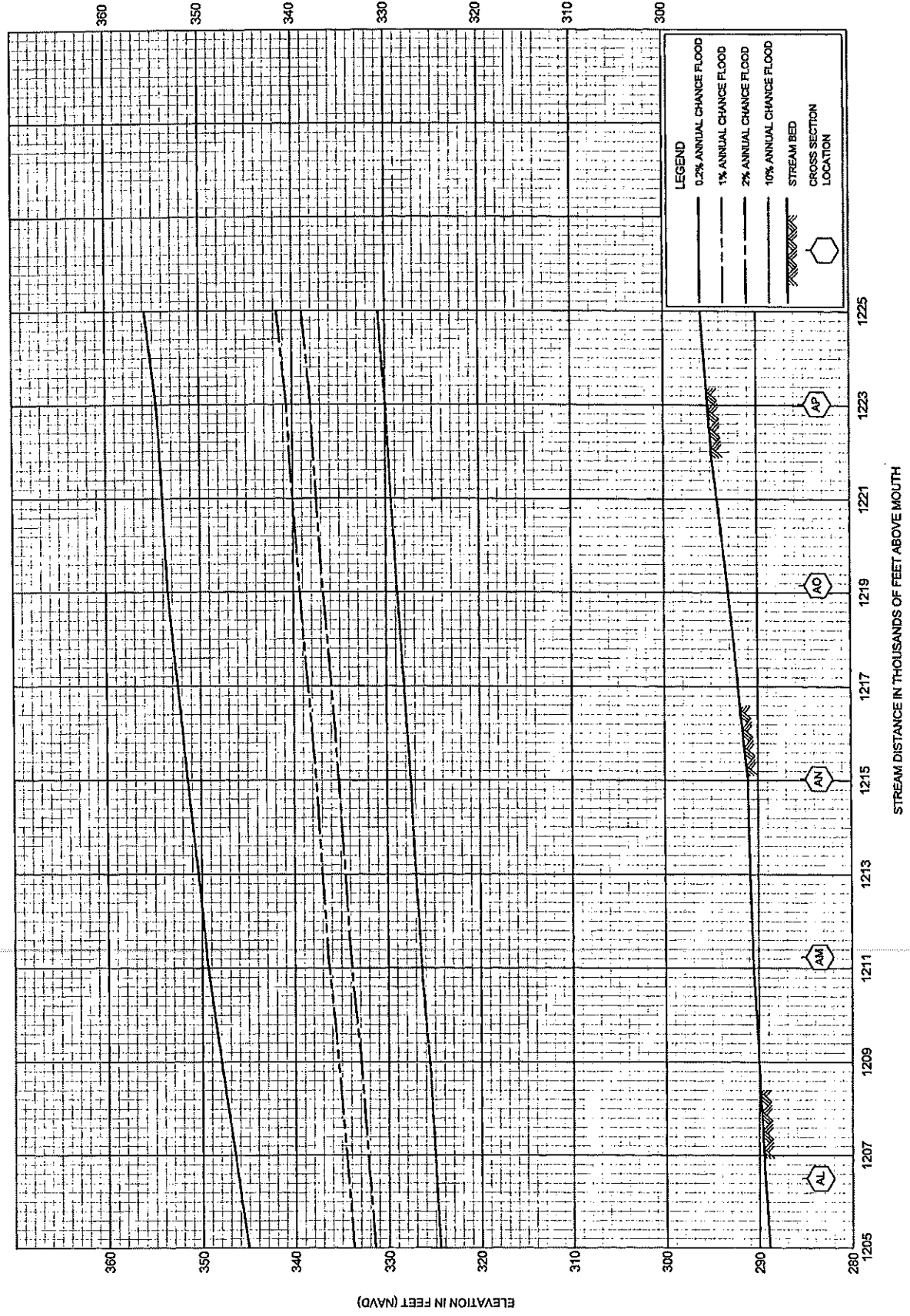
FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

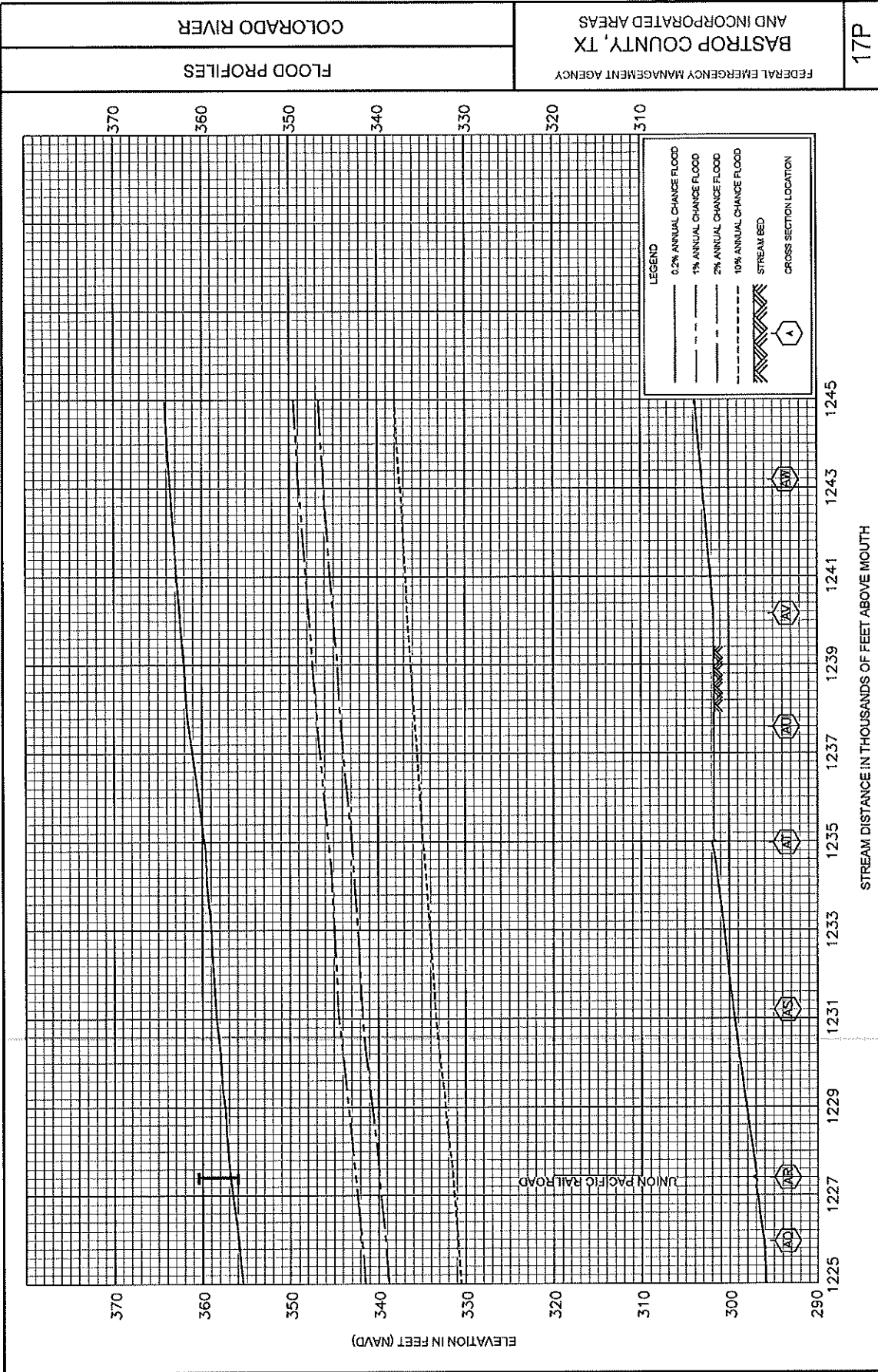
FLOOD PROFILES
COLORADO RIVER

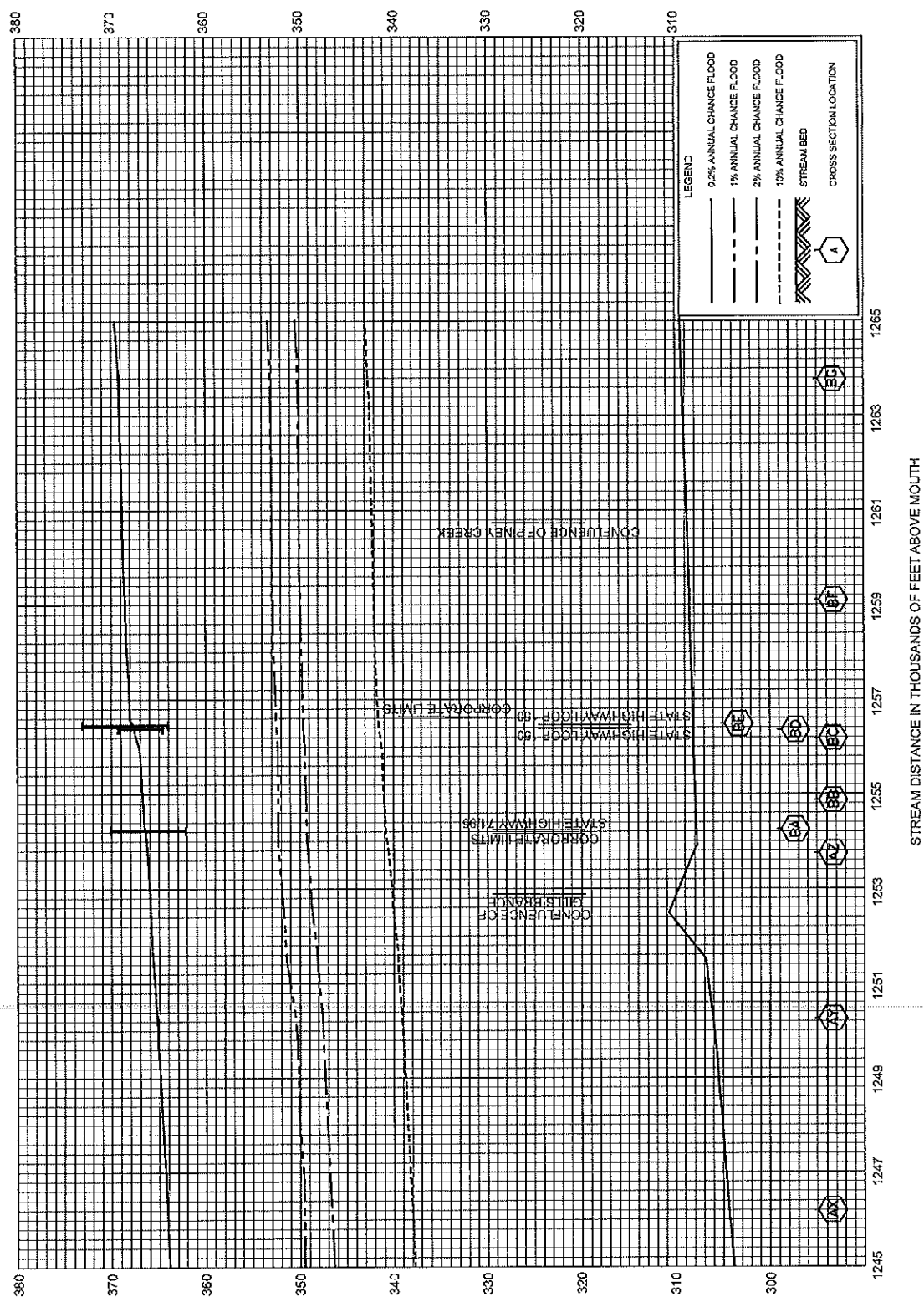


FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOOD PROFILES
COLORADO RIVER

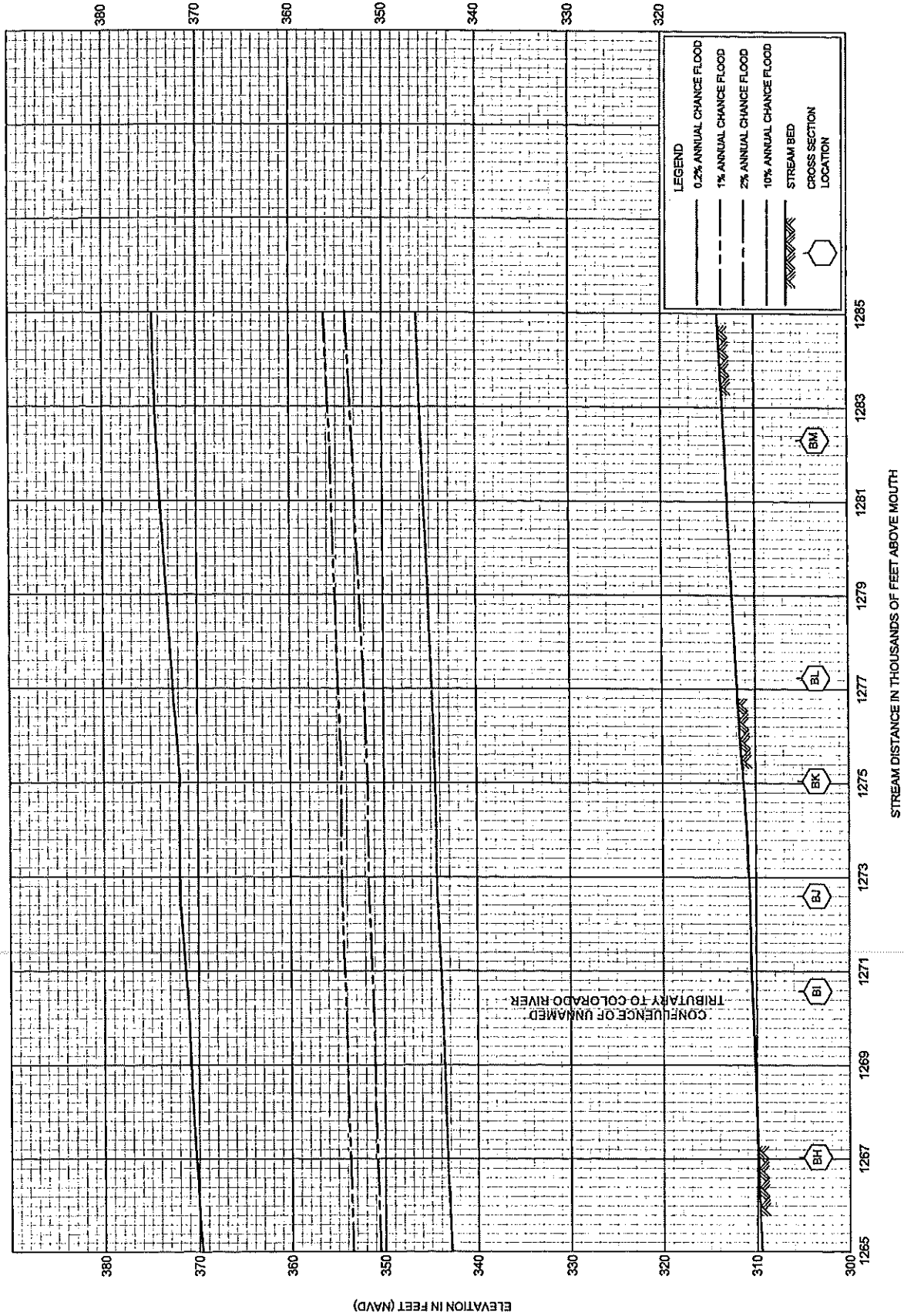






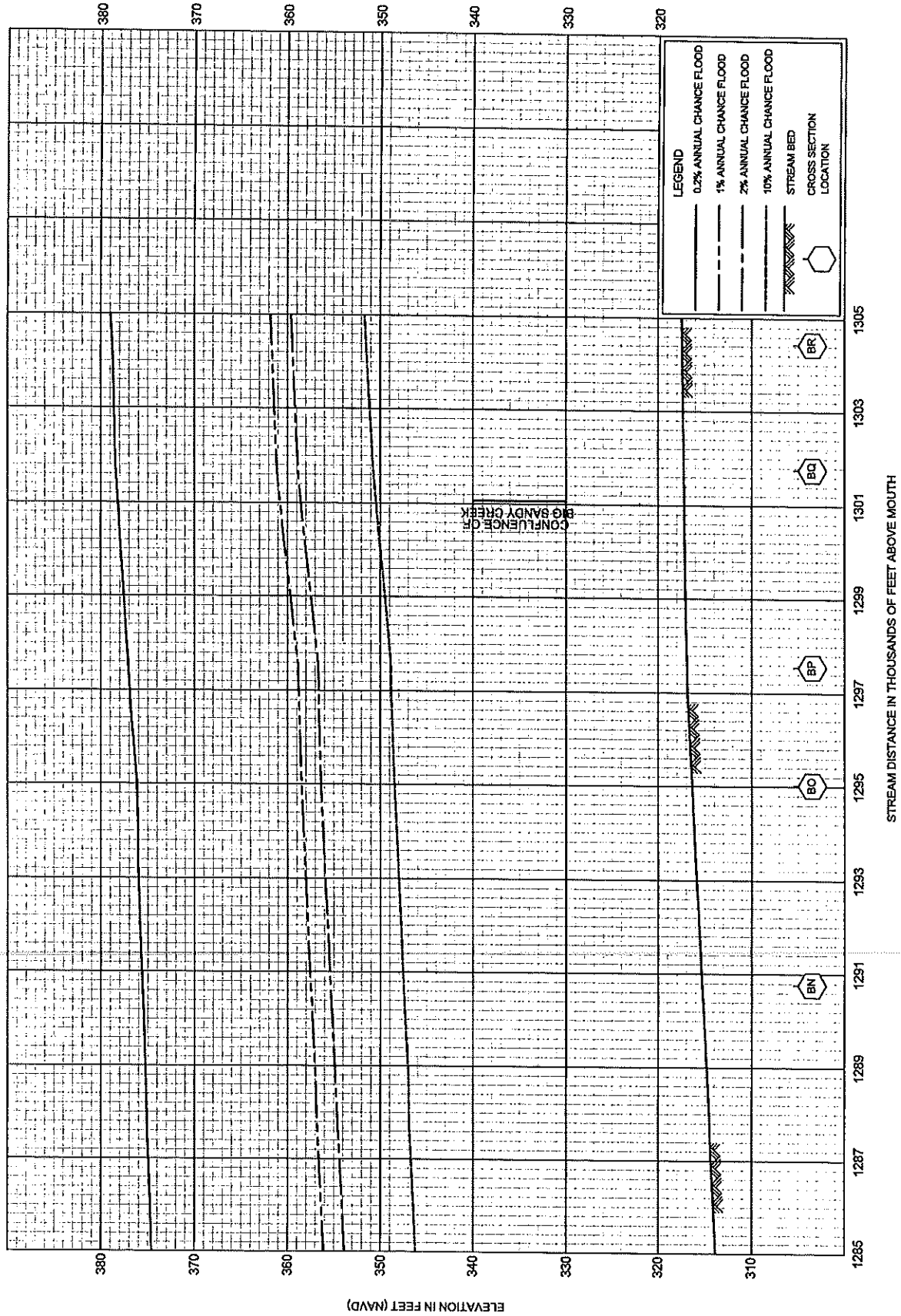
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

FLOOD PROFILES
 COLORADO RIVER



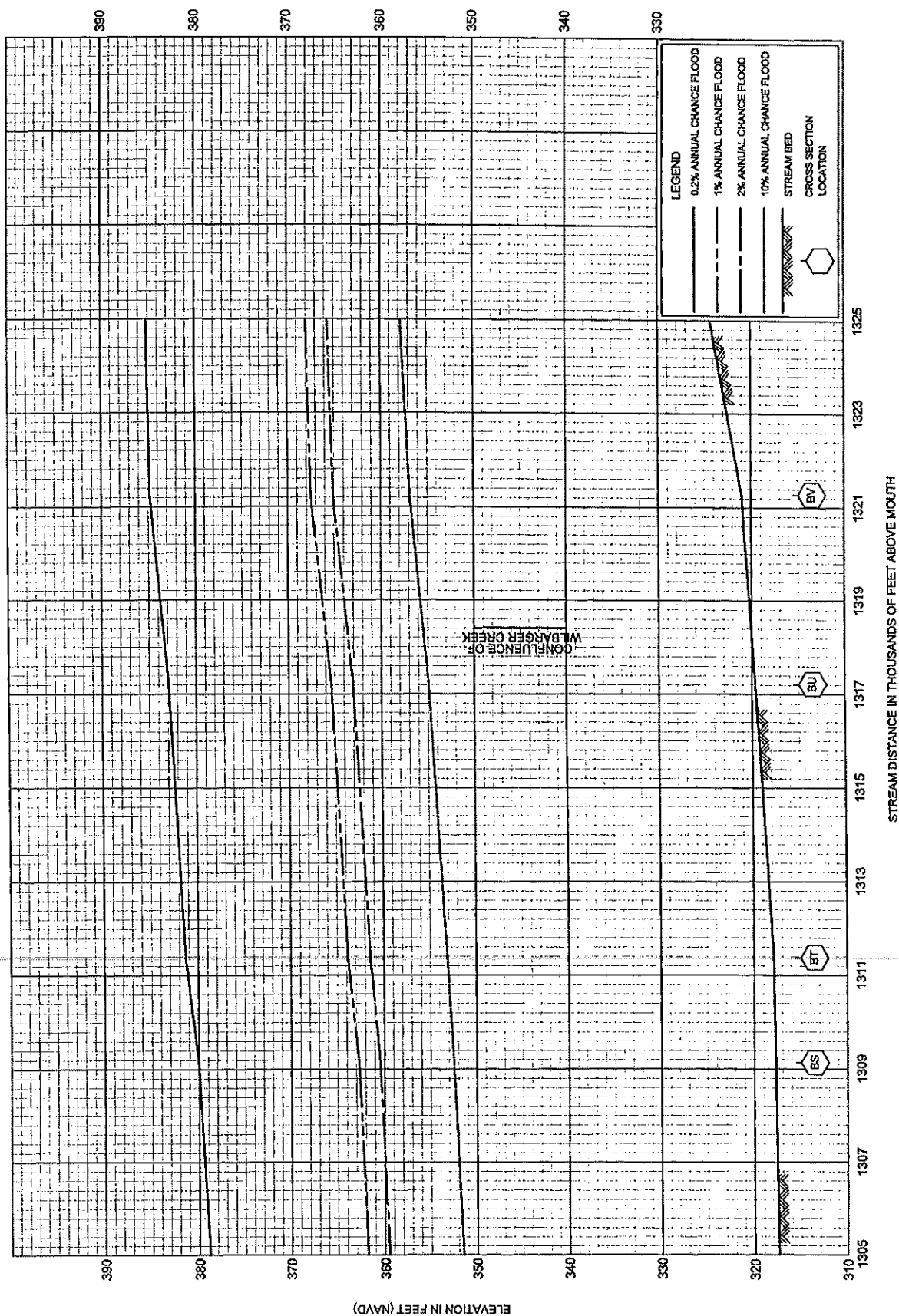
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

FLOOD PROFILES
 COLORADO RIVER



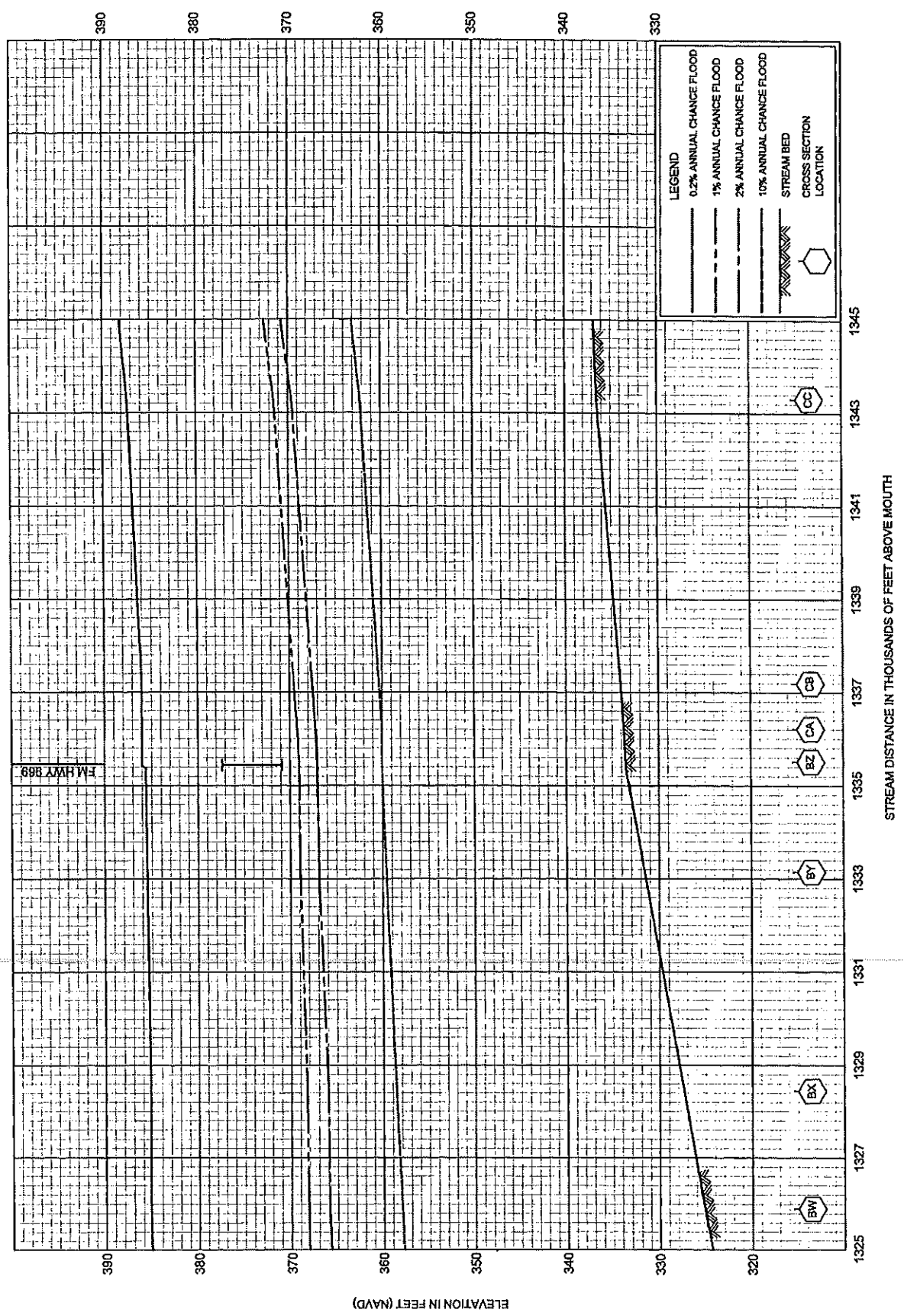
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

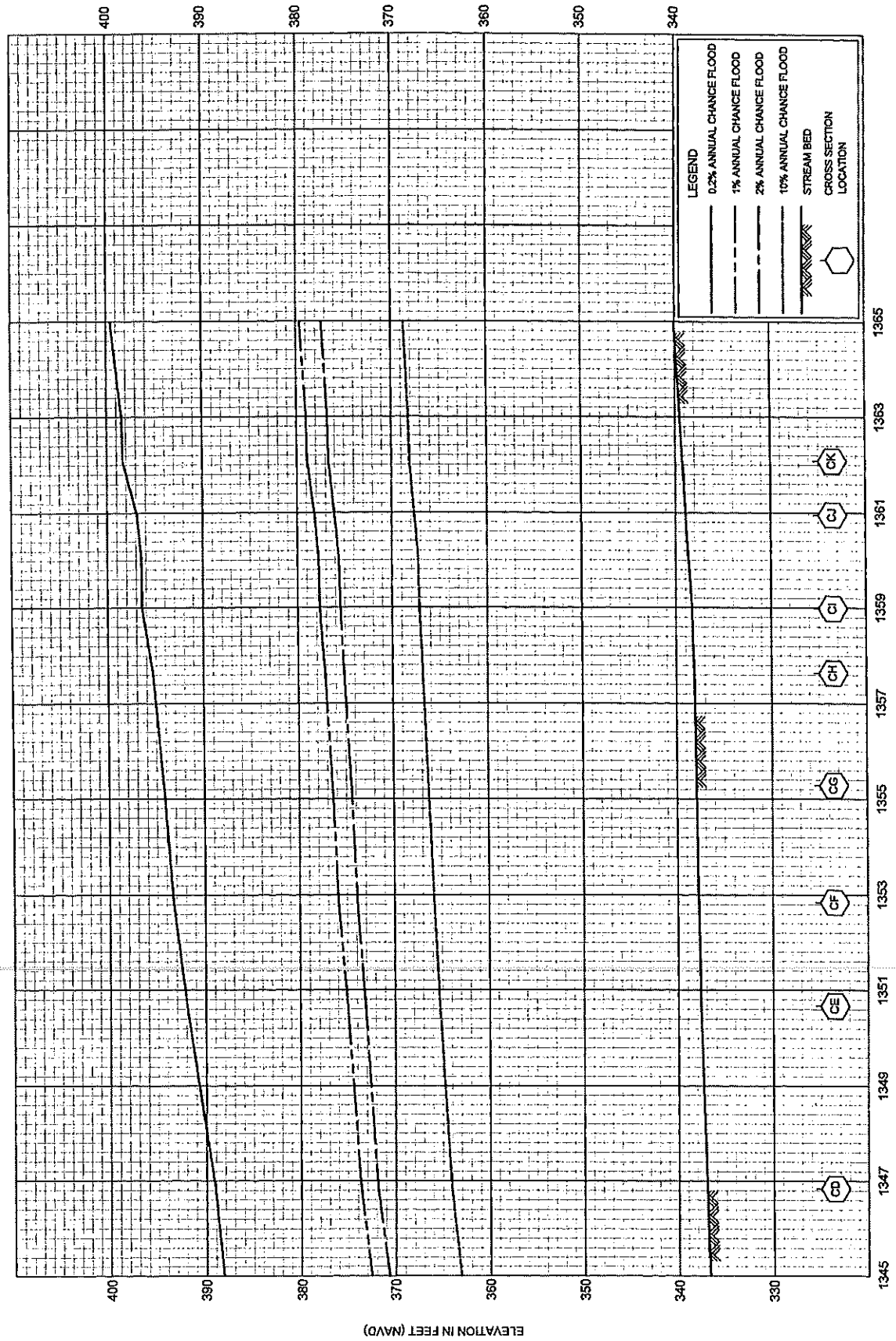
FLOOD PROFILES
 COLORADO RIVER



FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

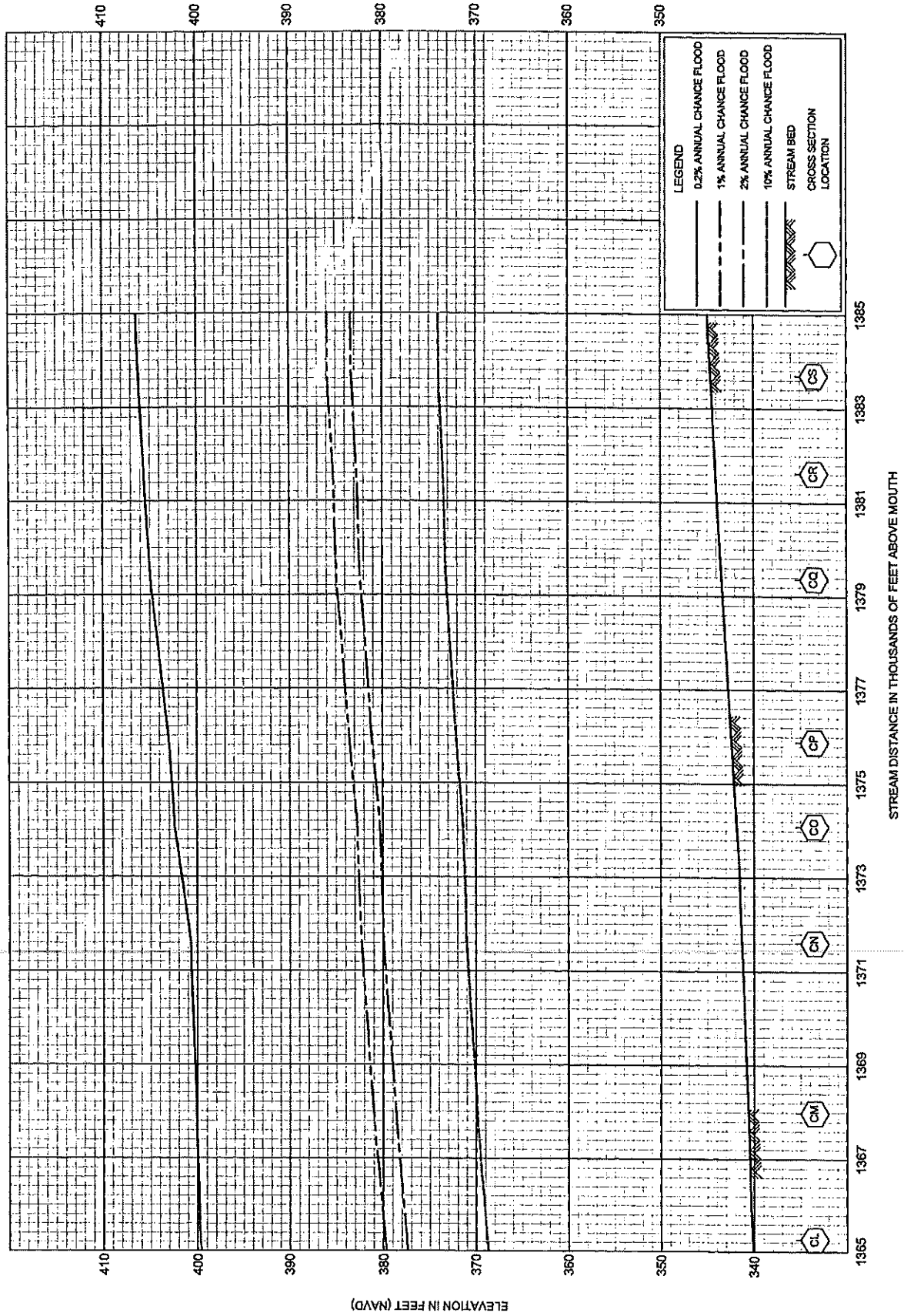
FLOOD PROFILES
 COLORADO RIVER





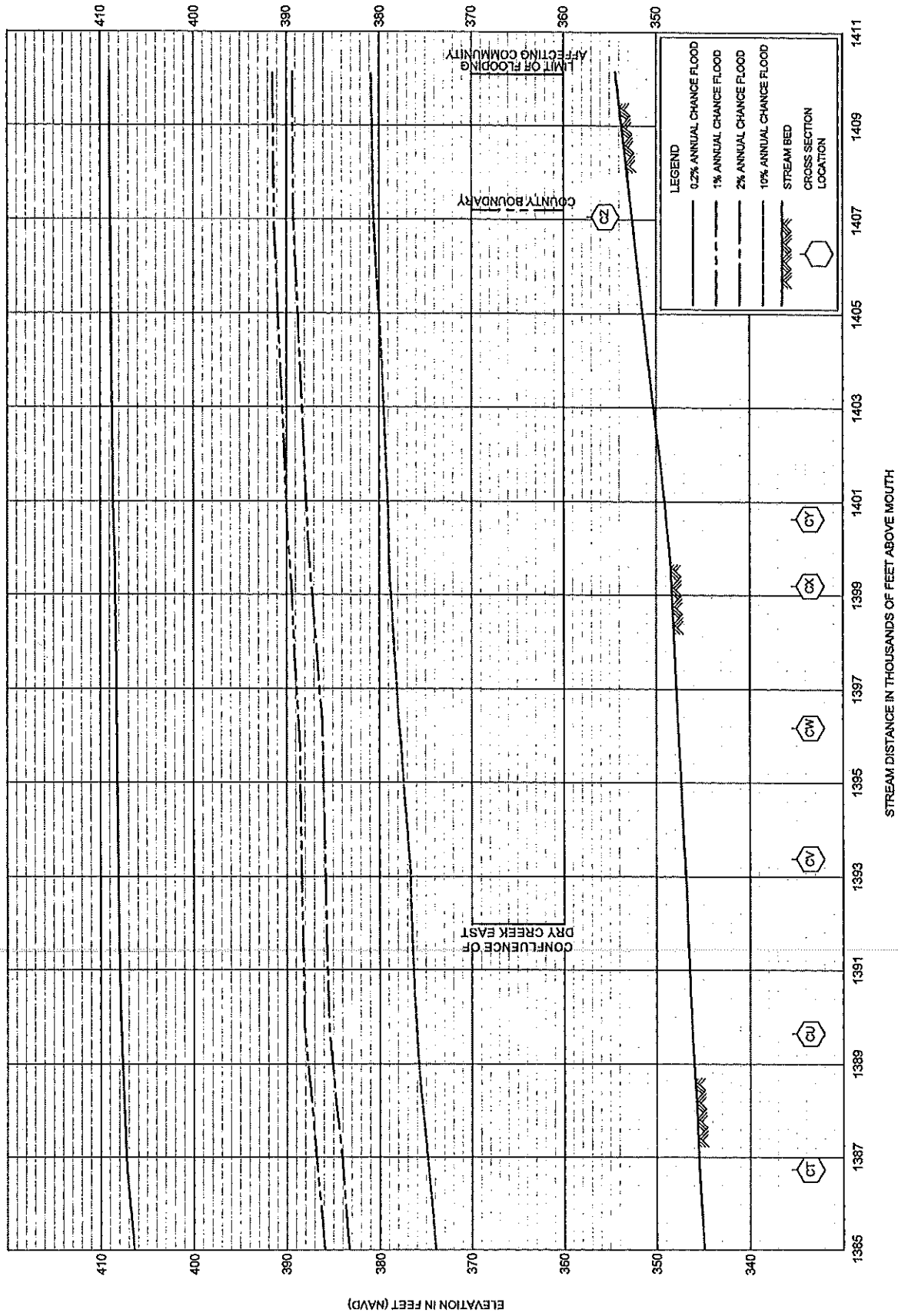
FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

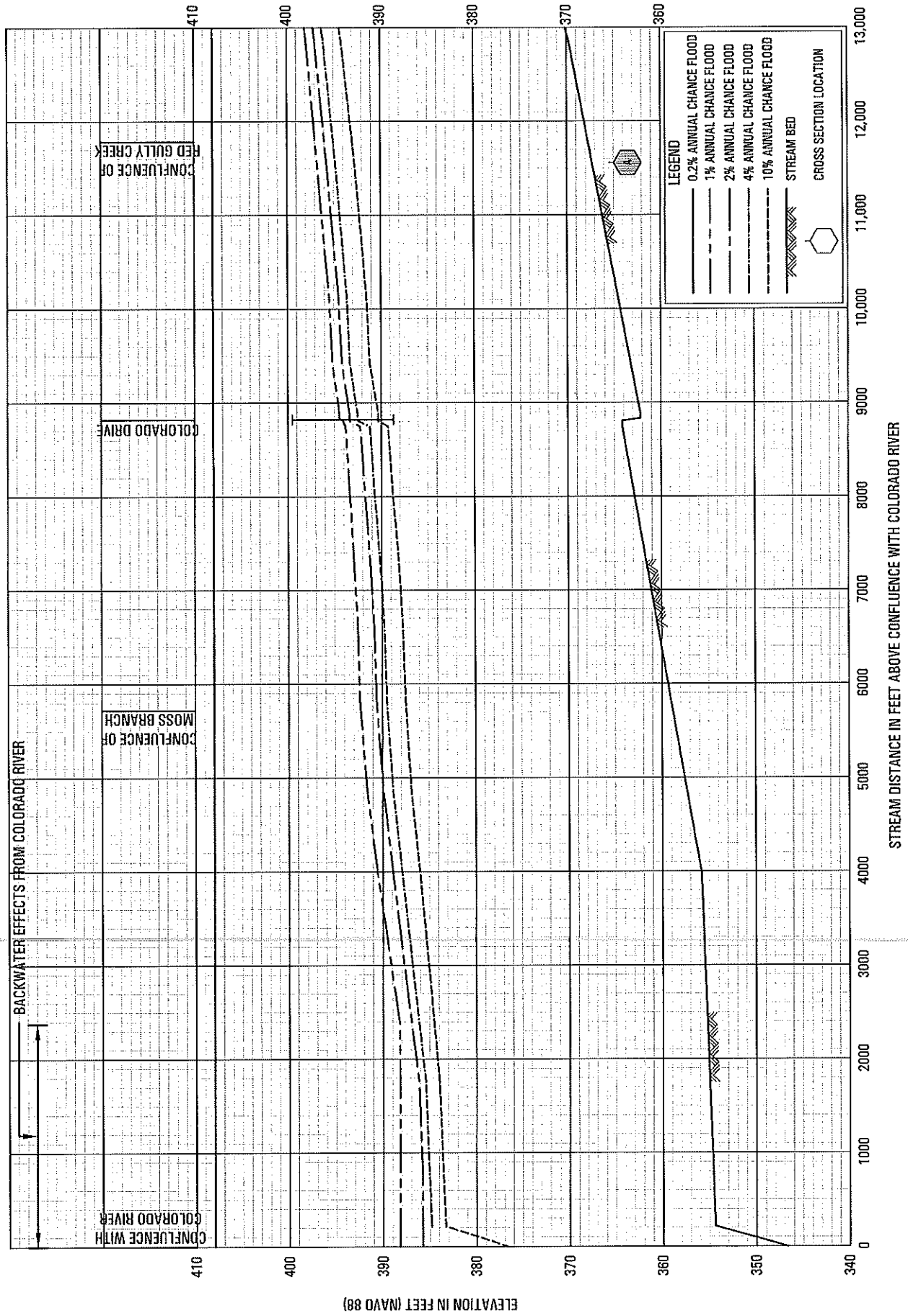
FLOOD PROFILES
COLORADO RIVER

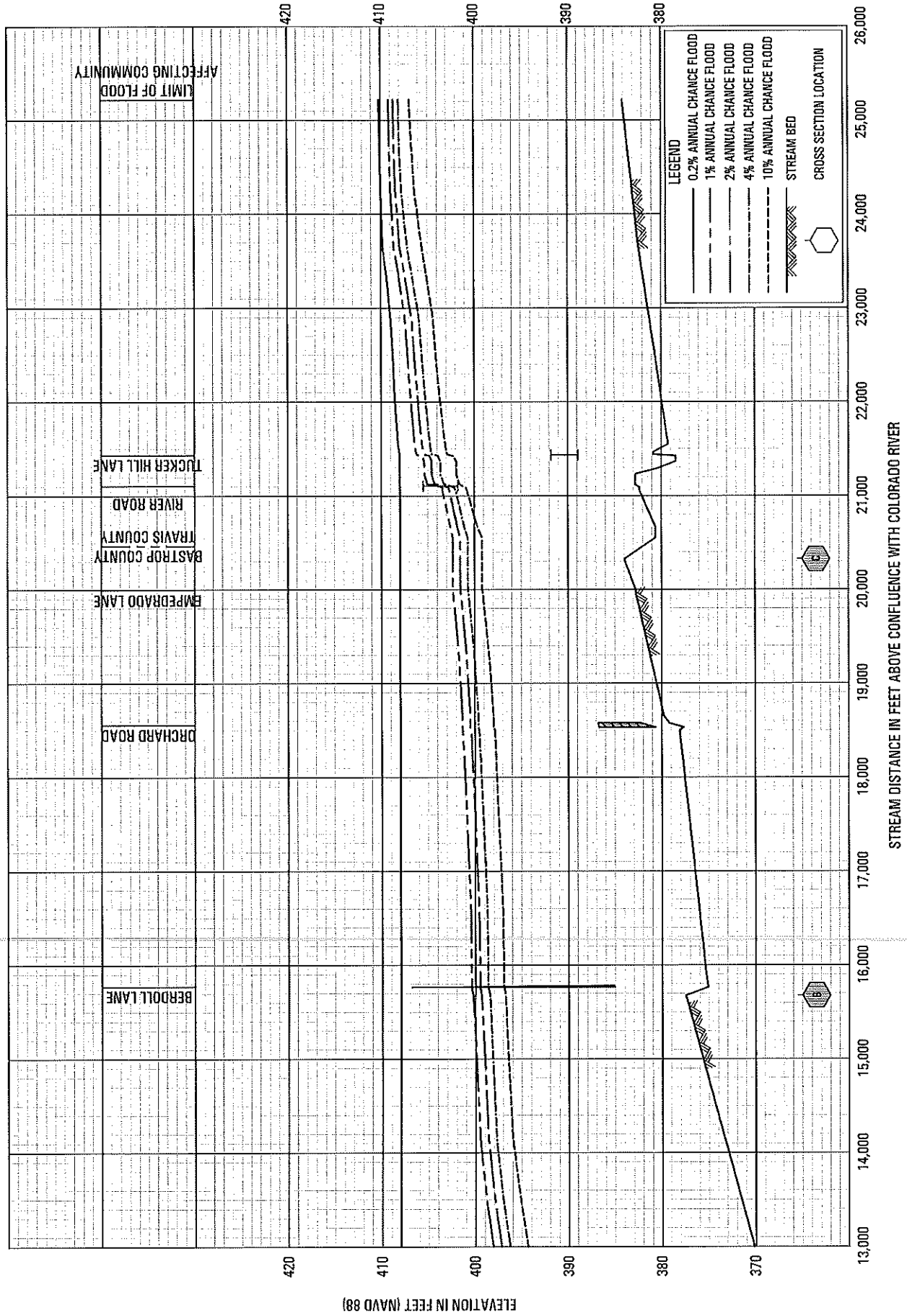


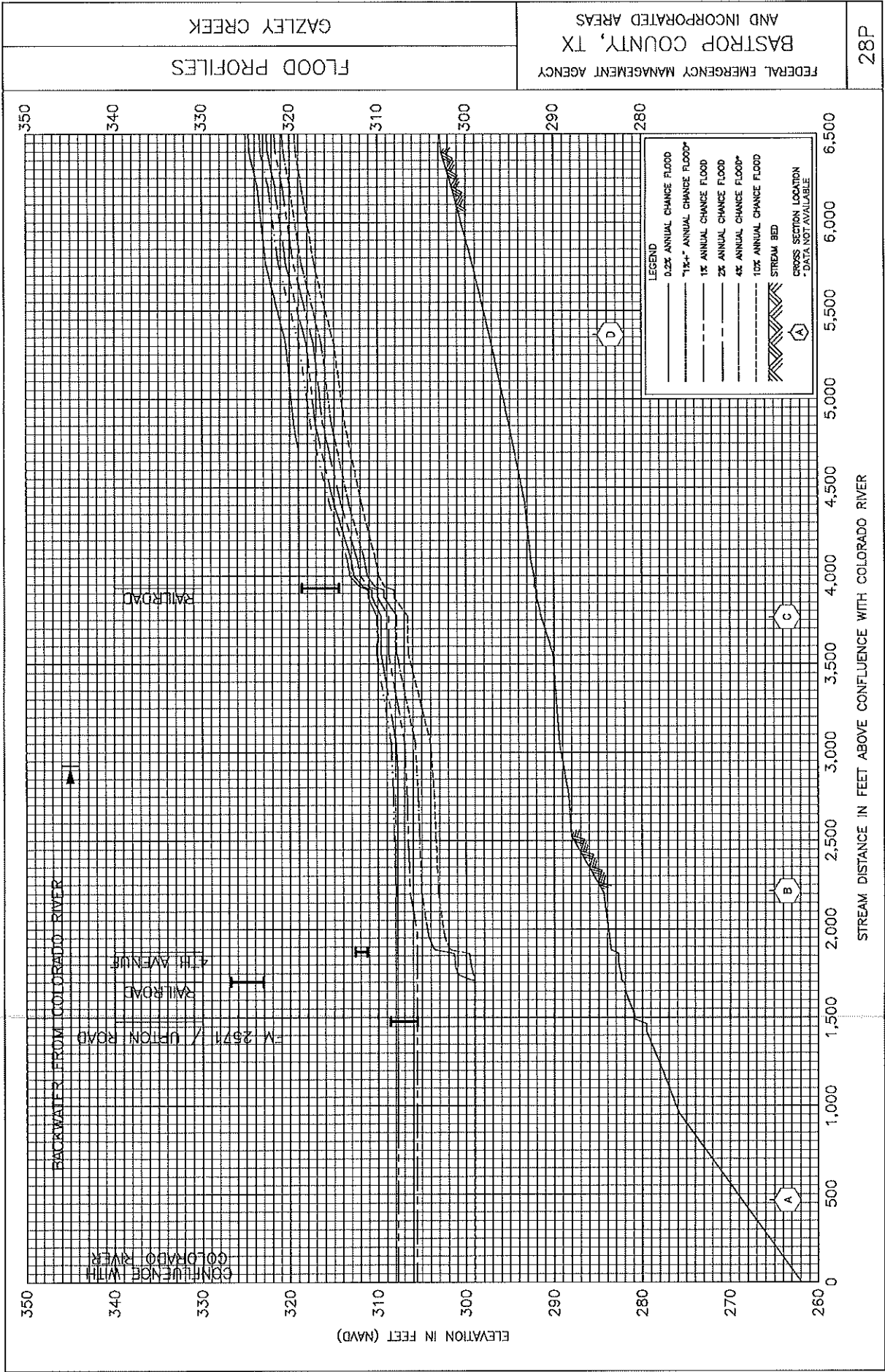
FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

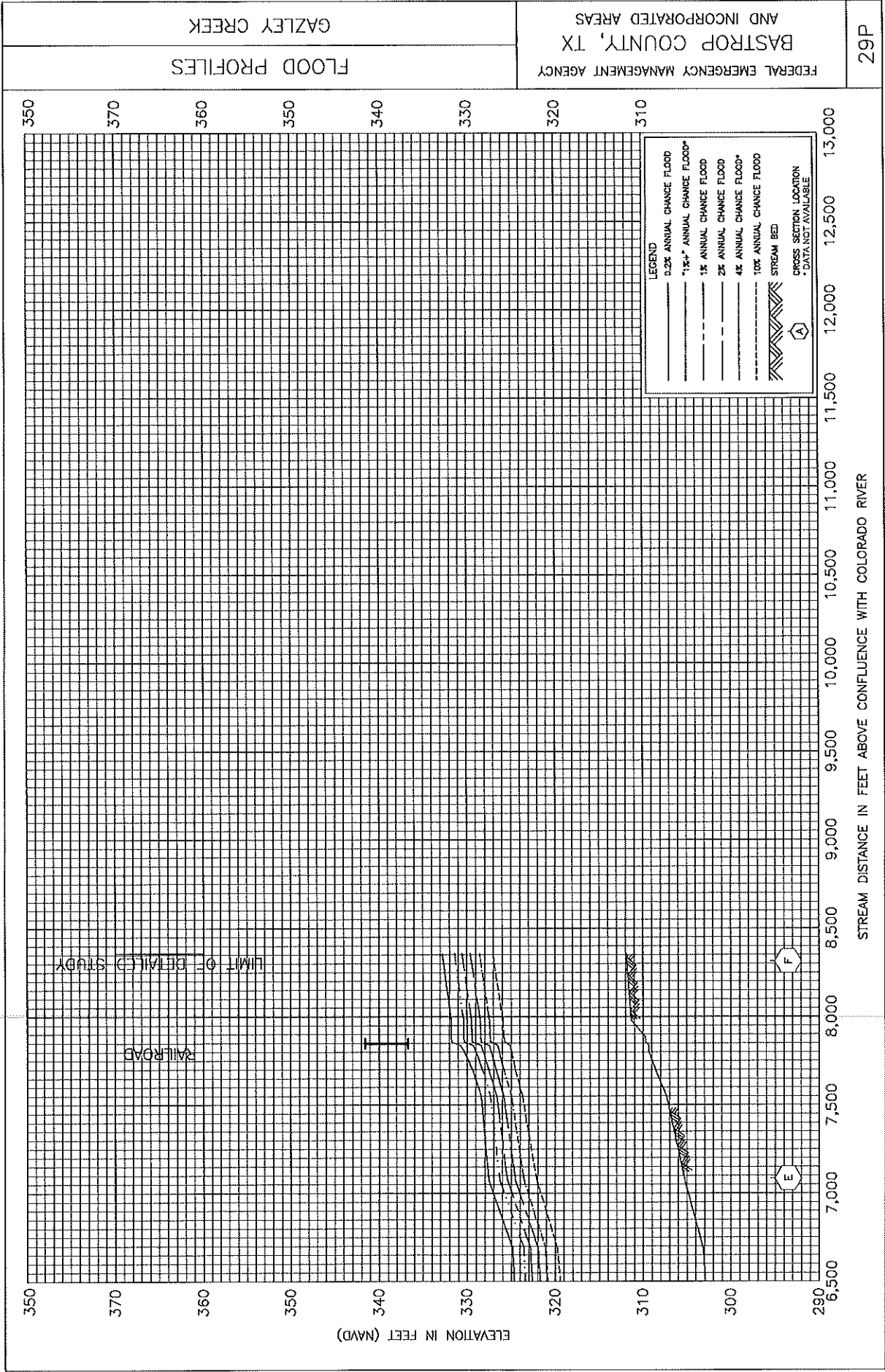
FLOOD PROFILES
COLORADO RIVER

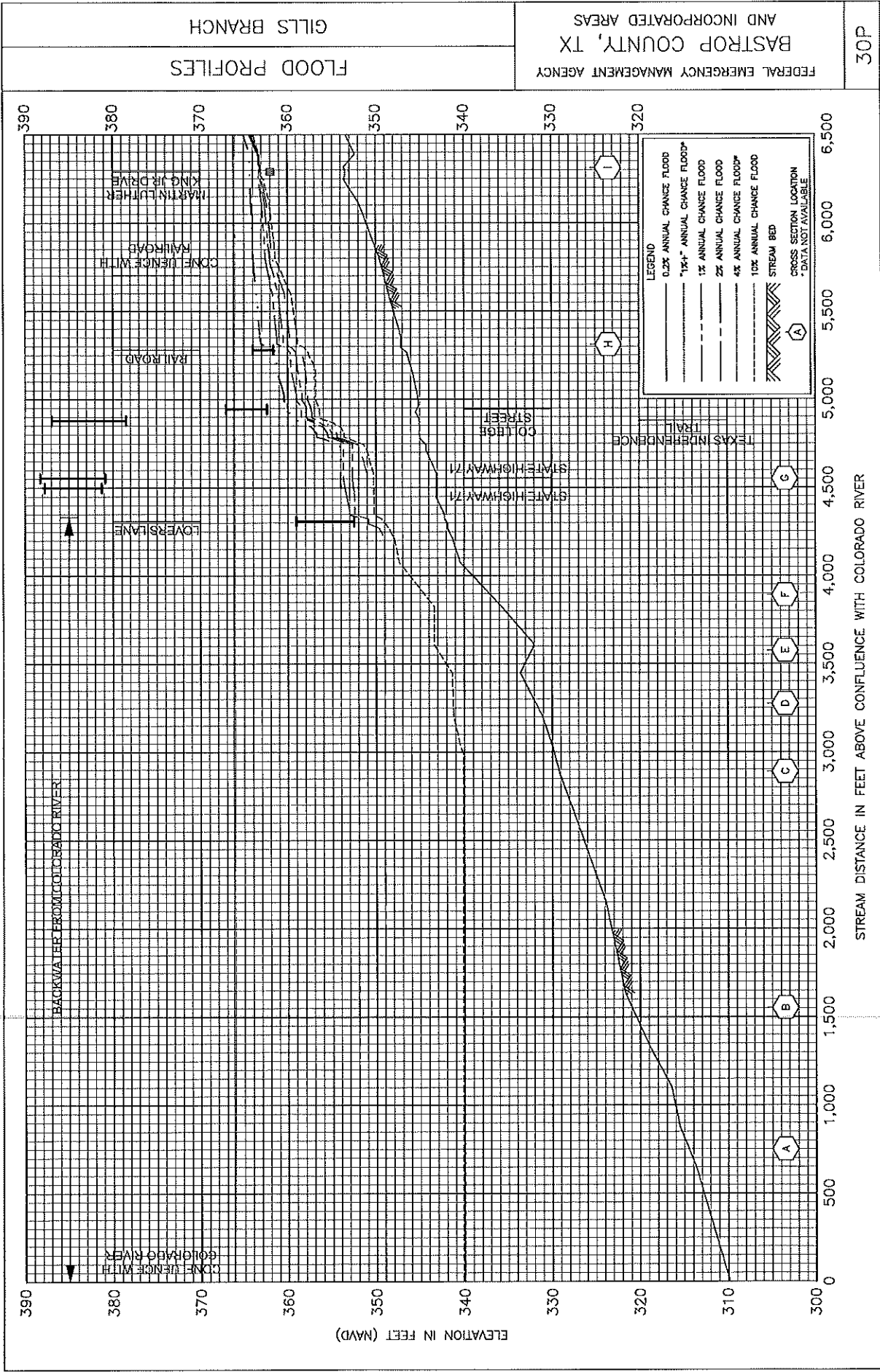


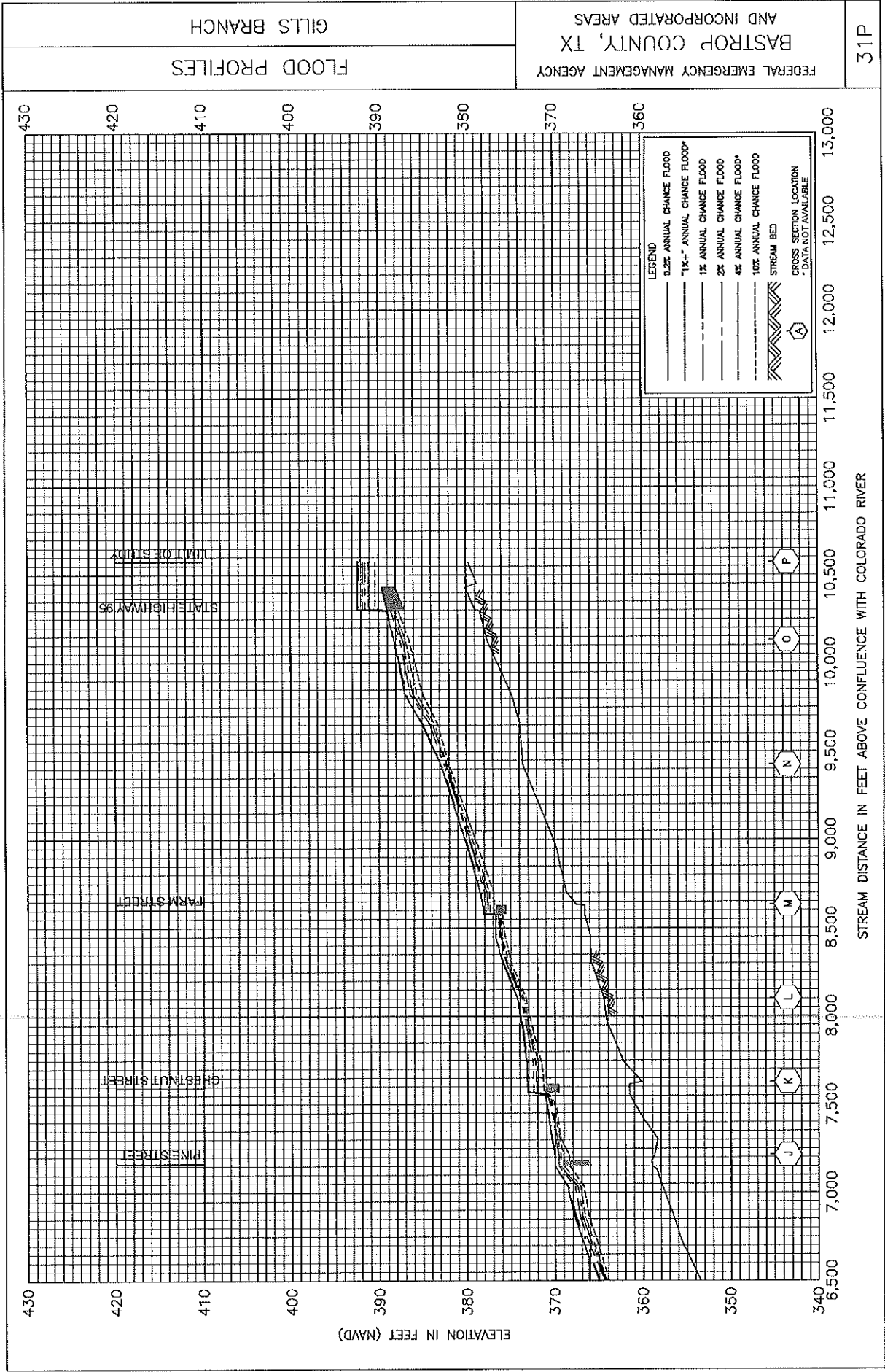


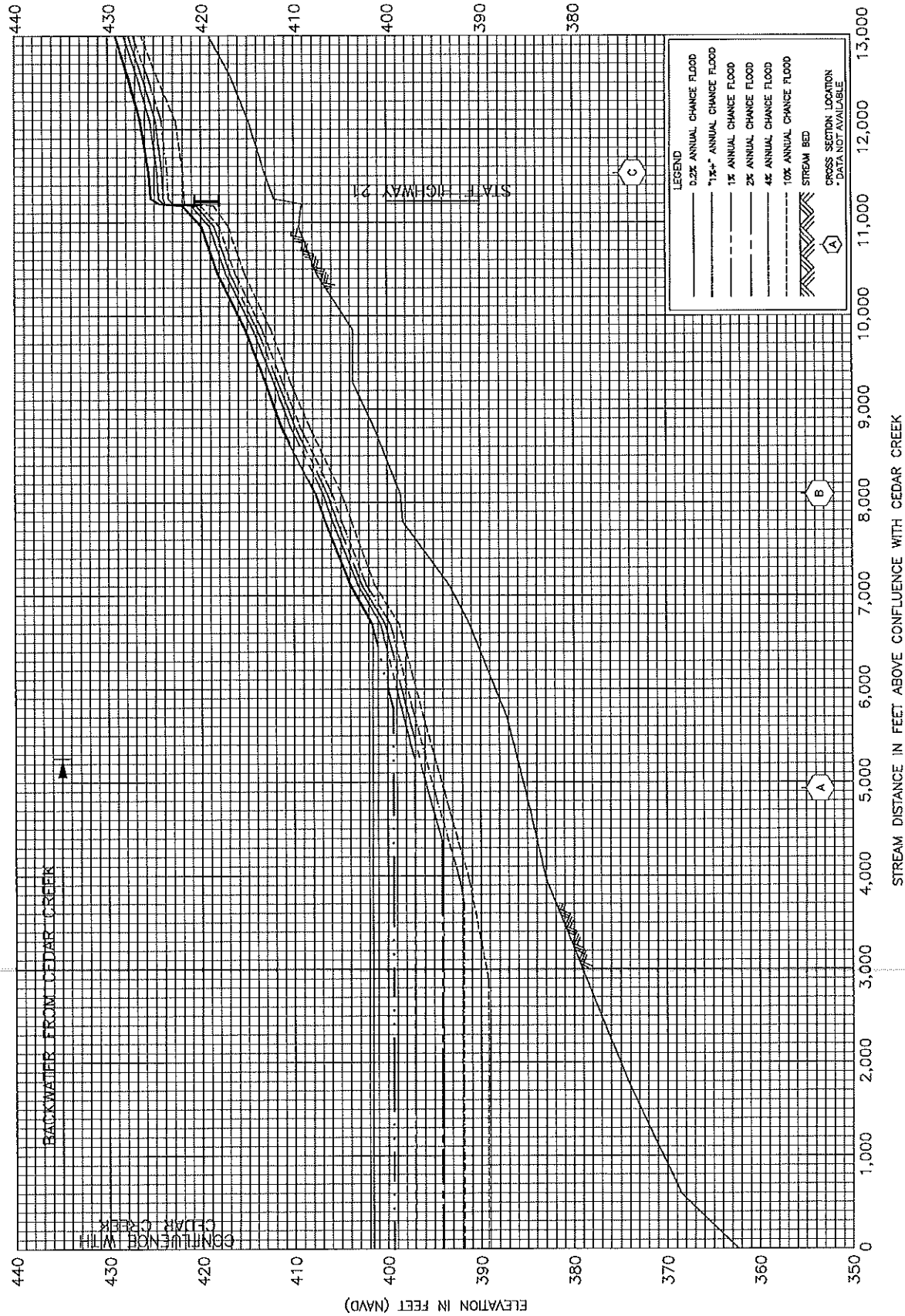


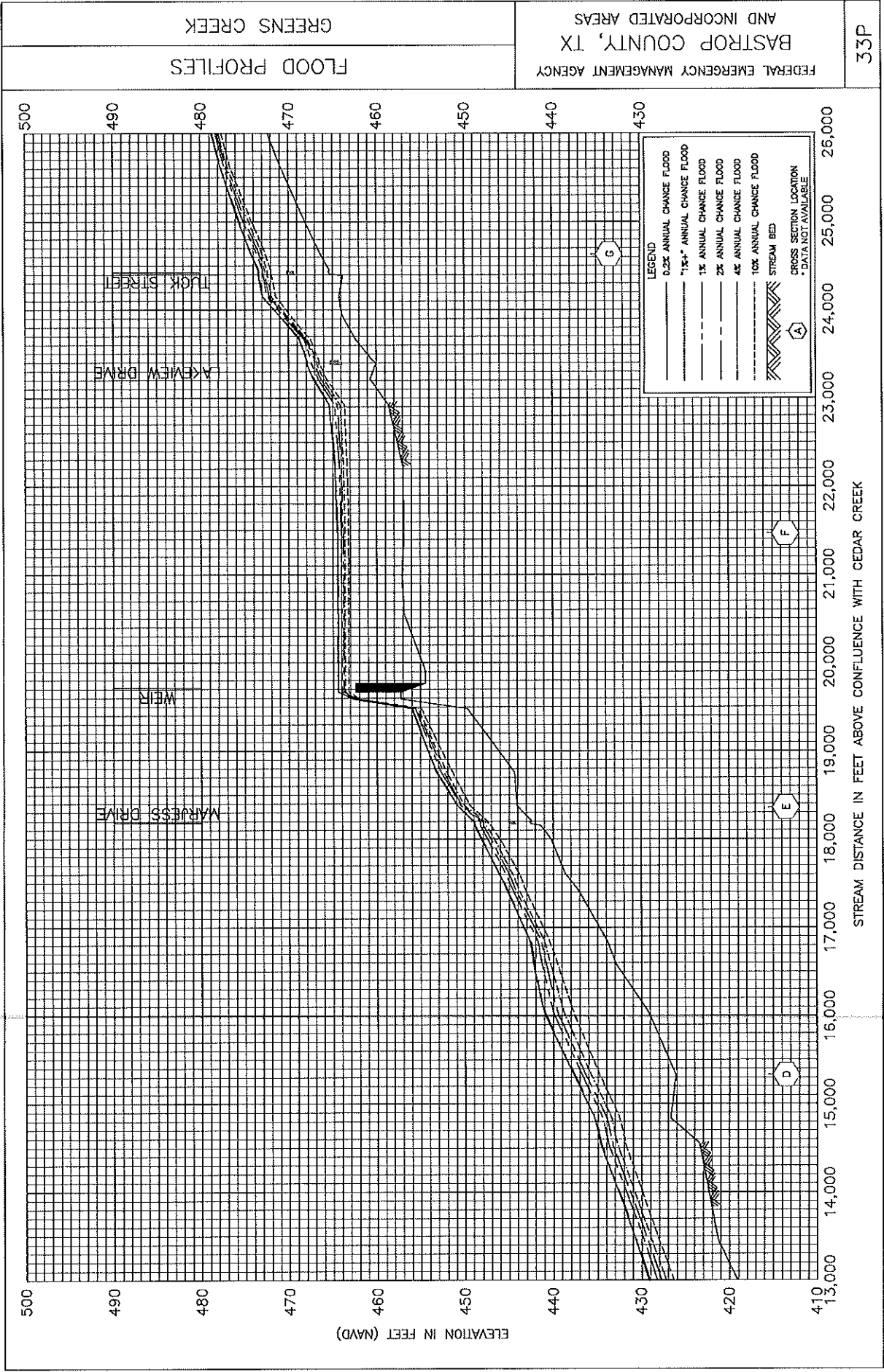


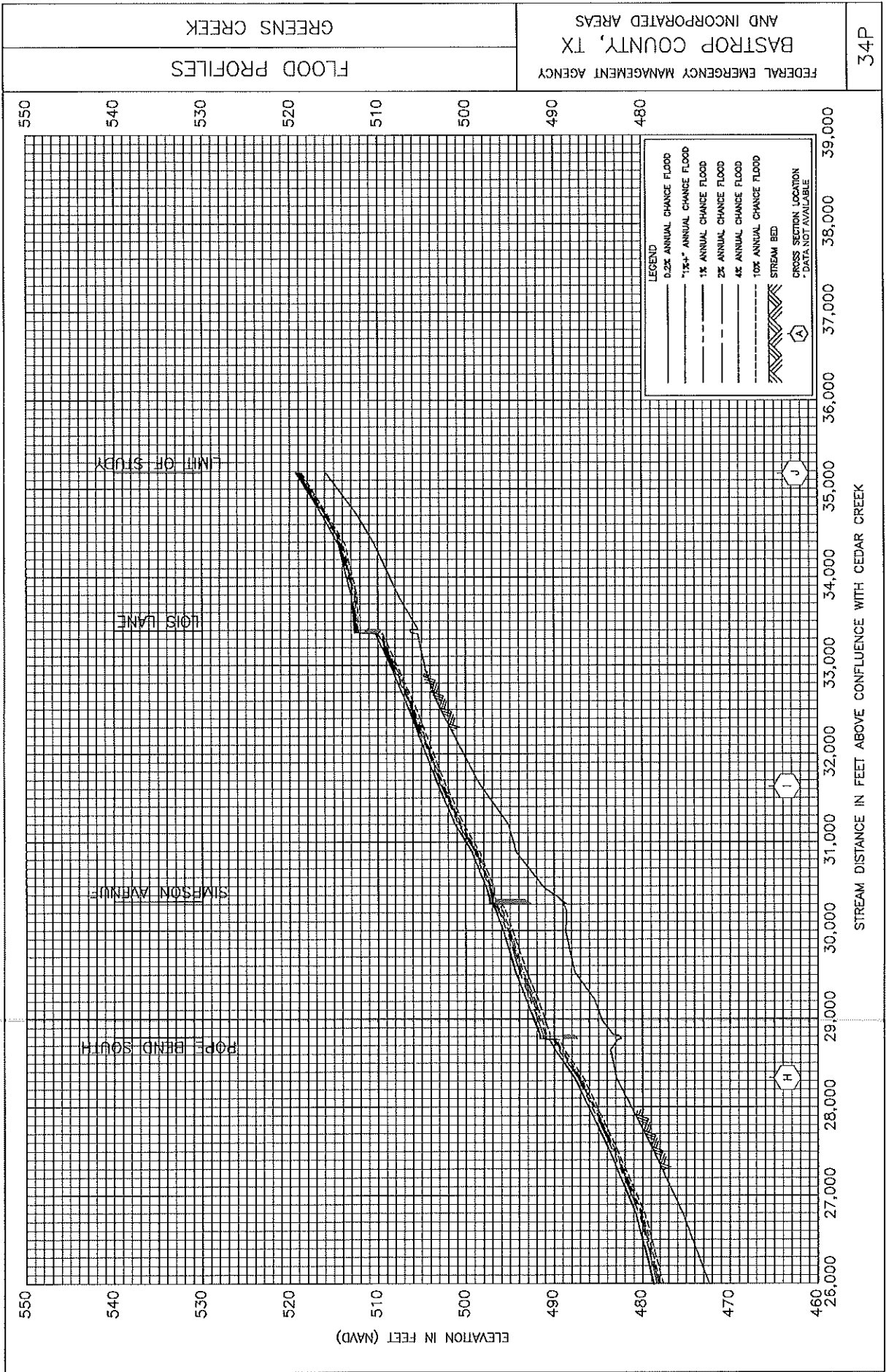


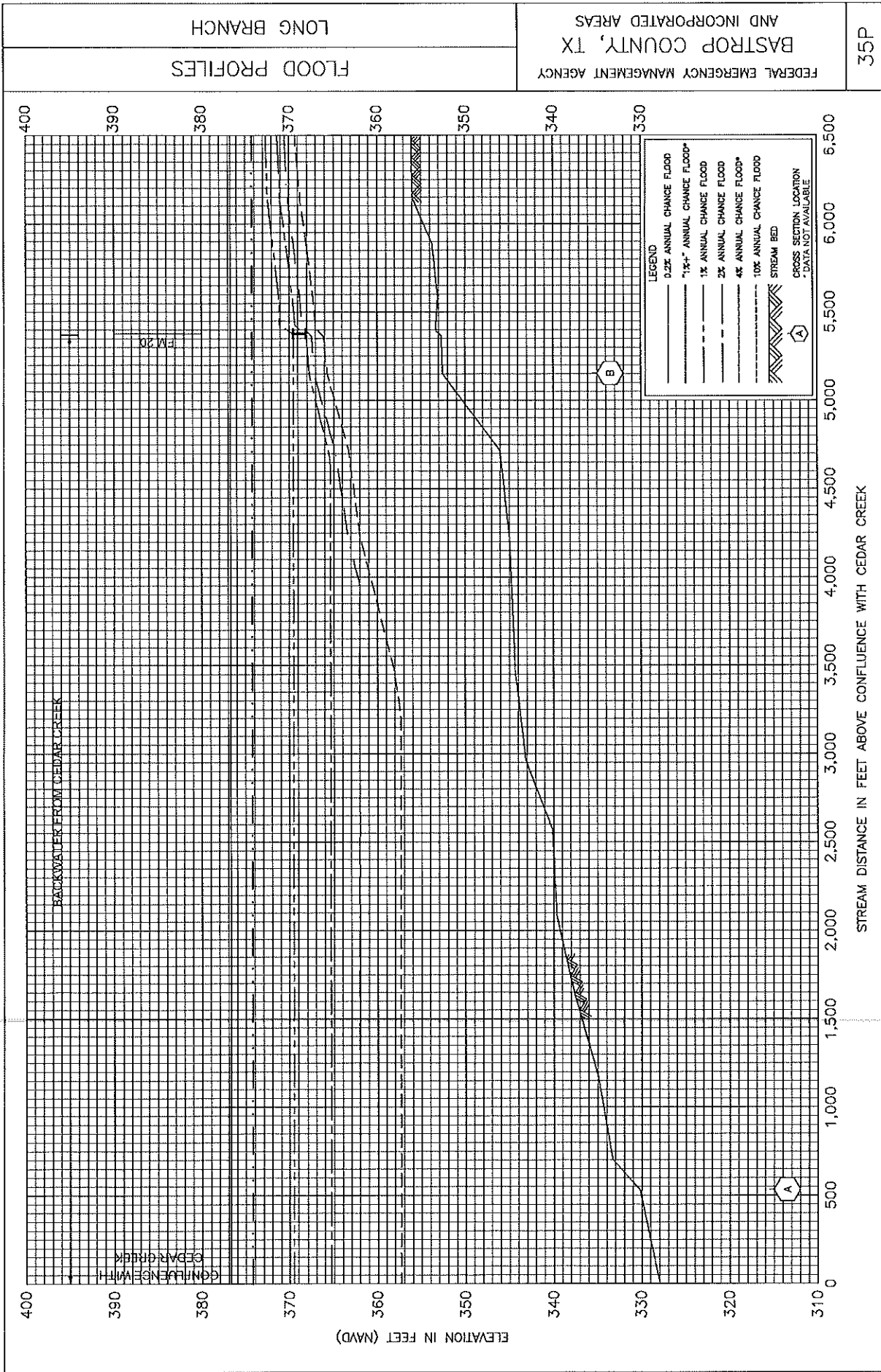


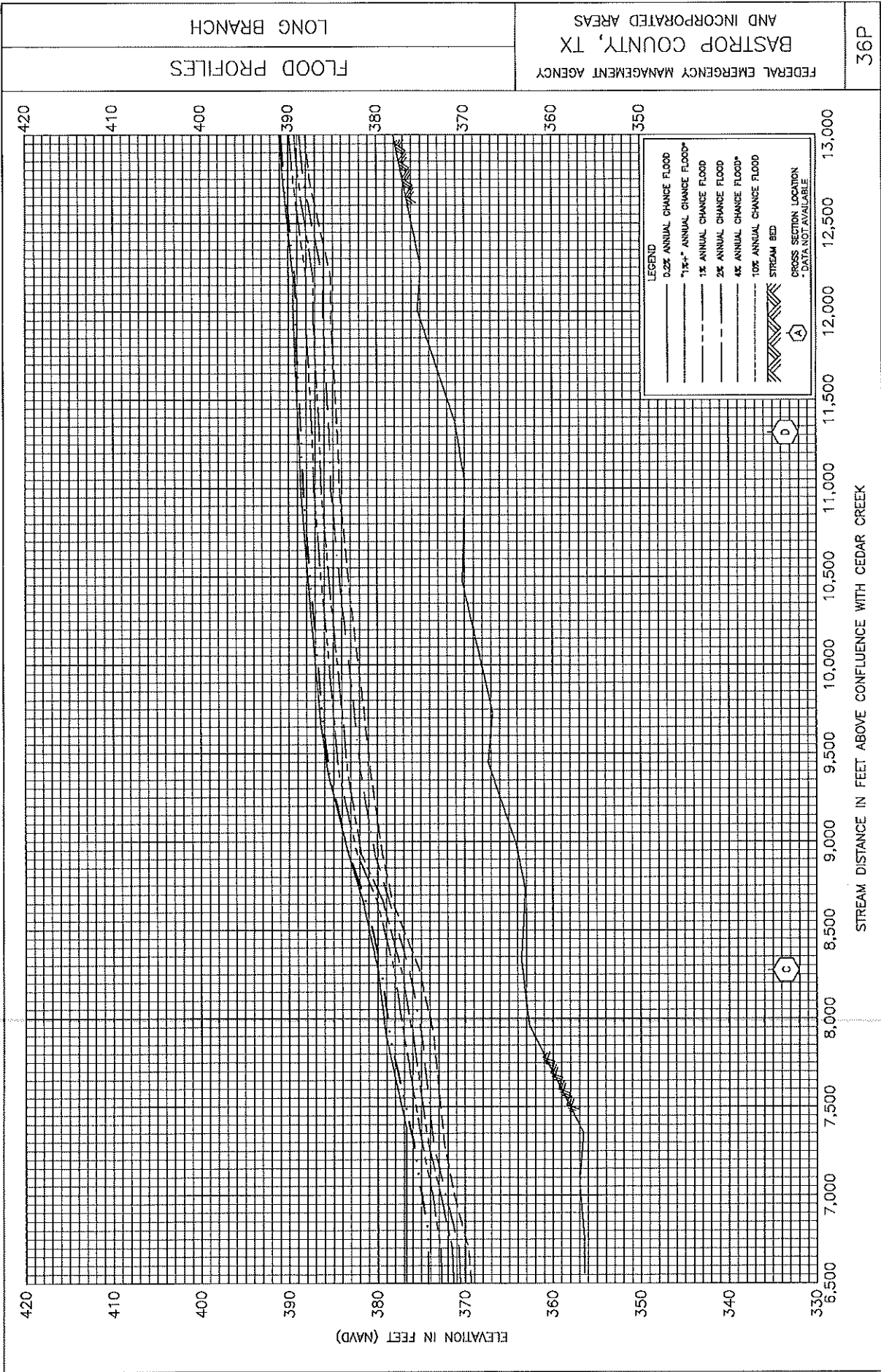


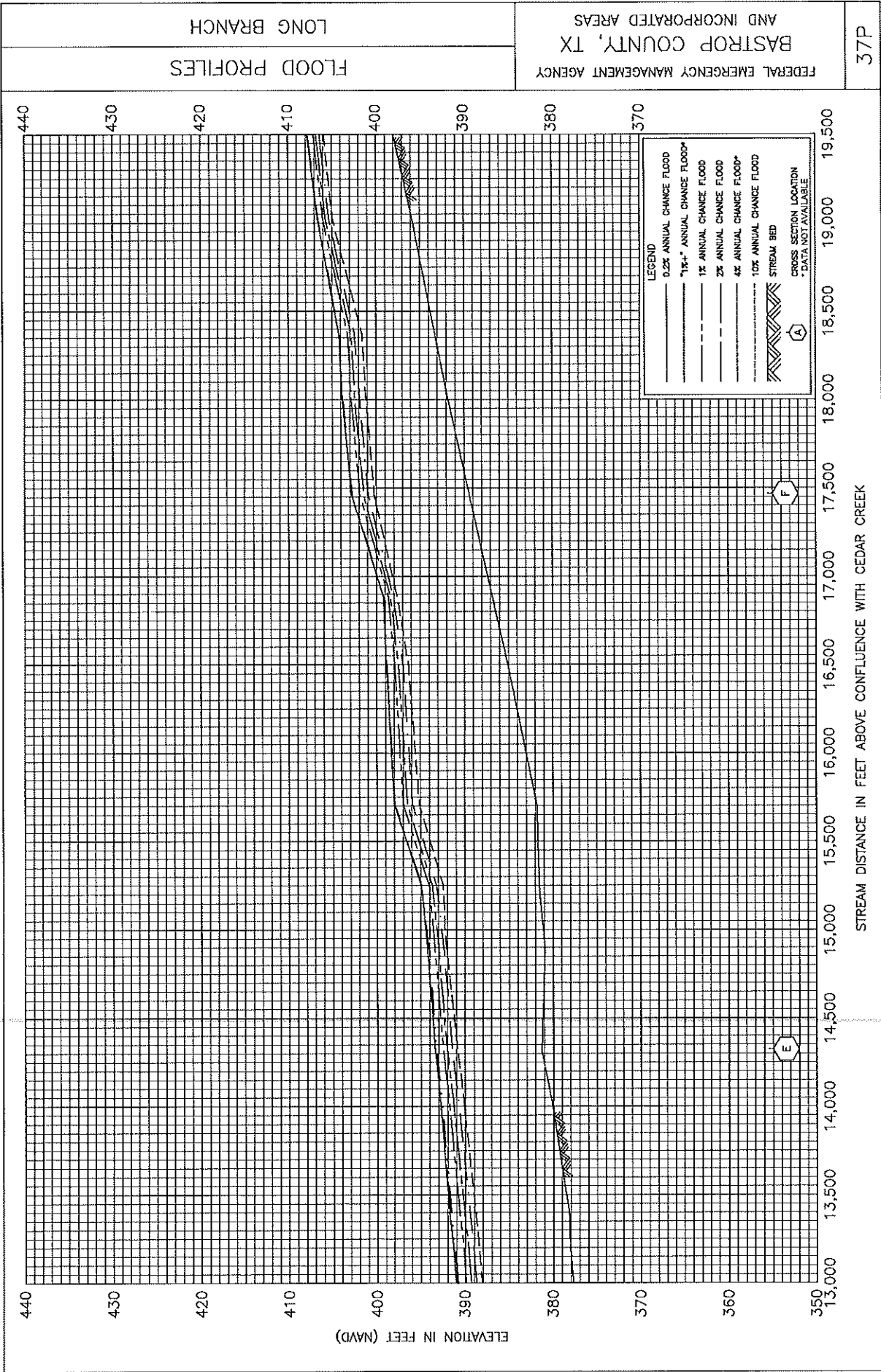


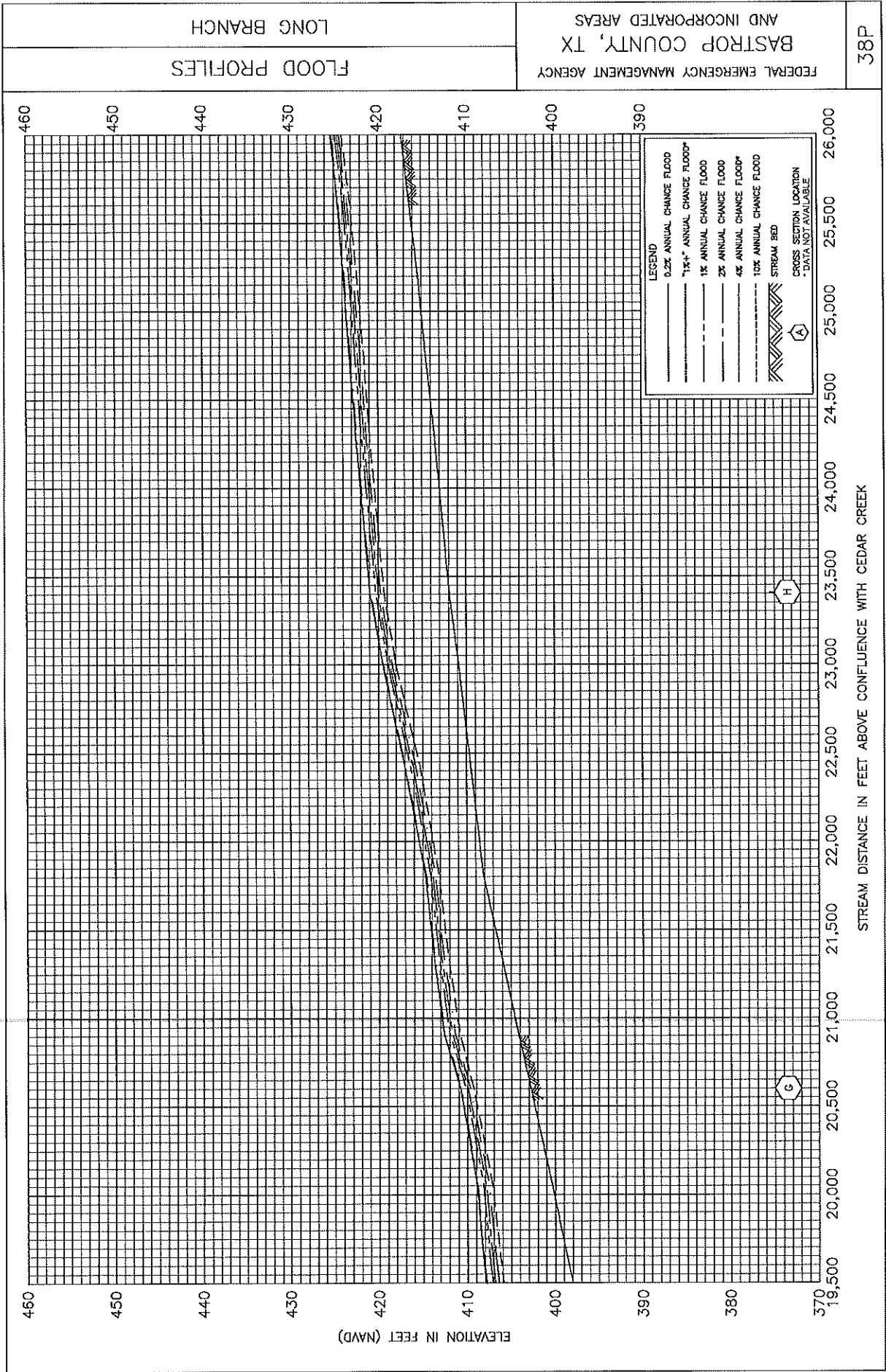


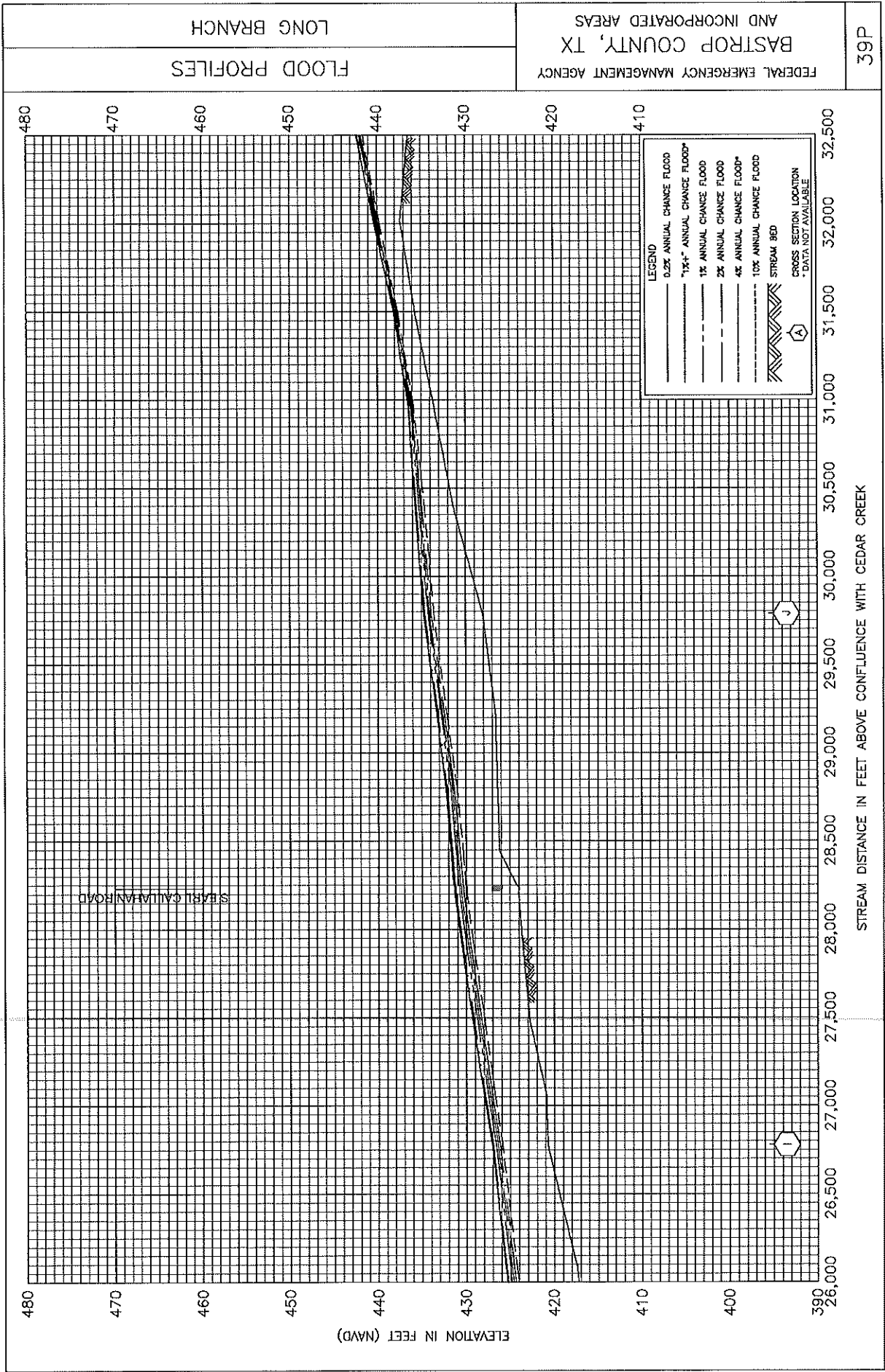


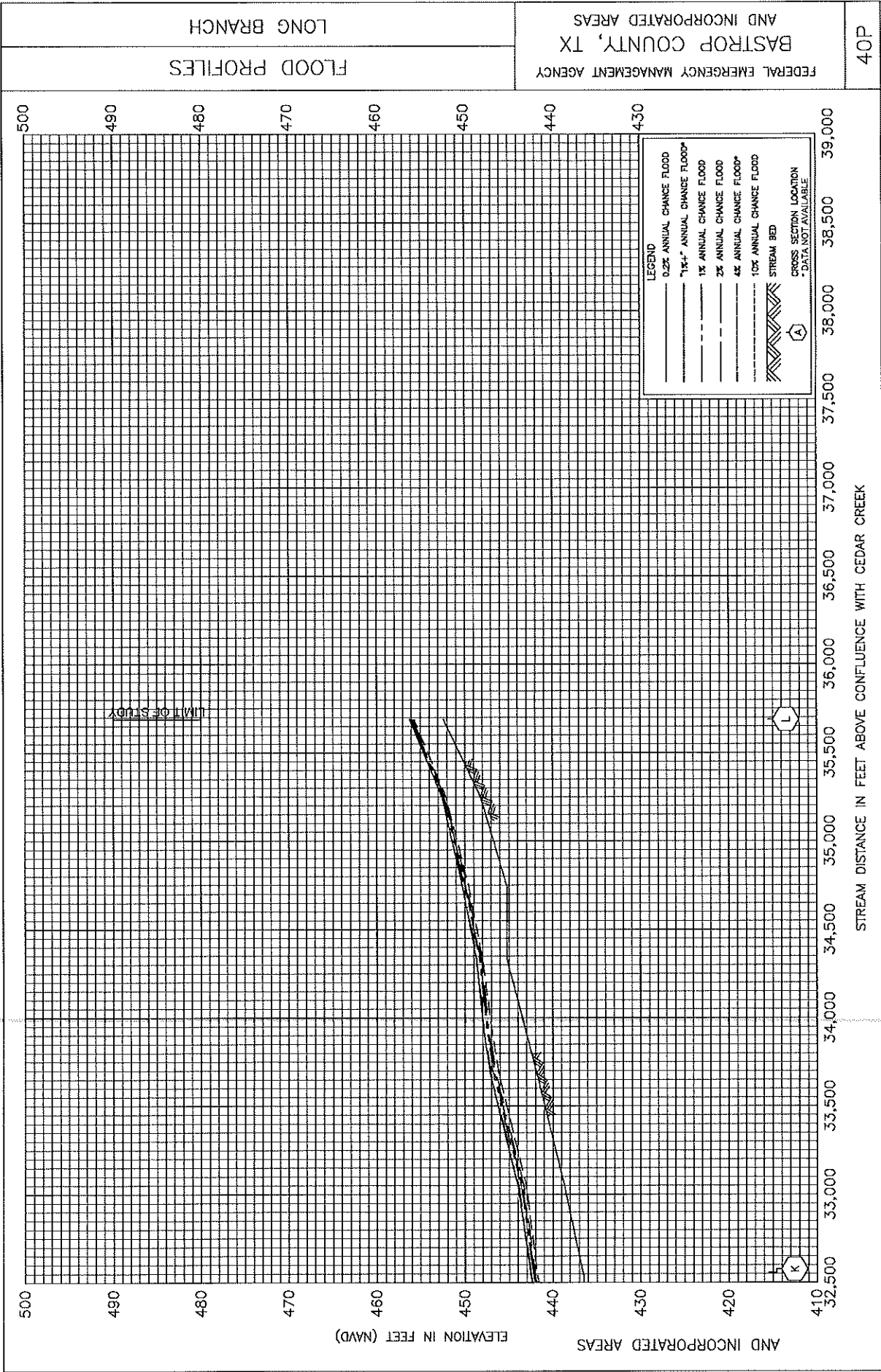


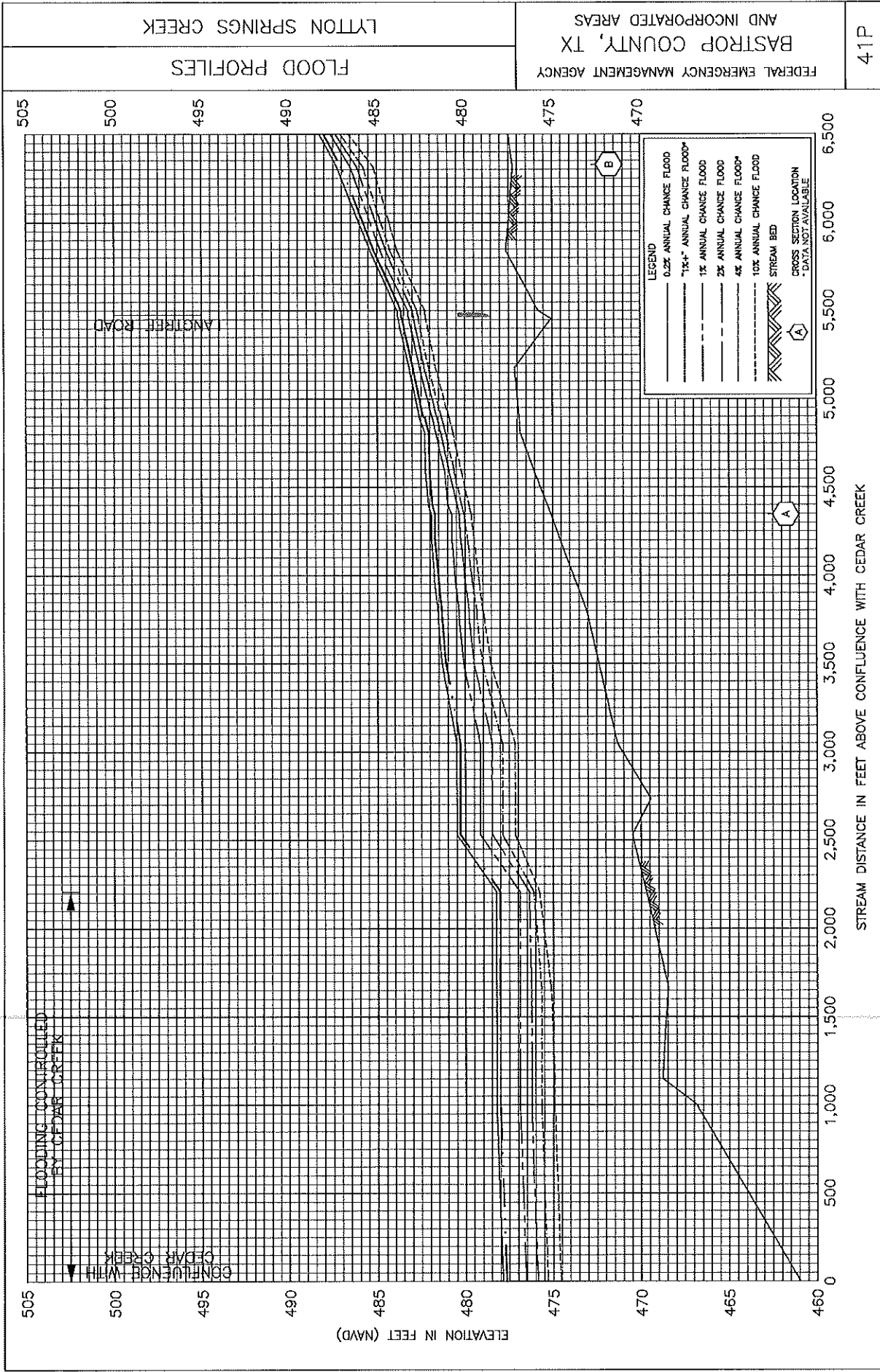


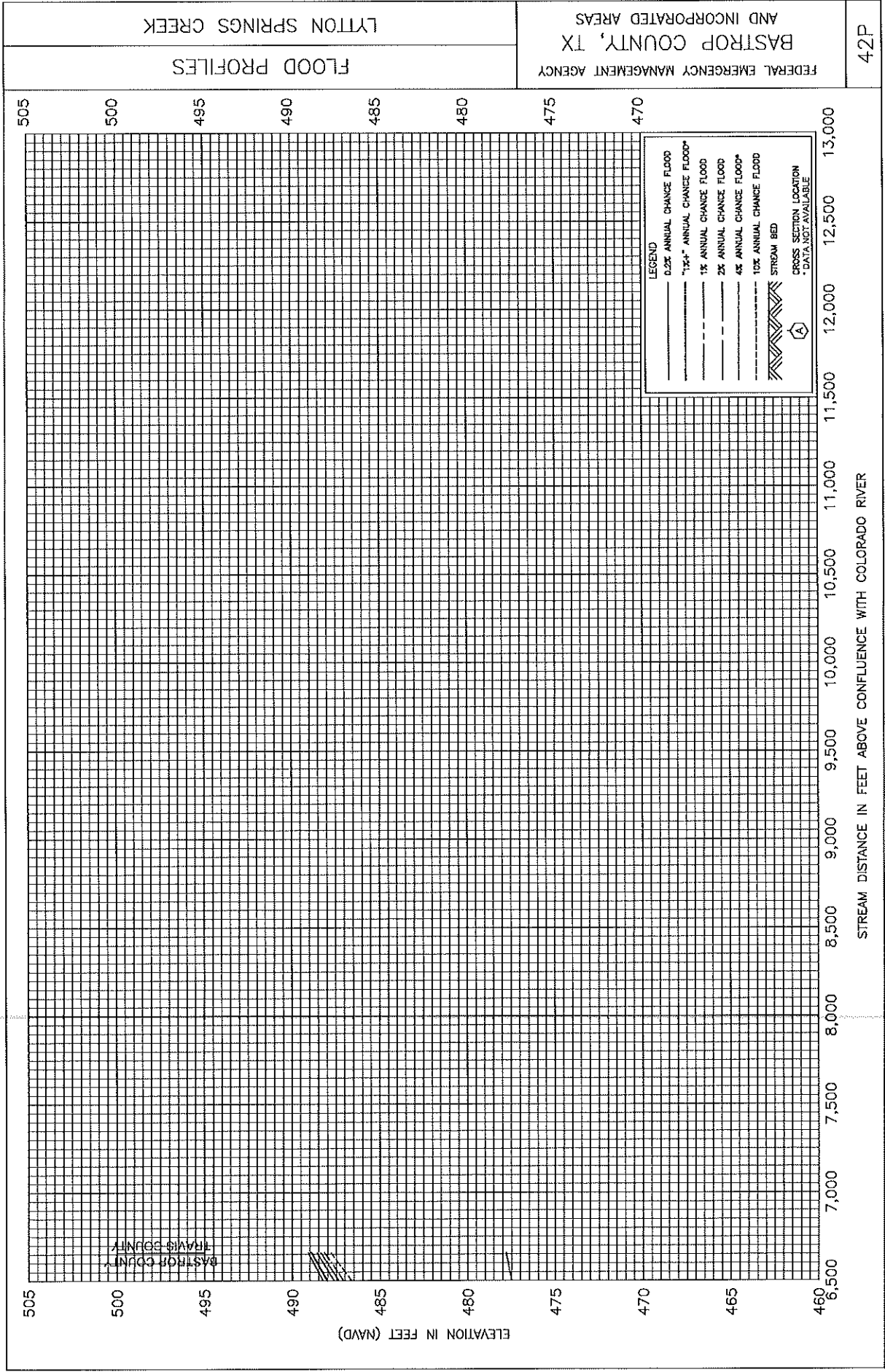


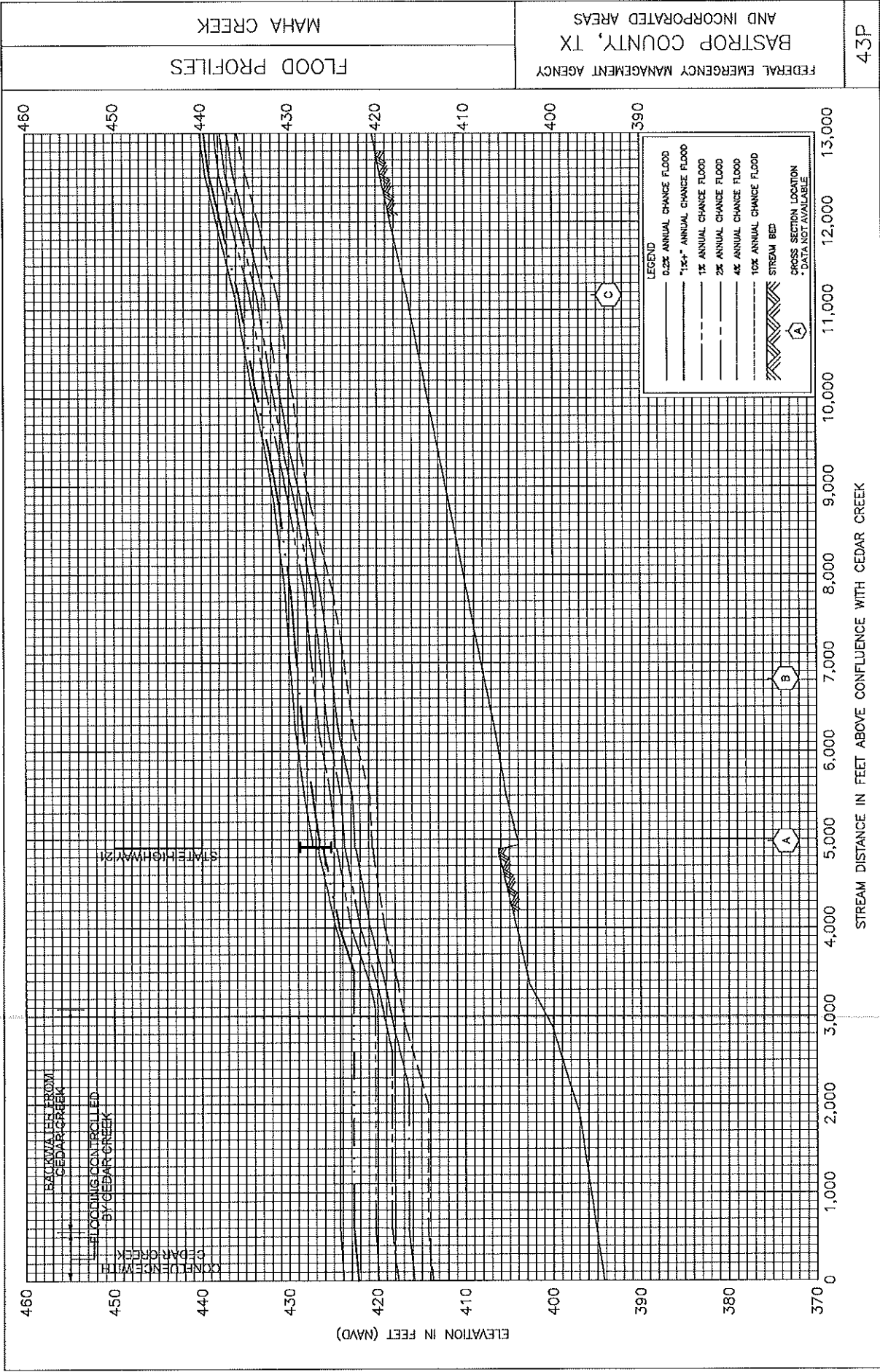


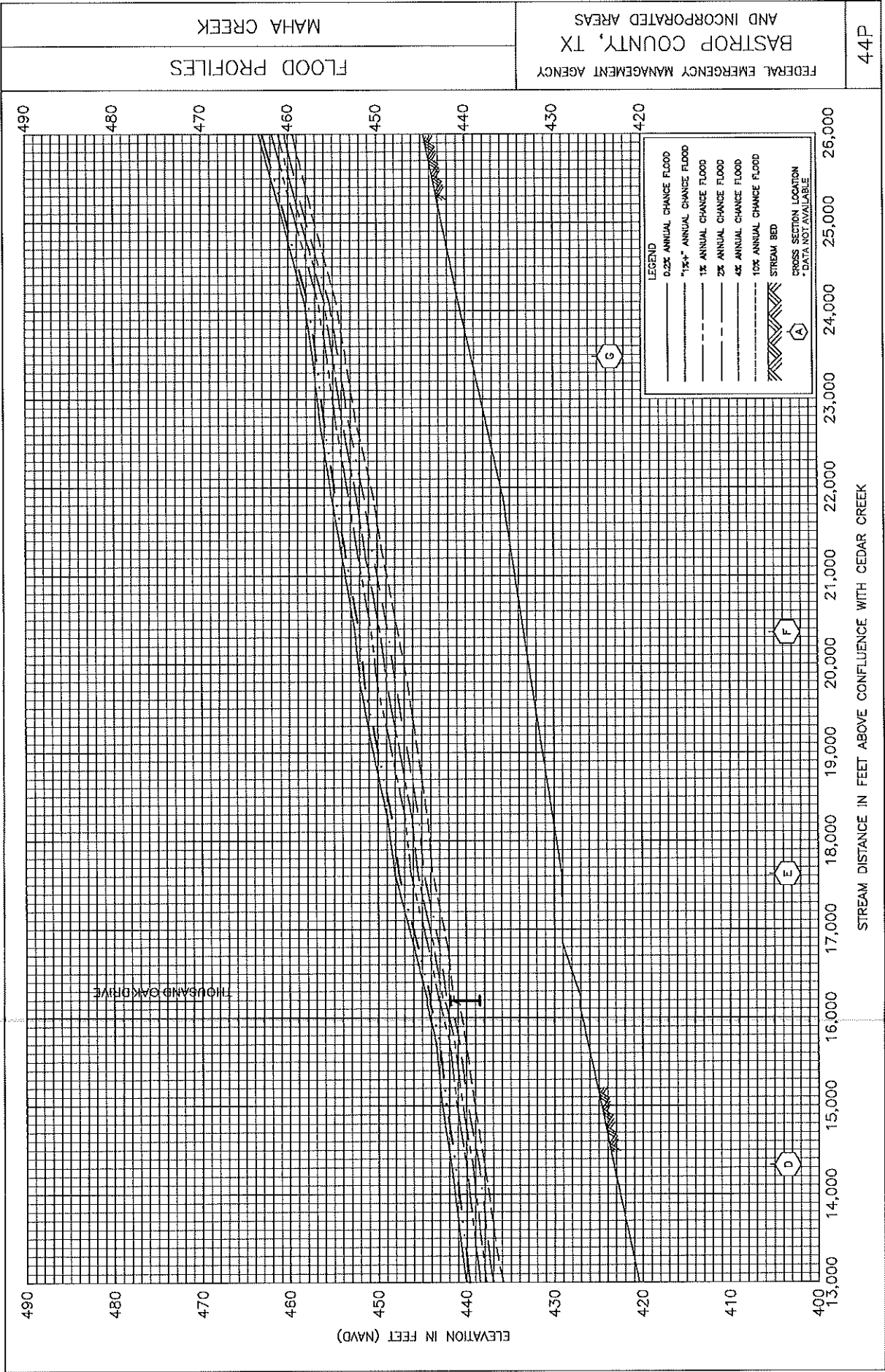


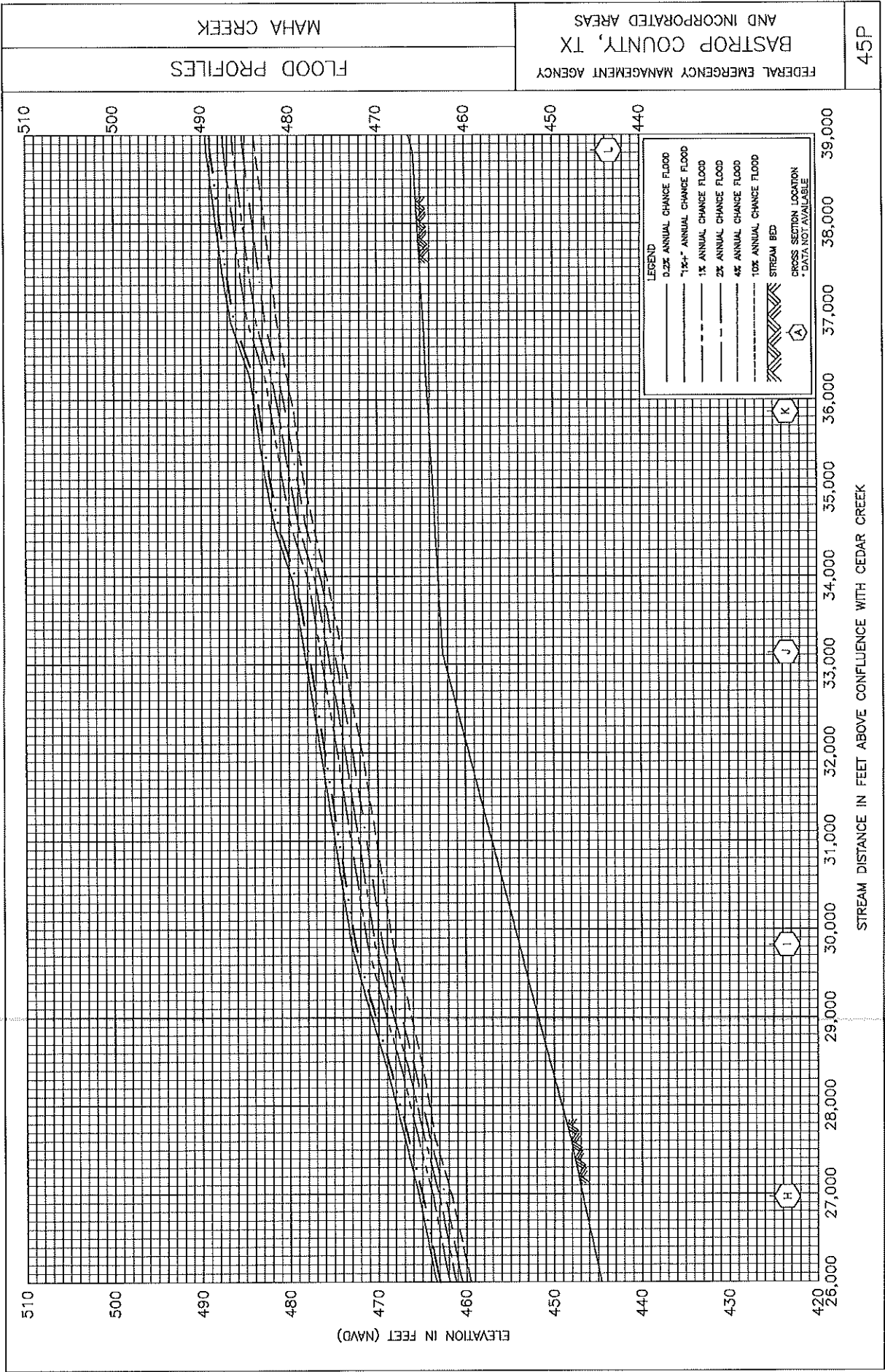


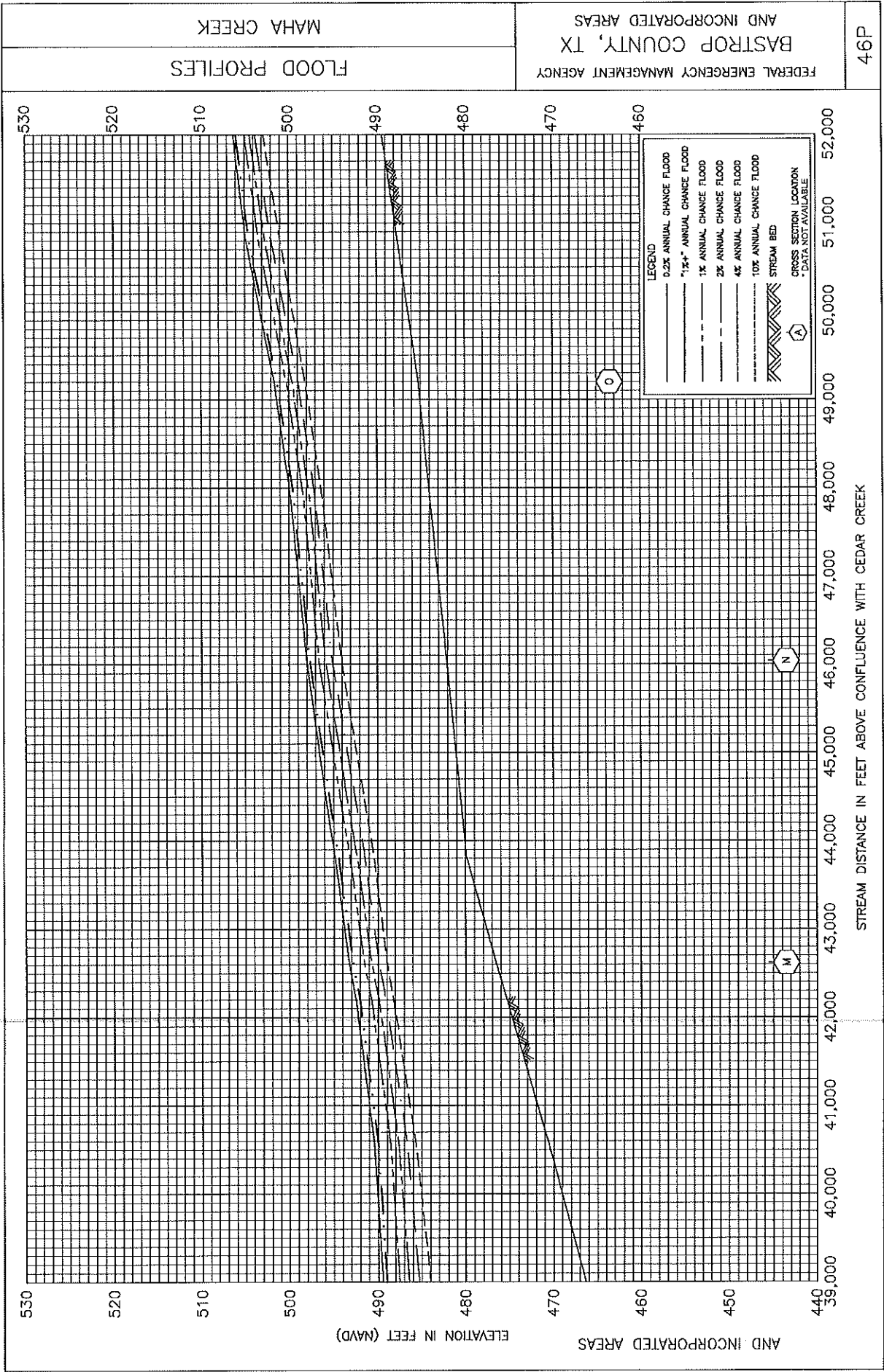


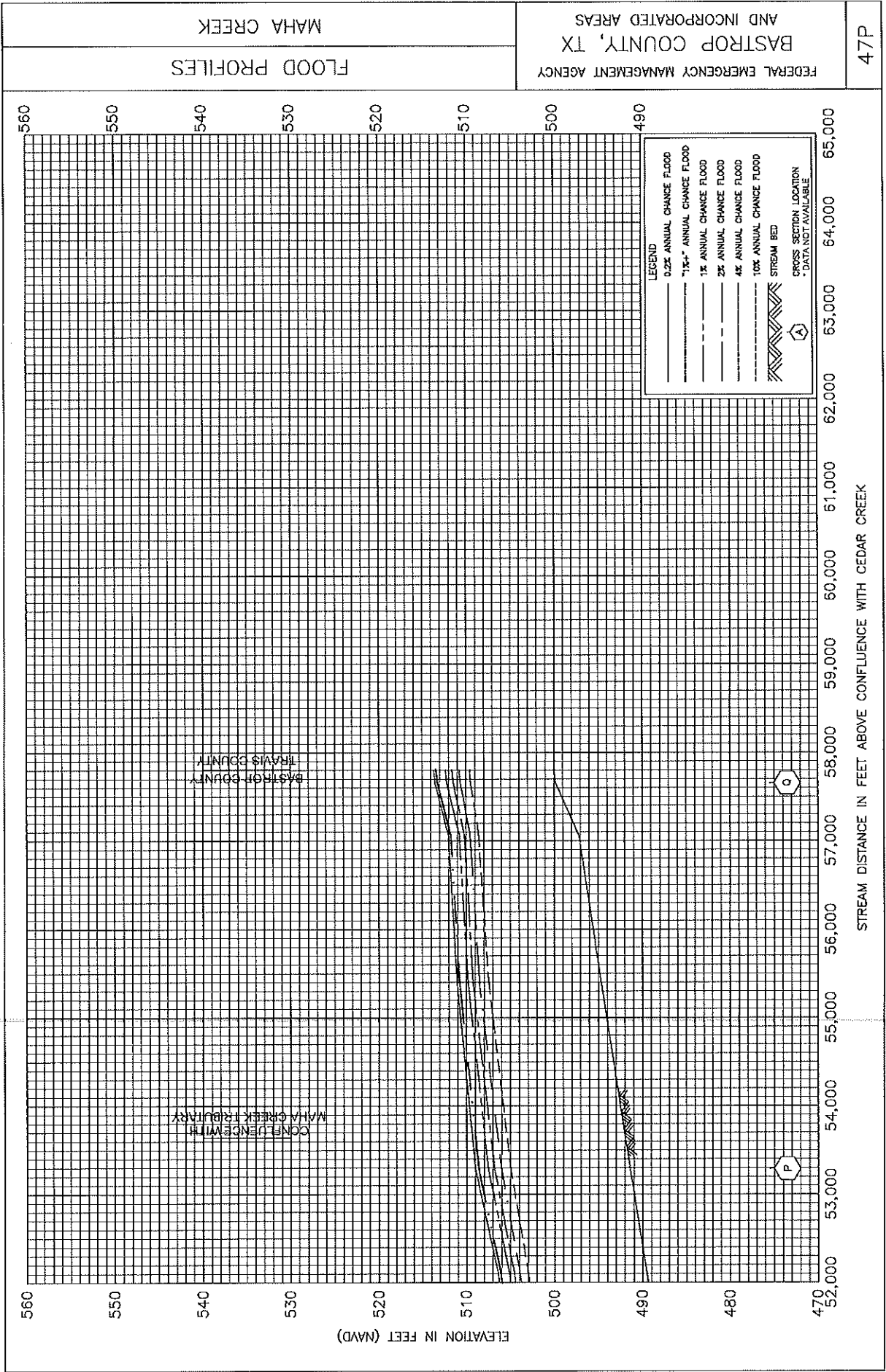






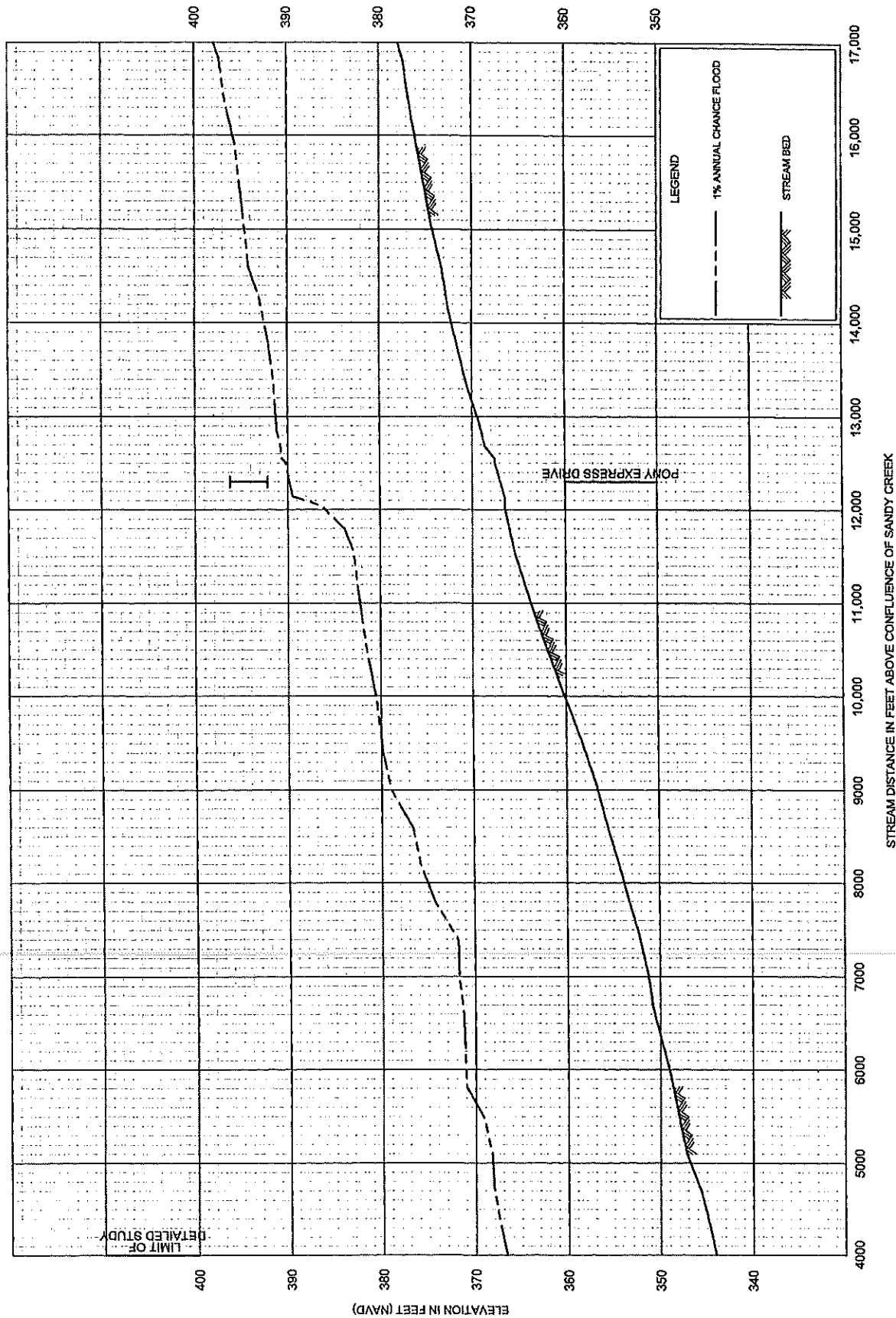






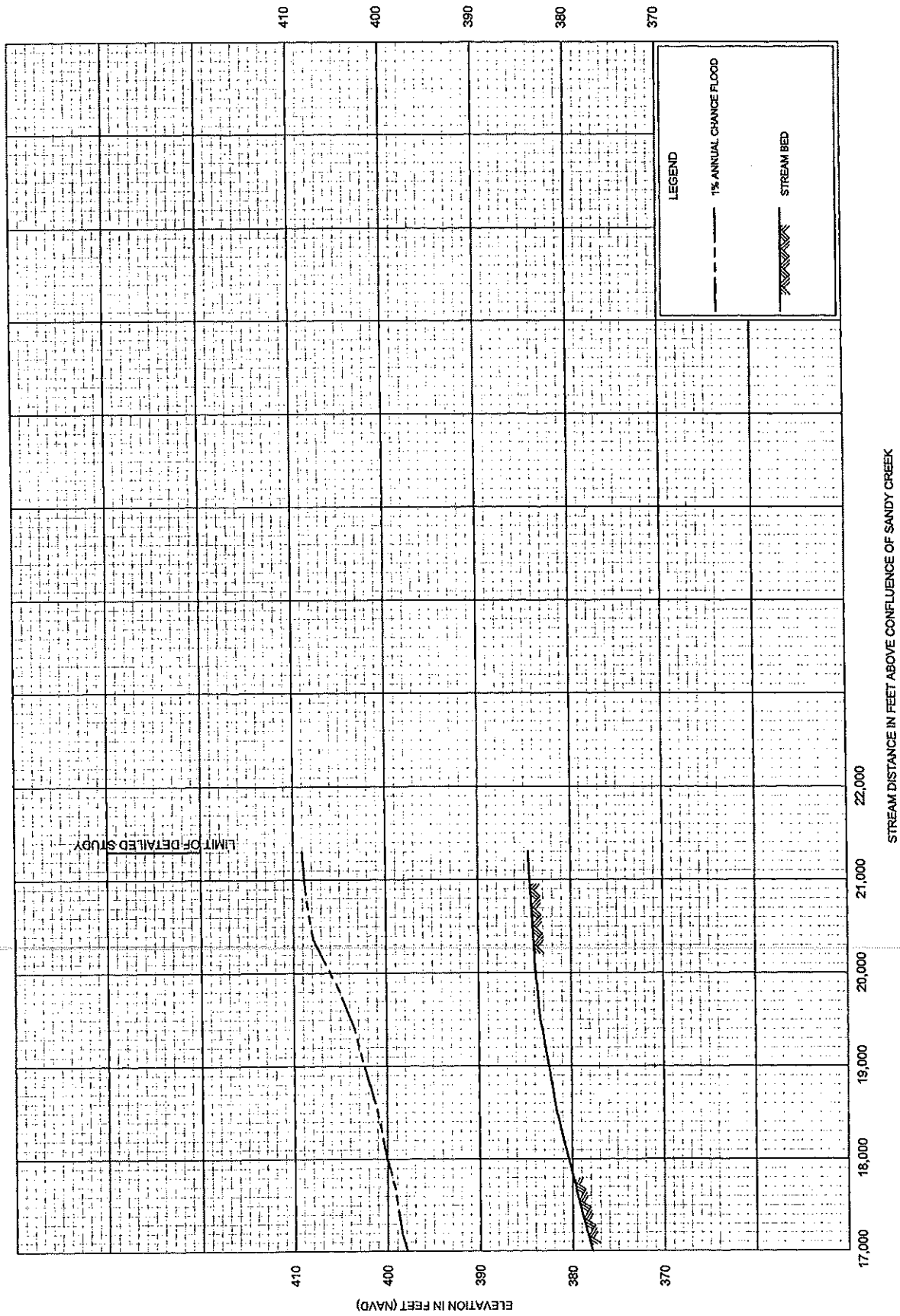
FEDERAL EMERGENCY MANAGEMENT AGENCY
BASTROP COUNTY, TX
AND INCORPORATED AREAS

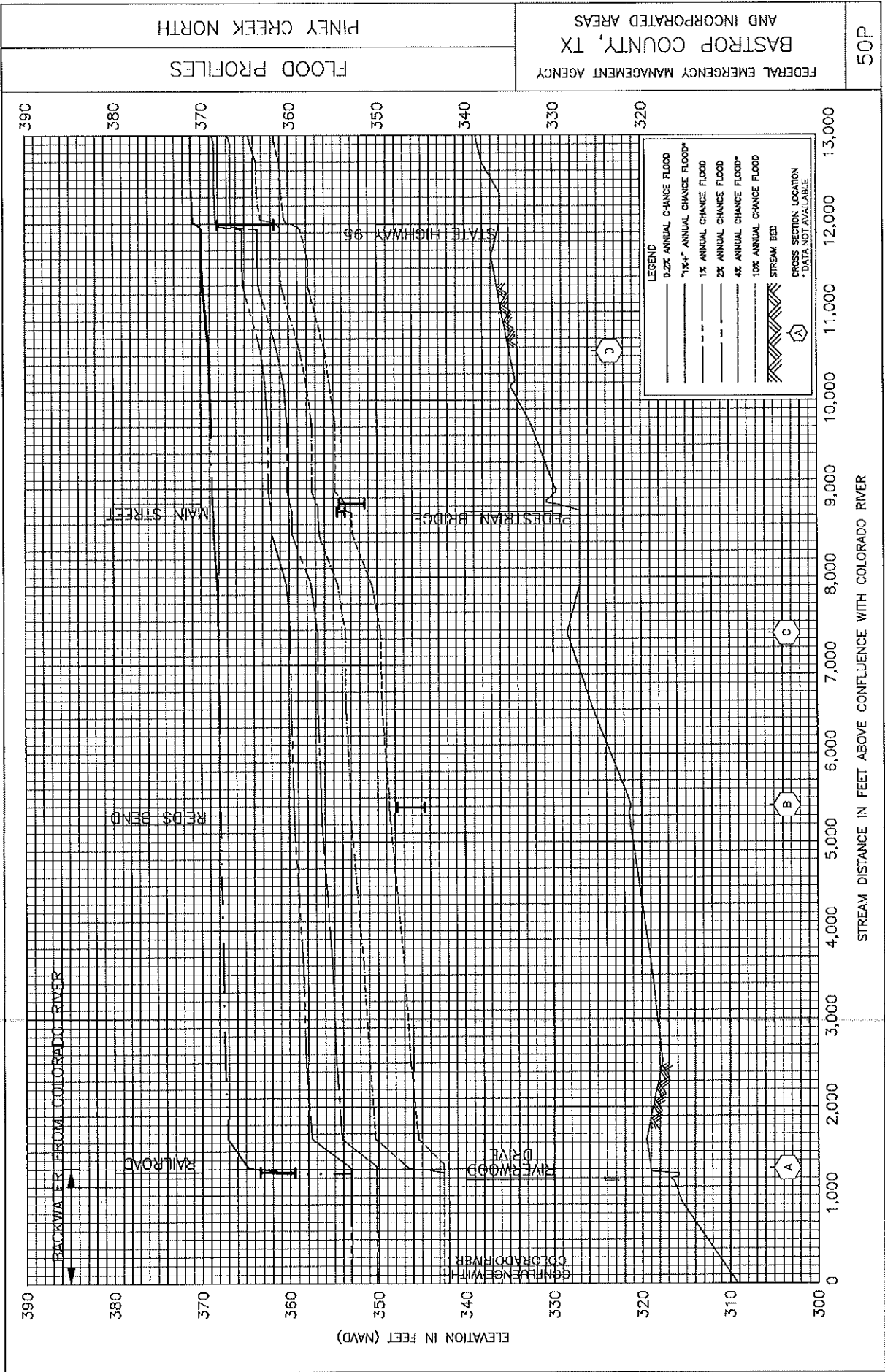
FLOOD PROFILES
PINEY CREEK

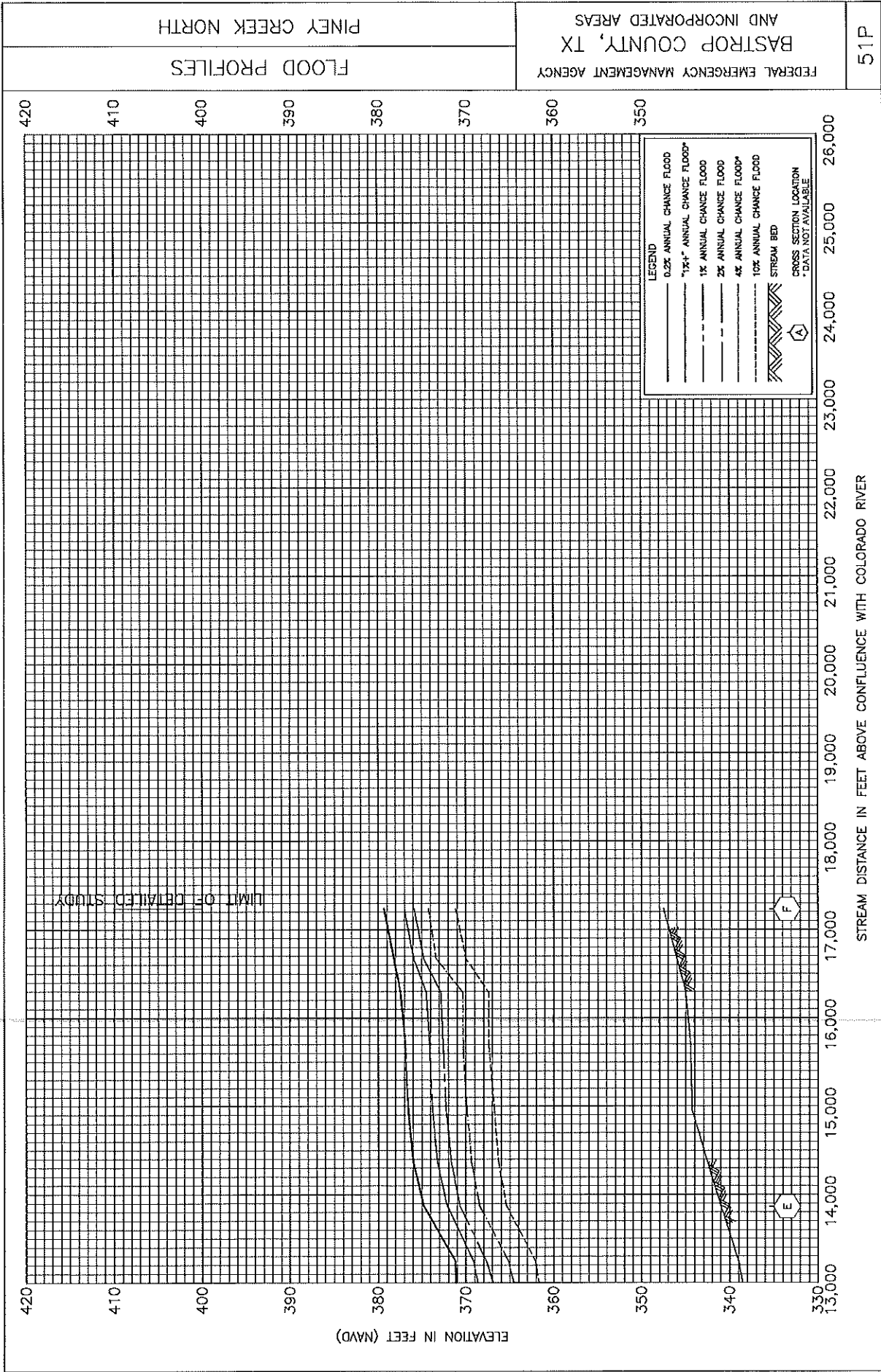


FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

FLOOD PROFILES
 PINEY CREEK

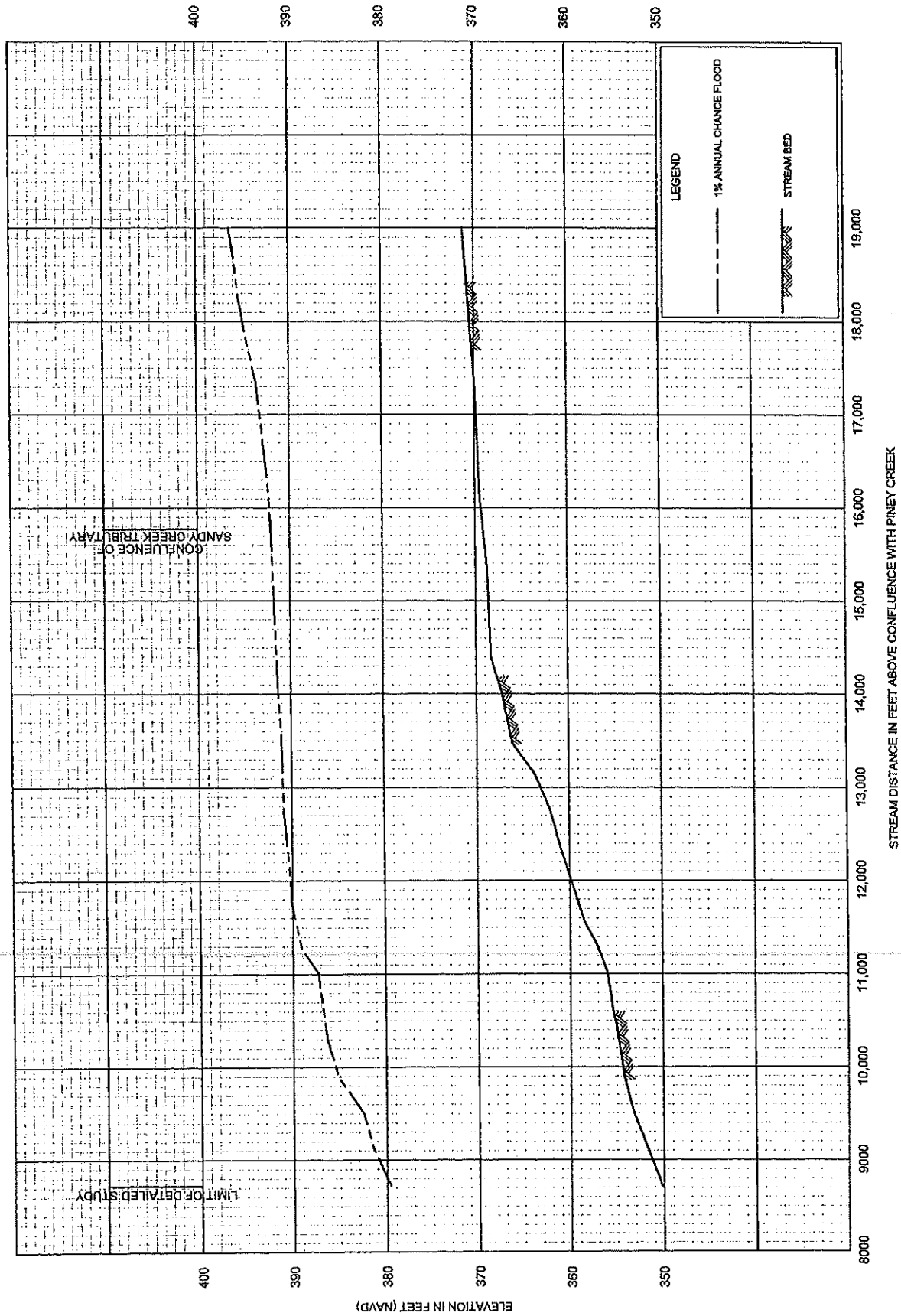






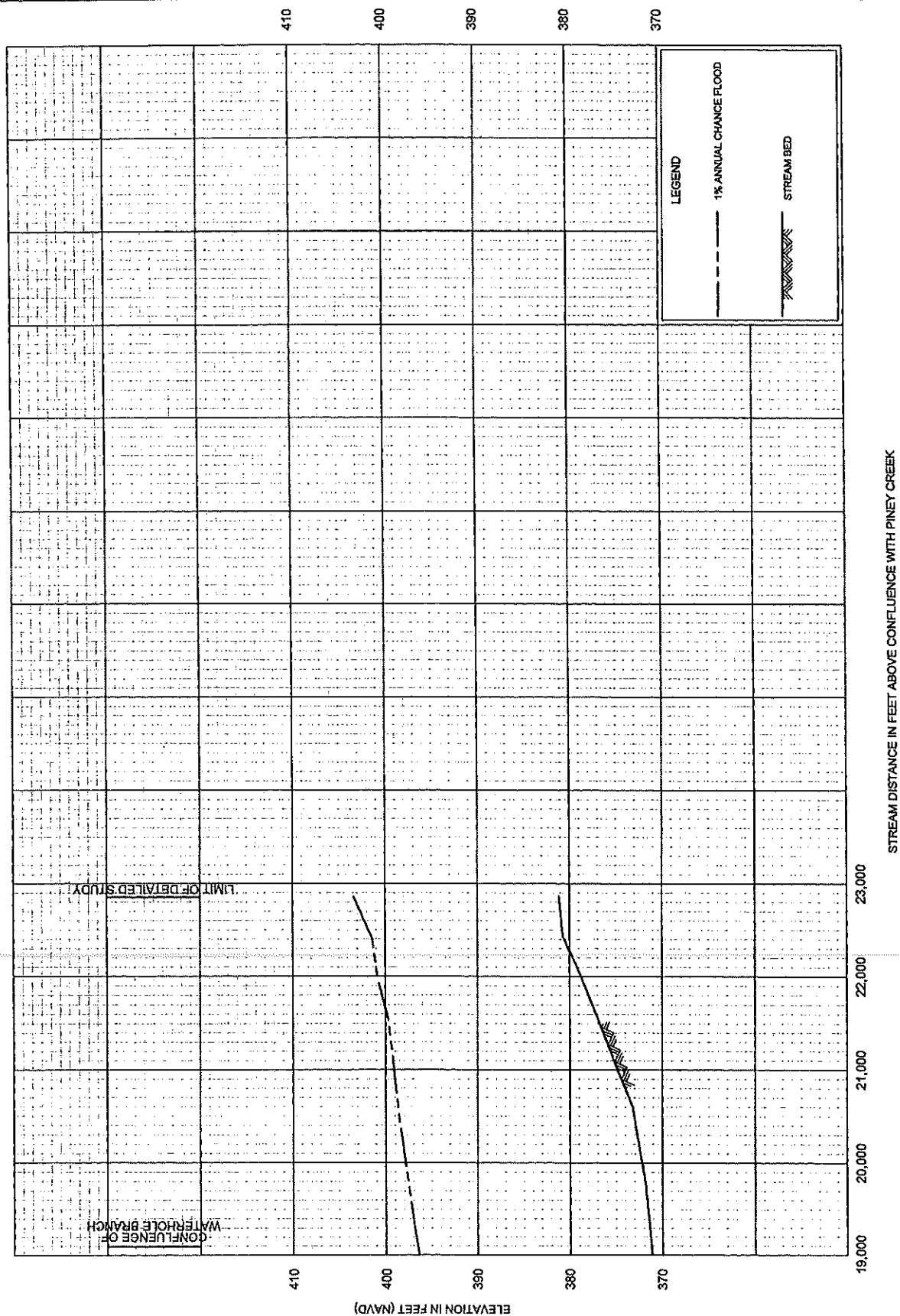
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

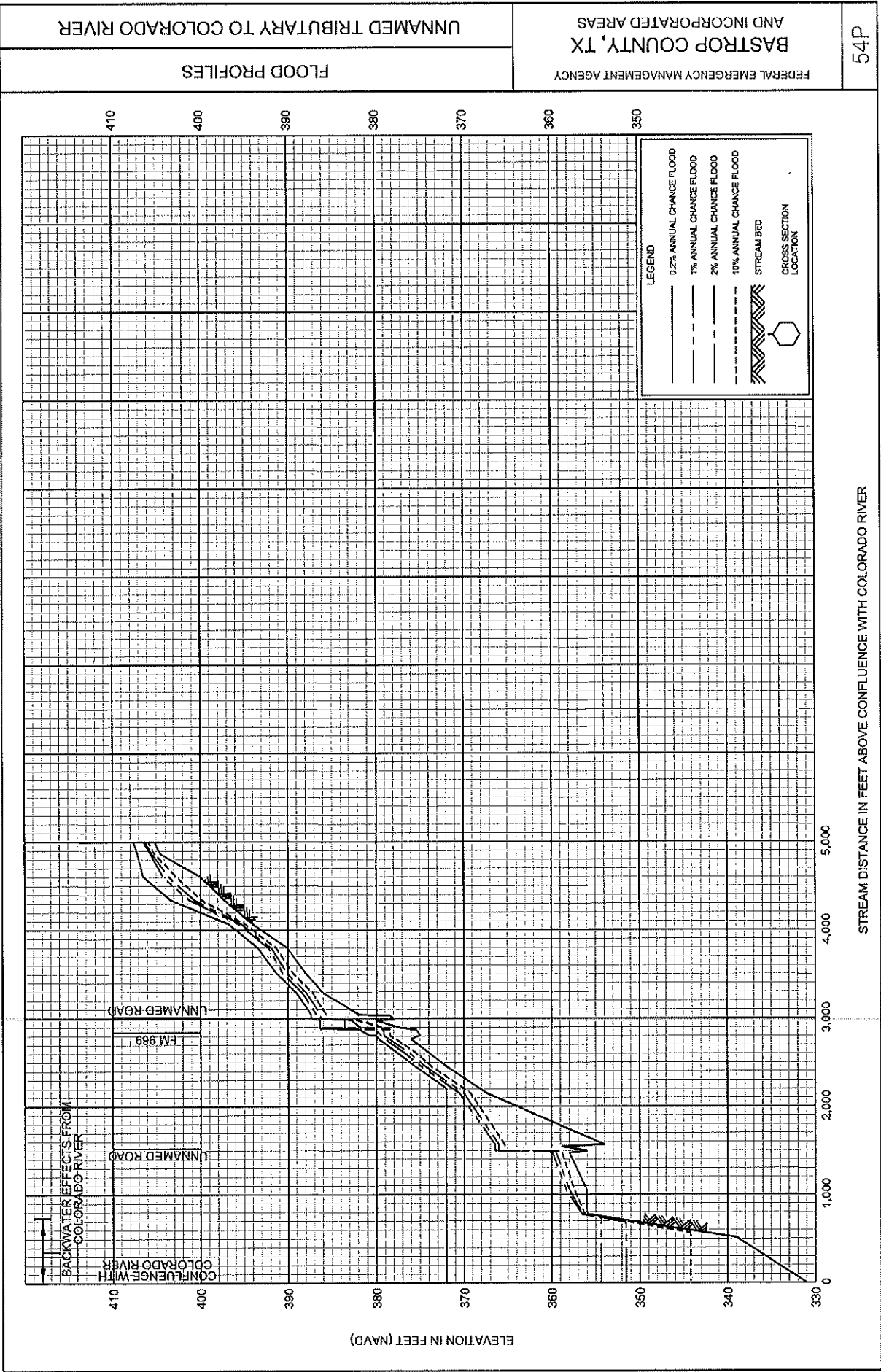
FLOOD PROFILES
 SANDY CREEK

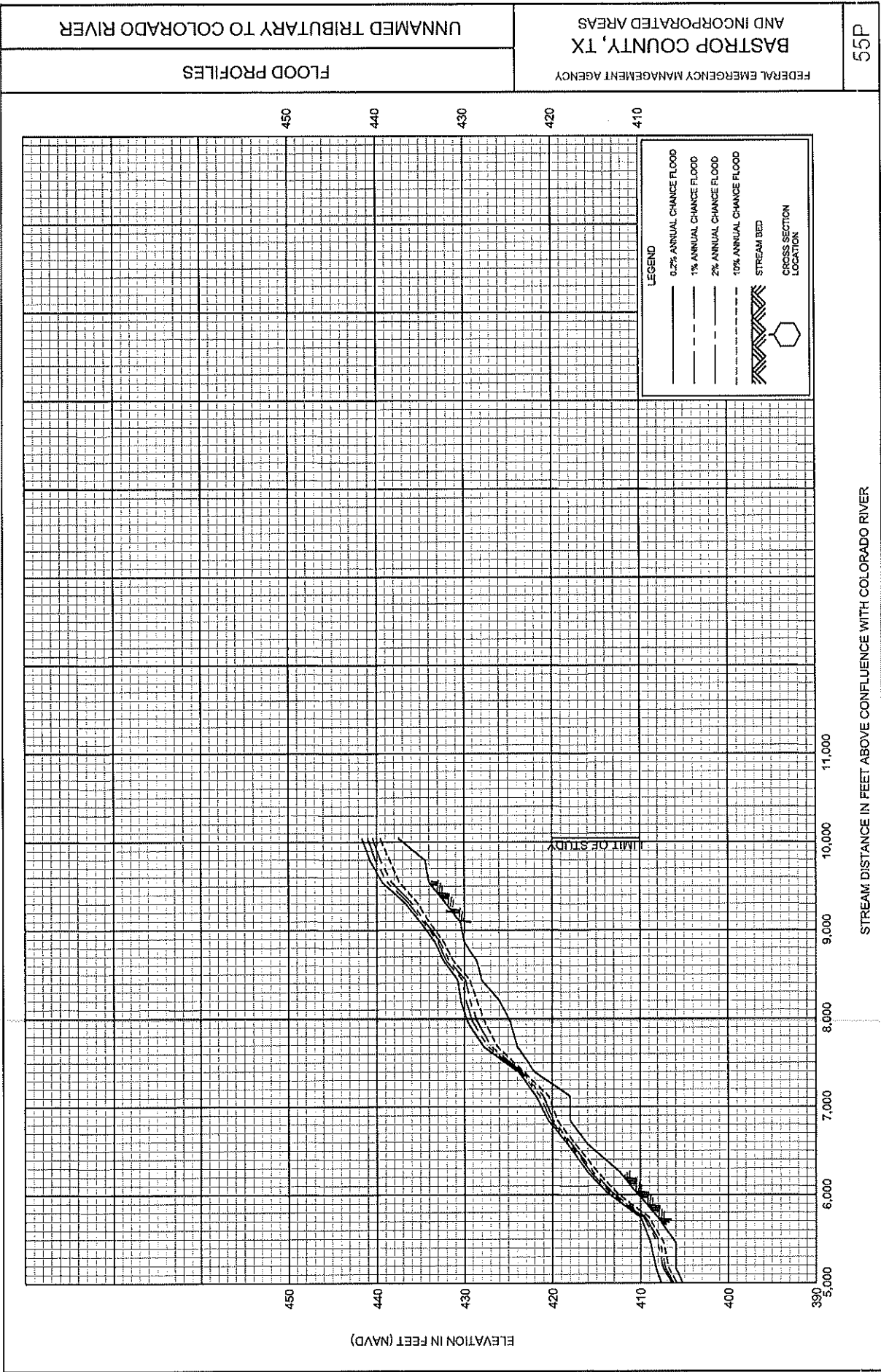


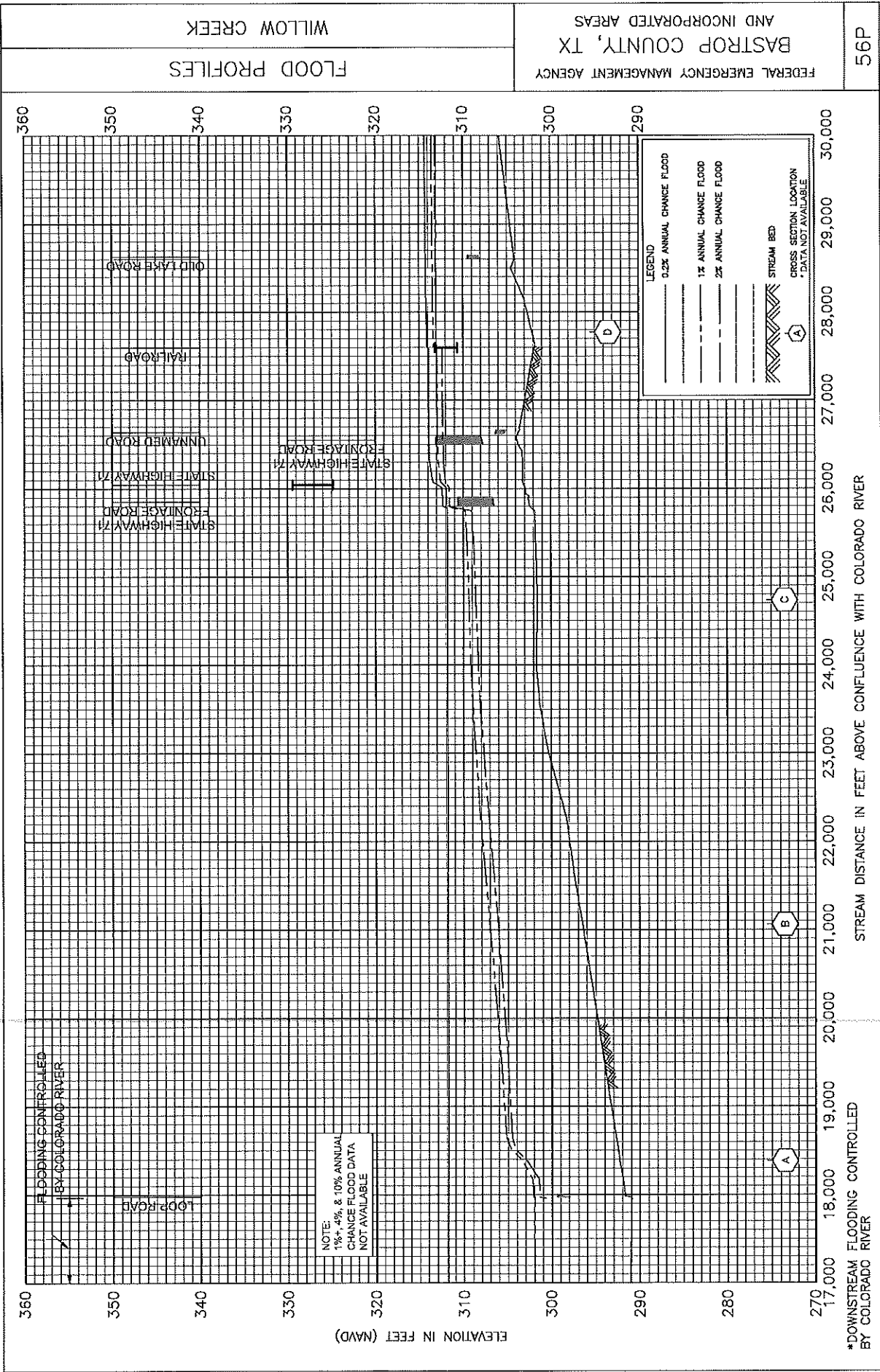
FEDERAL EMERGENCY MANAGEMENT AGENCY
 BASTROP COUNTY, TX
 AND INCORPORATED AREAS

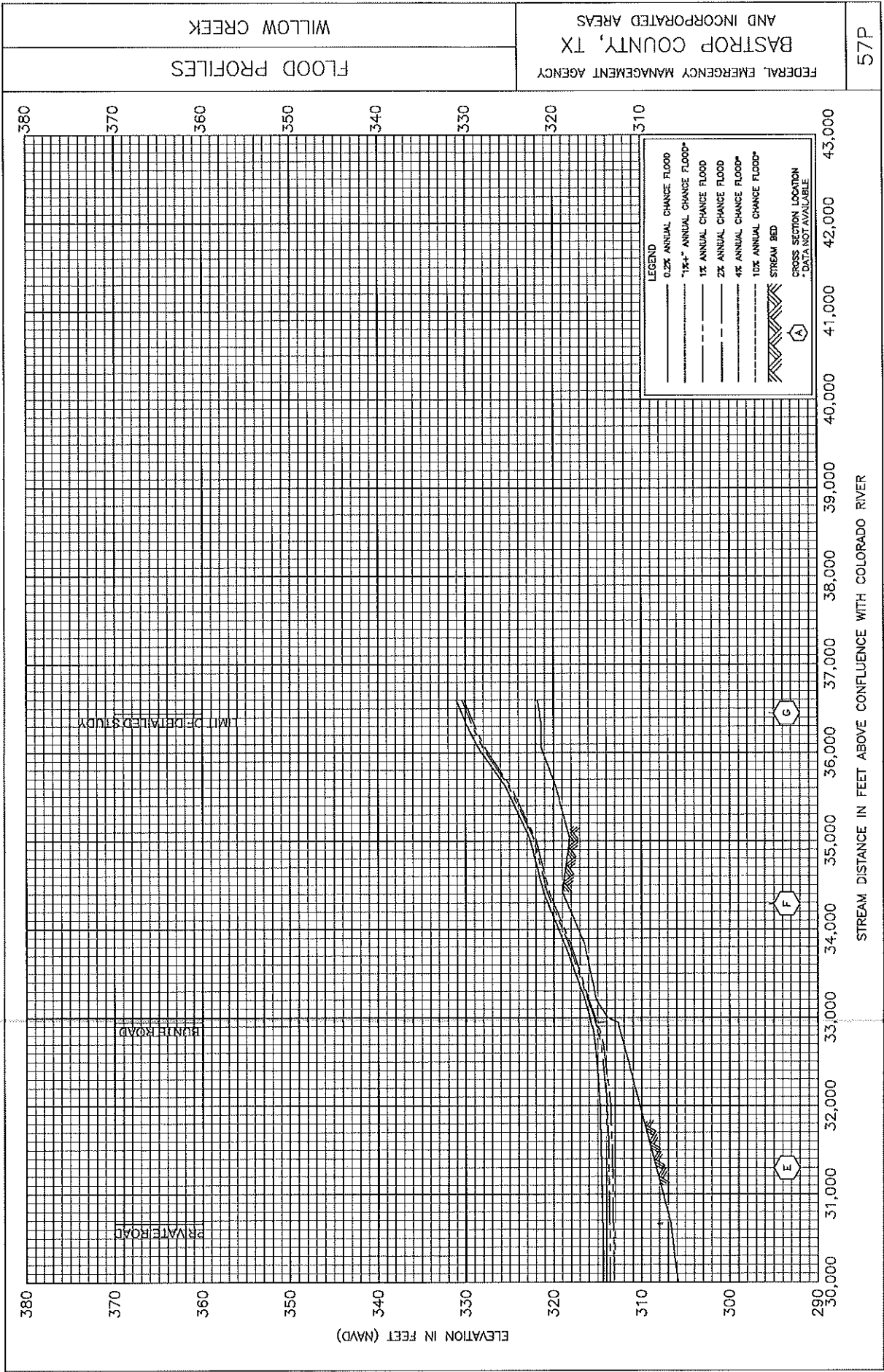
FLOOD PROFILES
 SANDY CREEK

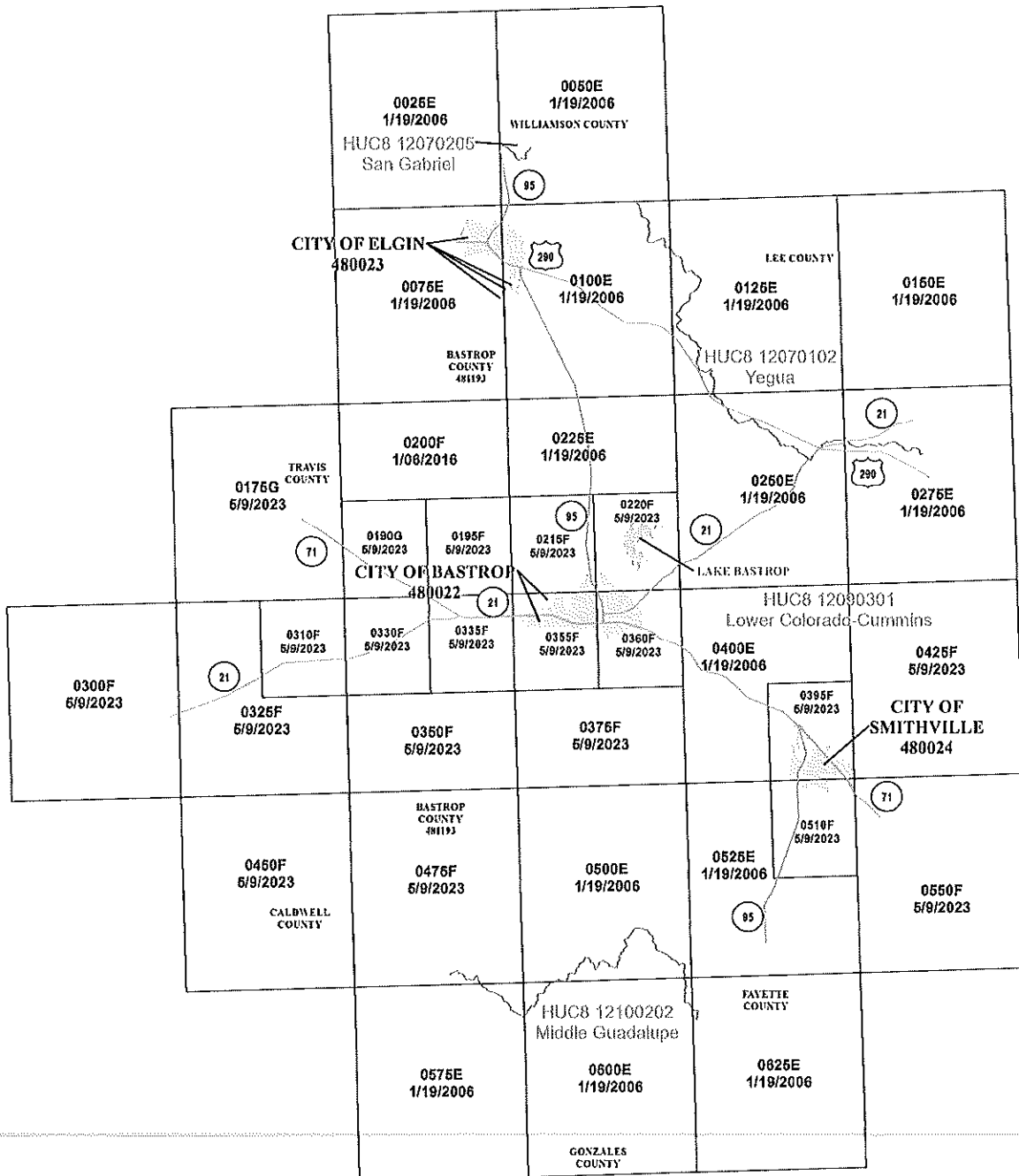




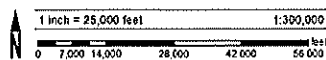








ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before May 8, 2023.



Map Projection:
State Plane Lambert Conformal Conic, Texas Central
Zone FIPS 4203; North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

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

[HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

COUNTY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP INDEX

BASTROP COUNTY, TEXAS and Incorporated Areas

PANELS PRINTED:

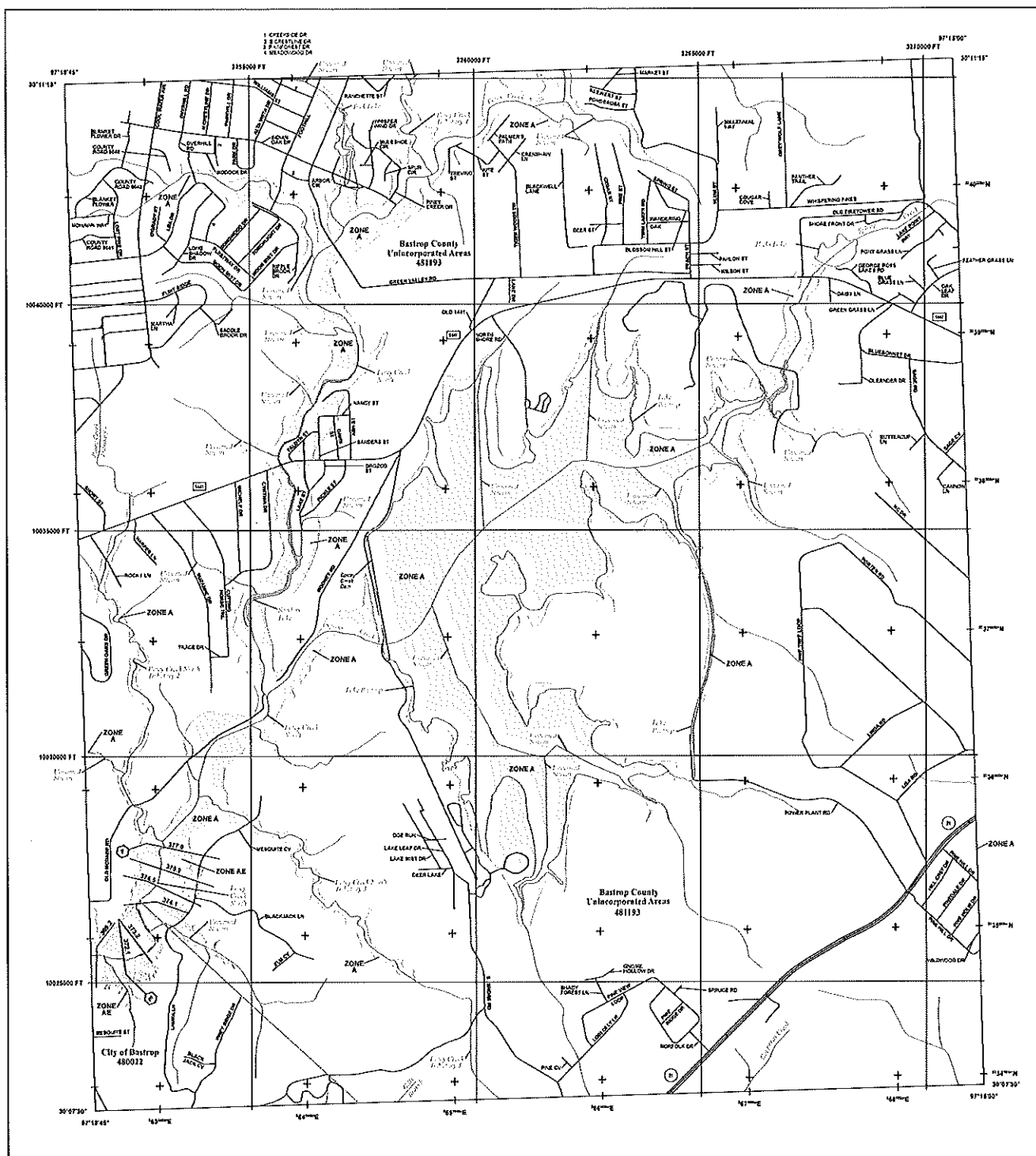
0025, 0050, 0075, 0100, 0125, 0150, 0175, 0190, 0195, 0200, 0215,
0220, 0225, 0250, 0275, 0300, 0310, 0325, 0330, 0335, 0350, 0355,
0360, 0375, 0395, 0400, 0425, 0450, 0475, 0500, 0510, 0525, 0550,
0575, 0600, 0625



FEMA

MAP NUMBER
48021CINDOC

MAP REVISED
May 9, 2023



VERSION NUMBER
2.6.4.6
MAP NUMBER
48021C0220F
MAP REVISION
MAY 0, 2023

VEFSQ NUMBER
2.6.4.6
MAP NUMBER
48021C0360F
MAP PENSED
MAY 9, 2023