FLOOD INSURANCE STUDY

BOWIE COUNTY, TEXAS,
AND INCORPORATED AREAS

Community Name	Community Number
Bowie County	
(Unincorporated Areas)	481194
De Kalb, City of	480055
Hooks, City of	480056
Leary, City of	481142
Maud, City of	480057
Nash, City of	480058
New Boston, City of	480059
Red Lick, City of	480176
Redwater, City of	480309
Texarkana, City of	480060
Wake Village, City of	480061

REVISED: **PRELIMINARY 3/24/2016**

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
48037CV000B

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

Selected Flood Insurance Rate Map panels for the community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

OldZone	NewZone
A1 through A30	AE
B	X
C	X

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

Initial Countywide FIS Effective Date: October 19, 2010
Revised Countywide FIS Effective Date:

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1

1.1 PURPOSE OF STUDY 1
1.2 AUTHORITY AND ACKNOWLEDGMENTS 1
1.3 COORDINATION 2

2.0 AREA STUDIED 3

2.1 SCOPE OF STUDY 3
2.2 COMMUNITY DESCRIPTION 8
2.3 PRINCIPAL FLOOD PROBLEMS 8
2.4 FLOOD PROTECTION MEASURES 9

3.0 ENGINEERING METHODS 9

3.1 HYDROLOGIC ANALYSES 10
3.2 HYDRAULIC ANALYSES 25
3.3 VERTICAL DATUM 28

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS 8

4.1 FLOODPLAIN BOUNDARIES 29
4.2 FLOODWAYS 29

5.0 INSURANCE APPLICATIONS 46

6.0 FLOOD INSURANCE RATE MAP 47

7.0 OTHER STUDIES 49

8.0 LOCATION OF DATA 49

9.0 BIBLIOGRAPHY AND REFERENCES 49

FIGURES

FIGURE 1 – FLOODWAY SCHEMATIC 46
FIGURE 2 – FIRM NOTES TO USERS 153
FIGURE 3 – MAP LEGEND FOR FIRM 156

TABLES

TABLE 1 - LIMIT OF DETAILED STUDY 3
TABLE 2 - SUMMARY OF STREAMS STUDIED BY APPROXIMATE METHODS 7
TABLE 3 - SUMMARY OF DISCHARGES. 13
TABLE 4 - MANNING'S 'N' VALUES 27
TABLE 5 - FLOODWAY DATA TABLE 31
TABLE 6 - COMMUNITY MAP HISTORY 48
TABLE 7 - MAP REPOSITORIES 160
TABLE 8 - LISTING OF NFIP JURISDICTIONS 160

EXHIBITS

Exhibit 1 -	Flood Profiles	
	Aiken Creek	Panels 01P – 05P
	Clear Creek	Panels 06P – 09P
	Corral Creek	Panels 10P - 11P
	Cowhorn Creek	Panels 12P - 15P
	Cowhorn Creek East Tributary	Panel 16P
	Cowhorn Creek West Tributary	Panel 17P
	Days Creek	Panel 18P
	Howard Creek	Panel 19P
	Nix Creek	Panel 20P
	Noname Creek	Panel 21P
	South Wagner Creek	Panel 22(a-c)P
	Spring Creek	Panels 23P –24P
	Stream AC-1	Panels 25P – 26P
	Stream AC-1A	Panels 27P – 28P
	Stream AC-2	Panels 29P - 30P
	Stream AC-2A	Panel 31P
	Stream AC-3	Panels 32P – 33P
	Stream AC-4	Panel 34P
	Stream AC-5	Panels 35P – 36P
	Stream AC-6	Panels 37P – 38P
	Stream AC-7	Panel 39P
	Stream AC-7A	Panel 40P
	Stream AC-7B	Panel 41P
	Stream BC-1	Panels 42P - 43P
	Stream BC-1A	Panels 44P – 45P
	Stream BC-2	Panel 46P
	Stream BC-2A	Panels 47P – 48P
	Stream BC-3	Panel 49P
	Stream BC-3A	Panels 50P – 51P
	Stream CC-1	Panels 52P –54P
	Stream CC-2	Panels 55P – 56P
	Stream CC-3	Panels 57P – 61P
	Stream CC-4	Panels 62P – 63P
	Stream CC-5	Panels 64P – 65P
	Stream CC-6	Panels 66P – 67P
	Stream MB-1	Panel 68P
	Stream MB-1A	Panel 69P
	Stream SC-1	Panels 70P - 71P
	Stream SC-2	Panels 72P – 73P
	Stream SC-3	Panels 74P – 75P
	Stream SC-3A	Panels 76P – 77P
	Stream SC-4	Panels 78P – 79P
	Stream SC-5	Panels 80P – 81P
	Stream SC-6	Panels 82P – 83P
	Stream WC-1	Panels 84P - 85P
	Stream WC-2	Panels 86P - 87P
	Stream WC-3	Panel 88P
	Stream WC-4	Panel 89P

EXHIBITS

Exhibit 1 - Flood Profiles (continued)

Swampoodle Creek	Panels 90P - 92P
Swampoodle Creek East Tributary	Panel 93P
Swampoodle Creek West Channel	Panel 94P
Wagner Creek	Panels 95P – 102P

Exhibit 2 - Flood Insurance Rate Map Index
Flood Insurance Rate Map

FLOOD INSURANCE STUDY
BOWIE COUNTY, TEXAS AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1. Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic areas of Bowie County, Texas, including the Cities of De Kalb, Hooks, Leary, Maud, Nash, New Boston, Red Lick, Redwater, Texarkana and the unincorporated areas of Bowie County (referred to collectively herein as Bowie County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the City of Texarkana is geographically located in Bowie County, Texas and Miller County, Arkansas. The flood-hazard information for the City of Texarkana is shown for those areas within Bowie County only. See separately published FIS report and Flood Insurance Rate Map (FIRM) for areas outside of Bowie County.

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

1.2. Authority and Acknowledgments

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

This FIS was prepared to include the unincorporated areas of, and incorporated communities within, Bowie County in a countywide format. Information on the authority and acknowledgement for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below.

The hydrologic and hydraulic analyses for the previous study done for Bowie County unincorporated areas were prepared by the Fort Worth District of the U.S. Army Corps of Engineers (USACE), for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-6-E-2226, Project Order No. 17. This study was completed in March 1990 (Reference 1).

The hydrologic and hydraulic analyses for the original study done for the City of Texarkana were prepared by the USACE for FEMA, under Inter-Agency Agreement No. IAA-H-2-73, Project Order No. 4 (Reference 2).

The hydrologic and hydraulic analyses for the FIS for the City of Texarkana dated September 3, 1992 were revised by Everage Consultants, Inc. for FEMA, under Contract No. EMW-89-C-2835. This study was completed in October 1990 (Reference 2).

There were no hydrologic and hydraulic analyses performed for the October 19, 2010 countywide study. Redelineation of the Special Flood Hazard Areas (SFHAs) was performed by Comprehensive Flood Risk Resources and Response Joint Venture (CF3R), for FEMA, under contract EMT-2002-CO-0049. This study was completed in July 2008. Information was also provided by the Arkansas-Texas Council of Governments (ATCOG), as well as the United States Geological Survey (USGS) Digital Line Graphs. Additional information may have been derived from other sources. Users of the Flood Insurance Rate Map (FIRM) should be aware that minor adjustments may have been made to specific base map features.

The countywide study has been revised to incorporate the results of hydrologic and hydraulic analyses performed by Halff Associates for the City of Texarkana, completed in December 2013 (Reference 3). This information has been incorporated by Compass for FEMA under contract no. HSFE60-15-D-0003.

The coordinate system used for the production of this FIRM is the Texas State Plane North Central Zone 4202 (Feet), North American Datum 1983 (NAD83). Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3. Coordination

The initial Consultation Coordination Officer (CCO) meeting for the previous study done in Bowie County unincorporated areas was held on September 25, 1985 with representatives of FEMA, Bowie County, and the USACE to determine the streams to be studied by detailed methods.

The following agencies, communities, businesses, and/or persons were contacted for information and/or coordination of results: Bowie County, the USGS, the United States Coast and Geodetic Survey (USC&GS), the Texas Department of Transportation (TxDOT) (Reference 4), Dewberry and Davis, the Texas Commission on Environmental Quality (Reference 5), and the Soil Conservation Service (SCS).

The results of that study were reviewed at the final CCO meeting held on November 28, 1990, and attended by representatives of FEMA, the county, and the USACE.

The initial CCO meeting for the previous study done in the City of Texarkana was held on June 7, 1988, with representatives of the City of Texarkana, the USACE and FEMA.

The following organizations were contacted for information pertinent to the study: the City of Texarkana, TxDOT, National Climatic Data Center, USGS, Fort Worth District – USACE, New Orleans District – USACE, Kansas City Southern Railway Co., Texarkana Gazette, Texarkana Chamber of Commerce, and Dewberry & Davis.

For the October 19, 2010 countywide study, an initial and a final CCO meeting were held on April 19, 2007 and December 10, 2008 respectively. They both were attended by representatives of FEMA, CF3R and Bowie County.

The results of this countywide revision were reviewed at the final CCO meeting held on_____, and attended by representatives of FEMA, Compass and communities. All problems raised at that meeting have been addressed in this study.

2.0 **AREASTUDIED**

2.1. Scope of Study

This FIS report covers the geographic areas of Bowie County, Texas, including the incorporated communities listed in Section 1.1. The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction.

Table 1, "Limit of Detailed Study," lists the limits of study for the flooding source studied by detailed methods.

TABLE 1 – LIMIT OF DETAILED STUDY

Stream	Limits of Detailed Study
Aiken Creek	From a point approximately 2,800 feet downstream of Henry Road to approximately 1,440 feet upstream of Access Road
Barkman Creek	From its confluence with McKinney Bayou to Bringle Lake Dam
Clear Creek*	From its confluence with McKinney Bayou to Wyatt Road
Corral Creek*	From its confluence with Howard Creek to corporate limits
Cowhorn Creek*	From its confluence with Wagner Creek to approximately 1,400 feet upstream of Cowhorn Creek Road

* Studied in 2013 as a part of countywide revision.

TABLE 1 – LIMIT OF DETAILED STUDY
(continued)

Stream	Limits of Detailed Study
Cowhorn Creek East Tributary*	From its confluence with Cowhorn Creek to just downstream of Summerhill Road
Cowhorn Creek West Tributary*	From its confluence with Cowhorn Creek to approximately 500 feet upstream of St. Michael Drive
	Days Creek From approximately 460 feet downstream of its confluence with Howard Creek to its confluence with Nix and Swampoodle Creeks.
Howard Creek*	From its confluence with Days Creek to just upstream of corporate limits
Nix Creek	From its confluence with Days creek to just upstream of corporate limits
Noname Creek	From just downstream of corporate limits to just upstream of corporate limits
South Wagner Creek*	From its confluence with Wagner Creek to just upstream of W 7th Street
Spring Creek	From a point approximately 2,000 feet upstream of its confluence with the Sulphur River to a point approximately 1,000 feet south of U. S. Route 59
Stream AC-1	From its confluence with Aiken Creek to a point at its headwaters near a dirt road
Stream AC-1A	From its confluence with Aiken Creek to a point approximately 0.47 mile upstream
Stream AC-2	From its confluence with Aiken Creek to approximately 4,740 feet upstream of FM 991
Stream AC-2A	From its confluence with Stream AC-2 to approximately 1,360 feet upstream of its confluence with Stream AC-2
Stream AC-3	From its confluence with Aiken Creek to a point near the western corporate limits of the City of Texarkana
Stream AC-4	From its confluence with Aiken Creek to a point approximately 525 feet upstream of Oak Forest Road
Stream AC-5	From its confluence with Aiken Creek to a point approximately 1,235 feet upstream of Oak Forest Road

* Studied in 2013 as a part of countywide revision.

TABLE 1 – LIMIT OF DETAILED STUDY
(continued)

Stream	Limits of Detailed Study
Stream AC-6	From its confluence with Aiken Creek to a point just upstream of Tri State Road
Stream AC-7	From its confluence with Aiken Creek to a just upstream of Gravel Road
Stream AC-7A	From its confluence with Stream AC-7 to approximately 2100 feet upstream of State Road
Stream AC-7B	From its confluence with Stream AC-7 to approximately 2,000 feet upstream of State Road
Stream BC-1	From its confluence with Barkman Creek, through King Lake, to the upstream side of Field Road.
Stream BC-1A	From a point within King Lake to a point approximately 1.1 miles upstream
Stream BC-2	From its confluence with Barkman Creek to a point just downstream of FM 989
Stream BC-2A	From its confluence with Stream BC-2 to a point approximately 1,000 feet downstream of FM 989
Stream BC-3	From its confluence with Barkman Creek to approximately 130 feet upstream of Myrtle Springs Road
Stream BC-3A	From Arrow Head Dam to just upstream of Myrtle Spring Road
Stream CC-1	From a point within Bringle Lake to a point approximately 0.80 mile upstream
Stream CC-2	From a point within Bringle Lake to a point approximately 0.70 mile stream
Stream CC-3	From a point within Bringle Lake to a point approximately 1.1 miles upstream
Stream CC-4	From a point within Bringle Lake to a point approximately 0.70 mile upstream
Stream CC-5	From a point within Bringle Lake to a point approximately 0.90 mile upstream
Stream CC-6	From its confluence with Clear Creek to a point approximately 0.70 mile upstream
Stream MB-1	From its confluence with McKinney Bayou to a point approximately 1.1 miles upstream

TABLE 1 – LIMIT OF DETAILED STUDY
(continued)

Stream MB-1A	From its confluence with Stream MB-1 to a point approximately 1.0 mile upstream
Stream SC-1	From its confluence with Spring Creek to the downstream side of FM 2516
Stream SC-2	From its confluence with Spring Creek to a point approximately 1100 feet downstream of Kay Lane.
Stream SC-3	From its confluence with Spring Creek to a point approximately 1,000 feet upstream of FM 989
Stream SC-3A	From its confluence with Stream SC-3 to a point approximately 1,200 feet upstream of FM 989
Stream SC-4	From its confluence with Spring Creek to a point approximately 1,000 feet upstream of a north-south dirt road
Stream SC-5	From its confluence with Spring Creek to a point approximately 900 feet upstream of a paved road
Stream SC-6	From its confluence with Spring Creek to a point approximately 700 feet upstream of FM 989
Stream WC-1*	From its confluence with Wagner Creek to approximately 1,000 feet upstream of Arista Blvd
Stream WC-2*	From its confluence with Wagner Creek to approximately 2,300 feet upstream of Concord Place
Stream WC-3	From Approximately 660 feet downstream of Myrtle Springs Road to its confluence with Wagner Creek
Stream WC-4	From its confluence with Wagner Creek to the downstream side of FM 989
Swampoodle Creek*	From its confluence with Days and Nix Creek to approximately 750 feet upstream of 40th Street
Swampoodle Creek East Tributary*	From its confluence with Swampoodle Creek to approximately 100 feet upstream of Pine Street
Swampoodle Creek West Channel*	From its confluence with Swampoodle Creek to upstream of College Drive
Wagner Creek*	From its confluence with Days Creek to approximately 220 feet upstream of Birdwell-Davis Road

* Studied in 2013 as a part of countywide revision.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and Bowie County.

All or portions of the following flooding sources were studied by approximate methods:

TABLE 2 – SUMMARY OF STREAMS STUDIED BY APPROXIMATE METHODS

Anderson Creek	Eds Creek	Parker Lake
Austin Chapel Branch	Flag Lake	Peters Branch
Barkman Creek	Herron Creek	Pine Lake
Bassett Creek	Holly Branch	Red Bayou
Beaverdam Creek	Holly Creek	Red River
Big Branch	Hooks Bayou	Rice Creek
Big Creek	Hubbard Slough	Rochelle Creek
Blue Lake	Jones Creek	Rock Creek
Blythe Creek	Kelley Creek	Round Lake
Booth Creek	Kruse Branch	Rush Lake
Brooks Creek	Little Creek	Russett Creek
Brushy Lake	Little Red Lake	Shaw Lake
Calvert Creek	Martin Lake	Smith Lake
Calvert Lake	McKinney Bayou	Spring Branch
Campbell Creek	Meade Creek	Sulphur River
Caney Branch	Milan Creek	Summerhill Lake
Cedar Creek	Mill Creek	Tanyard Creek
Cooper Creek	Moss Creek	T&P Lake
Cowhorn Creek	Mossy Lake	Thompson Creek
Cowhorn Creek West Tributary	Mud Creek	Ward Creek
Dalby Creek	Mudd Lake	Weaver Creek
Dalby Creek	Nettles Creek	Whaley Lake
Daniels Creek	New Lake	Wilson Lake
Diverson Canal	North Mill Creek	Winston Lake
Dogwood Creek	Orear Branch	Wright Patman Lake
Ector Lake	Panther Creek	Young Creek

2.2. Community Description

Bowie County, which lies between the Red and Sulphur Rivers, is the farthest northeastern Texas county, bordering Oklahoma to the north and Arkansas to the north and east. The City of New Boston is the County seat. Bowie County is bordered by the following counties: Red River to the west, Morris to the southwest, Cass to the south, Miller to the east and Little River to the north in Arkansas, and McCurtain to the northwest in Oklahoma. The county is approximately 888 square miles in size, and per Census Bureau, had a population of 92,565 in 2010 and 89,306 in 2000.

There are 10 incorporated communities within Bowie County, with the larger communities located in the eastern portion of the county. Texarkana, the county's largest city, is a border city with areas in the States of Texas and Arkansas. The City of Texarkana has experienced the highest development growth rate, and this trend continues to happen within communities in and around Texarkana.

The soils in Bowie County consist of sands, silts, and clays, with rich bottom lands, and the vegetation consists of abundant forests of short-leaf pine, cedar, and white oak.

Bowie County is situated in the Geological Survey Hydrologic Unit Numbers 11140106 and 11140302. The watershed for this area is in the Water Resources Council Arkansas-Red White Region, Subregion 14, and the Red River Basin.

2.3. Principal Flood Problems

Major flooding produced by intense rainfall is usually associated with localized thunderstorms. These thunderstorms may occur at any time during the year but are more prevalent in the spring and summer months. There are no official stream gaging stations in the county.

In the City of Texarkana, the main flood season is in winter and spring. Most of the higher floods have resulted from heavy rains during those times. According to the 1975 Flood Insurance Study, since 1904 the five highest 24-hour rainfalls have occurred in October 1926, July 1940, May 1968, December 1945, and January 1938 (Reference 6). However, floods due to intense local thunderstorms occur in the summer, and large floods may occur any time, particularly on the more urbanized Nix Creek.

On May 28, 1998, Texarkana experienced one of the largest recorded rainfall events, which dumped from 10.5 to 14 inches of rain in the span of 8 hours. Several homes in the study area were damaged, with significant damage occurring at road crossings within the Nix Creek watershed. There was also bank and slope failure along improved channels within subdivisions located in the northern study area. The official rainfall amount recorded at the local airport was 10.48 inches (Reference 7).

Nix Creek, with a drainage area of 12.7 miles, is the major watercourse through the City of Texarkana and along its length many existing bridges contribute to flooding. Love Creek and two of its tributaries, Lost Creek and Love Creek Tributary, do not present major flooding problems, but do cause local flood problems. Both Love Creek and Lost Creek sustained roadway structure damages during the May 1998 spring storm. During this storm, McKinney Bayou Tributary 1 sustained slope and bank failures. The rapid urbanization of the northern area may increase the occurrence of localized flooding as well.

2.4. Flood Protection Measures

A Federal project involving channel improvement and realignment on Days Creek, in the area south of Wagner Creek was completed in 1953 (Reference 8).

The City of Texarkana made improvements to several of the streams within its corporate limits, notably Cowhorn Creek and Swampoodle Creek, based on recommendations found in a Survey Report by the USACE, dated April 1972. Improvements included concrete lined channels in parts of Cowhorn Creek, and a system of detention ponds in the headwaters of Swampoodle Creek.

In the City of Texarkana, there are no manmade flood protection structures at the present time (Reference 6). The Nix Creek channel was improved by clearing and grading the banks in 1969. Zoning ordinances and building codes are being used to restrict new construction in order to reduce potential flood damage.

3.0 **ENGINEERING METHODS**

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1. Hydrologic Analyses

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

October 19, 2010 Countywide Study:

For flooding sources in the unincorporated areas of the county, flow frequencies were developed using the computer program NUDALLAS (Reference 8). The watershed was divided into sub-basins, and synthetic unit and flood hydrographs were developed at selected locations. National Weather Service (NWS) Technical Paper No. 40 (TP-40), National Oceanic and Atmospheric Administration (NOAA) Technical Memorandum NWS Hydro-35, and the USACE Civil Engineer Bulletin No. EM 1110-2-1411 reports were used in developing the 1-percent-annual-chance frequency storms (References 9, 10, and 11). Peak discharge-frequency values were computed for selected locations. Routing of the flood hydrographs through each sub–basin reach was accomplished using a Modified-PULS reservoir routing. The USACE HEC-2 step-backwater computer model provided the elevation-discharge storage relationships for each reach on all streams studied by detailed methods.

Within the City of Texarkana, for all of the streams studied by detailed methods, the USACE HEC-1 computer program was used to develop synthetic unit hydrographs for the individual sub-basins (Reference 12). The data for Nix Creek, which is located primarily in Arkansas, was modified from the previous FIS for the City of Texarkana (Reference 2). Data for the other streams were developed from aerial topographic maps, photographs, and the Soil Survey of Bowie County (Reference 13). The extent of development on the watersheds was determined by aerial photographs taken in March 1989 (Reference 14).

To develop the 10-, 2-, and 1-percent-annual-chance frequency floods for the detailed studied streams, NWS TP-40 and NOAA Technical Memorandum NWS-Hydro-35 were used (References 10 and 11). Discharges for the 0.2- percent-annual-chance frequency flood were developed by extrapolating the computed flood discharges on a logarithmic-probability scale.

The Clark unit hydrograph was used to develop the discharge frequency relationships, with infiltration losses determined by the use of the Green-Ampt method, which is based on specific soil groups. Green-Ampt parameters were developed individually for each sub-basin from the soil classifications found in the Bowie County Soil Survey (Reference 14). There were no stream gages available for calibrating the model on any of the streams studied in detail.

Also, in the areas studied in detail, the flood hydrographs were routed using the Modified Puls storage routing method, with discharge storage relationships obtained from the USACE HEC-2 computer program (Reference 15). In areas upstream of the detailed analysis, the Muskingum method was used to route the hydrographs. The use of the storage routing in several areas caused downstream decreases in discharges. These decreases were due primarily to storage in the overbank areas, especially in heavily vegetated areas and in the vicinity of the old strip mines, and to attenuation of the hydrographs.

This Revision to the Countywide Study:

For this revision, Clear, Corral, Cowhorn (including East and West Tributaries), Howard, South Wagner, Swampoodle (including East Tributary, West Channel), Wagner creeks; streams WC-1 and WC-2 are studied in detailed methods. To develop the 10-, 2-, 1-, and 0.2 percent-annual-chance frequency floods, HEC- HMS v.3.5 rainfall-runoff model was used.

Watershed boundaries were delineated using visual inspection of the 2006 City of Texarkana topographic data. The sub-basin boundaries were adjusted based on visual identification of above ground storm sewer features from 2010 aerial photos obtained from the City of Texarkana as well as field identification. The five (5) main watersheds: Clear Creek, Cowhorn Creek, Howard Creek, Swampoodle Creek and Wagner Creek encompass a total watershed area of approximately 40.5 square miles. The watershed was divided into 133 subbasins with an average subbasin size of 0.30 square miles.

The standard 24-hour (hr) duration frequency storm event was used to establish rainfall parameters. Point rainfall depths were obtained from the "United States Geological Survey (USGS) Water Resources Investigation Report Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas 98-4044".

All rainfall-runoff losses were computed using the Soil Conservation Service (SCS) Curve Number (CN) loss method, developed by the Natural Resources Conservation Service (NRCS), formerly SCS. This method is used to predict the direct runoff or infiltration of an area based on the area's land use, aerial photos, hydrologic soil group, hydrologic condition, and ultimate condition. Land use for the watersheds was determined for existing conditions based on the City of Texarkana 2010 aerial photos and ultimate conditions from the City of Texarkana Zoning Maps. For the purposes of this study, the zoning for office/institutional, retail, and mixed-use development was grouped with commercial land use due to the similar nature of the rainfall runoff characteristics. Residential land use was divided into large-lot low-density, small-lot low density, small-lot moderate density, and small-lot high-density areas to differentiate between the diverse residential characteristics of the watershed.

The hydrologic soil types in this study were obtained from the NRCS, Soil Survey Geographic database (SSURGO) for Bowie County. Soil properties influence the relationship between rainfall and runoff so the soils are grouped into four hydrologic soil groups: A, B, C, and D based on runoff potential. All watersheds studied within this report are predominately Group C soil which indicates moderately fine to fine texture and slow infiltration rates. The stream corridors in these watersheds are a mixture of Group D soils and Group B soils.

The antecedent moisture condition (AMC) defines the soil moisture condition prior to a storm. AMC-II, average soil moisture conditions, was used for the purposes of this study.

The NRCS dimensionless unit hydrograph was selected to compute the unit hydrograph. The time of concentration calculations were split into three sections including overland, shallow, and channel flow. Overland flow was calculated using the coefficient of velocity. Times of concentration (tc) were computed using a modified velocity method outlined in the NRCS Technical Release 55 for shallow, and channel flow. Lag time (tlag) for each watershed was calculated by using the equation tlag = (0.6) tc.

The Modified PULS method was selected to route the hydrographs for most reaches. Discharge-storage relationships were computed using the HEC-RAS models developed for the hydraulic studies.

Peak discharge-drainage area relationships for streams studied by detailed methods are shown in Table 3, "Summary of Discharges."

TABLE 3 – SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
AIKEN CREEK					
Below St. Louis Southwestern Railroad	18.52	*	*	11,680	*
Upstream of Stream AC-1	15.66	*	*	9,750[1]	*
Downstream of Stream AC-2	14.28	*	*	10,360	*
Upstream of Stream AC-2	12.05	*	*	8,620[1]	*
Downstream of Stream AC-3	11.91	*	*	9,310	*
Upstream of Stream AC-3	7.93	*	*	6,320	*
Upstream of Stream AC-6	7.78	*	*	6,550[1]	*
Downstream of Stream AC-7	6.84	*	*	6,780	*
Upstream of Stream AC-7	2.44	*	*	2,310	*
At a point approximately 0.57 mile downstream of unnamed private road	2.05	*	*	2,300	*
At unnamed road along a long alignment of U. S. Route 82	1.50	*	*	2,170	*
BARKMAN CREEK					
Above FM 559	56.91	*	*	16,300[1]	*
Below Stream BC-3	53.18	*	*	16,610	*
Above Stream BC-3	50.92	*	*	16,550	*
Below Jones Creek	44.28	*	*	14,150	*

[1] A flatter average stream slope and longer stream length cause the unit hydrograph time to peak (Tp) to lengthen. The result is a decrease in the downstream discharge.

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
CLEAR CREEK					
Upstream of Bringle Lake	5.07	2,570	4,250	5,070	7,240
Below confluence with Stream CC-6	1.89	2,230	3,640	4,310	6,100
Below confluence with Stream CC-9	1.67	2,110	3,420	4,030	5,650
Below confluence with Stream CC-8	1.11	1,380	2,330	2,770	3,930
Upstream of Skyline Road	0.37	450	790	950	1,350
CORRAL CREEK					
At Confluence with Howard Creek	1.88	2,070	2,940	3,330	4,240
Upstream of Chelf Road	1.32	1,500	2,100	2,310	2,960
Upstream of Bishop Street	0.61	790	1,190	1,380	1,920
COWHORN CREEK					
At confluence with Wagner Creek	5.52	3,720	5,070	5,690	7,480
At West 15th	4.98	3,610	4,940	5,450	7,250
At Tucker Street	4.10	3,400	4,630	5,200	7,380
At College Street	3.23	2,760	3,720	4,260	6,320
At Kennedy Lane	2.89	2,710	3,860	4,410	6,050

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
COWHORN CREEK (continued)					
At Interstate 30	1.50	1,560	2,310	2,690	3,590
Upstream of Confluence with Cowhorn Creek East Tributary	0.77	800	1,190	1,370	1,950
Approximately 1,330 feet upstream of Cowhorn Creek Road	0.30	390	580	670	920
COWHORN CREEK EAST TRIBUTARY					
Just upstream of confluence with Cowhorn Creek	0.62	800	1,130	1,270	1,660
At Summerhill Road	0.40	560	810	940	1,300
COWHORN CREEK WEST TRIBUTARY					
At Interstate Route 30	0.57	640	1,390	1,610	2,240
Just upstream of confluence with Cowhorn Creek	0.41	680	1,010	1,170	1,640
DAYS CREEK					
At confluence of Swampoodle and Nix Creeks	18.32	9,400	13,000	14,800	18,500
At confluence of Wagner Creek	41.94	13,700	19,100	22,100	29,000
At confluence of Howard Creek	50.16	17,200	23,600	27,200	34,000
HOWARD CREEK					
At Jarvis Parkway	3.58	2,630	3,350	3,650	4,190
At Lake Drive	4.54	2,690	3,530	3,800	5,090
At Flower Acres Road Just	4.75	2,700	3,580	3,840	5,320
Upstream of confluence of Corral Creek	5.36	2,670	3,650	3,940	5,760
Just upstream of confluence with Days Creek	7.71	2,850	4,080	5,250	8,550
NIX CREEK					
At confluence with Days Creek	12.72	7,100	9,600	10,900	13,700

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
NO NAME CREEK					
At Forrest Lake Drive	1.11	1,270	1,710	1,940	2,700
At corporate limits, approximately 600 feet upstream of Forrest Lake Drive	1.54	1,620	2,240	2,560	3,500
SOUTH WAGNER CREEK					
Upstream of U.S. Route 67	0.27`	490	750	890	1,220
At Falvey Street	0.83	910	1,440	1,700	2,410
At Robison Road	1.17	950	1,460	1,740	1,840
At Findley Street	1.47	1,160	1,680	1,900	2,430
At confluence with Wagner Creek	1.92	900	2,040	2,360	3,230
SPRING CREEK					
Below Stream SC-1	9.50	*	*	6,540	*
Above Stream SC-1	8.20	*	*	5,620	*
Below Stream SC-2	7.29	*	*	5,500	*
Above Stream SC-2	6.22	*	*	4,700[1]	*
Below Stream SC-3	4.95	*	*	5,150	*
Below Stream SC-4	4.00	*	*	3,940	*
Above Stream SC-4	3.40	*	*	3,320	*
Below Stream SC-5	2.54	*	*	2,970	*
Above Stream SC-5	2.08	*	*	2,390	*
Below Stream SC-6	1.52	*	*	2,030	*
Above Stream SC-6	0.82	*	*	1,040	*
Below Stream SC-7	0.46	*	*	700	*
Above U. S. Route 59	0.24	*	*	460	*
STREAM AC-1					
Above confluence with Aiken Creek	2.86	*	*	2,800	*
At Double L Road	2.31	*	*	2,680	*

[1] A flatter average stream slope and longer stream length cause the unit hydrograph time to peak (Tp) to lengthen. The result is a decrease in the downstream discharge.
* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM AC-1 (continued)					
Above confluence with Stream AC-1A	1.72	*	*	2,800	*
At a point approximately 1,900 feet upstream of Double L Road	0.12	*	*	330	*
STREAM AC-1A					
Above confluence with Stream AC-1	0.22	*	*	440	*
STREAM AC-2					
Above confluence with Aiken Creek	2.23	*	*	2,460	*
At State Route 991	1.30	*	*	1,670	*
Downstream of Stream AC-2A	0.90	*	*	1,320	*
Upstream of Stream AC-2A	0.84	*	*	1,260	*
STREAM AC-2A					
Above confluence with Stream AC-2	0.06	*	*	160	*
STREAM AC-3					
Above confluence with Aiken Creek	3.55	*	*	3,380	*
Approximately 1,500 feet upstream of FM 2148	3.01	*	*	3,205	*
Downstream of unnamed gravel road	2.11	*	*	2,810	*
Approximately 400 feet upstream of unnamed gravel road	1.03	*	*	1,470	*
Downstream of Kelley Road	0.94	*	*	1,370	*
Approximately 400 feet upstream of Kelley Road	0.16	*	*	400	*

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM AC-4					
Above confluence with Aiken Creek	0.04	*	*	120	*
STREAM AC-5					
Above confluence with Aiken Creek	0.06	*	*	140	*
STREAM AC-6					
Above confluence with Aiken Creek	0.15	*	*	330	*
STREAM AC-7					
Above confluence with Aiken Creek	4.40	*	*	5,240	*
Downstream of Stream AC-7	4.25	*	*	4,550	*
Below Stream AC-7B	3.59	*	*	4,670	*
Above Stream AC-7B	1.76	*	*	2,610	*
Approximately 600 feet downstream of Tri-State Road	0.67	*	*	1,240	*
STREAM AC-7A					
Above confluence with Stream AC-7A	0.52	*	*	870	*
Approximately 900 feet downstream of Tri- State Road	0.22	*	*	480	*
STREAM AC-7B					
Above confluence with Stream AC-7	1.83	*	*	2,160	*
STREAM BC-1					
Above King Lake	0.27	*	*	590	*
Approximately 1,900 feet downstream of unnamed road	0.10	*	*	250	*

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM BC-1A					
At confluence with King Lake	0.23	*	*	430	*
Approximately 1,800 feet upstream of King Lake	0.12	*	*	320	*
STREAM BC-1B					
Above confluence with Stream AC-1	0.05	*	*	170	*
STREAM BC-2					
Below Stream BC-2A	1.54	*	*	2,350	*
Above Stream BC-2A	0.83	*	*	1,290	*
Approximately 1,500 feet downstream of Carter Lane	0.56	*	*	1,230	*
At Carter Lane	0.3	*	*	680	*
Approximately 2,000 feet upstream of Carter Lane	0.08	*	*	220	*
STREAM BC-2A					
At confluence with Stream BC-2	0.71	*	*	1,120	*
Approximately 2,500 feet upstream of confluence with Stream BC-2	0.46	*	*	950	*
Approximately 1.0 mile upstream of confluence with Stream BC-2	0.12	*	*	280	*
STREAM BC-3					
Below confluence with Stream BC-3A	2.26	*	*	3,100	*
Above Stream BC-3A	1.24	*	*	1,700[1]	*

[1] Actual discharge decreased due to storage effects.
* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM BC-3 (continued)					
Approximately 0.76 mile upstream of Clem Bachman Ranch Road	1.03	*	*	1,820	*
Approximately 0.95 mile upstream of Clem Bachman Ranch Road	0.64	*	*	1,080	*
At Collins Road	0.38	*	*	910	*
STREAM BC-3A					
Above confluence with Stream BC-3	1.02	*	*	1,420	*
Approximately 1,700 feet upstream of Arrow Head Dam	0.73	*	*	1,330	*
At Collins Road	0.31	*	*	660	*
STREAM CC-1					
At confluence with Bringle Lake	0.24	*	*	600	*
STREAM CC-2					
At confluence with Bringle Lake	0.17	*	*	400	*
STREAM CC-3					
At confluence with Bringle Lake	0.49	*	*	900	*
STREAM CC-4					
At confluence with Bringle Lake	0.21	*	*	420	*
STREAM CC-5		*	*		*
At confluence with Bringle Lake	0.51	*	*	1,000	*

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM CC-6					
At confluence with Bringle Lake	0.16	*	*	360	*
STREAM MB-1					
Above confluence with McKinney Bayou	0.11	*	*	360	*
Above Stream MB-1A	0.05	*	*	170	*
STREAM MB-1A					
Above Stream MB-1A	0.05	*	*	180	*
STREAM SC-1					
Above confluence with Spring Creek	1.30	*	*	1,397	*
Above unnamed gravel road	0.70	*	*	970	*
At gravel road	0.33	*	*	707	*
STREAM SC-2					
Above confluence with Spring Creek	1.07	*	*	1,610	*
At a point approximately 0.76 mile upstream of Spring Creek	0.51	*	*	707	*
STREAM SC-3					
Above confluence with Spring Creek	0.95	*	*	1,320	*
Below Stream SC-3A	0.60	*	*	1,140	*
Above Stream SC-3A	0.28	*	*	600	*
Above FM 989	0.11	*	*	360	*
STREAM SC-4					
Above confluence with Spring Creek	0.60	*	*	1,110	*
Above unnamed gravel road	0.16	*	*	510	*

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM SC-5					
Above confluence with Spring Creek	0.46	*	*	792	*
Above unnamed gravel road	0.23	*	*	580	*
STREAM SC-6					
Above confluence with Spring Creek	0.70	*	*	1,030	*
At a point approximately 0.38 mile downstream of FM 989	0.45	*	*	880	*
Above FM 989	0.33	*	*	707	*
STREAM WC-1					
Upstream of University Avenue	0.82	710	1,220	1,500	2,200
At a point approximately 420 feet upstream of Jonathan Street	0.38	500	910	1,080	1,530
STREAM WC-2					
At confluence with Wagner Creek	0.86	890	1,540	1,850	2,750
At a point approximately 660 feet downstream of Independence Circle	0.44	530	810	960	1,360
At a point approximately 1,150 feet upstream of Concord Place	0.16	380	580	680	970
At a point approximately 2,350 feet upstream of Concord Place	0.17	260	380	450	620

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
STREAM WC-3					
Above confluence with Wagner Creek	0.87	*	*	1,540	*
At a point approximately 1,100 feet downstream of FM 989	0.42	*	*	970	*
At a point approximately 650 feet upstream of FM 989	0.25	*	*	600	*
STREAM WC-4					
Above confluence with Wagner Creek	0.42	*	*	760	*
At a point approximately 1,900 feet above Wagner Creek	0.29	*	*	630	*
At a point approximately 300 feet upstream of FM 989	0.15	*	*	370	*
SWAMPOODLE CREEK					
At West 40th	0.32	550	810	940	1,280
Above confluence of Swampoodle Creek East Tributary	0.42	1,170	1,710	1,940	2,520
Below confluence of Swampoodle Creek East Tributary	2.03	2,800	3,940	4,410	5,900
Above Richmond Road	2.07	2,770	3,950	4,430	5940
At US Highway 82	2.53	3,040	4,430	5,060	6,900
At confluence with Days and Nix Creek	4.43	4,420	6,190	7,110	10,010

* Data was not computed.

TABLE 3 – SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2- PERCENT ANNUAL CHANCE	1- PERCENT ANNUAL CHANCE	0.2- PERCENT ANNUAL CHANCE
SWAMPOODLE CREEK EAST TRIBUTARY					
At confluence with Swampoodle Creek	0.95	1,080	1,480	1,840	2,770
At Olive Street	0.76	910	1,410	1,730	2,630
SWAMPOODLE CREEK WEST CHANNEL					
At confluence with Swampoodle Creek	0.66	630	790	810	870
Above College Drive	0.36	540	800	920	1,270
WAGNER CREEK					
At confluence with Days Creek	23.16	6,190	11,230	13,610	23,020
At Lake Drive	22.62	6,220	11,450	13,660	23,220
At confluence of Cowhorn Creek	19.65	5,400	11,640	13,010	22,330
Above Interstate Route 30	6.13	3,920	6,720	8,310	12,460
Below Stream WC-2	5.34	4,670	7,390	8,690	12,340
Above Stream WC-2	4.43	4,000	6,450	7,650	10,960
Below Stream WC-3	2.84	*	*	3,600	*
Below Stream WC-4	2.30	*	*	3,320	*
Above Stream WC-4	1.88	*	*	2,620	*
At a point approximately 600 feet downstream of FM 989	1.66	*	*	2,650	*
At a point approximately 750 feet upstream of FM 989	0.94	*	*	1,500	*
Above Norton Road	0.56	*	*	1,080	*
Above Birdwell-Davis Road	0.25	*	*	600	*

* Data was not computed.

3.2. Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

October 19 ,2010 Countywide Study:

Within the City of Texarkana, cross sections for the backwater analyses were field surveyed and were located at close intervals above and/or below bridges and culverts in order to compute the significant backwater effects of these structures. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM. Bridge data was obtained by field measurements and by bridge plans from the Texas Department of Highways and Public Transportation.

Water-surface elevations of floods of the selected recurrence intervals were computedusing the USACE HEC-2 step-backwater computer program (Reference 15). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Channel roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of engineering judgment and field inspections of the stream and floodplain areas. For the streams studied by detailed methods, "n" values are shown in the following tabulation.

This Revision to the Countywide Study:

For this revision, Clear, Corral, Cowhorn (including East and West tributaries), Howard, South Wagner, Swampoodle (including East Tributary, West Channel), Wagner creeks; streams WC-1 and WC-2 are studied in detailed methods. To develop the 10-, 2-, 1-, and 0.2- percent-annual-chance frequency floods, HEC- RAS v.4.1 hydraulic model was used.

Study stream centerlines from the 2010 Bowie County Digital Flood Insurance Rate Map (DFIRM) Database were adjusted to reflect survey data and 2006 LiDAR. Hydraulic cross sections used for the study streams' HEC-RAS models were placed at close intervals above and below bridges and culverts, where applicable, in order to compute the significant effective flow and backwater effects of these structures. HEC-GeoRAS software was used to extract geographical data for centerlines and cross sections. Elevation data was extracted from the terrain model created from 2006 City of Texarkana LiDAR for each cross section and imported into HEC-RAS. The cross

section profiles were supplemented with field survey where available. Flowlines and channels of non-surveyed hydraulic cross sections were interpolated based on nearby channel surveys when the topographic data was not sufficient to define the channels.

Channel roughness factors (Manning's "n") were assigned based on field inspection and aerial photographs.

Ineffective flow areas were entered in the overbanks of the channel upstream and downstream of structures to account for overbank loss of conveyance due to the structures. Ineffective flow limits were also used in situations where there was storage without conveyance in the cross section overbanks.

The starting boundary conditions varied for many of the detailed study streams included in this study. The following streams utilized known water surface elevations based on coincident flow elevations as the starting boundary condition: Cowhorn Creek East Tributary, Cowhorn Creek West Tributary, South Wagner Creek, Swampoodle Creek, Swampoodle Creek East Tributary, Swampoodle Creek West Channel, Stream WC-2, and Wagner Creek. The current effective HEC-2 known water surface elevations were utilized for Swampoodle Creek and Wagner Creek. Normal depth was used as the starting boundary condition when it produced higher starting water surface elevations compared to the coincident flow elevations. The following streams utilized normal depth as the starting boundary condition: Corral Creek, Cowhorn Creek, Howard Creek, and Stream WC-1. The starting boundary conditions for Clear Creek utilized the current effective HEC-2 known water surface elevation from Bringle Lake for the 100-year storm event. All other storm events for Clear Creek utilized starting water surface elevations based on normal depth calculations.

Detailed Light Detection and Ranging (LiDAR) elevation data from 2006, provided by the City of Texarkana, and cross-section and bridge/culvert surveys were used to enhance the accuracy of the models. The LiDAR information was used to delineate the 1- and 0.2-percent-annual chance floodplains and regulatory floodway.

TABLE 4 – MANNING'S 'N' VALUES

Stream	Channel "n"	Overbank "n"
Aiken Creek	0.030 – 0.080	0.030 – 0.100
Barkman Creek	0.050 – 0.070	0.060 – 0.085
Clear Creek	0.030 – 0.055	0.050 – 0.100
Corrall Creek	0.030 – 0.070	0.045 – 0.100
Cowhorn Creek & Tribs.	0.015 – 0.060	0.040 – 0.150
Howard Creek	0.045 – 0.075	0.050 – 0.100
Noname Creek	0.015 – 0.060	0.065 – 0.085
Spring Creek	0.050 – 0.075	0.065- 0.100
South Wagner Creek	0.045 – 0.100	0.045 – 0.100
Swampoodle Creek & Tribs.	0.015 – 0.070	0.015 – 0.100
Stream AC-1	0.045 – 0.080	0.045 – 0.100
Stream AC-1A	0.075	0.095
Stream AC-2	0.075	0.030 – 0.100
Stream AC-2A	0.075	0.095
Stream AC-3	0.045 – 0.075	0.045 – 0.100
Stream AC-4	0.060 – 0.085	0.09
Stream AC-5	0.065	0.085
Stream AC-6	0.065	0.050 – 0.085
Stream AC-7	0.045 – 0.075	0.045 – 0.090
Stream AC-7A	0.045 – 0.075	0.075
Stream AC-7B	0.065	0.075
Stream BC-1	0.06	0.070 – 0.075
Stream BC-1A	0.060 – 0.070	0.065 – 0.085
Stream BC-2	0.065	0.070 – 0.075
Stream BC-2A	0.065	0.07
Stream BC-3	0.060 – 0.065	0.080 – 0.090
Stream BC-3A	0.060 – 0.070	0.070 – 0.090
Stream CC-1	0.050	0.065
Stream CC-2	0.055	0.075
Stream CC-3	0.055 – 0.060	0.050 – 0.060
Stream CC-4	0.050	0.055 – 0.060
Stream CC-5	0.055	0.060
Stream CC-6	0.050 – 0.065	0.055 – 0.080
Stream MB-1	0.065 – 0.075	0.085 – 0.095
Stream MB-1A	0.065 – 0.075	0.085 – 0.095
Stream SC-1	0.050	0.060
Stream SC-2	0.050	0.060
Stream SC-3	0.045 – 0.070	0.095
Stream SC-3A	0.045 – 0.075	0.050 – 0.095
Stream SC-4	0.050 – 0.075	0.050 – 0.095
Stream SC-5	0.070 – 0.075	0.080 – 0.095
Stream SC-6	0.055 – 0.070	0.065 – 0.095
Stream WC-1	0.045 – 0.070	0.045 – 0.100
Stream WC-2	0.015 – 0.060	0.015 – 0.100
Stream WC-3	0.050 – 0.075	0.070 – 0.100
Stream WC-4	0.050 – 0.055	0.050 – 0.065
Wagner Creek	0.025 – 0.100	0.050 – 0.100

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

3.3. Vertical Datum

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

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88. The datum conversion factor from NGVD29 to NAVD88 in Bowie County is -0.035.

For additional information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey (NGS) website at www.ngs.noaa.gov, or contact the NGS at the following address:

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

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

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

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM

and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1. Floodplain Boundaries

To provide a national standard without regional discrimination, the 1- percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplains have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic data derived from digital elevation models with 2 feet contour interval (Reference 16)

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM.

Approximate 1-percent annual chance floodplain boundaries in some portions of the study area were taken directly from the Flood Hazard Boundary Maps for the Cities of Leary, Maud and Nash (References 17, 18 and 19).

For Clear, Corral, Cowhorn (including East and West Tributaries), Howard, South Wagner, Swampoodle (including East Tributary, West Channel), Wagner creeks; streams WC-1 and WC-2; 2006 LiDAR elevation data provided by the City of Texarkana was used to delineate the 1- and 0.2-percent-annual chance floodplains and regulatory floodway (Reference 3).

4.2. Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that

hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 5, Floodway Data). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Clear Creek								
A	15,440	421	1,817	4.0	305.0	305.0	306.0	1.0
B	16,484	171	1,232	7.0	309.1	309.1	309.5	0.4
C	17,242	369	2,232	4.0	310.3	310.3	311.2	0.9
D	20,209	122	638	6.5	314.8	314.8	315.4	0.6
E	21,172	106	561	3.8	318.1	318.1	318.9	0.8
F	22,133	124	436	4.7	320.0	320.0	320.6	0.6
G	22,769	21	81	11.8	326.0	326.0	326.0	0.0

[1] Stream distance in feet above confluence with Mckinney Bayou

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

CLEAR CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Corral Creek								
A	1,937	245	1,561	2.2	274.8	274.8	275.6	0.9
B	5,817	90	653	4.4	285.2	285.2	285.9	0.7
C	7,888	54	344	5.1	291.3	291.3	291.9	0.5
D	9,909	90	801	2.8	302.3	302.3	302.4	0.1

[1] Stream distance in feet above confluence with Howard Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

CORRAL CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Cowhorn Creek								
A	791	408	1,506	6.9	281.1	281.1	282.1	1.0
B	1,471	313	2,440	2.3	284.9	284.9	285.6	0.7
C	2,470	260	1,470	7.1	286.3	286.3	286.8	0.5
D	5,118	180	1,163	4.7	291.4	291.4	291.8	0.4
E	6,220	300	1,364	5.5	292.8	292.8	293.3	0.5
F	6,846	135	955	5.3	297.2	297.2	297.2	0.0
G	7,891	420	1,451	5.8	298.1	298.1	298.9	0.8
H	9,074	515	1,586	6.6	299.6	299.6	300.5	0.9
I	9,688	340	1,318	6.6	301.6	301.6	302.4	0.8
J	10,371	285	1,232	5.6	303.5	303.5	303.9	0.4
K	11,068	256	1,081	7.1	305.9	305.9	306.8	0.9
L	11,658	172	712	10.4	306.4	306.4	307.3	0.9
M	12,020	207	817	5.2	309.7	309.7	310.1	0.4
N	13,652	240	973	6.3	313.6	313.6	314.4	0.8
O	15,085	126	564	7.3	317.4	317.4	317.6	0.2
P	15,803	78	457	6.3	319.8	319.8	320.6	0.8
Q	16,589	87	649	4.1	323.0	323.0	323.9	0.9
R	17,272	166	1,631	2.1	329.9	329.9	330.2	0.3
S	18,254	170	910	1.5	331.3	331.3	332.0	0.7
T	18,707	124	589	2.3	331.7	331.7	332.3	0.6
U	20,012	49	168	4.4	335.0	335.0	335.7	0.7
V	21,127	65	204	3.3	341.1	341.1	341.8	0.7

[1] Stream distance in feet above confluence with Wagner Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

COWHORN CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Cowhorn Creek								
East Tributary								
A	496	170	1,049	1.6	331.3	331.3	332.1	0.8
B	1,357	60	287	3.8	331.5	331.5	332.4	0.9
C	1,826	60	210	5.5	332.5	332.5	333.1	0.6
D	1,883	65	207	5.6	332.5	332.5	333.4	0.9
E	2,063	45	145	6.5	334.5	334.5	334.5	0.0
F	2,249	64	343	2.7	335.6	335.6	336.0	0.4
G	2,373	54	277	3.4	336.2	336.2	336.8	0.6
H	2,892	47	223	4.2	338.2	338.2	339.1	0.9

[1] Stream distance in feet above confluence with Cowhorn Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

COWHORN CREEK EAST TRIBUTARY

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Cowhorn Creek								
West Tributary								
A	929	49	214	7.5	316.7	316.7	317.4	0.7
B	2,717	91	760	1.6	332.0	332.0	332.0	0.0
C	3,421	87	388	3.1	332.1	332.1	332.6	0.5

[1] Stream distance in feet above confluence with Cowhorn Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

COWHORN CREEK WEST TRIBUTARY

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Howard Creek								
A	3,801	894	7,390	0.7	270.4	270.4	271.3	0.9
B	4,481	603	4,785	2.1	270.5	270.5	271.3	0.8
C	7,328	715	5,327	1.1	270.9	270.9	271.9	1.0
D	9,598	385	1,741	3.6	276.6	276.6	277.1	0.5
E	12,394	295	1,529	2.5	282.7	282.7	283.6	0.9
F	14,776	350	2,823	1.4	287.8	287.8	288.6	0.8
G	16,351	245	1,329	4.0	289.2	289.2	290.2	0.1
H	17,363	278	1,163	4.8	291.5	291.5	291.9	0.4
I	17,665	295	2,459	1.5	294.3	294.4	294.6	0.2
J	19,017	267	1,880	3.7	295.4	295.4	296.2	0.8

[1] Stream distance in feet above confluence with Days Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

HOWARD CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Nix Creek								
A	0.05	600	9,932	2.0	277.0	277.0	278.0	1.0
B	0.20	450	2,092	9.5	279.6	279.6	280.1	0.5

[1] Stream distance in feet above confluence with Swampoodle and Days Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

NIX CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
South Wagner								
Creek								
A	2,390	117	437	5.4	275.4	275.4	276.4	1.0
B	2,964	205	777	2.4	278.4	278.4	278.9	0.5
C	4,326	215	1,212	1.6	279.0	279.0	279.8	0.8
D	4,588	245	978	1.9	281.9	281.9	282.0	0.1
E	6,126	114	342	6.4	283.4	283.4	284.3	0.9
F	6,491	59	315	5.5	286.4	286.4	286.4	0.0
G	7,010	280	886	2.0	290.2	290.2	290.4	0.2
H	7,954	155	611	4.7	293.0	293.0	293.5	0.5
I	9,490	120	807	2.1	296.7	296.7	297.2	0.5
J	9,754	117	580	2.9	299.6	299.6	300.1	0.5
K	10,502	185	609	2.8	300.2	300.2	301.0	0.7
L	10,682	175	1,035	1.6	302.6	302.6	303.4	0.8
M	11,075	190	1,058	1.6	303.0	303.0	303.8	0.8
N	11,634	215	749	2.3	303.4	303.4	304.1	0.7
O	11,897	243	570	4.5	303.6	303.6	304.4	0.8
P	12,641	110	518	3.3	307.2	307.2	308.1	0.9
Q	12,944	130	458	1.9	308.4	308.4	309.3	1.0
R	13,029	130	460	2.0	308.5	308.5	309.4	0.9

[1] Stream distance in feet above confluence with Wagner Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH WAGNER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Noname Creek								
A	2,872	330	1,007	2.5	278.6	278.6	279.5	0.9
B	6,250	210	484	4.0	291.7	291.7	292.6	0.9

[1] Stream distance in feet above confluence with McKinney Bayou

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

NONAME CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Stream WC-1								
A	2,179	95	292	5.1	311.2 [2]	310.3	310.7	0.4
B	3,117	100	242	5.7	315.0	315.0	315.4	0.4
C	3,310	170	743	1.9	318.6	318.6	318.6	0.0
D	5,641	260	1,215	0.9	328.7	328.7	329.0	0.3
E	6,661	125	292	2.7	332.3	332.3	332.9	0.6
F	7,153	141	476	1.6	335.4	335.4	336.4	1.0
G	7,891	82	194	4.0	339.2	339.2	339.2	0.0
H	9,225	33	75	3.6	346.2	346.2	346.2	0.0
Stream WC-2								
A	944	130	729	3.9	318.0 [2]	316.9	317.9	1.0
B	1,946	126	518	3.5	319.7	319.7	320.6	0.9
C	2,160	158	1,049	1.7	323.2	323.2	324.1	0.9
D	2,442	127	857	2.4	323.2	323.2	324.2	1.0
E	3,542	76	419	2.3	328.2	328.2	329.2	1.0
F	3,971	93	400	2.4	330.4	330.4	331.4	1.0
G	4,446	130	356	2.7	331.4	331.4	332.4	1.0
H	5,219	115	317	4.2	335.5	335.5	335.9	0.4
I	6,593	56	74	7.0	342.9	342.9	343.2	0.3

[1] Stream distance in feet above confluence with Wagner Creek

[2] Backwater effect from Wagner Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

STREAM WC-1
STREAM WC-2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Swampoodle								
Creek								
A	1,523	221	1,783	4.0	282.2	282.2	282.2	0.0
B	1,855	262	3,154	2.3	286.3	286.3	286.4	0.1
C	2,117	305	4,407	1.6	286.9	286.9	287.2	0.3
D	2,642	215	1,731	4.1	286.9	286.9	287.4	0.5
E	2,957	200	1,460	5.5	287.2	287.2	287.7	0.5
F	3,443	615	4,835	1.7	288.7	288.7	289.2	0.5
G	3,848	605	4,872	1.6	288.8	288.8	289.3	0.5
H	4,632	498	2,091	3.8	289.0	289.0	289.6	0.6
I	5,062	313	1,662	3.4	289.9	289.9	290.3	0.4
J	5,656	247	1,437	5.5	290.2	290.2	291.1	0.9
K	7,237	272	926	6.0	294.0	294.0	294.0	0.0
L	8,403	178	781	6.5	296.0	296.0	296.9	0.9
M	8,897	60	420	12.1	296.0	296.0	296.8	0.8
N	10,292	148	957	5.0	301.9	301.9	302.3	0.4
O	10,842	96	590	7.5	301.9	301.9	302.3	0.3
P	12,163	160	1,043	6.6	308.5	308.5	309.3	0.8
Q	12,567	109	773	6.8	309.1	309.1	309.9	0.8
R	13,576	67	451	4.7	311.4	311.4	311.8	0.4
S	14,367	63	382	3.1	316.6	316.6	316.7	0.1
T	15,633	26	126	7.5	321.8	321.8	321.8	0.0
U	17,057	31	119	7.9	327.1	327.1	328.0	0.9
V	17,716	30	94	4.5	332.2	332.2	333.1	0.9

[1] Stream distance in feet above confluence with Days Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

SWAMPOODLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Swampoodle Creek								
East Tributary								
A	1,455	189	518	9.8	314.9	314.9	315.0	0.1
B	1,959	162	563	9.3	317.0	317.0	317.7	0.7
C	2,341	210	669	8.2	318.8	318.8	319.2	0.4

[1] Stream distance in feet above confluence with Swampoodle Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

SWAMPOODLE CREEK EAST TRIBUTARY

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Swampoodle Creek								
West Channel								
A	452	50	288	0.5	314.5	314.5	314.6	0.1
B	1,496	77	752	1.2	314.6	314.6	314.9	0.3

[1] Stream distance in feet above confluence with Swampoodle Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

SWAMPOODLE CREEK WEST CHANNEL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Wagner Creek								
A	1,729	650	6,736	3.7	269.9	269.9	270.3	0.4
B	3,133	700	5,830	2.3	270.7	270.7	271.5	0.8
C	3,539	840	4,666	2.9	271.0	271.0	271.8	0.8
D	4,010	855	5,064	2.7	272.4	272.4	273.2	0.8
E	4,928	960	7,550	1.7	273.9	273.9	274.9	1.0
F	6,607	600	3,821	3.4	276.0	276.0	276.4	0.4
G	7,125	550	4,389	3.0	277.7	277.7	277.9	0.2
H	7,416	1,000	6,243	5.5	278.2	278.2	278.5	0.3
I	7,926	765	7,289	1.8	279.0	279.0	279.5	0.5
J	10,041	630	4,769	5.6	280.8	280.8	281.7	0.9
K	12,109	570	3,407	2.9	283.3	283.3	284.0	0.7
L	13,532	635	3,909	4.6	284.9	284.9	285.6	0.7
M	13,867	423	1,873	5.4	284.9	284.9	285.7	0.8
N	14,437	805	7,882	1.3	288.3	288.3	288.4	0.1
O	15,547	430	4,539	4.1	288.6	288.6	288.8	0.2
P	17,149	670	5,976	3.2	289.5	289.5	290.3	0.8
Q	18,801	1,267	11,182	1.2	291.9	291.9	291.9	0.0
R	20,846	555	4,264	2.5	294.0	294.0	294.8	0.8
S	21,236	430	3,099	3.4	297.6	297.6	298.3	0.7
T	22,112	505	4,027	2.6	298.4	298.4	299.1	0.7
U	24,261	785	5,914	3.6	298.9	298.9	299.9	1.0
V	26,793	905	6,165	3.7	301.1	301.1	302.0	0.9
W	29,154	880	5,506	1.9	303.3	303.3	303.9	0.6
X	29,999	440	2,797	7.6	304.3	304.3	304.9	0.6
Y	31,276	395	2,501	6.2	307.7	307.7	308.5	0.8
Z	33,753	1,010	7,370	1.2	310.5	310.5	311.0	0.5

[1] Stream distance in feet above confluence with Days Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

WAGNER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Wagner Creek								
AA	34,191	1,210	8,097	1.1	311.2	311.2	311.9	0.7
AB	36,714	520	3,780	4.3	312.3	312.3	313.1	0.8
AC	39,873	445	3,718	2.3	316.8	316.8	317.7	0.9
AD	41,599	430	3,669	3.6	319.8	319.8	320.7	0.9

[1] Stream distance in feet above confluence with Days Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOWIE COUNTY, TEXAS
AND INCORPORATED AREAS

FLOODWAY DATA

WAGNER CREEK

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation (WSEL) of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

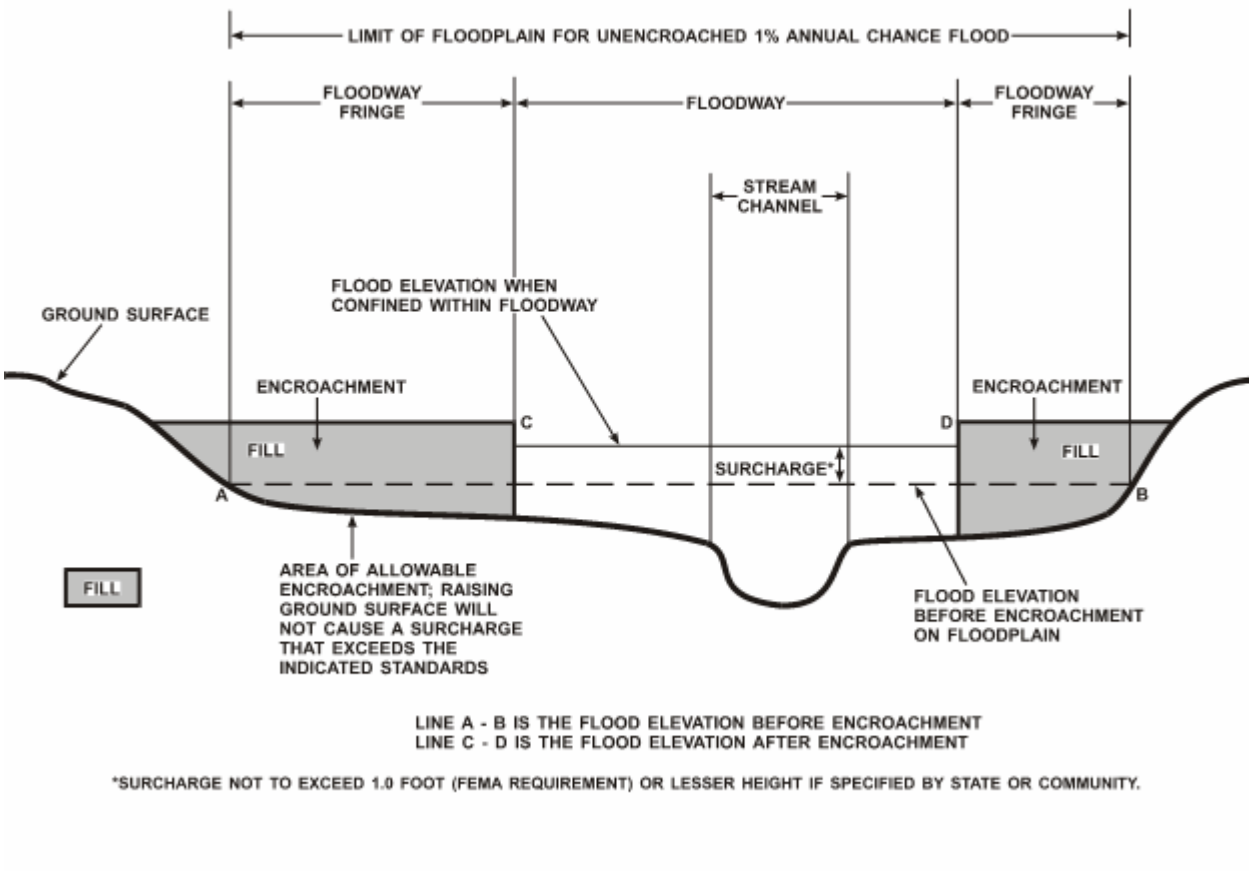


FIGURE 1 – FLOODWAY SCHEMATIC

5.0 **INSURANCE APPLICATIONS**

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the areas of 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

This countywide FIRM presents flooding information for the entire geographic area of Bowie County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on FHBM and Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 6, “Community Map History.”

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Bowie County (Unincorporated Areas)	August 15, 1978	None	September 27, 1991	None
De Kalb, City of [1]	N/A	None	October 19, 2010	N/A
Hooks, City of	March 15, 1974	April 23, 1976	April 1, 1987	N/A
Leary, City of	November 26, 1976	None	October 19, 2010	N/A
Maud, City of	April 12, 1974	April 2, 1976	December 12, 1978	N/A
Nash, City of	January 23, 1974	None	June 21, 1977	N/A
New Boston, City of	December 17, 1973	April 16, 1976	November 21, 1978	N/A
Red Lick, City of [1]	N/A	None	October 19, 2010	N/A
Redwater, City of [1]	N/A	None	October 19, 2010	N/A
Texarkana, City of	June 7, 1974	None	March 1, 1979	May 17, 1993 September 3, 1992
Wake Village, City of	January 16, 1974	June 4, 1976	October 15, 1985	None

[1] This community does not have a map history prior to the first countywide mapping

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

FIS were prepared for the Cities of Leary, Maud, Nash, New Boston, and Wake Village (References 18, 19, 20, 21 and 22).

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

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA Region VI, Federal Insurance and Mitigation Division, 800 North Loop 288, Denton, Texas 76209.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Study, Bowie County and Unincorporated Areas, Texas, Washington DC, September 21, 1991.

2. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, City of Texarkana, Bowie County, Texas, Washington, DC, September 3, 1992.

3. Halff Associates, Inc., City of Texarkana City-Wide LOMR, December 20, 2013

4. Texas State Department of Highway and Public Transportation's name change in 1991 to the Texas Department of Transportation with the merging of the Texas State Department of Highways and Public Transportation, the Texas Department of Aviation, and the Texas Motor Vehicle Commission; http://www.lib.utexas.edu/taro/tslac/30120/tsl-30120.html

5. Texas Department of Water Resources' name changed to the Texas Natural Resource Conservation Commission in the fall of 1993 by the Texas State Legislature, and again to the Texas Commission on Environment Quality on September 1, 2002; http://www.tceq.state.tx.us/about/tceqhistory.html.

6. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, City of Texarkana, Miller County, Arkansas, Washington, DC, July 5, 2001.

7. National Oceanic and Atmospheric Administration, Storm Data and Unusual Weather Phenomena with Late Reports and Corrections, Volume 40, No. 5, May 1998.

8. U.S. Army Corps of Engineer, New Orleans District, Flood Plain Information, Days Creek and Tributaries, Texarkana, Arkansas-Texas, New Orleans, Louisiana, August 1970.

9. U.S. Army of Corps of Engineers, Fort Worth District, Computer Program NUDALLAS, revised September 1982.

10. U.S. Department of Commerce, National Weather Service, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D.C., 1961, Revised 1963.

11. National Oceanic and Atmospheric Administration, Technical Memorandum NWS Hydro-35, Five to 60 Minute Precipitation Frequency for the Eastern and Central United States, June 1977.

12. U.S. Army Corps of Engineers, Civil Engineer Bulletin Number EM 1110-2-1411, Standard Project Flood Determinations.

13. U.S. Army of Corps of Engineer, Hydrologic Engineering Center, HEC-1 Flood Hydrograph Package, Davis, California, updated September 1981.

14. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Bowie County, Texas, October 1980.

15. Williams-Stackhouse, Inc., San Antonio, Texas, Topographic Maps, Scale 1"= 800', Contour Interval 4 Feet, from March 1989 aerial photography.

16. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized computer program, Davis, California, April 1984.

17. Federal Emergency Management Agency, Flood Insurance Study, Bowie County, Texas and Incorporated Areas, Washington D.C., in progress.

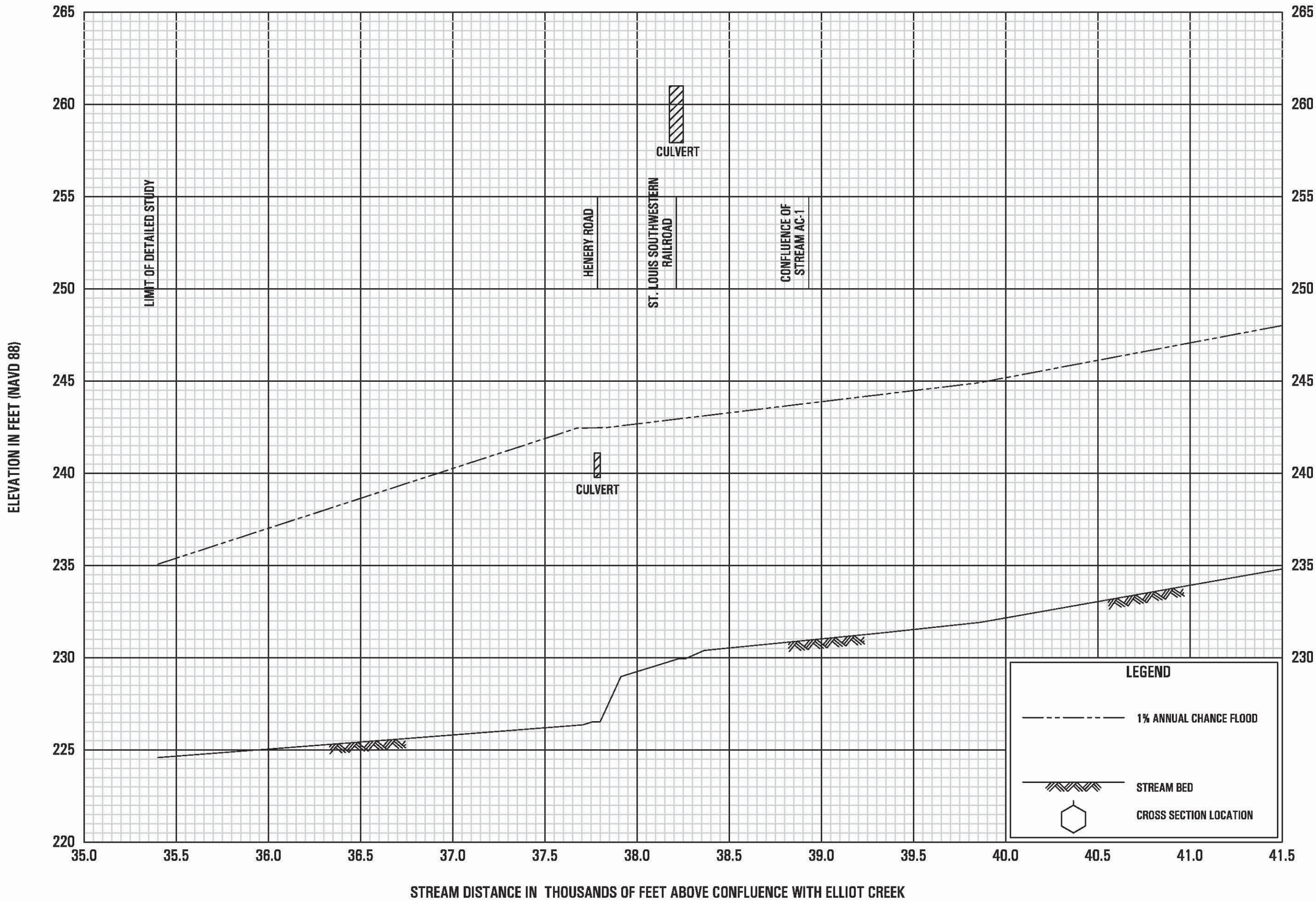
18. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Leary, Bowie County, Texas, Washington, D. C., November 26, 1976.

19. Federal Emergency Management Agency, Federal Insurance Administration, Flood Hazard Boundary Map, City of Maud, Bowie County, Texas, Washington, D. C., December 12, 1978.

20. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Nash, Bowie County, Texas, Washington, D. C., June 21, 1977.

21. Federal Emergency Management Agency, Federal Insurance Administration, Flood Hazard Boundary Map, City of New Boston, Bowie County, Texas, Washington, D. C., November 11, 1978.

22. Federal Emergency Management Agency, Flood Insurance Study, City of Wake Village, Bowie County, Texas, Washington, D. C., October 15, 1985.



FLOOD PROFILES

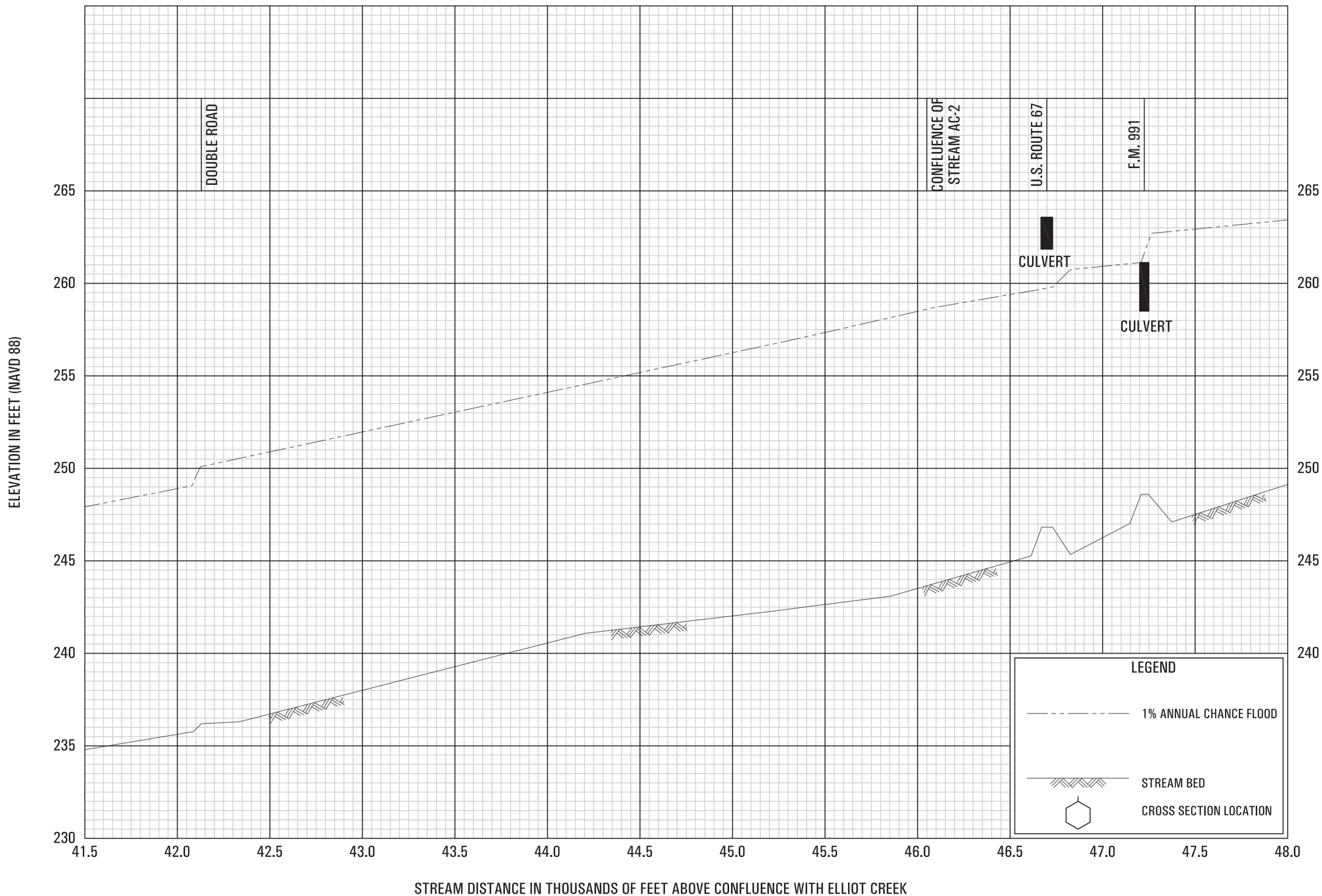
AIKEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

01P



FLOOD PROFILES

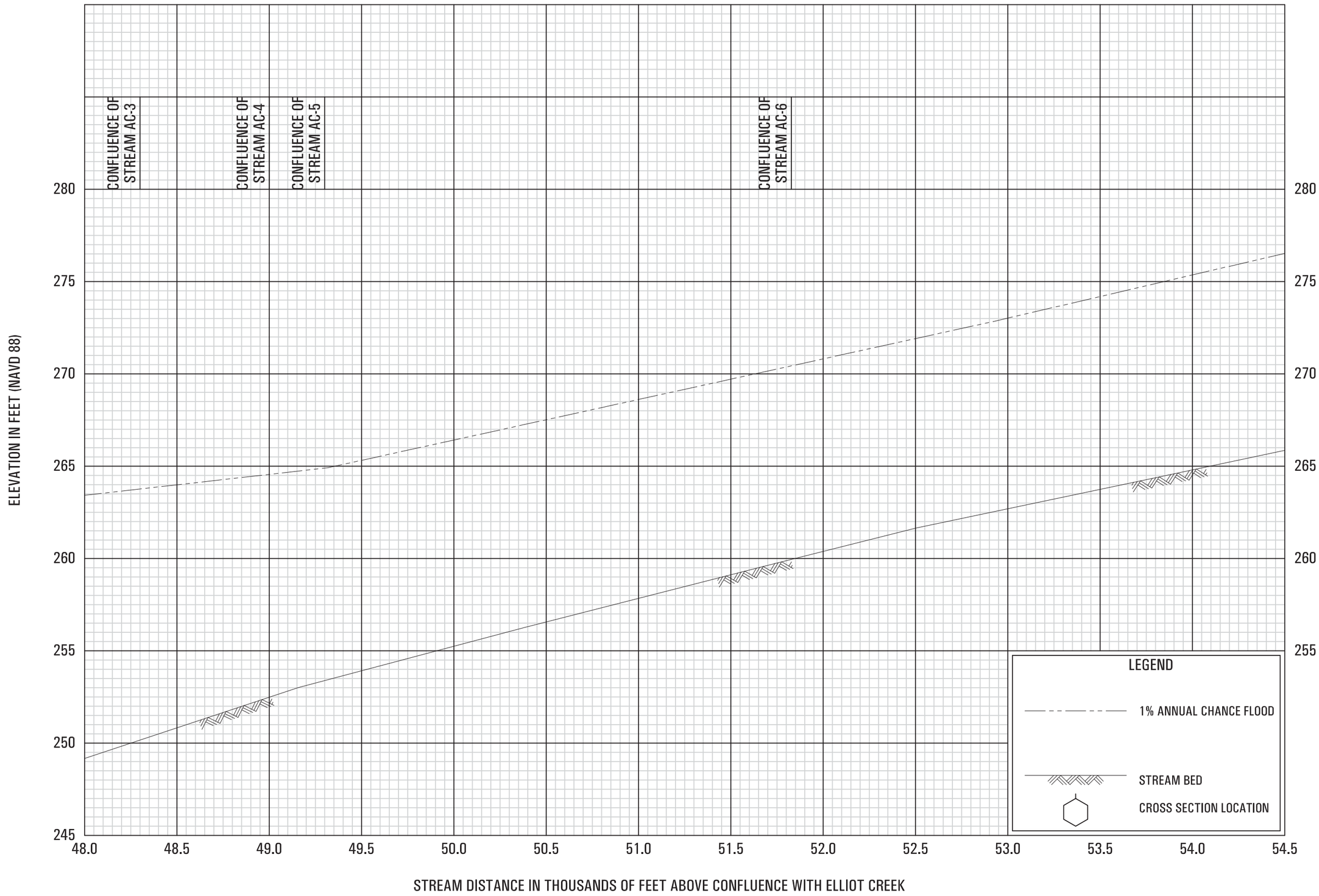
AIKEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

02P



FLOOD PROFILES

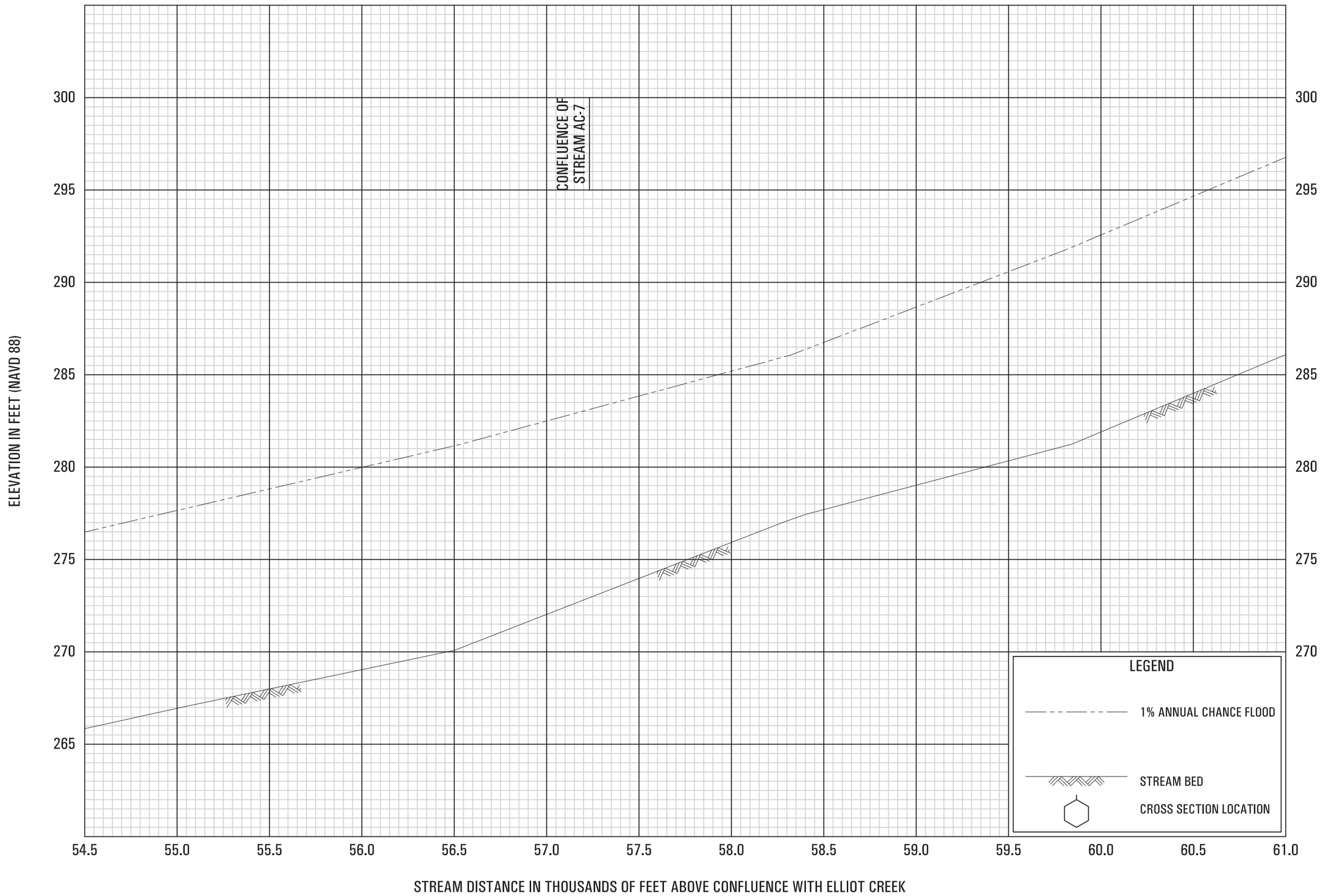
AIKEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

03P



FLOOD PROFILES

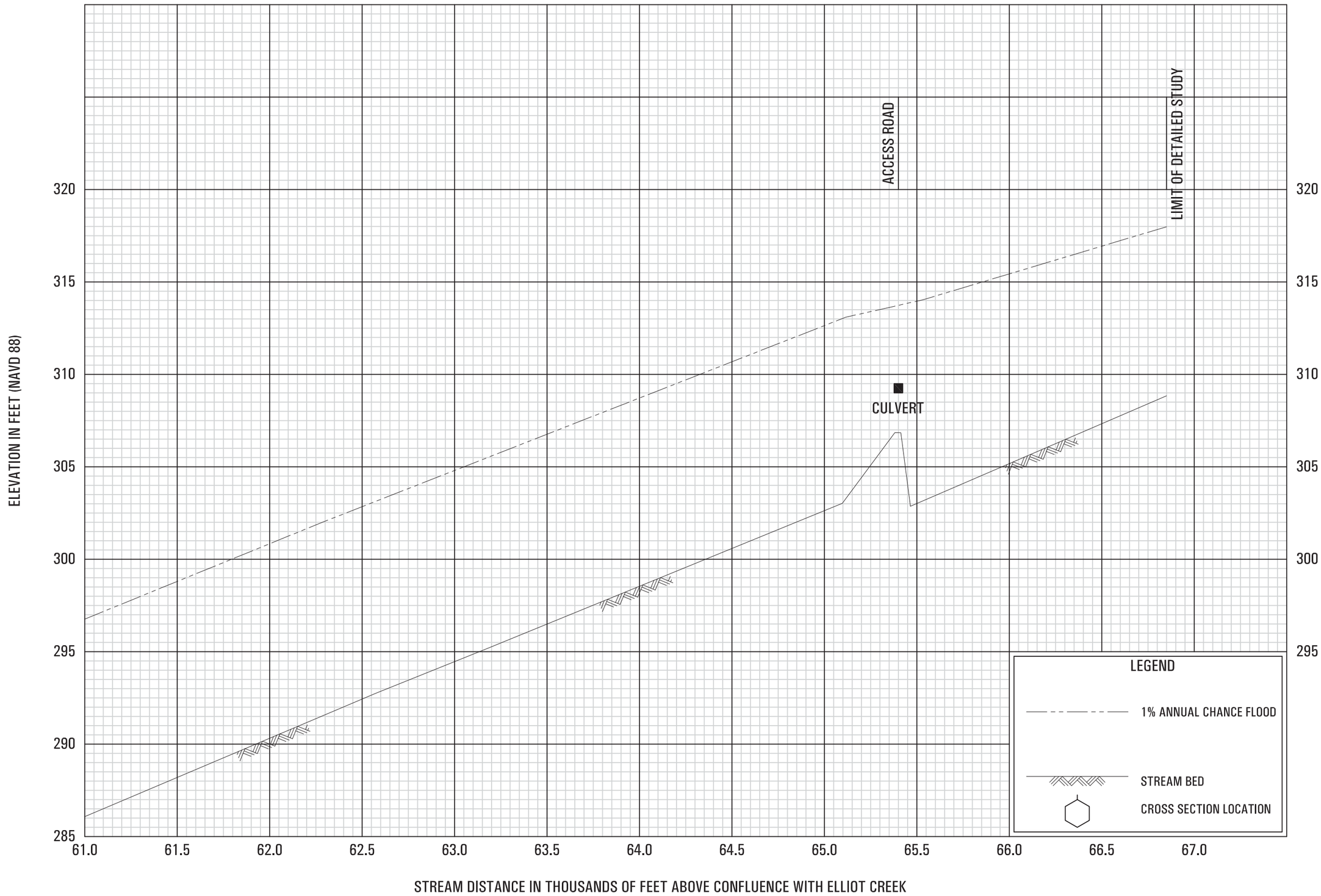
AIKEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

04P



FLOOD PROFILES

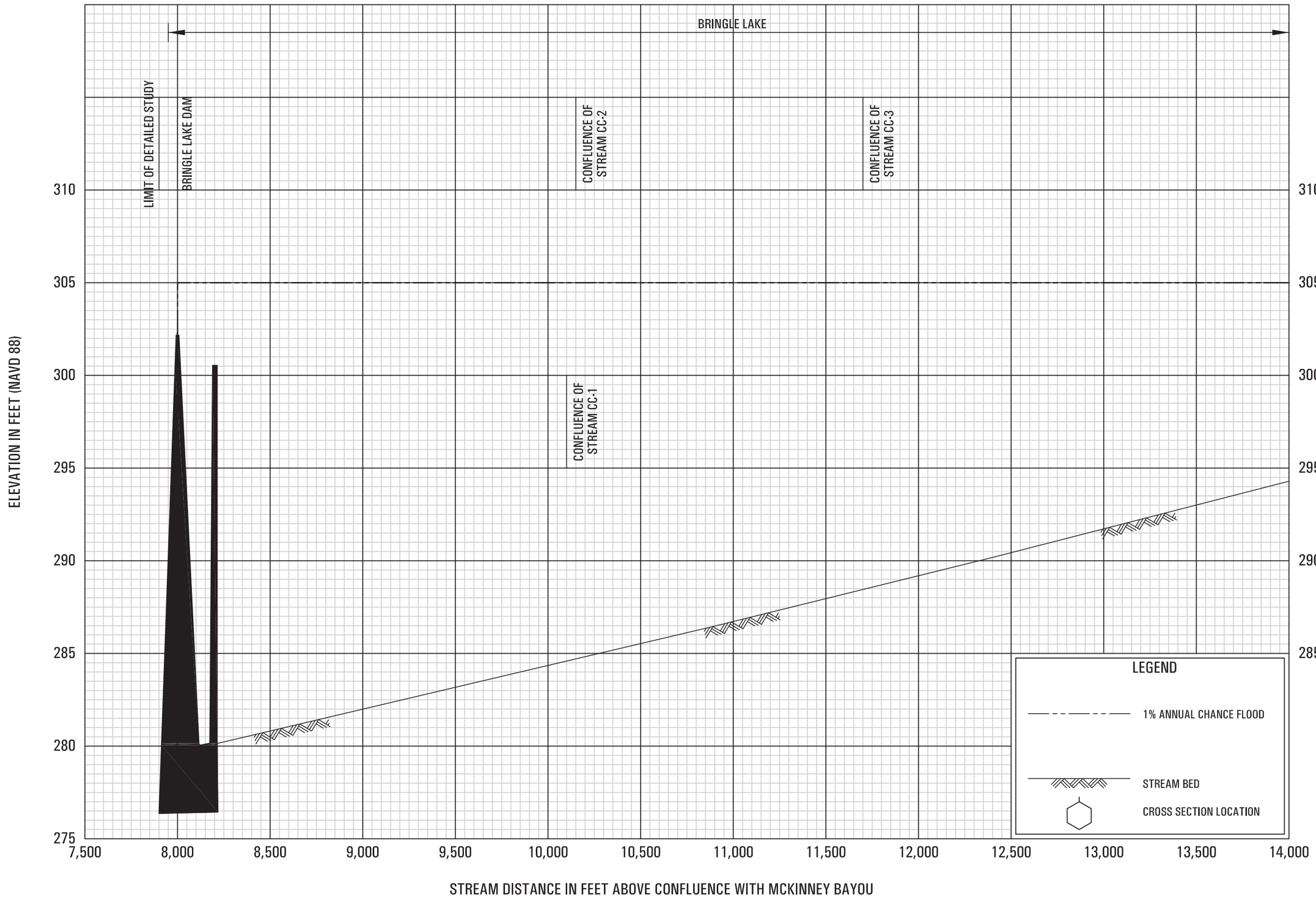
AIKEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

05P



FLOOD PROFILES

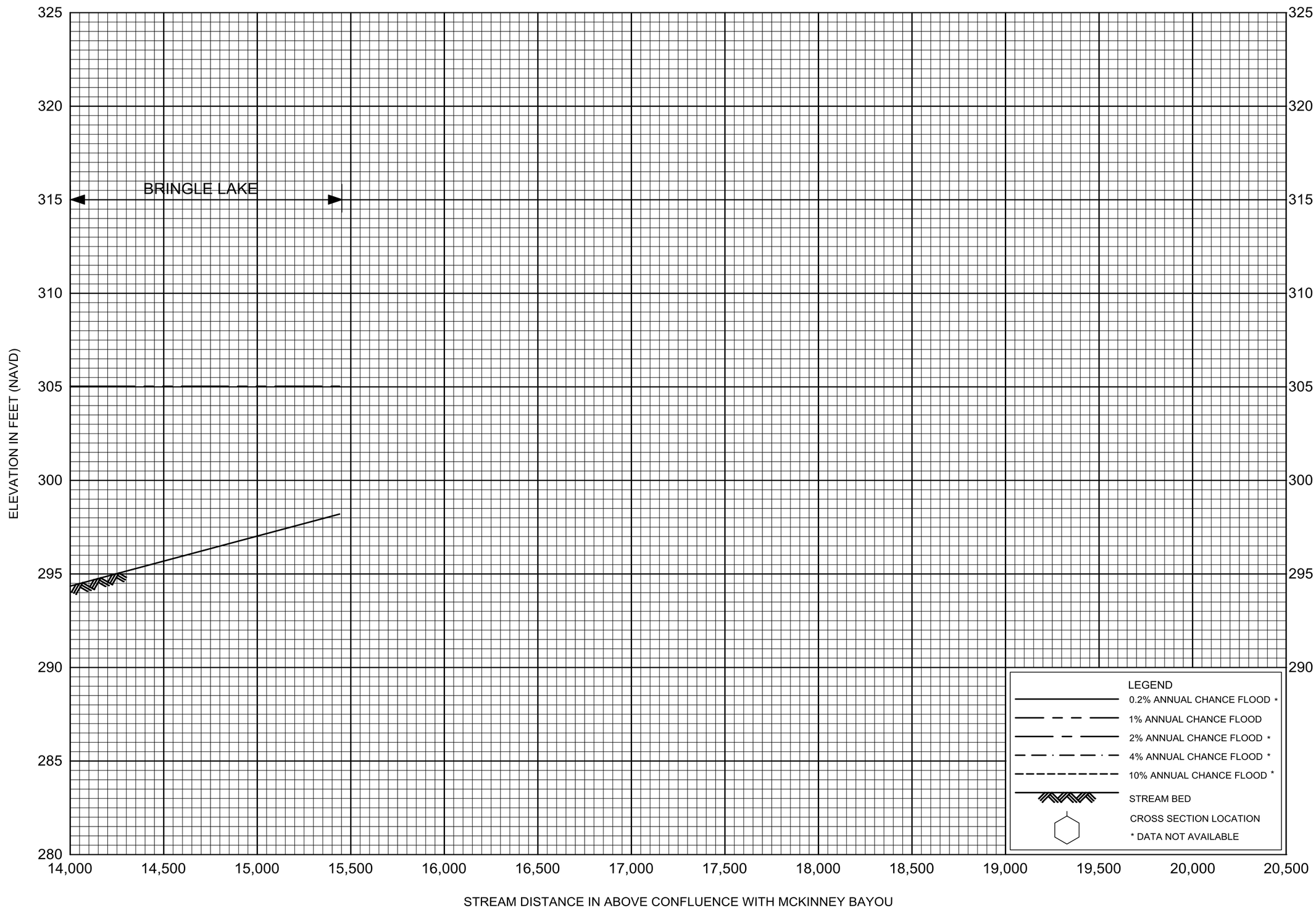
CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

06P



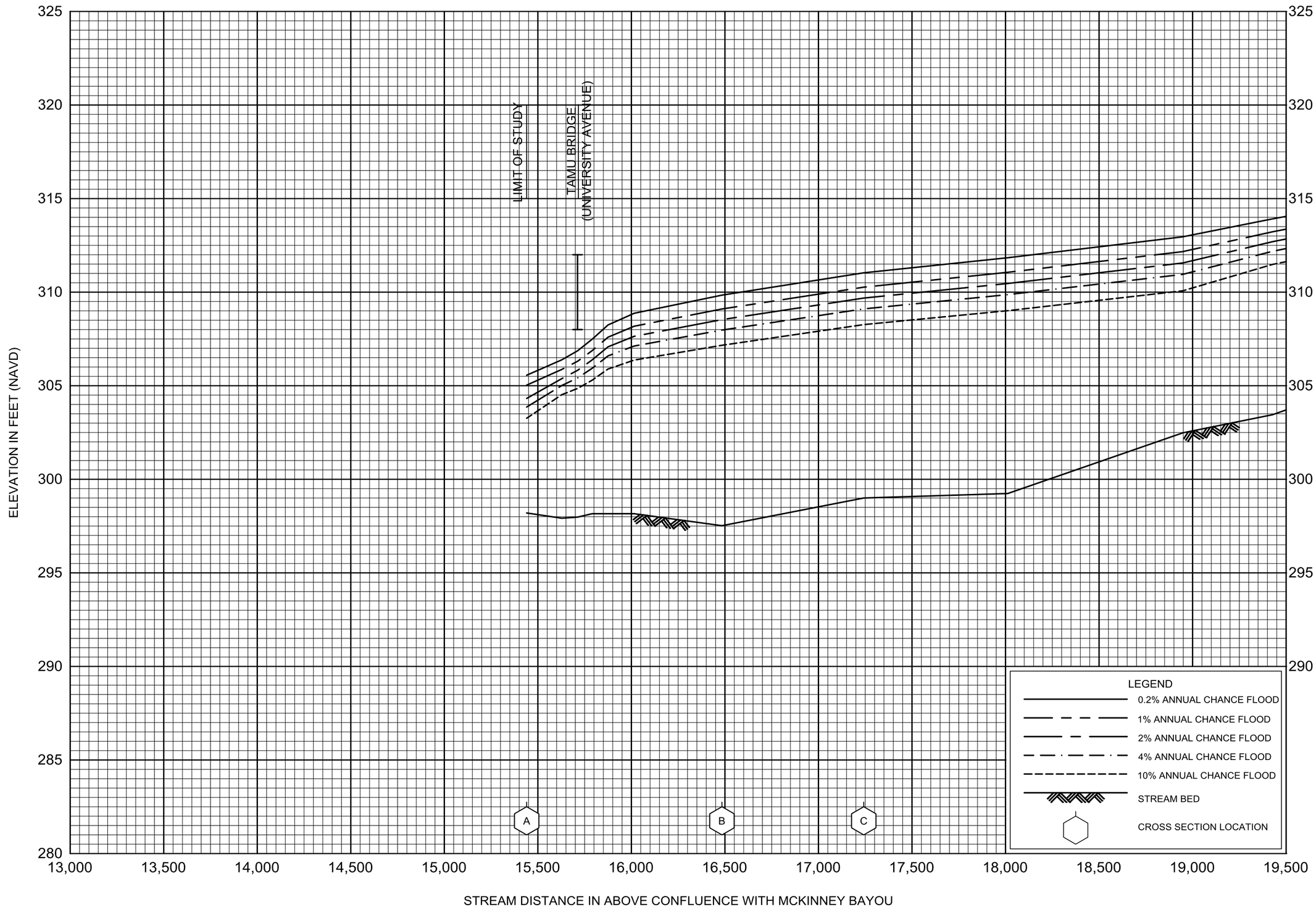
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



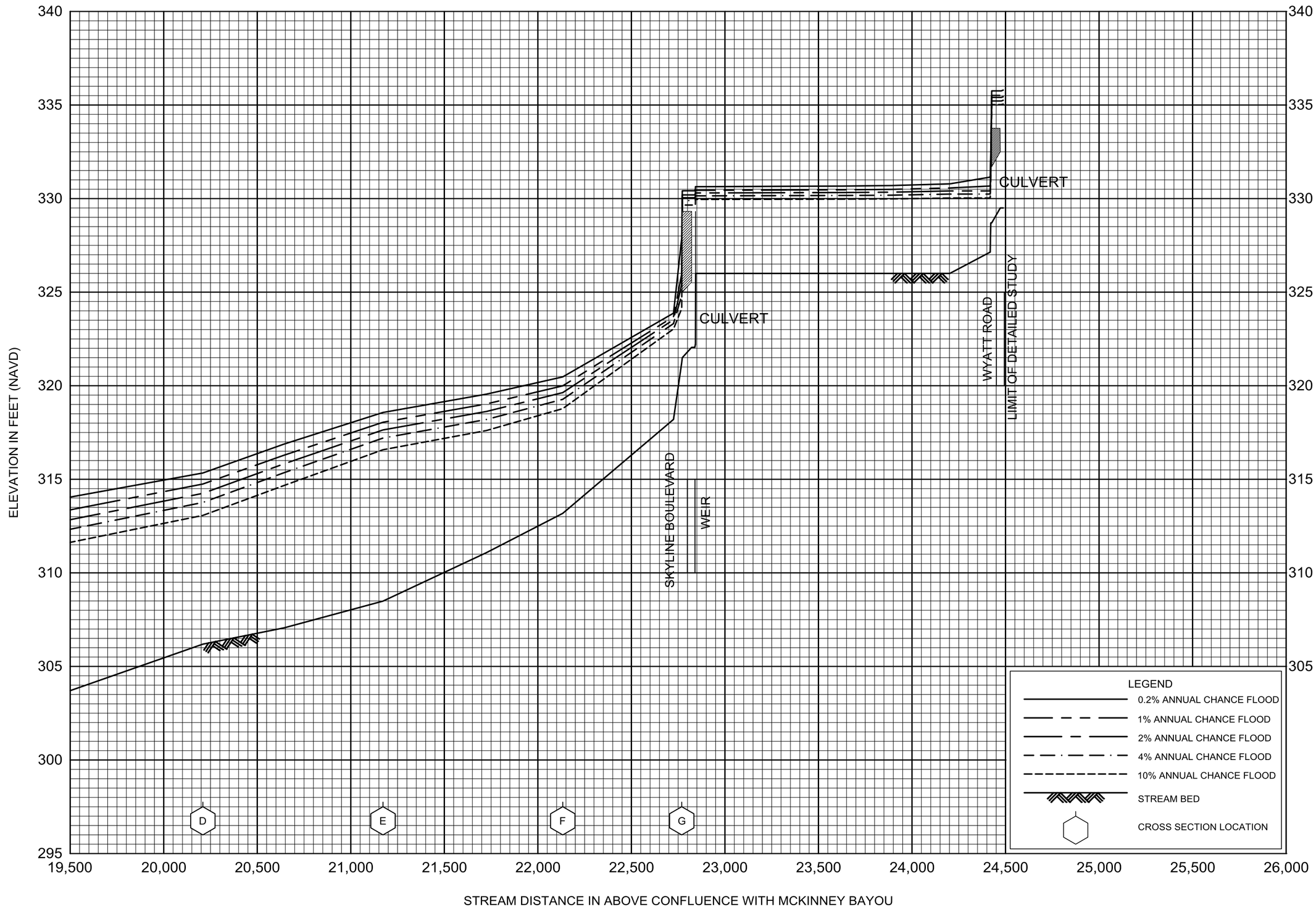
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



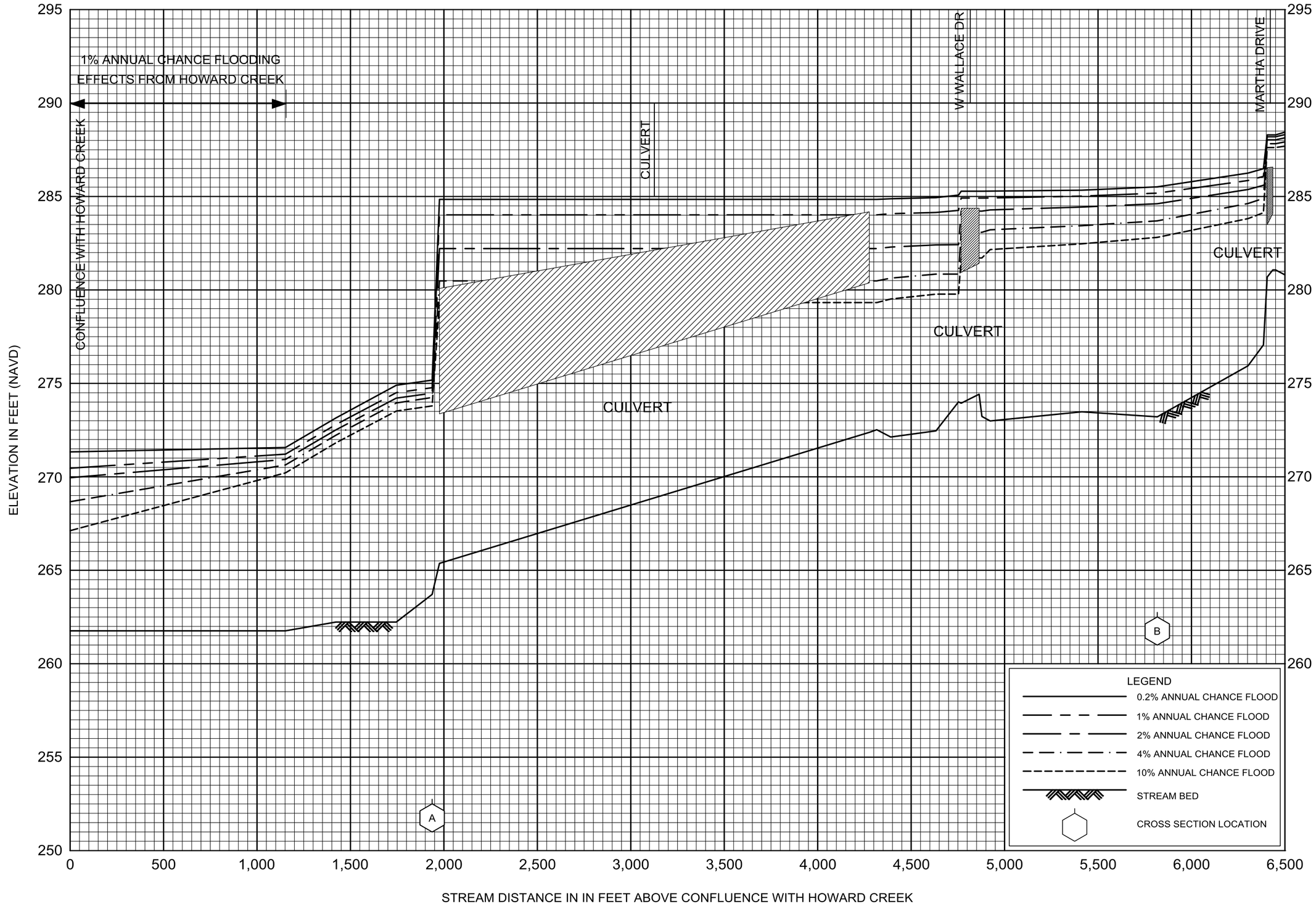
FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



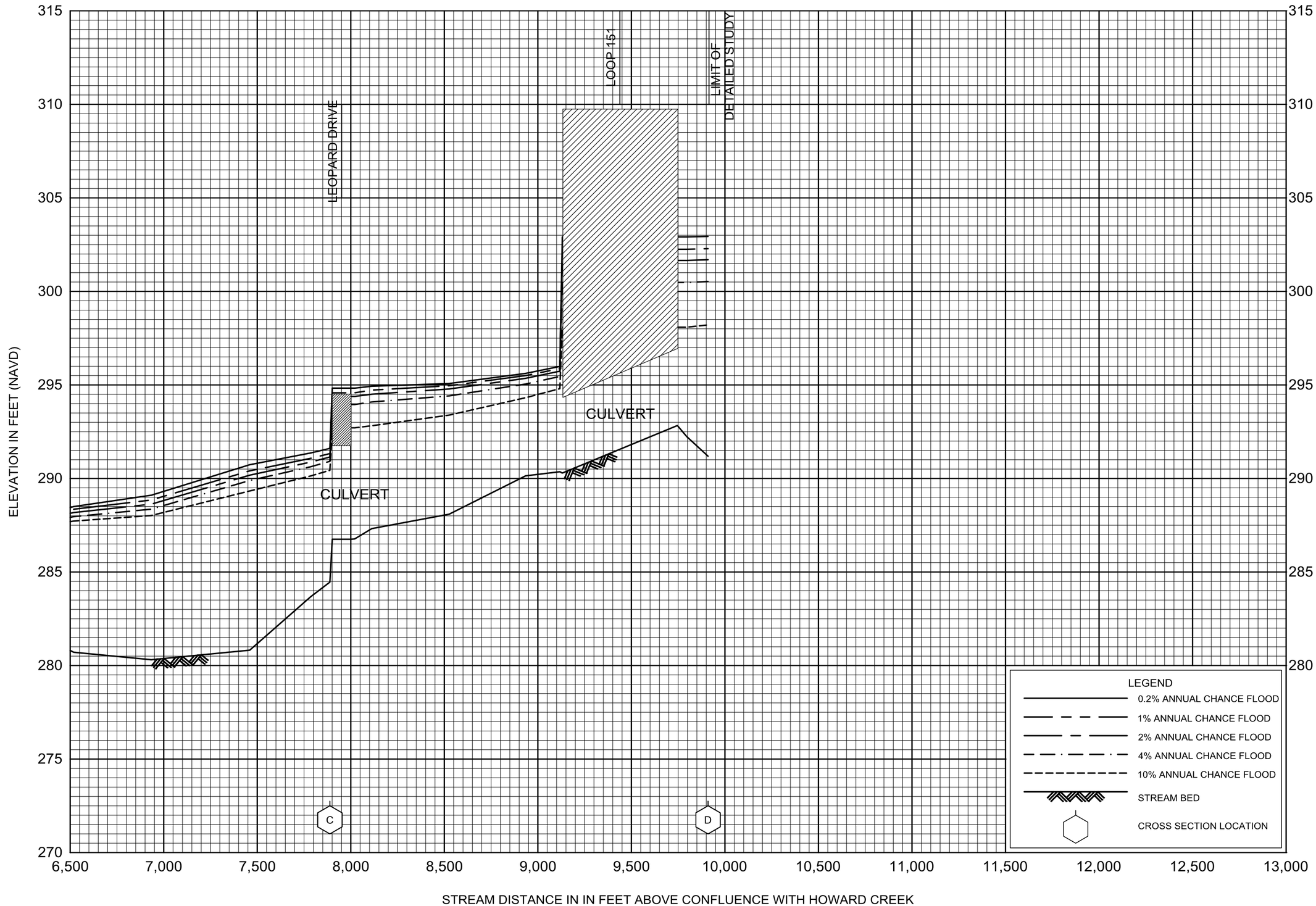
FLOOD PROFILES

CORRAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



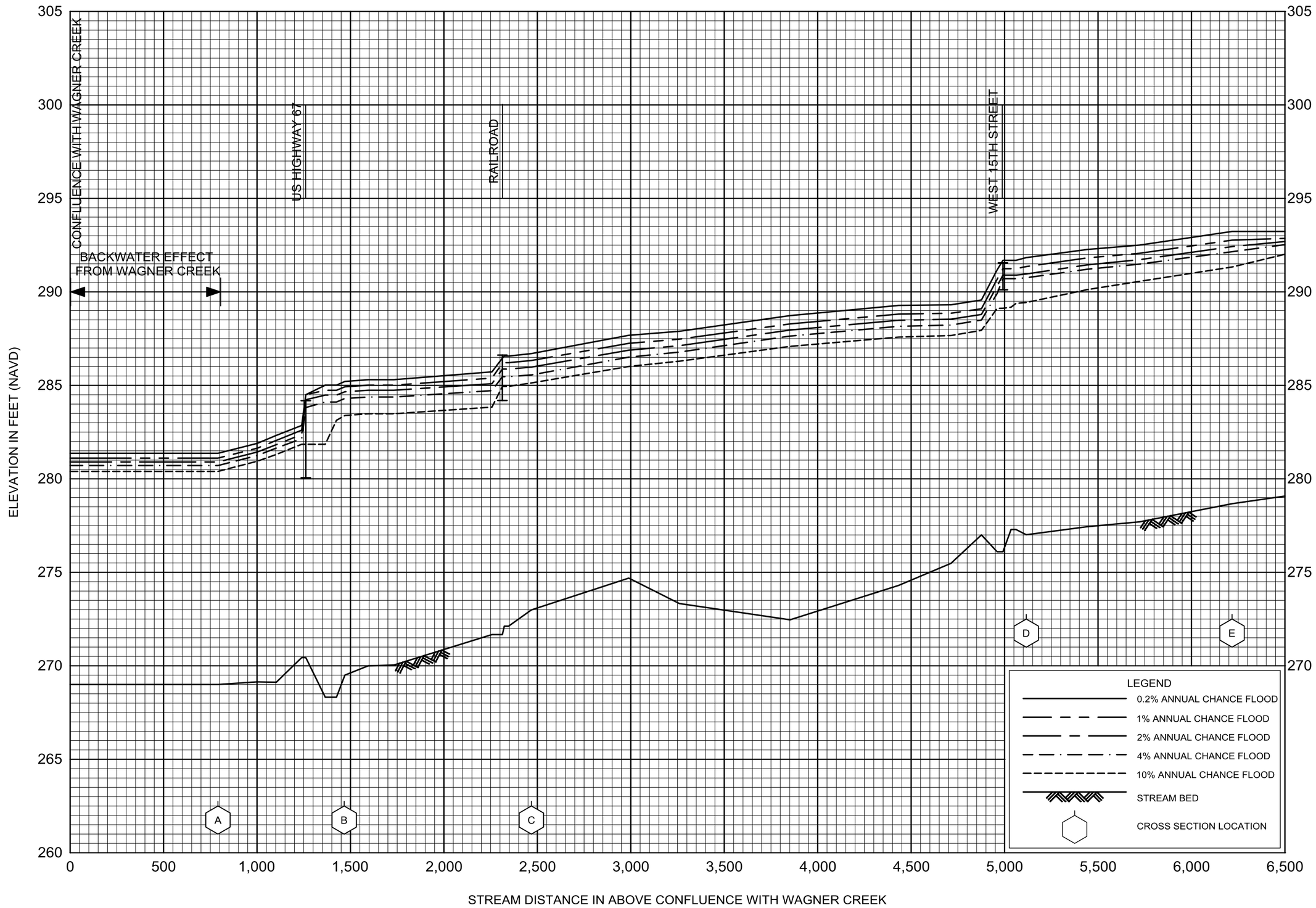
FLOOD PROFILES

CORRAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



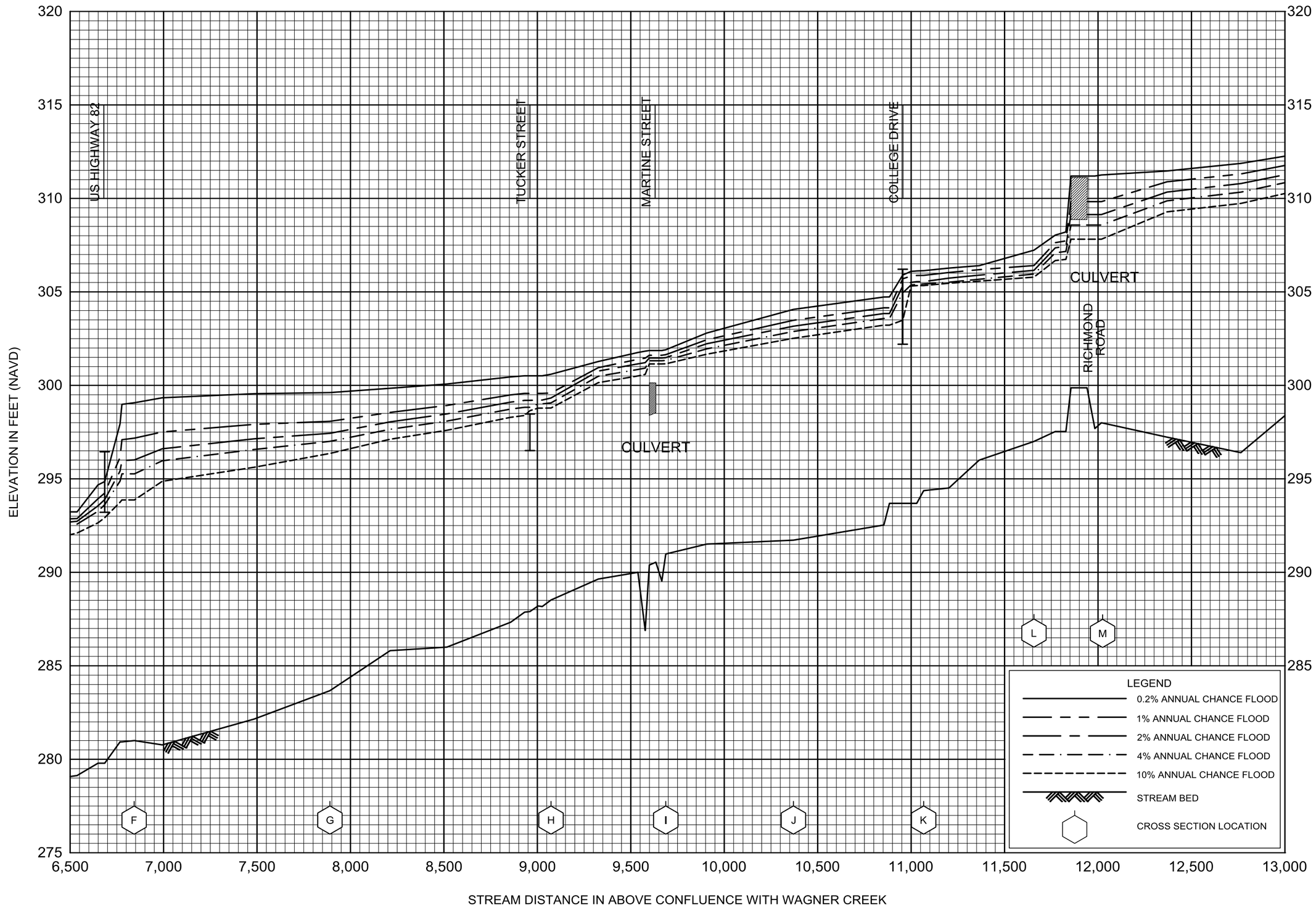
FLOOD PROFILES

COWHORN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



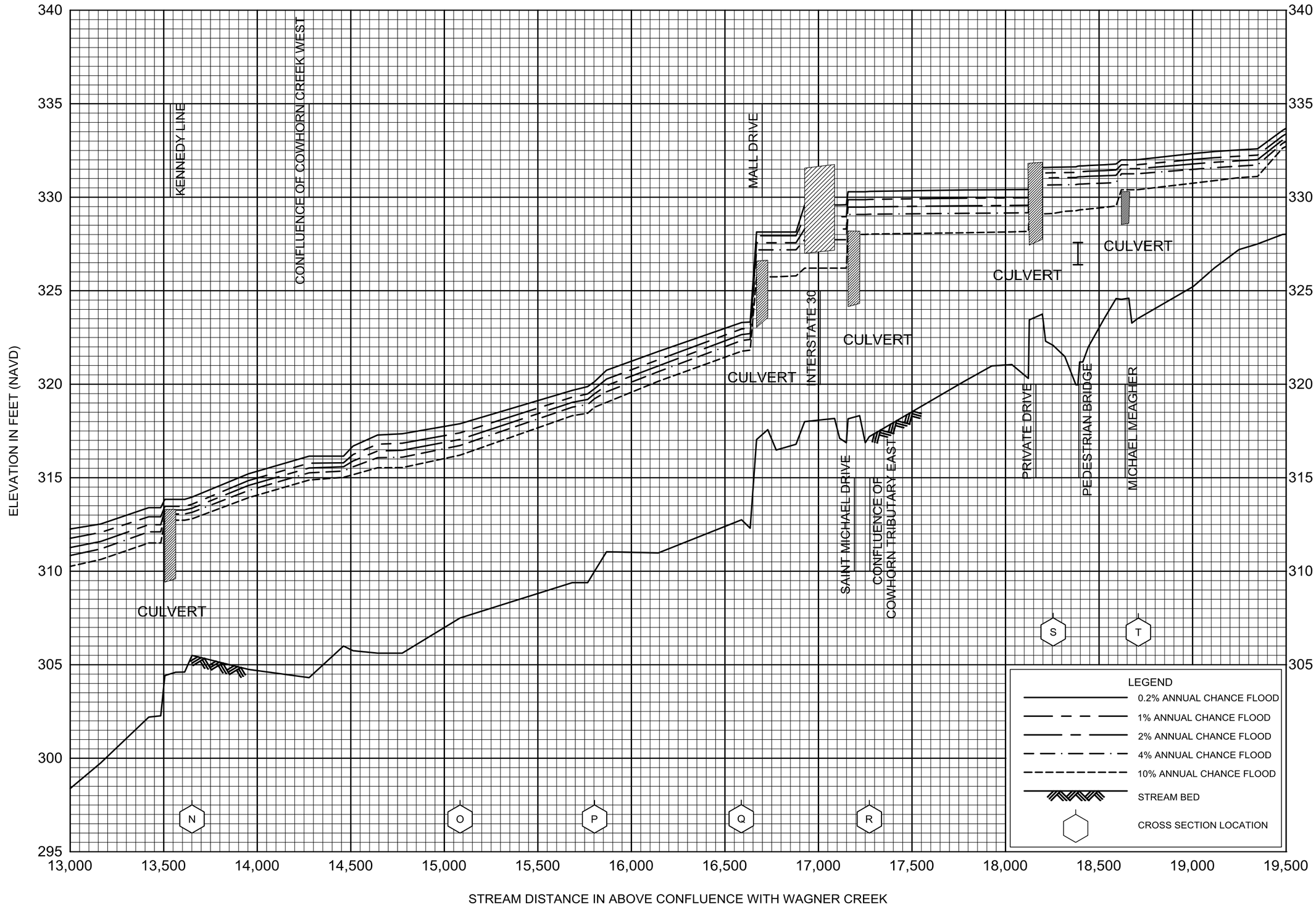
FLOOD PROFILES

COWHORN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

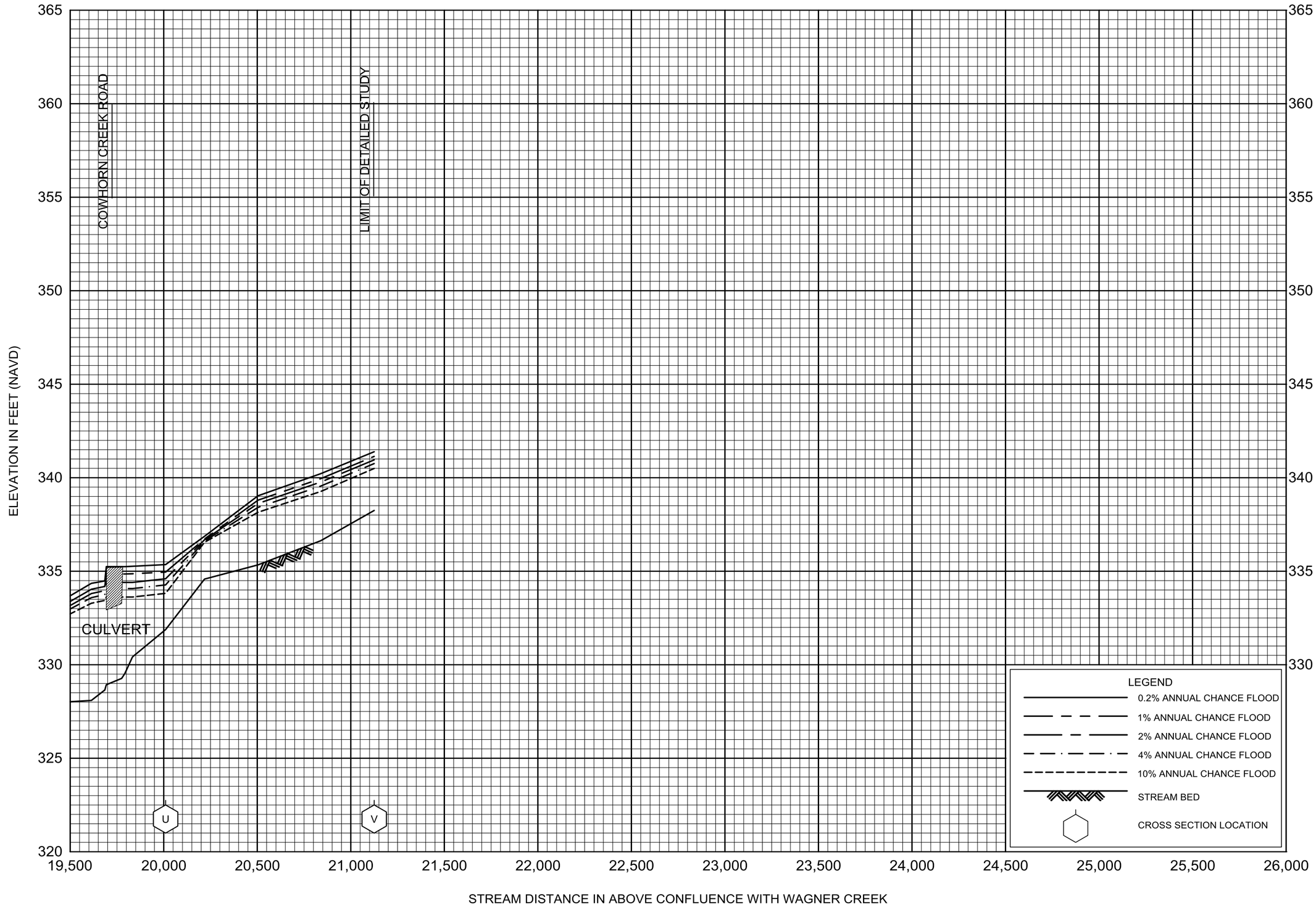


FLOOD PROFILES

COWHORN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX
AND INCORPORATED AREAS



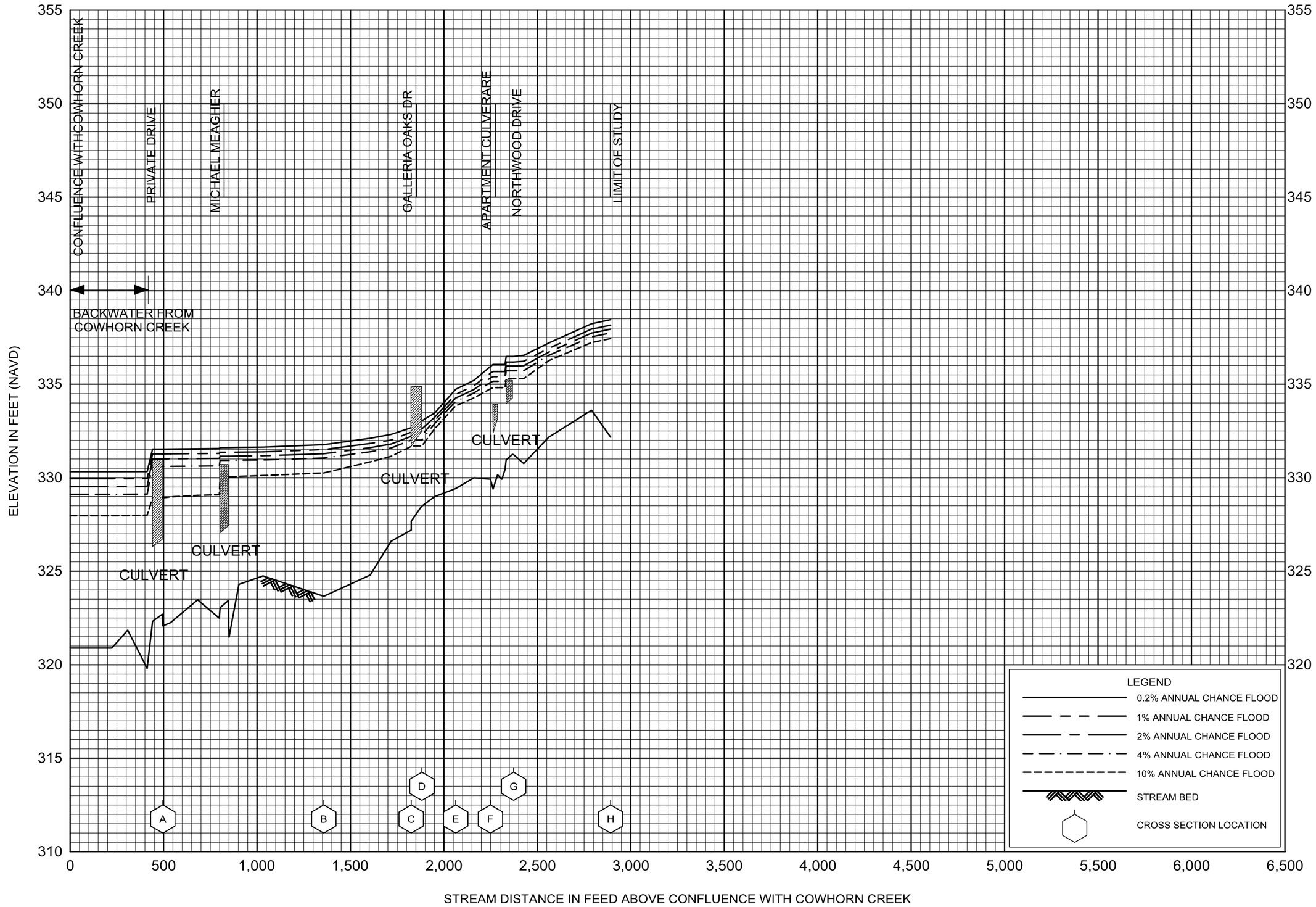
FLOOD PROFILES

COWHORN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



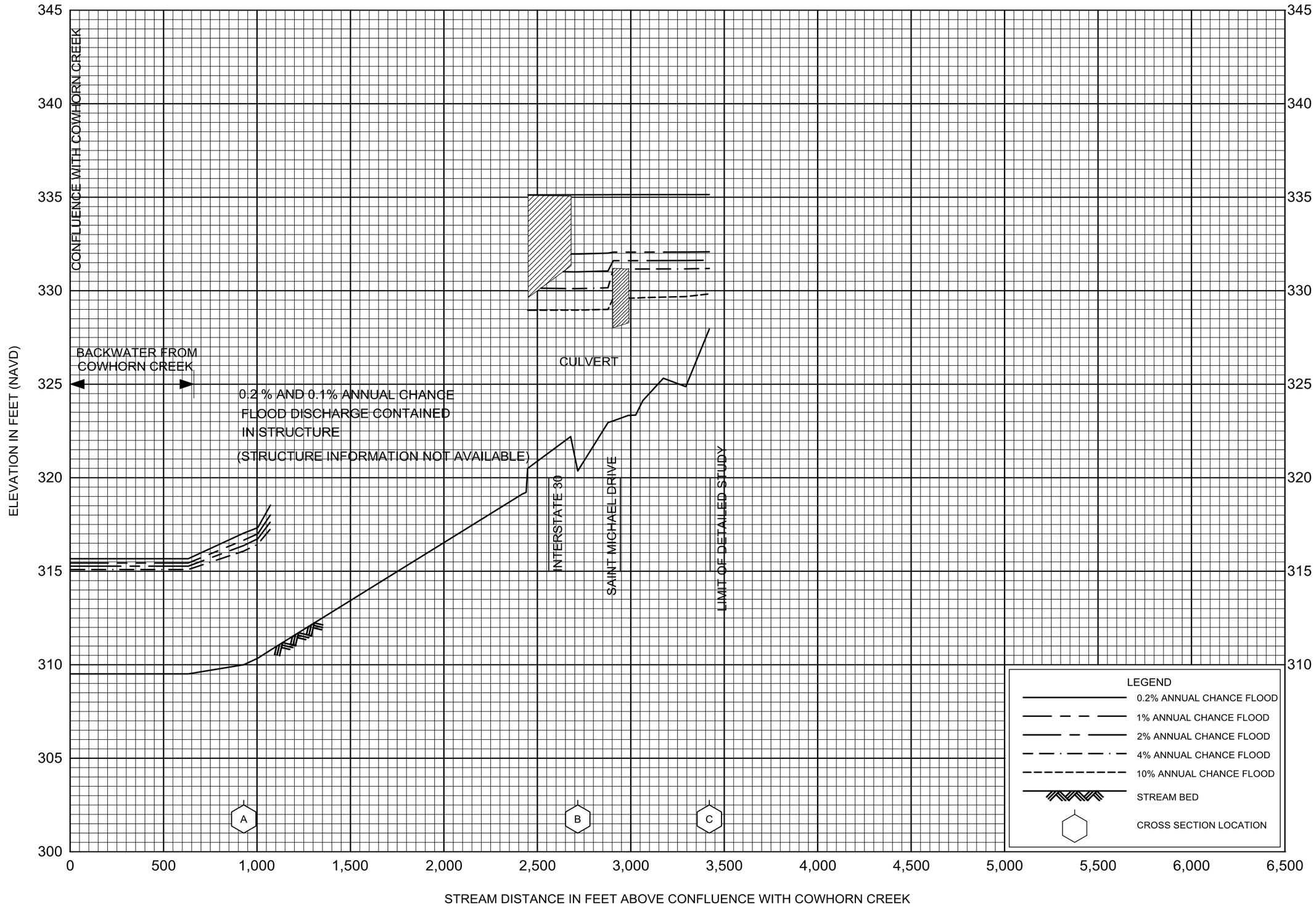
FLOOD PROFILES

COWHORN CREEK EAST TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



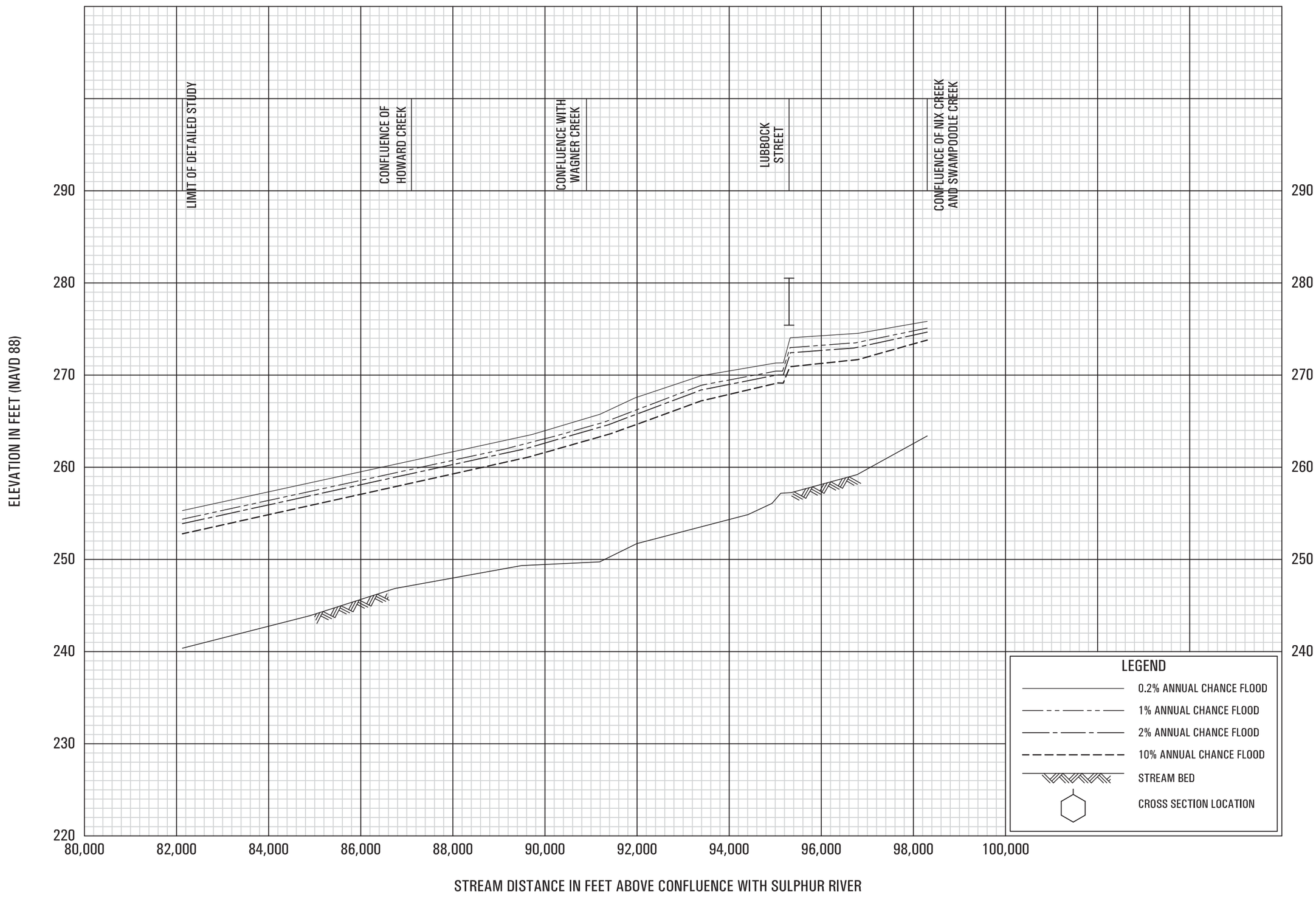
FLOOD PROFILES

COWHORN CREEK WEST TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



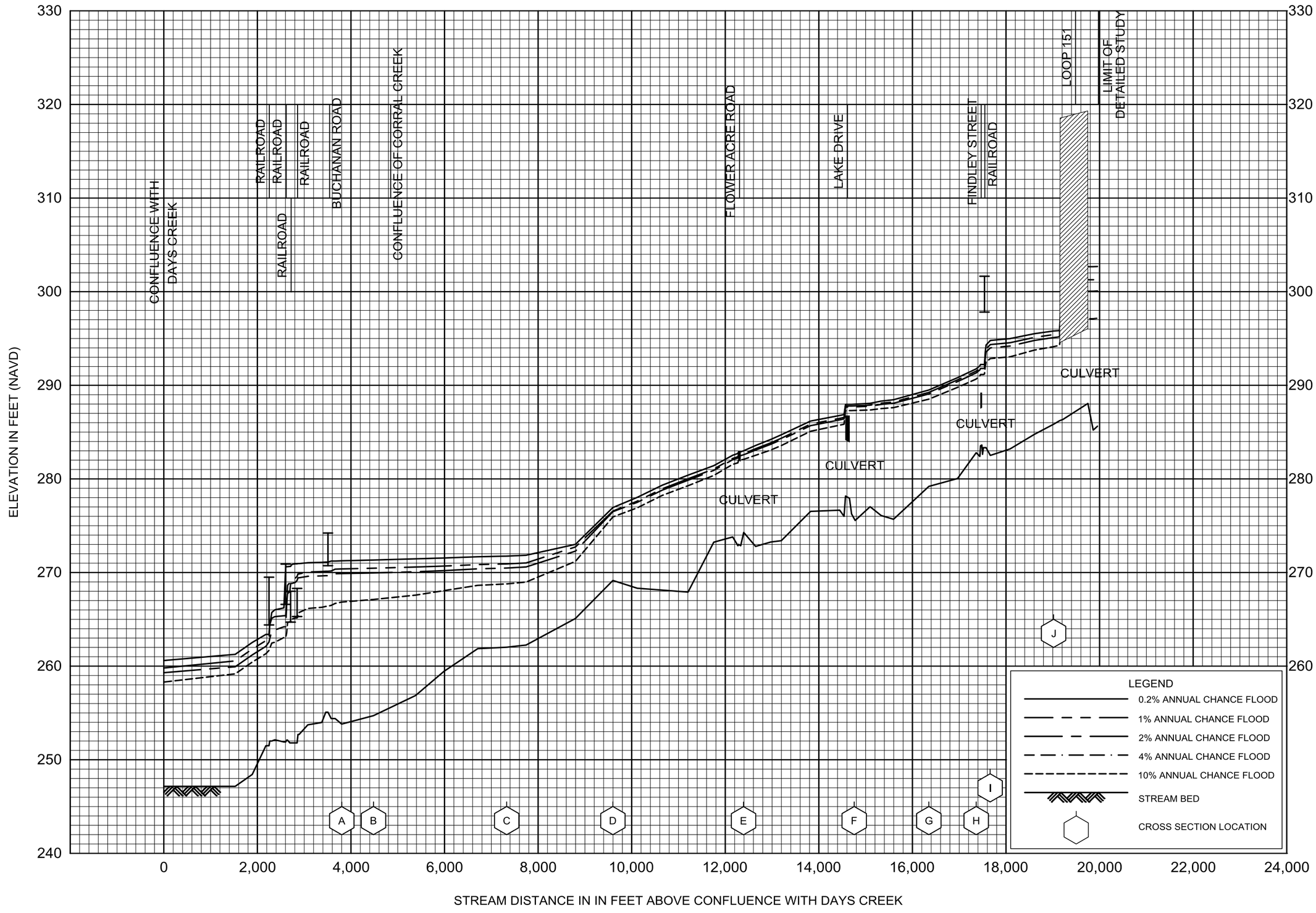
FLOOD PROFILES

DAYS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



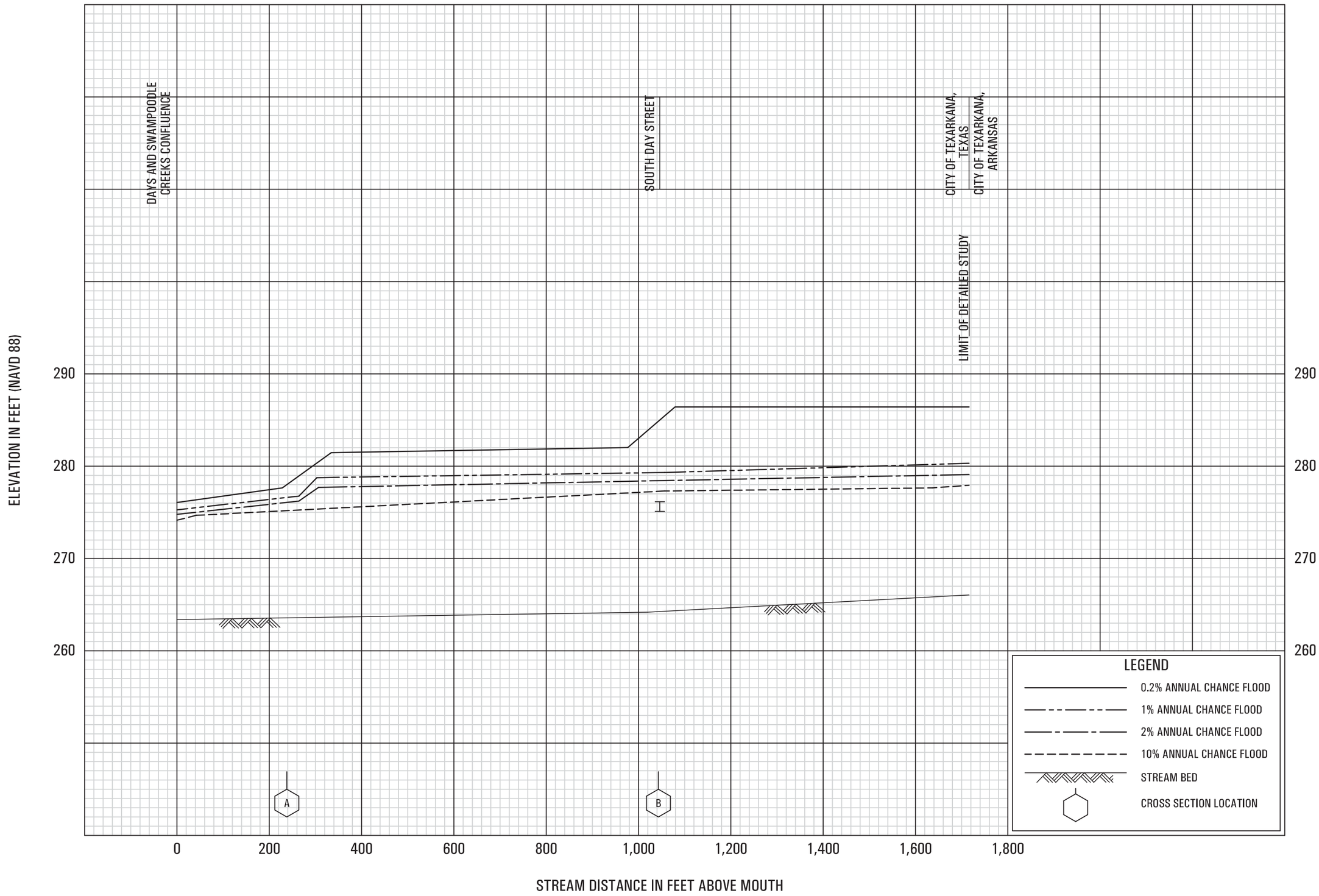
FLOOD PROFILES

HOWARD CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



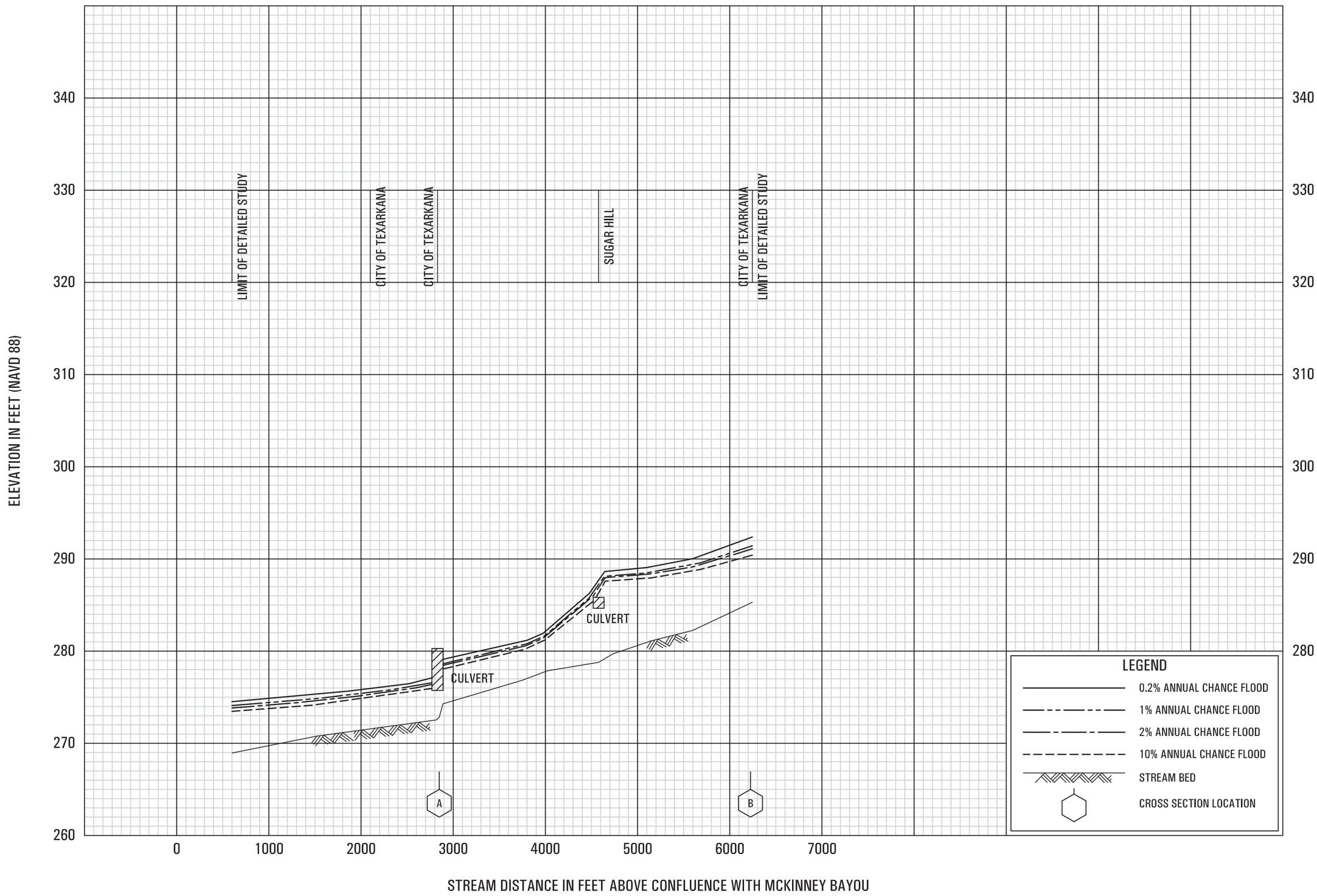
FLOOD PROFILES

NIX CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



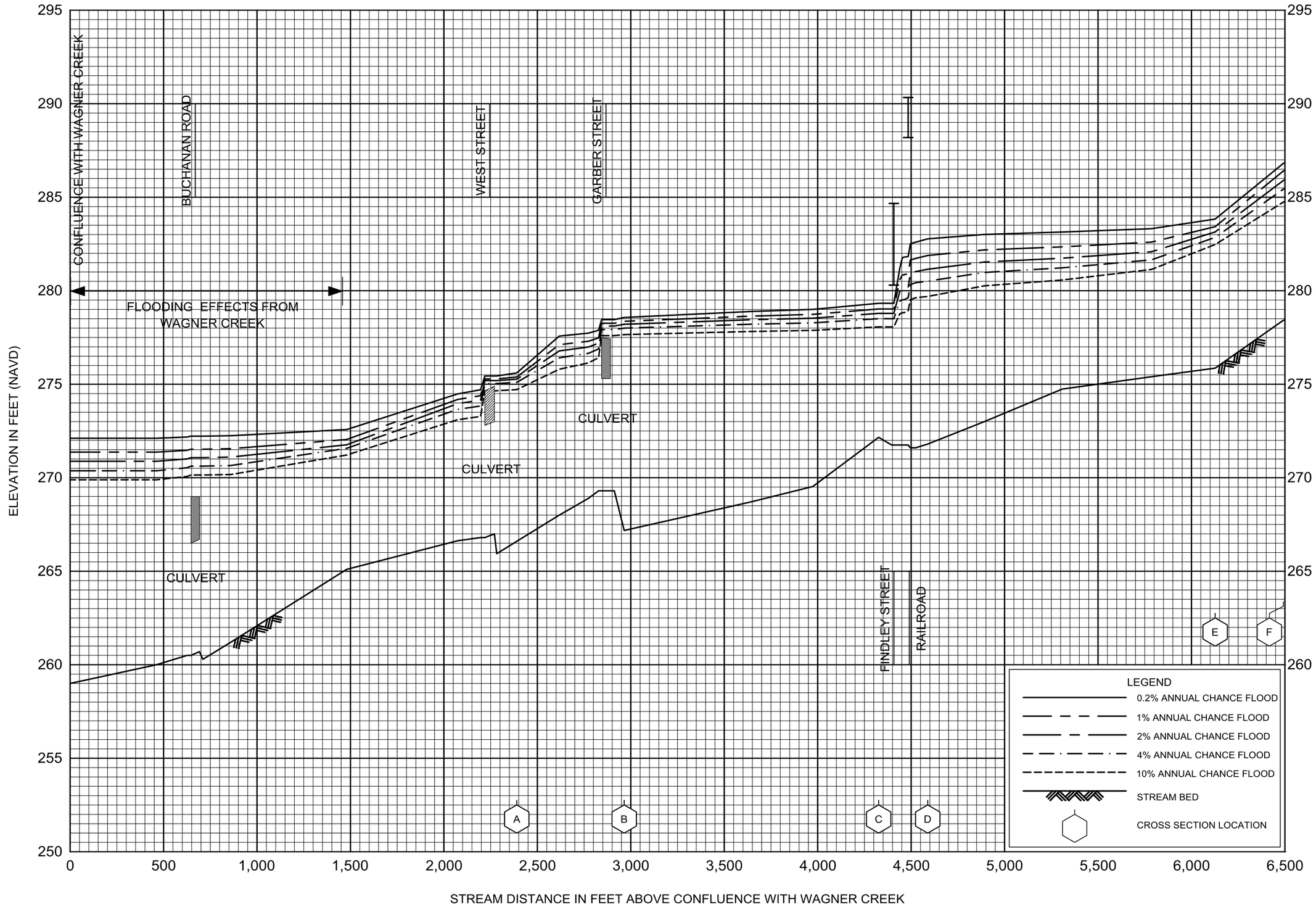
FLOOD PROFILES

NONAME CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



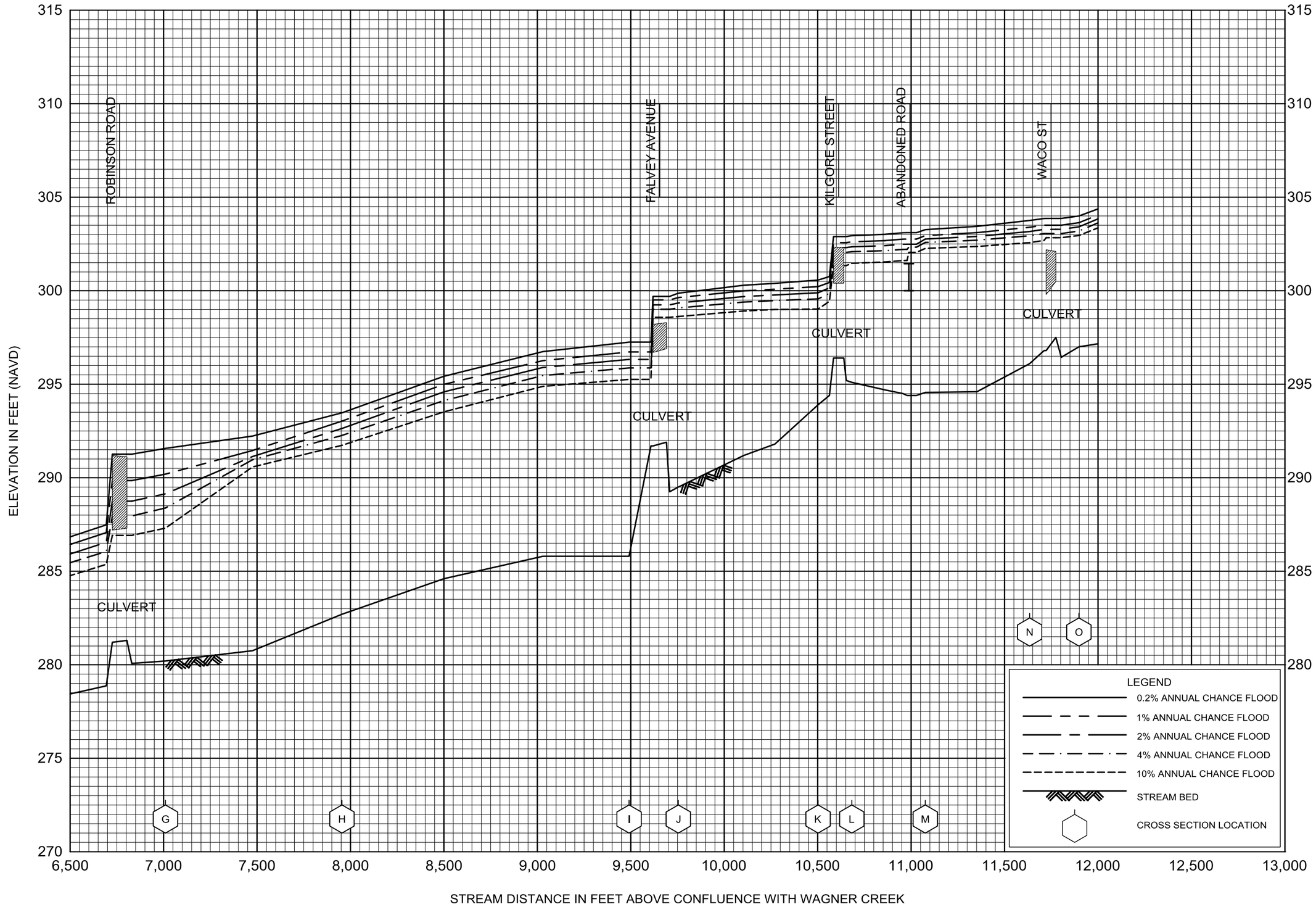
FLOOD PROFILES

SOUTH WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



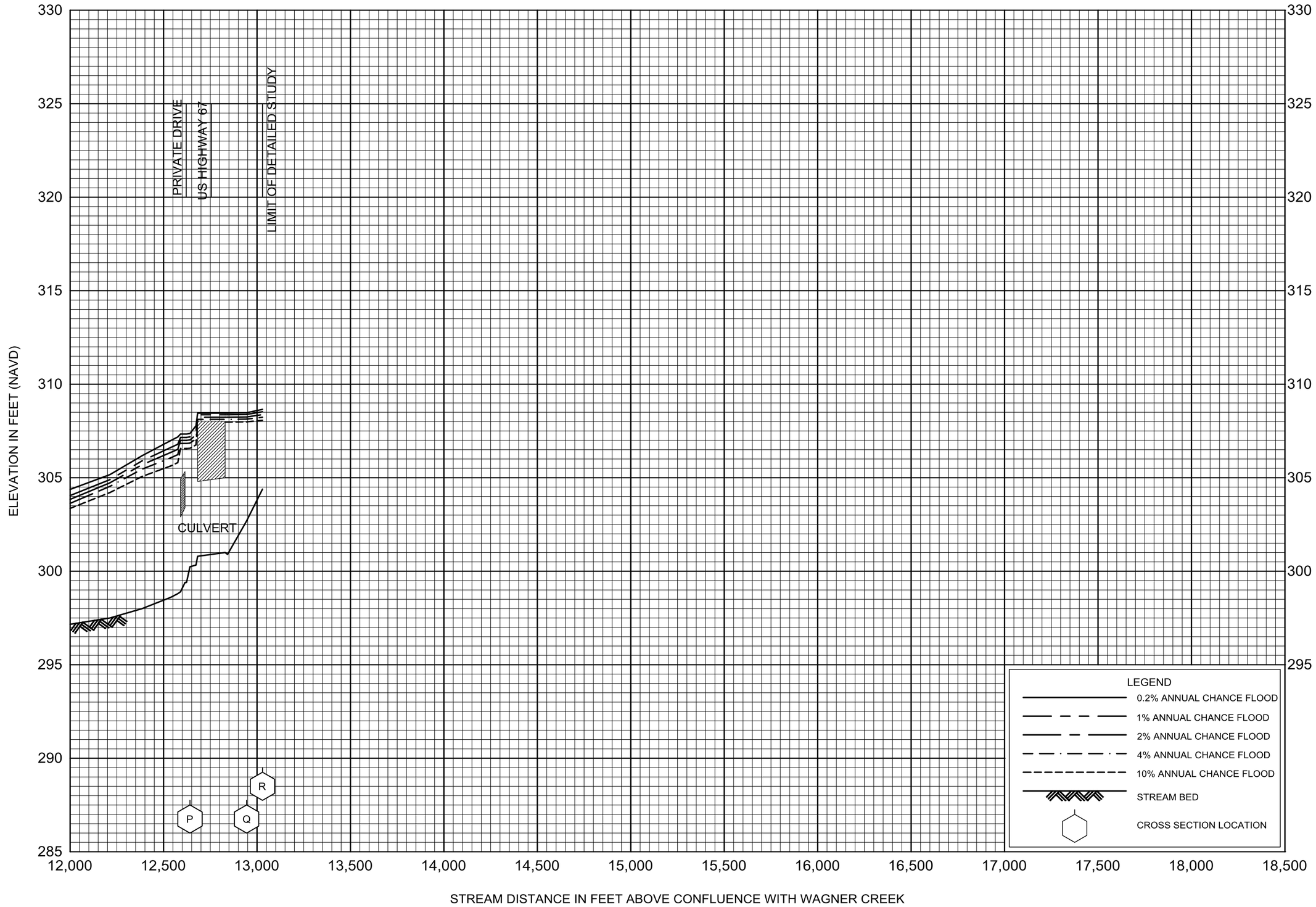
FLOOD PROFILES

SOUTH WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



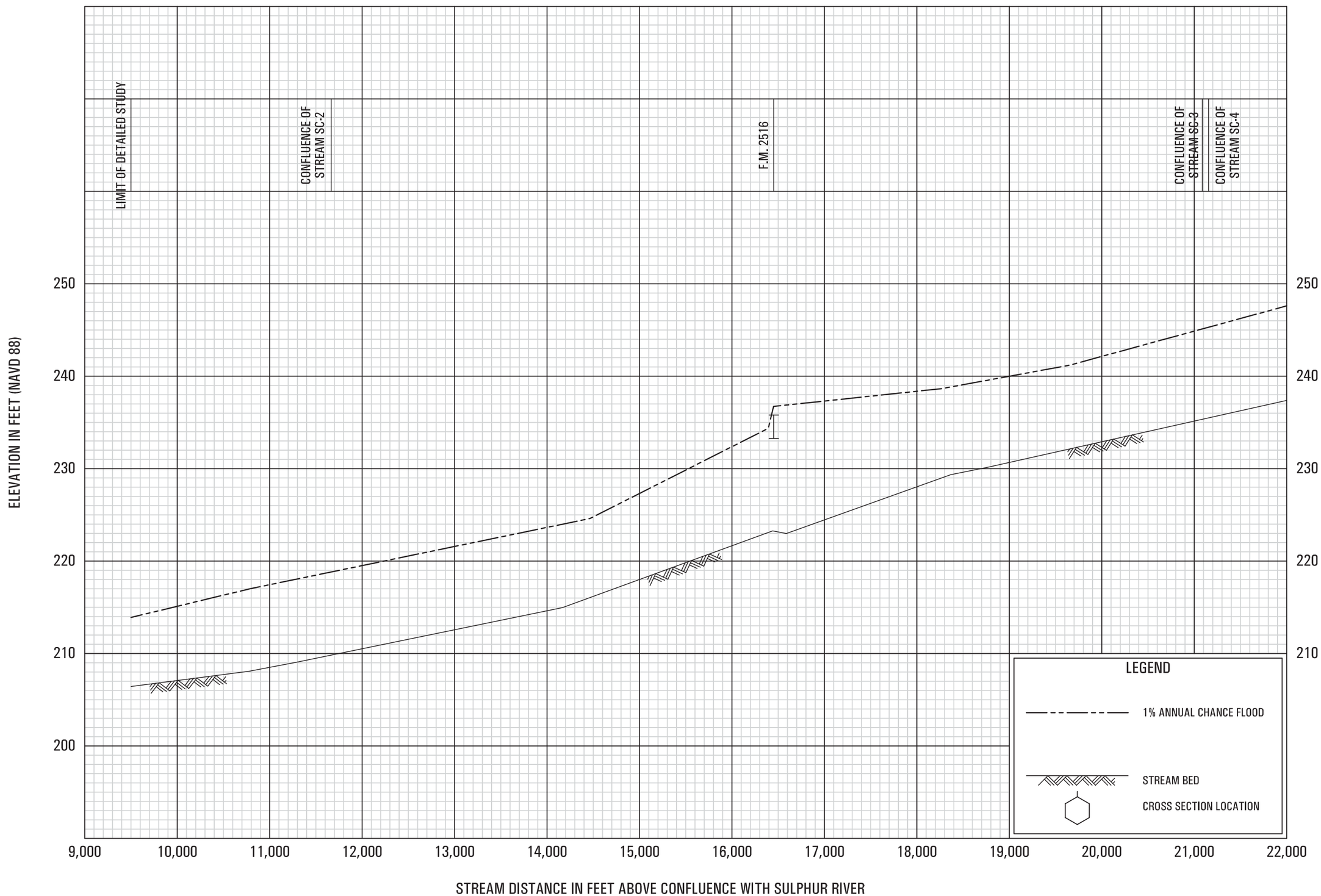
FLOOD PROFILES

SOUTH WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



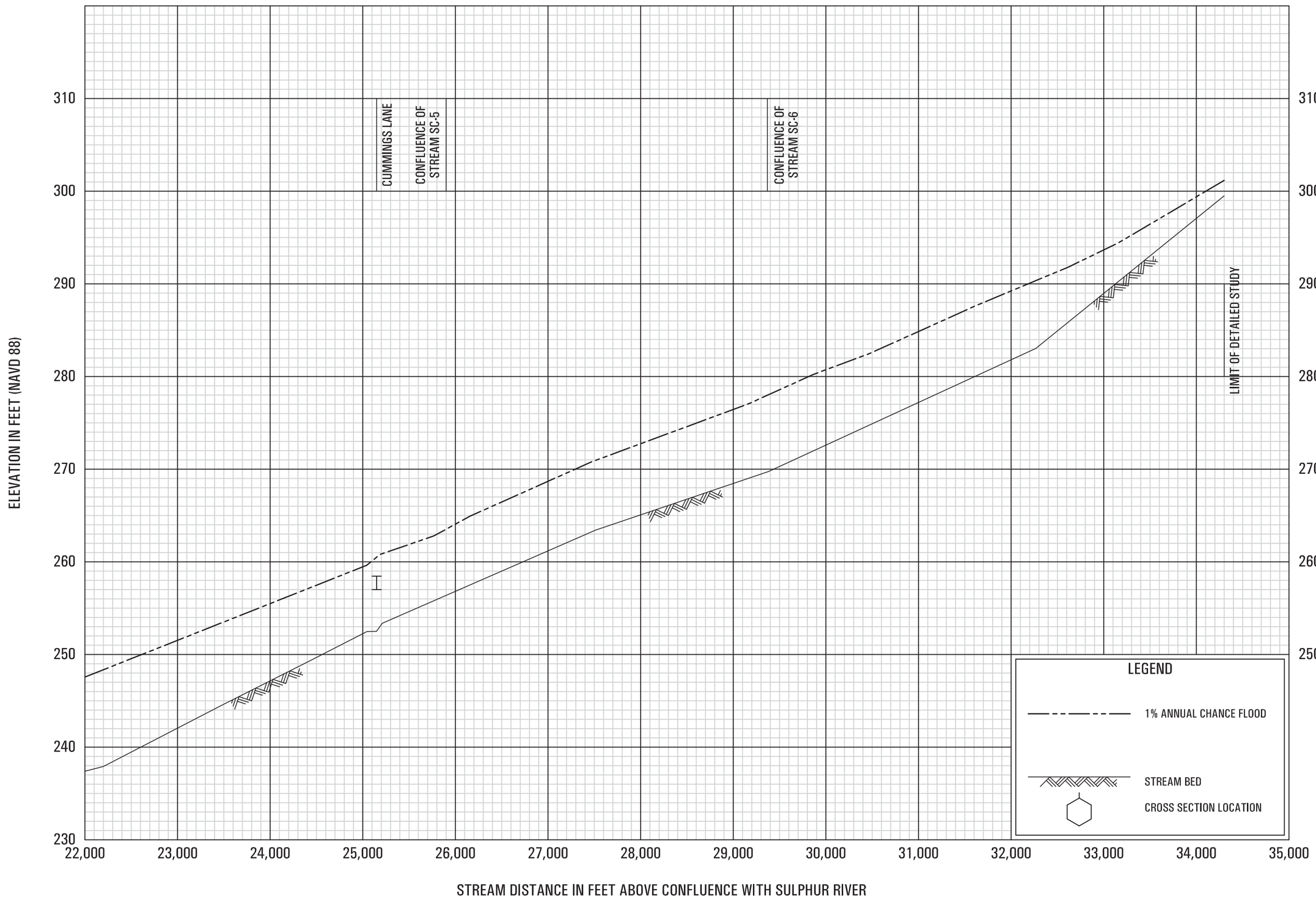
FLOOD PROFILES

SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



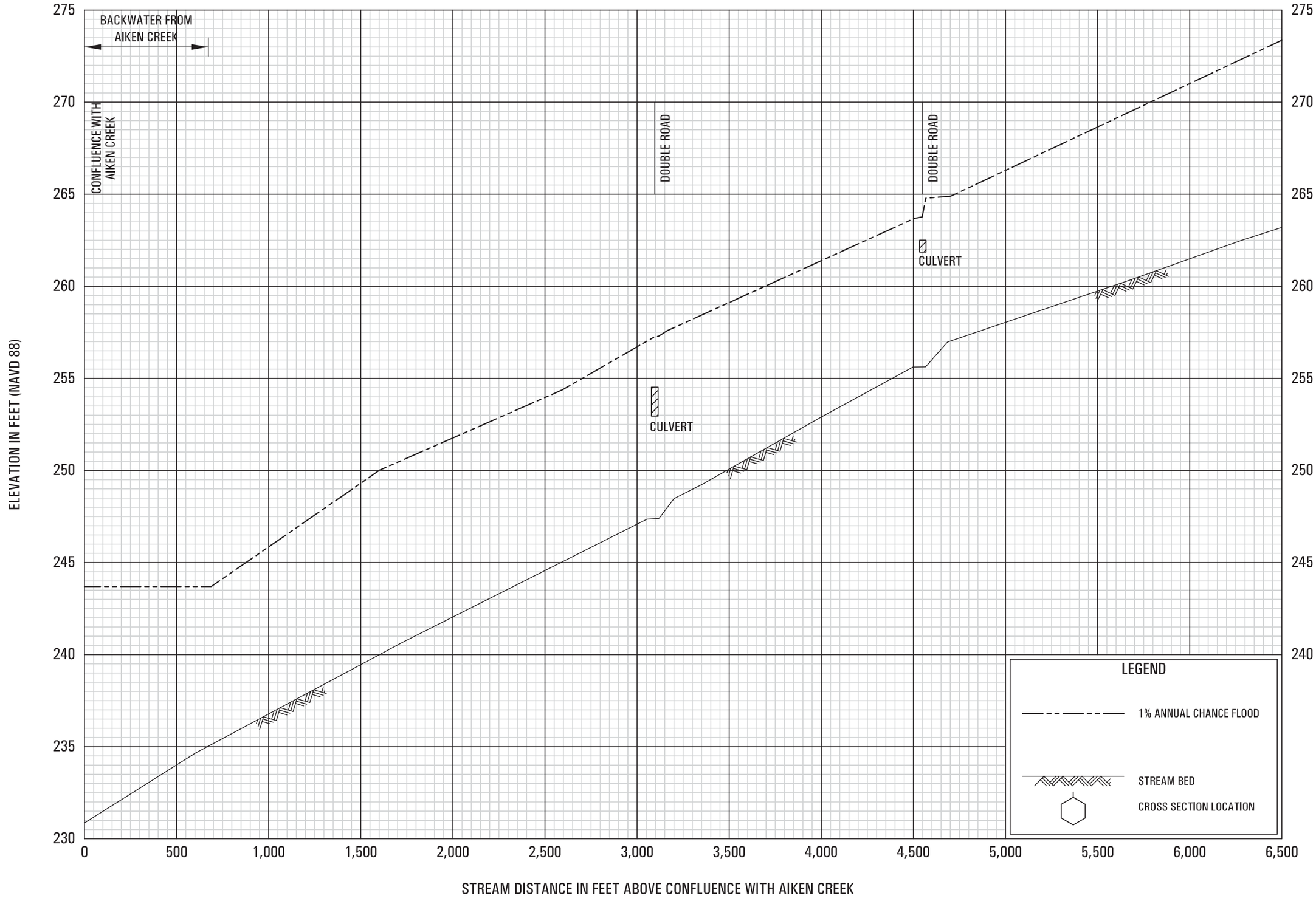
FLOOD PROFILES

SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



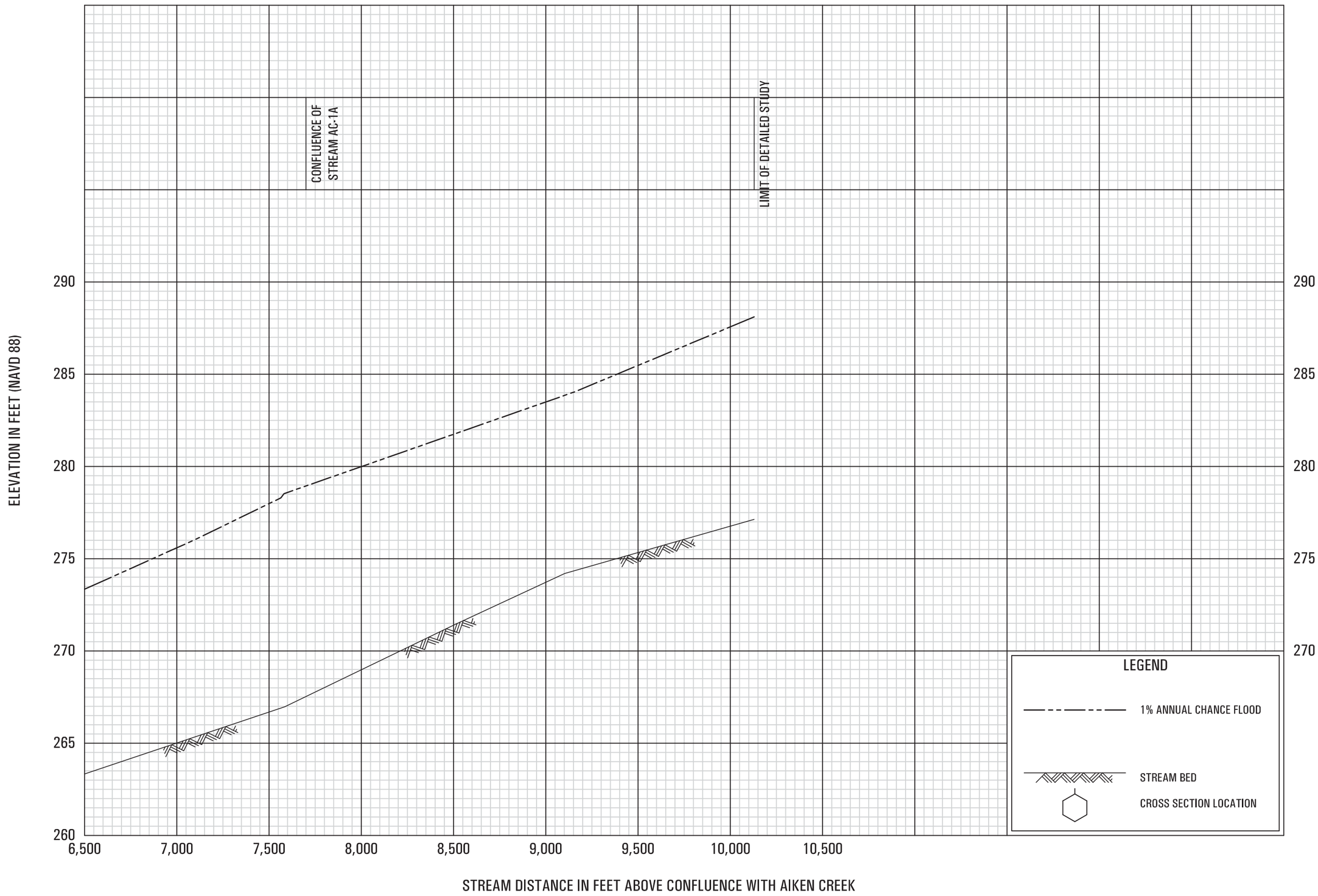
FLOOD PROFILES

STREAM AC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



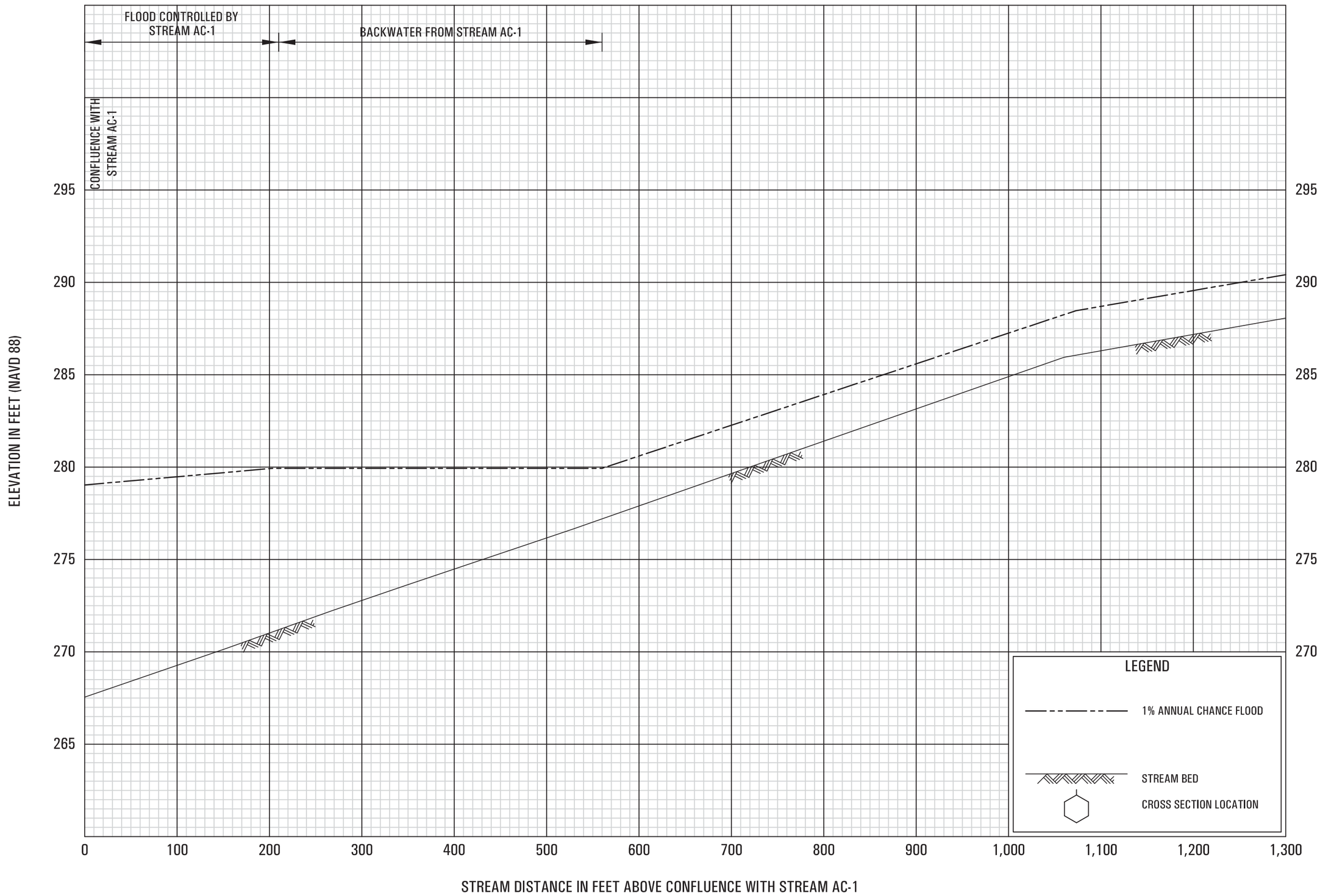
FLOOD PROFILES

STREAM AC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



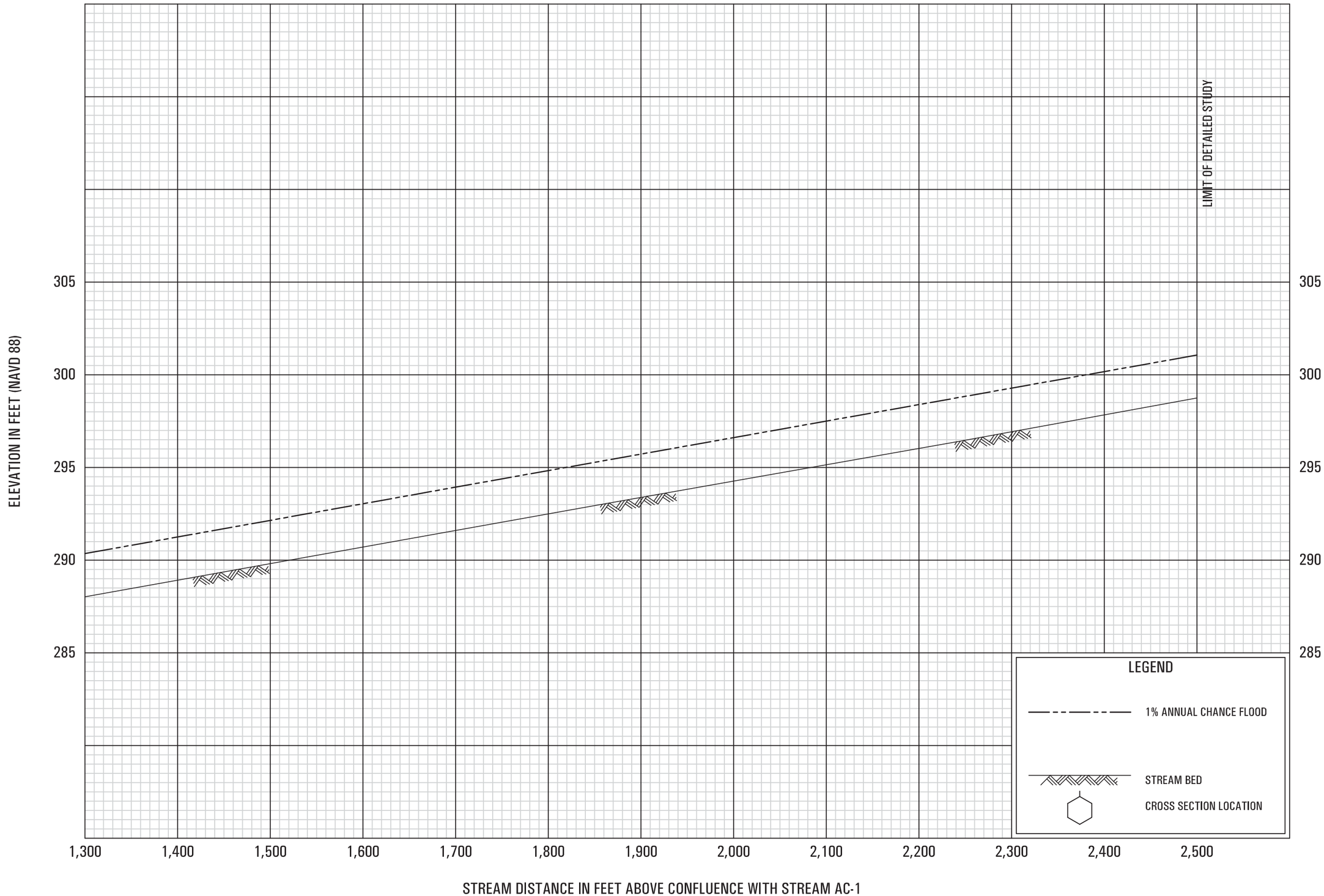
FLOOD PROFILES

STREAM AC-1A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



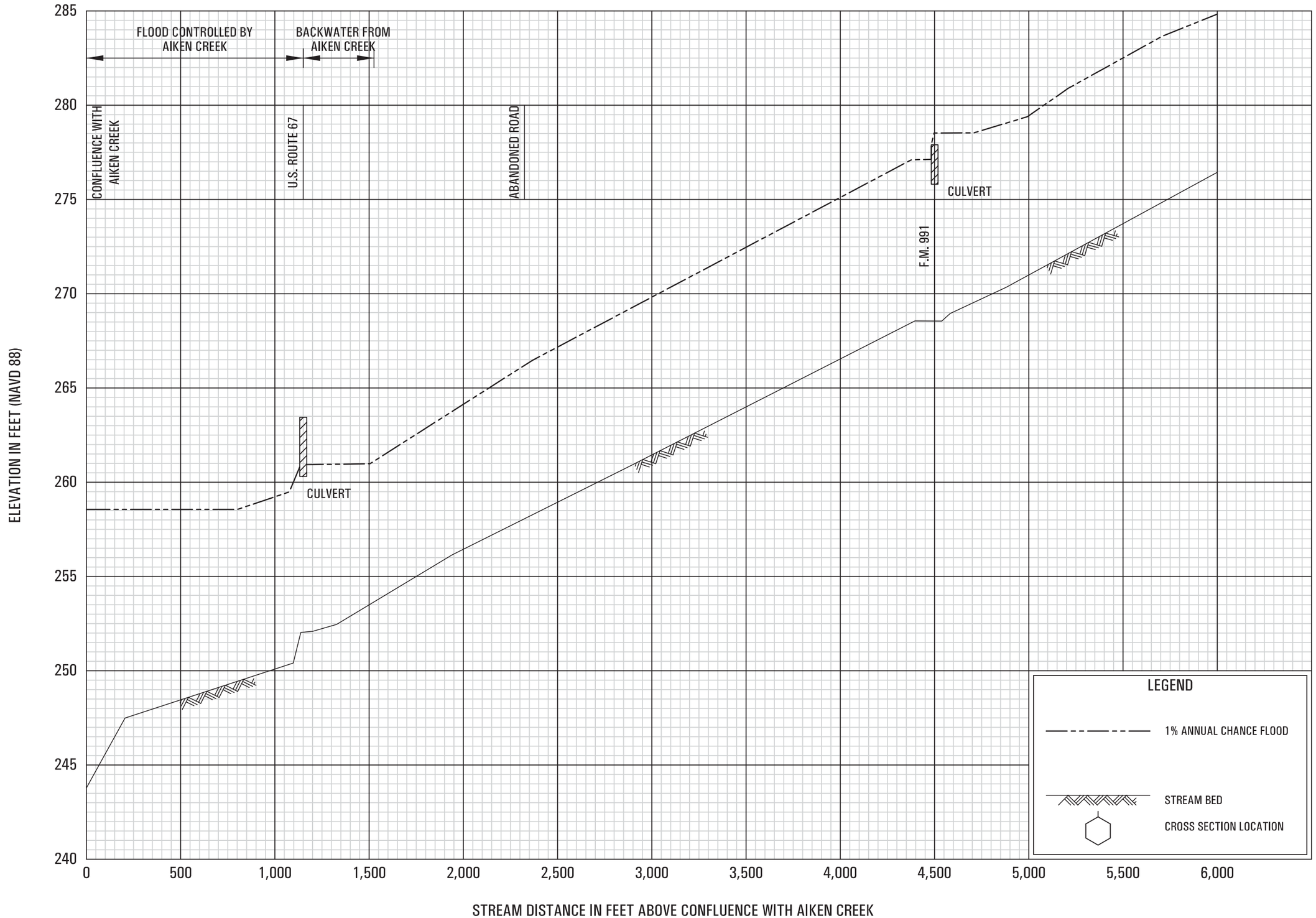
FLOOD PROFILES

STREAM AC-1A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



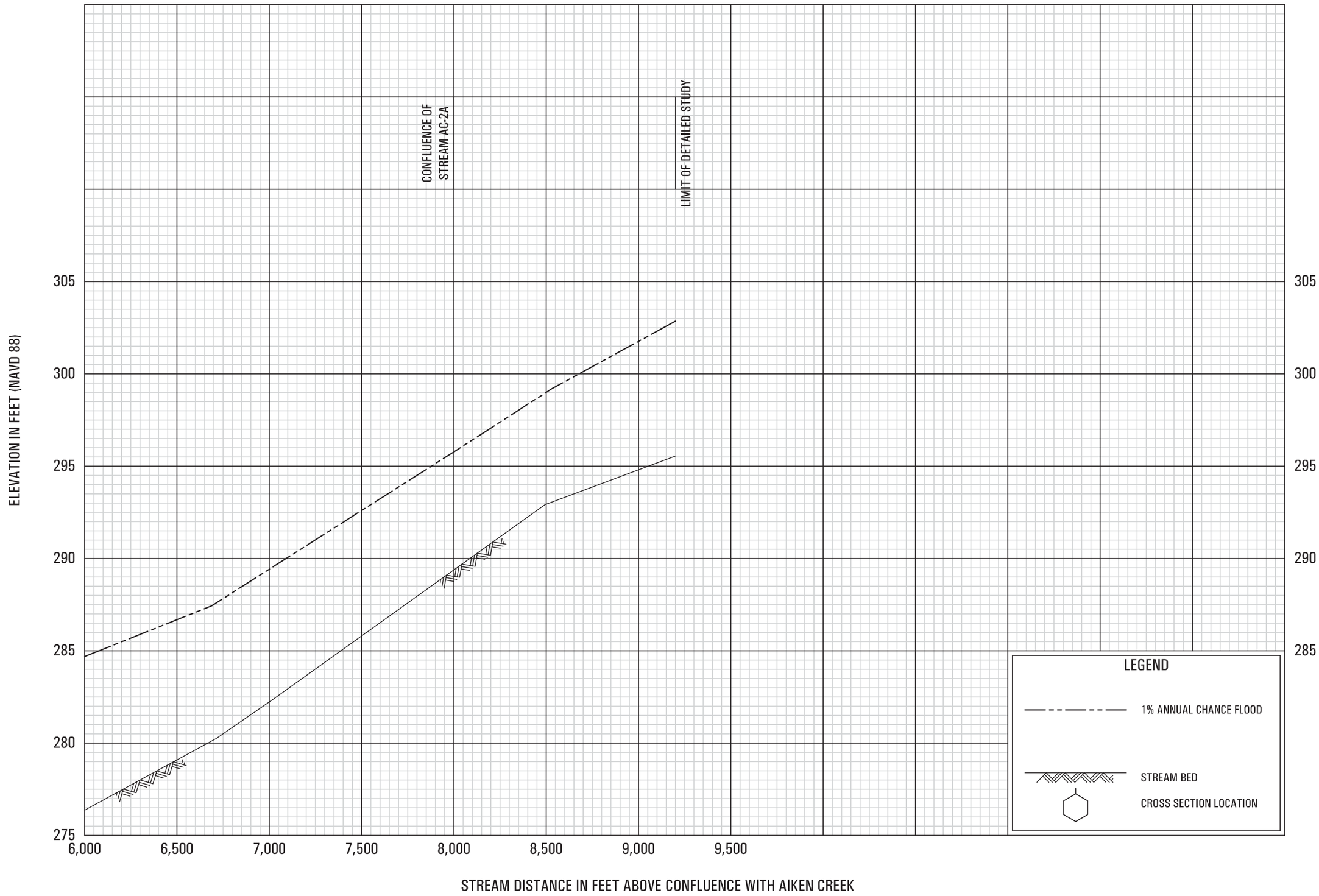
FLOOD PROFILES

STREAM AC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



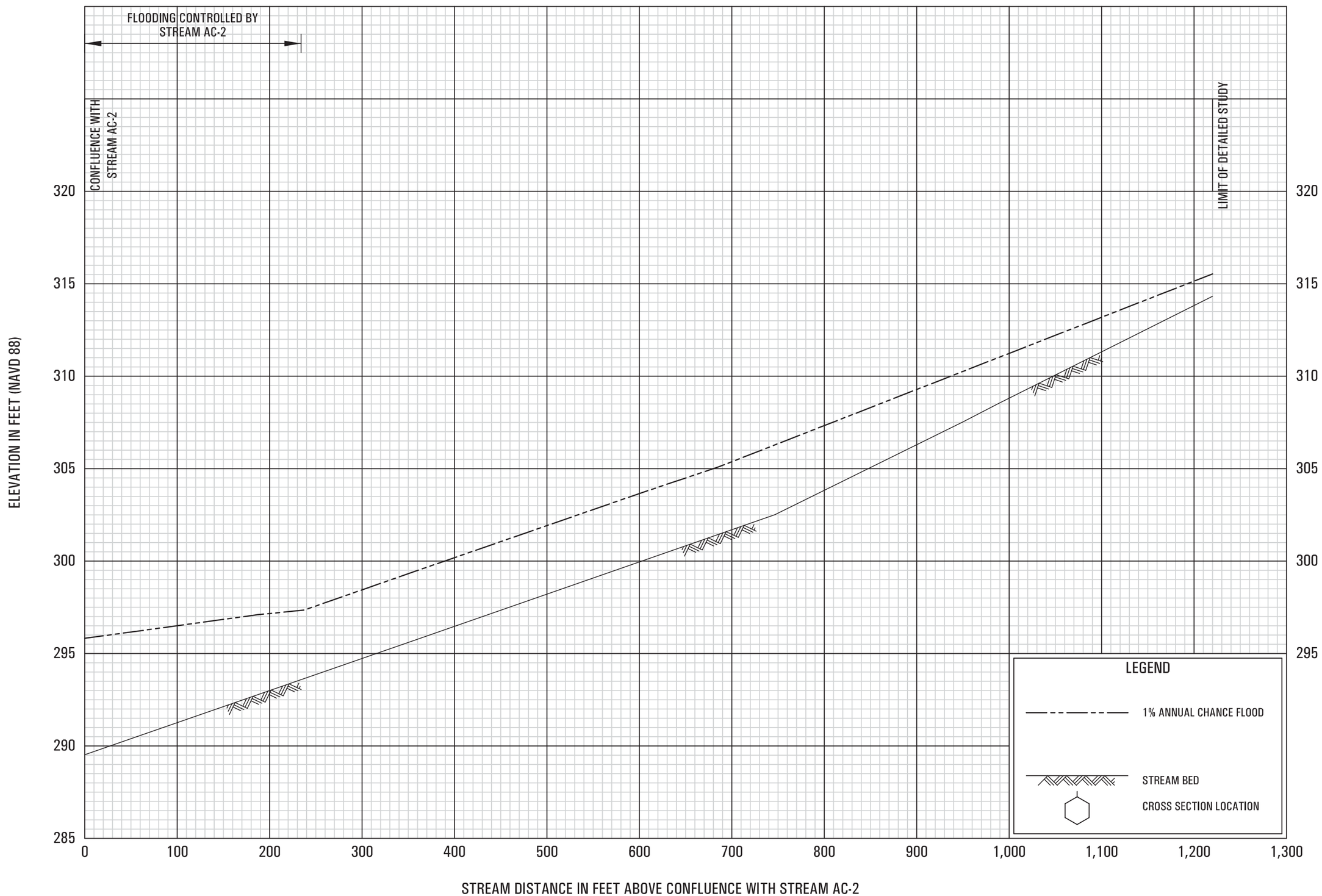
FLOOD PROFILES

STREAM AC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



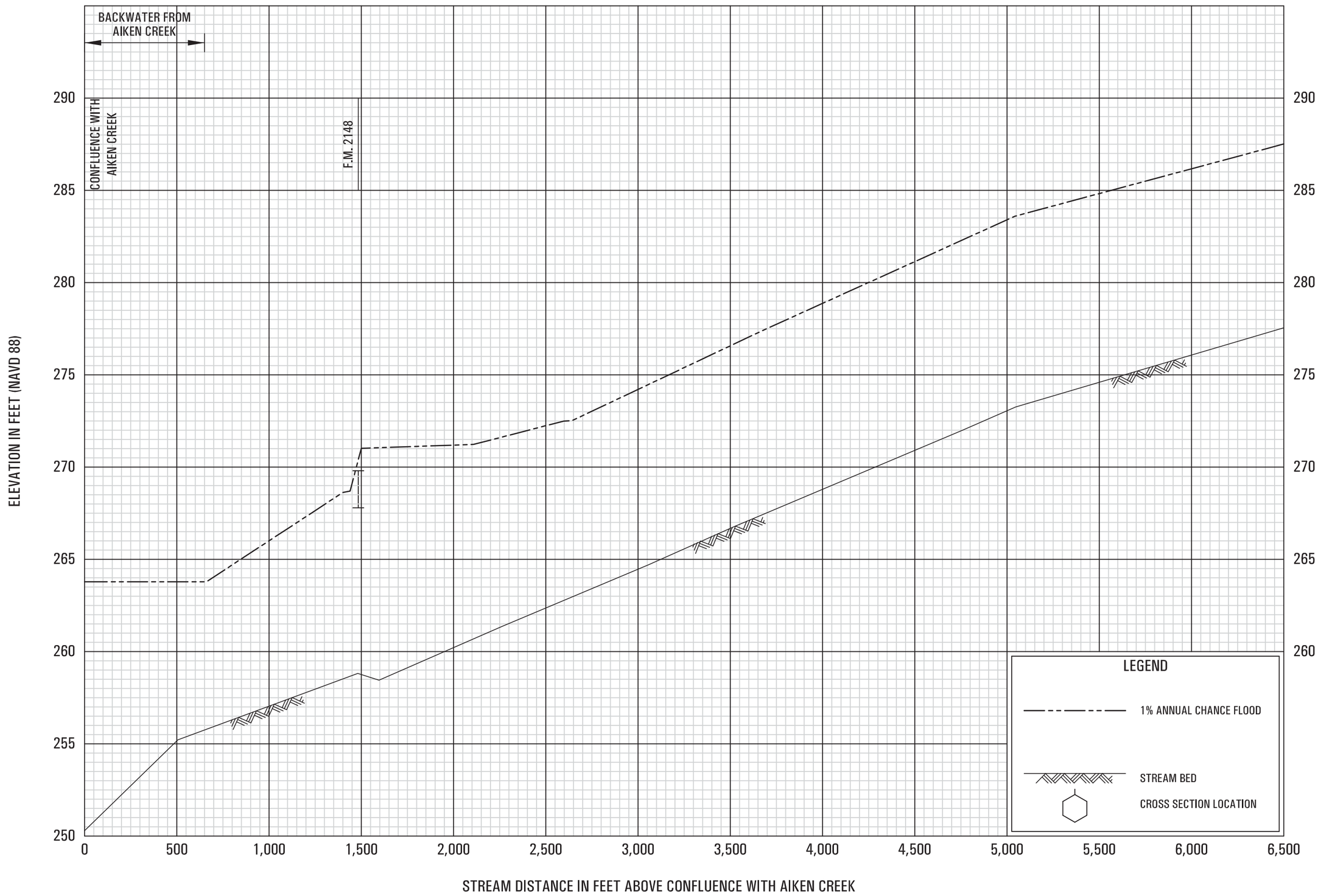
FLOOD PROFILES

STREAM AC-2A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



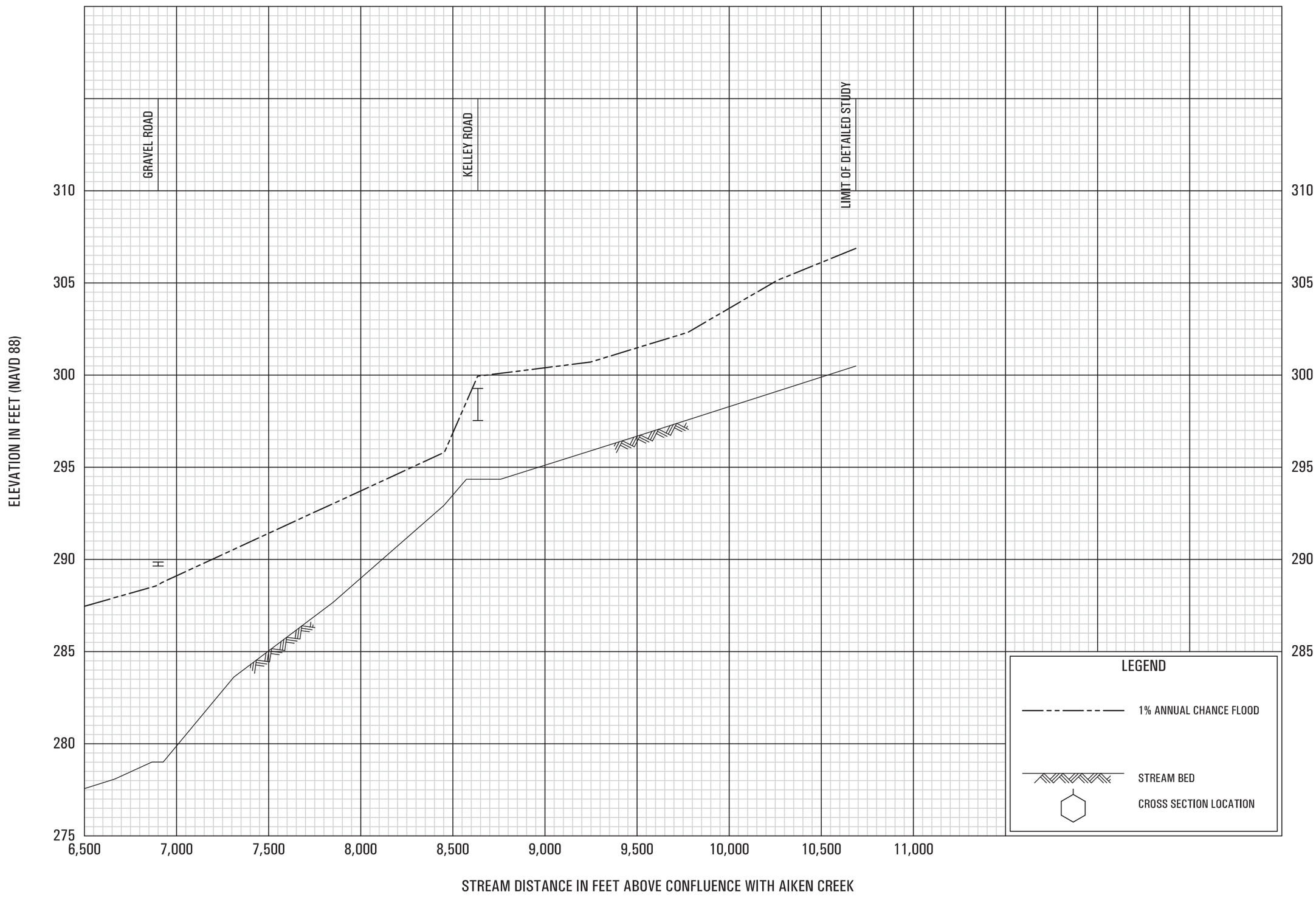
FLOOD PROFILES

STREAM AC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



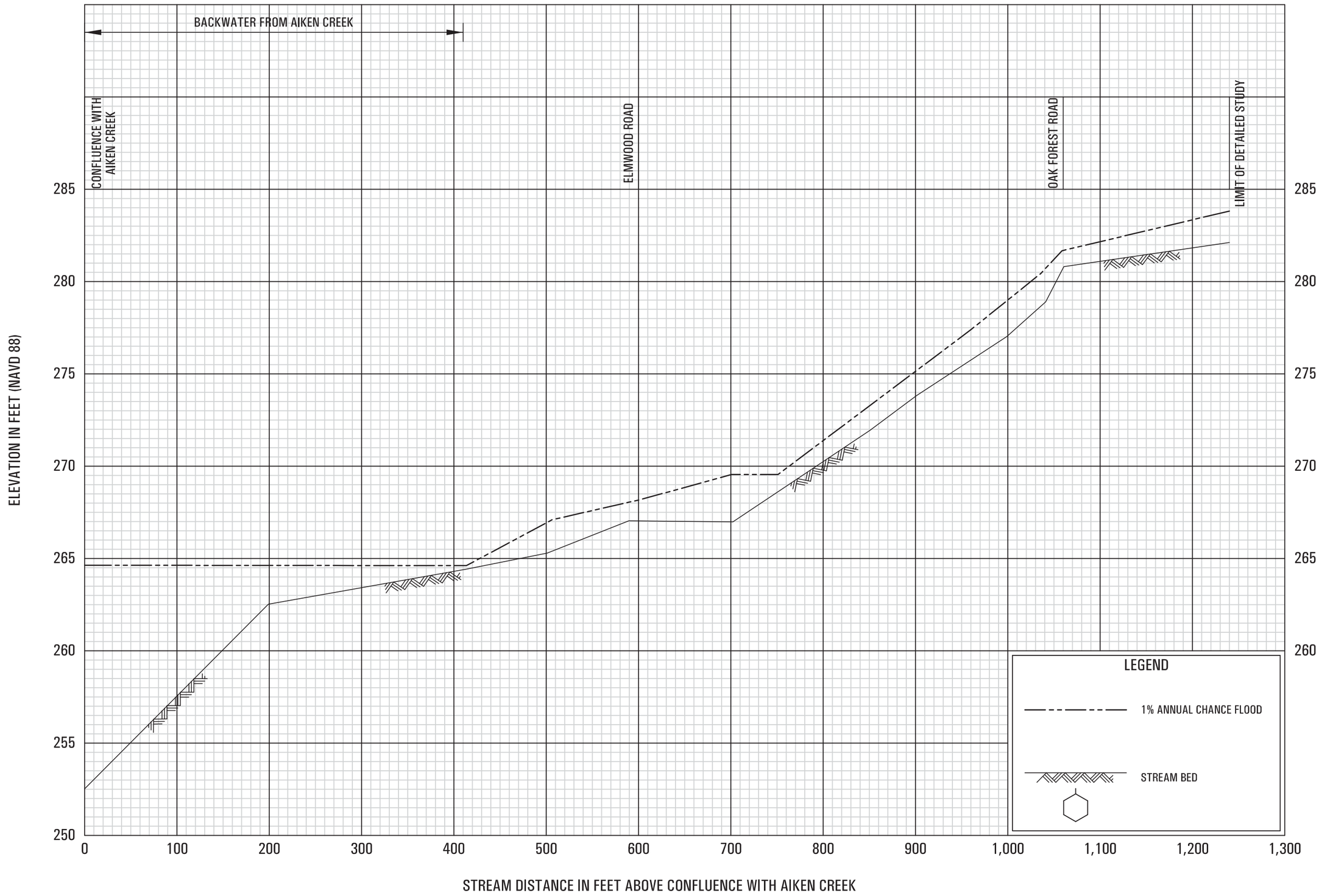
FLOOD PROFILES

STREAM AC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



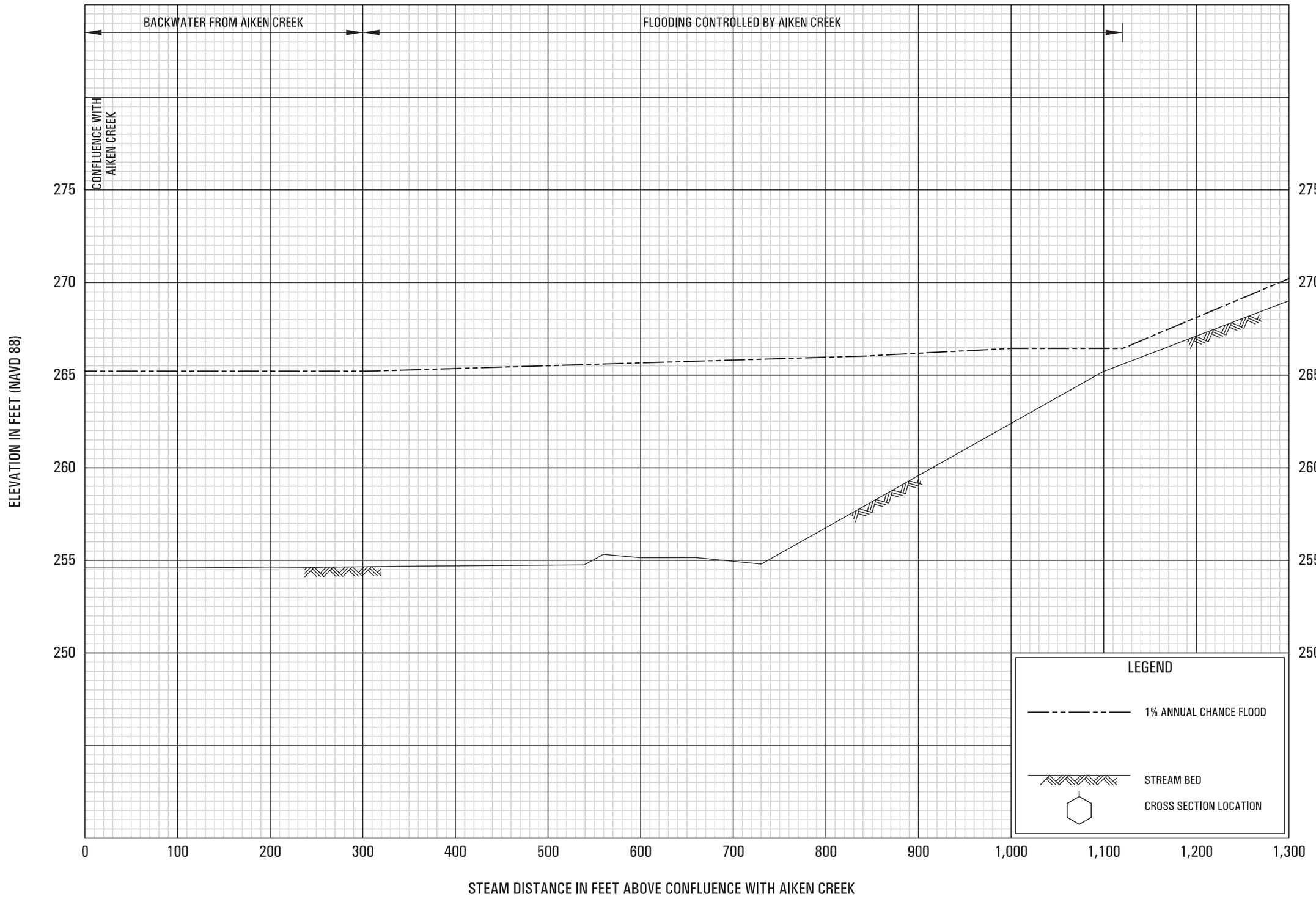
FLOOD PROFILES

STREAM AC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



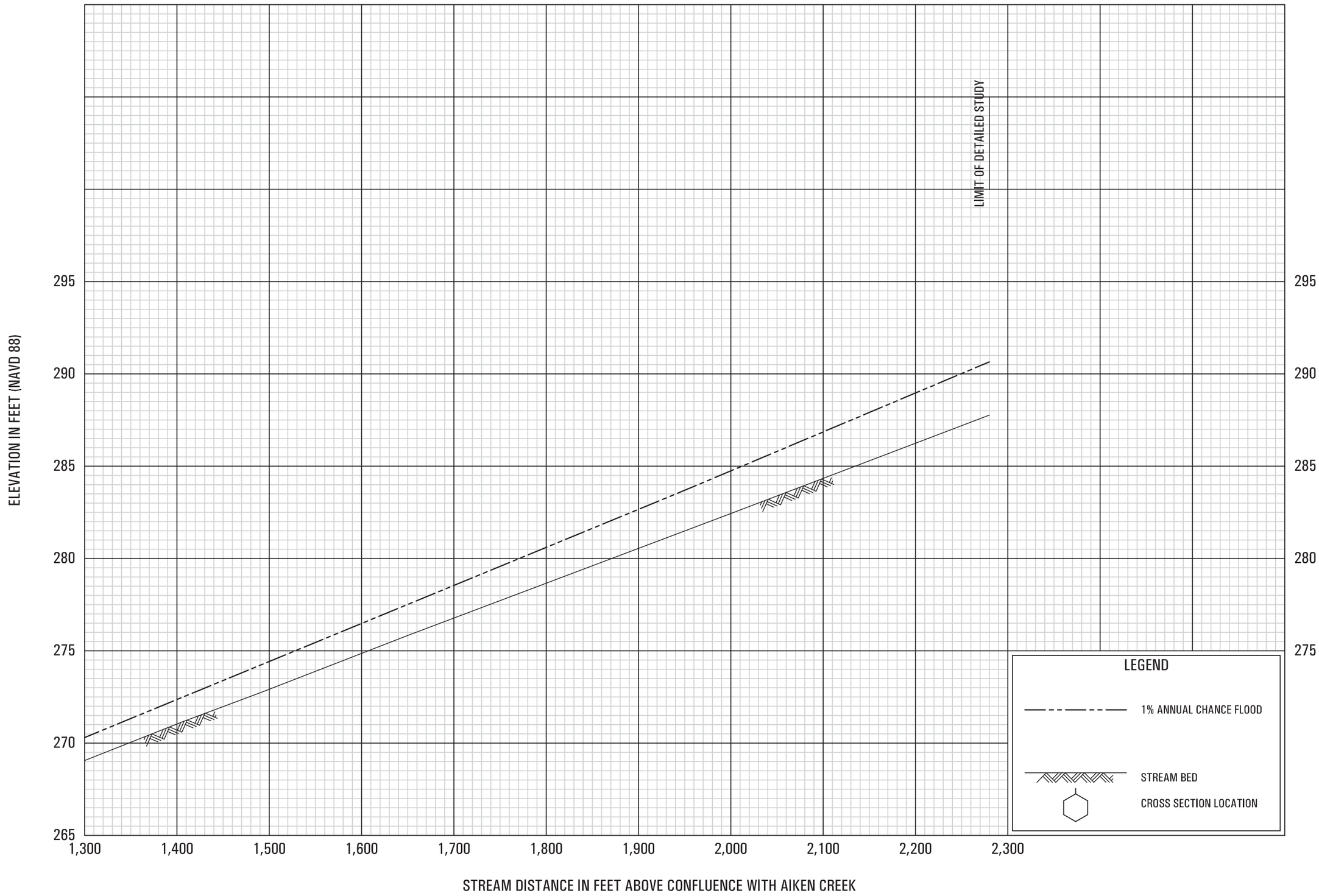
FLOOD PROFILES

STREAM AC-5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



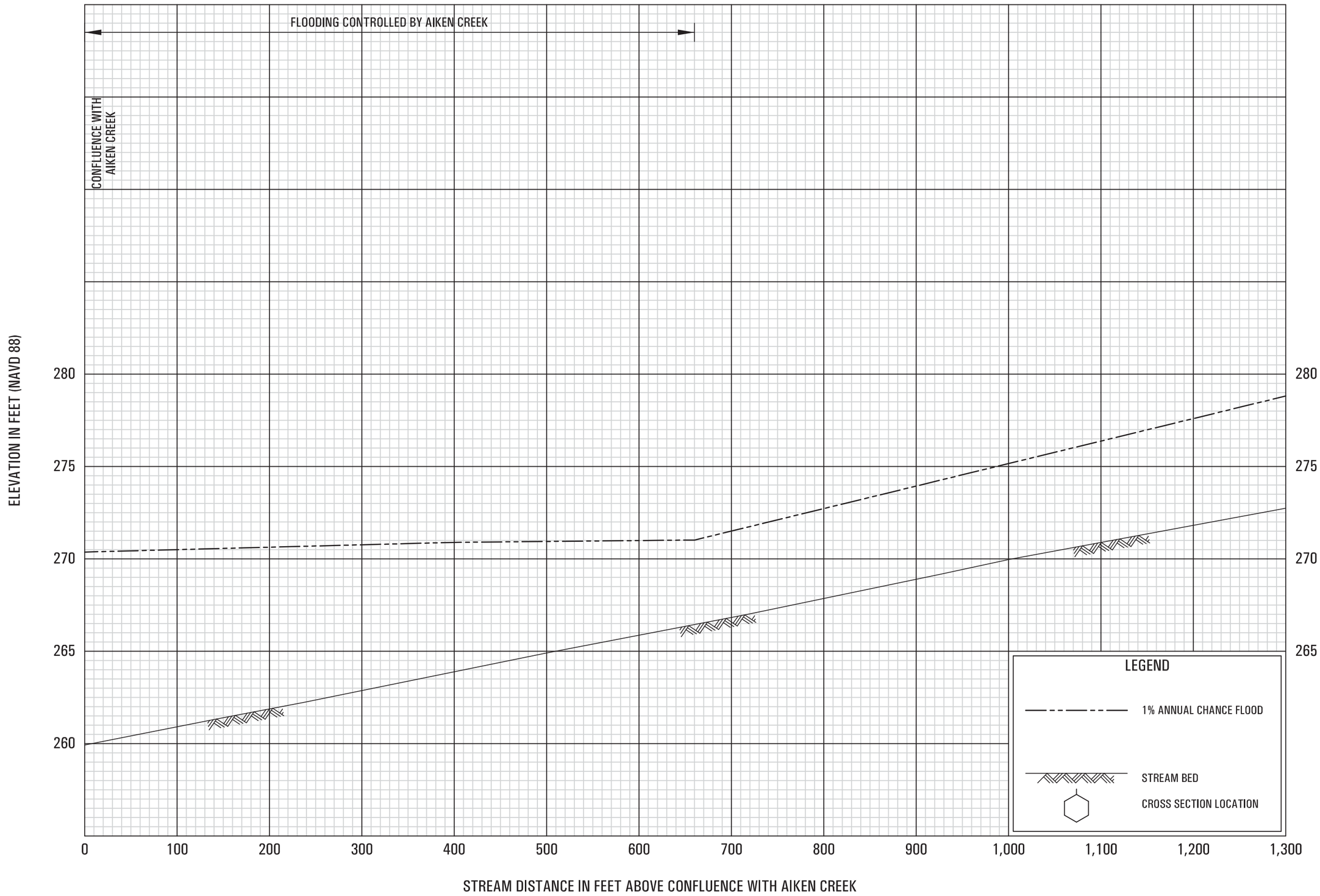
FLOOD PROFILES

STREAM AC-5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



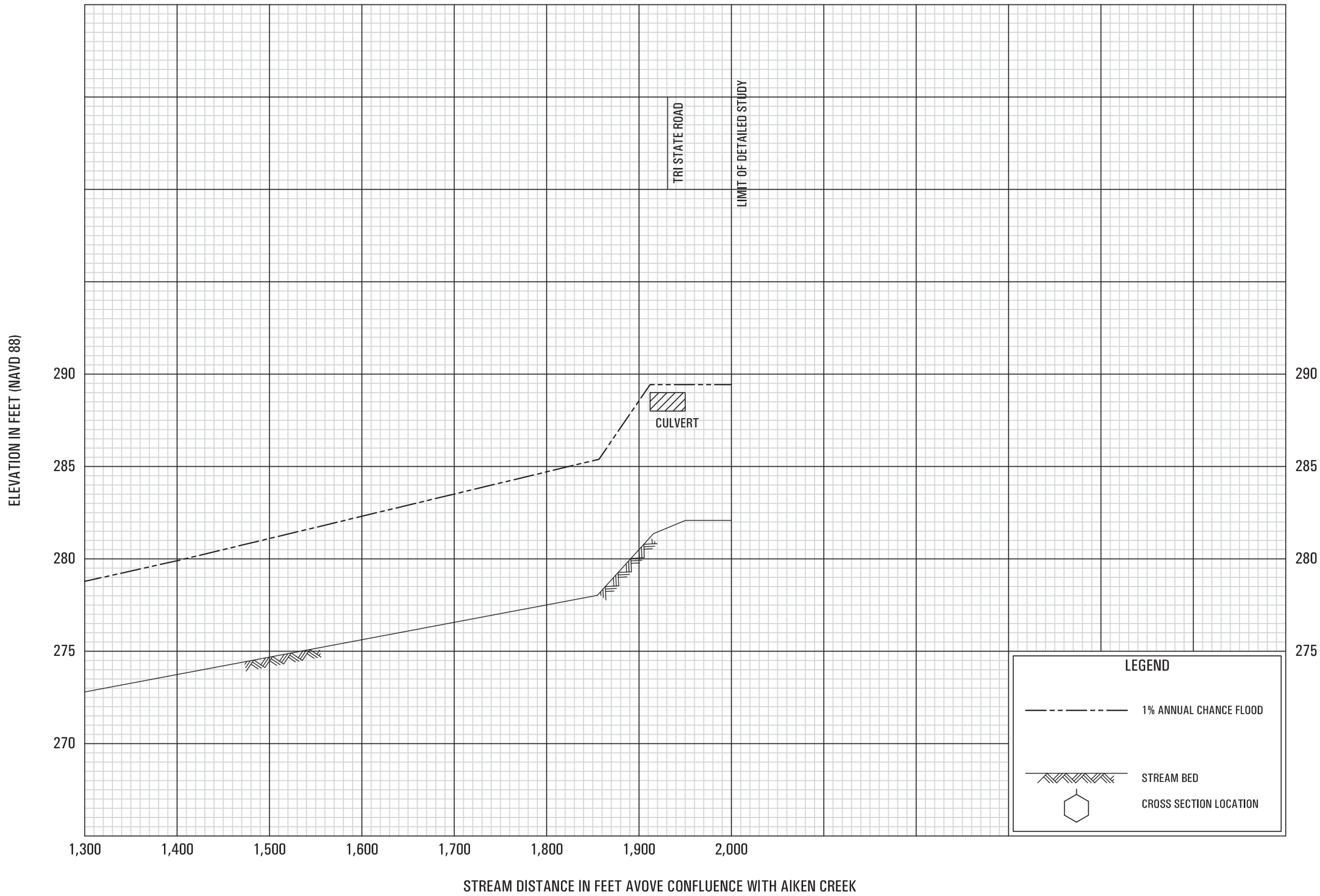
FLOOD PROFILES

STREAM AC-6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



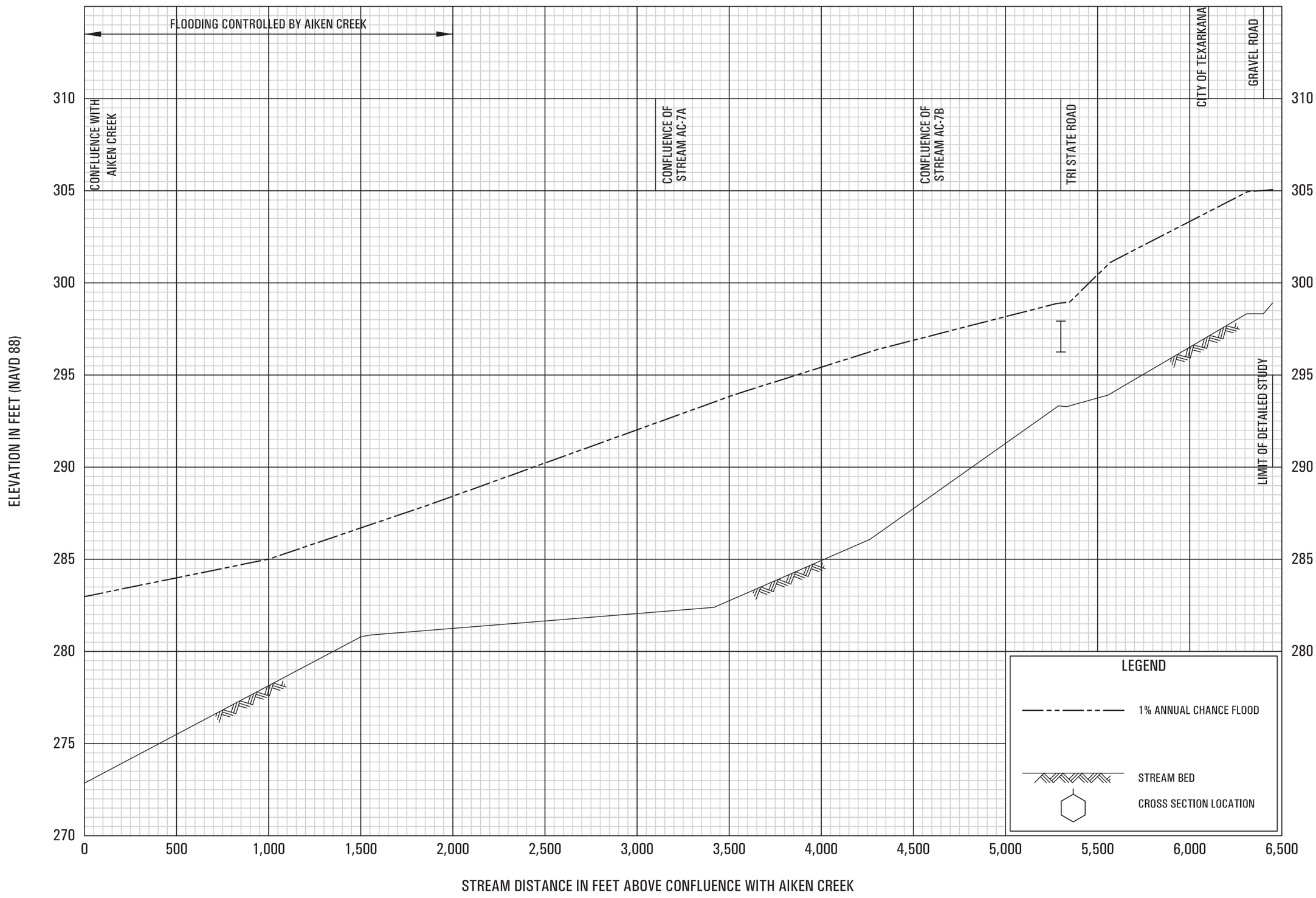
FLOOD PROFILES

STREAM AC-6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



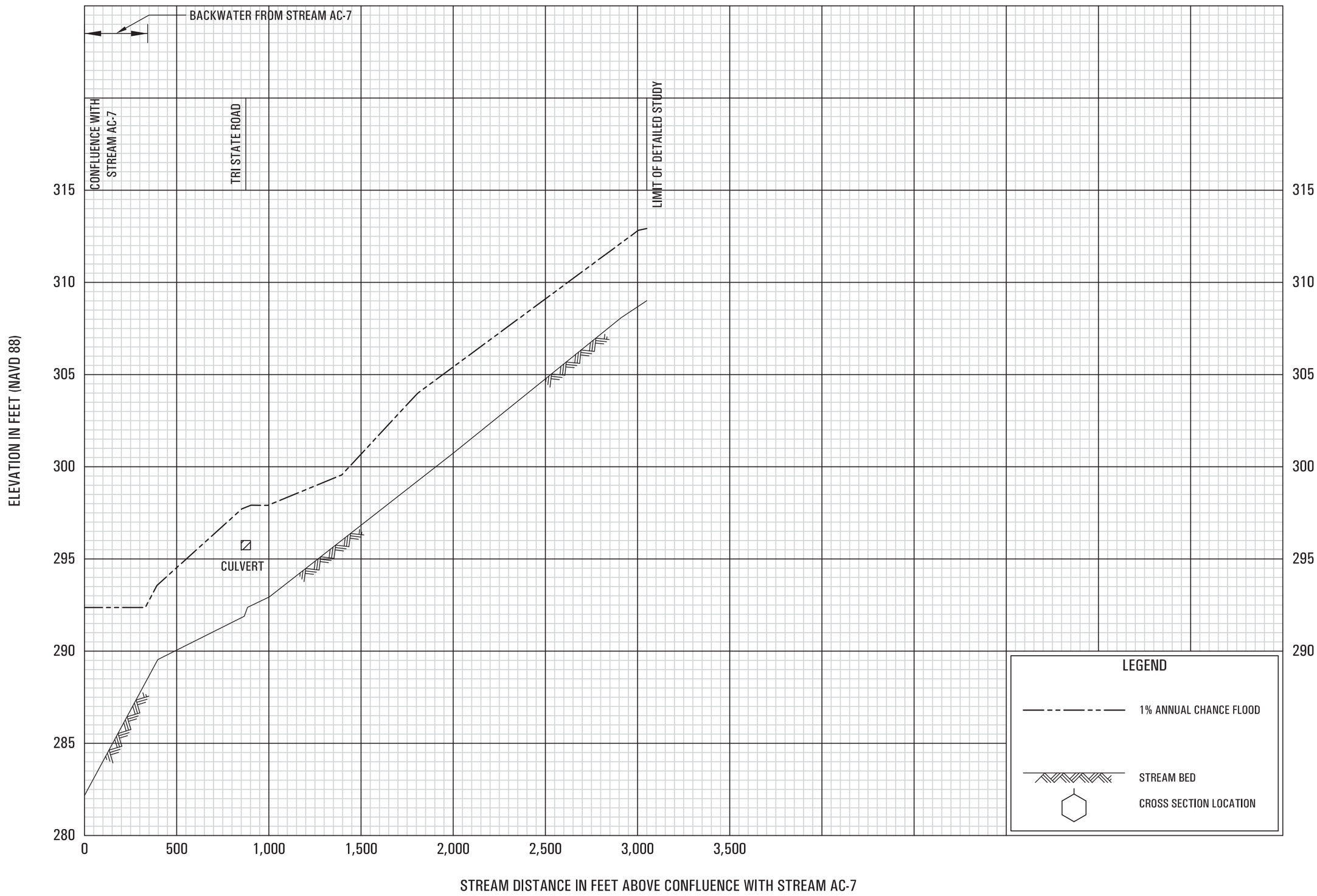
FLOOD PROFILES

STREAM AC-7

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



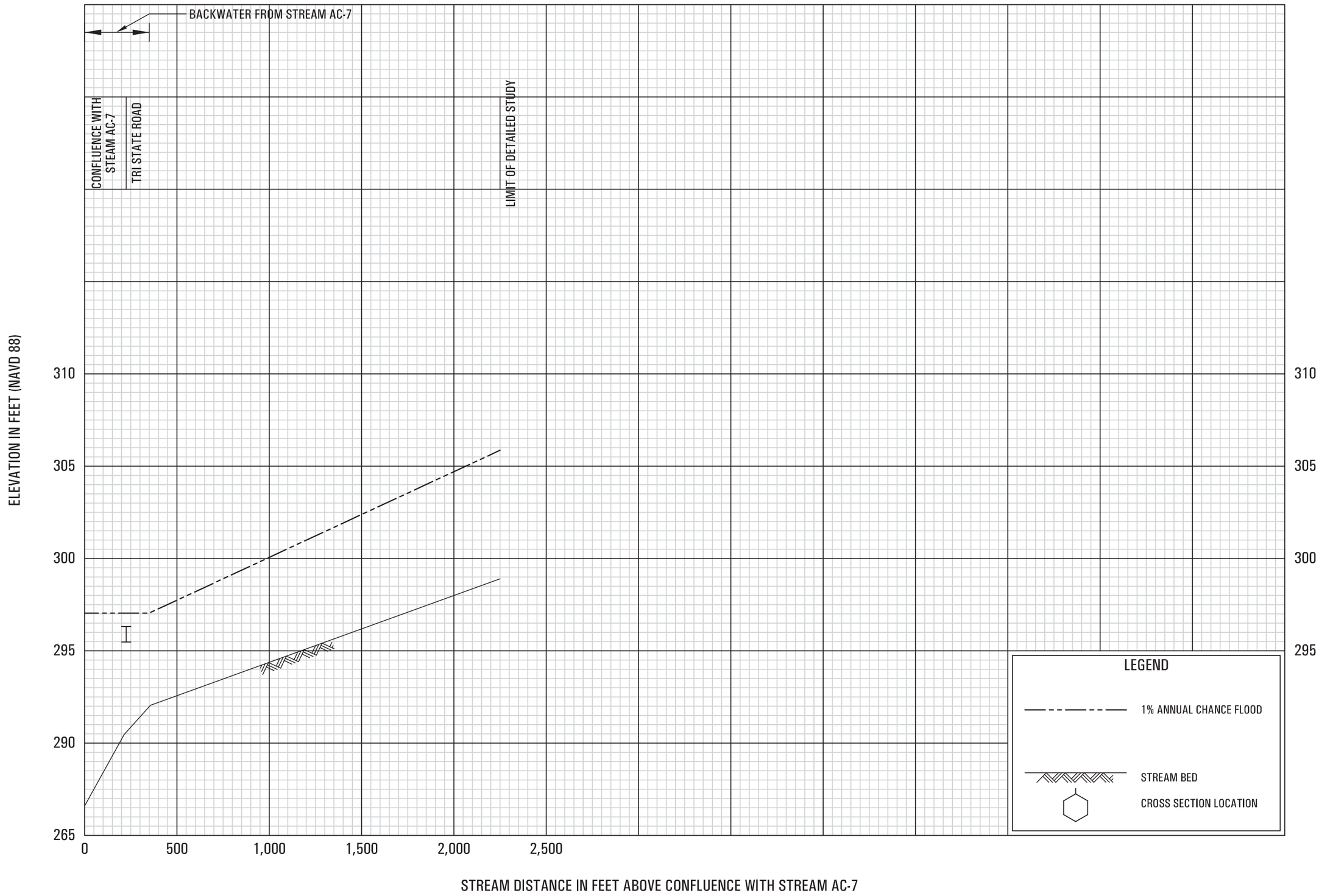
FLOOD PROFILES

STREAM AC-7A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



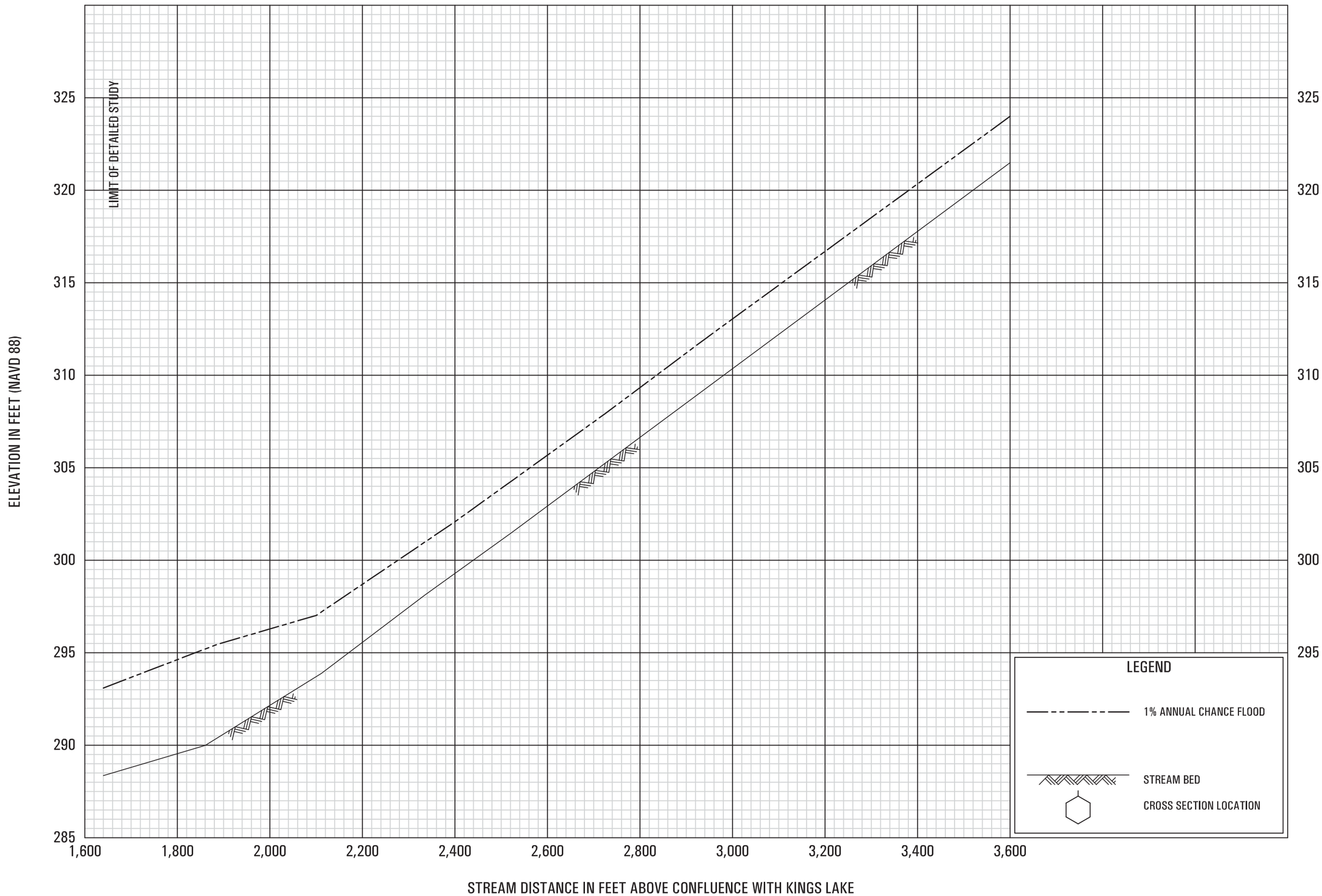
FLOOD PROFILES

STREAM AC-7B

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



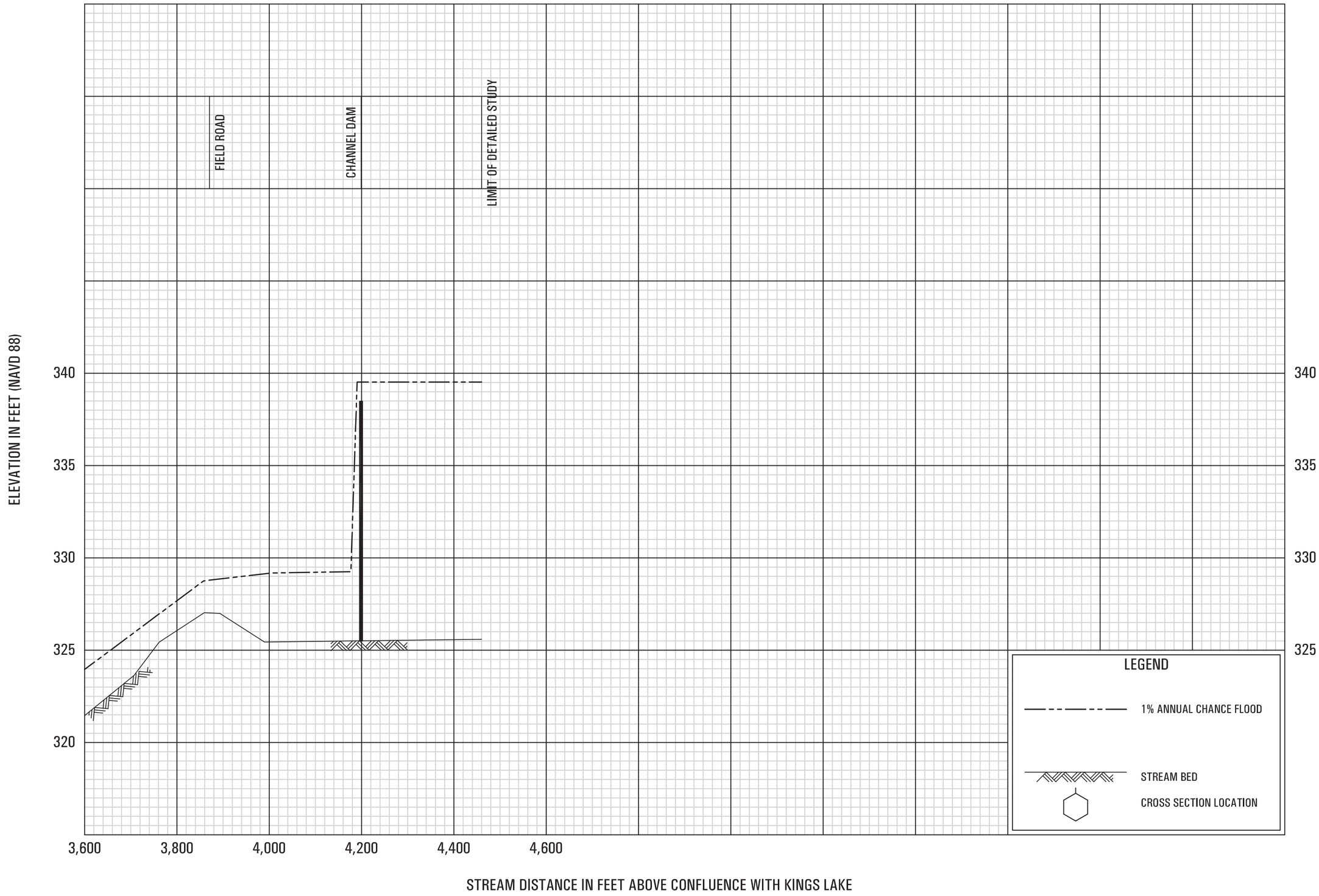
FLOOD PROFILES

STREAM BC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



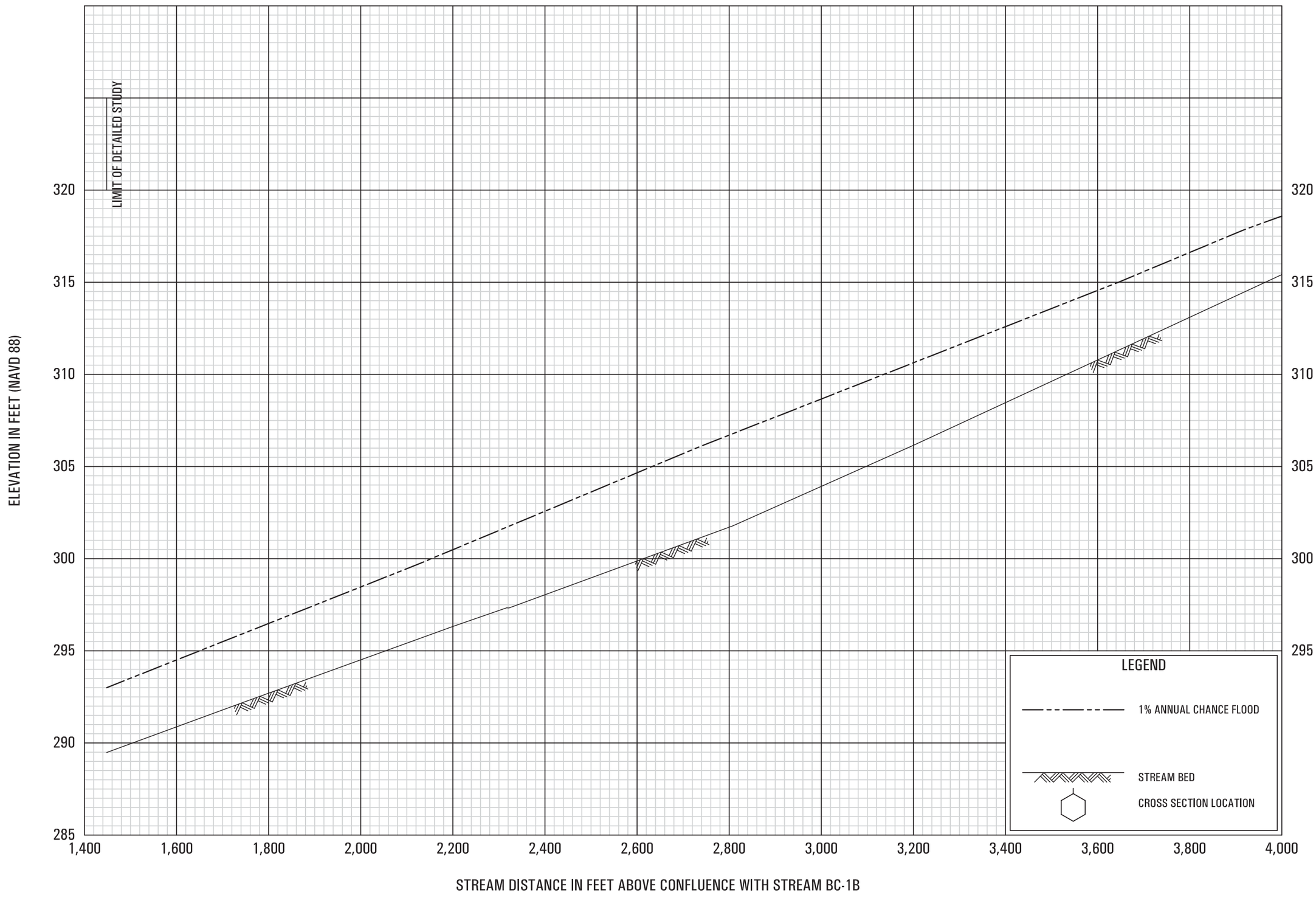
FLOOD PROFILES

STREAM BC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



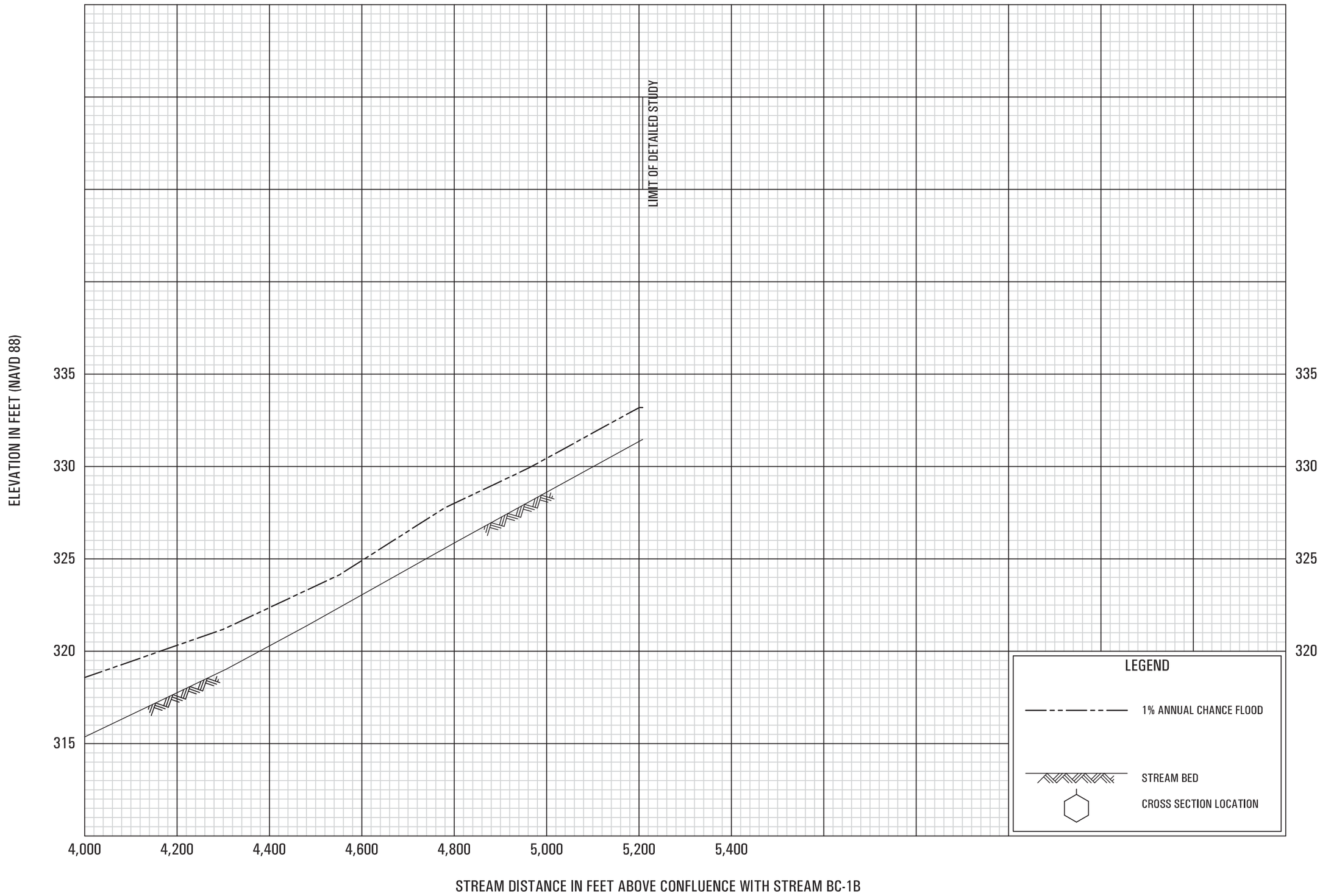
FLOOD PROFILES

STREAM BC-1A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



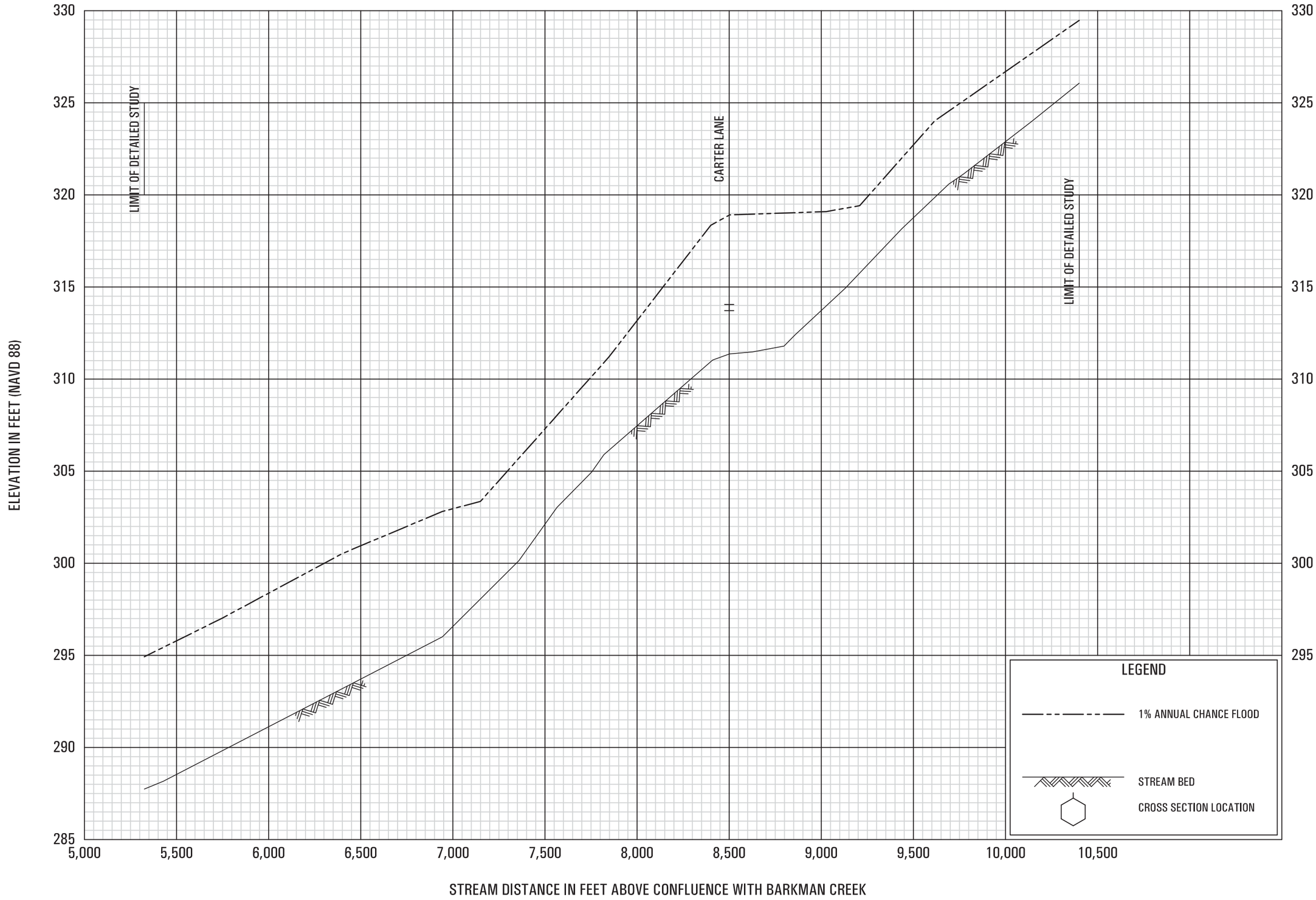
FLOOD PROFILES

STREAM BC-1A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



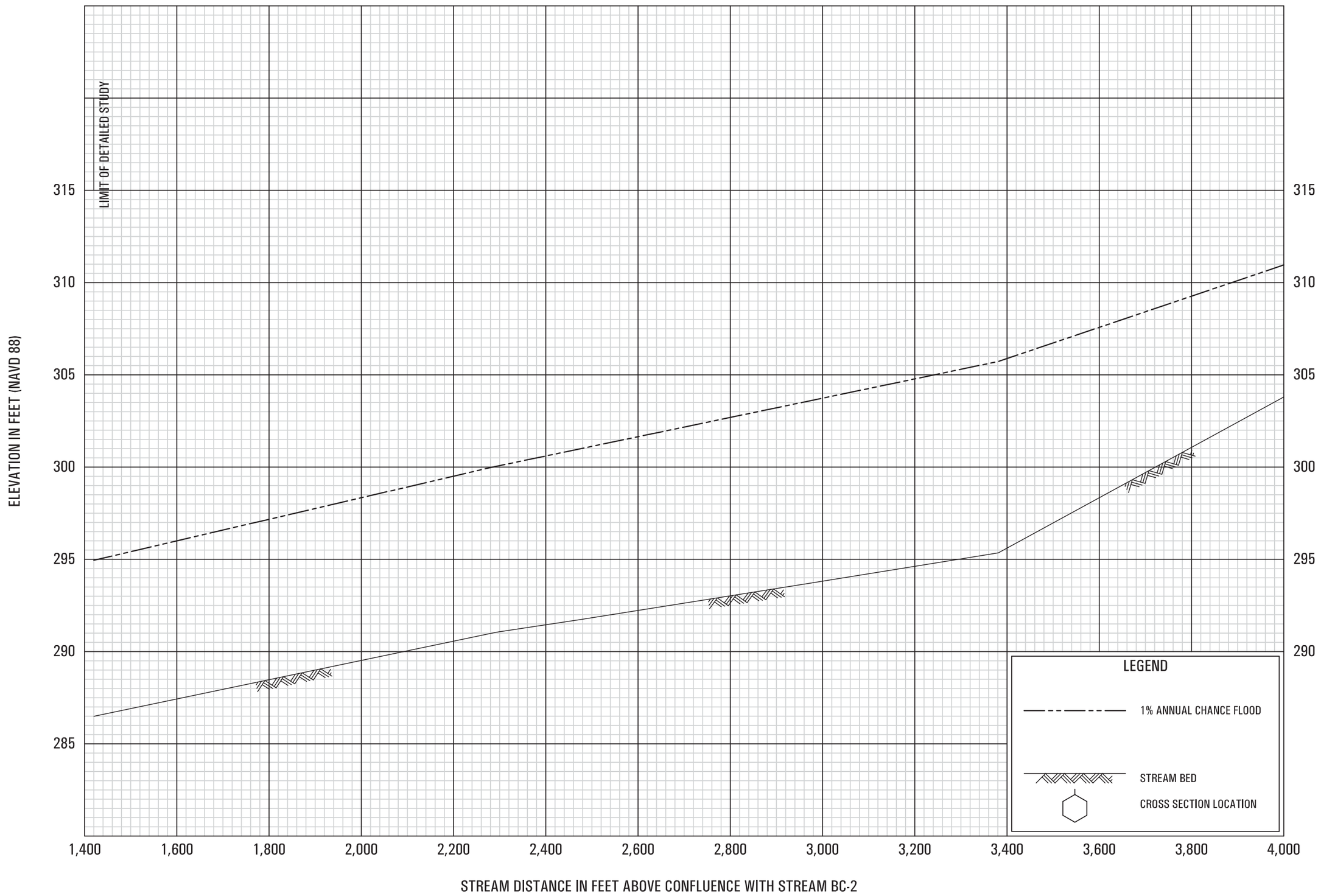
FLOOD PROFILES

STREAM BC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



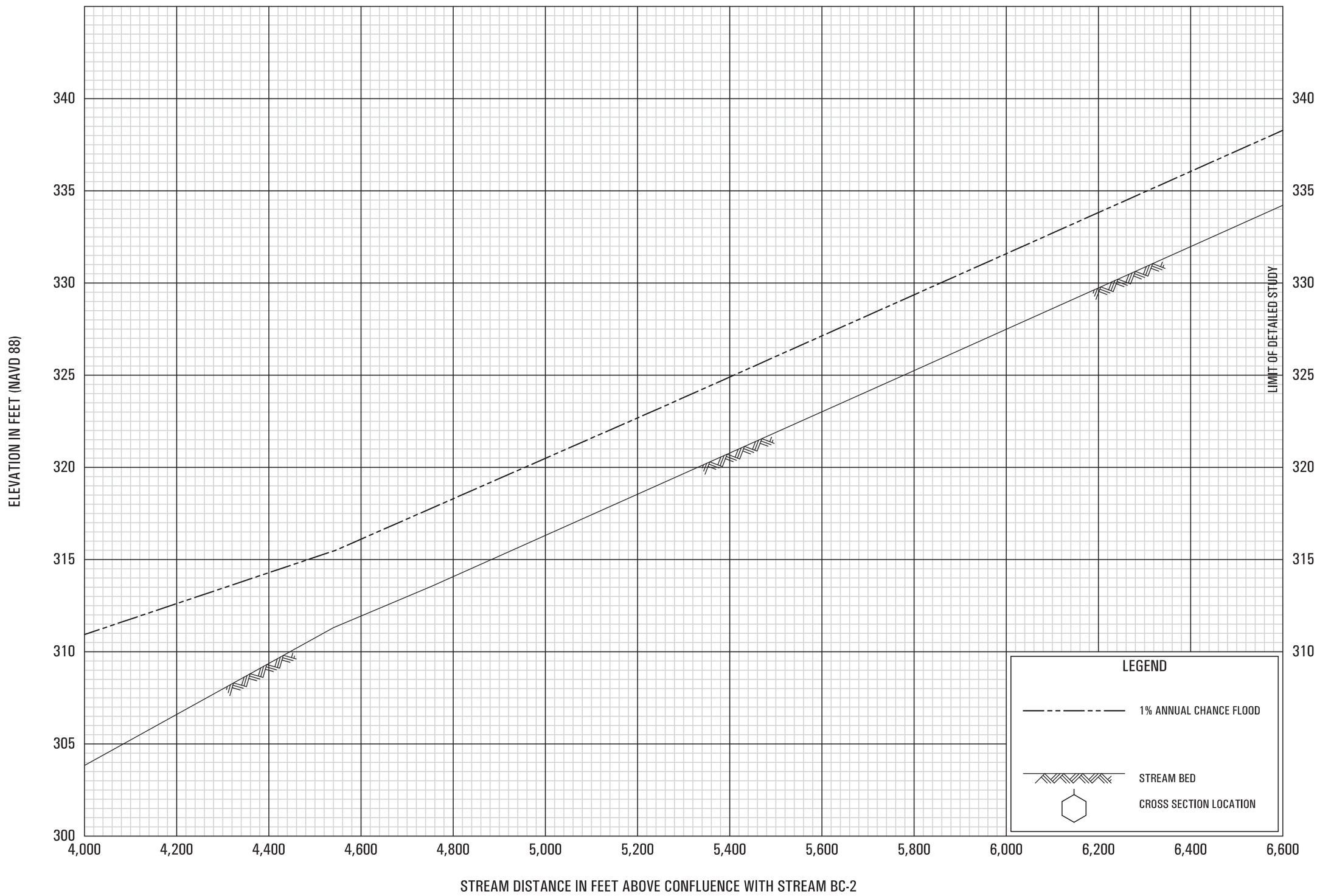
FLOOD PROFILES

STREAM BC-2A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



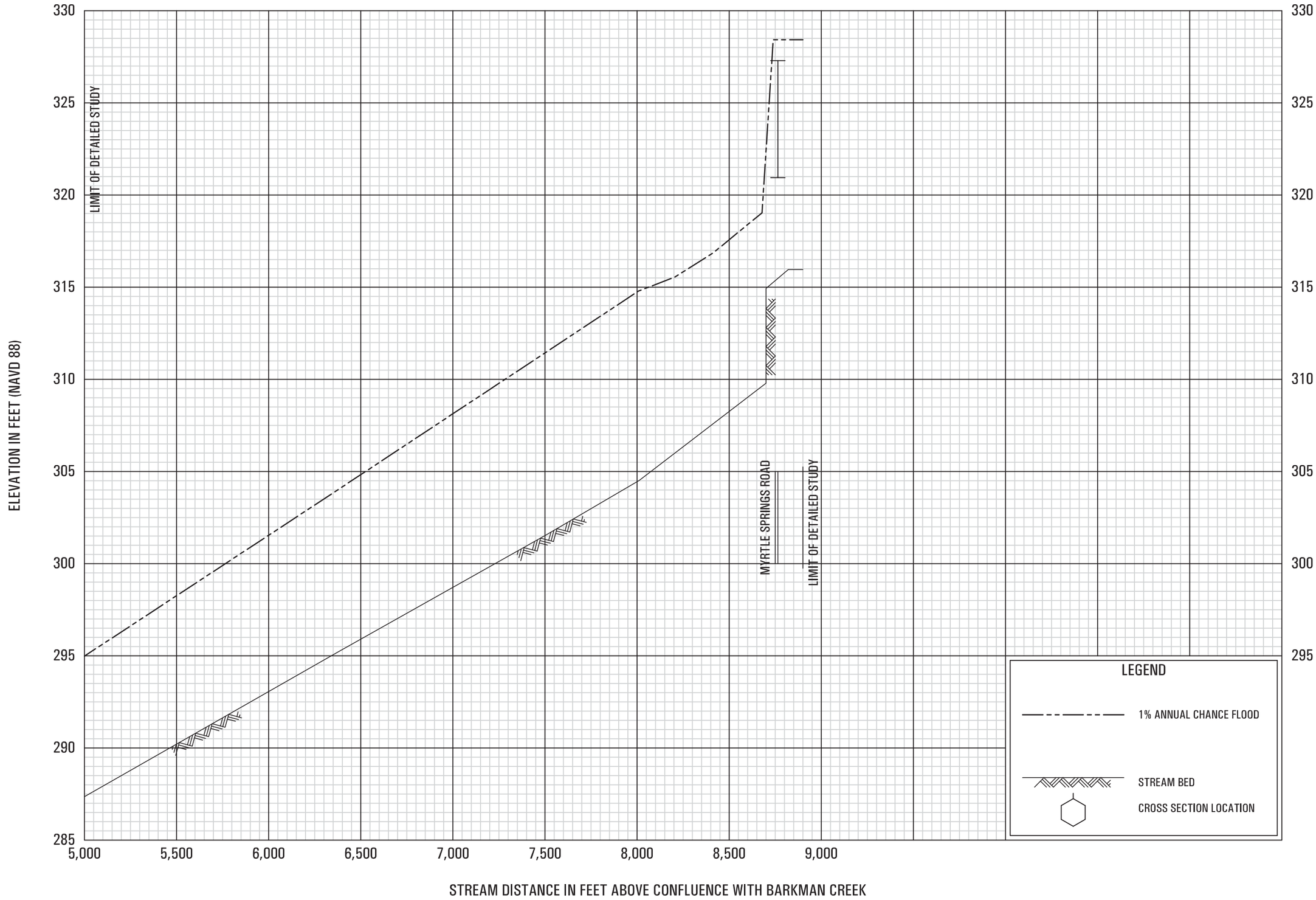
FLOOD PROFILES

STREAM BC-2A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



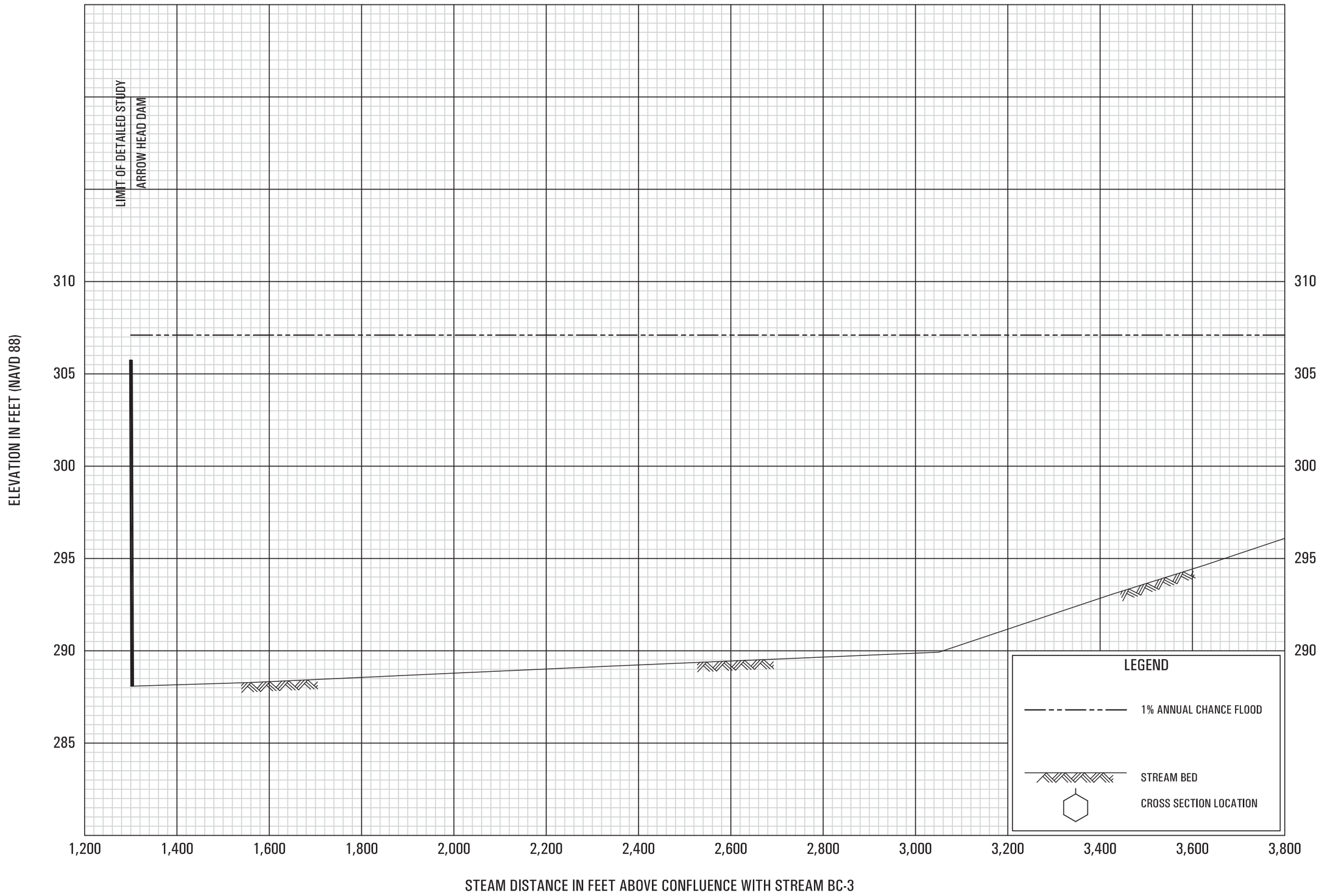
FLOOD PROFILES

STREAM BC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



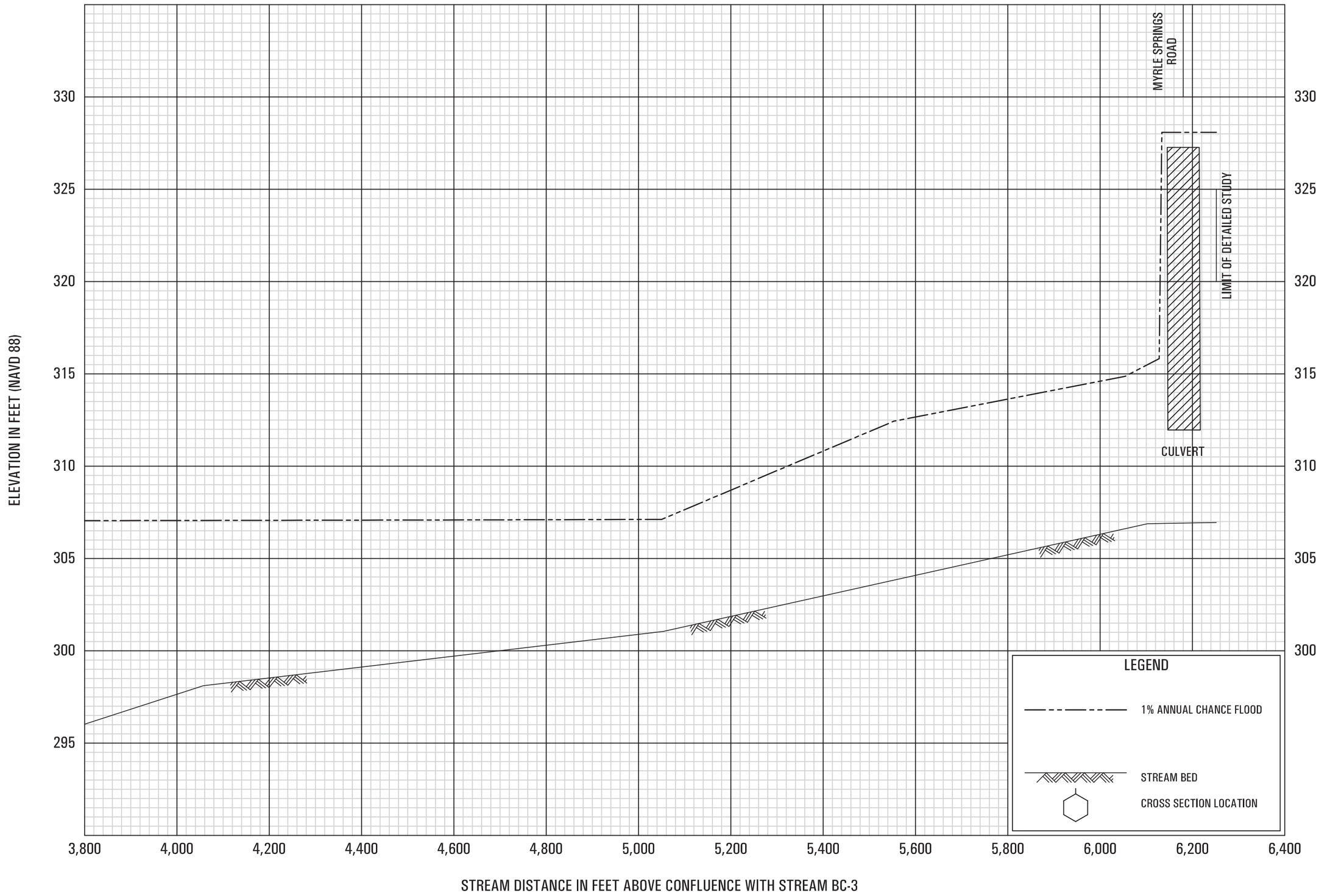
FLOOD PROFILES

STREAM BC-3A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



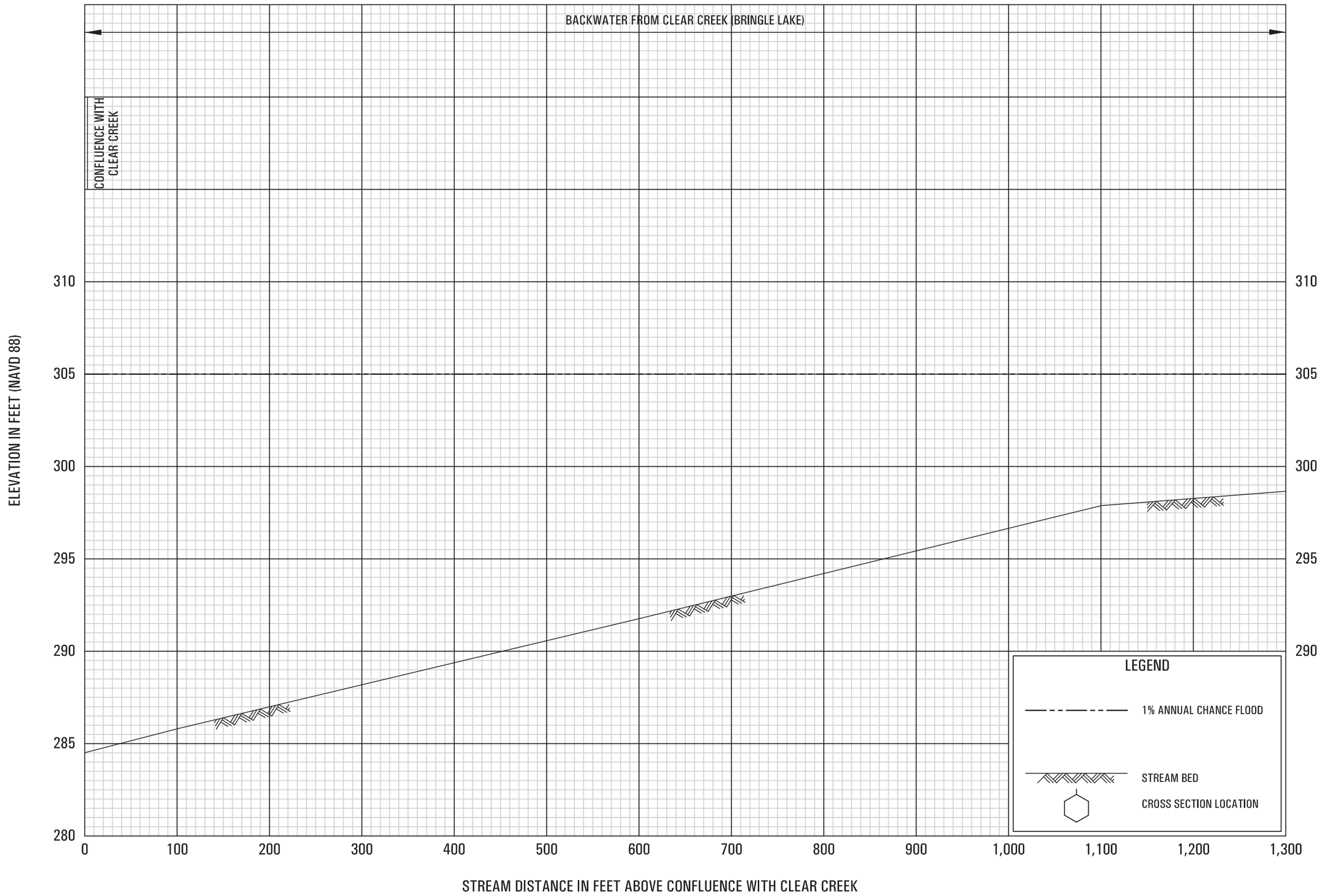
FLOOD PROFILES

STREAM BC-3A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



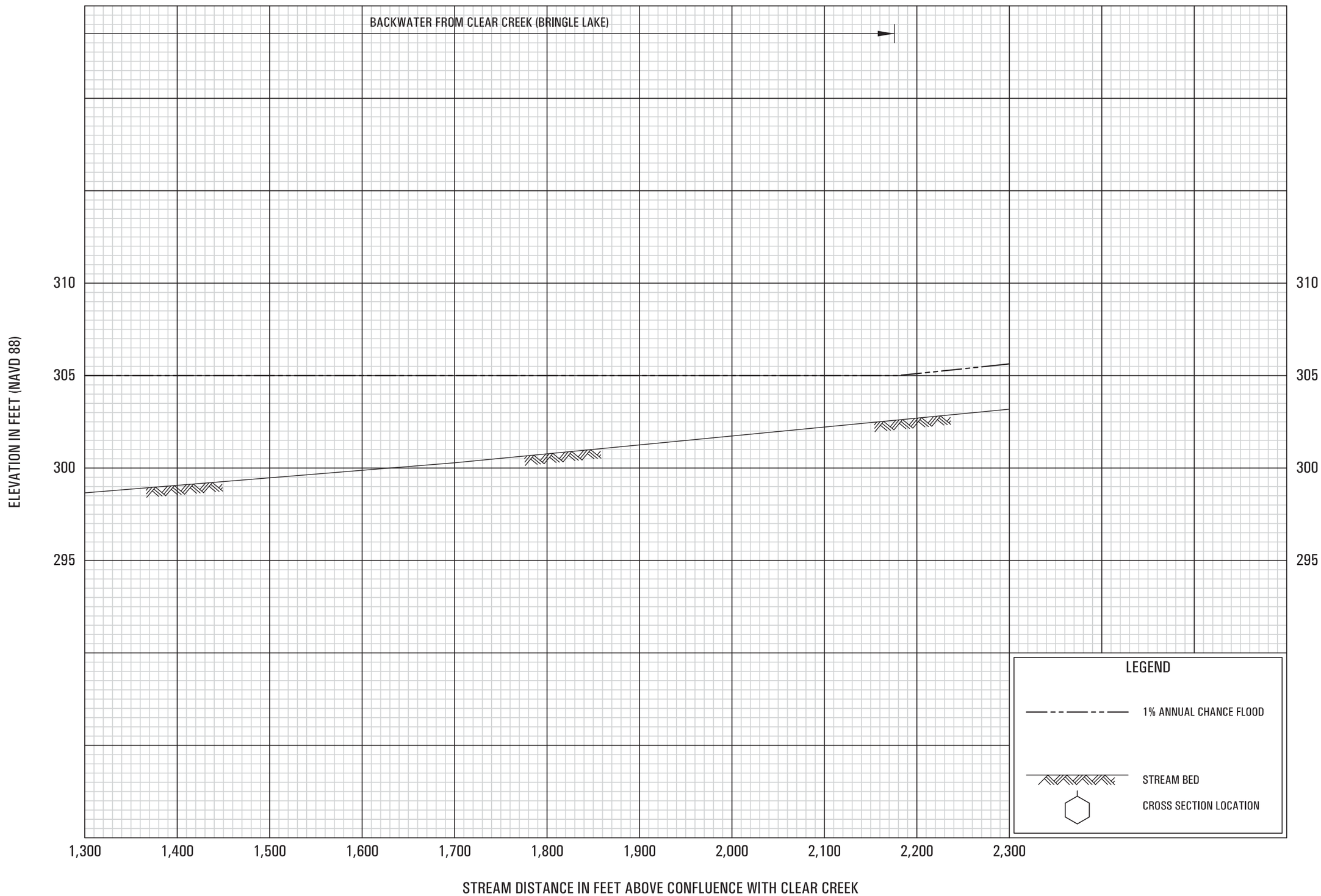
FLOOD PROFILES

STREAM CC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



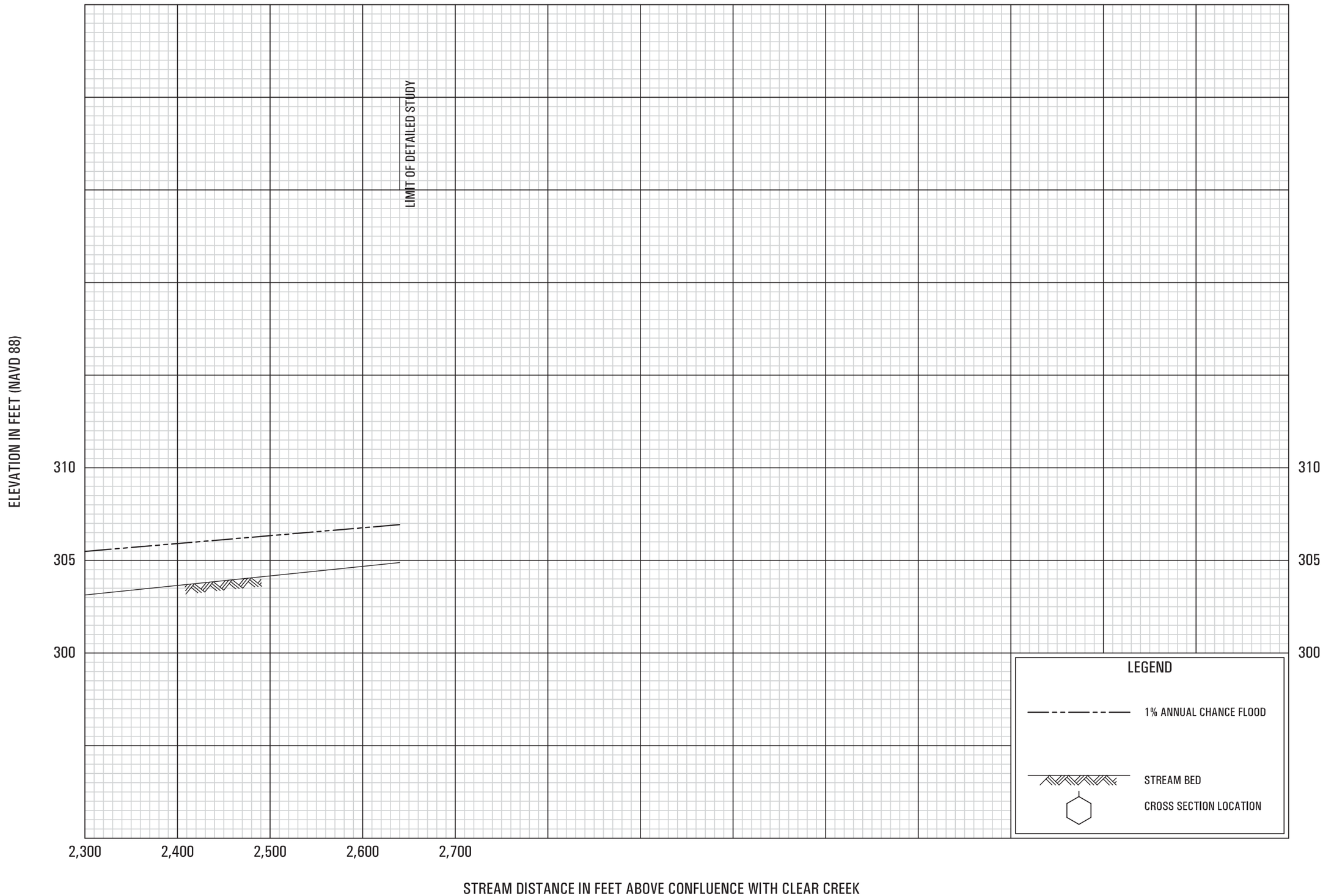
FLOOD PROFILES

STREAM CC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



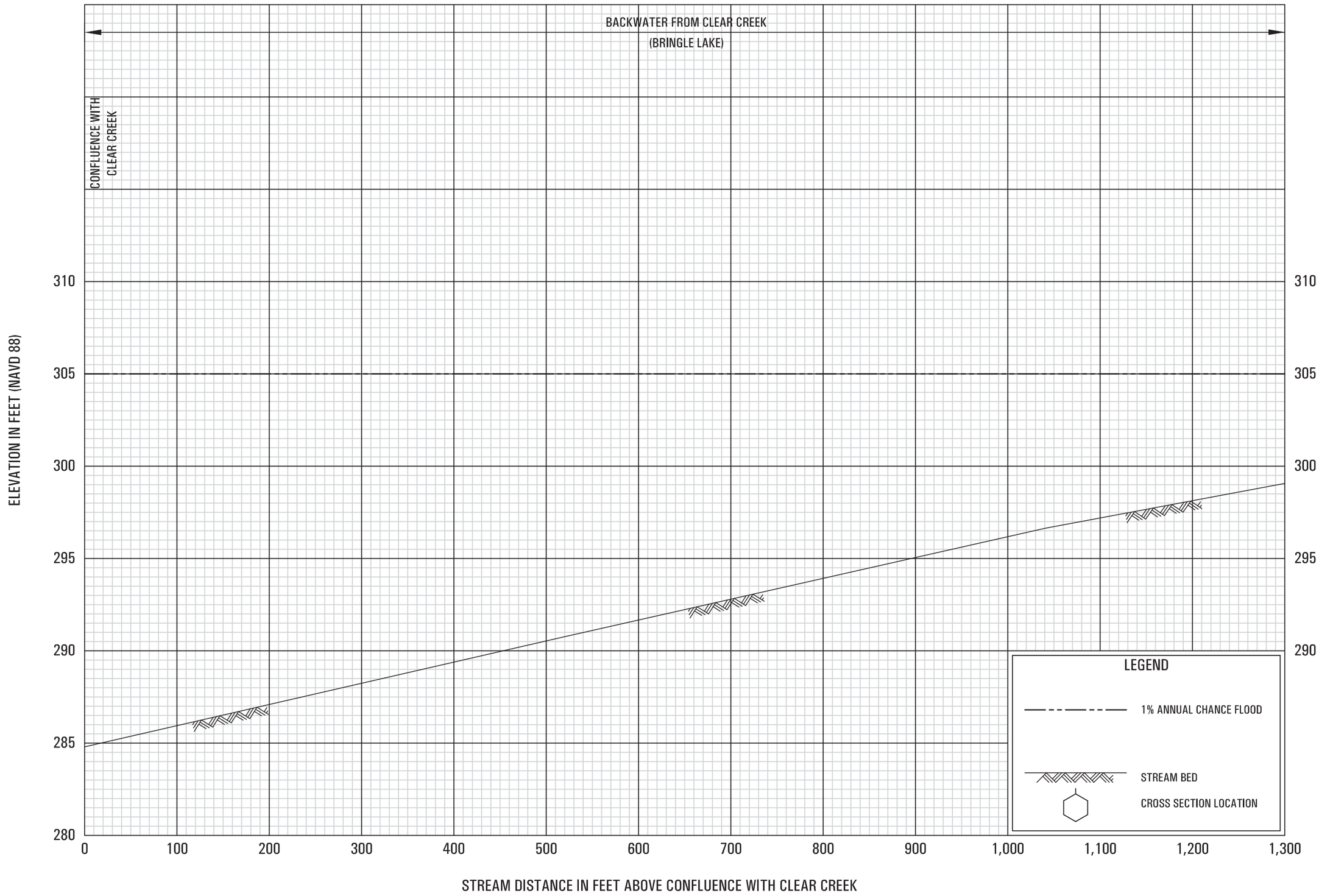
FLOOD PROFILES

STREAM CC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



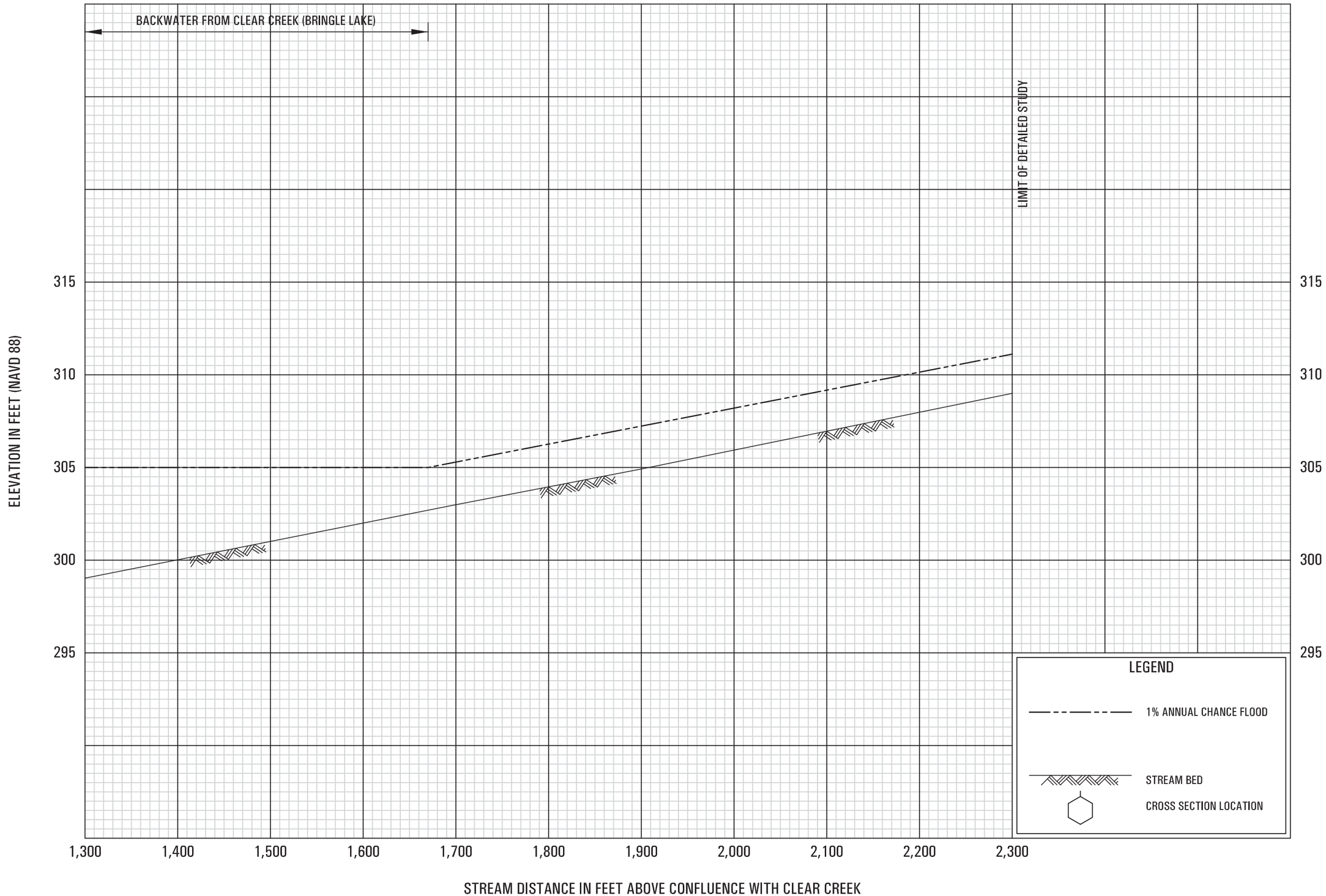
FLOOD PROFILES

STREAM CC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



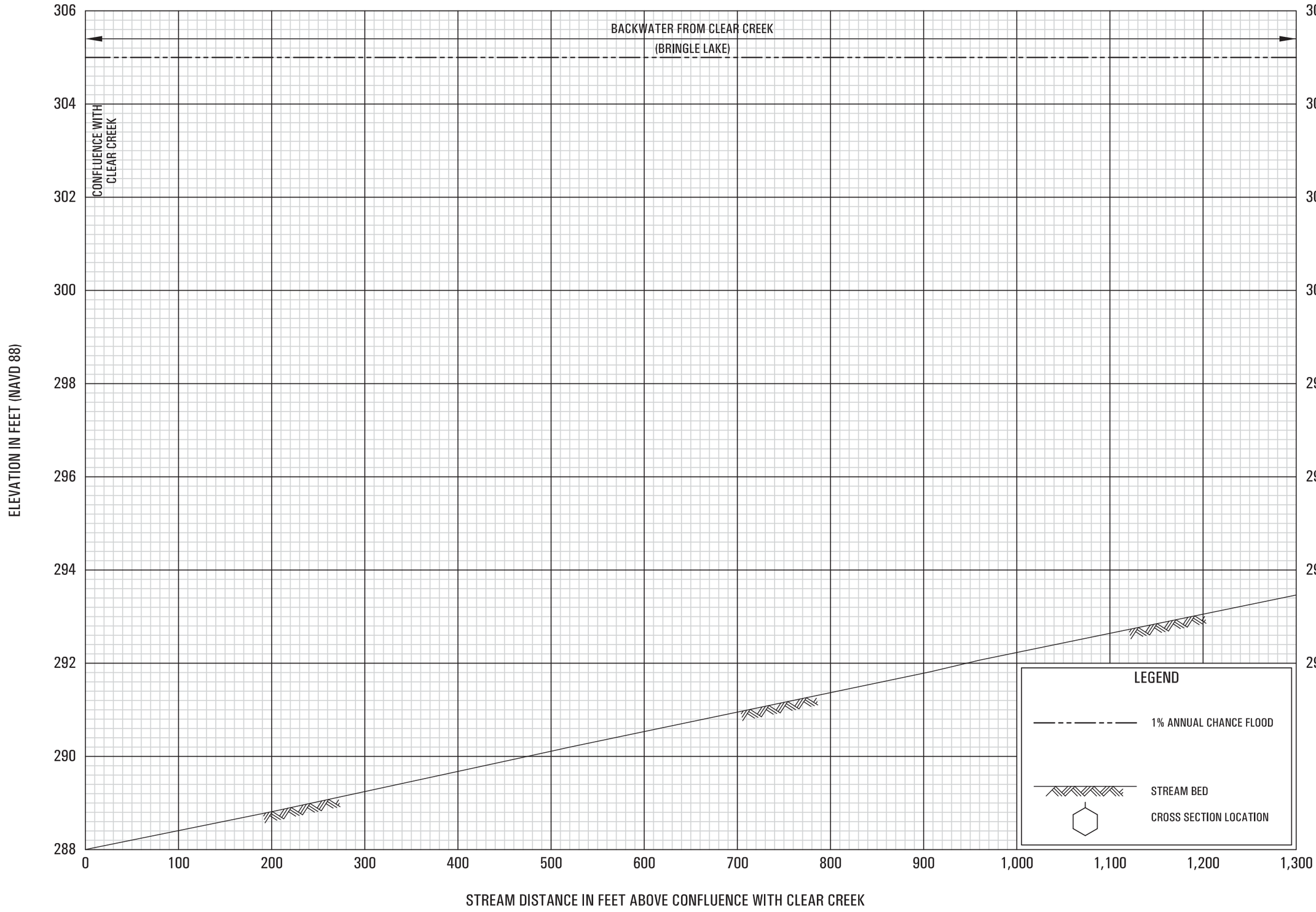
FLOOD PROFILES

STREAM CC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



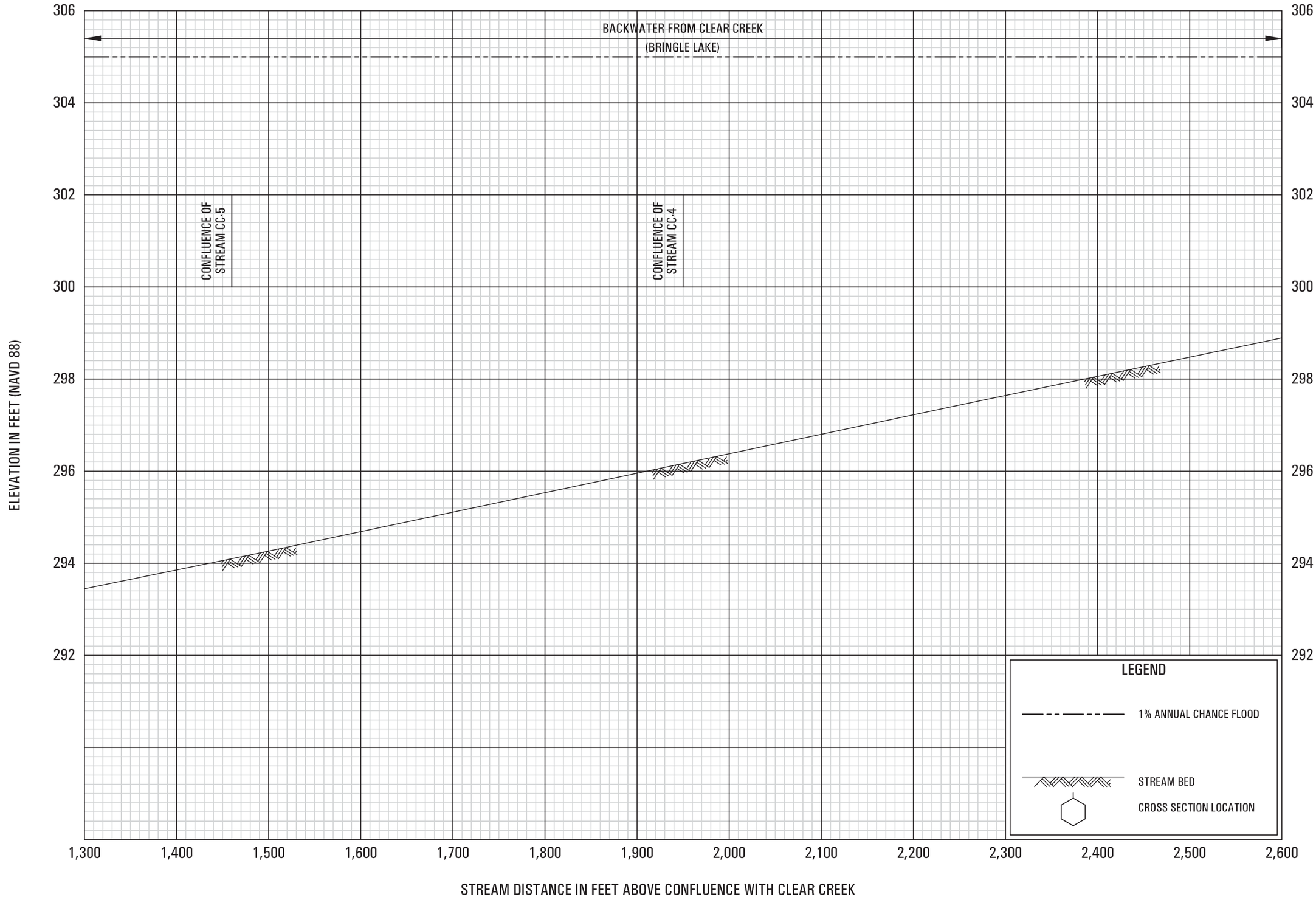
FLOOD PROFILES

STREAM CC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



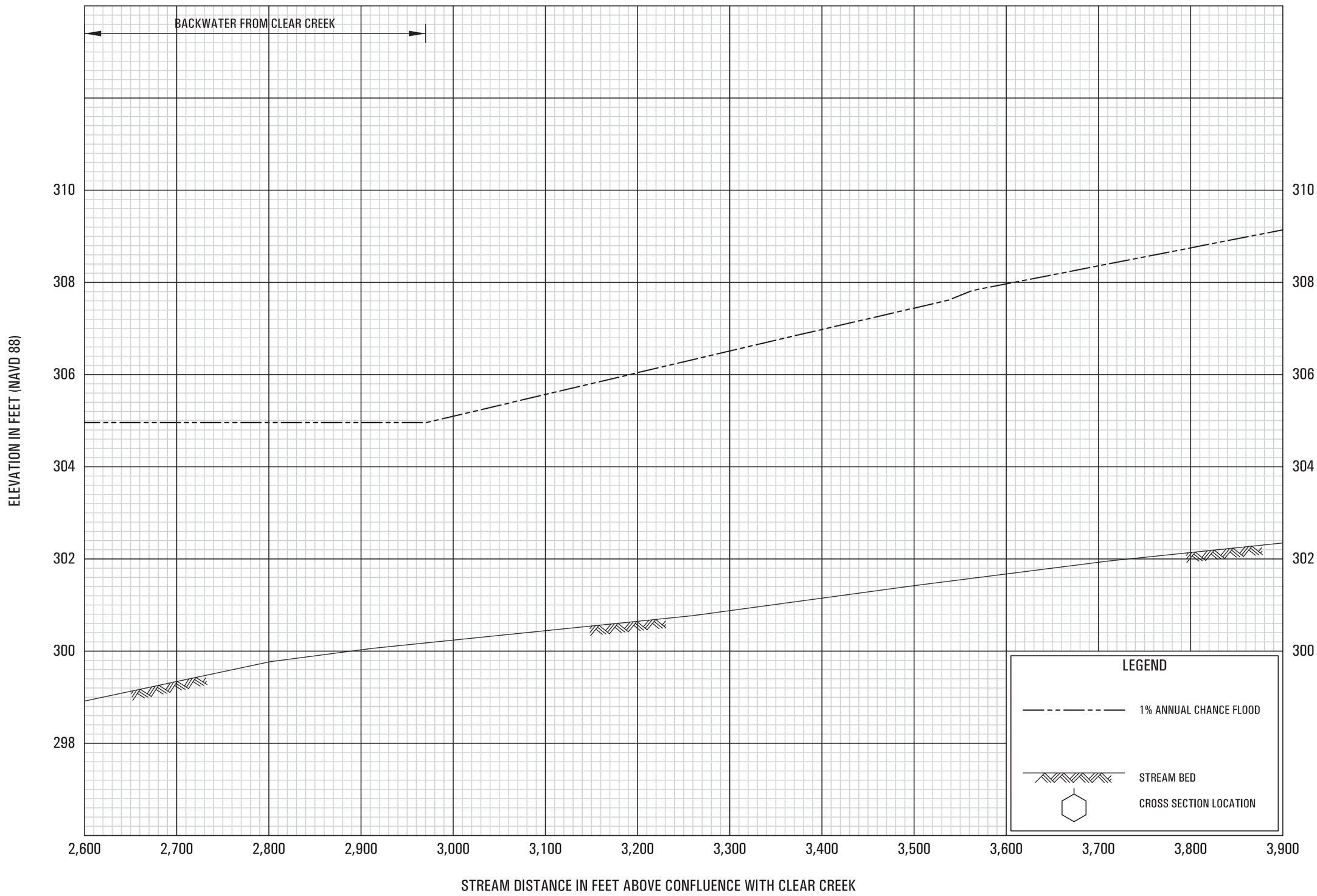
FLOOD PROFILES

STREAM CC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



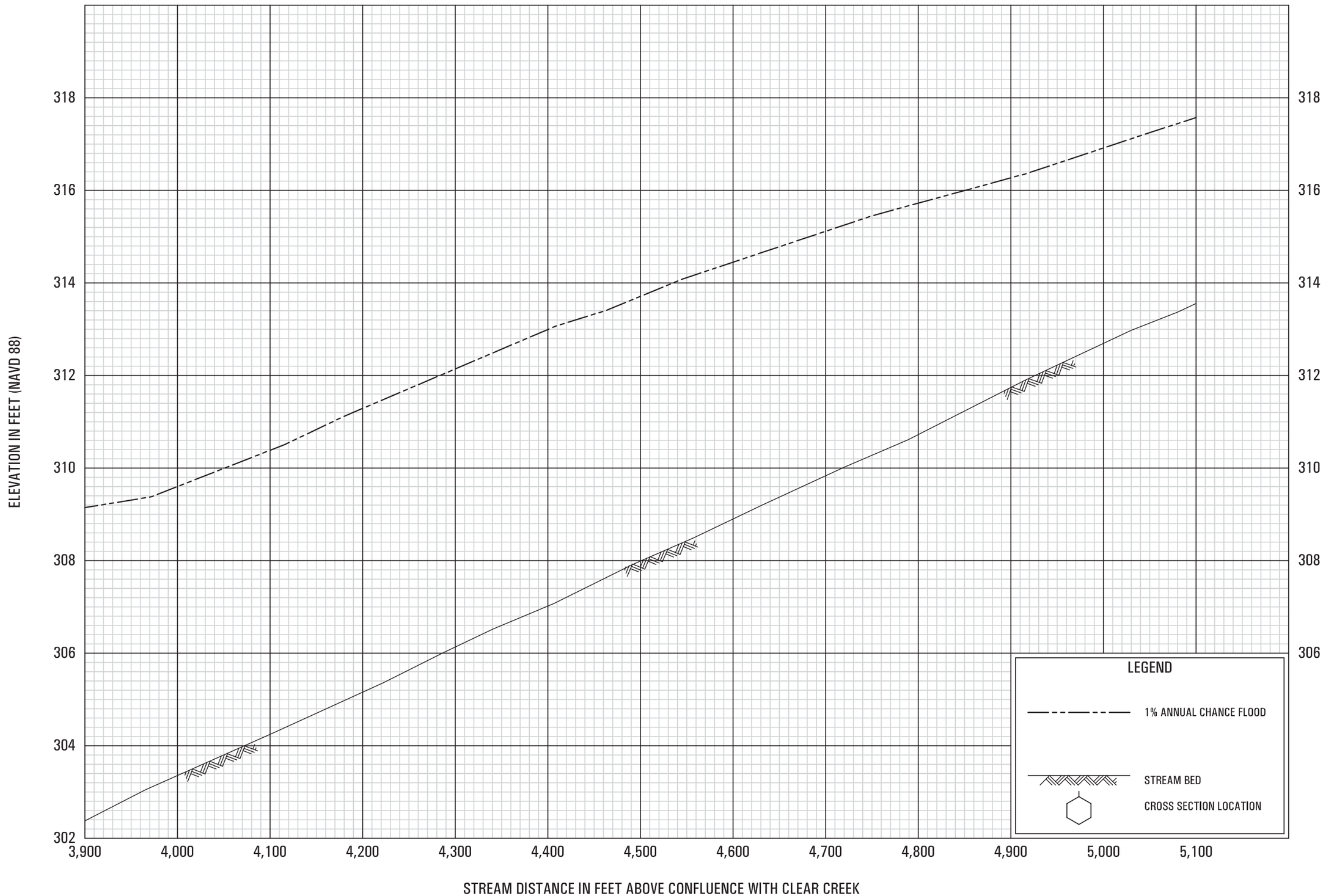
FLOOD PROFILES

STREAM CC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



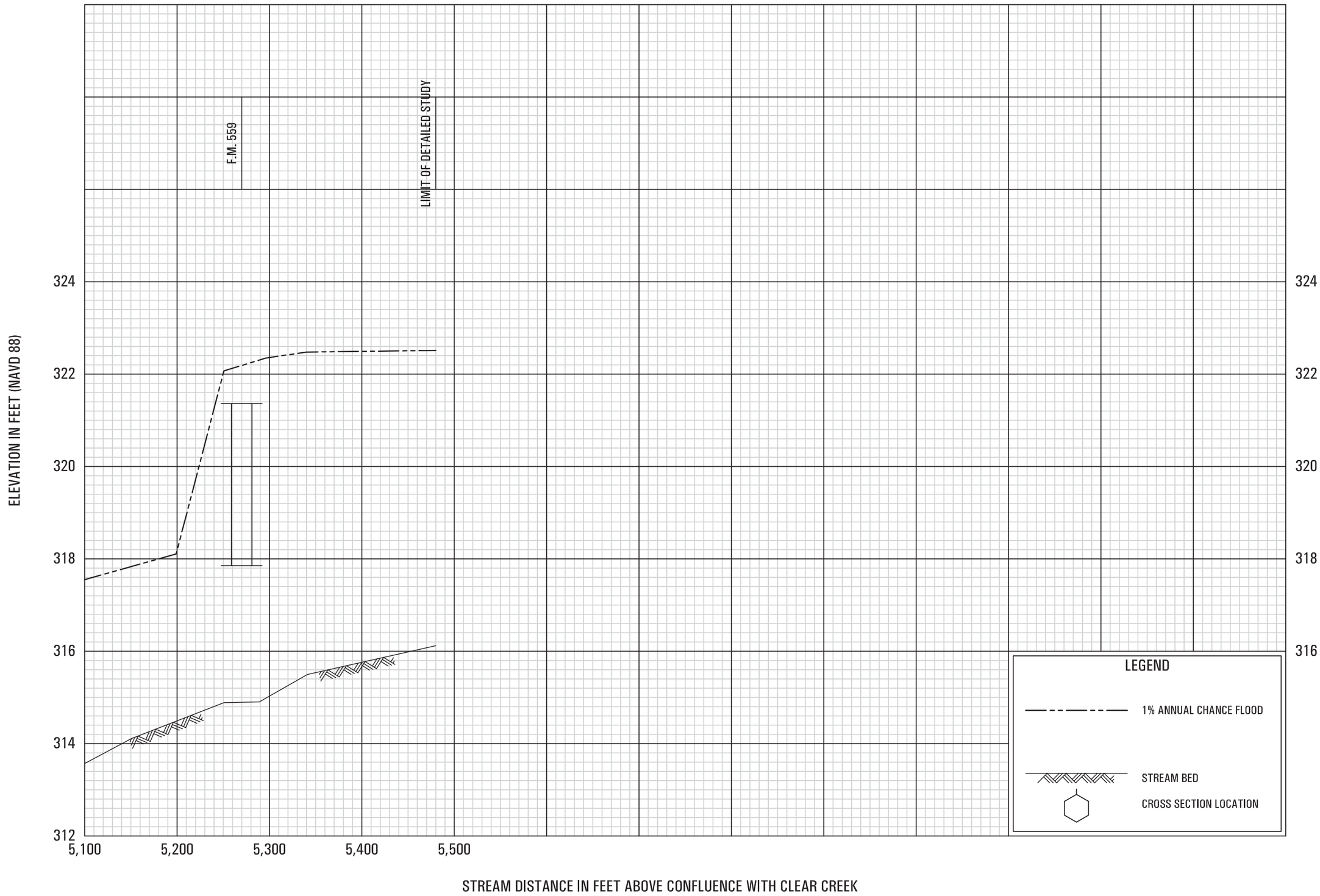
FLOOD PROFILES

STREAM CC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



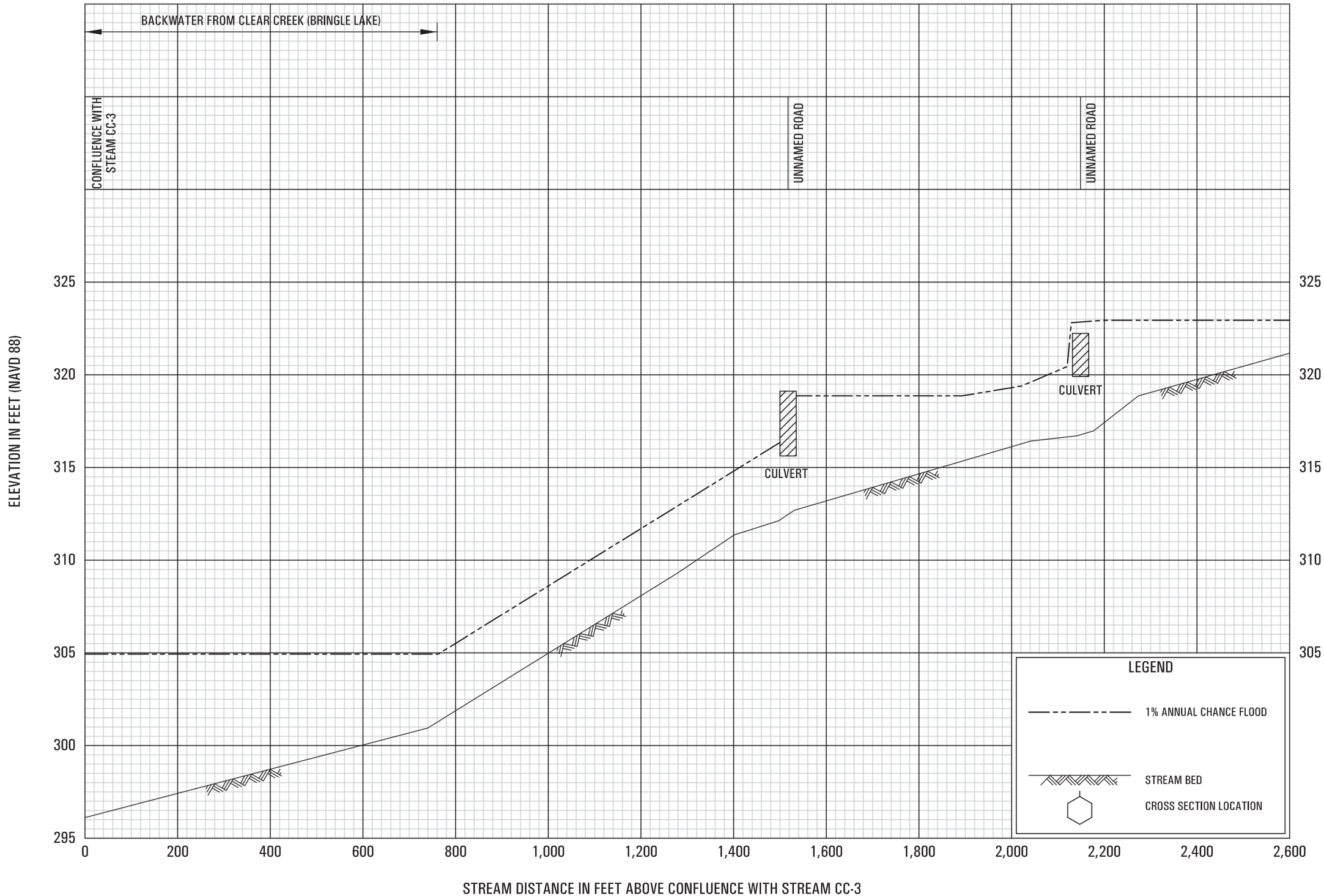
FLOOD PROFILES

STREAM CC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



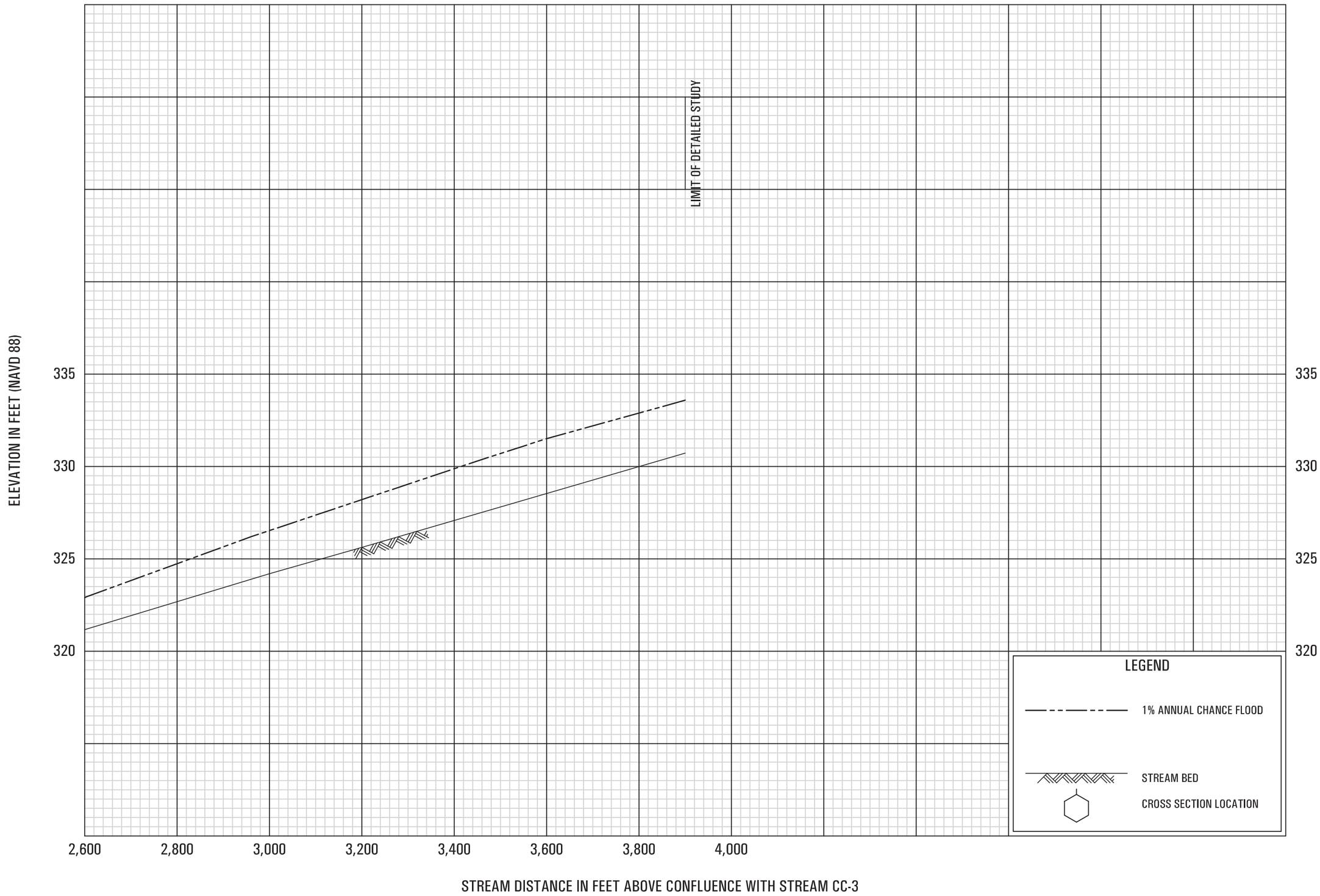
FLOOD PROFILES

STREAM CC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



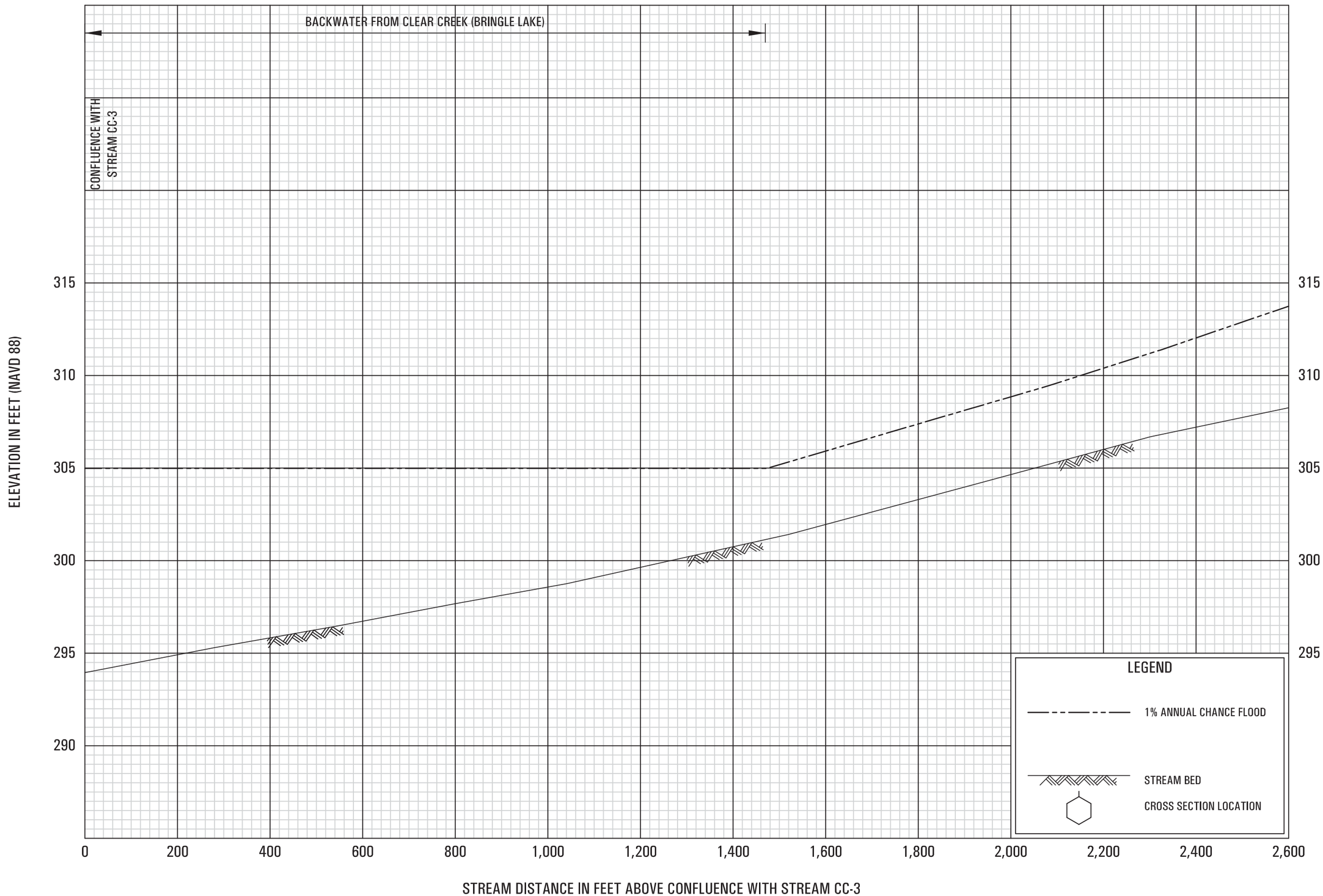
FLOOD PROFILES

STREAM CC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



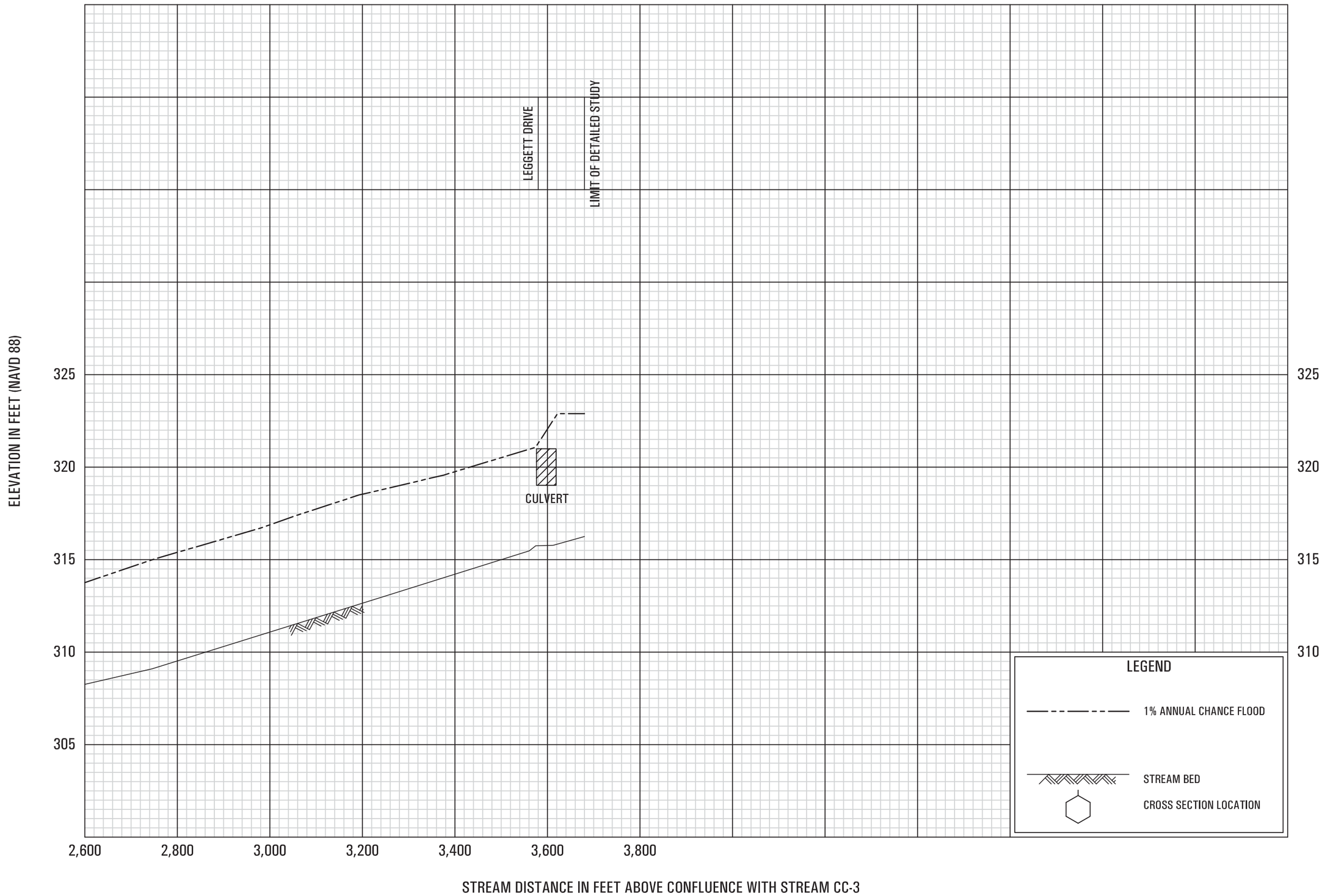
FLOOD PROFILES

STREAM CC-5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



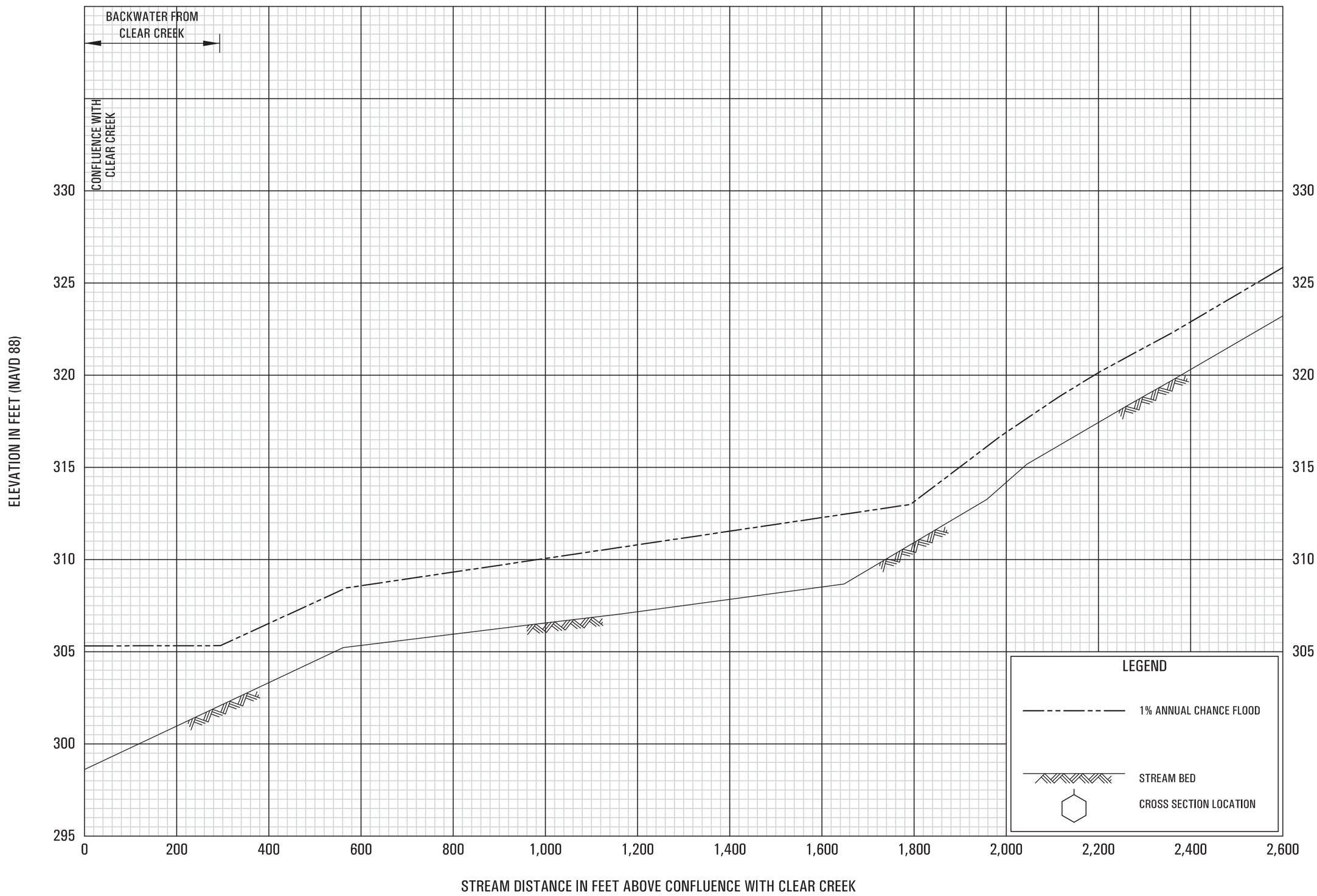
FLOOD PROFILES

STREAM CC-5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



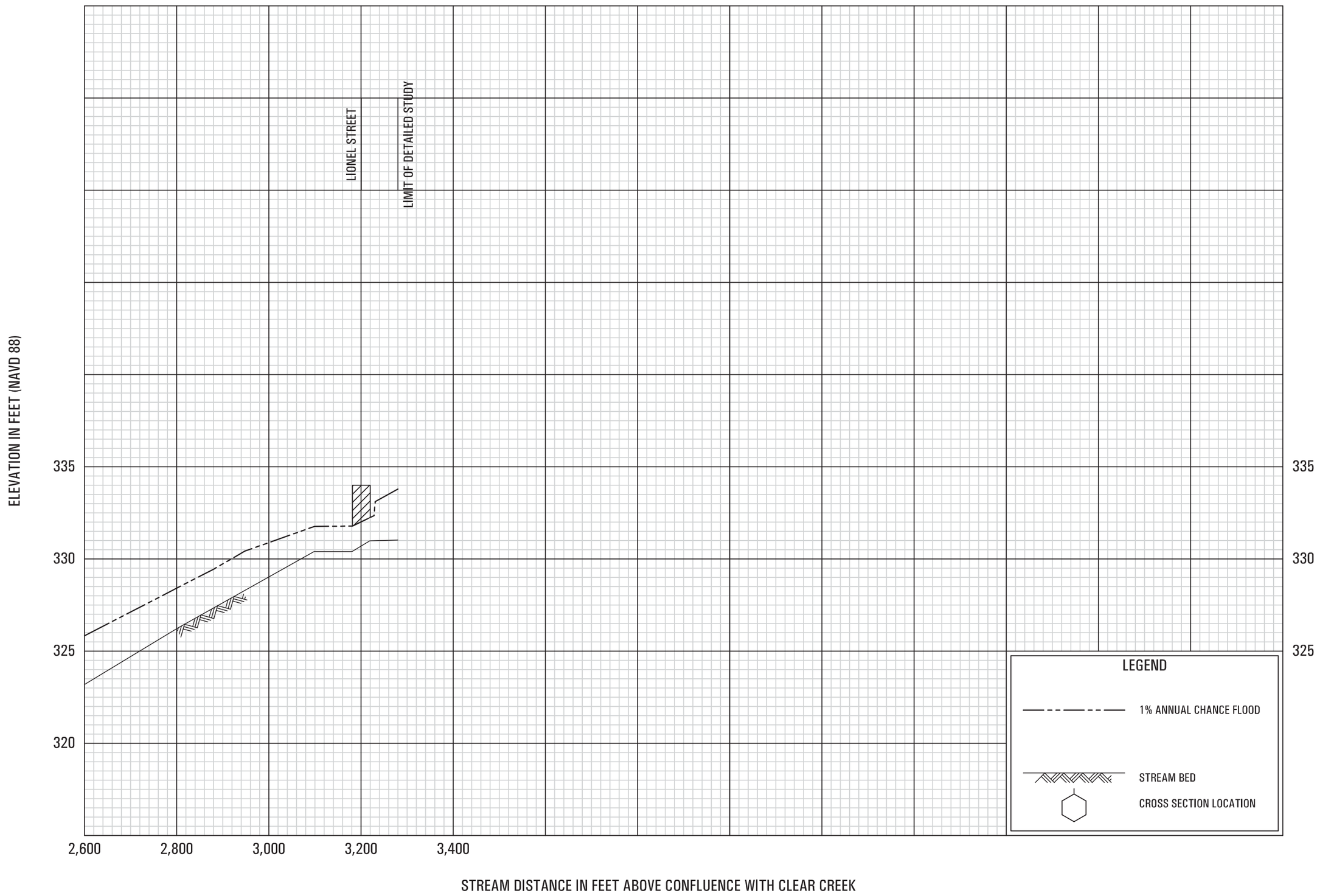
FLOOD PROFILES

STREAM CC-6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



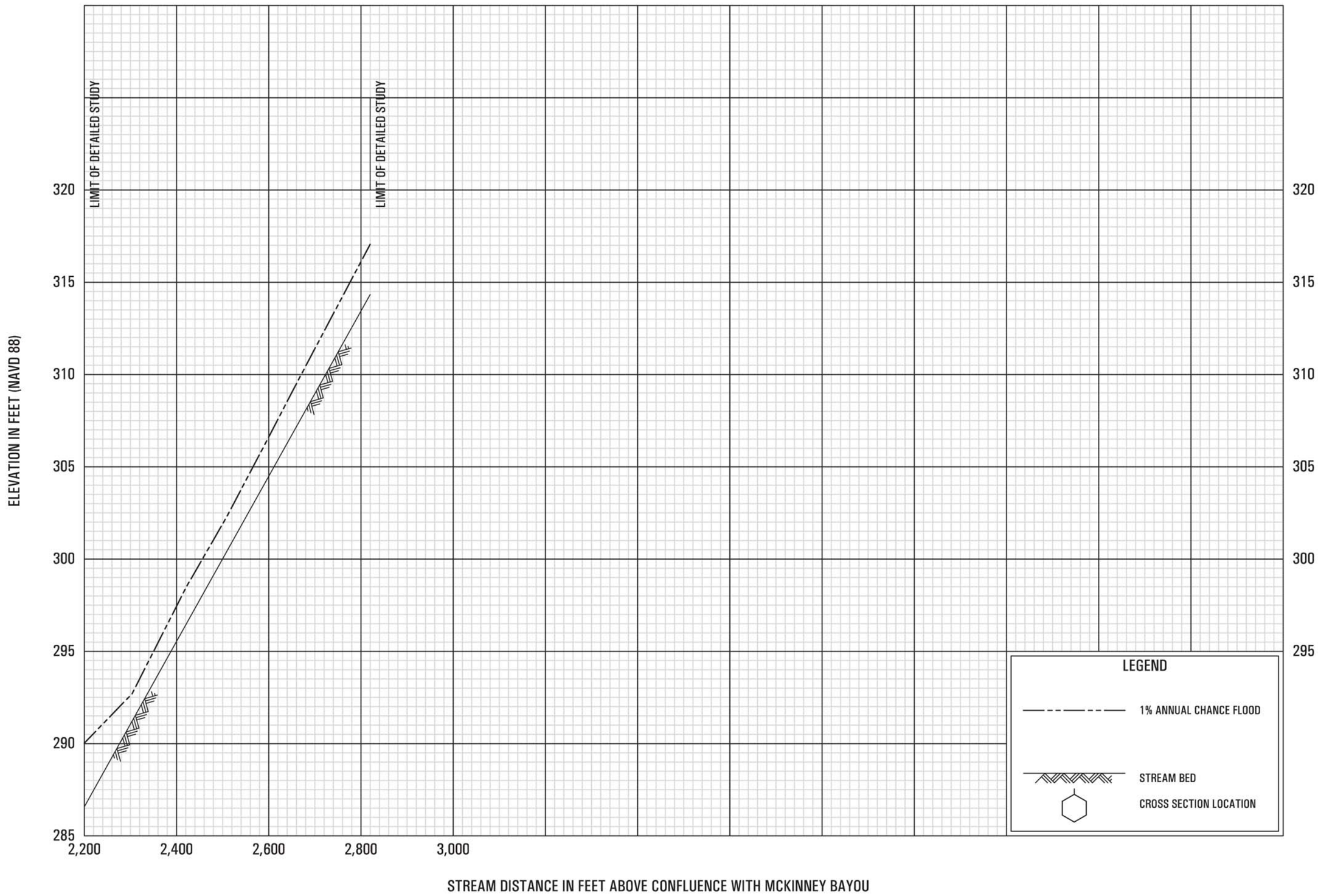
FLOOD PROFILES

STREAM CC-6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



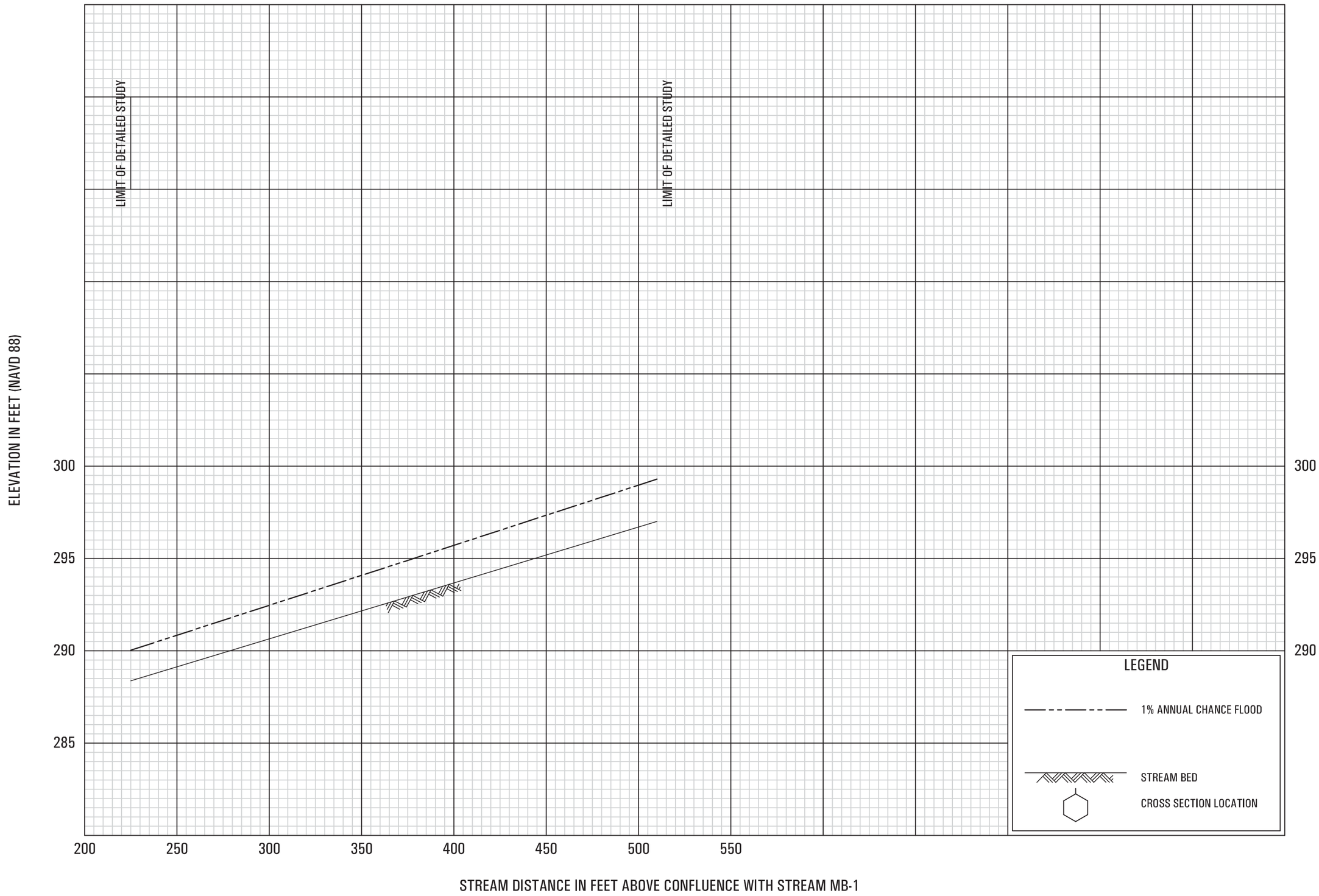
FLOOD PROFILES

STREAM MB-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



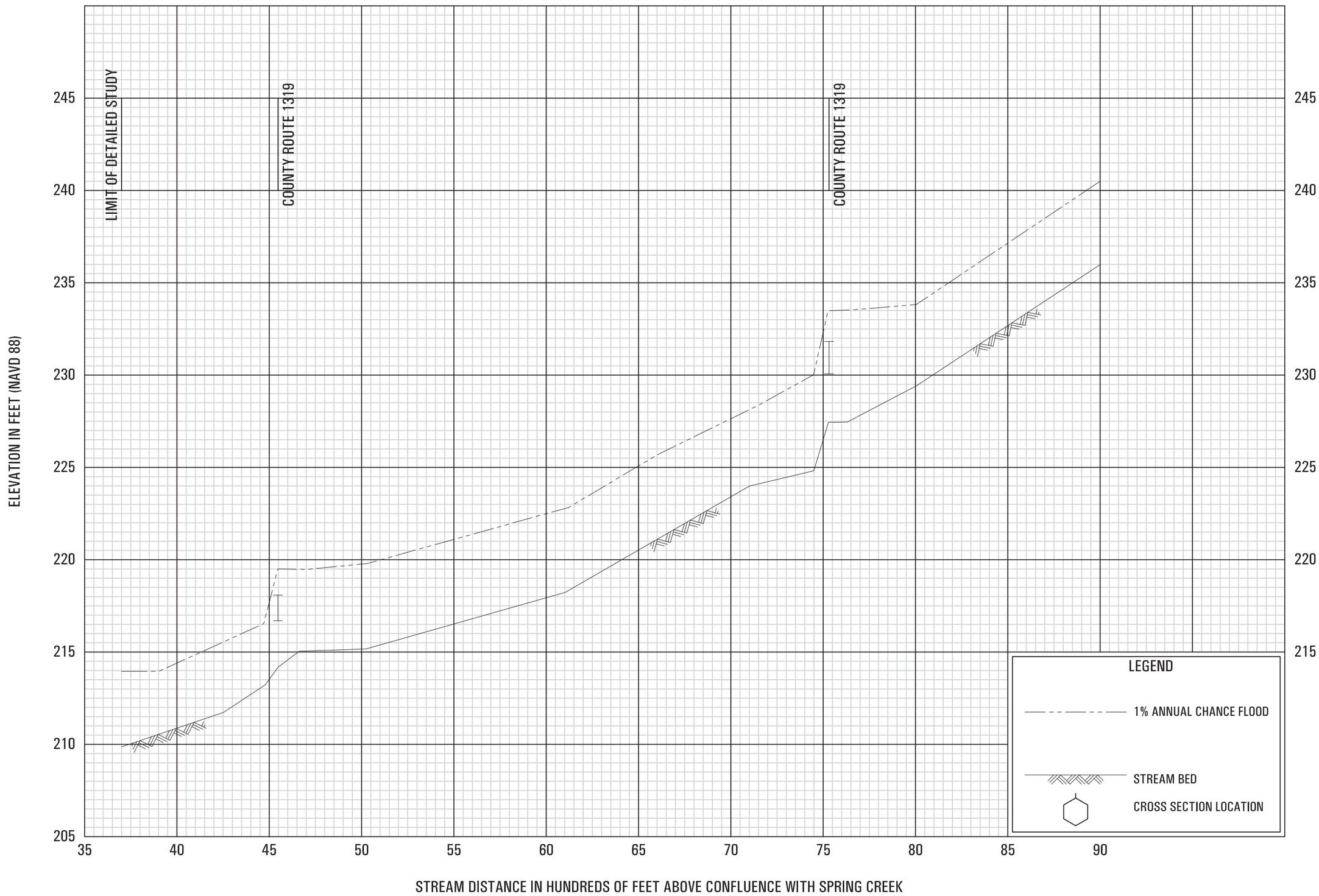
FLOOD PROFILES

STREAM MB-1A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



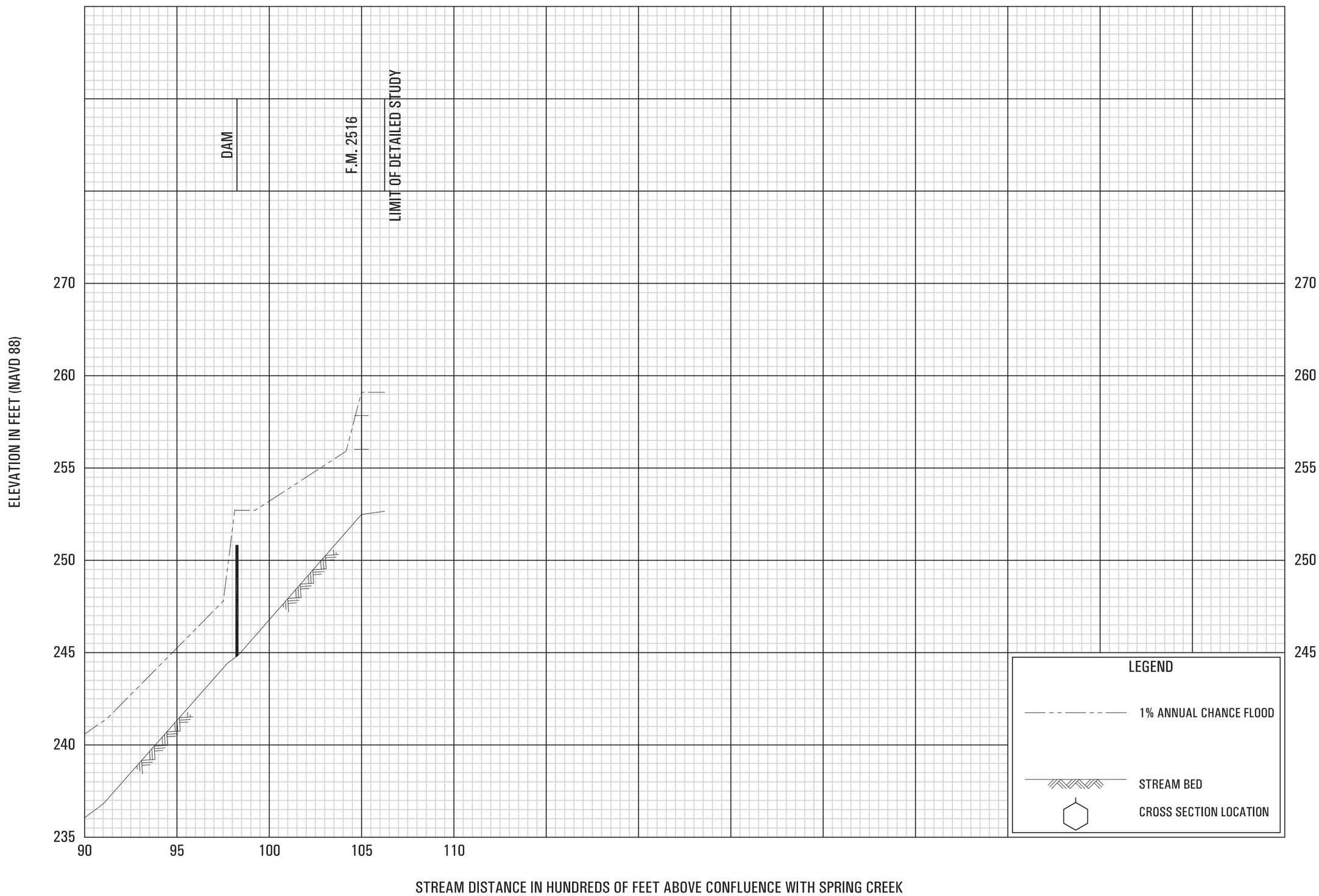
FLOOD PROFILES

STREAM SC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



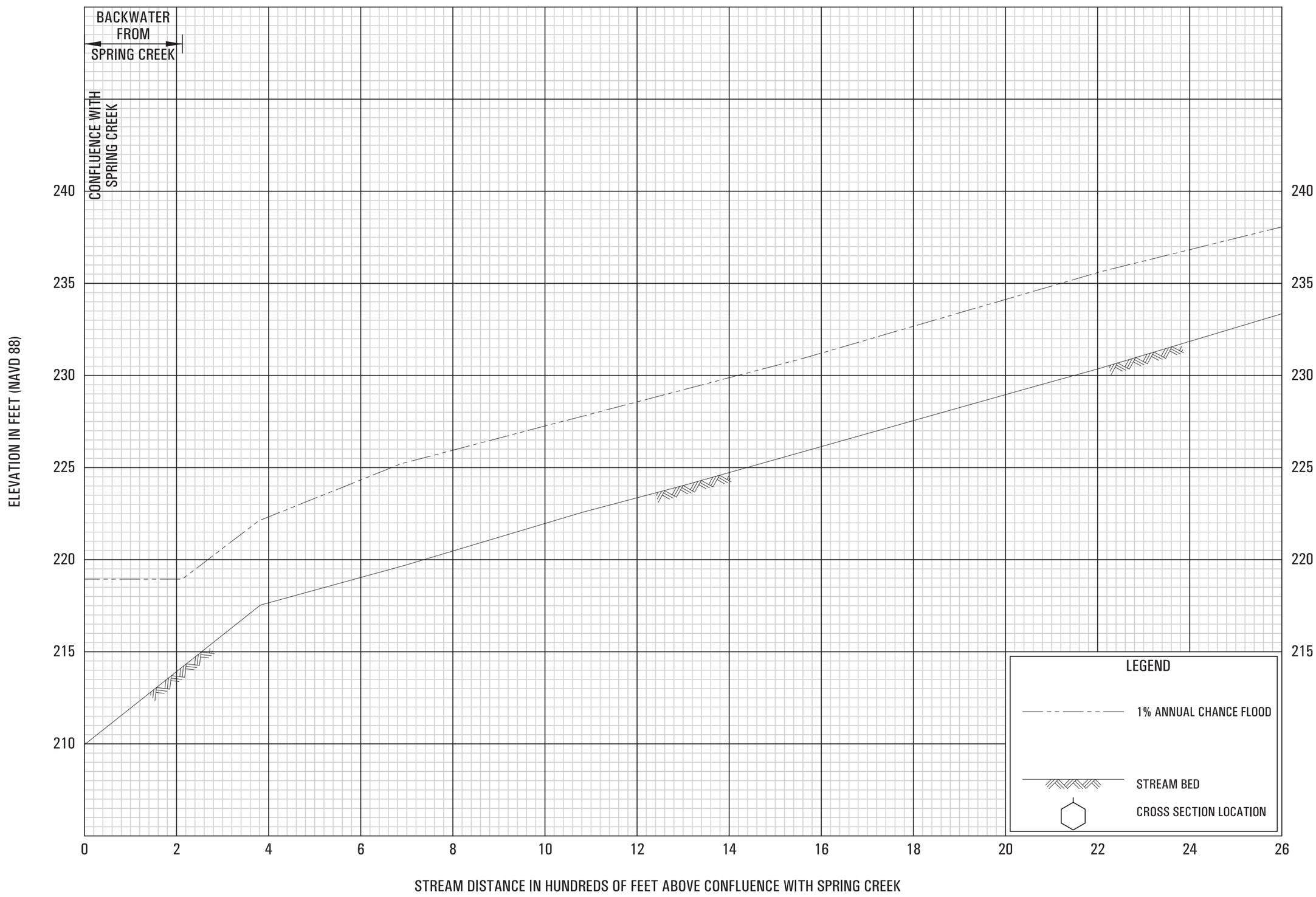
FLOOD PROFILES

STREAM SC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



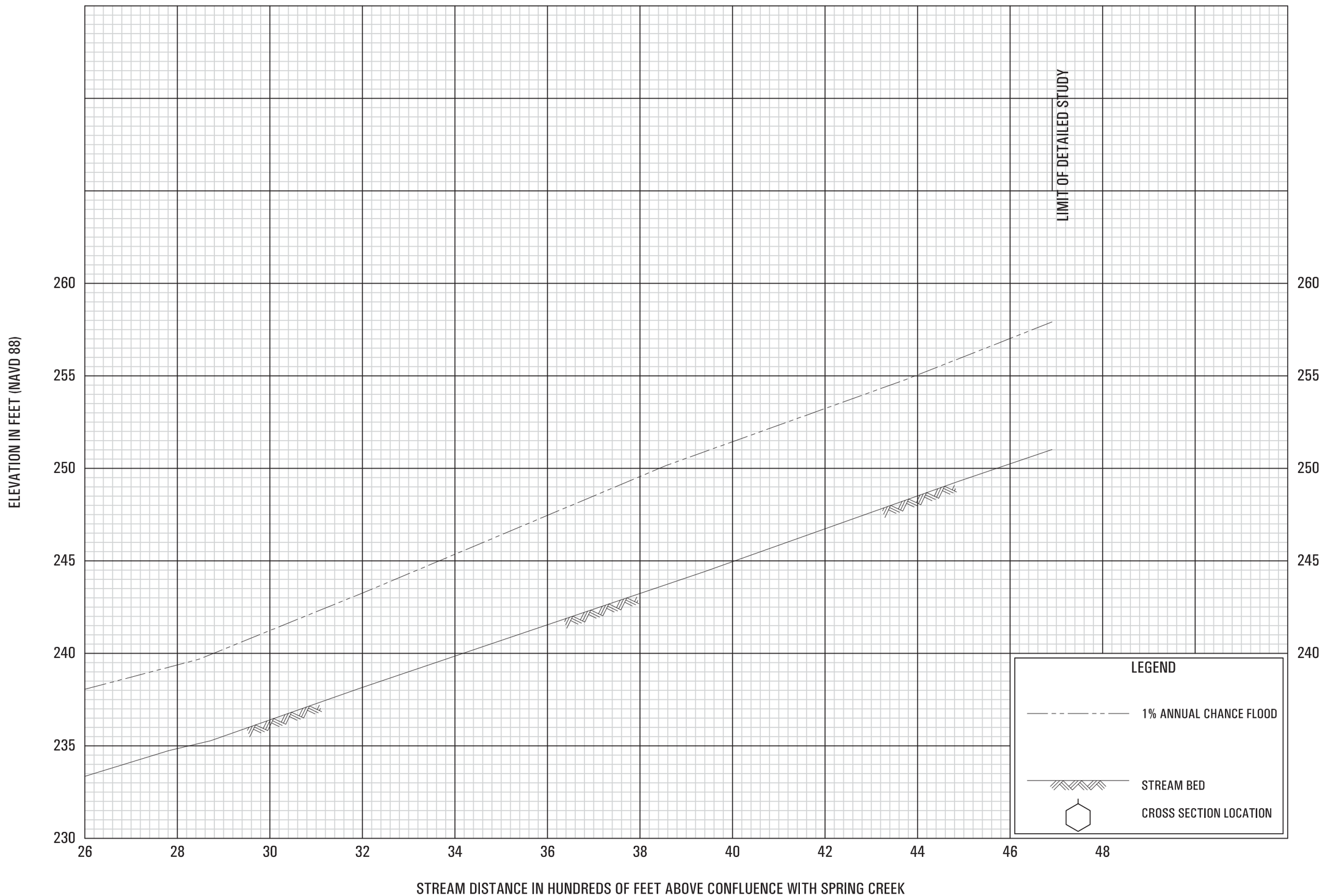
FLOOD PROFILES

STREAM SC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



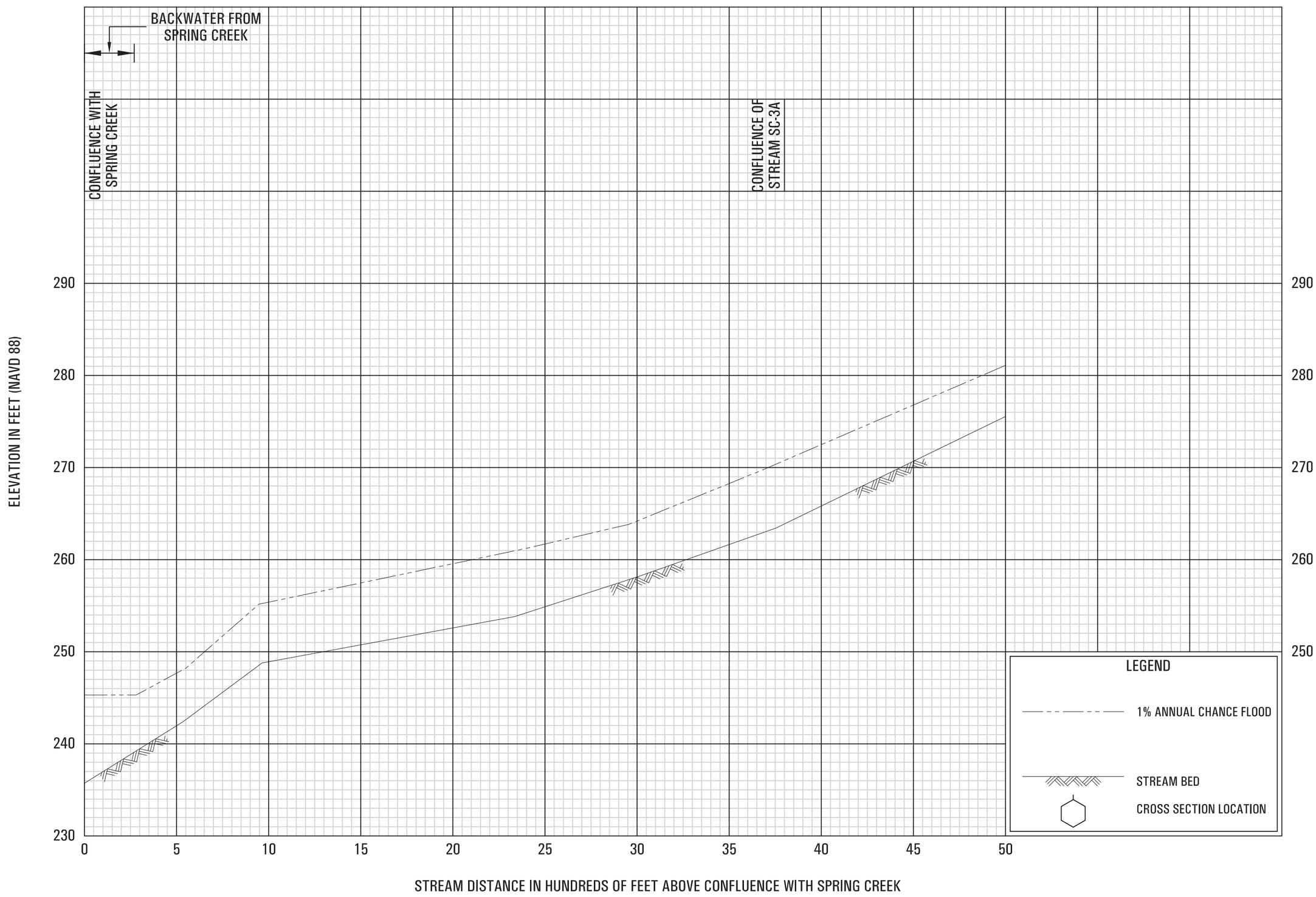
FLOOD PROFILES

STREAM SC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



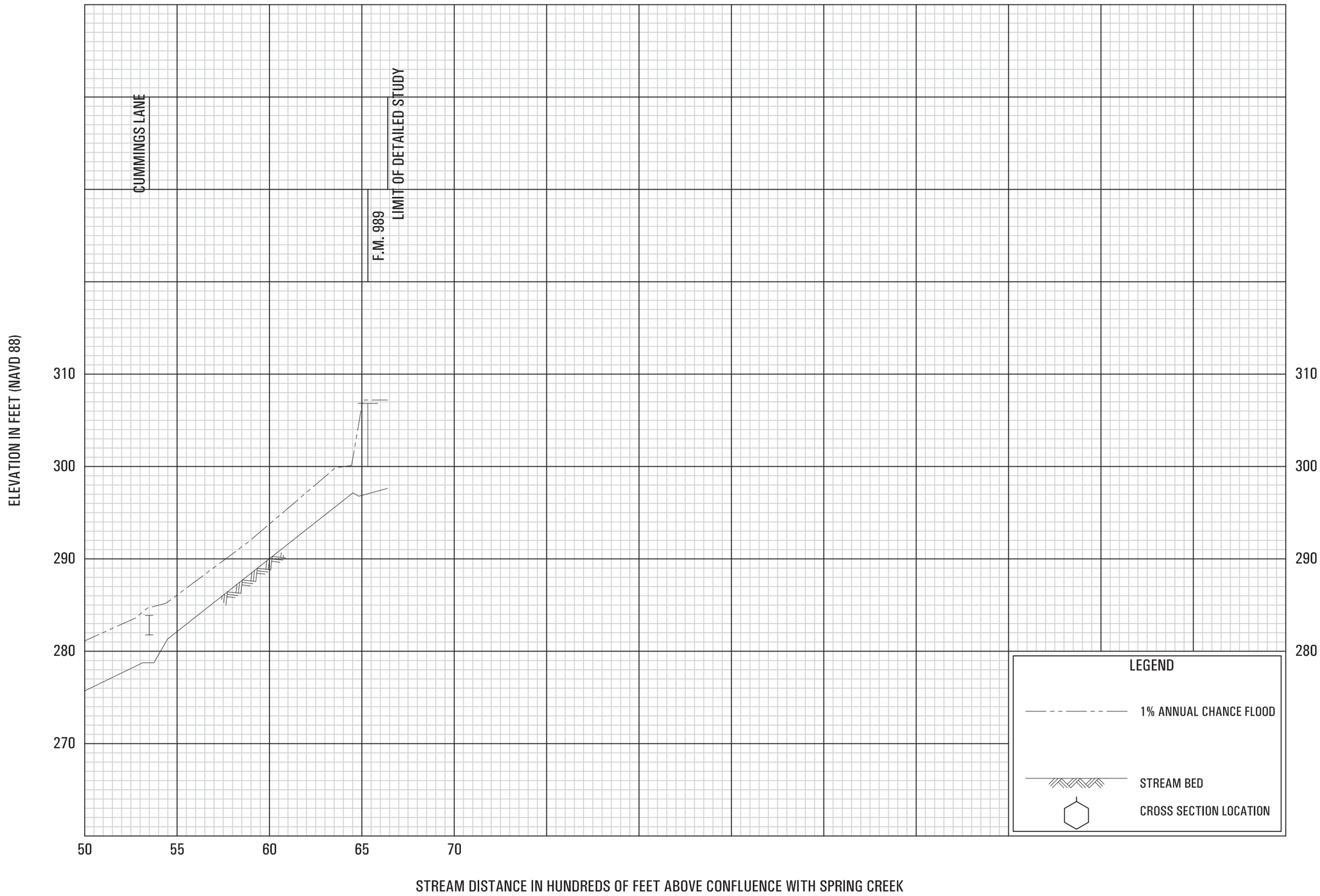
FLOOD PROFILES

STREAM SC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



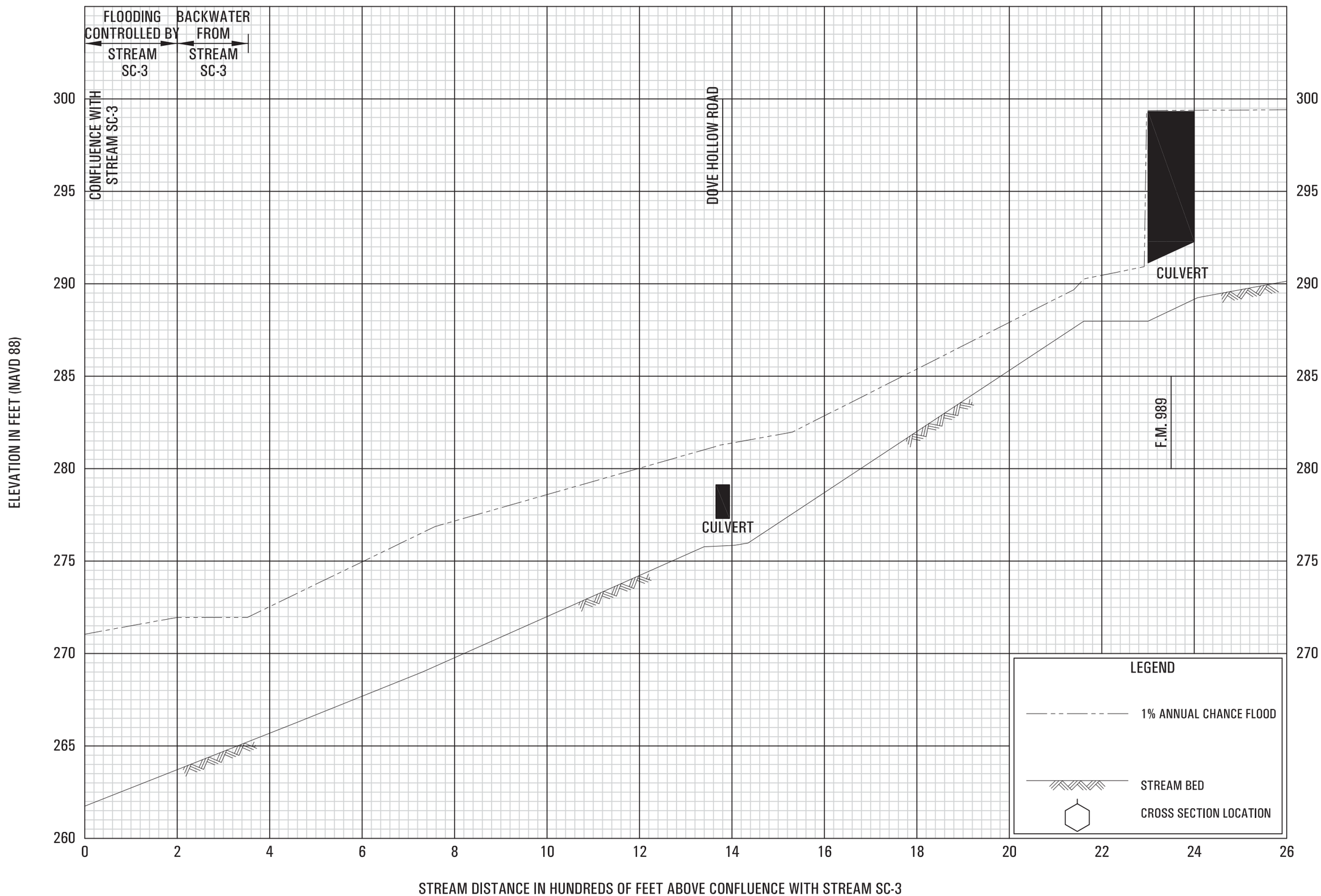
FLOOD PROFILES

STREAM SC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



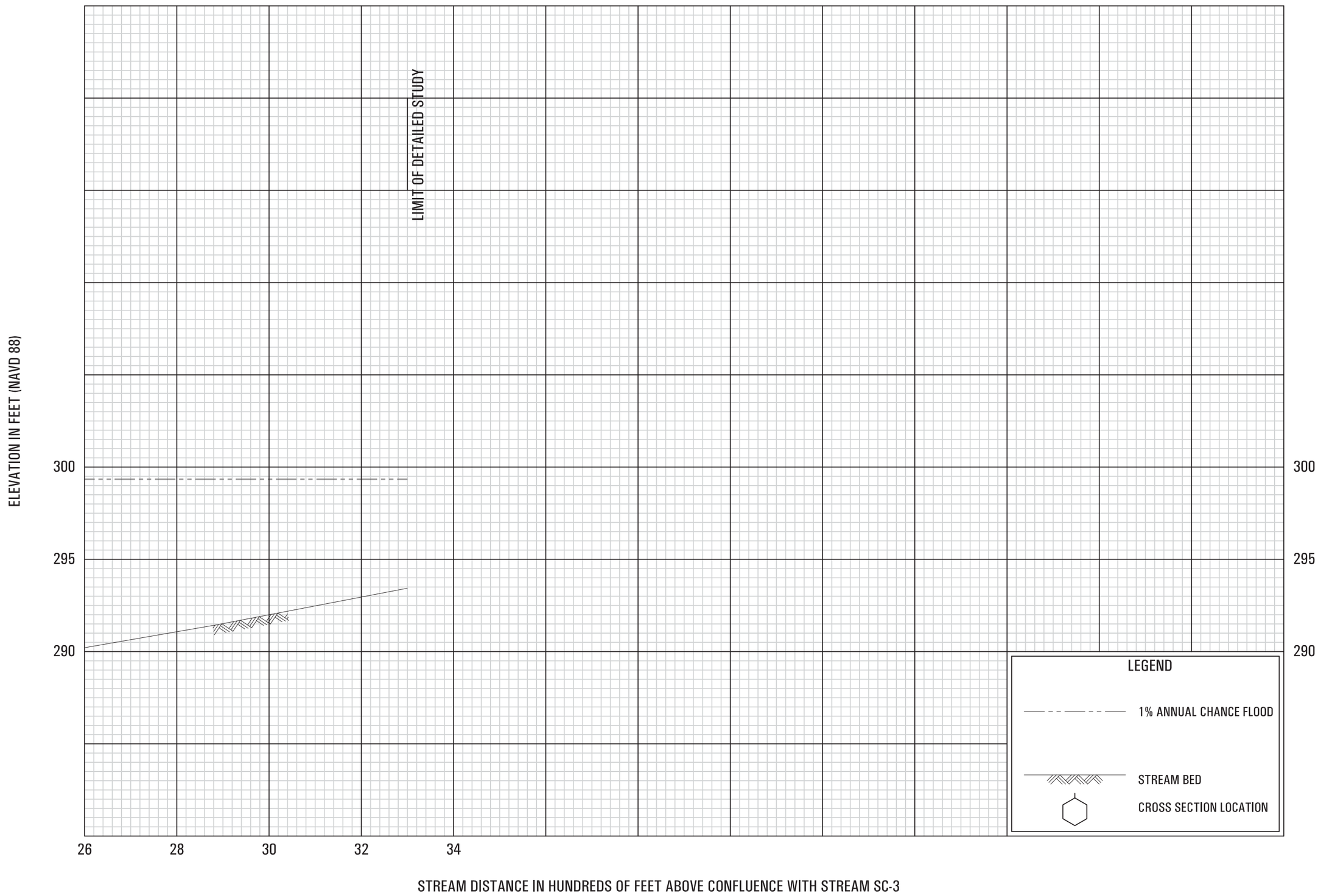
FLOOD PROFILES

STREAM SC-3A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



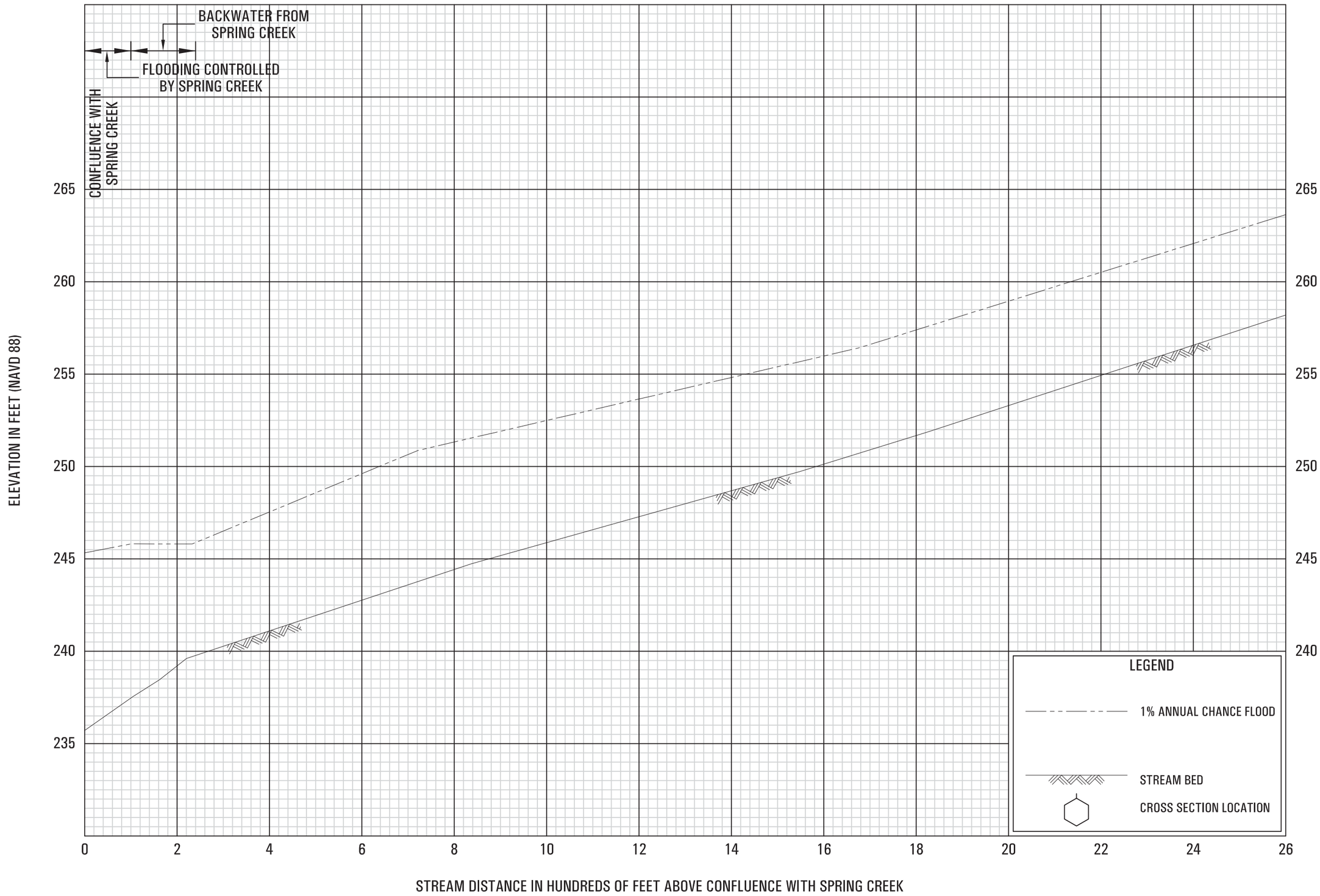
FLOOD PROFILES

STREAM SC-3A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



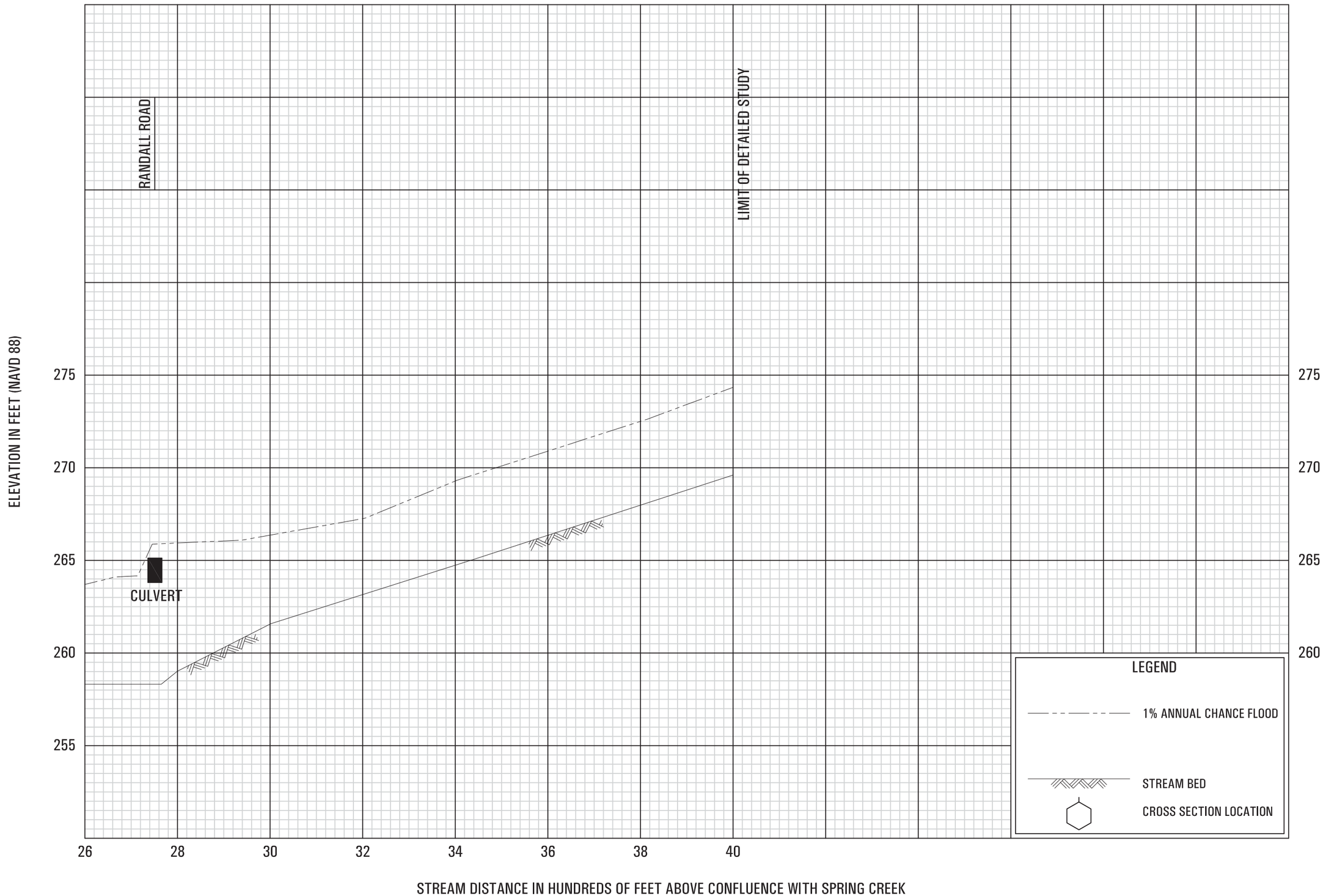
FLOOD PROFILES

STREAM SC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



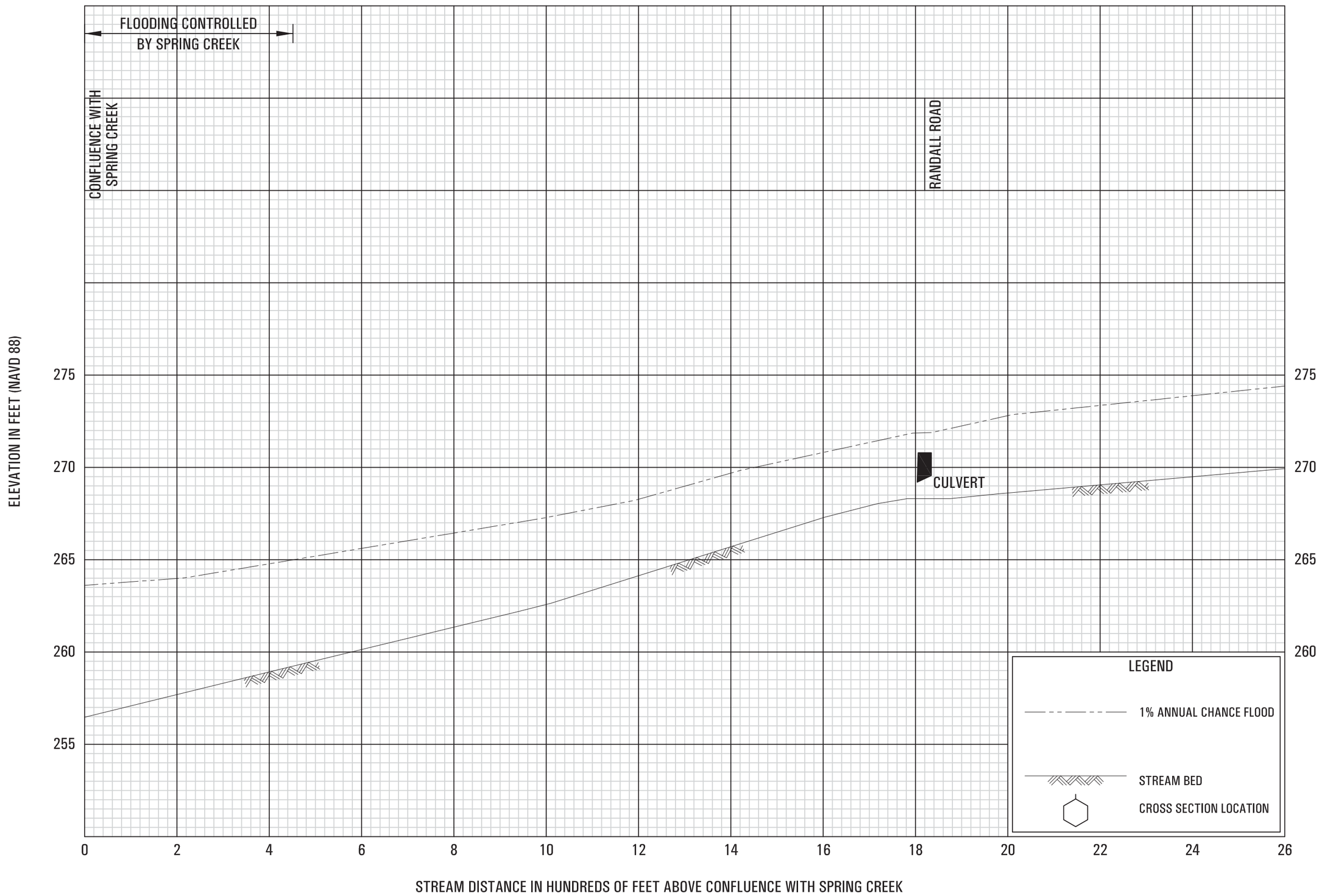
FLOOD PROFILES

STREAM SC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



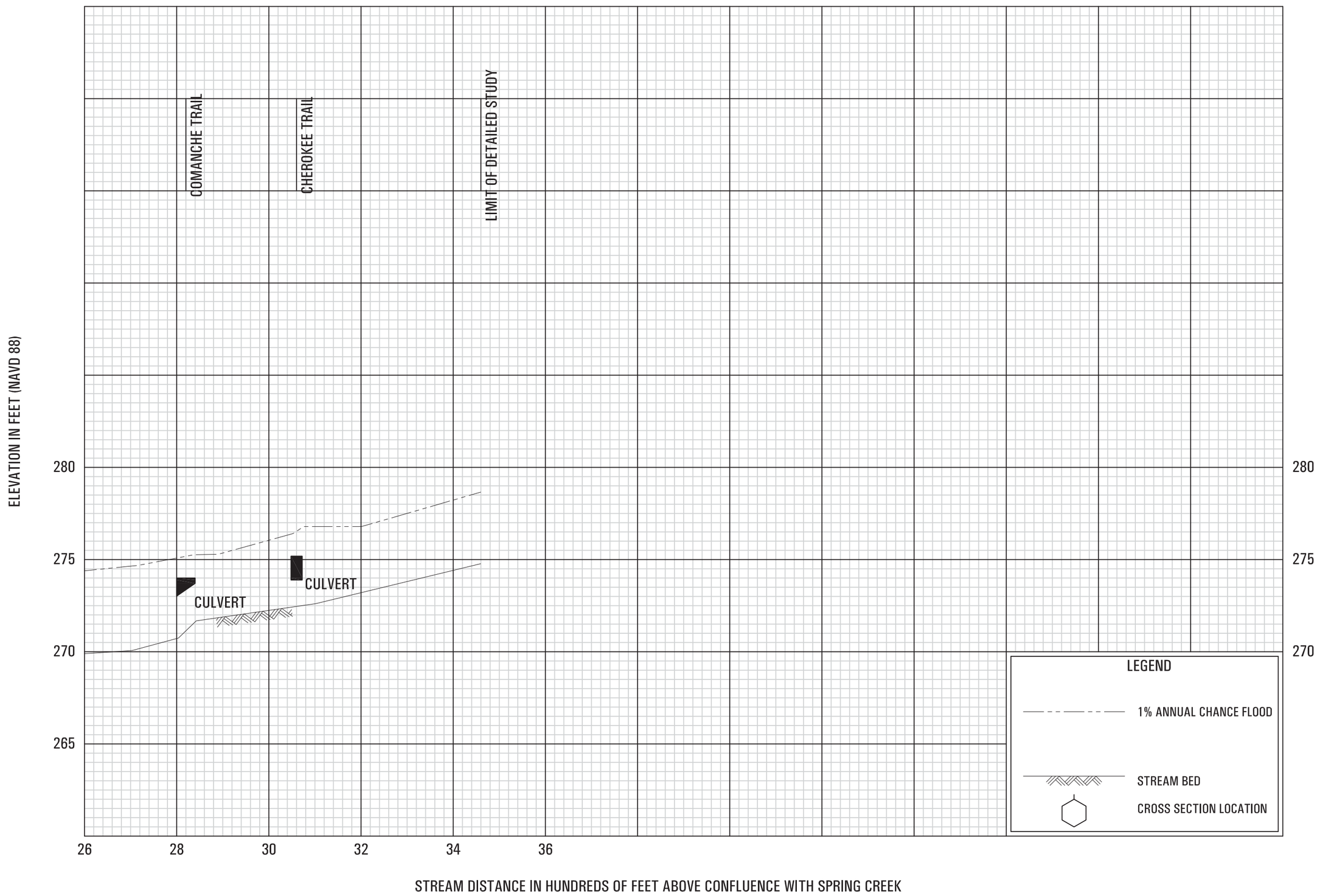
FLOOD PROFILES

STREAM SC-5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



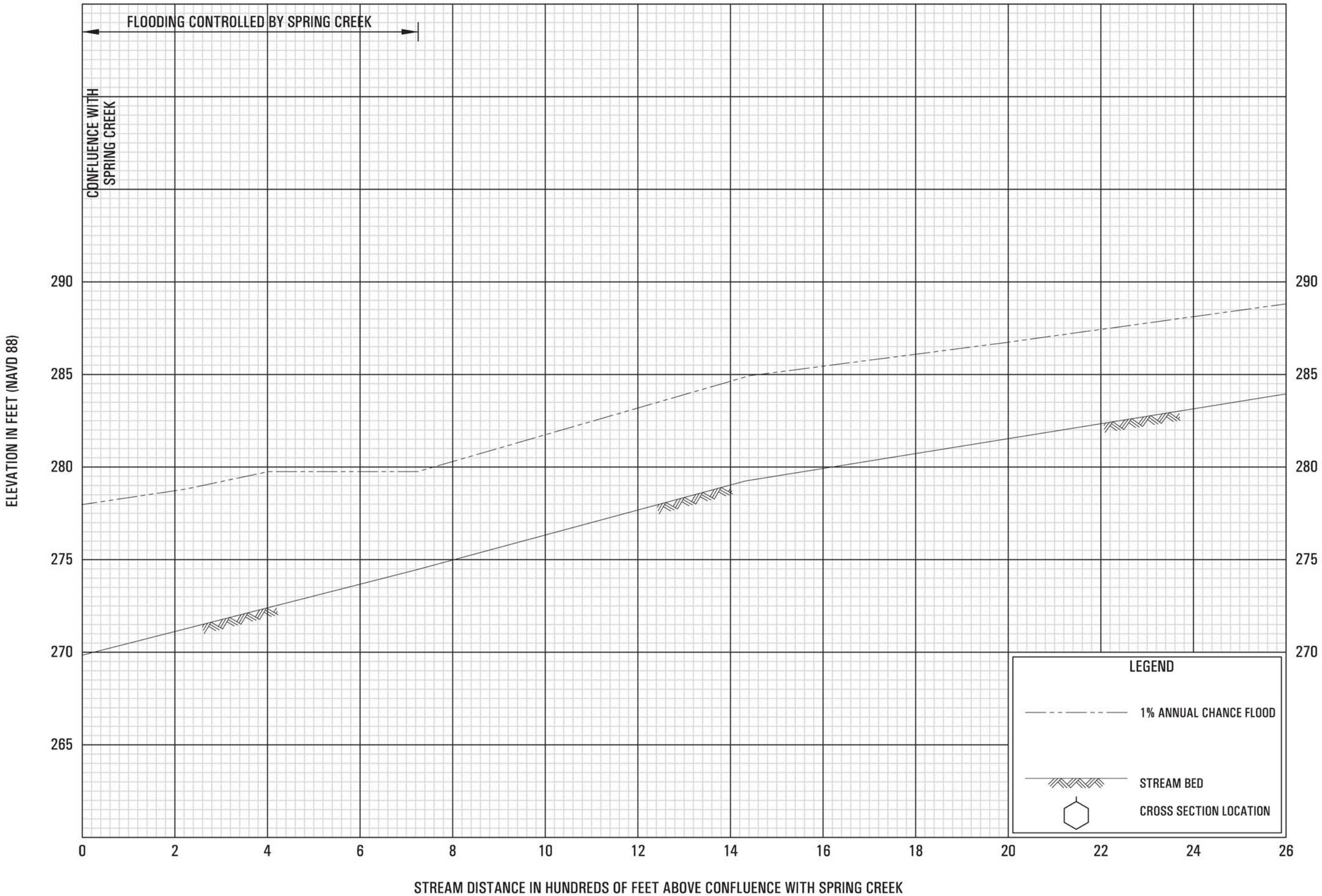
FLOOD PROFILES

STREAM SC-5

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

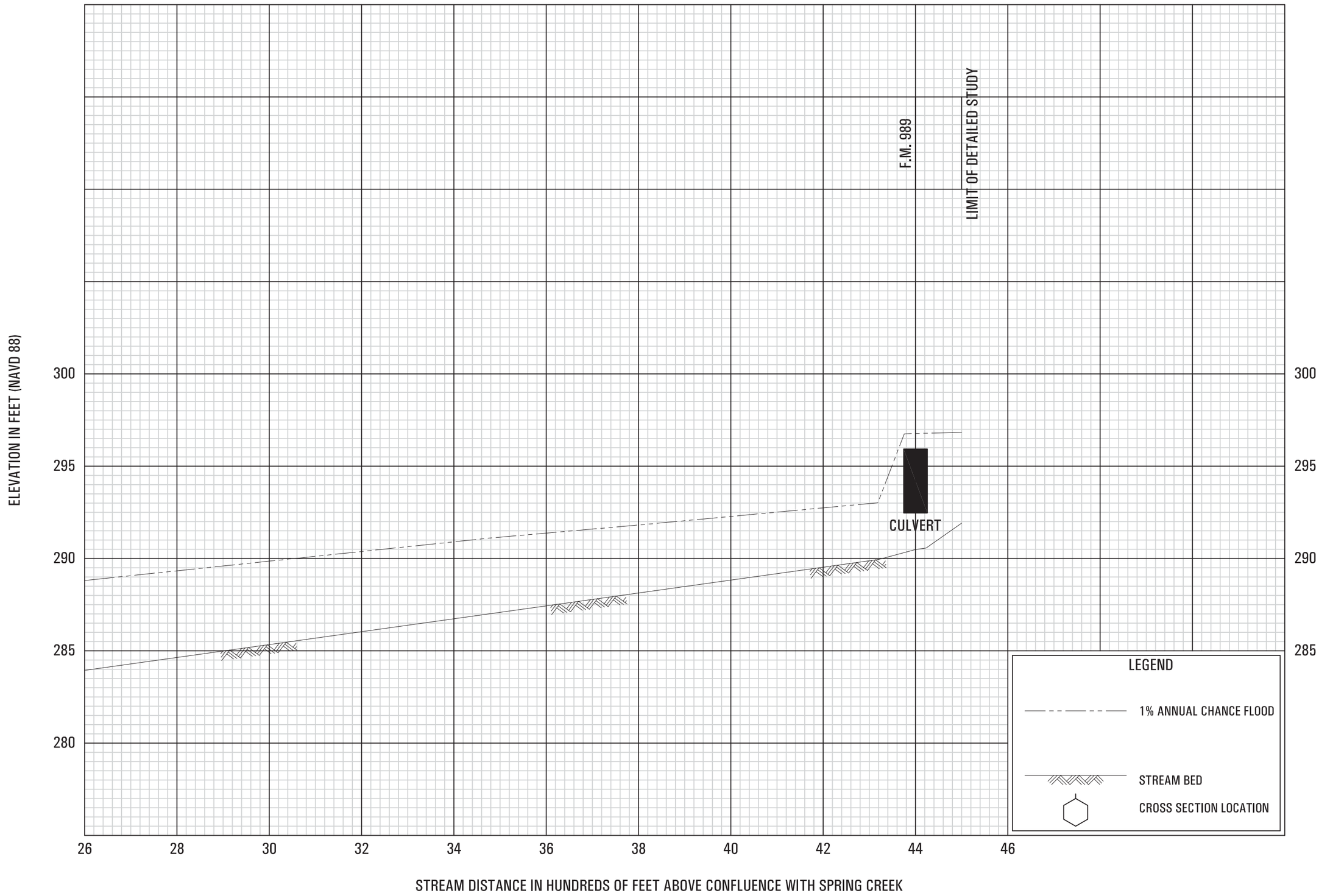
STREAM SC-6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

82P



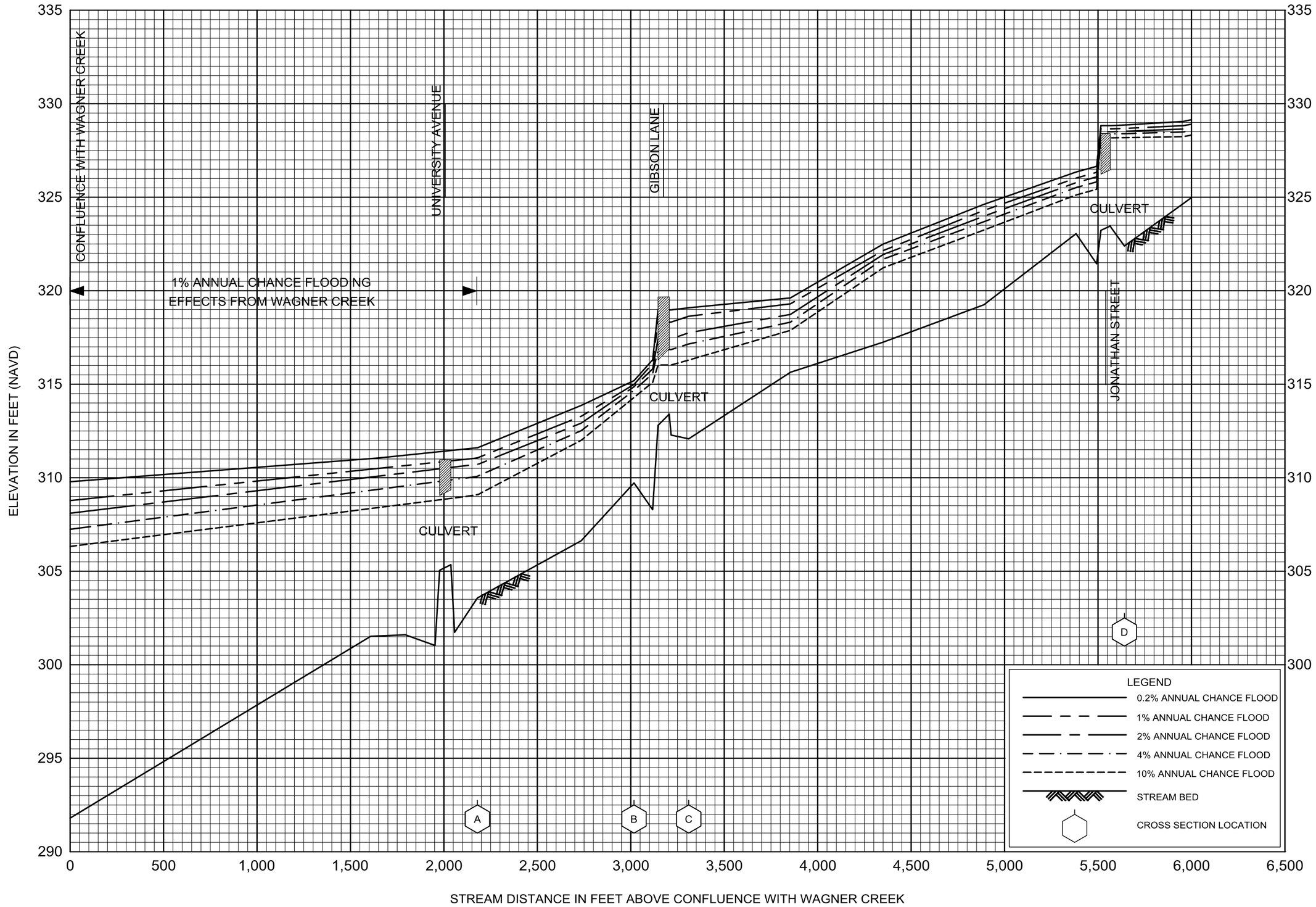
FLOOD PROFILES

STREAM SC-6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



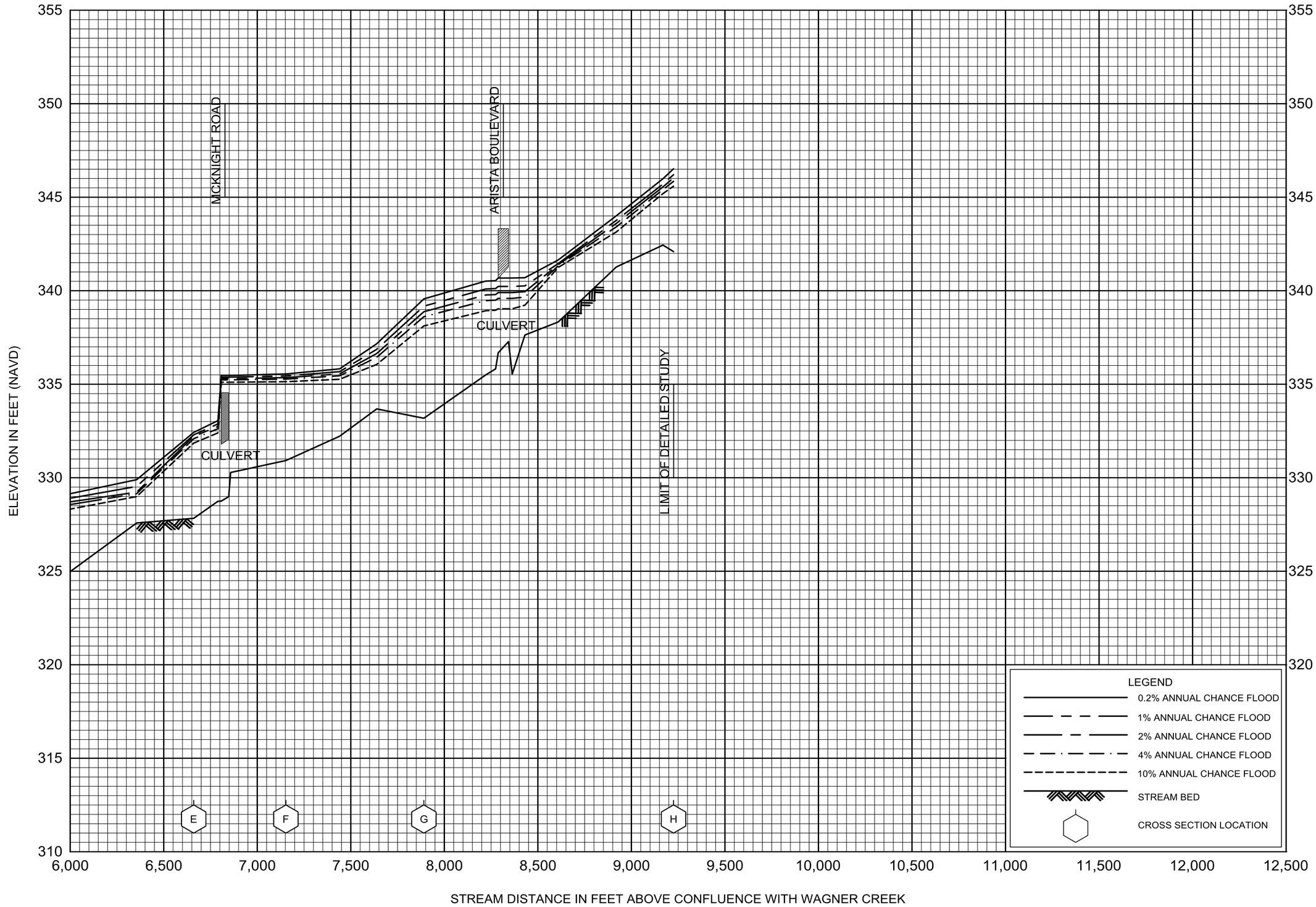
FLOOD PROFILES

STREAM WC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



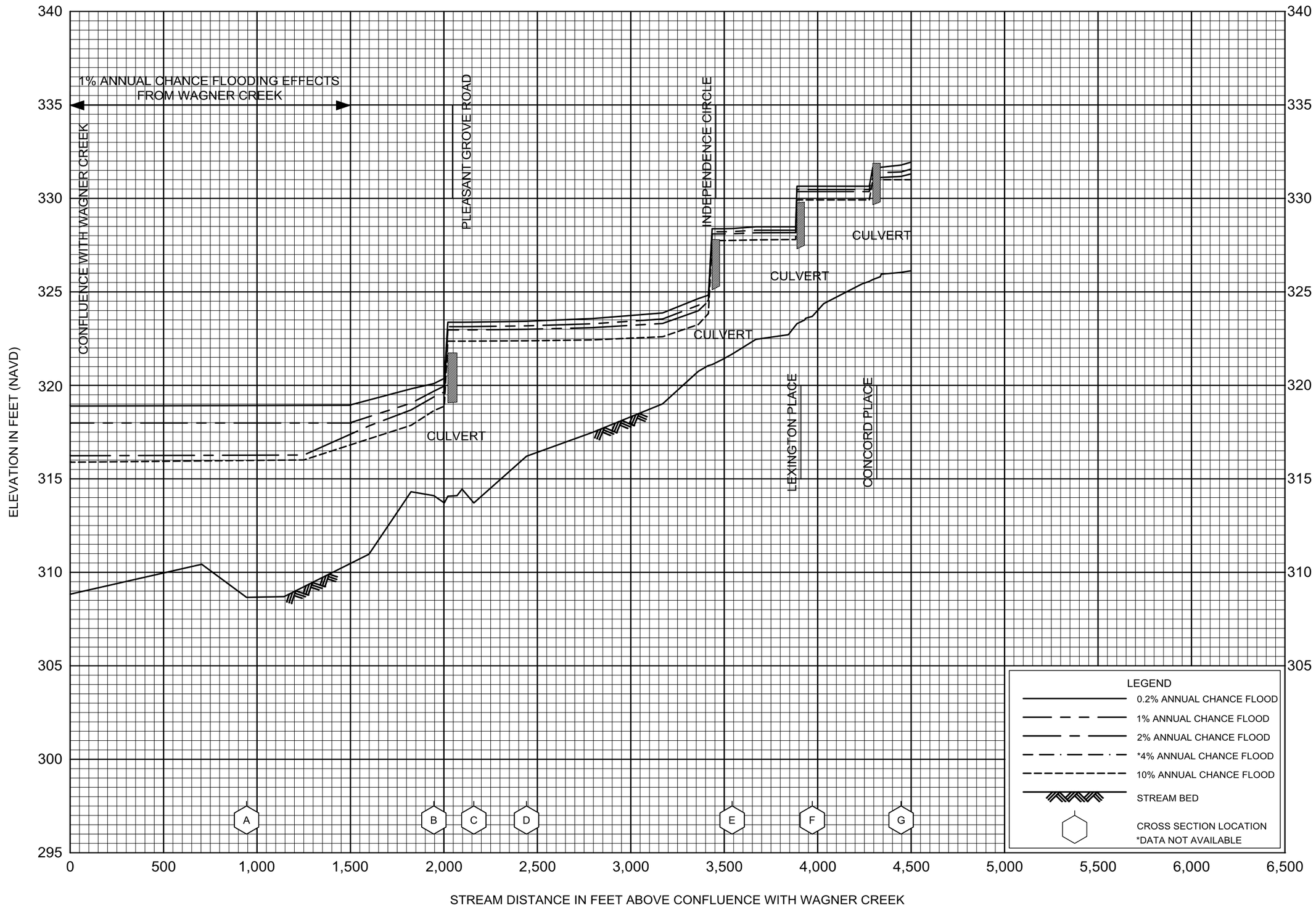
FLOOD PROFILES

STREAM WC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



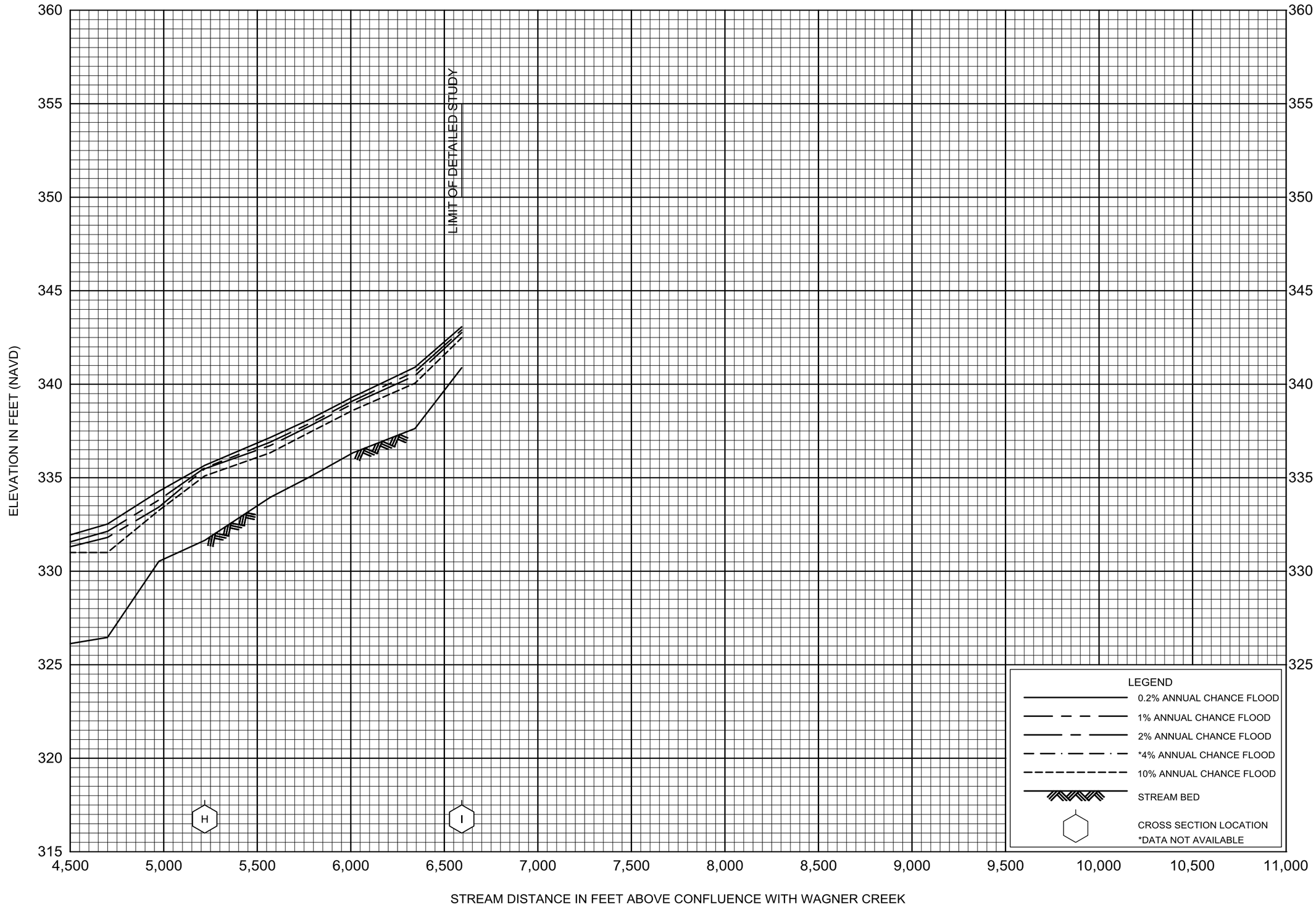
FLOOD PROFILES

STREAM WC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



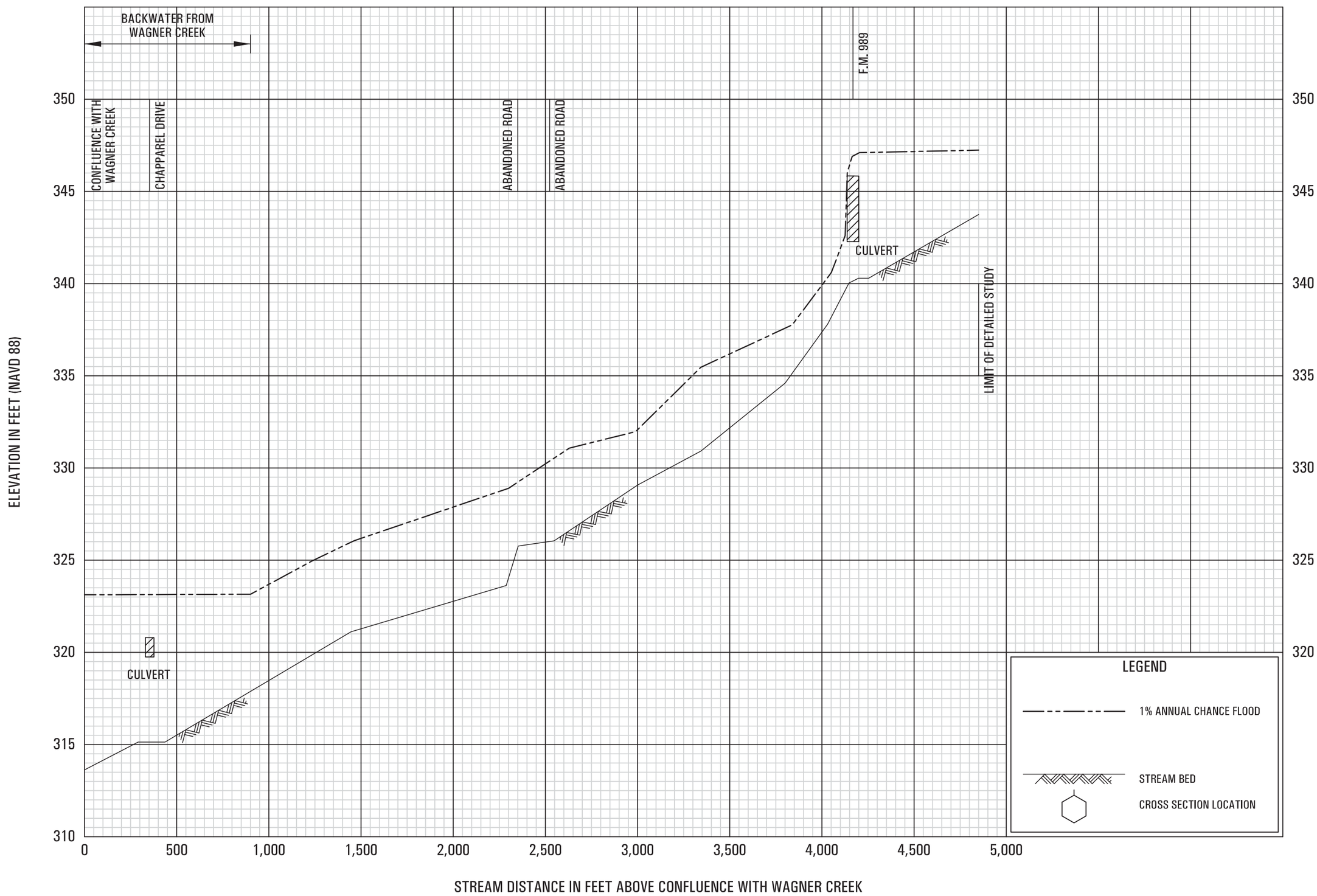
FLOOD PROFILES

STREAM WC-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

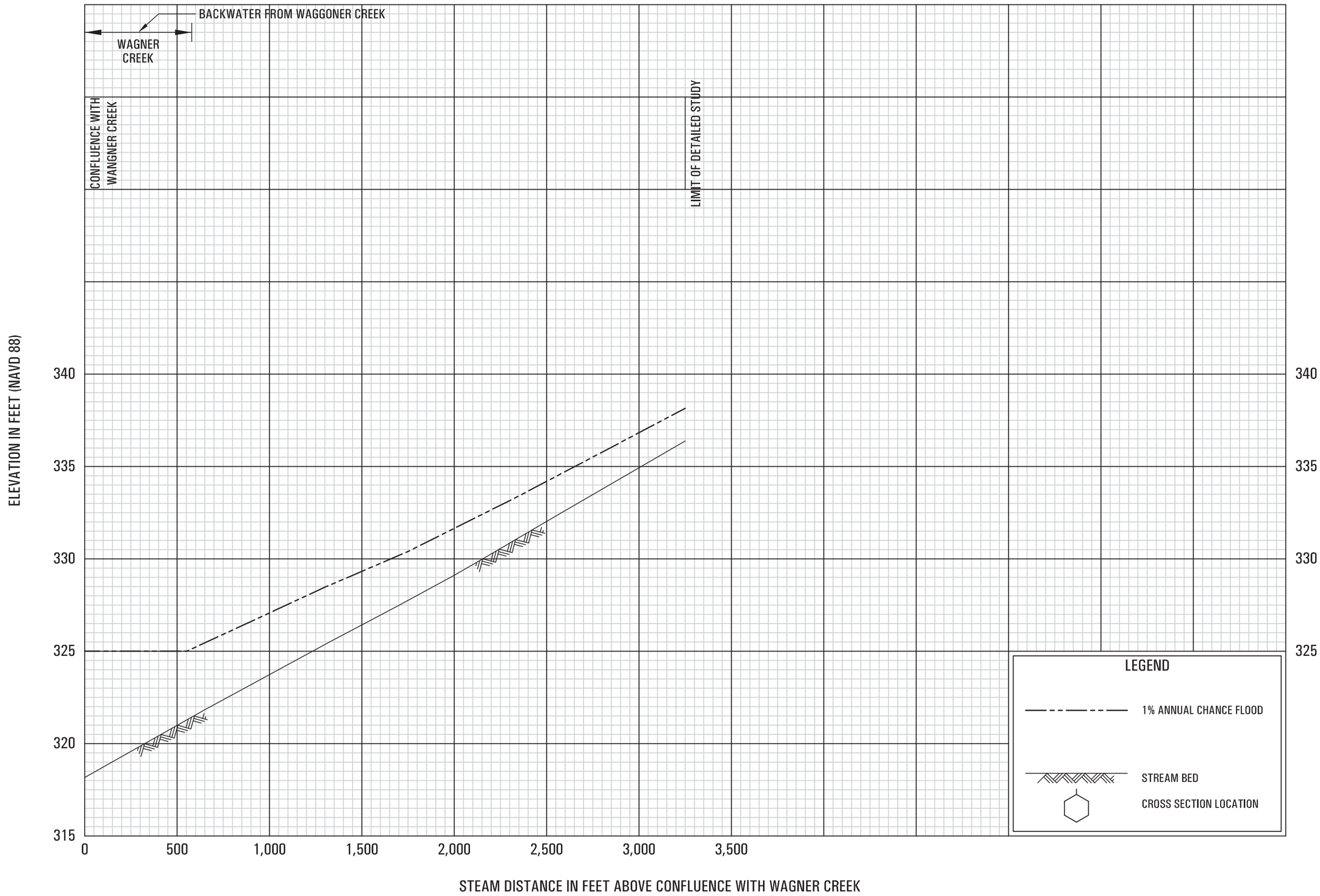
STREAM WC-3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

88P



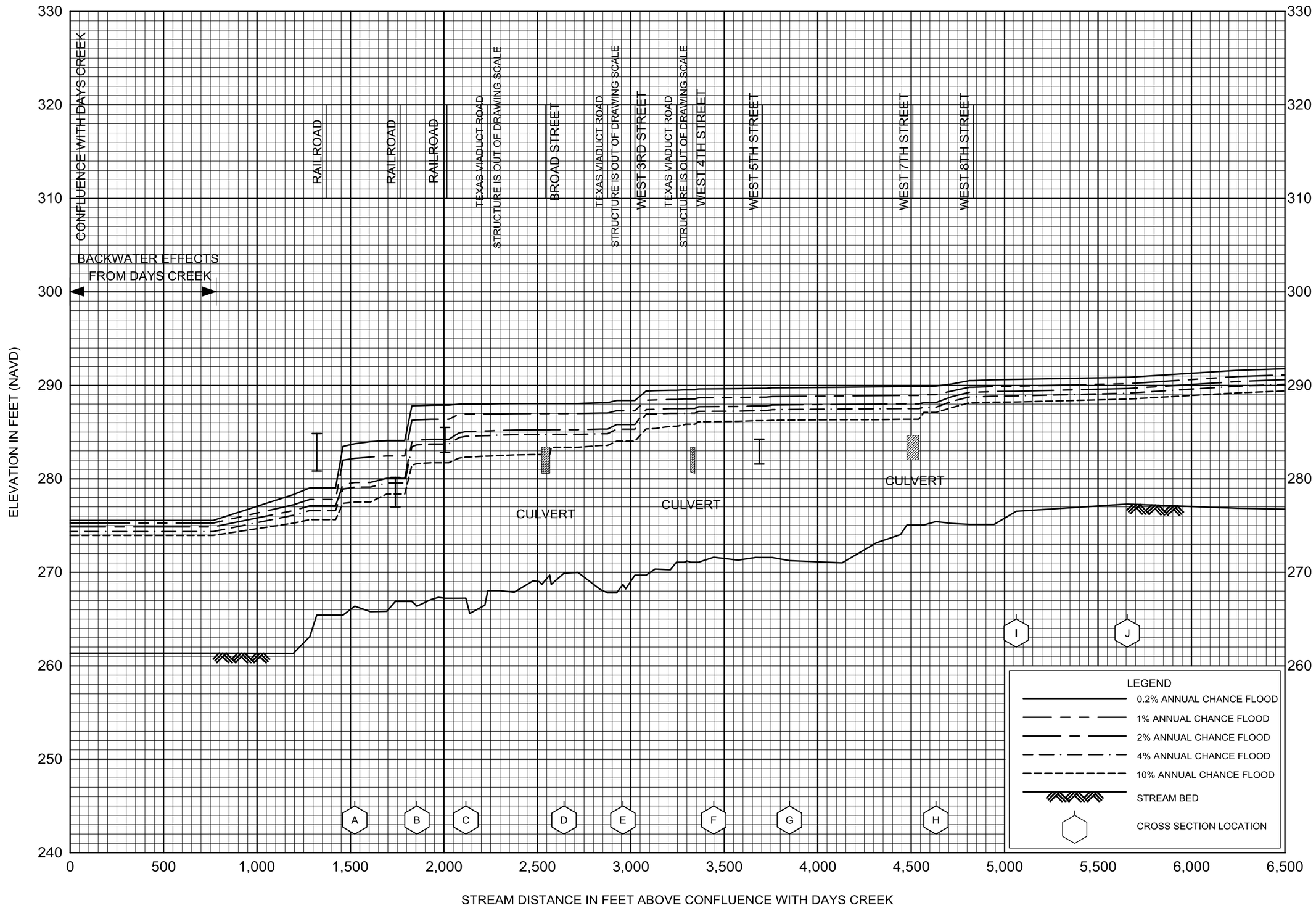
FLOOD PROFILES

STREAM WC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



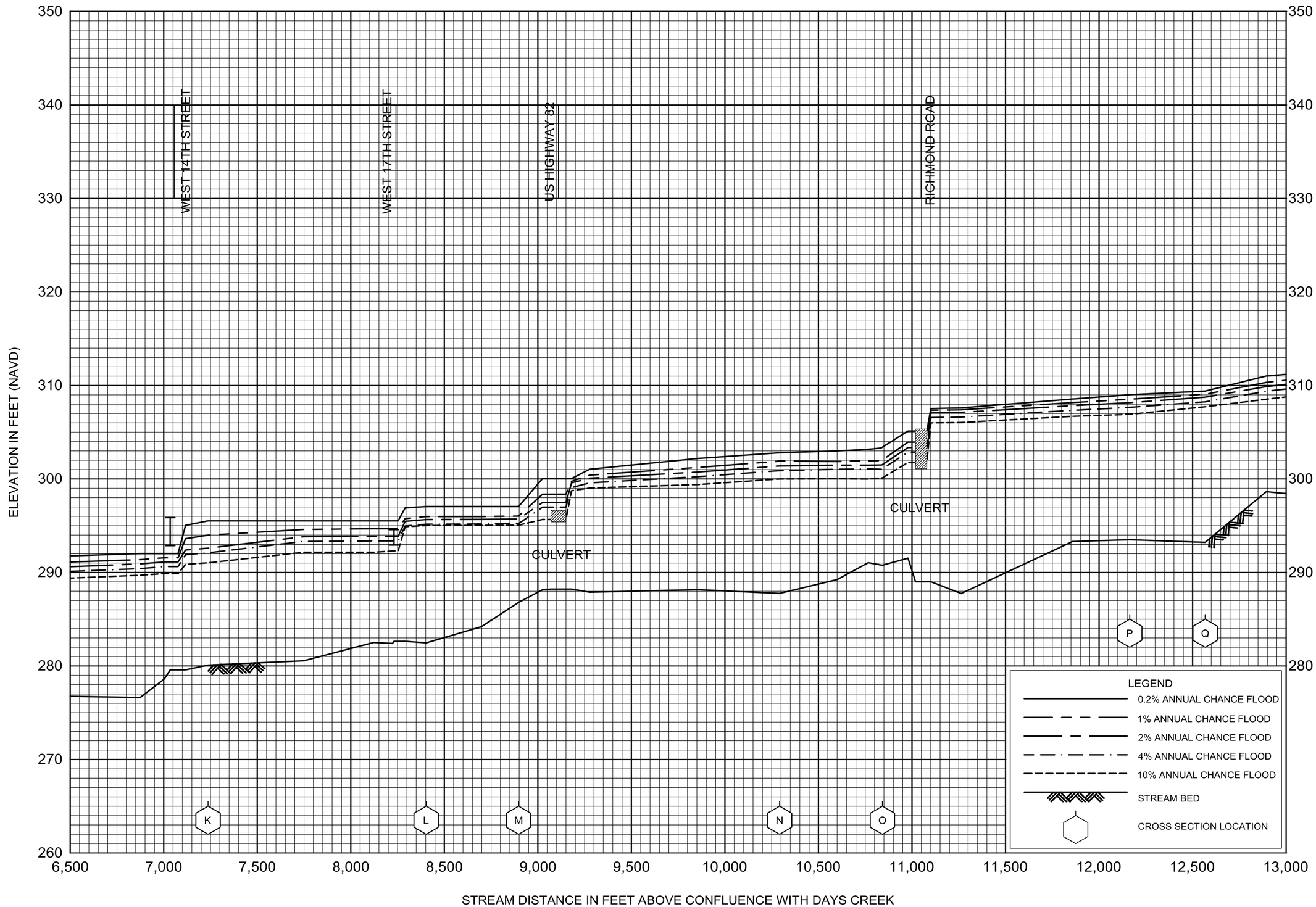
FLOOD PROFILES

SWAMPOODLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



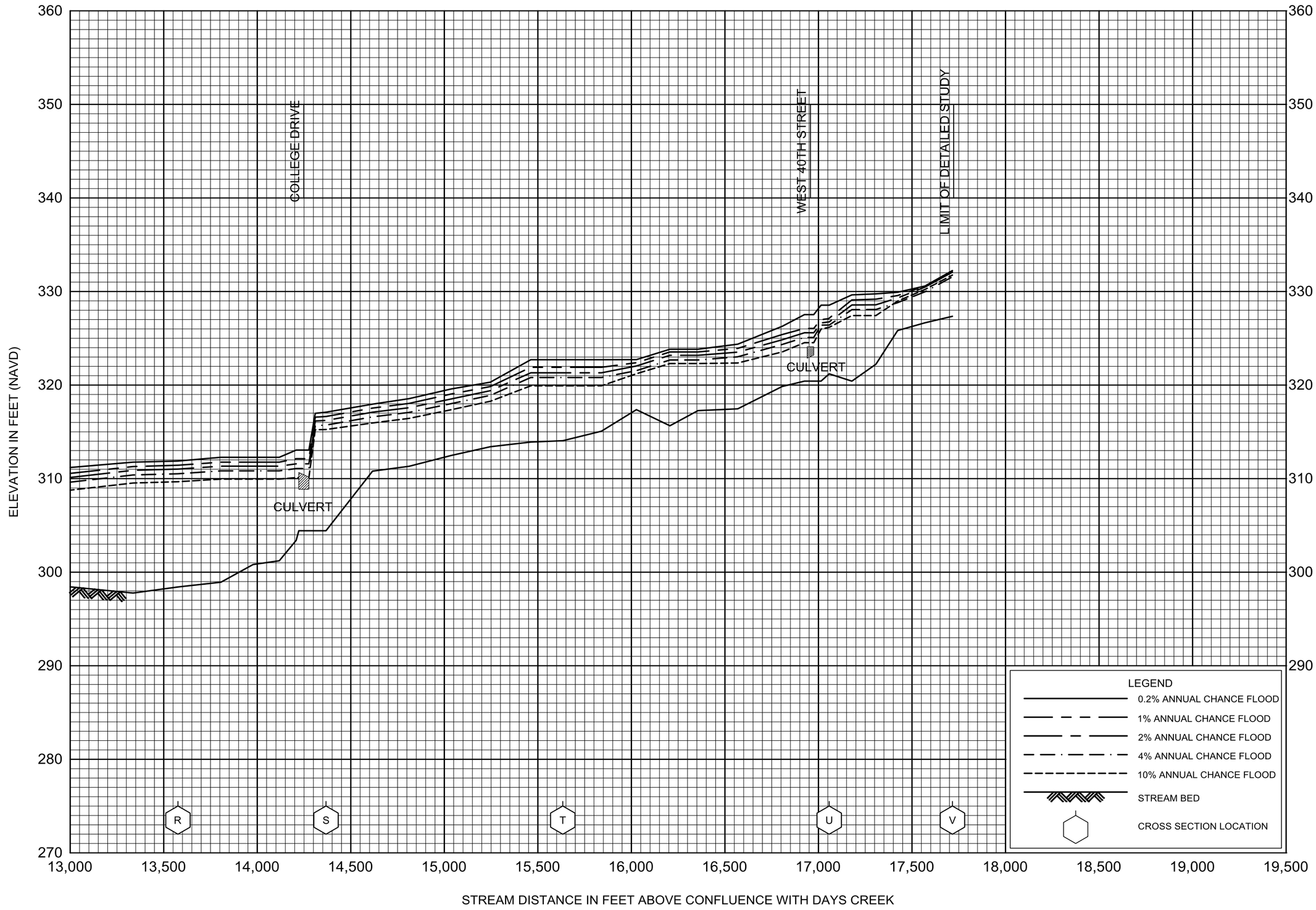
FLOOD PROFILES

SWAMPOODLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



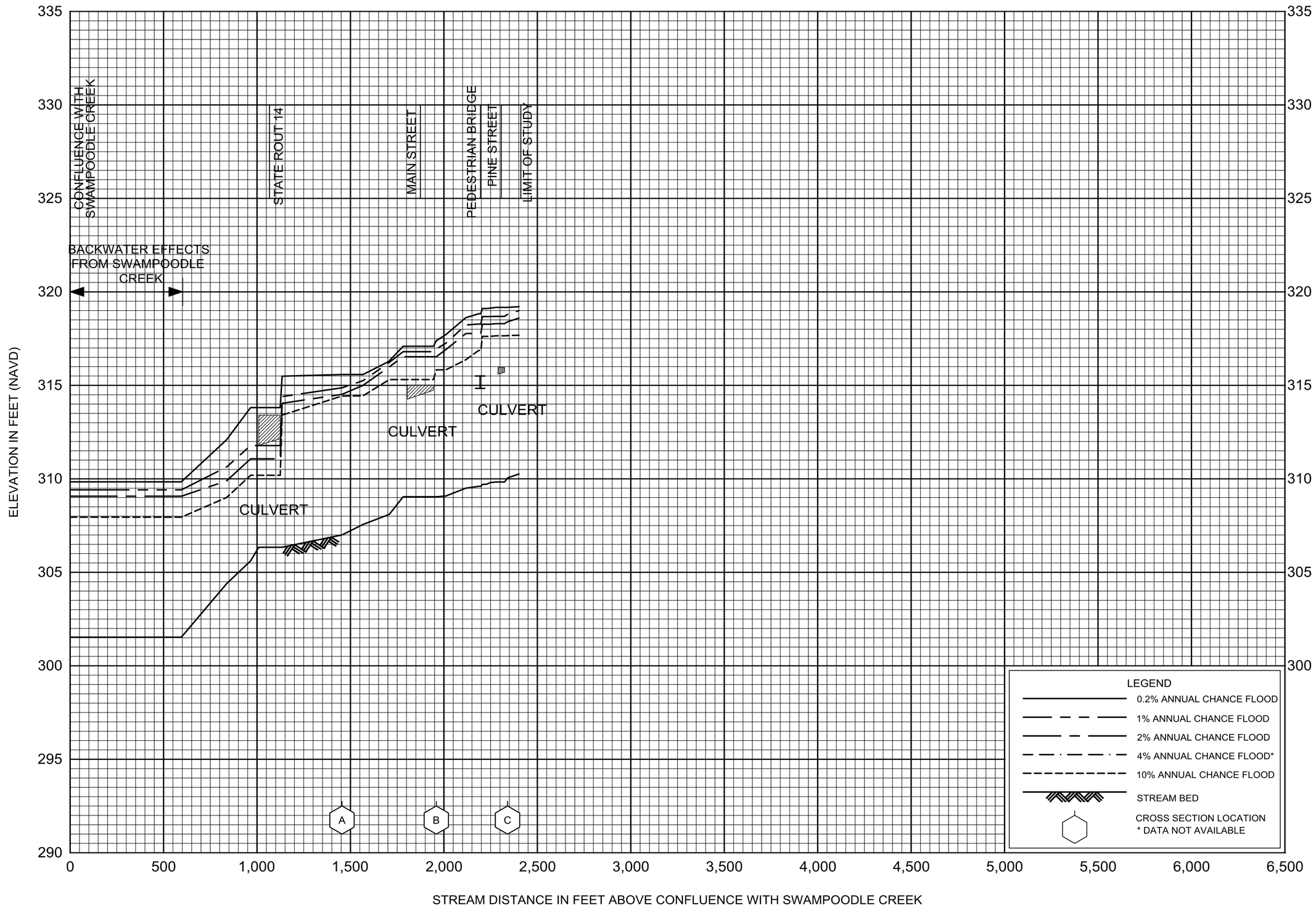
FLOOD PROFILES

SWAMPOODLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



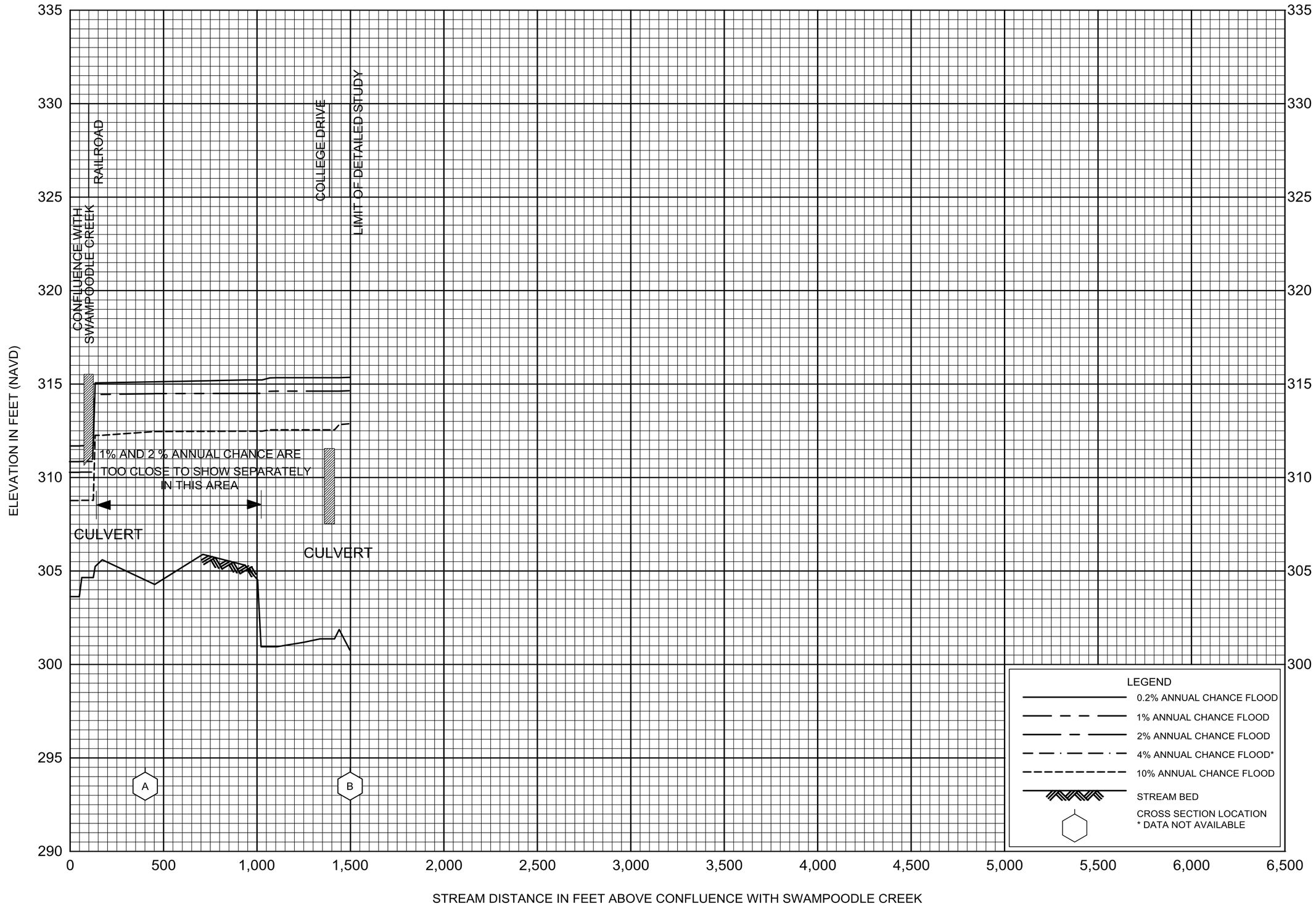
FLOOD PROFILES

SWAMPOODLE CREEK EAST TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



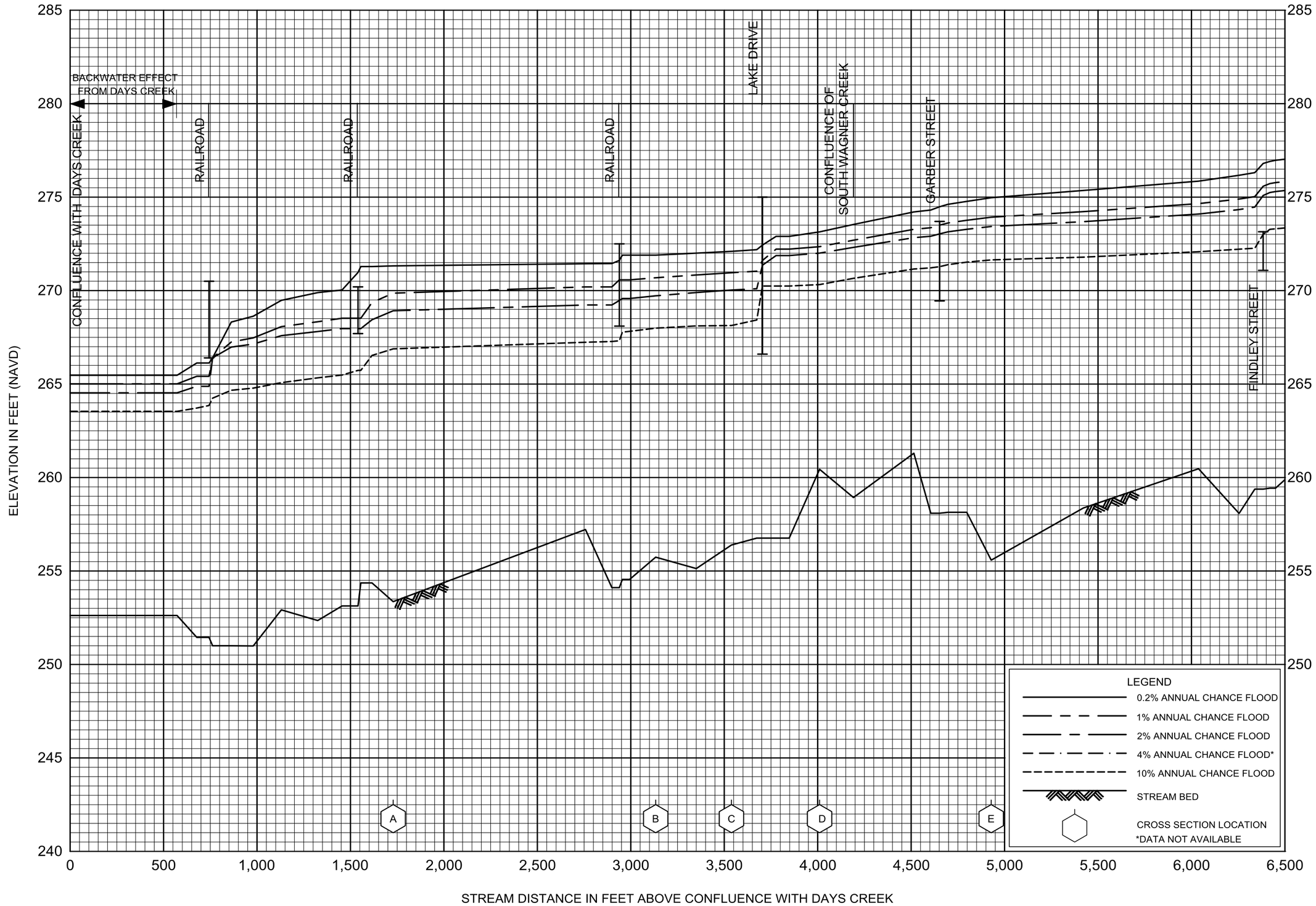
FLOOD PROFILES

SWAMPOODLE CREEK WEST CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



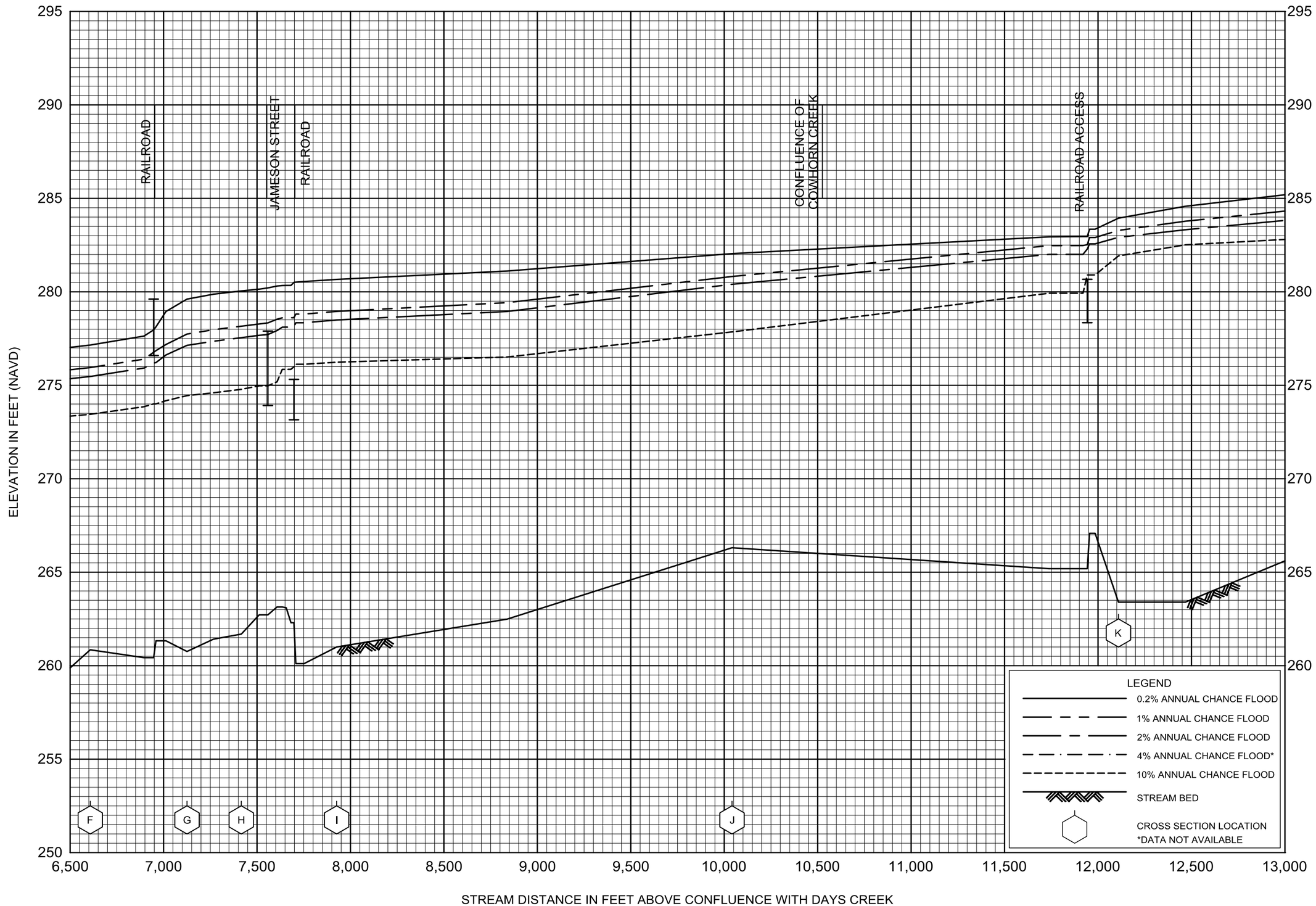
FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



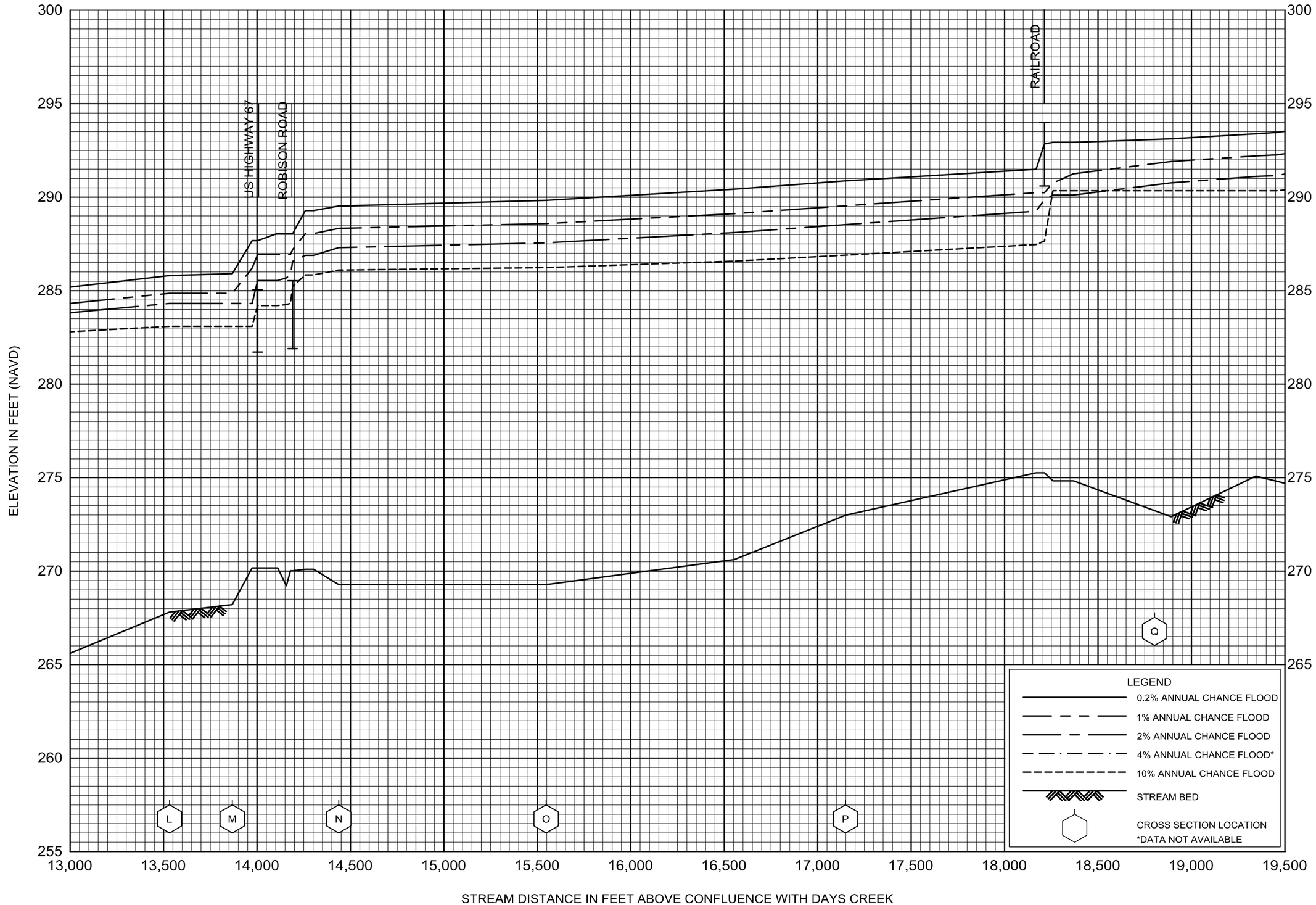
FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



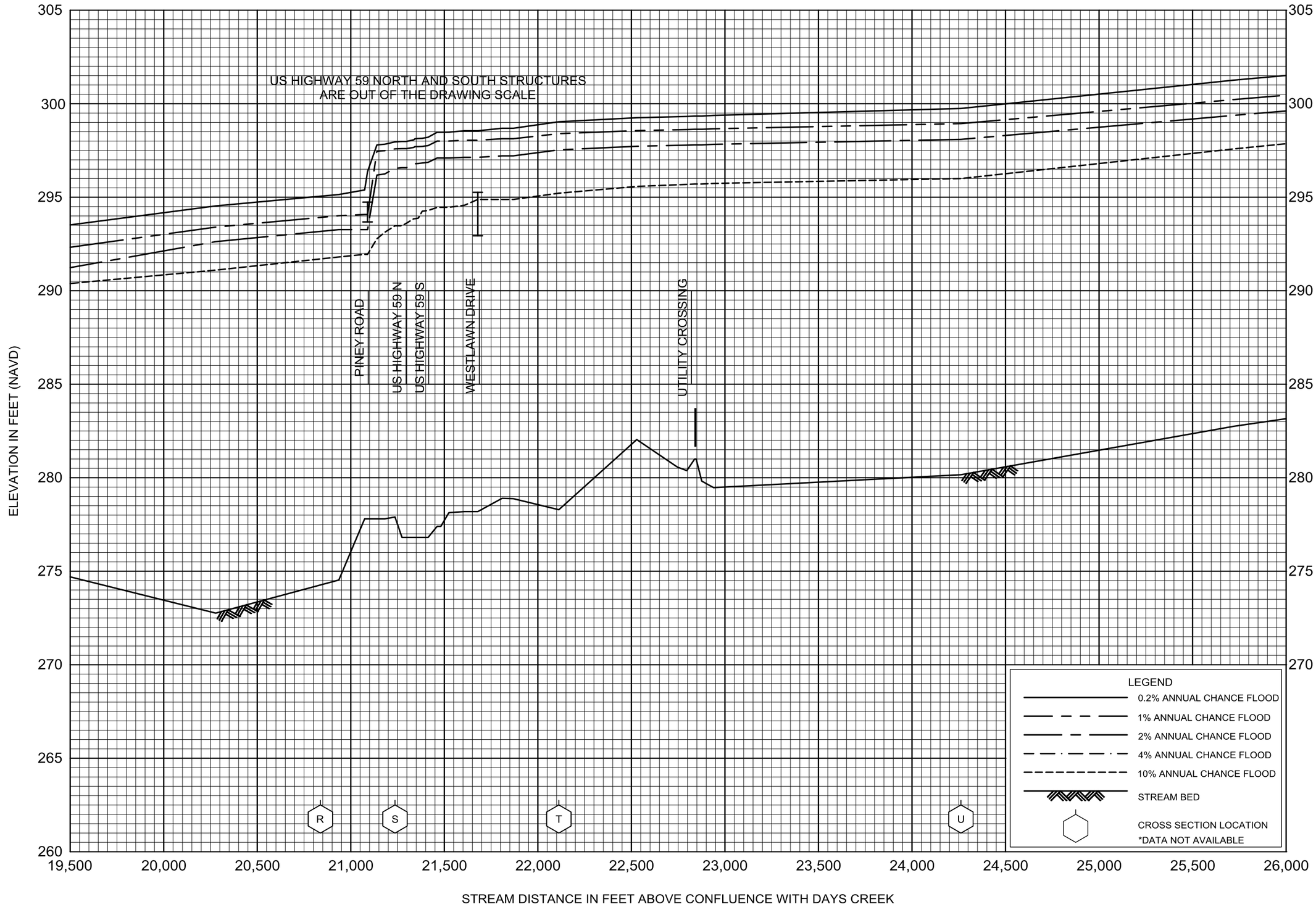
FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



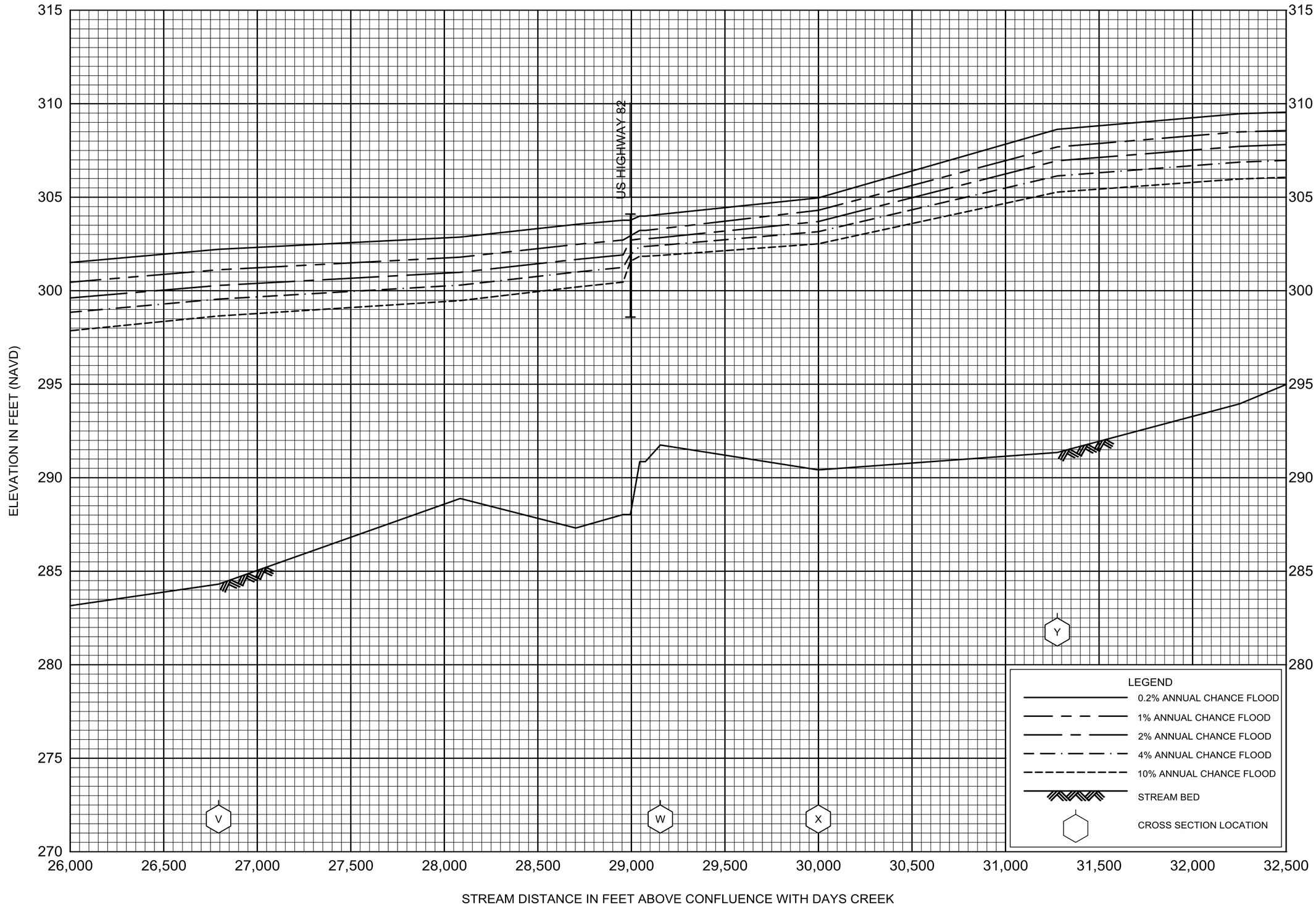
FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



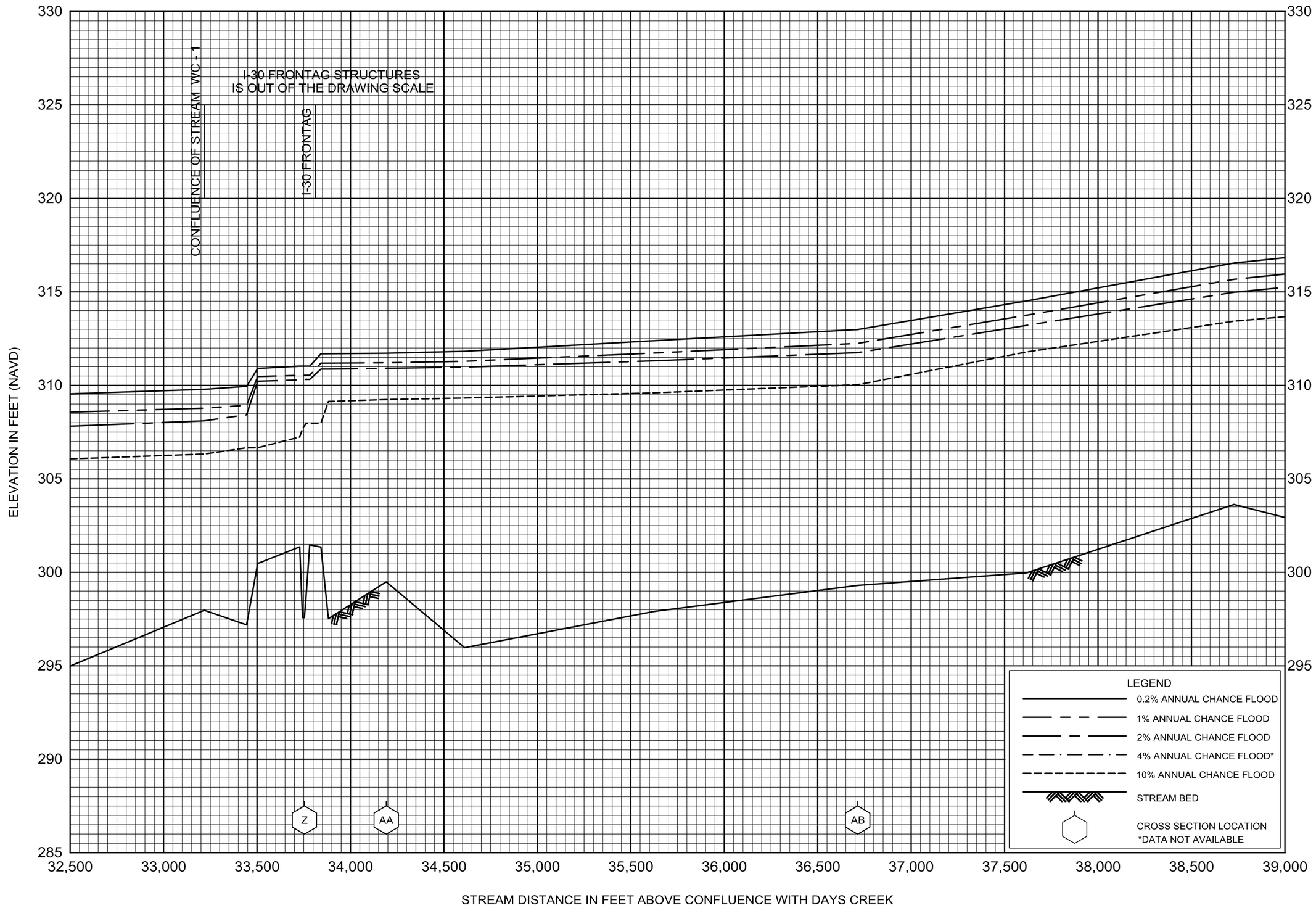
FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



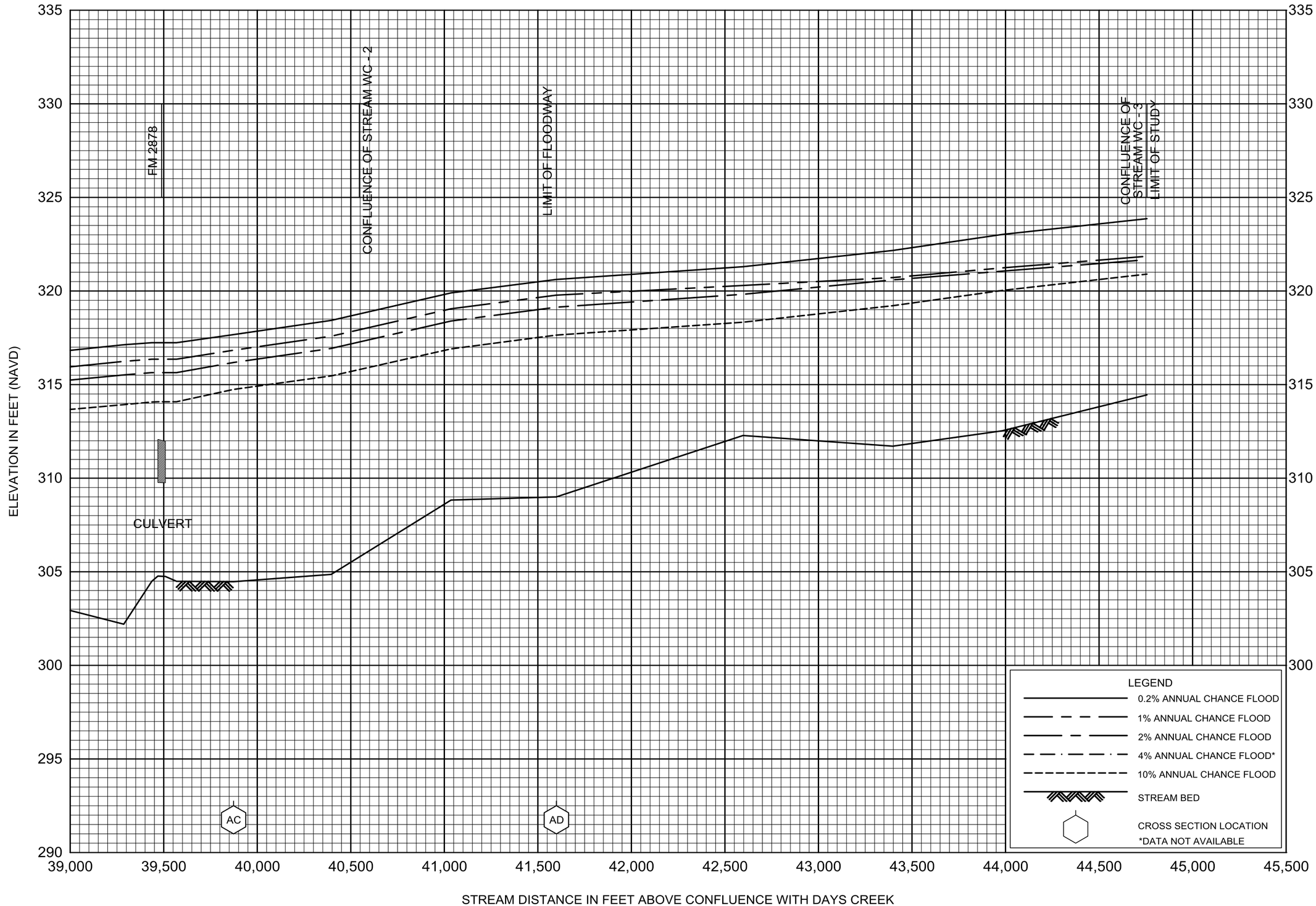
FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

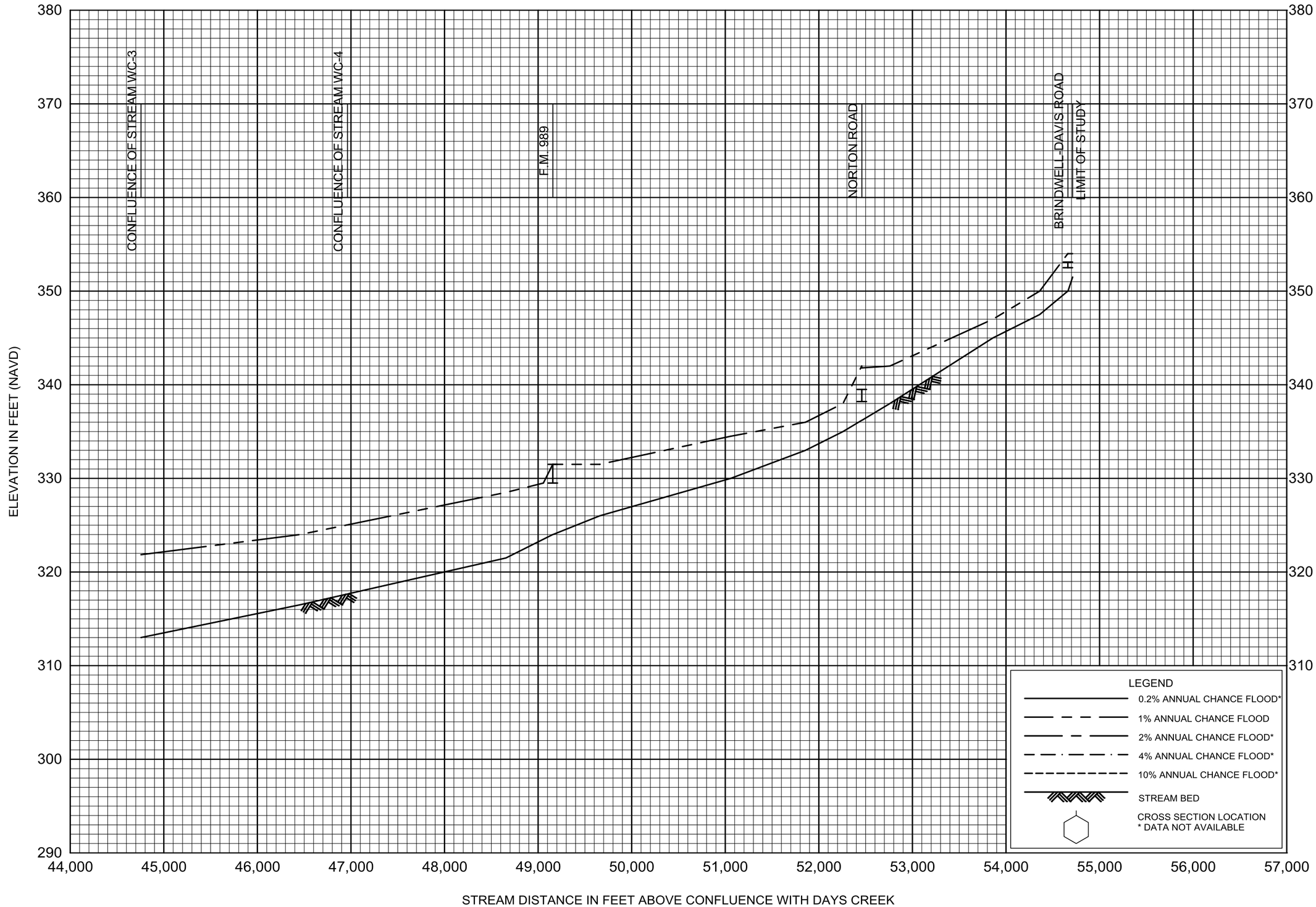
WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

101P



FLOOD PROFILES

WAGNER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOWIE COUNTY, TX

AND INCORPORATED AREAS

102P

FIGURE 2: FIRM Notes to Users

NOTES TO USERS

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

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

For community and countywide map dates, refer to Table 6 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.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

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

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

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

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

PROJECTION INFORMATION: The projection used in the preparation of the map was Texas State Plane, North Central zone (FIPSZONE 4202). The horizontal datum was 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/ or contact the National Geodetic Survey at the following address:

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

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 7 of this FIS Report.

BASE MAP INFORMATION: The following panels used base map information provided by the United States Department of Agriculture (USDA) Aerial Photography Field Office; source scale 1:12,000; dated 2014: 225, 350, 355, 360, 365, 370.

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

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

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Bowie 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 6 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 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 [date TBD].

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.

FIRM panels 225, 350, 355, 360, 365, and 370 contain an abbreviated legend for the features shown on the maps. However, these FIRM panels do 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 Bowie County.

Figure 3: Map Legend for FIRM

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

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

	Non-encroachment zone (see Section 2.4 of this FIS Report for more information)
FLOOD INSURANCE IS NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER APRIL 8, 1987, IN THE DESIGNATED COLORADO RIVER FLOODWAY	**The Colorado River Floodway was established by Congress in the Colorado River Floodway Protection Act of 1986, Public Law 99-450 (100 Statute 1129). The Act imposes certain restrictions within the Floodway.**
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. **See Notes to Users for important information.**
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.
NO	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
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.* ***See Notes to Users for important information.***	
CBRS AREA **09/30/2009**	Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.
OTHERWISE PROTECTED AREA **09/30/2009**	Otherwise Protected Area
REFERENCE MARKERS	
22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	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
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

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 http://www.fema.gov.

Below is a list of the locations where FIRMs for Bowie 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 7 – MAP REPOSITORIES

Community	Address	City	State	Zip Code
BOWIE COUNTY, UNINCORPORATED AREAS	Courthouse, 710 James Bowie Drive	New Boston	Texas	75570
CITY OF DE KALB	City Hall, 110 South East Front Street	De Kalb	Texas	75559
CITY OF HOOKS	City Hall, 601 East Avenue A	Hooks	Texas	75561
CITY OF LEARY	Leary City Hall 9534 West New Boston Road	Hooks	Texas	75561
CITY OF MAUD	City Hall, 135 Main Street	Maud	Texas	75567
CITY OF NASH	City Hall, 119 Elm Street	Nash	Texas	75569
CITY OF NEW BOSTON	City Hall, 301 East-North Front Street	New Boston	Texas	75570
CITY OF RED LICK	3193 Old Red Lick Road	Red Lick	Texas	75503
CITY OF REDWATER	City Hall, 120 Red Water Boulevard West	Redwater	Texas	75573
CITY OF TEXARKANA	Public Works Department, 919 Elm Street	Texarkana	Texas	75504
CITY OF WAKE VILLAGE	City Hall, 624 Burma Road	Wake Village	Texas	75501

TABLE 8 – LISTING OF NFIP JURISDICTIONS

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
BOWIE COUNTY, UNINCORPORATED AREAS	481194	11140106 11140201 11140302	48037C0025D 48037C0050D 48037C0075D 48037C0100D 48037C0125D 48037C0150D 48037C0175D 48037C0200D 48037C0225E 48037C0250D 48037C0275D 48037C0285D 48037C0295D 48037C0300D 48037C0305D	

TABLE 8 – LISTING OF NFIP JURISDICTIONS (continued)

			48037C0310D 48037C0325D 48037C0345D 48037C0350E 48037C0355E 48037C0360E 48037C0365E 48037C0370E 48037C0400D 48037C0425D 48037C0450D 48037C0475D 48037C0500D 48037C0525D 48037C0550D 48037C0575D 48037C0600D	
CITY OF DE KALB	480055	11140106 11140302	48037C0100D 48037C0125D 48037C0250D 48037C0275D	
CITY OF HOOKS	480056	11140106	48037C0305D 48037C0310D	
CITY OF LEARY	481142	11140106	48037C0350E	
CITY OF MAUD	480057	11140302	48037C0475D	
CITY OF NASH	480058	11140302	48037C0345D 48037C0350E 48037C0350E 48037C0355E 48037C0365E	
CITY OF NEW BOSTON	480059	11140106 11140302	48037C0285D 48037C0295D	
CITY OF RED LICK	480176	11140106 11140302	48037C0350E	
CITY OF REDWATER	480309	11140302	48037C0475D 48037C0500D	
CITY OF TEXARKANA	480060	11140201 11140302	48037C0225E 48037C0350E 48037C0355E 48037C0360E 48037C0365E 48037C0370E	
CITY OF WAKE VILLAGE	480061	11140302	48037C0345D 48037C0365E	