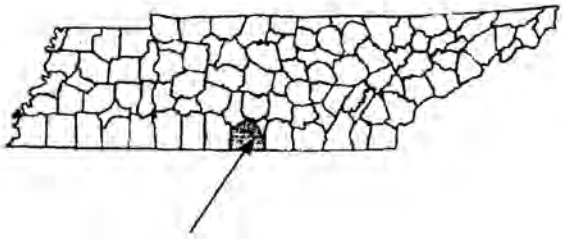
FLOOD INSURANCE STUDY

LINCOLN COUNTY, TENNESSEE
AND INCORPORATED AREAS



Lincoln County

Community Name	Community Number
ARDMORE, TOWN OF	470293
FAYETTVILLE, CITY OF	470105
LINCOLN COUNTY (UNINCORPORATED AREAS)	470104
PETERSBURG, CITY OF	470106

Revised:
November 18, 2016

Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
47103CV000B

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 (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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

The initial Countywide FIS was published with an Effective Date of December 20, 1999. The revised Countywide FIS Report was published on September 19, 2007. This FIS Report was revised on November 18, 2016. Users should refer to Section 10.0, Revisions Description, for further information. Section 10.0 is intended to present the most up-to-date information for the specific portions of this FIS report. Therefore, users of this FIS report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of this FIS report.

TABLE OF CONTENTS

TABLE OF CONTENTS - continued

FLOOD INSURANCE STUDY
LINCOLN COUNTY, TENNESSEE, AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) revises and updates a previous FIS/ Flood Insurance Rate Map (FIRM) for the geographic area of Lincoln County, Tennessee, including: the Cities of Fayetteville, and Petersburg, the Town of Ardmore, and the unincorporated areas of Lincoln County (hereinafter referred to collectively as Lincoln County). The City of Petersburg is also located in Marshall County, but is shown in it's entirety in this countywide FIS. The Town of Ardmore is also located in Giles County, and Limestone County, Alabama. Only the portion of the Town of Ardmore located in Lincoln County is included in this FIS.

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by Lincoln County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

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

1.2 Authority and Acknowledgments

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

The original December 20, 1999, countywide FIS was prepared to include all jurisdictions within Lincoln County into a countywide format FIS. The authority and acknowledgments prior to that countywide FIS have been compiled for the City of Fayetteville from its previously printed FIS report, dated February 17, 1988. The hydrologic and hydraulic analyses for this FIS report were prepared by the Tennessee Valley Authority (TVA) for the Federal Emergency Management Agency (FEMA) under Inter-Agency Agreement No. EMW-84-E-5149, Project Order No. 1. That work was completed in March 1986.

The authority and acknowledgments for the City of Petersburg and the unincorporated areas of Lincoln County are not included because there were no previously printed FIS reports for these communities.

For the December 20, 1999, countywide FIS, additional information for Boonshill Road Branch, Cotton Mill Branch, Elk River, Norris Creek, and Wells Creek in the unincorporated areas of Lincoln County were obtained from the previously published FIS for the City of Fayetteville. Elk River was extended in the annexed areas of the City of Fayetteville using data that was also obtained from the previously published FIS for the City of Fayetteville. All modeling was originally prepared by the TVA. New modeling for the upstream portion of the Elk River was also obtained from the TVA.

For this countywide revision, no updated hydrologic and hydraulic analyses were prepared. Watershed IV Alliance redelineated floodplain boundaries based on more up-to-date topography submitted by the State of Tennessee.

Base map information shown on the FIRM was provided in digital format by the State of Tennessee. This information was photogrammatically compiled at a scale of 1" = 400' from aerial photography dated March 2000. Additional information may have been derived from other sources. Users of this FIRM should be aware that minor adjustments may have been made to specific base map features.

The coordinate system used for the production of this FIRM is Tennessee State Plane (FIPSZONE 4100), North American Datum of 1983 (NAD 83). Corner coordinates shown on the FIRM are in latitude and longitude referenced to the Tennessee State Plane (FIPSZONE 4100) projection, NAD 83. 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

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

For the February 7, 1988 FIS for the City of Fayetteville streams requiring detailed studies were identified at a meeting attended by representatives of the study contractor, FEMA, and the City of Fayetteville in February 1984. The results of this study were reviewed at a final coordination meeting held on April 1, 1987 and attended by representatives of the study contractor, FEMA, and the community.

For the December 20, 1999 countywide FIS the county was notified of the creation of the countywide FIS by FEMA in a letter dated April 20, 1998.

For this countywide revision, an initial CCO meeting was held on July 13, 2005, and attended by representatives of Lincoln County, City of Fayetteville, FEMA, State of Tennessee, and Watershed IV Alliance. A final CCO meeting was help on December 7, 2006 and was attended by representatives of Lincoln County, City of Fayetteville, the state of Tennessee, and Watershed IV Alliance.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Lincoln County, Tennessee.

All or portions of the flooding sources were studied by detailed methods: Boonshill Road Branch, Cotton Mill Branch, Elk River, Norris Creek, and Wells Creek. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

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

The Cities of Fayetteville and Petersburg corporate limits were updated.

This countywide FIS incorporates the determination of a Letter of Map Revision (LOMR): case number 00-04-035P, dated February 18, 2000 issued for Norris Creek.

This countywide FIS also reflects a vertical datum conversion from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the North American Vertical Datum of 1988 (NAVD 88).

Floodplain boundaries have been redelineated based on more up-to-date topographic mapping.

2.2 Community Description

Lincoln County is located in southern middle Tennessee, approximately 80 miles south of Nashville and 25 miles north of Huntsville, Alabama. Lincoln County has a total of 580 square miles within its borders. It is a growing, maturing community with a strong base of commercial and industrial businesses, manufacturers and distributors. The Elk River has 59 river miles that flow through Lincoln County from east to west, which offers recreation to its citizens as well as an economic boost to the community. The 2000 population was 31,340, the estimated 2005 population was 32,392.

The monthly average temperatures range from 77 degrees Fahrenheit (°F) in summer to 37°F in winter. Annual average precipitation for the region is 52.4 inches (U.S. Department of Commerce).

2.3 Principal Flood Problems

The largest known flood on the Elk River occurred on March 16, 1973. At the gaging station above Fayetteville, the flood reached an elevation of 679.21 feet National Geodetic Vertical Datum of 1929 (NGVD), with a discharge of 41,600 cubic feet per second (cfs) and an estimated recurrence interval of approximately 500 years. About 50 homes were evacuated, and the estimated damage was over one million dollars (Lincoln County News, 1973).

In 1990 and 1991, the largest floods on record occurred in the City of Fayetteville and Lincoln County. The 1990 flood alone exceeded 2 million dollars in damage and both floods exceeded the 500 year level. The combination of these floods created a declared disaster (889 DR TN).

2.4 Flood Protection Measures

Flood potential on the Elk River has been substantially decreased since the closure of the Tims Ford Dam in December 1970. This dam, located on the Elk River about 45 miles upstream of the community, drains 529 square miles and has a maximum flood control storage volume of 219,600 acre-feet. Nonstructural measures of flood protection are being used to aid in the prevention of future flood damage. These are in the form of land-use regulations, adopted from the Code of Federal Regulations, which control building within areas that have a high risk of flooding (U.S. Department of Housing and Urban Development, 1976).

In 1993, the City of Fayetteville received a mitigation grant for a flood warning system. The concept was to survey the floor elevations of businesses and residential housing in the flood area. From that information, a notification list for 10-, 2-, 1-, and 0.2-percent chance floods was prepared, partially funded by the TVA. This computer system was put in place to provide early flood warning utilizing a computerized call-out system directly to citizens' homes and to first responders by telephone.

The TVA also assisted Fayetteville and Lincoln County by placing an Aquatape Gauging System 12 miles upstream from the city. This gauge will send a computerized message to the warning system when the flood water has reached a certain potential flood levels for Fayetteville and, in turn, provide ample warning time frames in the event of the 2-, 1-, and 0.2-percent chance flood.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this FIS. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been

selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1-percent chance of annual exceedance) in any 50-year period is approximately 40 percent (4 in 10), and, 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 county at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

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

Information on the methods used to determine peak discharge-frequency relationships for the streams studied by detailed methods is shown below.

Pre-countywide Analyses

The City of Fayetteville has a previously printed FIS report. The hydrologic analyses described in that report has been compiled and is shown below.

For the Elk River, the U.S. Geological Survey (USGS) gaging stations just above Fayetteville (No. 03582000, period of record 1934-1985) and in Giles County, Tennessee, 41.5 miles above the mouth (No. 03584500, period of record 1934-1985), were the principal sources of data for defining peak discharge-frequency relationships. Peak discharge-frequency for other locations was determined by interpolation of extrapolation using these two gage points.

Flood discharges for the Elk River at Fayetteville are based on analysis of stream gage records of unregulated annual peak discharges prior to December 1970 (adjusted to reflect regulated conditions) and stream gage records of regulated annual peak discharges since December 1970. The relationship to adjust unregulated discharges to reflect regulated conditions was developed by calculating the regulated peak discharges of selected pre-1970 floods as if Tim Ford Dam was in place.

For Norris Creek, the USGS gaging station near Fayetteville (No. 03582300, period of record 1954-1983) was the principal source of data defining peak discharge-frequency relationships. The frequency curve for the gaging station was computed using procedures outlined in Bulletin 17B (U.S. Department of the Interior, 1982).

Regional relationships were developed for the remaining study streams from stream gage records on watersheds with hydrometeorologic characteristics similar to the study streams.

December 20, 1999, Countywide Analysis

The hydrologic methodology used for all streams was the U.S. Army Corps of Engineers (USACE) HEC-2 step-backwater computer program (USACE, 1980).

This Countywide Revision

No hydrologic analyses were carried out for this countywide revision.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-percent chance	2-percent chance	1-percent chance	0.2-percent chance
BOONSHILL ROAD BRANCH					
At mouth	1.28	1,280	1,790	1,910	2,410
Approximately 1.4 miles above mouth	0.77	1,020	1,390	1,460	1,820
COTTON MILL BRANCH					
At mouth	1.32	780	1,180	1,300	1,790
Approximately 1.4 miles above mouth	0.83	550	830	920	1,270
ELK RIVER					
Just downstream of Cane Creek	1,005	30,400	41,600	46,100	56,700
Just upstream of Cane Creek	899	26,400	35,700	39,300	47,900
Just downstream of Norris Creek	894	26,200	35,400	38,900	47,500
Just upstream of Norris Creek	846	24,500	32,800	36,000	43,600
Approximately 3.6 miles above Norris Creek	843	24,400	32,700	35,800	43,400
Approximately 97.5 miles above mouth	823	23,650	31,600	34,600	41,800
NORRIS CREEK					
At mouth	47.5	12,300	18,800	21,900	30,000
Approximately 2.6 miles above mouth	42.6	11,300	17,300	20,200	27,700
Approximately 3.0 miles above mouth	36.1	9,970	15,300	17,800	24,500
WALKER CREEK					
Approximately 0.47 mile upstream of the Tennessee/Alabama state boundary	22.72	7,490	11,590	13,560	18,100

WELLS CREEK					
At mouth	2.78	1,360	2,060	2,280	3,120
About 1.0 mile above mouth	2.07	1,090	1,650	1,830	2,500

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. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

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 revised FIRM (Exhibit 2).

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

Pre-countywide Analyses

The City of Fayetteville has a previously printed FIS report. The hydraulic analyses described in that report has been compiled and is summarized below.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (USACE, 1980). Starting water-surface elevations were calculated by the slope/area method except for the Elk River, for which the May 1984 flood was used.

December 20, 1999, Countywide Analyses

Hydraulic analyses for Boonshill Road Branch, Cotton Mill Branch, Elk River, Norris Creek, and Wells Creek were extended into the unincorporated areas of Lincoln County from a previous analyses completed for the City of Fayetteville (FEMA, 1988).

This Countywide Revision

No hydraulic analyses were carried out for this countywide revision.

Roughness coefficients (Manning's "n") used in the hydraulic computations were chosen based on field inspections of the channels and floodplain areas, previous studies by the TVA, and computed coefficients based on known flood profiles. Table 2, "Manning's "n" Values," provides a listing of roughness coefficients used in the models.

TABLE 2 – MANNING'S "n" VALUES

Stream	Channel "n"	Overbank "n"
Boonshill Road Branch	0.050-0.060	0.075-0.120
Cotton Mill Branch	0.045-0.055	0.055-0.120
Elk River	0.035-0.040	0.065-0.120
Norris River	0.030-0.050	0.060-0.120
Wells Creek	0.050-0.060	0.065-0.100

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was NGVD 29. With the finalization of NAVD 88, many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the county must, therefore, be referenced to NAVD 88. It is important to note that adjacent counties may be referenced to NGVD 29. This may result in differences in base flood elevations (BFEs) across the county boundaries between the counties.

The average datum shift from NGVD 29 to NAVD 88 for Lincoln County used was + 0.1 feet.

For information regarding conversion between the NGVD and NAVD, 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, MD 20910-3282
(301) 713-3242

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

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-,

and 0.2-percent annual chance flood elevations; delineations of the 1-percent and 0.2-percent annual chance floodplains; and 1-percent annual chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevations table. Users should reference the data presented in the FIS 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 (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the county. For the streams studied in detail, the 1-percent and 0.2-percent annual chance floodplains have been delineated using the flood elevations determined at each cross section.

For this countywide FIS, floodplain boundaries between cross sections were interpolated using an Excel Spreadsheet and 10-foot contours for guidance on topographic characteristics.

The 1-percent and 0.2-percent annual chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1-percent and 0.5-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 (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this FIS are presented to

local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS were computed by setting encroachments in the stream overbanks, testing these with the HEC-2 program, and adjusting and retesting them until an allowable increase in flood elevation was reached (TVA, 1961). Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections in Table 3, "Floodway Data."

The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 3, "Floodway Data." To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 3 for certain downstream cross sections of Boonshill Road Branch, Cotton Mill Branch, Norris Creek, and Wells Creek are lower than the regulatory flood elevations in that area, which must take into account the 1-percent annual chance flooding due to backwater from other sources.

Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplains will not cause more than a 1.0-foot increase in the BFEs at any point within the community.

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent annual chance flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1, "Floodway Schematic."

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Boonshill Road Branch								
A	0.37[1]	200	483	3.1	665.2	654.9[3]	655.4	0.5
B	0.80[1]	200	755	2.2	665.2	660.5[3]	661.5	1.0
C	0.98[1]	140	640	2.5	665.2	665.2	666.2	1.0
D	1.11[1]	140	567	2.8	668.0	668.0	668.8	0.8
E	1.16[1]	145	634	2.4	670.7	670.7	671.7	1.0
F	1.35[1]	90	354	4.2	674.8	674.8	675.8	1.0
Cotton Mill Branch								
A	370[2]	45	188	6.8	676.8	666.1[4]	666.4	0.3
B	860[2]	45	154	8.1	676.8	672.4[4]	672.6	0.2
C	1,266[2]	90	606	2.0	676.8	677.8[4]	678.8	1.0
D	1,556[2]	90	385	3.1	678.2	678.2	679.2	1.0
E	1,996[2]	37	208	5.8	680.9	680.9	681.3	0.4
F	2,566[2]	85	286	4.1	684.6	684.6	685.1	0.5
G	2,911[2]	85	310	3.8	686.0	686.0	686.9	0.9
H	3,493[2]	195	700	1.6	690.2	690.2	690.9	0.7
I	4,153[2]	40	200	5.4	693.4	693.4	694.3	0.9
J	5,103[2]	35	182	5.7	698.2	698.2	699.0	0.8
K	5,633[2]	40	192	5.3	701.2	701.2	701.6	0.4
L	6,083[2]	40	155	6.4	704.4	704.4	704.5	0.1
M	7,193[2]	35	181	5.1	711.3	711.3	712.1	0.8

[1]Miles above confluence with Elk River
[2]Feet above confluence with Norris Creek
[3]Elevation computed without consideration of backwater effects from Elk River
[4]Elevation computed without consideration of backwater effects from Norris Creek

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN AND INCORPORATED AREAS

FLOODWAY DATA

BOONSHILL ROAD BRANCH – COTTON MILL BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Elk River								
A	461,208	900	12,266	3.8	662.9	662.9	663.2	0.3
B	463,988	900	11,469	4.0	664.1	664.1	664.4	0.3
C	465,388	979	13,334	3.5	665.0	665.0	665.2	0.2
D	469,998	1,100	14,962	2.6	665.6	665.6	666.3	0.7
E	472,338	1,140	13,473	2.9	666.0	666.0	666.9	0.9
F	474,738	1,140	13,612	2.9	666.5	666.5	667.4	0.9
G	475,738	1,050	13,658	2.9	666.8	666.8	667.8	1.0
H	481,328	900	13,757	2.8	668.3	668.3	669.2	0.9
I	482,768	295	6,432	6.0	668.5	668.5	669.5	1.0
J	483,130	280	5,823	6.7	669.1	669.1	670.0	0.9
K	484,932	750	11,560	3.2	670.9	670.9	671.9	1.0
L	487,112	800	13,481	2.7	671.7	671.7	672.6	0.9
M	489,202	800	13,103	2.7	672.1	672.1	673.1	1.0
N	491,802	1,000	14,623	2.5	672.6	672.6	673.5	0.9
O	494,982	1,260	16,104	2.2	673.2	673.2	674.2	1.0
P	498,312	400	6,126	5.8	673.9	673.9	674.9	1.0
Q	501,852	410	7,536	4.8	676.5	676.5	677.4	0.9
R	505,392	590	8,065	4.4	678.1	678.1	679.1	1.0
S	508,872	448	5,466	6.5	679.9	679.9	680.9	1.0
T	512,412	450	7,331	4.8	682.3	682.3	683.0	0.7
U	515,952	550	9,364	3.8	683.8	683.8	684.4	0.6

[1]Feet above mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN AND INCORPORATED AREAS

FLOODWAY DATA

ELK RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Elk River (continued)								
V	518,952[1]	600	11,765	3.0	684.8	684.8	685.4	0.6
W	520,842[1]	650	12,020	2.9	685.1	685.1	685.9	0.8
X	523,312[1]	1,600	26,260	1.3	685.7	685.7	686.6	0.9
Y	525,152[1]	1,400	17,789	1.9	686.1	686.1	687.1	1.0
Norris Creek								
A	171[2]	200	2,499	8.8	669.8	668.6[3]	669.4	0.8
B	2,172[2]	600	6,860	3.2	670.6	670.6	671.3	0.7
C	3,348[2]	650	9,023	2.4	671.4	671.4	672.2	0.8
D	4,638[2]	784	9,936	2.2	671.7	671.7	672.6	0.9
E	6,748[2]	954	10,468	2.0	672.3	672.3	673.2	0.9
F	8,222[2]	800	10,968	1.9	676.6	676.6	677.5	0.9
G	9,053[2]	400	3,512	5.5	676.9	676.9	677.9	1.0
H	9,787[2]	450	5,035	4.1	677.7	677.7	678.6	0.9
I	10,957[2]	735	10,745	1.9	678.8	678.8	679.6	0.8
J	13,017[2]	650	6,597	3.1	679.8	679.8	680.5	0.7
K	14,117[2]	610	4,298	4.7	681.0	681.0	681.8	0.8

[1]Feet above mouth
[2]Feet above confluence with Elk River
[3]Elevation computed without consideration of backwater effects from Elk River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN AND INCORPORATED AREAS

FLOODWAY DATA

ELK RIVER – NORRIS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wells Creek								
A	0.16	55	306	7.2	673.0	665.1[2]	665.1	0.0
B	0.41	50	370	5.5	675.8	675.8	676.3	0.5
C	0.60	80	344	5.8	681.3	681.3	682.2	0.9
D	0.76	90	561	3.5	688.8	688.8	689.8	1.0
E	0.93	40	241	7.8	693.2	693.2	694.2	1.0
Walker Creek								
A	900[3]	500	4,686	3.7	788.9	788.9	789.5	0.6
B	2,561[3]	750	3,812	3.6	793.0	793.0	793.4	0.4

[1]Miles above confluence with Elk River
[2]Elevation computed without consideration of backwater effects from Elk River
[3]Feet above state boundary

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN AND INCORPORATED AREAS

FLOODWAY DATA

WELLS CREEK - WALKER CREEK

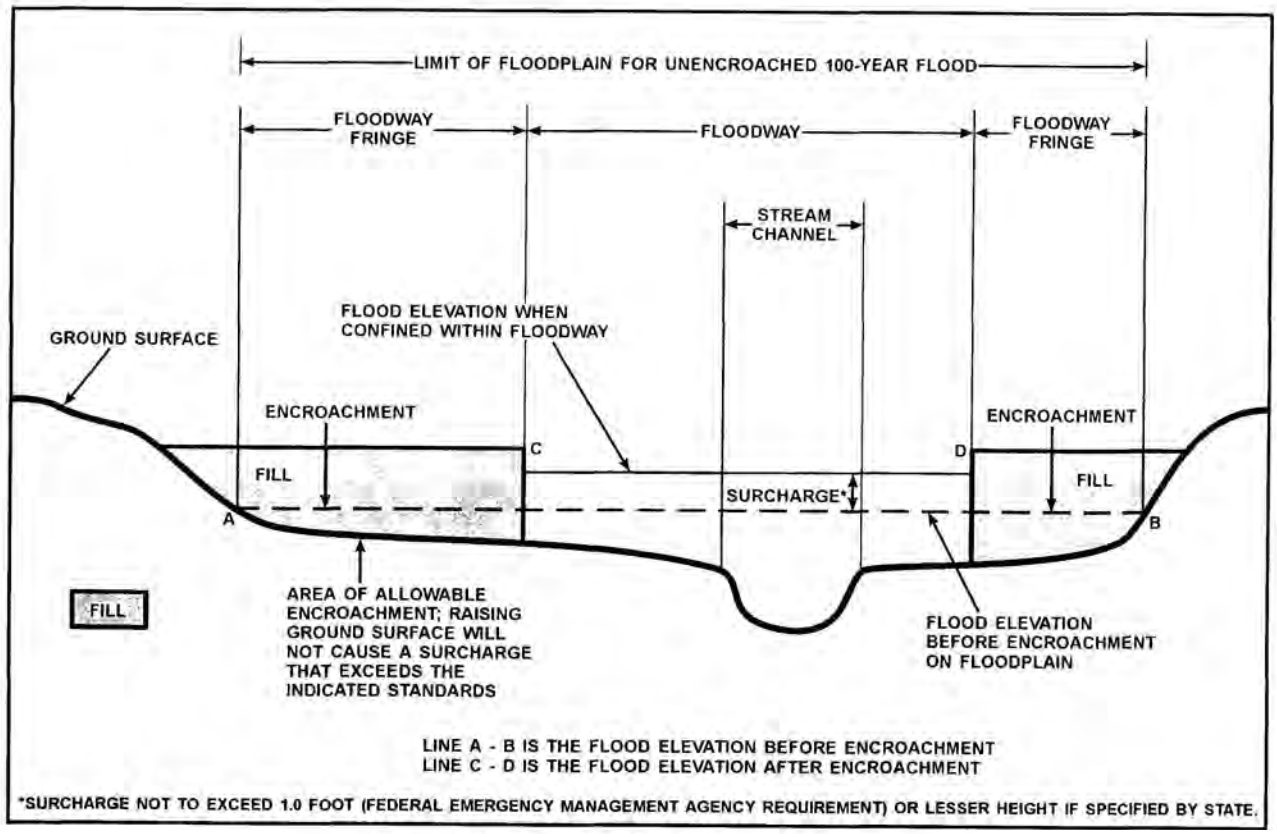


Figure 1: FLOODWAY SCHEMATIC

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 by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, 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, and areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 100-year 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 shows selected whole-foot BFEs or average depths in the 1-percent annual chance floodplains that were studied by detailed methods. 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 uses tints, screens, and symbols to show the 1-percent and 0.2-percent annual chance floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Lincoln County. Previously, separate FIRMs were prepared for each identified flood-prone incorporated community and the unincorporated areas of the county. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community, up to and including this countywide FIS, are presented in Table 4, "Community Map History."

7.0 OTHER STUDIES

FISs have been prepared for the unincorporated areas of Franklin (FEMA, 1995), and Giles counties (FEMA, 1992); the unincorporated areas of Limestone, Alabama (FEMA, 1981); Madison County, Alabama and Incorporated Areas(FEMA, 1998) and Marshall County and Incorporated Areas (FEMA, 1988); and Lynchburg-Moore County, Metropolitan Government (FEMA, 1995).

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

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Ardmore, Town of	December 17, 1976	June 6, 1980	June 1, 2005	None
Fayetteville, City of	March 1, 1974	July 2, 1976	February 17, 1988	None
Lincoln County (Unincorporated Areas)	October 28, 1977	None	October 1, 1992	None
Petersburg, City of	February 15, 1974	September 17, 1976	September 29, 1986	None

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Koger Center - Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

9.0 BIBLIOGRAPHY AND REFERENCES

Federal Emergency Management Agency. (September 30, 1995). Flood Insurance Study, Franklin County, Tennessee (Unincorporated Areas). Washington, D.C.

Federal Emergency Management Agency. (January 2, 1992). Flood Insurance Study, Giles County, Tennessee (Unincorporated Areas). Washington, D.C.

Federal Emergency Management Agency. (FIRM July 16, 1981; FIS Report January 16, 1981). Flood Insurance Study, Limestone County, Alabama (Unincorporated Areas). Washington D.C.

Federal Emergency Management Agency. (April 20, 1998). Flood Insurance Study, Madison County, Alabama and Incorporated Areas. Washington, D.C.

Federal Emergency Management Agency. (February 17, 1988). Flood Insurance Study, Marshall County and Incorporated Areas. Washington, D.C.

Federal Emergency Management Agency. (May 16, 1995). Flood Insurance Study, Lynchburg-Moore County, Metropolitan Government. Washington, D.C.

Federal Emergency Management Agency. (February 17, 1988). Flood Insurance Study, City of Fayetteville, Lincoln County, Tennessee. Washington D.C.

The Lincoln County News. (1973). "Article". Fayetteville, Tennessee.

Tennessee Valley Authority, Division of Water Control Planning. (May 1961). Floods on Elk River in Vicinity of Fayetteville, Tennessee, Report No. 0-5482-R. Knoxville, Tennessee.

Tennessee Valley Authority, Mapping Services Branch. (1984). Topographic Maps, Scale 1:4,800, Contour Interval 4 feet. Fayetteville, Tennessee.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. (November 1976, updated April 1980). HEC-2 Water-Surface Profiles, Generalized Computer Program. Davis, California.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service. (1951-1980). Monthly Averages of Temperature and Precipitation for State (TN) Climatic Divisions.

U.S. Department of Housing and Urban Development, Federal Insurance Administration. (revised 1976). "Code of Federal Regulations, Title 24, Chapter 10, Parts 1910.3A and 3B" Federal Register, Vol. 41, No. 207. Washington D.C.

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

10.0 REVISIONS DESCRIPTION

The date of this revision is November 18, 2016.

a. Acknowledgments

Hydrologic and hydraulic analyses were performed by AMEC for FEMA, under the State of Alabama Office of Water Resources (OWR) Cooperating Technical Partner Agreement. The revisions were made as part of the Wheeler Lake Risk Map project. The Wheeler Lake watershed is mostly in the state of Alabama, but extends into southern Tennessee. Floodplain boundaries were delineated using a digital elevation model (DEM) created from USGS 10m data.

b. Coordination

An initial CCO meeting was held on May 9, 2014, and was attended by representatives of FEMA, OWR, AMEC, and constituents from throughout the Wheeler Lake watershed. A final CCO meeting was held on April 20, 2015, and was attended by representatives of AECOM, affected communities, state officials, and FEMA.

c. Scope

This revision includes updating existing approximate studies in the Wheeler Lake watershed.

For this revision Letter of Map Revision (LOMR) Case Number 08-04-4212P for Walker Creek was incorporated into the FIRM. This revision is based on updated topography, hydrologic analysis, and hydraulic analysis.

d. Hydrologic and Hydraulic Analyses

For the updated approximate studies, frequency discharges were computed using regression equations published by the USGS in Water Resources Investigations Report 03-4176 titled *Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000*.

For the updated approximate studies, water surface elevations of selected flood recurrence intervals were computed using USACE HEC-RAS v.4.1.0.

The LOMR for Walker Creek was incorporated and is reflected in the Summary of Discharge, Floodway Data Tables, and Flood Profiles of this document.

e. Floodplain Boundaries

Floodplain boundaries were delineated using a DEM created from USGS 10m data.

f. Bibliography and References

1. U.S. Army Corps of Engineers Hydrologic Engineering Center River Analysis System v.4.1.0
2. U.S. Geological Survey, 10-meter digital elevation model
3. U.S. Geological Survey, Water Resources Investigations Report 03-4176 *Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000.*

FLOODING CONTROLLED BY ELK RIVER

ELEVATION IN FEET (NAVD)

670
665
660
655
650
645
640
635
630

CONFLUENCE WITH ELK RIVER

0 0.10 0.20 0.30 0.40 0.50 0.60 0.70

STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH ELK RIVER

LEGEND

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

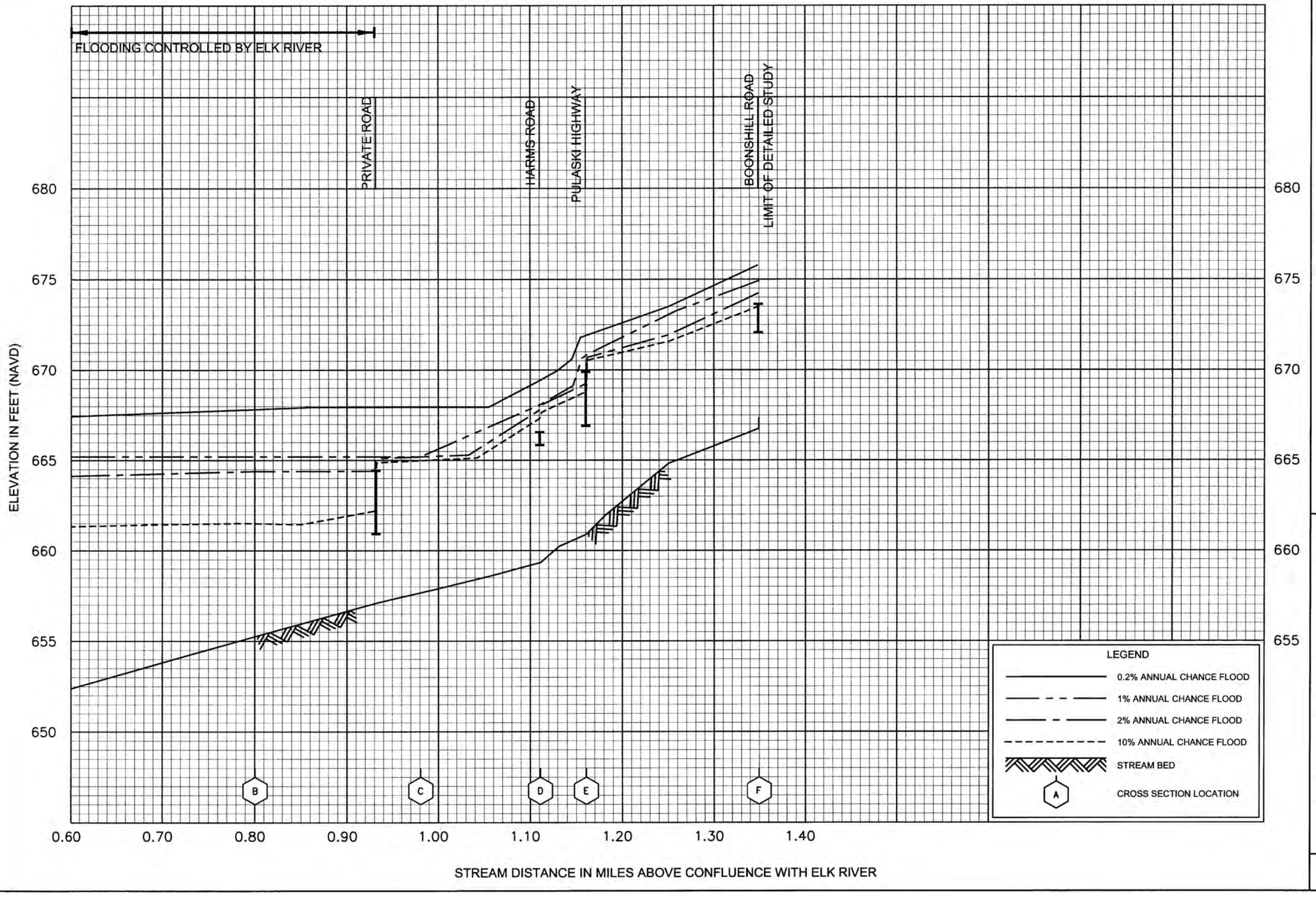
FLOOD PROFILES

BOONSHILL ROAD BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

01P



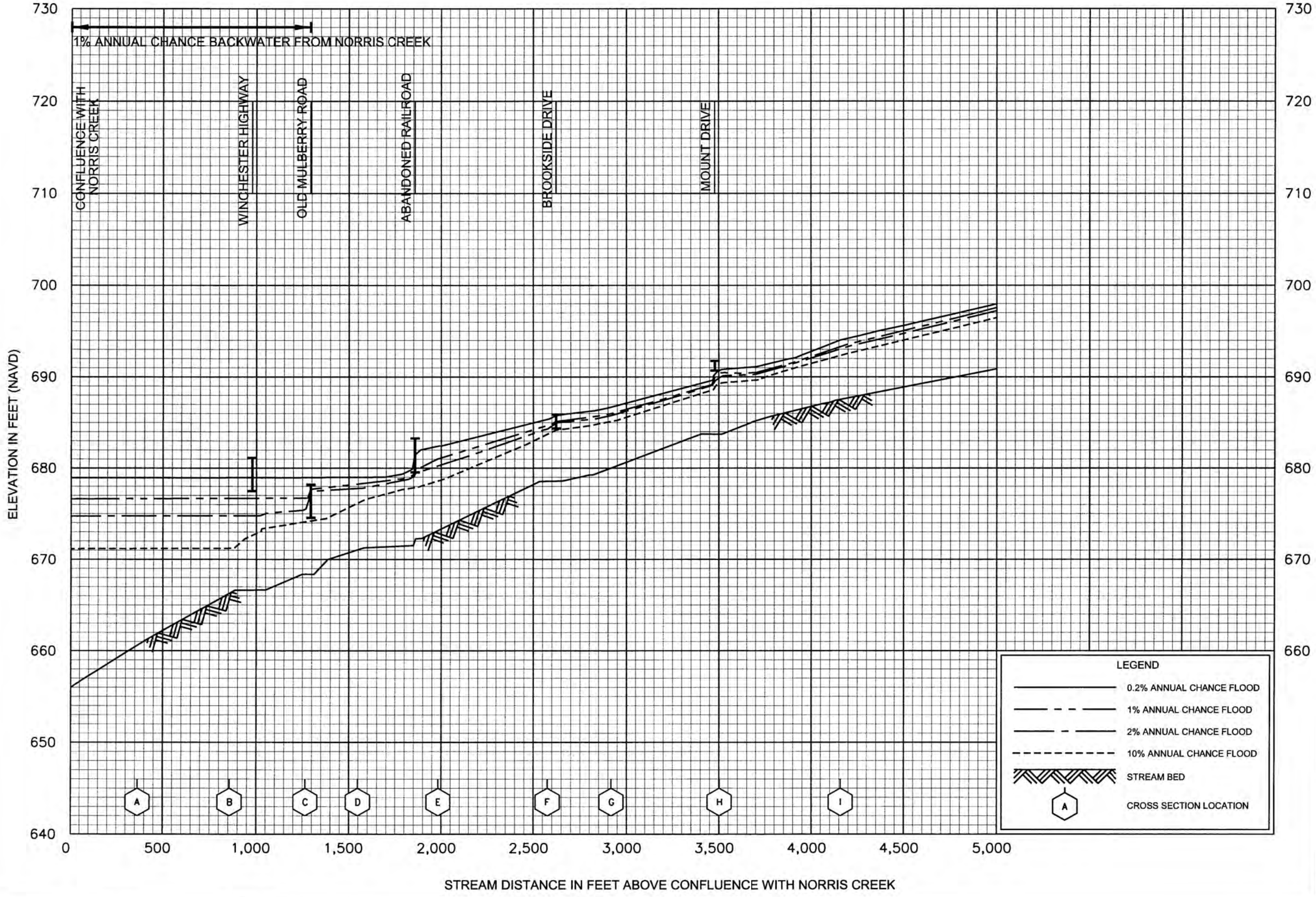
FLOOD PROFILES

BOONSHILL ROAD BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

02P



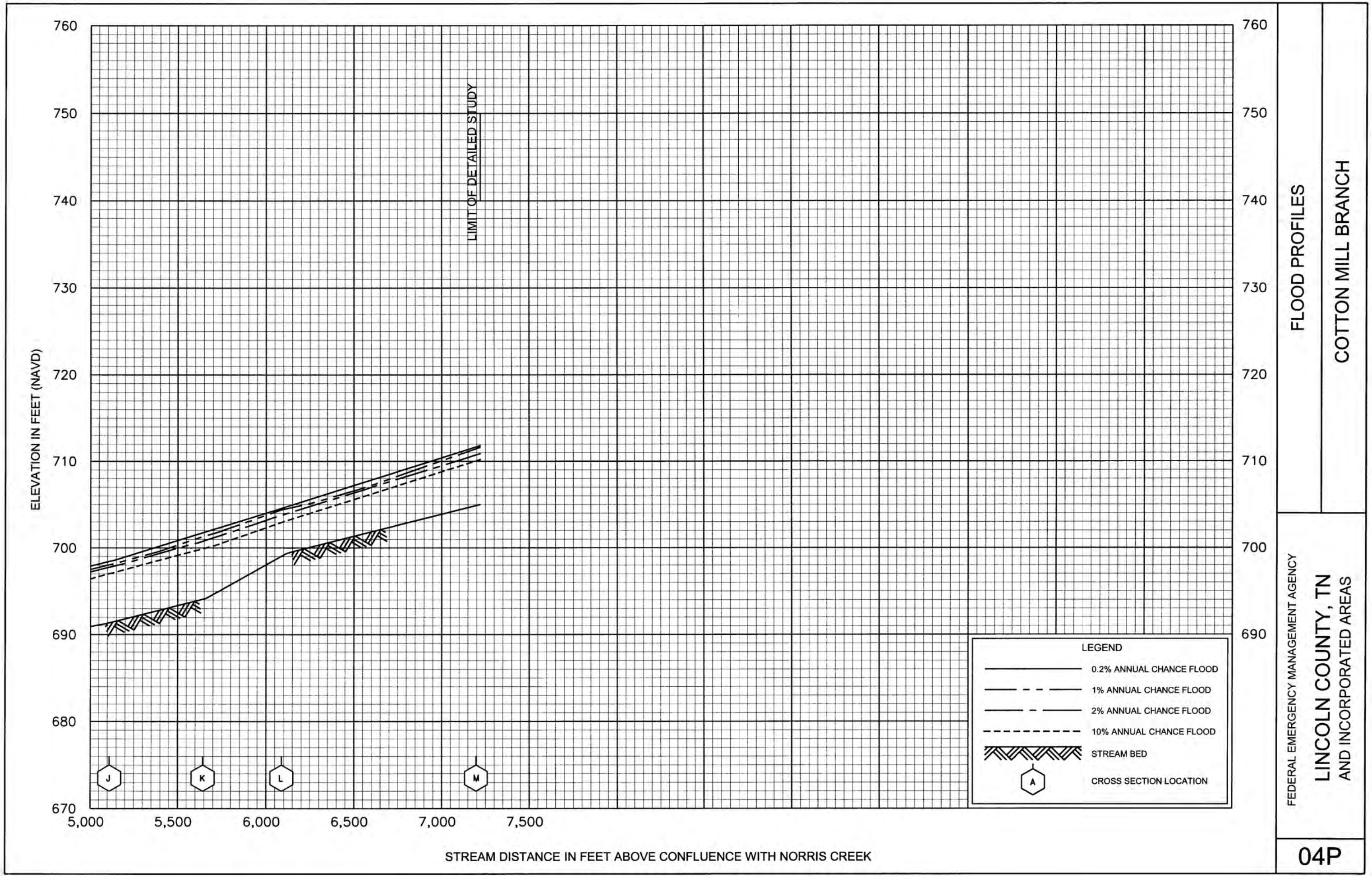
FLOOD PROFILES

COTTON MILL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

03P



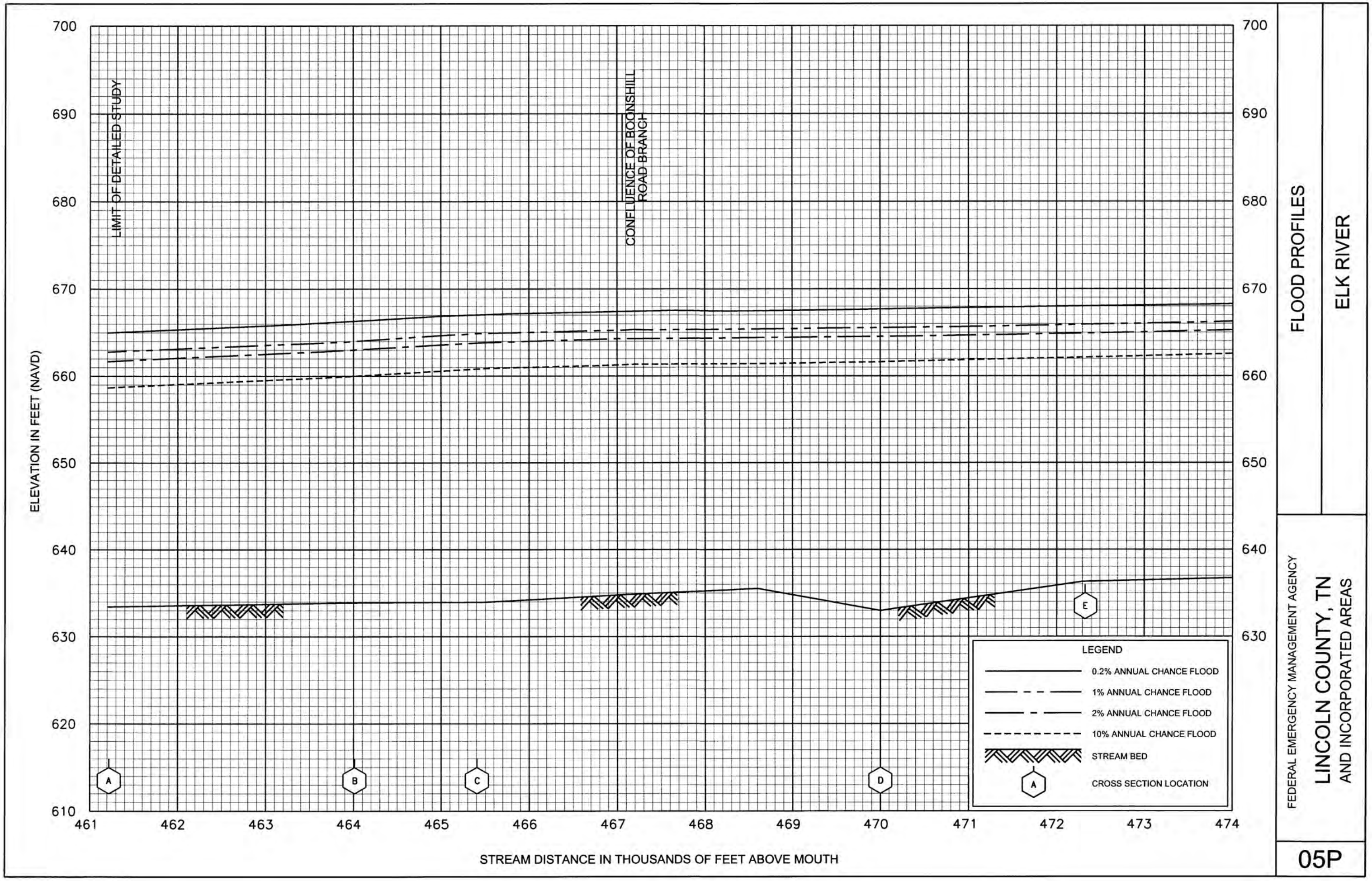
FLOOD PROFILES

COTTON MILL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

04P



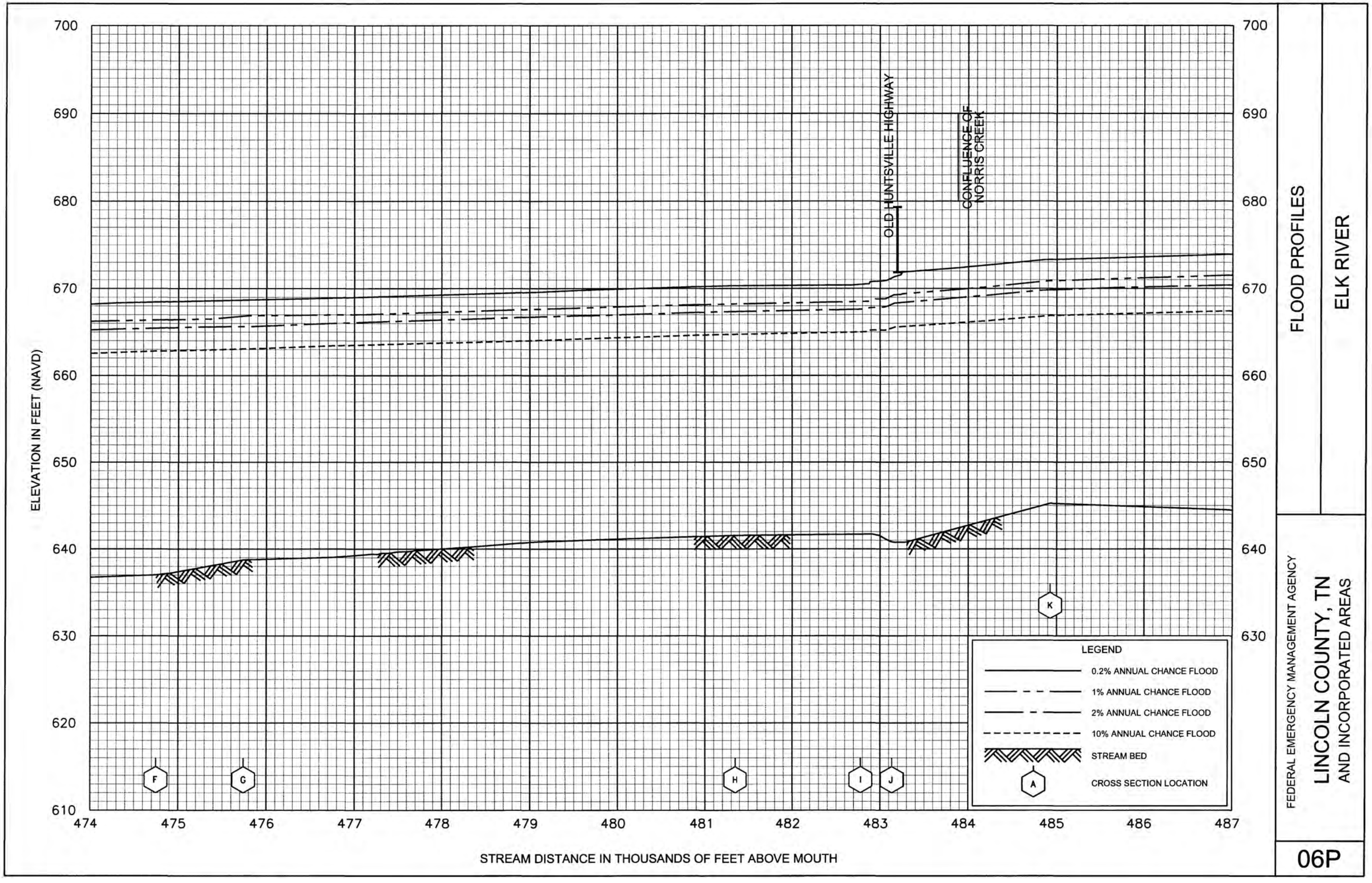
FLOOD PROFILES

ELK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

05P



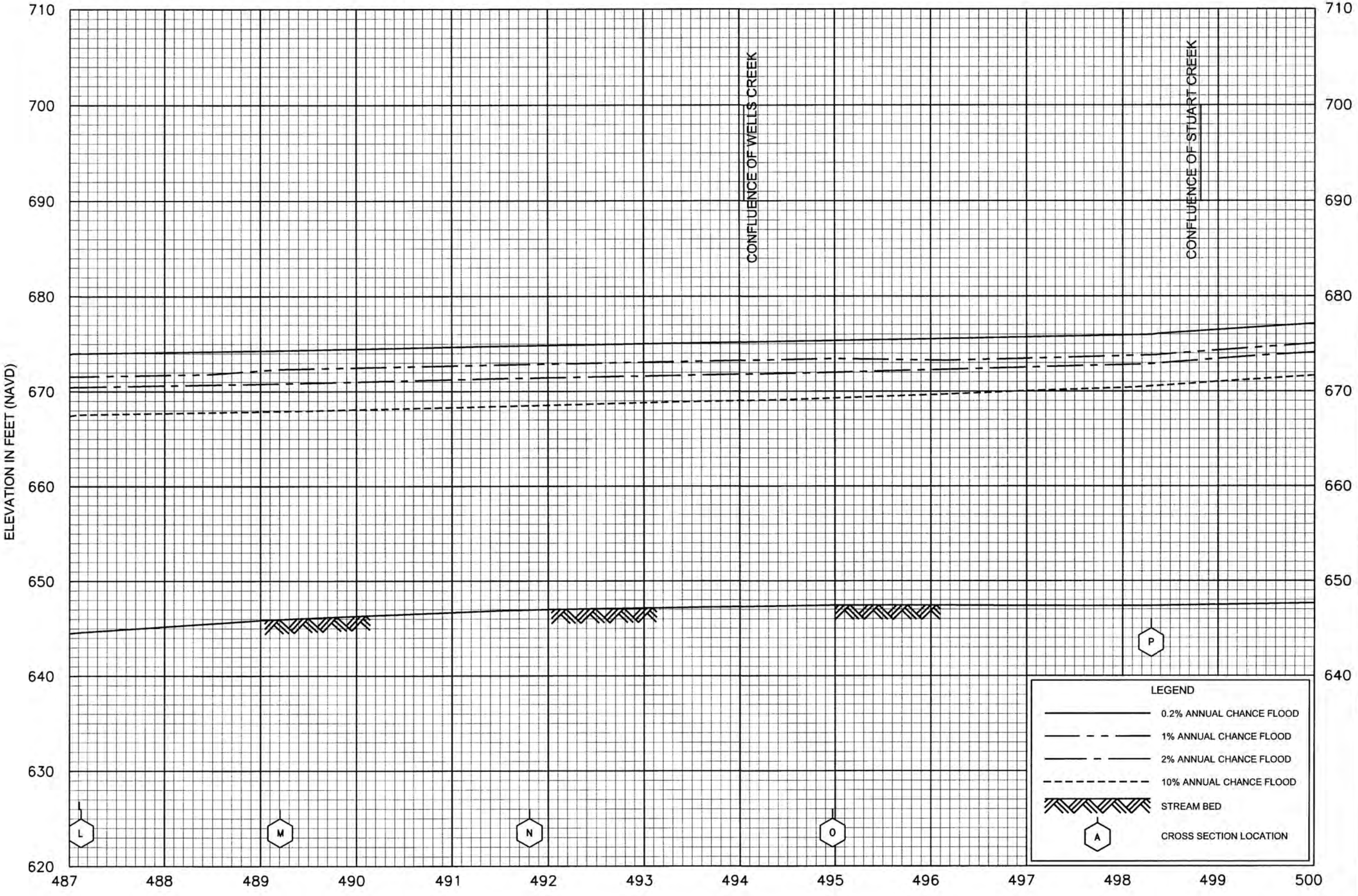
FLOOD PROFILES

ELK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

06P



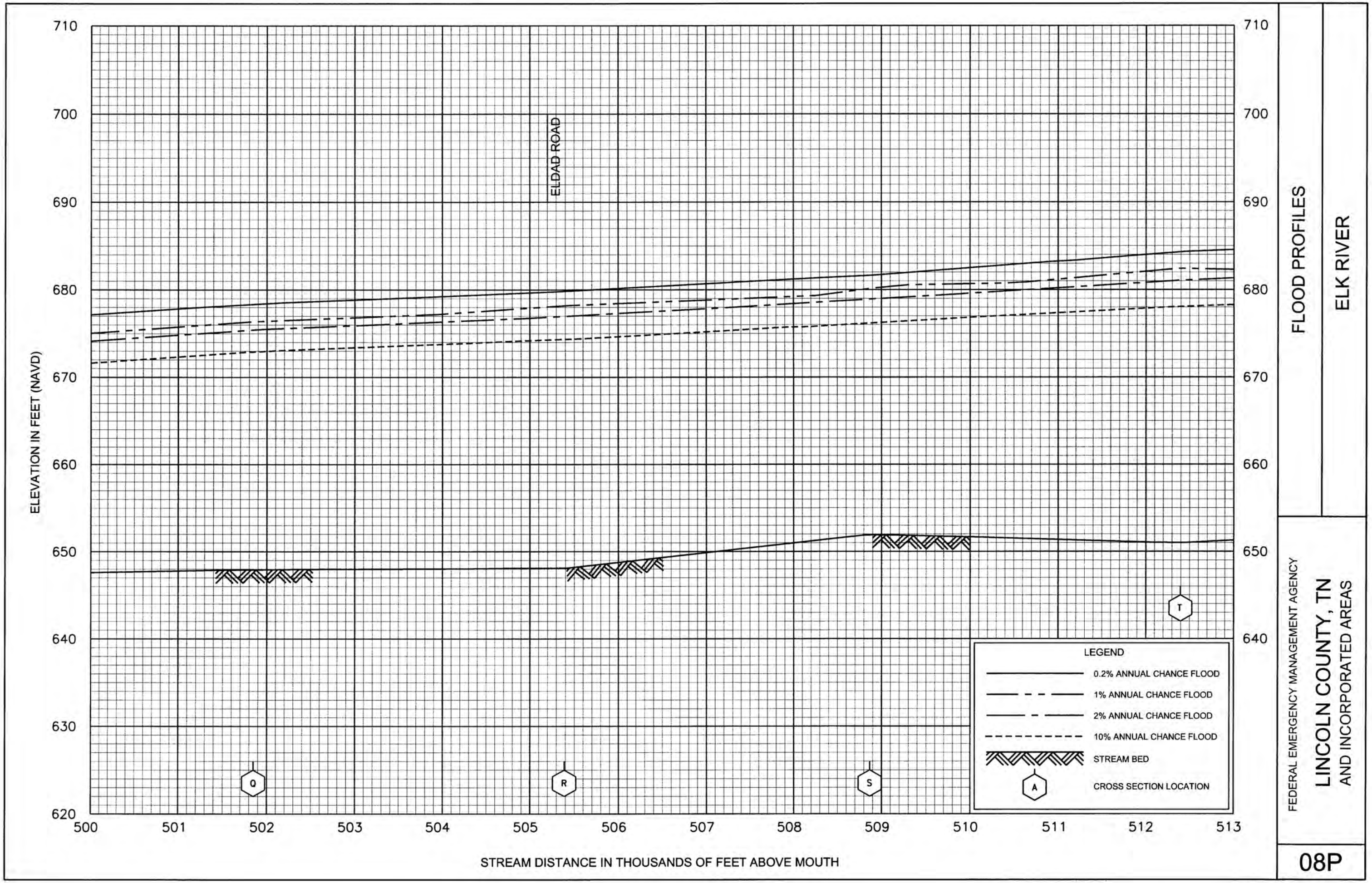
FLOOD PROFILES

ELK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

07P



FLOOD PROFILES

ELK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

08P

720
710
700
690
680
670
660
650
640
630

ELEVATION IN FEET (NAVD)

513 514 515 516 517 518 519 520 521 522 523 524 525 526

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE MOUTH

LIMIT OF DETAILED STUDY

U V W X Y

LEGEND

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

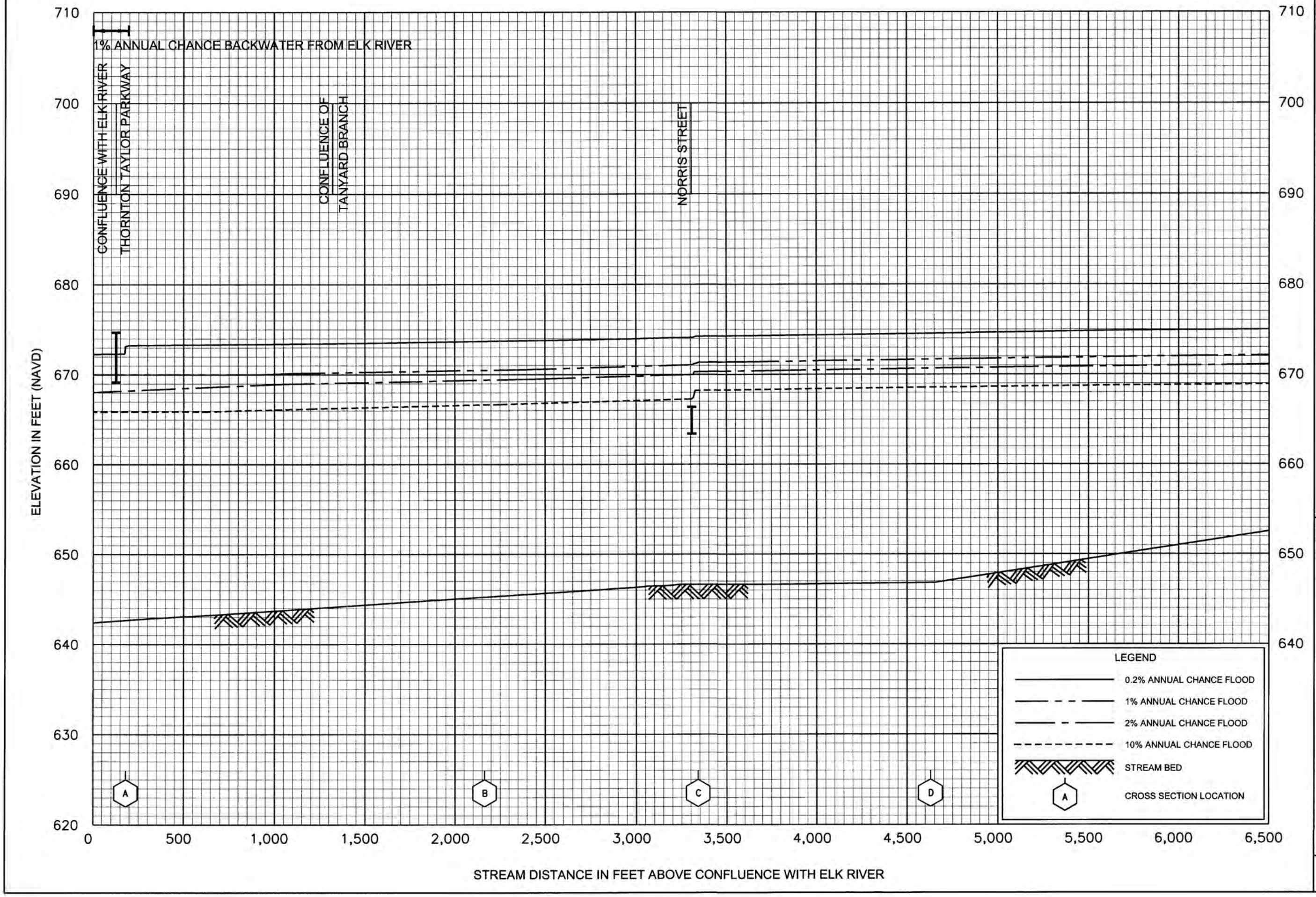
FLOOD PROFILES

ELK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

09P



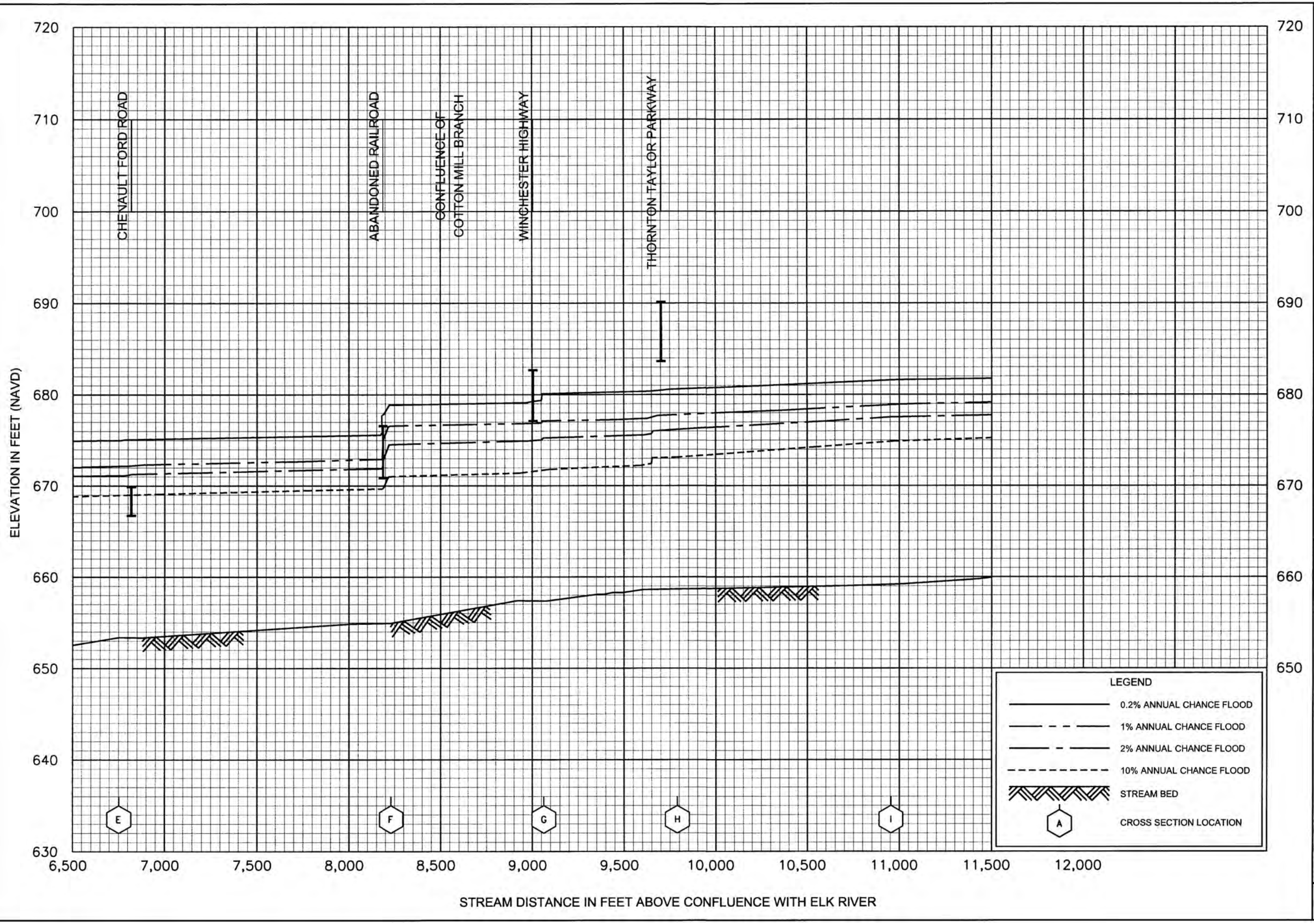
FLOOD PROFILES

NORRIS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

10P



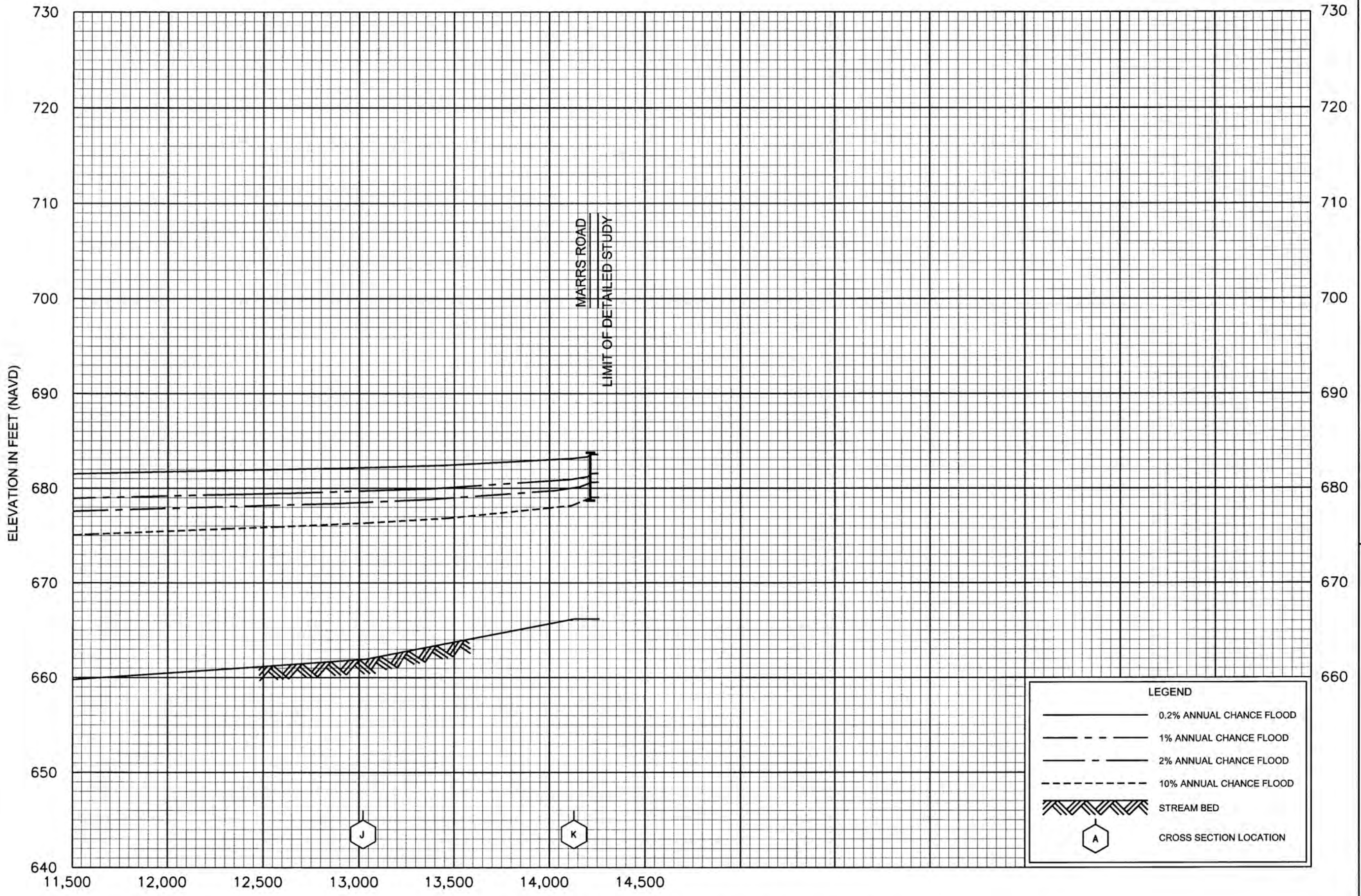
FLOOD PROFILES

NORRIS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

11P



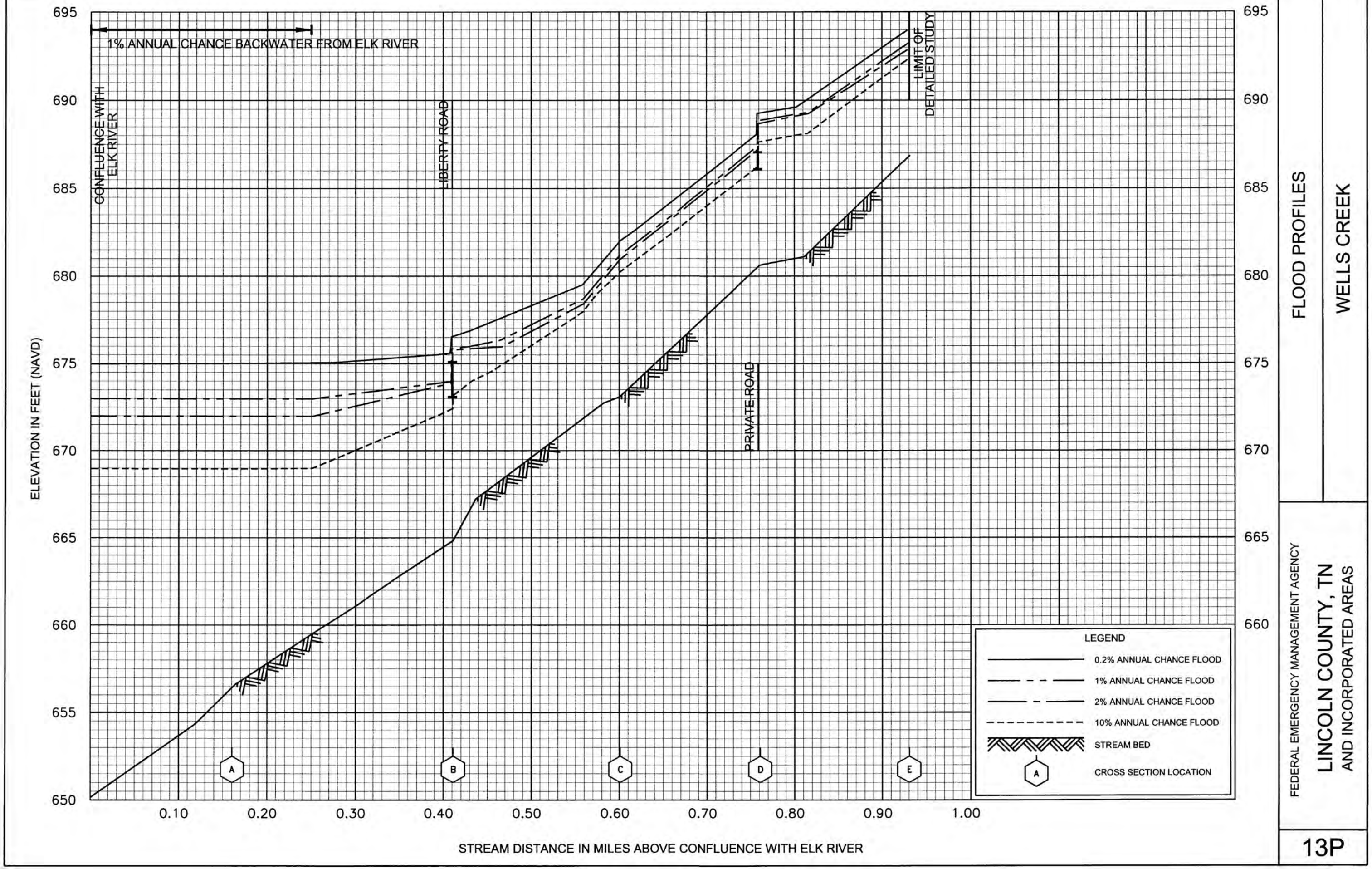
FLOOD PROFILES

NORRIS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

12P



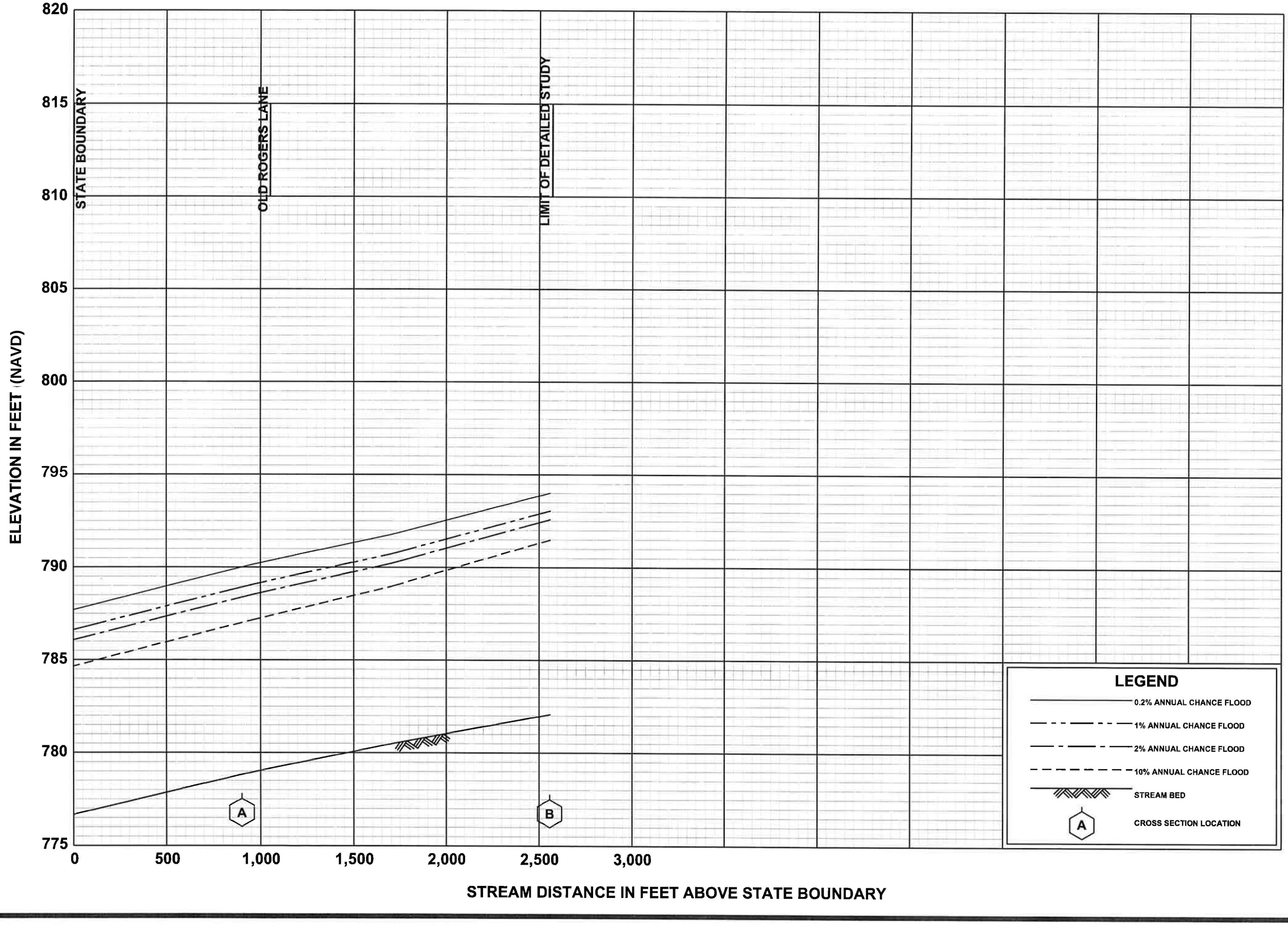
FLOOD PROFILES

WELLS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

13P



FLOOD PROFILES

WALKER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LINCOLN COUNTY, TN
AND INCORPORATED AREAS

14P