FLOOD INSURANCE STUDY

TIPPECANOE COUNTY, INDIANA,
AND INCORPORATED AREAS

Community Name	Community Number
BATTLE GROUND, TOWN OF	180252
CLARKS HILLS, TOWN OF*	180602
DAYTON, TOWN OF	180486
LAFAYETTE, CITY OF	180253
OTTERBEIN, TOWN OF*	180562
SHADELAND, TOWN OF	180603
TIPPECANOE COUNTY, UNINCORPORATED AREAS	180428
WEST LAFAYETTE, CITY OF	180254

* No Special Flood Hazard Areas Identified

Preliminary:

April 17, 2015

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
18157CV000C

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 Preliminary Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this Preliminary FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult community officials and check the Community Map Repository to obtain the most current FIS components.

Selected Flood Insurance Rate Map panels for this 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:

Old Zones	New Zone
A1 through A30	AE
B	X (shaded)
C	X

Initial Countywide FIS Effective Date: September 25, 2009

Revised Countywide FIS Dates: March 15, 2012
To Be Determined

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FLOOD INSURANCE RATE MAP

FLOOD INSURANCE STUDY
TIPPECANOE COUNTY, INDIANA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) report revises and supersedes the FIS report and Flood Insurance Rate Maps (FIRMs) in the geographic area of Tippecanoe County, Indiana, including the Cities of Lafayette and West Lafayette, the Town of Battle Ground, the Town of Shadeland, the Town of Dayton and the Unincorporated Areas of Tippecanoe County (hereinafter referred to collectively as Tippecanoe County). 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 community that will be used to establish actuarial flood insurance rates. This information will also be used by Tippecanoe 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.

Please note that on the effective date of this study, the Towns of Clarks Hills and Otterbein have no identified Special Flood Hazard Areas (SFHA). This does not preclude future determinations of SFHAs that could be necessitated by changed conditions affecting the community (i.e., annexation of new lands) or the availability of new scientific or technical data about flood hazards.

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. Information of the authority and acknowledgments for each of the new studies and previously printed FIS reports and FIRMs for the communities within Floyd County was compiled and is shown below:

Precountywide FIS Report

The hydrologic and hydraulic analyses for the May 1980 FIS report for the City of Lafayette, the May 1980 FIS report for the City of West Lafayette and Town of Battle Ground, and the September 1980 FIS report for the Unincorporated Areas of Tippecanoe County were performed by Howard Needles Tammen & Bergendoff under Contract No. [H-4565] This work was completed in January 1979.

The authority and acknowledgments for the Town of Dayton are not available because no FIS reports were ever published for that community.

September 25, 2009
Initial Countywide FIS Report

The hydrologic and hydraulic analyses for Cole Ditch, Cole Ditch Unnamed tributary 1, Cole Ditch Unnamed tributary 2, Cuppy Ditch, East Branch Wea Creek, Indian Creek and Tippecanoe River in this countywide study were performed by IDNR. This work was completed on September 2005.

Base map information that was used for this study was provided in digital format by the Indiana department of Natural Resources Orthophoto images were produced at scale of 1:800. Aerial photography is dated March 2002.

March 15, 2012
Physical Map Revision

The March 15, 2012, Physical Map Revision (PMR) was requested by FEMA on behalf of the City of Lafayette, to remove the Provisionally Accredited Levee (PAL) designation for the wastewater treatment plant levee. The work was performed by STARR for FEMA, under contract number HSFEHQ-09-D-0370, Task Order Number 3. The work was completed on March 15, 2012.

This Physical Map Revision

This countywide revision was initiated by a PMR request submitted by the IDNR. The request was made on behalf of Christopher B. Burke Engineering, LLC to incorporate revised hydrologic and hydraulic analysis for Elliott Ditch from the confluence with Wea Creek to approximately 105 feet upstream of Veterans Memorial Parkway East. The work was completed in April 2014.

Base map information shown on the FIRM was derived from Farm Services Administration produced at a scale of 1:12,000, from aerial photography dated October 2012 or later. The projection used in the preparation of this map is State Plane Indiana West, and the horizontal datum used is NAD83.

1.3 Coordination

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

Precountywide FIS Report

The results of the May 1980 FIS report for the City of Lafayette were reviewed at the final CCO meeting held on October 2, 1979, and attended by county officials, IDNR, FIA and the community.

The results of the July 1980, FIS reports for the City of West Lafayette and the Town of Battle Ground were reviewed at final CCO meetings held on October 3, 1979, and attended by county officials, IDNR, FIA and the community.

The results of the September 1980, FIS report for the Unincorporated Areas of Tippecanoe County were reviewed at the final CCO meeting held on October 2, 1979, and attended by county officials, IDNR, FIA and the community.

September 25, 2009
Initial Countywide FIS Report

The initial CCO meeting for the countywide study was held in June 2004, and attended by representatives of CDM, IDNR, FEMA and the communities. The results of the study were reviewed at the final CCO meeting held on March 4, 2008. This meeting was attended by representatives of CDM, IDNR, FEMA and the communities. All issues raised during this meeting have been addressed in this study.

March 15, 2012
Physical Map Revision

No meetings were held during the March 15, 2012, PMR.

This Physical Map Revision

The initial meeting was held on May 1, 2014, and attended by representatives of the IDNR and the City of Lafayette.

The results of the study were reviewed at the final meeting held on _____, and attended by representatives of _____. All issues and/or concerns raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Tippecanoe County, Indiana, including the incorporated communities listed in Section 1.1. 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.

September 25, 2009
Initial Countywide FIS Report

All or portions of the flooding sources listed in Table 1, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM.

Approximate studies were performed for Burnett Creek and Indian Creek.

For streams studied by detailed method for this study, see Table 2, "Scope of Revision." This FIS also incorporates the determinations of letters issued by FEMA resulting in map changes (Letter of Map Revision (LOMR), and Letter of Map Revision Based on Fill (LOMR-F)), as shown in Table - 3 "Letters of Map Change."

Table 1 - Flooding Sources Studied by Detailed Methods

Flooding Source	Limits of Detailed Study
Burnett Creek	From its confluence with Wabash River to 1,050 ft Upstream of State Route 43
Elliott Ditch	From its confluence with Wea Creek to County Road 250 East
Little Wea Creek	From its confluence with Wea Creek to Railroad
Middle Fork Wildcat Creek	From its confluence with South Fork Wildcat Creek to County Road 900 East
South Fork Wildcat Creek	From mouth at Wildcat Creek to State Highway 38
Wabash River	From approximately 306 miles upstream of mouth to County Road 775 East
Wea Creek	From its confluence with Wabash River to County Road 150 East
Wildcat Creek	From mouth at Wabash River to Wolfe Road

Table 2 - Scope of Revision

Flooding Source	Limits of Revised Study
Cole Ditch	From its confluence with Cole Ditch Unnamed Tributary 2 to approximately 3,900 ft Upstream of County Road 150 West
Cole Ditch Unnamed Tributary 1	From its confluence with Cole Ditch to approximately 1,250 ft Upstream of County Road 350 North
Cole Ditch Unnamed Tributary 2	From its confluence with Cole Ditch to approximately 1,350 ft Upstream of County Road 500 North
Cuppy Ditch	From its confluence with Cole Ditch to approximately 63 ft Downstream of County Road 150 North

Table 2 - Scope of Revision *(continued)*

Flooding Source	Limits of Revised Study
East Branch Wea Creek	From its confluence with Wea Creek to approximately 540 ft Upstream of County Road 500 East
Indian Creek	From approximately 2,500 ft Downstream of Norfolk and Western Railway to approximately 1,780 ft Upstream of Highway 52
Tippecanoe River	From its confluence with Wabash River to the County Line (Town of Battle Ground)

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 Tippecanoe County.

This countywide FIS also incorporates names of streams, other than those used in the previously printed FIS reports for the communities in which they are located. Listed below are the streams with name changes:

Community Name	Old Name	New Name
Tippecanoe County, Unincorporated Areas	Boes Creek	Cuppy Ditch
Tippecanoe County, Unincorporated Areas	Hoffner Drain	Cole Ditch Unnamed Tributary 1
Tippecanoe County, Unincorporated Areas	Country Farm Ditch	Cole Ditch Unnamed Tributary 2

Table 3 - Letters of Map Change

Community Name	Flooding Source	Date Issued	Case Number
City of Lafayette	Elliot Ditch	August 12, 1998	98-05-259P
Tippecanoe County Unincorporated Areas	Elliott Ditch	August 12, 1998	98-05-259P
Tippecanoe County Unincorporated Areas	Burnett Creek	June 18, 2004	04-05-2106A
Tippecanoe County Unincorporated Areas	Durkees Run	July 29, 2004	04-05-A185A

March 15, 2012
Physical Map Revision

The March 15, 2012, PMR was requested by FEMA on behalf of the City of Lafayette, to remove the PAL designation for the wastewater treatment plant levee.

This Physical Map Revision

For this PMR, Elliott Ditch was restudied from the confluence with Wea Creek to approximately 105 feet upstream of Veterans Memorial Parkway East in the City of Lafayette and the Unincorporated Areas of Tippecanoe County.

2.2 Community Description

Tippecanoe County is in the lower northwest quarter of Indiana, approximately 40 miles northwest of Indianapolis. It is 25 miles east of the Indiana-Illinois state line. The major communities within the county are Lafayette, West Lafayette, and Battle Ground, all located in the central to north-central portion of the county. Adjacent counties are White County to the north, Montgomery County to the south, Fountain, Benton, and Warren Counties to the west, and Clinton and Carroll Counties to the east. Other neighboring communities include Monticello to the north in White County, Frankfort to the southeast in Clinton County, and Crawfordsville to the south in Montgomery County. The 2010 population of Tippecanoe County, according to the U.S. Bureau of the Census, was 172,780 (U.S. Census Bureau, 2014).

The climate in Tippecanoe County is temperate, with warm summers and moderately cold winters. During the summer, the average monthly high is 85 degrees Fahrenheit (F.) and the average monthly low is 62 degrees F. The highest temperatures are usually recorded during July. During the winter, the average monthly high is 37 degrees F. and the average monthly low is 21 degrees F. The lowest temperatures are usually recorded during January (IDNR, 1977; USDOC, 1976). The annual rainfall in Tippecanoe County is 35 to 40 inches. Rainfall is distributed over the year, with more rain usually occurring during the spring (IDNR, 1977; USDOC, 1976; IDOC, 1971).

The terrain in Tippecanoe County is flat to gently rolling, with local areas having steep embankments. Maximum local relief is approximately 185 feet (Perdue, 1959). Surface drainage is best developed in the uplands adjacent to the Wabash River and its principal tributaries (Perdue, 1959). Drainage density, which is an indicator of drainage system development, is relatively high, 8.2 miles per square mile, in the upper reaches of South Fork Wildcat Creek (IDNR, 1976). Other streams in Tippecanoe County have lower drainage densities, indicating less well-defined systems. There are a number of soil associations found in Tippecanoe County, but primarily five associations border the study reaches. The Genessee-Shoals-Eel soils border the Wabash River, Wea Creek, and Wildcat Creek; Hennepin-Rodman near Wildcat Creek; Ockley-Westland near Little Wea Creek and Elliott Ditch; and Elston-Wea and Miami-Russell-Fincastle border Burnett Creek. For the most part, these associations are nearly level to sloping, well-drained soils (Perdue, 1971). The vegetation in Tippecanoe County is comprised of the trees, shrubs, and grasses common to mid-western Indiana, as well as farm crops such as wheat, corn, and soy beans. Forested areas border many of the streams (Tippecanoe County APC, 1974).

The Wabash River and its tributaries form the primary drainage system for Tippecanoe County. The tributaries within the Flood Insurance Study reach include the Tippecanoe River, Burnett Creek, Wildcat Creek, Wea Creek, and Indian Creek. The Wabash River flows from northeast to southwest through the upper half of Tippecanoe County. Three flood control reservoirs are located upstream from Tippecanoe County which provide control of streamflow in the Wabash River. Huntington Lake began operations in January 1969, Salamonie Lake in 1967, and Mississinewa Lake in 1968 (USGS, 1976). The Tippecanoe River, Burnett Creek, and Wildcat Creek drain the northeastern quarter of the county and join the Wabash River upstream of Lafayette. Two reservoirs are located upstream of the study reach on the Tippecanoe River near Monticello, Indiana. The lakes, Lake Shaffer and Lake Freeman, were not primarily constructed for flood control purposes, but may provide incidental flood relief. Burnett Creek has one major tributary within the study reach, North Fork Burnett Creek, which joins Burnett Creek west of Battle Ground. Wildcat Creek flows from Carroll County and is joined by South Fork Wildcat Creek. Middle Fork Wildcat Creek is tributary to South Fork Wildcat Creek. Wea Creek, which receives the flow from Elliott Ditch and Little Wea Creek, drains the central portion of the county before joining the Wabash River downstream of Lafayette. Indian Creek flows in a southwesterly direction to the Wabash River and drains portions of the northwest quarter of the county.

Residential and commercial development has taken place primarily in Lafayette, West Lafayette, Battle Ground, and other smaller communities which are scattered throughout the county. Some light residential development is scattered in the flood plains of the Wabash River, Indian Creek, Wildcat Creek, the Tippecanoe River, Elliot Ditch and Wea Creek. The flood plains of the other study streams in Tippecanoe County are relatively free from development. The Unincorporated Areas of Tippecanoe County are primarily used for agricultural purposes such as crop and livestock production.

The Town of Battle Ground is situated in the north-central part of Tippecanoe County in the lower northwest quarter of Indiana. It is located approximately 5 miles northeast of Lafayette and West Lafayette. Indianapolis is 60 miles to the southeast. Other nearby communities are Brookston and Delphi to the north and northeast, and Otterbein to the west. According to U.S. Census Data from the year 2010, the Town of Battle Ground was estimated to have a population size of 1,334 (U.S. Census Bureau, 2014).

The Town of Clarks Hill is located in the southeast portion of Tippecanoe County. According to the U.S. Census Data from the year 2010, the community was estimated to have a population size of 611 (U.S. Census Bureau, 2015).

The Town of Dayton is located in the eastern portion of Tippecanoe County. According to the U.S. Census Data from the year 2010, the community was estimated to have a population size of 1,420 (U.S. Census Bureau, 2015).

The City of Lafayette is located in the central portion of Tippecanoe County, in the lower portion of the northwestern quarter of Indiana. It is 60 miles northwest of Indianapolis and 125 miles southeast of Chicago. The Wabash River forms the western boundary, and the rest of the city is surrounded by unincorporated Tippecanoe County. According to Census Data from the year 2010, the City of Lafayette was estimated to have a population size of 67,140 (U.S. Census Bureau, 2014).

The Town of Otterbein is located in the southeast portion of Tippecanoe County. According to the U.S. Census Data from the year 2010, the community was estimated to have a population size of 1,262 (U.S. Census Bureau, 2015).

The Town of Otterbein is located in the west central portion of Tippecanoe County. According to the U.S. Census Data from the year 2010, the community was estimated to have a population size of 1,610 (U.S. Census Bureau, 2015).

The City of West Lafayette is situated in the central portion of Tippecanoe County which is in the lower portion of the northwest quarter of Indiana. It is located approximately 60 miles northwest of Indianapolis, the state capitol, and 125 miles southeast of Chicago, Illinois. It is surrounded on all sides by the Unincorporated Areas of Tippecanoe County. According to U.S. Census Data from the year 2010, the City of West Lafayette was estimated to have a population size of 29,596 (U.S. Census Bureau, 2014).

2.3 Principal Flood Problems

Major floods occur primarily during the winter and spring, but can occur during any season. Two types of storm events cause flooding. During the winter and spring, storms of moderate intensity and long duration, coupled with frozen ground, can cause flooding. During the summer, thunderstorms which have high intensities and relatively short durations can cause floods. During the late winter and early spring, rainfall events are usually of long duration and low intensity. Snowmelt, combined with the added precipitation, can cause flooding.

The principal flooding sources in Tippecanoe County identified for this Flood Insurance Study are the Wabash River, Burnett Creek, Wildcat Creeks, Little Wea Creek, Wea Creek, and Elliott Ditch.

Major recorded floods of the Wabash River, in order of magnitude, occurred in March 1913, May 1943, June 1958, February 1936, January 1950, February 1959, and January 1930 (USGS 1976; USACE 1968; USGS 1977).

Although the Tippecanoe River is tributary to the Wabash River and contributes to flooding conditions, it does not contribute proportionally to the size of its drainage area. This is due primarily to the large number of natural lakes upstream from the study reach. Records of the U.S. Geological Survey (USGS) gaging station on the Tippecanoe River near Delphi show that major flooding occurred in February 1959, June 1958, February 1958, July 1957, and November 1936 (USGS 1976; USGS 1978).

There is no USGS gaging station on Indian Creek, another tributary to the Wabash River; therefore, records are not available for past floods on this stream. It is assumed that flooding occurred on Indian Creek concurrently with flooding on other streams in the area, in March 1913, May 1943, June 1958, and February 1959.

The frequencies of the above-mentioned floods of the Wabash River have been affected by the construction of the three Upper Wabash River reservoirs. It is estimated, however, that a discharge of 131,000 cubic feet per second (cfs) or greater on the Wabash River under the present modified conditions would have a probable frequency greater than a 0.2-annual-chance, and that a discharge of 95,000 cfs would equal about a 1-percent-

annual-chance. The peak discharge of the March 1913 flood was about 190,000 cfs, and the May 1943 flood was about 131,000 cfs (USACE 1968). Both occurred prior to the construction of the reservoirs and most likely would have lower peak discharges if the floods were to occur today.

Elevations and peak discharges for the major floods on the Wabash River at the Lafayette USGS gauging station (no. 03335500) are listed in the following table. The datum of the gage is 503.85 feet NAVD 88 (USGS 1977).

ELEVATIONS AND PEAK DISCHARGES FOR HISTORIC WABASH RIVER FLOODS

Date	Elevation (NAVD)	Peak Discharge (cfs)
March 26, 1913	536.71	190,000*
May 19, 1943	532.31	131,000
June 14, 1958	530.11	99,000
February 27, 1936	529.31	93,500
January 6, 1950	529.21	90,000
February 11, 1959	529.11	89,000
January 16, 1930	528.51	74,600

* Estimated

Elevations and peak discharges for the seven greatest known floods on the Tippecanoe River are presented in the following table (USGS 1976, USGS 1978). The elevations and discharges were recorded at the USGS gaging station near Delphi (no. 03333000). The datum of the gage is 551.72 feet (NAVD).

ELEVATIONS AND PEAK DISCHARGES FOR HISTORIC TIPPECANOE FLOODS

Date	Elevation (NAVD)	Peak Discharge (cfs)
February 10, 1959	566.82	22,600
June 10, 1958	566.44	21,400
February 2, 1968	566.08	20,600
July 17, 1957	566.80	18,800
November 3, 1936	565.22	17,400
April 4, 1950	565.15	17,200
May 18, 1943	564.96	16,900

There is no USGS gauging station on Indian Creek; therefore, records are not available on the elevations reached in the Indian Creek drainage area by these floods. High water marks from past floods were also not identified within this Flood Insurance Study.

The March 1913 flood was the greatest known flood of the Wabash River in Tippecanoe County. Route bridges were destroyed, and farm lands were damaged by erosion and deposition of debris (USACE, 1969; Journal & Courier 1958). Livestock were also lost during that flood (Journal & Courier, 1971). Damages from the 1943 and 1958 floods were also severe as a headline from the Lafayette Journal and Courier, May 19, 1943, indicates: “Loss in Property and Farm Crops Amounts to million” (Journal & Courier, 1943). In 1958, county and state roads were closed, families were evacuated from their

homes, and several homes were covered with floodwaters. Crop damage was again substantial (Journal & Courier 1958).

The extent of damages from the floods of 1913, 1943, 1958, and 1959 on Indian Creek is unknown. Indian Creek does flow through the small community of Klondike, however, and several buildings are located within the flood plain. These buildings may have experienced flood damage during any of the mentioned floods, assuming they were in existence at those times.

Bridges and flood plain development are usually two major influences on flooding conditions. Within the unincorporated areas bordering the Wabash River, however, development is scattered; and the presence of bridges is the primary factor influencing flooding. There are three highway bridges and one railroad bridge that cross the detailed portion of the study reach of the Wabash River. There is one highway bridge and one pedestrian bridge crossing the approximate study reach. The three reservoirs mentioned previously partially control flooding of the Wabash River in Tippecanoe County.

There are no bridges within the study reach which would influence flooding of the Tippecanoe River. The river is, however, subject to backwater flooding from the Wabash River. Indian Creek is crossed by seven county highway bridges and one railroad bridge within the study reach.

A historical flood profile of Burnett Creek is available for the flood in May 1968 (IDNR, 1959, 1966, 1969, 1972, 1975). In addition, it is expected that flooding of Burnett Creek occurred in March 1913, May 1943, June 1958, and February 1959, concurrent with flooding of other streams in Tippecanoe County. Discharge measurements were not made on Burnett Creek during the May 1968 flood. However, based on analysis of miscellaneous discharge measurements on nearby streams and surrounding stream gauging stations, it is estimated that the May 1968 flood had a frequency equivalent to a 50- to 1-percent-annual-chance flood (USGS, 1978). A review of rainfall data indicates that large amounts of rainfall occurred along a band from Logansport, Indiana, to Lafayette, Indiana, during the same flood period (USDOC, 1969). The historic flood profile for Burnett Creek indicates that in May 1968, floodwaters reached elevations of 538.0 feet at the Burnett Road bridge and 602.7 feet at the State Route 43 bridge (IDNR, 1959, 1966, 1969, 1972, 1975). Moderate agricultural damage probably resulted from the floods of 1943, 1958, 1959, and 1968 due to the relative absence of development within the flood plain. Four county four route bridges cross Burnett Creek and one crosses North Fork Burnett Creek within the study reach. Several of these bridges have been enlarged or replaced in recent years, and channel modifications have been made on Burnett Creek. As a result, the impacts that the bridges may have on flood stages have been reduced, although debris may still collect around the bridge structures. Burnett Creek is also subject to backwater flooding from the Wabash River.

The four highest known floods of Wildcat Creek, in order of magnitude, occurred in March 1913, May 1943, June 1958, and February 1959 (USACE, 1968). The highest known floods of South Fork Wildcat Creek occurred in May 1943, June 1958, January 1950, and April 1964 (References USGS, 1976; USGS, 1978). Discharge records are not available on Middle Fork Wildcat Creek, however high water marks were obtained from the June 1958 flood (IDNR, 1959, 1966, 1969, 1972, 1975). It is expected that flooding also occurred on this creek concurrently with flooding on the other streams. Two of the

above-mentioned floods on Wildcat Creek occurred before the installation of the USGS gauging station near Lafayette, but it was still possible to estimate flood frequencies.

It is estimated that a 1-percent-annual-chance frequency flood on Wildcat Creek would have a peak discharge of 28,000 cubic feet per second (cfs) at the gauging station. The peak discharge of the June 1958 flood (25,000 cfs) would equal about a 2-percent-annual-chance flood. A 1-percent-annual-chance frequency flood on South Fork Wildcat Creek would have an estimated discharge of 28,000 cfs. The peak discharge of the June 1958 flood on Wildcat Creek would have a frequency of less than 10 years. A 1-percent-annual-chance frequency on Middle Fork Wildcat Creek would have an estimated discharge of 12,200 cfs. The peak discharge of the June 1958 flood (14,000 cfs) would equal a 100- to 0.2-percent-annual-chance flood. Elevations and peak discharges for the greatest known floods of Wildcat Creek at the USGS gauging station near Lafayette (no. 03335000) are listed in the following table (USACE, 1968). The period of record for this gauging station discussed herein is from May 1954 to the 1979 previous FIS.

ELEVATIONS AND PEAK DISCHARGES FOR HISTORIC
WILDCAT CREEK FLOODS

Date	Elevation (NAVD)	Peak Discharge (cfs)
March 1913	552.91*	Unknown
May 1943	551.91*	Unknown
June 10, 1958	548.91	25,000
June 13, 1958	547.11	19,600
February 10, 1959	546.71	18,400

* Estimated from high water marks.

Data for peak discharges and corresponding elevations for South Fork Wildcat Creek are presented in the following table and were obtained for the USGS gaging station near Lafayette (no. 03334500) (USGS 1976, USGS 1978).

ELEVATIONS AND PEAK DISCHARGES FOR HISTORIC
SOUTH FORK WILDCAT CREEK FLOODS

Date	Elevation (NAVD)	Peak Discharge (cfs)
May 18, 1943	583.11	17,900
June 10, 1958	581.61	12,600
January 4, 1950	581.41	12,000
April 20, 1964	580.91	10,800
December 22, 1967	597.81	8,550
February 10, 1959	581.01*	8,400

*Elevation includes backwater effects of Wildcat Creek

High water marks for the June 1958 flood on Middle Fork Wildcat Creek indicate the flood reached elevations of 582.5 feet at the State Route 26 Bridge and 588.5 feet at the County Road 775 East bridge (IDNR, 1959, 1966, 1969, 1972, 1975).

The floods of March 1913 and May 1943 were the largest known floods on Wildcat Creek. Flooding conditions during these periods and in June 1958 have been previously

described within discussion on the Wabash River. The peak discharge and elevation for this flood at the Lafayette gauging station (no. 03335000) were 10,600 cfs and 542.7 feet, respectively, and were reached on January 27, 1962, (USACE, 1968). Flooding was extensive, yet the flood in 1962 was almost 9.5 feet below the peak elevation reached in May 1943.

The primary factors which influence flooding are the accumulation of debris around bridge structures and the actual configurations of the bridges. Four bridges cross Wildcat Creek within the study reach, two cross North Fork Wildcat Creek, three cross South Fork Wildcat Creek, and three cross Middle Fork Wildcat Creek. There are no USGS gauging stations on Wea Creek, Little Wea Creek, or Elliott Ditch; therefore, few records are available on past floods on these streams.

A historical high water profile has been developed for Wea Creek by the Indiana Department of Natural Resources of the flood of January 1969 (IDNR, 1959, 1966, 1969, 1972, 1975). The profile indicates the flood of January 1969 reached elevations of 541.5 feet at the State Route 25 bridge, 580.5 feet at the U.S. Route 231 bridge, and 620.5 feet at the County Road 150 East bridge. In addition, it is assumed that flooding occurred on these streams concurrently with flooding on other streams in the county in March 1913, May 1943, June 1958, and February 1959. It is estimated that the January 1969 flood on Wea Creek had a frequency of less than a 10-percent-annual-chance flood. The discharges for a 1-percent-annual-chance flood on Wea Creek, Little Wea Creek, and Elliott Ditch at each stream mouth are estimated to be 15,000 cfs, 5,850 cfs, and 2,930 cfs, respectively.

Damages from the floods of 1913, 1943, 1958, 1959, and 1969 were probably agricultural in nature due to the relative absence of development within the flood plains.

Bridges are the primary factors influencing flooding on Wea Creek and its tributaries. Wea Creek has six bridge crossings, Little Wea Creek has four, and Elliott Ditch has eight. Debris can collect against the piers of bridges and block floodwaters. Bridge configuration such as low structures and high overbank bridge approaches can also block floodwaters and cause backwater to develop.

2.4 Flood Protection Measures

Three flood control reservoirs are located upstream from Tippecanoe County which provides partial flood control for the Wabash River. The reservoirs and their beginning dates of operation are as follows: Salamonie Lake, April 1967; Mississinewa Lake, April 1968; and Huntington Lake, January 1969. Two reservoirs located in White and Carroll Counties, Lake Shaffer and Lake Freeman, may provide incidental flood reduction for the Tippecanoe River, although they were not constructed solely for that purpose. A comprehensive land use plan regulates land use of flood plains (Tippecanoe County APC, 2006). The ordinance is enforced in all unincorporated areas of the county by the Tippecanoe County Area Plan Commission. In addition, the Indiana Flood Control Act of 1945 requires that proposed construction within flood plains be approved by the Indiana Natural Resources Commission (State of Indiana, 1945).

A levee system is located along the Wabash River in the City of Lafayette. Please refer to the corresponding Flood Insurance Rate Map (FIRMs) panels for the protection status of this levee system.

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 0.2-percent-annual-chance 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 0.2-percent-annual-chance 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 1-percent-annual-chance flood (1-percent chance of annual exceedence) in any 2-percent-annual-chance 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 the September 1980 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 the flooding sources studied in detail affecting the county.

Precountywide Analyses

The hydrologic analyses described in the previously printed FIS reports for each community have been compiled and are summarized below.

Battle Ground, Town of

Discharge curves for the 10-, 50-, 100-, and 0.2-percent-annual-chance floods were developed for Burnett Creek using several different procedures and compared for consistency. There are no known planned activities which might significantly affect the discharge values that have been developed. Because the study stream is ungauged and historic peak discharge data are unavailable, estimates of flood characteristics were made based on regional gage data. The following USGS gauging stations on the Wabash River tributary streams were used because they have watershed characteristics similar to Burnett Creek (USGS, 1976, 1977).

Frequency-discharge data for the selected gauging stations were developed by the DNR using the log-Pearson Type III distribution and a regional skew value of -0.2. The regional skew value was developed in accordance with the U.S. Water Resources Council Bulletin No. 17 (USWRC 1976). USGS Circular No. 710 describes a multiple-regression analysis which uses the relationships between floods and drainage basin characteristics to develop frequency discharges (USGS, 1974). Other procedures applied

to Burnett Creek to obtain discharges were: the DNR regression procedure; a USGS regression procedure which uses different aerial skew and standard deviation values; and an SCS procedure for relating discharges to small drainage areas (IDNR, 1977).

The discharges obtained from each method were then plotted by frequency against drainage areas and a line of best fit was drawn through the data points. In developing the frequency curves, consideration was given to the relative locations of stream gages to the study reach, the basin characteristics, and other hydrologic factors. These data were coordinated with the Indiana offices of the SCS, the USGS, and the Louisville District COE through a memorandum of understanding dated May 6, 1976.

Lafayette, City of

Standard and accepted hydrologic methods were used to develop discharge data on the Wabash River and Elliott Ditch (USGS, 1973, 1974, 1975; IDNR 1977, 1976; USWRC 1976). These data were coordinated with the IDNR, the SCS, the USGS, and the Louisville District COE, through a memorandum of understanding dated May 6, 1976.

Frequency discharge curves for the 10-, 50-, and 1-percent-annual-chance floods were developed for the Wabash River by the Louisville District COE. In developing the discharges, consideration was given to the impacts of the three flood control reservoirs on downstream flooding.

The 0.2-percent-annual-chance frequency discharge for modified conditions was determined after careful examination of existing historic flood profiles and their associated discharges. The complexity of the hydraulics and the associated flood routing computations made it necessary to establish a discharge representing a severe magnitude of occurrence. It was determined that the 1943 flood discharge equals or exceeds a 0.2-percent-annual-chance flood, and that it would be used since it is a historic flood that would produce a flood profile for comparison purposes.

The use of the 1943 flood discharge was reviewed with the FIA and coordinated with the IDNR, the SCS, the USGS, and the COE. The resulting discharge versus drainage area plot, in addition to the plots developed by the COE for the 10-, 50-, and 100-year floods, were selected as the final values for use in the Lafayette Flood Insurance Study. There are no known planned activities which might significantly affect the discharge values that have been developed.

Tippecanoe County, Unincorporated Areas

Standard and accepted hydrologic methods were used to develop discharge data on the study streams in Tippecanoe County (USGS, 1973, 1974, 1975, IDNR 1977, 1976, USGS 1977). These data were coordinated with the Indiana Department of Natural Resources, the SCS, the USGS, and the Louisville District COE through a memorandum of understanding dated May 6, 1976.

Frequency-discharge data for the lower reach of the Wabash River, including the Lafayette stream gauging station, were developed by the Louisville District COE (USACE, 1968). Several relationships were examined to establish frequency-discharge data for the upper end of the Wabash River study reach, which had not been included in

the COE investigation. The records of the USGS gauging stations at Logansport (NO. 03329000, 52 years of record), Peru (No. 03327500, 35 years) and Delphi (No. 03329500, 32 years; discontinued in 1971) were reviewed. Frequency analyses of peak discharges were computed for the period of record prior to the Upper Wabash River reservoirs and for the period of record after the reservoirs went into operation. The analyses used were log-Pearson Type III distribution and a regional skew value of -0.2. The regional skew value was developed in accordance with U.S. Water Resources Bulletin No. 17 (USWRC, 1976).

Regression equations developed by the USGS (USGS, 1974), which use relationships between floods and drainage basin characteristics were used to develop frequency discharges. Indiana Department of Natural Resources regression equations (IDNR, 1977) which uses relationships between floods and drainage basin characteristics to develop frequency discharges and a statistical analysis of gage data (USWRC, 1976) were also used.

The 0.2-percent-annual-chance frequency-discharge was not determined by the COE. The complexity and magnitude of the hydraulics and associated flood routing calculations did not warrant making the computation for this study. Therefore, it was necessary to establish a discharge representing a severe magnitude of occurrence. After careful evaluation of existing historic profiles and discharges, it was determined that the 1943 flood should be used since it was a flood that had a peak discharge in excess of the probable 0.2-percent-annual-chance peak discharge. The use of the 1943 flood discharge was reviewed and approved by the Forest Inventory and Analysis National Program (FIA), and coordinated with the Indiana Department of Natural Resources, the SCS, the USGS and the COE. Discharge curves for Wildcat Creek, Middle Fork, Wildcat Creek and South Fork Wildcat Creek were developed by the Indiana Department of Natural Resources through their coordination procedure with uses a regression equation (IDNR, 1977).

Discharge curves for the 10-, 50-, 100- and 0.2-percent-annual-chance floods for Burnett Creek, Wea Creek, Little Wea Creek and Elliott Ditch were developed using log-Pearson Type III distribution, regression equations developed by USGS (USGS, 1974), SCS method for comparing basin characteristics (USGS 1973). These study streams are ungauged, and actual flood peak data are unavailable, therefore, estimates of flood characteristics were made based on regional gage data. The following Wabash River tributary stream gauging stations were analyzed either because they are on a study stream or because they have watershed characteristics similar to the streams in Tippecanoe County (USGS, 1976; USGS 1977; USGS 1978).

STREAM GAUGES USED IN DEVELOPING FREQUENCY CURVES

Stream and Location	Gauge Number	Years of Record
Tippecanoe River near Delphi	03333000	39
South Fork Wildcat Creek near Lafayette	03334500	35
Wildcat Creek near Lafayette	03335000	24

STREAM GAUGES USED IN DEVELOPING
FREQUENCY CURVES *(continued)*

Stream and Location	Gauge Number	Years of Record
Wildcat Creek at Owasco	03334000	30
Wildcat Creek at Kokomo	03333700	23
Deer Creek	03329700	35
Big Pine Creek near Williamsport	03335700	23

The discharges obtained from each method were then plotted by frequency against drainage areas and a "best fit" line was drawn through the data. In developing the frequency curves, consideration was given to the relative locations of the stream gages to each study reach, the basin characteristics, and other hydrologic parameters. The discharges were coordinated with the Indiana Department of Natural Resources, and the resulting frequency discharge versus drainage area plots were selected as the final values for use in the Tippecanoe County Flood Insurance Study. Discharge values for these stream reaches identified for approximate study were included in the previously-described coordination and determination efforts.

Several natural overflow areas are specified in this Flood Insurance Study. One is shown north of Lafayette, where Wabash River backwater combines with headwater flooding from Wildcat Creek. The water then flows southwesterly along the alignment of the Old Erie Canal and the Louisville and Nashville Railroad. A common overflow generally occurs between Wildcat Creek and South Fork Wildcat Creek at the confluence of the two streams. One is also shown between South Fork Wildcat Creek and Middle Fork Wildcat Creek upstream of the State Route 26 Bridge.

Discharges for these divided flow areas were determined by an iterative HEC-2 subroutine (USACE, 1974). Discharges were assumed for each flow, elevations were then determined at the confluence point. This procedure was repeated, adjusting the discharges until the confluence elevations were equal.

West Lafayette, City of

Standard and accepted hydrologic methods were used to develop discharge data on the Wabash River (USGS, 1973, 1974, 1975; IDNR 1977, 1976; USWRC 1976). These data were coordinated with the IDNR, the SCS, the USGS, and the Louisville District COE, through a memorandum of understanding dated May 6, 1976.

Frequency discharge curves for the 10-, 50-, and 100-year flood were developed for the Wabash River by the Louisville District COE. In developing the discharges, consideration was given to the impacts of the three flood control reservoirs on downstream flooding. The 0.2-percent-annual-chance frequency discharge for modified conditions was determined after careful examination of existing historic flood profiles and their associated discharges. The complexity of the hydraulics and the associated flood routing computations made it necessary to establish a discharge representing a severe magnitude of occurrence. It was determined that the 1943 flood discharge equals

or exceeds a 0.2-percent-annual-chance flood, and that it would be used since it is a historic flood that would produce a flood profile for comparison purposes.

The use of the 1943 flood discharge was reviewed with the FIA and coordinated with the IDNR, the SCS, the USGS, and the COE. The resulting discharge versus drainage area plot and the plots developed by the COE for the 10-, 50-, and 100-year floods were selected as the final values for use in the West Lafayette Flood Insurance Study. There are no known planned activities which might significantly affect the discharge values that have been developed.

The discharge for the 0.2-percent-annual-chance flood is the peak discharge for the 1943 flood. This historic discharge was selected because it represents a discharge which is of rare occurrence.

September 25, 2009
Initial Countywide FIS Report

Information on the methods used to determine peak discharge-frequency relationships for the streams restudied as part of this countywide FIS is shown below.

Peak discharges for the selected recurrence intervals on the Cole Ditch watershed study (Cole Ditch, Cuppy Ditch, Unnamed Tributary Cole Ditch 1, Unnamed Tributary Cole Ditch 2) were determined from a HEC-1 hydrologic model. Published coordinate discharge curves for waterways in Indiana were used to determine discharges in the East Branch Wea Creek and Indian Creek studies. The Tippecanoe River discharge was also determined using published discharge curves and verified using 100-year discharge numbers from USGS gauging station near the Delphi, Indiana.

March 15, 2012
Physical Map Revision

No hydrologic analyses were performed for the March 15, 2012, PMR.

This Physical Map Revision

The hydrologic analysis for Elliott Ditch was provided by Christopher B. Burke Engineering, LLC.

A summary of the drainage area-peak discharge relationships for all the streams studied by detailed methods is shown in Table 4, "Summary of Discharges."

Table 4 - Summary of Discharges

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Burnett Creek					
At the confluence with Wabash River	53.70	3,450	5,500	6,400	8,250
Just upstream of Indian Highway 225 (Downstream bridge)	51.00	3,350	5,300	6,200	8,000
Just downstream of Indian Highway 225 (Upstream bridge)	47.90	3,180	5,050	5,900	7,600
Above State Route 43	44.40	3,000	4,800	5,580	7,200
Cole Ditch					
At confluence Unnamed Tributary 2	11.76	1,490	2,662	3,296	4,500
Just upstream of Cole Ditch Unnamed Tributary 1	6.10	608	1,058	1,298	1,800
Just upstream of Cuppy Ditch	1.75	373	656	806	1,100
Cuppy Ditch – McClure Drain					
At confluence with Cole Ditch	4.35	237	406	498	700
Cole Ditch Unnamed Tributary 1					
At confluence with Cole Ditch	2.50	325	607	764	1050
Cole Ditch Unnamed Tributary 2					
At confluence with Cole Ditch	1.26	271	476	585	800
East Branch Wea Creek					
At confluence with Wea Creek	28.6	*	*	5,340	*
At confluence with Blikenstaff Ditch	24.8	*	*	4,910	*
At confluence with Platt Ditch	17.0	*	*	3,940	*
At confluence with Unnamed Tributary	14.4	*	*	3,570	*
Elliott Ditch					
At confluence with Wea Creek	19.25	1,800	2,980	3,560	5,130
At U.S. Highway 231	18.72	1,730	2,850	3,410	4,910
Just upstream of Kirkpatrick Ditch	13.43	1,060	1,730	2,060	2,950
At County Road 100 East	12.54	962	1,560	1,850	2,660
At County Road 250 East	10.68	760	1,220	1,450	2,080
Just upstream of Wilson Ditch	6.39	390	691	844	1,260
State Road 38/25	4.70	278	496	607	912

*Data not available

Table 4 - Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Indian Creek					
Just upstream of Jackson Highway	13.44	1,650	2,500	2,930	*
Just upstream of Highway 52	10.21	1,400	2,150	2,500	*
Little Wea Creek					
At confluence with Wea Creek	33.4	3,050	4,900	5,850	7,600
At County Road 500 South	27.8	2,730	4,400	5,200	6,760
Just Upstream of Louisville & Nashville Railroad Bridge	18.4	2,150	3,450	4,100	5,330
Middle Fork Wildcat Creek					
At confluence with Wildcat Creek	121	5,700	7,000	7,500	8,400
Just upstream of State Route 26	120	6,600	10,400	12,200	16,200
South Fork Wildcat Creek					
At confluence with Wildcat Creek	372	11,500	18,300	21,700	28,600
Just upstream of Middle Fork Wildcat Creek	243	9,200	14,700	17,500	23,000
Tippecanoe River					
At confluence with Wabash River	1,950	*	*	29,000	*
Just upstream of Moots Creek	1,896	*	*	28,000	*
Just upstream of Spring Creek	1,869	*	*	27,000	*
At Delphi USGS Gauging Station	1,865	*	*	27,000	*
Just upstream of Big Creek	1,794	*	*	26,000	*
Wabash River					
Just upstream of Jordan Creek	7,448	62,500	86,000	95,000	131,000
At Brown Street	7,267	62,500	86,000	95,000	131,000
Just upstream of confluence with Wildcat Creek	6,398	56,000	77,000	86,000	117,000
Just upstream of confluence with Tippecanoe River	4,400	50,000	69,000	79,000	107,000
Wea Creek					
At confluence with Wabash River	163	7,800	12,700	15,000	19,500
Just upstream of Little Wea Creek	126	6,700	10,800	12,800	16,600
Just upstream of Elliott Ditch	106	6,100	9,800	11,700	15,200

*Data not available

Table 4 - Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Wildcat Creek					
At confluence with Wabash River	805	18,000	25,000	28,000	36,500

*Data not available

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source 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.

Cross sections were determined from topographic maps and field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. All topographic mapping used to determine cross sections are referenced in Section 4.1.

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 (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.

Precountywide Analyses

Each incorporated community within, and the Unincorporated Areas of Tippecanoe County, with the exception of the Town of Dayton has a previously printed FIS report. The hydraulic analyses described in those reports have been compiled and are summarized below.

Battle Ground, Town of

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along the flooding source studied in detail.

An evaluation of topographic information (USGS 1962) was the basis for determining the specific valley cross sections to be surveyed. Field crews surveyed cross sections at specified locations to elevations just greater than the estimated 0.2-percent-annual-

chance flood. The cross sections were positioned with respect to identifiable field features for easy location and were perpendicular to the channel and flood plain flow. The two highway bridges within the study reach were also surveyed, and measurements were obtained to define the waterway openings under the bridges; the number, type, and dimensions of piers; and the width of bridges in the direction of stream flow. Road profiles, including overbank areas, were also established at each bridge crossing.

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 (Exhibit 2).

Roughness factors (Manning's "n") were determined by field observation and comparison of field photographs of the study channel and overbanks with standard roughness. The ranges for the stream channel of Burnett Creek were 0.030 to 0.100 and for the overbanks were 0.030 to 0.120. The 1968 historical flood profile was matched to verify the roughness factors developed and to determine the effects the bridges could reasonably be expected to have on computed frequency profiles.

Using data obtained from cross sections, estimated roughness factors, and the geometry for bridge structures, a HEC-2 computer model was developed (USACE 1974_1, 1974_2, 1976). The estimated discharge for the May 1968 flood was used to reproduce the historical flood profile (IDNR 1975). This calibrated model was run to develop 10-, 50-, 100-, and 0.2-percent-annual-chance profiles.

The starting water-surface elevation was developed within the HEC-2 computer model using the slope-area procedure (USACE 1976). The starting water-surface elevation was estimated at the mouth of Burnett Creek, and the flood profile developed as part of the Tippecanoe County Flood Insurance Study (USDHUD 1980) was computed through Battle Ground.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

Lafayette, City of

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each flooding source studied in detail.

The original Wabash River HEC-2 model was developed by the IDNR using two-foot contour maps at a scale of 1:2,400, to locate cross sections and determine elevations for overbank extensions (IDNR, 1966). For Elliott Ditch, the cross sections were determined from field surveys. A HEC-2 model was developed to determine elevations for overbank extensions. Field surveys performed for a previous study were used to describe channel sections and bridges (IDNR, 1968).

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.

The values of "n," the Manning roughness factor, for the Wabash River channel and overbanks were developed by the IDNR and verified by matching the floods of June 1958 and December 1966. The summer flood had higher roughness factors than the winter flood due to the associated vegetation growth. Average "n" values reproduced a flood slightly lower and higher in elevation than the floods of 1958 and 1966, respectively. For the stream channel, the range of "n" was from 0.030 to 0.045 and for the overbanks was from 0.045 to 0.060 (IDNR, Unpublished). For Elliott Ditch, the range of "n" was from 0.035 to 0.100 in the channel and 0.035 to 0.120 in the overbank.

The starting water-surface elevations for the Wabash River, as well as the other model input data, were defined by the IDNR in preparation of the HEC-2 model. The elevations were determined from a stage-discharge curve, which was produced by evaluating the stream rating curves for the initial cross section and the Brown Street stream gauging station (no. 03335500). The starting water-surface elevation for Elliott Ditch was determined by the slope-area method.

An analysis of the hydraulic characteristics of the Wabash River was performed by the IDNR to determine a flood elevation and associated floodway for the 100-year flood (IDNR Unpublished). A computer model (HEC-2) was developed to determine the flood elevation, and it required input data consisting of cross section configurations, bridge geometries, and estimated roughness factors (IDNR, 1966).

The original program prepared by the IDNR was acquired and modified to reflect 1980 conditions and was extended to include the total Wabash River study reach in Tippecanoe County. Historic high water profiles, developed by the IDNR for the floods of June 1958 and December 1966, were verified prior to developing the 10-, 50-, 100-, and historic year flood profiles for the total study reach. Data pertinent to the Lafayette Flood Insurance Study were extracted from this modified program.

The hydraulic analyses for the 1980 FIS study were based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

Tippecanoe County, Unincorporated Areas

Analyses of the hydraulic characteristics of the streams in the county were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each flooding source studied in detail.

The cross section data for the Wabash River was developed using two-foot contour, 1:2400 scale maps (IDNR, 1966) to locate cross sections and to determine elevations for overbank extensions. The HEC-2 model for Wildcat Creek was developed from 5-foot contour maps with 2.5-foot supplemental contours at 1:2400 scale (USACE, 1966). Field surveys performed for a Flood Plain Information Report for Wabash River and Wildcat

Creek (USACE, 1968) and the field data for an IDNR model for Wildcat Creek, which was never completed, were used to describe channel sections and bridges. The models were extended and modified for the Tippecanoe County study reaches by using field survey data developed for the September 1980 Flood Insurance Study.

Locations of valley cross sections on Wea Creek were determined from evaluation of Indiana Department of Natural Resources maps at a scale of 1:6,000 (IDNR, 1977), and of the other study streams from USGS topographic maps at a scale of 1:24,000 (USGS 1962, 1961). Field crews surveyed the cross sections to elevations just greater than those considered required for the 0.2-percent-annual-chance flood. The cross sections were positioned with respect to identifiable field features for easy location and perpendicular to the channel and flood plain flow.

Each bridge within the study reaches was also surveyed; and measurements were obtained to define the waterway openings under the bridges, the number, type, and dimensions of piers, and the width of bridges in the direction of streamflow. Road profiles, including overbank areas, were also established at each bridge crossing.

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.

The values of "n," the Manning roughness factor, were developed by the Indiana Department of Natural Resources for the Wabash River and by both the Indiana Department of Natural Resources and the COE for Wildcat Creek (USACE 1968, IDNR Unpublished) by matching profiles and field observation. The “n” values were verified by matching the resulting profiles with historic flood profiles (IDNR 1959, 1966, 1969, 1972, 1975). Roughness factors for the remaining stream reaches were determined by field observation and by comparison of field photographs of the study channel and overbanks with standard roughness.

West Lafayette, City of

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along the flooding source studied in detail.

The original HEC-2 model (USACE, 1976) was developed using maps at a scale of 1:2,400, with a two-foot contour interval to locate cross sections and to determine elevations for overbank extensions (IDNR 1966). Field surveys performed for a previous study were used to describe channel sections and bridges (IDNR 1968). The model was extended for the Tippecanoe County study reach by using field survey data developed for the 1980 Flood Insurance Study.

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 (Exhibit 2).

The values of "n," the Manning roughness factor, for the Wabash River channel and overbanks were developed by the IDNR and verified by matching the floods of June

1958 and December 1966. The summer flood had higher roughness factors than the winter flood due to the associated vegetation growth. Average "n" values reproduced a flood slightly lower and higher in elevation than the floods of 1958 and 1966, respectively. For the stream channel, the "n" ranged from 0.030 to 0.045 and for the overbanks ranged from 0.045 to 0.060 (IDNR, Unpublished).

The starting water-surface elevations, as well as the other model input data, were defined by the IDNR in preparation of the HEC-2 model. The elevations were determined from a stage-discharge curve, which was produced by evaluating the stream rating curves for the initial cross section and the Brown Street stream gauging station (no. 03335500) with 55 years of record, through 1976.

Analyses of the hydraulic characteristics of the Wabash River were performed by the IDNR to determine a flood elevation and associated floodway for the 100-year flood (IDNR, Unpublished). A computer model (HEC-2) was developed to determine the flood elevation; and it required input data consisting of cross section configurations, bridge geometries, and estimated roughness factors (IDNR, 1966).

The 1979 program prepared by the IDNR was acquired and modified to reflect present conditions and was extended to include the total Wabash River study reach in Tippecanoe County. Historic high water profiles, developed by the IDNR for the floods of June 1958 and December 1966, were verified prior to developing the 10-, 50-, 100-, and historic year flood profiles for the total study reach. Data pertinent to the West Lafayette 1980 Flood Insurance Study were extracted from this modified program.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during the 1980 FIS study.

September 25, 2009
Initial Countywide FIS Report

Information on the methods used to determine peak discharge-frequency relationships for the streams restudied as part of this countywide FIS is shown below.

Cross sections of the Cole Ditch Drainage Basin #9 leverage study were delineated using Tippecanoe County two-foot topographic map data with HEC-GeoRAS. Culvert data was collected by the IDNR's Division of Water's engineering section in September of 2002, and bridge data in October of 2002. Channel roughness coefficients of 0.035 – 0.040 were assigned to the channel and 0.050-0.100 to the overbanks depending on conditions. HEC-RAS version 3.0.1 was used to determine water surface elevations, and normal depth was used as a starting water surface elevation.

Cross sections of the East Branch Wea Creek study were obtained from 2 foot contour mapping of Tippecanoe County. Bridge geometry was determined by field inspection. Flood elevations and floodway extent were computed using the U.S. Army Corps of Engineers HEC-RAS program, version 3.0.1.

Cross sections of the Indian Creek study were located using 2 foot contour mapping of Tippecanoe County. Much cross section and bridge data was taken from previous studies of the river. Flood elevations and floodway extent were computed using the U.S. Army Corp of Engineers HEC-RAS program, version 3.0.

Cross sections from the Tippecanoe River study were taken from the Tippecanoe River two-foot contour mapping from the mouth to Oakdale Dam developed by Dickerson Aerial Surveys Inc. in 1996. Bridge data was acquired through field survey and construction drawings. The hydraulic model was calibrated determining Manning's n values for the overbanks and channel. The recorded discharge at the Delphi gauging station and the slope of the coordinated curve between the Delphi and Ora stream gauges were used to estimate the stream flows during the 1985 flood event. Channel and overbank n-values of 0.03 and 0.07 respectively were determined to be the most appropriate. Starting water surface elevation coincides with the 100-year elevation of the Wabash River at its confluence with the Tippecanoe River.

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

In accordance with FEMA Memo 36, profile baselines have been put into all areas of detailed study. Profile baselines are shown in the location of the original work without regard to the redelineation or floodplain adjustment to the new base map. This is to maintain the relationship to the hydraulic models, floodway data tables, and profiles.

March 15, 2012
Physical Map Revision

No hydraulic analyses were performed for the March 15, 2012, PMR.

This Physical Map Revision

The hydraulic analysis for Elliott Ditch was provided by Christopher B. Burke Engineering, LLC.

Stream and Valley cross sections were developed from the 2013 Tippecanoe County Digital Elevation Model (DEM) using the USACE, HEC computer program, HEC-GeoRAS. All bridge and culvert data for Elliott Ditch were obtained from field measurements and survey data collected by and obtained by the IDNR.

Starting water surface elevations (WSELs) for Elliott Ditch were estimated by using the slope-area method or normal depth. For the floodway, the starting WSEL was determined by adding 0.1-feet to the water surface computed by the 1-percent annual change USACE, HEC computer program, HEC-RAS, version 4.1 model.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and floodplain areas. Roughness factors for all streams studied by detailed methods are shown in Table 5.

Table 5 - Summary of Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Burnett Creek	0.030 – 0.080	0.030 – 0.120
Cole Ditch	0.035 – 0.040	0.050 – 0.100
Cole Ditch Unnamed Tributary 1	0.035 – 0.040	0.050 – 0.100
Cole Ditch Unnamed Tributary 2	0.035 – 0.040	0.050 – 0.100
Cuppy Ditch	0.035 – 0.040	0.050 – 0.100
East Branch Wea Creek	0.035 – 0.040	0.050 – 0.100
Elliott Ditch	0.045 – 0.050	0.060 – 0.200
Indian Creek	0.035 – 0.040	0.050 – 0.100
Little Wea Creek	0.035 – 0.080	0.035 – 0.100
Middle Fork Wildcat Creek	0.055	0.060 – 0.075
South Fork Wildcat Creek	0.035 – 0.040	0.040 – 0.060
Tippecanoe River	0.035 – 0.040	0.050 – 0.100
Wabash River	0.030 – 0.045	0.045 – 0.060
Wea Creek	0.035 – 0.060	0.035 – 0.070
Wildcat Creek	0.040 – 0.055	0.040 – 0.075

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 the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevation shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevation in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in base flood elevations across the corporate limits between the communities.

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

The Flood Profiles, Floodway Data and Base (1-percent-annual-chance) Flood Elevations (BFEs) in the pre-countywide FIS reports, are in NGVD 29. These were converted to NAVD 88 by applying the conversion factor of **-0.3 ft.** to each detailed study stream in the effective FIS reports (**NGVD 29 - 0.3 ft. = NAVD 88**).

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- 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 Elevation tables. 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 (0.2-percent-annual-chance) flood is employed to indicate additional areas of flood risk in the county. For the streams studied in detail, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using digital base map information provided by the Tippecanoe County Geographic Information System (GIS) Department. This data includes March 2002 orthophotography and contours at two foot intervals; referenced to an Indiana State Plane coordinate system, NAD 83 horizontal datum, and NAVD 88 vertical datum

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

Floodplain boundaries along Cole Ditch, Cole Ditch Unnamed Tributary 1, Cole Ditch Unnamed Tributary 2, Cuppy Ditch, East Branch Wea Creek, Indian Creek, and Tippecanoe River, were delineated using topographic maps by the IDNR. These topographic maps were with contour intervals of 2 feet.

Floodplain boundaries for Elliott Ditch were delineated using the Digital Elevation Model (DEM) as a work map. The DEM has a 5-foot cell size which is equivalent to 2-foot contours. The 2-foot contours were generated from the DEM on hardcopy maps for visualization purposes only.

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 minimum standards 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 for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain or else established administratively without analysis. 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 (Table 6). 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.

The floodway for Hadley Pond is established administratively without engineering analysis from just upstream of Morehouse Road to just downstream of County Road 250.

Portions of the floodways for Tippecanoe River extend beyond the county boundary.

Near the confluences 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 Tables for certain downstream cross sections 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.

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 6, "Floodway Data." In order 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.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Burnett Creek								
A	0.050	550	1,295	4.9	534.2	519.7[2]	519.8	0.1
B	0.464	635	2,003	3.2	534.2	526.7[2]	526.8	0.1
C	1.006	800	2,774	2.3	534.2	533.9[2]	534.0	0.1
D	1.178	645	1,181	5.4	536.3	536.3	536.4	0.1
E	1.257	680	3,371	1.9	537.5	537.5	537.6	0.1
F	1.508	660	2,547	2.5	539.6	539.6	539.7	0.1
G	1.625	650	995	6.4	540.9	540.9	541.0	0.1
H	1.653	620	2,990	2.1	541.9	541.9	542.0	0.1
I	2.044	480	2,427	2.6	546.8	546.8	546.9	0.1
J	2.404	420	2,156	3.0	551.9	551.9	552.0	0.1
K	2.878	600	1,954	3.3	559.2	559.2	559.2	0.0
L	3.063	180	1,235	5.2	561.9	561.9	562.0	0.1
M	3.312	505	1,675	3.8	566.9	566.9	567.0	0.1
N	3.508	440	1,869	3.4	571.1	571.1	571.1	0.0
O	3.768	525	2,276	2.7	574.8	574.8	574.9	0.1
P	4.266	635	2,633	2.2	580.2	580.2	580.3	0.1
Q	4.539	220	923	6.4	583.7	583.7	583.8	0.1
R	4.739	600	2,987	2.0	586.8	586.8	586.9	0.1
S	5.184	255	1,611	3.7	591.0	591.0	591.1	0.1
T	5.617	585	3,233	1.8	594.4	594.4	594.5	0.1
U	6.214	445	1,777	3.3	598.3	598.3	598.4	0.1
V	6.600	310	1,909	3.1	602.6	602.6	602.7	0.1
W	6.788	505	2,473	2.3	604.6	604.6	604.7	0.1
X	6.885	540	2,038	2.7	605.6	605.6	605.7	0.1

[1] Miles above confluence with Wabash River

[2] Elevations without considering backwater from Wabash River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Burnett Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cole Ditch								
A	207	190	665	5.0	627.1	627.1	627.1	0.0
B	944	270	986	2.8	629.5	629.5	629.5	0.0
C	1,409	290	809	3.4	630.3	630.3	630.4	0.1
D	1,920	330	1,132	2.5	631.8	631.8	631.8	0.0
E	2,459	295	1,048	2.6	632.7	632.7	632.7	0.0
F	3,124	305	873	3.2	633.7	633.7	633.7	0.0
G	3,509	105	399	6.9	635.4	635.4	635.5	0.1
H	4,059	320	987	2.8	638.7	638.7	638.8	0.1
I	5,676	290	2,658	1.0	646.6	646.6	646.7	0.1
J	6,248	245	2,070	1.3	646.7	646.7	646.7	0.0
K	6,473	260	2,089	1.3	646.7	646.7	646.7	0.0
L	6,843	260	2,068	1.3	646.8	646.8	646.8	0.0
M	7,326	130	862	3.1	646.8	646.8	646.8	0.0
N	7,758	145	741	3.6	647.2	647.2	647.2	0.0
O	8,421	169	668	1.9	648.2	648.2	648.3	0.1
P	9,049	359	1,666	0.8	648.4	648.4	648.5	0.1
Q	9,705	444	1,426	0.9	648.5	648.5	648.6	0.1
R	11,213	105	223	3.6	651.6	651.6	651.6	0.0
S	12,303	140	262	3.1	656.9	656.9	657.0	0.1
T	13,103	52	159	5.1	660.0	660.0	660.1	0.1
U	14,113	57	174	4.6	664.0	664.0	664.1	0.1
V	15,244	130	272	3.0	668.0	668.0	668.0	0.0
W	15,676	145	264	3.1	669.2	669.2	669.3	0.1

[1] Feet above confluence with Burnett Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Cole Ditch

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cole Ditch Unnamed Tributary 1								
A	799	81	388	2.0	647.6	646.3[2]	646.4	0.1
B	1,266	83	183	4.2	648.4	648.4	648.4	0.0
C	2,091	76	251	3.1	653.3	653.3	653.3	0.0
D	2,909	139	267	2.9	655.5	655.5	655.6	0.1
E	3,497	48	137	5.6	658.2	658.2	658.3	0.1
F	4,073	50	173	4.4	661.2	661.2	661.2	0.0
G	4,602	75	186	4.1	663.2	663.2	663.2	0.0
H	6,133	60	107	7.1	667.7	667.7	667.8	0.1
I	6,944	78	236	3.2	672.5	672.5	672.5	0.0
J	7,244	60	200	3.8	673.2	673.2	673.2	0.0
K	7,808	60	120	3.8	675.3	675.3	675.3	0.0
L	8,768	230	230	0.9	681.5	681.5	681.5	0.0
M	9,328	60	119	3.9	682.3	682.3	682.2	-0.1
N	9,758	126	170	2.7	684.2	684.2	684.3	0.1
O	10,423	142	147	3.1	688.3	688.3	688.4	0.1
P	11,481	117	373	1.2	693.7	693.7	693.7	0.0
Q	11,947	65	175	2.6	693.9	693.9	693.9	0.0
R	12,332	97	210	2.2	694.3	694.3	694.4	0.1

[1] Feet above confluence with Cole Ditch

[2] Elevations computed without consideration of backwater effects from Cole Ditch

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Cole Ditch Unnamed Tributary 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cole Ditch Unnamed Tributary 2								
A	341	155	156	3.7	627.6	626.5[2]	626.5	0.0
B	1,089	84	154	3.8	630.5	630.5	630.5	0.0
C	1,611	111	178	3.3	633.2	633.2	633.2	0.0
D	2,071	75	139	4.2	635.2	635.2	635.3	0.1
E	2,480	62	104	5.6	637.5	637.5	637.5	0.0
F	2,803	65	113	5.2	640.5	640.5	640.5	0.0
G	3,605	70	158	3.7	644.1	644.1	644.1	0.0
H	4,826	101	305	1.9	652.5	652.5	652.6	0.1
I	5,610	80	155	3.8	654.9	654.9	654.9	0.0

[1] Feet above confluence with Cole Ditch

[2] Elevations computed without consideration of backwater effects from Cole Ditch

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Cole Ditch Unnamed Tributary 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cuppy Ditch								
A	254	96	258	1.9	649.6	649.6	649.6	0.0
B	1,624	65	243	2.1	652.2	652.2	652.2	0.0
C	2,403	70	196	2.5	652.6	652.6	652.6	0.0
D	3,107	200	499	1.0	652.9	652.9	653.0	0.1
E	3,575	200	700	0.7	653.0	653.0	653.0	0.0
F	4,043	91	205	2.4	653.0	653.0	653.1	0.1
G	4,677	347	1,453	0.3	653.2	653.2	653.3	0.1
H	5,234	339	1,060	0.5	654.5	654.5	654.6	0.1

[1] Feet above confluence with Cole Ditch

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Cuppy Ditch

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
East Branch Wea Creek								
A	500	540	1,651	3.2	684.1	684.1	684.2	0.1
B	1,400	612	2,120	2.5	687.5	687.5	687.6	0.1
C	2,867	738	2,228	2.4	689.2	689.2	689.3	0.1
D	3,768	526	1,347	4.0	690.6	690.6	690.8	0.2
E	4,652	528	2,959	1.8	695.8	695.8	695.8	0.0
F	5,777	429	1,915	2.8	696.6	696.6	696.8	0.2
G	6,789	594	2,037	2.6	698.3	698.3	698.4	0.0
H	8,300	450	1,512	3.5	701.3	701.3	701.5	0.2
I	9,650	673	2,053	2.6	704.0	704.0	704.1	0.1
J	11,347	468	1,318	4.1	706.6	706.6	706.6	0.0
K	15,058	502	2,113	2.3	714.3	714.3	714.4	0.1
L	16,500	466	1,797	2.7	716.3	716.3	716.4	0.1
M	18,900	525	2,004	2.0	721.5	721.5	721.6	0.1
N	20,900	579	2,192	1.8	723.7	723.7	723.9	0.2
O	22,350	358	1,343	2.7	726.6	726.6	726.6	0.0
P	24,435	436	1,203	3.0	731.2	731.2	731.3	0.1
Q	25,232	592	3,312	1.1	736.8	736.8	736.8	0.0
R	26,250	286	971	3.7	737.1	737.1	737.2	0.1
S	27,250	291	1,026	3.5	739.0	739.0	739.2	0.1
T	28,500	434	1,544	2.2	742.7	742.7	742.8	0.1
U	29,800	332	1,223	2.8	746.5	746.5	746.6	0.1
V	31,265	411	1,849	1.8	749.9	749.9	750.0	0.1
W	32,551	444	1,765	1.9	751.5	751.5	751.6	0.1
X	33,350	416	2,584	1.3	756.4	756.4	756.4	0.0

[1] Feet above confluence with Wea Creek

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
ELLIOTT DITCH								
A	423	265	1,073	5.1	570.3	568.9[3]	569.0	0.1
B	1,427	463	1,864	3.8	572.9	572.9	572.9	0.0
C	2,920	299	1,098	6.3	579.7	579.7	579.8	0.1
D	3,641	283	1,317	6.0	586.3	586.3	586.3	0.0
E	4,473	255	874	7.9	590.2	590.2	590.3	0.1
F	5,352	252	768	7.5	596.4	596.4	596.4	0.0
G	6,459	109	596	8.6	601.9	601.9	602.0	0.1
H	7,282	88	436	8.0	605.8	605.8	605.9	0.1
I	8,947	87	401	6.6	611.4	611.4	611.5	0.1
J	9,592	66	316	7.5	614.5	614.5	614.7	0.2
K	10,743	58	315	6.5	619.6	619.6	619.7	0.1
L	11,759	41	218	9.5	624.1	624.1	624.2	0.1
M	12,518	110	554	4.6	629.7	629.7	629.8	0.1
N	13,134	78	490	4.2	630.6	630.6	630.7	0.1
O	13,923	69	458	4.6	631.4	631.4	631.6	0.2
P	14,836	53	388	4.8	633.1	633.1	633.3	0.2
Q	15,916	77	490	4.7	635.1	635.1	635.2	0.1
R	16,725	101	592	4.3	636.0	636.0	636.2	0.2
S	17,601	101	737	3.3	636.7	636.7	636.8	0.1
T	19,038	352	1,318	2.4	640.9	640.9	640.9	0.0
U	19,923	372[2]	1,478	2.2	641.2	641.2	641.2	0.0

[1]Feet above confluence with Wea Creek

[2]The floodway shown on the FIRM has been widened beyond this value for administrative purposes

[3]Elevation computed without consideration of flooding controlled by Wea Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN
AND INCORPORATED AREAS

FLOODWAY DATA

ELLIOTT DITCH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
ELLIOTT DITCH (CONTINUED)								
V	20,916	341	2,022	1.6	641.5	641.5	641.5	0.0
W	21,434	128	549	4.4	641.5	641.5	641.5	0.0
X	22,351	53	375	3.9	642.4	642.4	642.4	0.0
Y	23,711	60[2]	464	3.1	643.7	643.7	643.7	0.0
Z	24,652	407	1,449	2.1	644.2	644.2	644.3	0.1
AA	27,508	381	835	1.5	646.1	646.1	646.2	0.1
AB	28,663	642	1,737	0.8	646.2	646.2	646.3	0.1
AC	33,172	242	1,501	0.6	653.2	653.2	653.2	0.0
AD	34,045	176	330	2.4	653.2	653.2	653.2	0.0

[1]Feet above confluence with Wea Creek

[2]The floodway shown on the FIRM has been widened beyond this value for administrative purposes

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN
AND INCORPORATED AREAS

FLOODWAY DATA

ELLIOTT DITCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Indian Creek								
A	30,313	315	872	3.4	631.3	631.3	631.4	0.1
B	30,893	145	462	6.4	633.2	633.2	633.1	-0.1
C	31,183	255	949	3.1	634.9	634.9	634.9	0.0
D	31,745	197	723	4.1	637.1	637.1	637.0	-0.1
E	32,530	196	1,148	3.2	639.7	639.7	639.7	0.0
F	33,032	90	3,312	3.1	651.9	651.9	651.9	0.0
G	33,655	596	4,170	0.7	652.2	652.2	652.2	0.0
H	34,420	1,075	9,976	0.3	652.2	652.2	652.2	0.0
I	35,033	1,023	8,417	0.4	652.2	652.2	652.2	0.0
J	35,913	290	2,782	1.0	652.2	652.2	652.2	0.0
K	36,268	242	2,068	1.4	652.3	652.3	652.3	0.0
L	36,858	300	2,042	1.4	652.3	652.3	652.4	0.1
M	37,458	416	2,170	1.3	652.4	652.4	652.5	0.1
N	37,730	116	1,307	3.5	652.6	652.6	652.7	0.1
O	38,755	406	1,485	1.7	653.1	653.1	653.2	0.1
P	39,455	321	1,086	2.3	653.6	653.6	653.7	0.1

[1] Feet above above confluence with Wabash River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Indian Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Little Wea Creek								
A	0.180	595	1,834	3.2	559.6	559.6	559.7	0.1
B	0.720	440	916	6.4	573.6	573.6	573.7	0.1
C	1.130	430	1,642	3.6	583.0	583.0	583.1	0.1
D	1.510	215	644	9.1	596.4	596.4	596.4	0.0
E	1.850	280	785	6.6	603.8	603.8	603.8	0.0
F	2.000	280	911	5.7	606.2	606.2	606.2	0.0
G	2.220	300	423	12.3	609.5	609.5	609.5	0.0
H	2.440	300	453	11.5	618.9	618.9	618.9	0.0
I	2.585	395	621	8.4	622.6	622.6	622.7	0.1
J	2.720	605	2,520	2.1	624.6	624.6	624.7	0.1
K	3.310	425	791	6.6	629.6	629.6	629.6	0.0
L	3.990	850	3,186	1.6	638.2	638.2	638.2	0.0
M	4.715	425	424	9.7	644.6	644.6	644.6	0.0
N	4.800	430	1,604	2.6	647.2	647.2	647.2	0.0
O	5.400	500	976	4.2	657.3	657.3	657.3	0.0
P	5.700	430	1,621	2.5	659.3	659.3	659.4	0.1
Q	6.230	470	1,229	3.3	665.1	665.1	665.1	0.0
R	6.630	340	1,514	2.7	673.7	673.7	673.8	0.1

[1] Miles above confluence with Wea Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Middle Fork Wildcat Creek								
A	0.120	1,335[2]	12,142	2.4	581.6	577.0[3]	577.1	0.1
B	0.500	540	2,257	3.3	582.5	581.4[3]	581.5	0.1
C	0.870	1,060	5,211	2.3	585.8	585.8	585.9	0.1
D	1.183	940	2,693	4.5	587.7	587.7	587.8	0.1
E	1.250	700	2,751	4.4	588.5	588.5	588.6	0.1
F	1.480	752	3,346	3.6	591.3	591.3	591.4	0.1
G	2.170	905	4,202	2.9	597.7	597.7	597.7	0.0
H	2.760	1,008	4,246	2.9	603.1	603.1	603.1	0.0
I	3.240	920	3,957	3.1	607.3	607.3	607.3	0.0
J	3.840	1,570	4,193	2.9	611.7	611.7	611.7	0.0
K	4.510	1,120	3,256	3.7	617.9	617.9	617.9	0.0

[1] Miles above confluence with South Fork Wildcat Creek

[2] Combined floodway width of South Fork Wildcat Creek and Middle Fork Wildcat Creek

[3] Elevations controlled by flooding effects from South Fork Wildcat Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Middle Fork Wildcat Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Fork Wildcat Creek								
A	0.750	3,405[2]	18,228	2.4	561.6	561.6	561.7	0.1
B	1.250	2,530[2]	10,140	4.2	564.1	564.1	564.1	0.0
C	1.400	760	3,553	6.1	565.3	565.3	565.3	0.0
D	1.655	1,050	6,471	3.4	567.1	567.1	567.2	0.1
E	1.770	915	5,574	3.9	567.4	567.4	567.5	0.1
F	2.350	995	5,592	3.9	569.9	569.9	570.0	0.1
G	2.760	320	3,443	6.3	572.2	572.2	572.2	0.0
H	3.360	440	2,962	7.3	577.0	577.0	577.0	0.0
I	3.650	695	4,530	4.8	579.8	579.8	579.9	0.1
J	3.970	1,335[3]	12,142	2.4	581.6	581.6	581.7	0.1
K	4.340	770	5,048	3.5	582.6	582.6	582.7	0.1
L	4.396	695	3,377	5.2	583.0	583.0	583.1	0.1
M	4.590	775	5,856	3.0	585.1	585.1	585.2	0.1
N	4.710	1,115	8,288	2.1	585.6	585.6	585.7	0.1
O	4.940	980	7,193	2.4	586.2	586.2	586.3	0.1
P	5.130	450	2,381	7.4	587.1	587.1	587.2	0.1
Q	5.730	925	4,505	3.9	593.6	593.6	593.7	0.1
R	6.610	680	3,835	4.6	598.8	598.8	598.9	0.1
S	7.880	1,610	7,289	2.4	605.6	605.6	605.7	0.1
T	8.450	2,055	6,050	2.9	608.9	608.9	609.0	0.1
U	8.700	1,400	3,437	5.1	611.0	611.0	611.0	0.0
V	9.190	970	5,688	3.1	617.1	617.1	617.1	0.0
W	9.860	1,450	3,189	5.5	621.0	621.0	621.1	0.1
X	10.160	820	3,283	5.3	623.2	623.2	623.3	0.1

[1] Miles above confluence with Wildcat Creek

[2] Combined floodway width of South Fork Wildcat Creek and Wildcat Creek

[3] Combined floodway width of South Fork Wildcat Creek and Middle Fork Wildcat Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

South Fork Wildcat Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tippecanoe River								
A	5,016	1,842	25,507	1.1	537.7	537.7	537.8	0.1
B	5,808	1,836	24,174	1.2	537.7	537.7	537.8	0.1
C	6,917	1,604	19,755	1.5	537.7	537.7	537.9	0.2
D	7,973	1,720	19,671	1.5	537.8	537.8	537.9	0.1
E	8,870	1,760	19,325	1.5	537.8	537.8	537.9	0.1
F	9,874	1,550	15,439	1.9	537.9	537.9	538.0	0.1
G	10,930	1,140	12,980	2.2	538.0	538.0	538.1	0.1
H	11,880	1,008	13,113	2.1	538.1	538.1	538.2	0.1
I	13,781	1,579	13,571	2.1	538.3	538.3	538.4	0.1
J	15,418	1,484	11,054	2.5	538.5	538.5	538.6	0.1
K	16,579	1,305	9,997	2.8	538.8	538.8	538.9	0.1
L	17,899	1,102	9,932	2.8	539.1	539.1	539.2	0.1
M	19,906	966	9,625	2.9	539.4	539.4	539.5	0.1
N	21,490	1,065	8,125	3.5	539.6	539.6	539.7	0.1
O	22,440	1,000	7,717	3.6	540.0	540.0	540.1	0.1
P	23,126	731	7,746	3.6	540.2	540.2	540.3	0.1
Q	23,760	472	5,858	4.8	540.2	540.2	540.3	0.1
R	25,344	638	6,585	4.3	540.7	540.7	540.8	0.1
S	25,925	731	5,432	5.2	540.8	540.8	540.9	0.1
T	26,664	813	7,181	3.9	541.4	541.4	541.5	0.1
U	27,667	488	5,739	4.9	541.6	541.6	541.6	0.0
V	28,670	753	8,498	3.3	542.0	542.0	542.1	0.1
W	29,779	1,234	8,862	3.2	542.2	542.2	542.3	0.1
X	30,413	1,343	8,912	3.1	542.4	542.4	542.4	0.0
Y	31,574	939	6,314	4.4	542.8	542.8	542.8	0.0
Z	32,261	731	5,849	4.8	543.1	543.1	543.1	0.0

[1] Feet above confluence with Wabash River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Tippecanoe River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tippecanoe River (continues)								
AA	32,842	489	5,428	5.2	543.4	543.4	543.5	0.1
AB	33,370	525	5,321	5.3	543.6	543.6	543.6	0.0

[1] Feet above confluence with Wabash River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Tippecanoe River (Continues)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wabash River								
A	305.7	3,608	46,676	2.0	525.6	525.6	525.7	0.1
B	306.2	3,924	48,256	2.0	525.8	525.8	525.9	0.1
C	306.7	4,031	50,374	1.9	526.0	526.0	526.1	0.1
D	307.1	3,531	44,373	2.1	526.2	526.2	526.3	0.1
E	308.2	2,349	39,646	2.4	526.8	526.8	526.9	0.1
F	308.5	2,277	35,091	2.7	526.9	526.9	527.0	0.1
G	309.2	2,324	36,854	2.6	527.4	527.4	527.5	0.1
H	309.5	2,671	38,758	2.5	527.6	527.6	527.7	0.1
I	309.9	3,018	38,404	2.5	527.8	527.8	527.9	0.1
J	310.4	2,774	39,276	2.4	528.2	528.2	528.3	0.1
K	310.8	2,962	37,355	3.5	528.4	528.4	528.5	0.1
L	311.0	2,948	38,782	2.4	528.6	528.6	528.7	0.1
M	311.2	2,344	31,319	3.0	528.8	528.8	528.9	0.1
N	311.4	1,559	23,605	4.0	529.0	529.0	529.1	0.1
O	311.6	937	17,771	5.3	529.4	529.4	529.5	0.1
P	311.7	709	16,115	5.9	529.7	529.7	529.8	0.1
Q	311.7	725	15,120	6.3	529.8	529.8	529.9	0.1
R	311.8	742	14,995	6.3	530.0	530.0	530.1	0.1
S	311.9	597	14,778	6.4	530.2	530.2	530.3	0.1
T	312.0	558	15,261	6.2	530.4	530.4	530.5	0.1
U	312.0	684	17,403	5.5	530.6	530.6	530.6	0.0
V	312.1	876	19,968	4.8	530.9	530.9	531.0	0.1
W	312.3	906	17,061	5.6	531.0	531.0	531.1	0.1
X	312.5	1,170	20,505	4.6	531.2	531.2	531.2	0.0
Y	312.6	1,524	27,283	3.5	531.5	531.5	531.5	0.0
Z	313.1	2,197	35,544	2.7	531.8	531.8	531.9	0.1

[1] Miles above confluence with Ohio River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Wabash River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wabash River (Continues)								
AA	313.6	2,780	38,120	2.5	532.1	532.1	532.2	0.1
AB	314.0	2,835	15,898	6.0	532.1	532.1	532.2	0.1
AC	314.3	2,859	34,979	2.7	533.2	533.2	533.3	0.1
AD	314.6	3,060	40,322	2.4	533.5	533.5	533.6	0.1
AE	315.3	3,900	42,695	2.2	533.8	533.8	533.9	0.1
AF	315.8	5,590	34,187	2.8	534.0	534.0	534.1	0.1
AG	316.4	5,522	24,404	3.9	534.5	534.5	534.6	0.1
AH	317.2	2,448	31,794	2.7	535.2	535.2	535.3	0.1
AI	317.3	2,272	26,069	3.3	535.4	535.4	535.5	0.1
AJ	317.5	2,262	33,665	2.6	535.5	535.5	535.6	0.1
AK	318.0	3,322	41,966	2.0	535.8	535.8	535.9	0.1
AL	318.8	3,297	48,688	1.8	536.1	536.1	536.2	0.1
AM	319.8	2,922	41,028	2.1	536.5	536.5	536.6	0.1
AN	320.9	3,868	49,650	1.7	536.9	536.9	537.0	0.1
AO	321.8	3,806	57,787	1.5	537.2	537.2	537.3	0.1
AP	323.0	3,129	44,565	1.8	537.5	537.5	537.6	0.1
AQ	323.9	2,762	31,810	2.5	537.9	537.9	538.0	0.1

[1] Miles above confluence with Ohio River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wea Creek								
A	0.820	2,555	6,661	2.3	526.7	517.8[2]	517.9	0.1
B	1.220	1,340	4,289	3.5	526.7	523.0[2]	523.1	0.1
C	1.560	1,925	6,390	2.3	527.3	527.3	527.4	0.1
D	1.760	2,125	5,559	2.7	530.4	530.4	530.5	0.1
E	1.830	2,270	4,849	3.1	532.7	532.7	532.7	0.0
F	2.100	1,295	4,314	3.5	537.6	537.6	537.7	0.1
G	2.400	745	3,602	4.2	543.9	543.9	543.9	0.0
H	2.740	345	3,753	4.0	549.3	549.3	549.4	0.1
I	2.900	405	2,753	5.4	550.5	550.5	550.6	0.1
J	3.100	680	3,985	3.8	552.6	552.6	552.6	0.0
K	3.270	655	3,344	4.5	554.4	554.4	554.5	0.1
L	3.620	780	2,563	5.0	561.1	561.1	561.1	0.0
M	3.740	895	3,815	3.4	562.5	562.5	562.5	0.0
N	3.900	1,065	3,963	3.2	563.7	563.7	563.7	0.0
O	4.100	1,015	3,961	3.2	565.2	565.2	565.3	0.1
P	4.220	820	3,755	3.4	566.6	566.6	566.6	0.0
Q	4.330	505	1,960	6.5	567.9	567.9	568.0	0.1
R	4.650	585	3,055	3.8	574.0	574.0	574.1	0.1
S	4.900	235	1,932	6.1	576.5	576.5	576.5	0.0
T	5.070	295	2,003	5.8	578.7	578.7	578.7	0.0
U	5.220	245	1,957	6.0	580.8	580.8	580.9	0.1
V	5.280	255	1,321	8.9	581.4	581.4	581.5	0.1
W	5.340	290	1,783	6.6	583.1	583.1	583.2	0.1
X	5.500	400	2,566	4.6	585.8	585.8	585.9	0.1
Y	5.701	1,150	2,724	4.3	590.0	590.0	590.0	0.0
Z	5.770	950	3,828	3.1	590.7	590.7	590.7	0.0

[1] Miles above confluence with Wabash River

[2] Elevations without considering backwater effects from Wabash River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Wea Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wea Creek (Continues)								
AA	5.920	215	1,284	9.1	591.7	591.7	591.8	0.1
AB	6.310	410	1,875	6.2	600.4	600.4	600.4	0.0
AC	6.720	460	1,714	6.8	607.5	607.5	607.5	0.0
AD	7.370	1,225	4,831	2.4	614.9	614.9	615.0	0.1
AE	7.700	450	2,474	4.7	617.5	617.5	617.6	0.1
AF	7.840	800	4,328	2.7	620.5	620.5	620.5	0.0
AG	8.030	650	3,967	2.9	621.5	621.5	621.5	0.0
AH	8.330	860	3,338	3.5	623.7	623.7	623.8	0.1

[1] Miles above confluence with Wabash River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wildcat Creek								
A	0.790	4,980	8,598	3.3	535.2	527.7[2]	527.8	0.1
B	1.410	3,960	13,025	2.1	535.2	530.7[2]	530.8	0.1
C	1.910	1,870	8,658	3.2	535.2	532.4[2]	532.5	0.1
D	2.200	700	3,760	7.4	535.2	534.0[2]	534.0	0.0
E	2.530	630	5,487	5.1	536.7	536.7	536.7	0.0
F	2.690	720	5,027	5.6	538.1	538.1	538.1	0.0
G	2.760	780	3,775	7.4	538.2	538.2	538.2	0.0
H	2.860	765	3,925	7.1	539.0	539.0	539.0	0.0
I	2.900	830	4,072	6.9	539.6	539.6	539.6	0.0
J	3.030	855	6,603	4.2	541.6	541.6	541.6	0.0
K	3.210	1,015	5,948	4.7	542.2	542.2	542.2	0.0
L	3.550	605	4,135	6.8	543.7	543.7	543.7	0.0
M	3.980	535	5,362	5.2	546.2	546.2	546.2	0.0
N	4.083	425	4,115	6.8	546.8	546.8	546.8	0.0
O	4.140	530	5,584	5.0	547.3	547.3	547.3	0.0
P	4.320	800	6,966	4.0	548.0	548.0	548.0	0.0
Q	4.740	605	5,247	5.3	549.1	549.1	549.1	0.0
R	4.820	610	4,032	6.9	549.3	549.3	549.3	0.0
S	4.910	580	6,419	4.4	550.5	550.5	550.5	0.0
T	5.450	400	4,355	6.4	552.0	552.0	552.0	0.0
U	5.620	895	6,489	4.3	553.2	553.2	553.2	0.0
V	5.790	780	6,605	4.2	553.9	553.9	553.9	0.0
W	6.080	920	9,077	3.1	555.0	555.0	555.0	0.0
X	6.510	1,425	10,459	2.7	555.8	555.8	555.8	0.0
Y	6.880	1,845	13,052	2.1	556.5	556.5	556.5	0.0
Z	7.410	1,860	8,248	3.4	557.9	557.9	557.9	0.0

[1] Miles above confluence with Wabash River

[2] Elevations without considering backwater from Wabash River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

Tippecanoe County, IN

AND INCORPORATED AREAS

FLOODWAY DATA

Wildcat Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wildcat Creek (Continues)								
AA	8.190	3,405	18,228	2.4	561.6	561.6	561.6	0.0
AB	8.510	2,530	10,140	4.2	564.1	564.1	564.1	0.0
AC	8.860	420	2,219	6.7	565.3	565.3	565.3	0.0
AD	9.030	395	2,788	5.3	565.3	565.3	565.3	0.0
AE	9.530	451	2,546	5.8	568.8	568.8	568.8	0.0
AF	9.860	255	2,381	6.2	571.8	571.8	571.8	0.0
AG	10.330	360	2,570	5.8	574.9	574.9	574.9	0.0
AH	11.040	2,150	5,020	2.9	579.2	579.2	579.2	0.0
AI	11.590	1,205	6,036	2.5	581.3	581.3	581.3	0.0
AJ	11.950	660	3,892	3.8	583.1	583.1	583.1	0.0
AK	13.260	1,180	7,111	2.1	587.8	587.8	587.8	0.0
AL	14.260	2,181	4,928	3.0	591.3	591.3	591.3	0.0
AM	14.940	1,430	7,860	1.9	595.1	595.1	595.1	0.0

[1] Miles above confluence with Wabash River

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 the1-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.

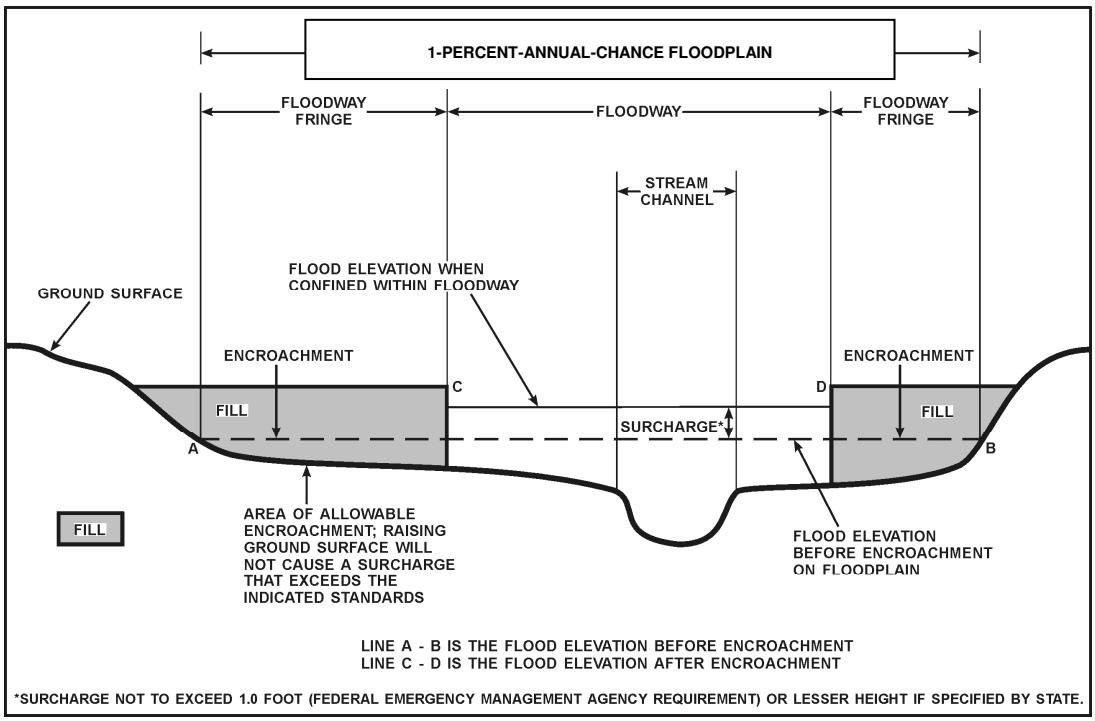

Figure 1 – Floodway Schematic

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 base flood elevations 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 base flood elevations 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 to 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 base flood elevations 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 base flood elevations or average depths. Insurance agents use the zones and base flood elevations 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 are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Tippecanoe County. Previously, separate FIRMs were prepared for each identified flood-prone incorporated community and the unincorporated areas of the county. Historical data relating to the maps prepared for each community are presented in Table 7, "Community Map History."

7.0 OTHER STUDIES

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

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this FIS can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region V, 536 South Clark Street, Sixth Floor, Chicago, Illinois 60605.

9.0 BIBLIOGRAPHY AND REFERENCES

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COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Battle Ground, Town of	May 24, 1974	June 25, 1976 March 16, 1979	January 2, 1981	
Clarks Hill, Town of[1,2]	N/A	N/A	N/A	
Dayton, Town of[2]	N/A	N/A	N/A	
Lafayette, City of	December 7, 1973	January 16, 1976	November 19, 1980	
Otterbein, Town of[1,2]	N/A	N/A	N/A	
Shadeland, Town of[2]	N/A	N/A	N/A	
Tippecanoe County (Unincorporated Areas)	March 3, 1978	None	March 16, 1981	
West Lafayette, City of	December 7, 1973	August 15, 1975 October 13, 1978	January 2, 1981	

[1]No Special Flood Hazard Areas Identified
[2]This community does not have map history prior to the first countywide mapping

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

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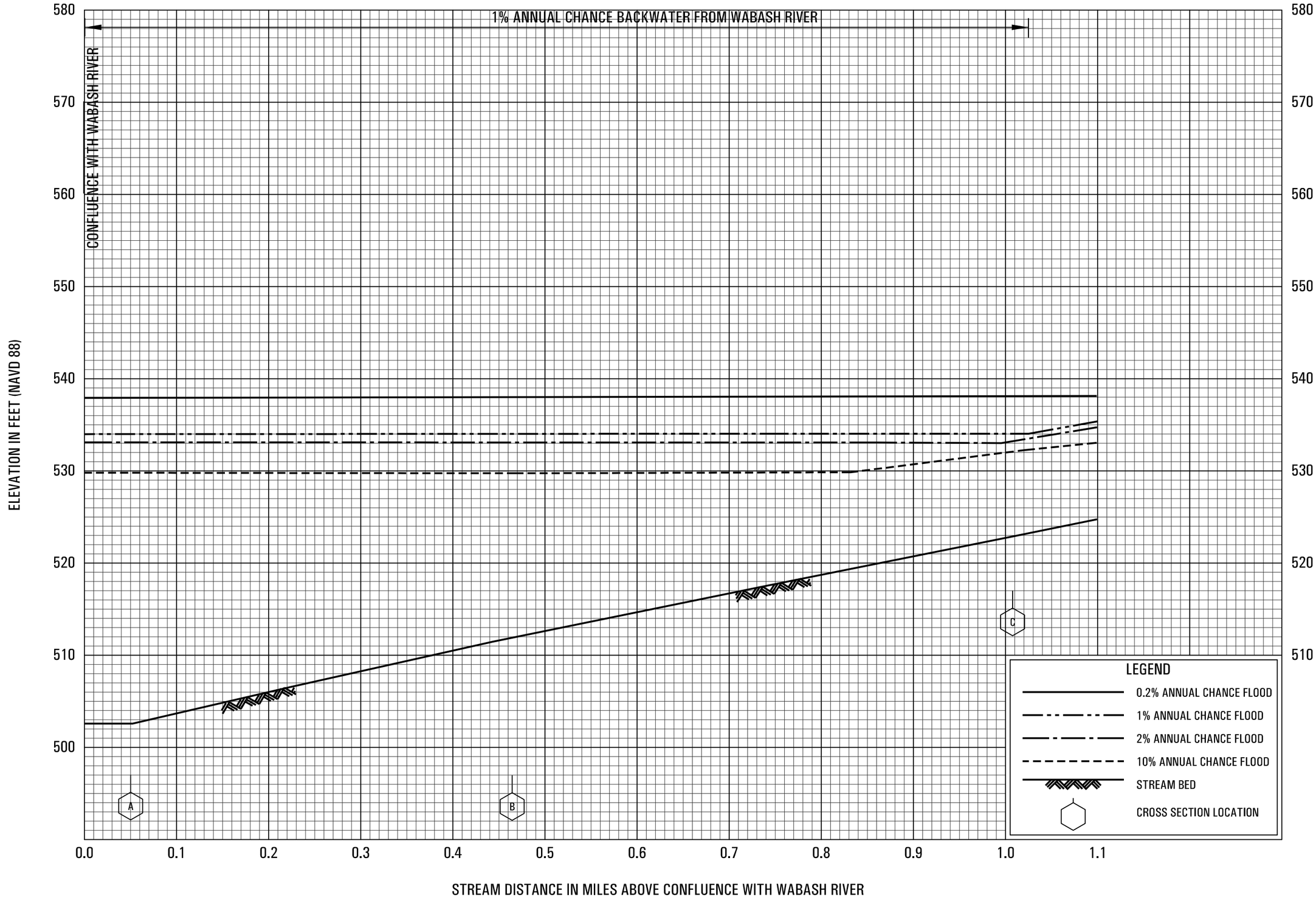


FLOOD PROFILES

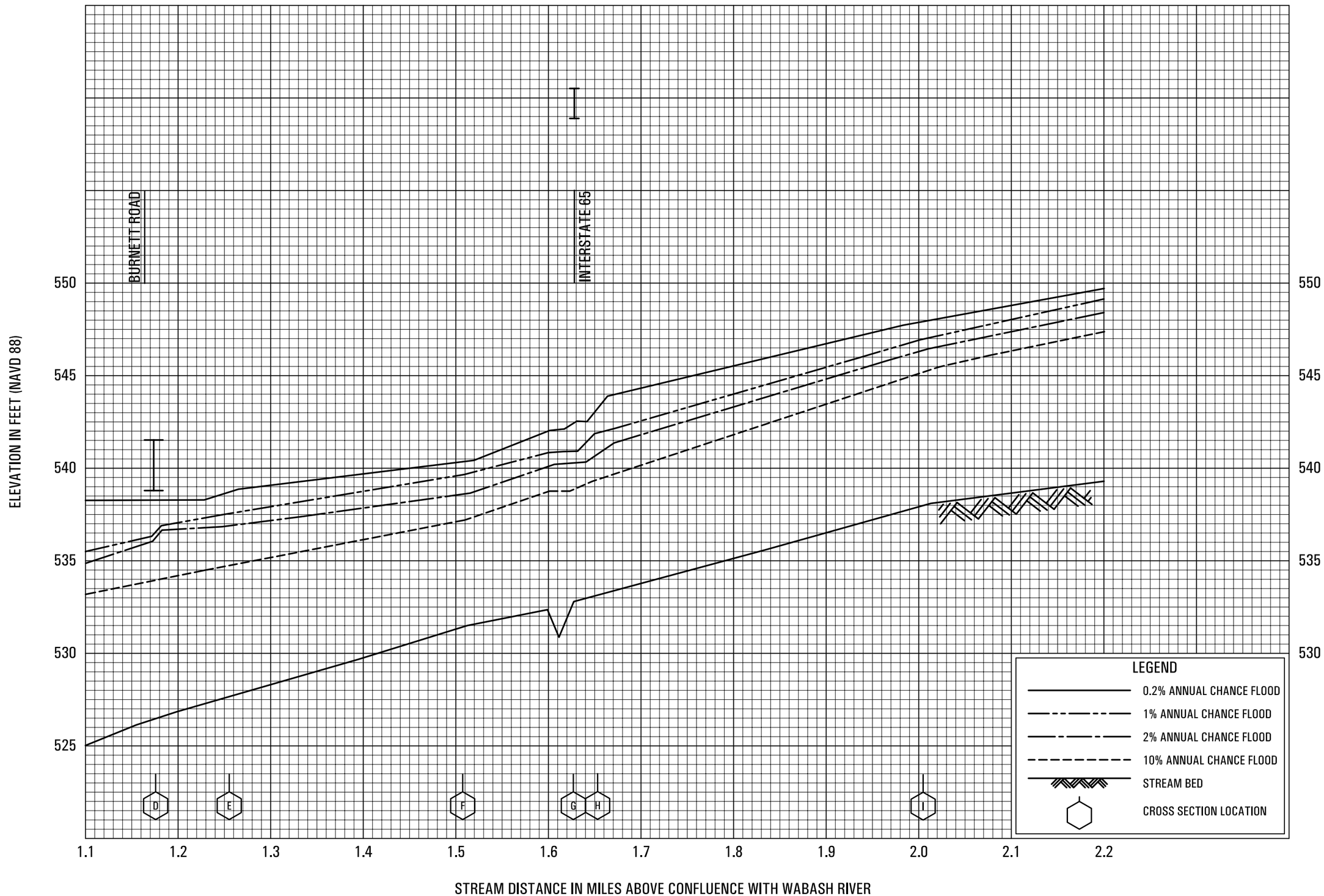
BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

01P



FLOOD PROFILES

BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

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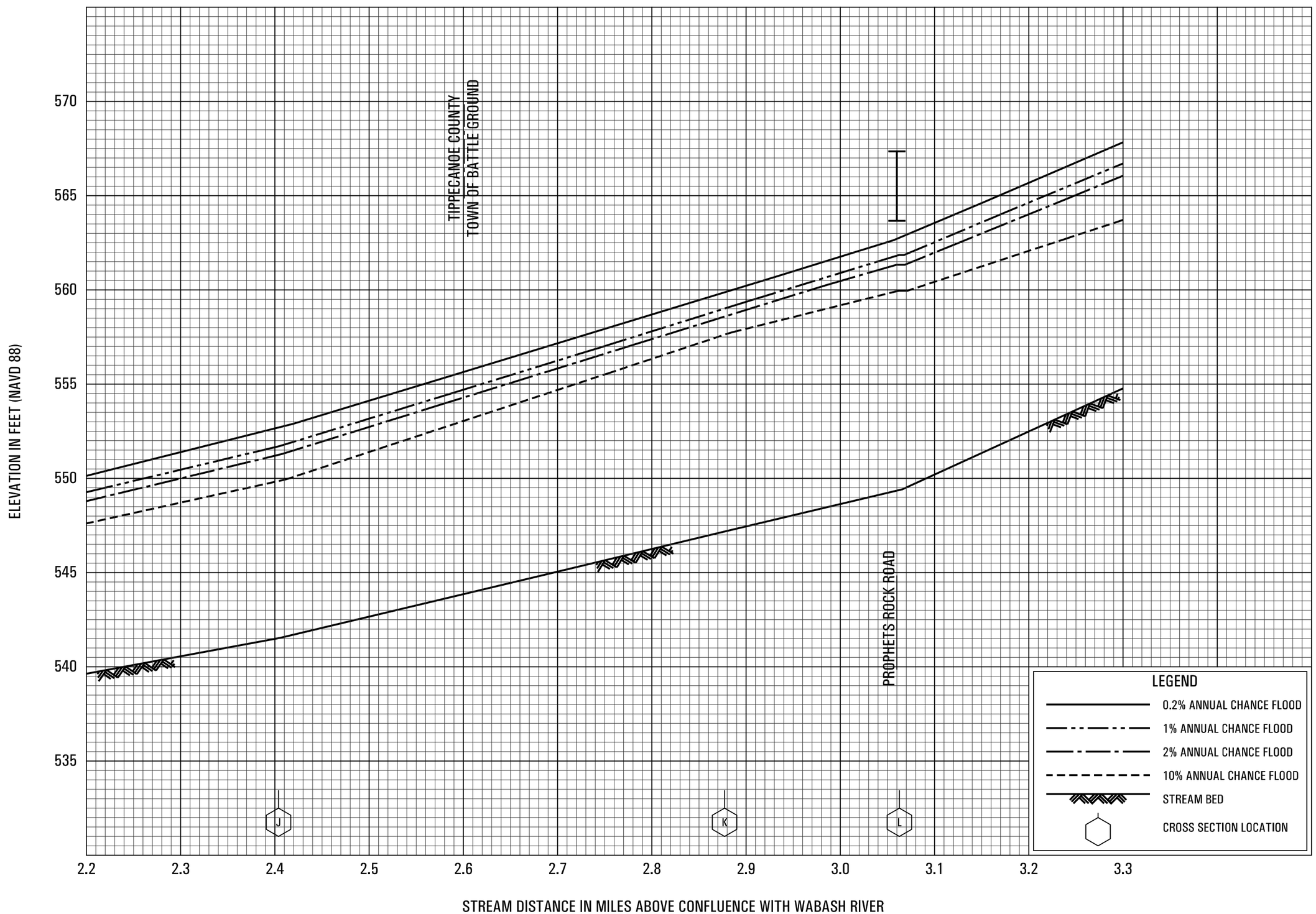

FLOOD PROFILES

BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

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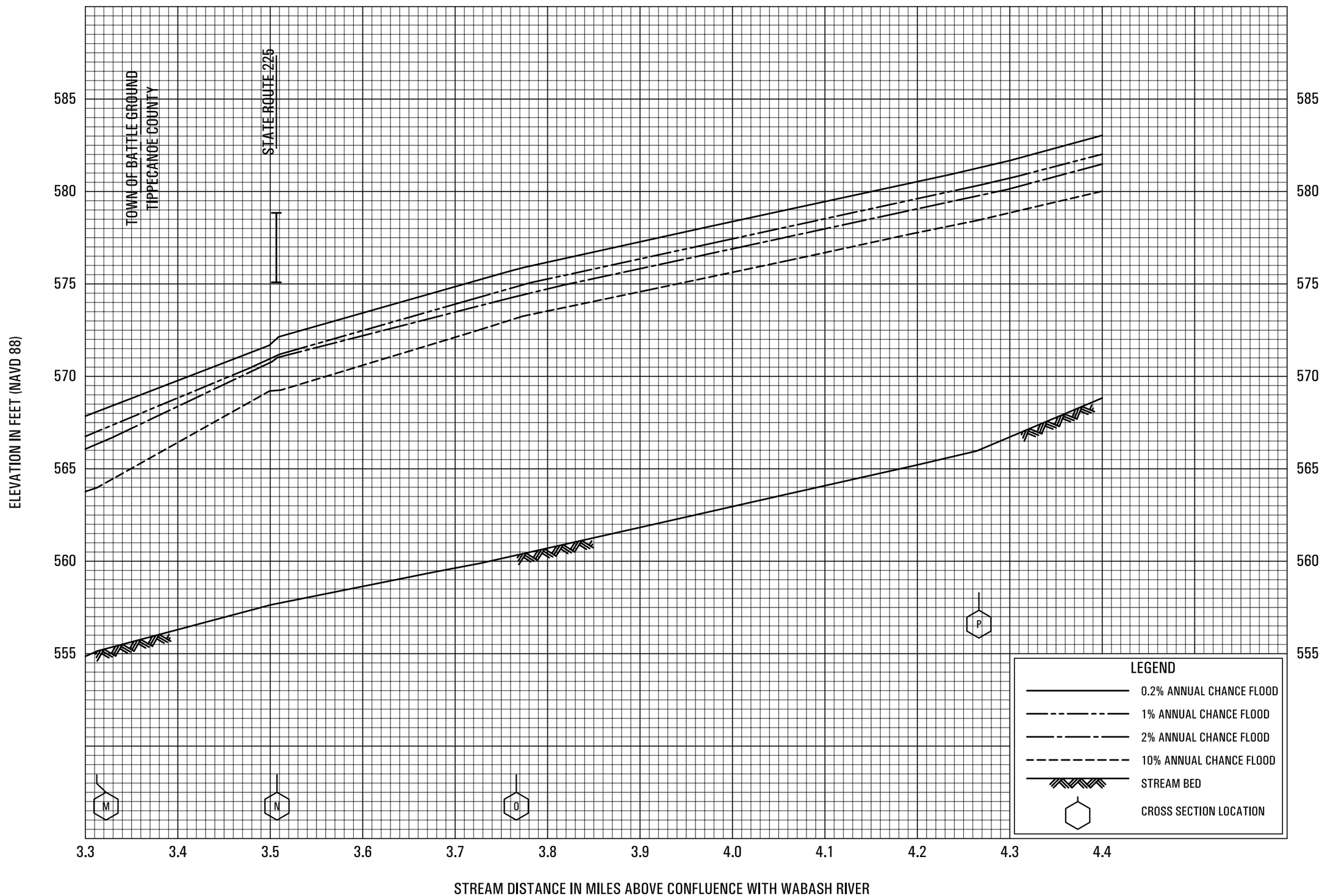

FLOOD PROFILES

BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

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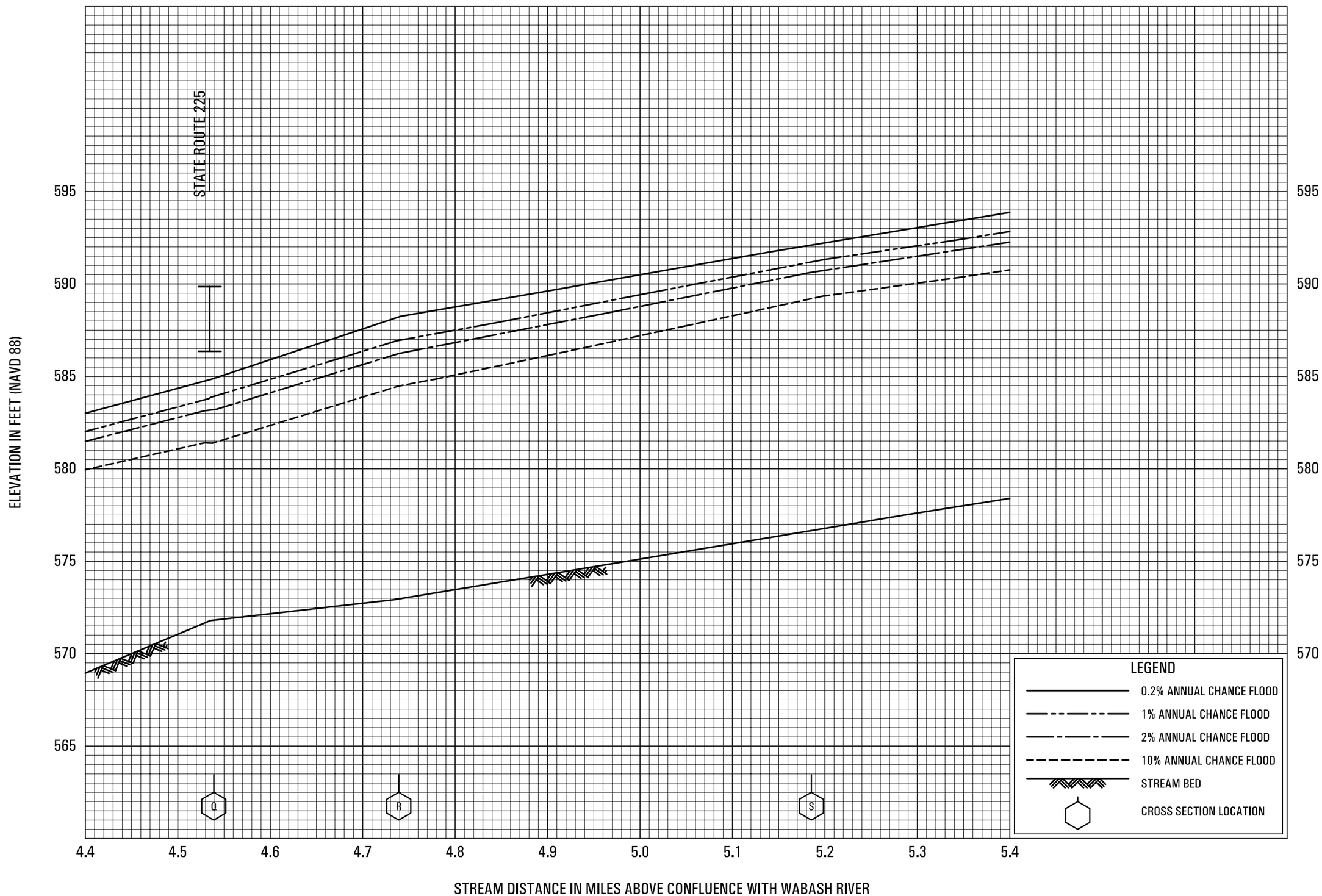

FLOOD PROFILES

BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

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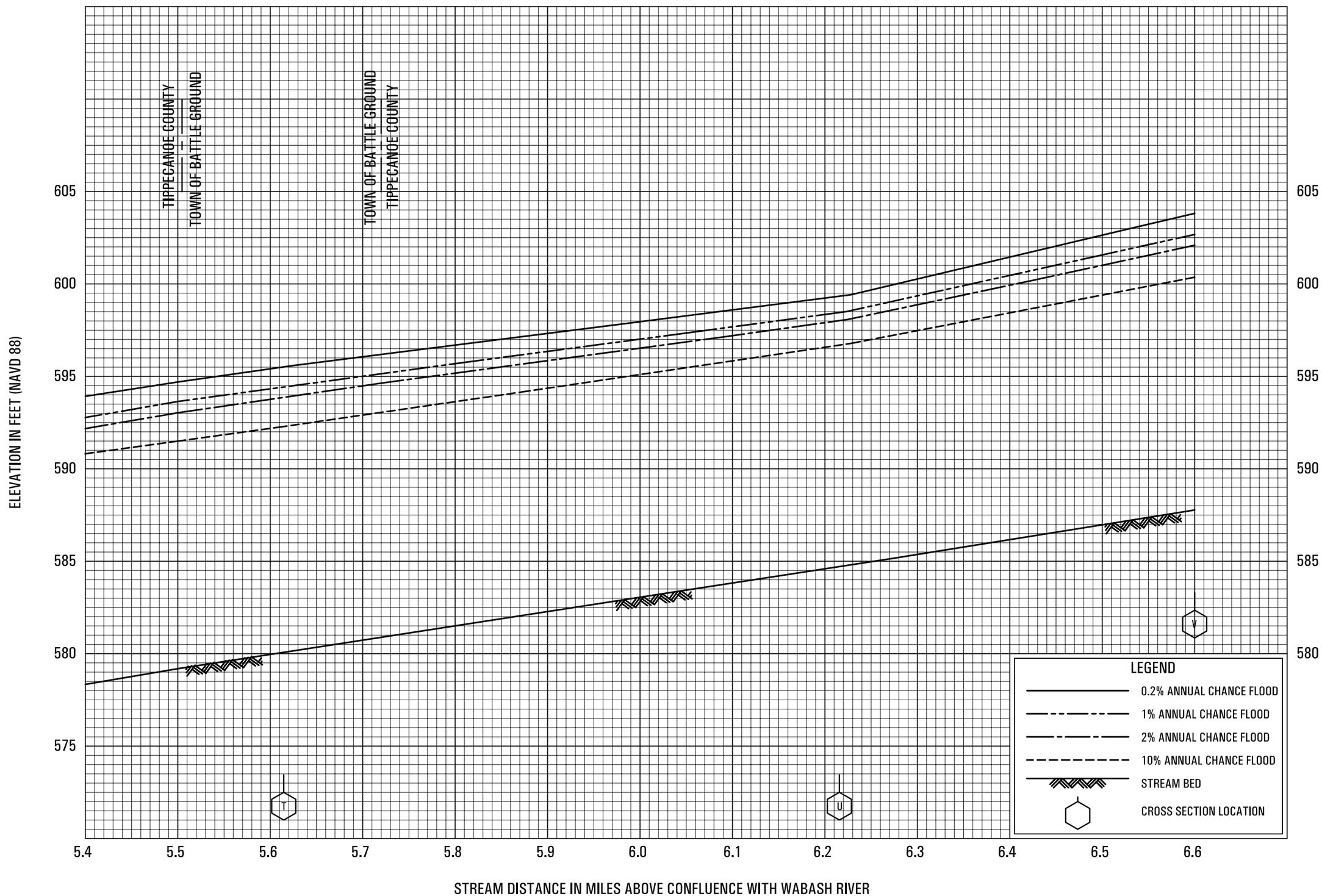

FLOOD PROFILES

BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

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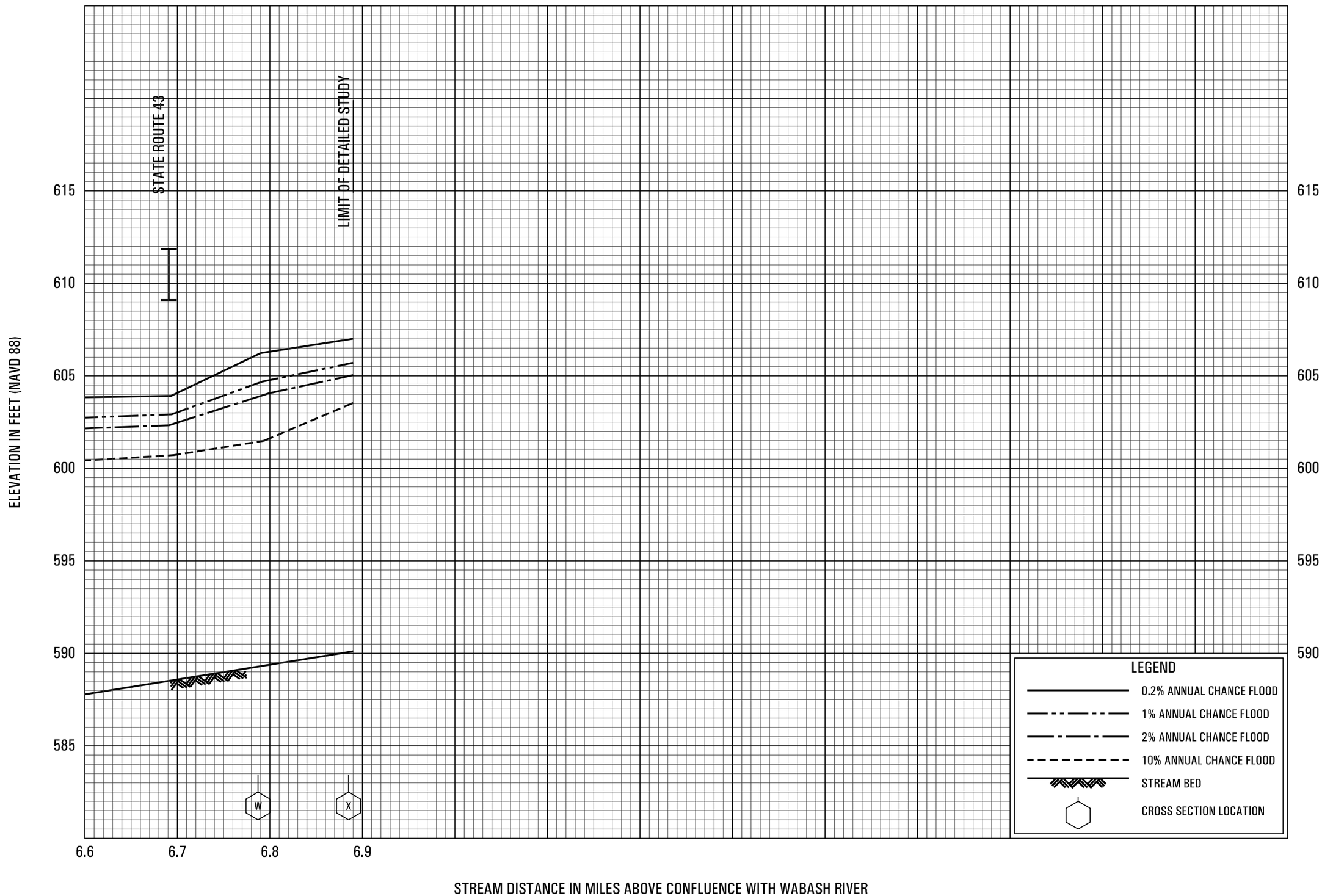

FLOOD PROFILES

BURNETT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

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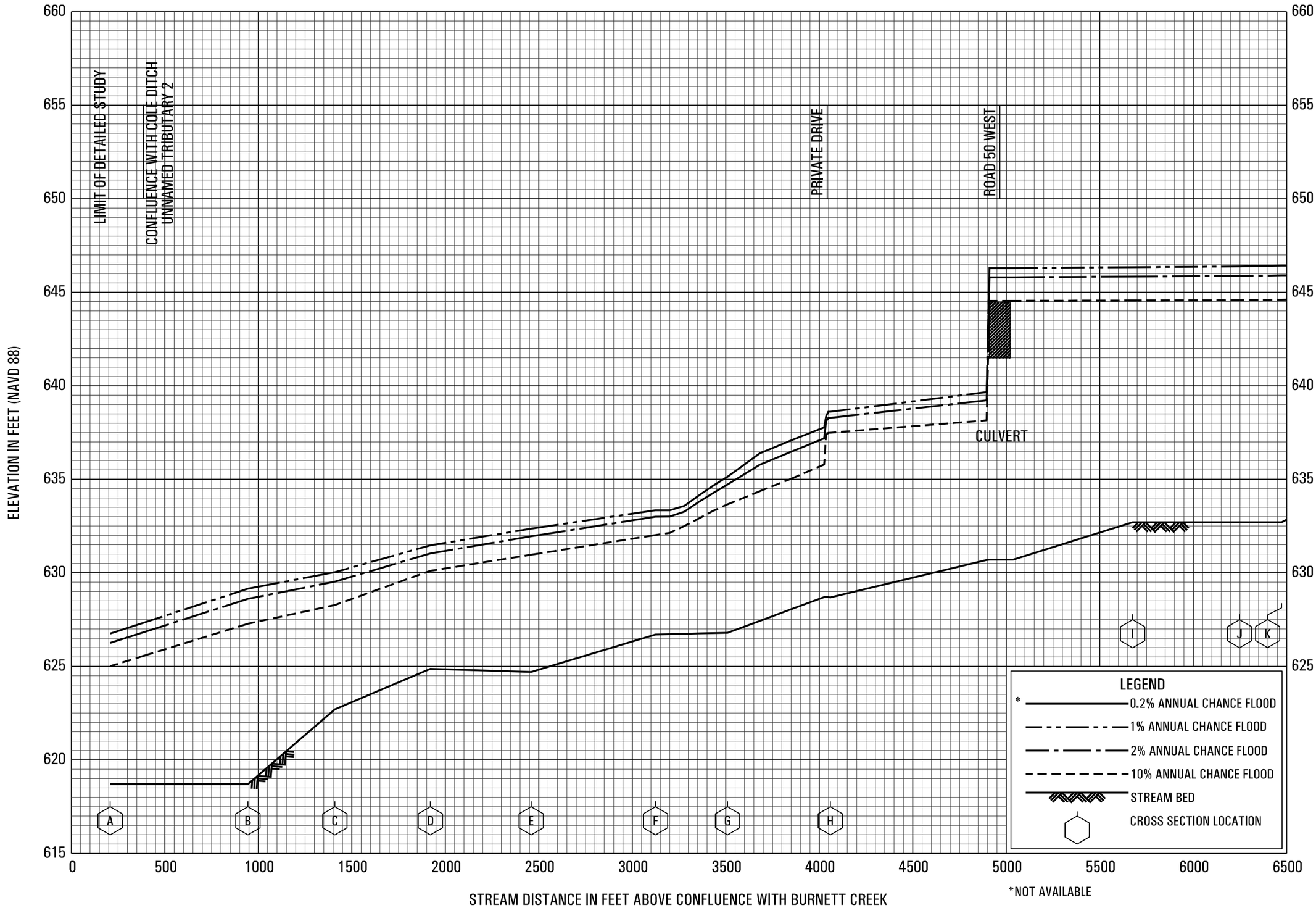


FLOOD PROFILES

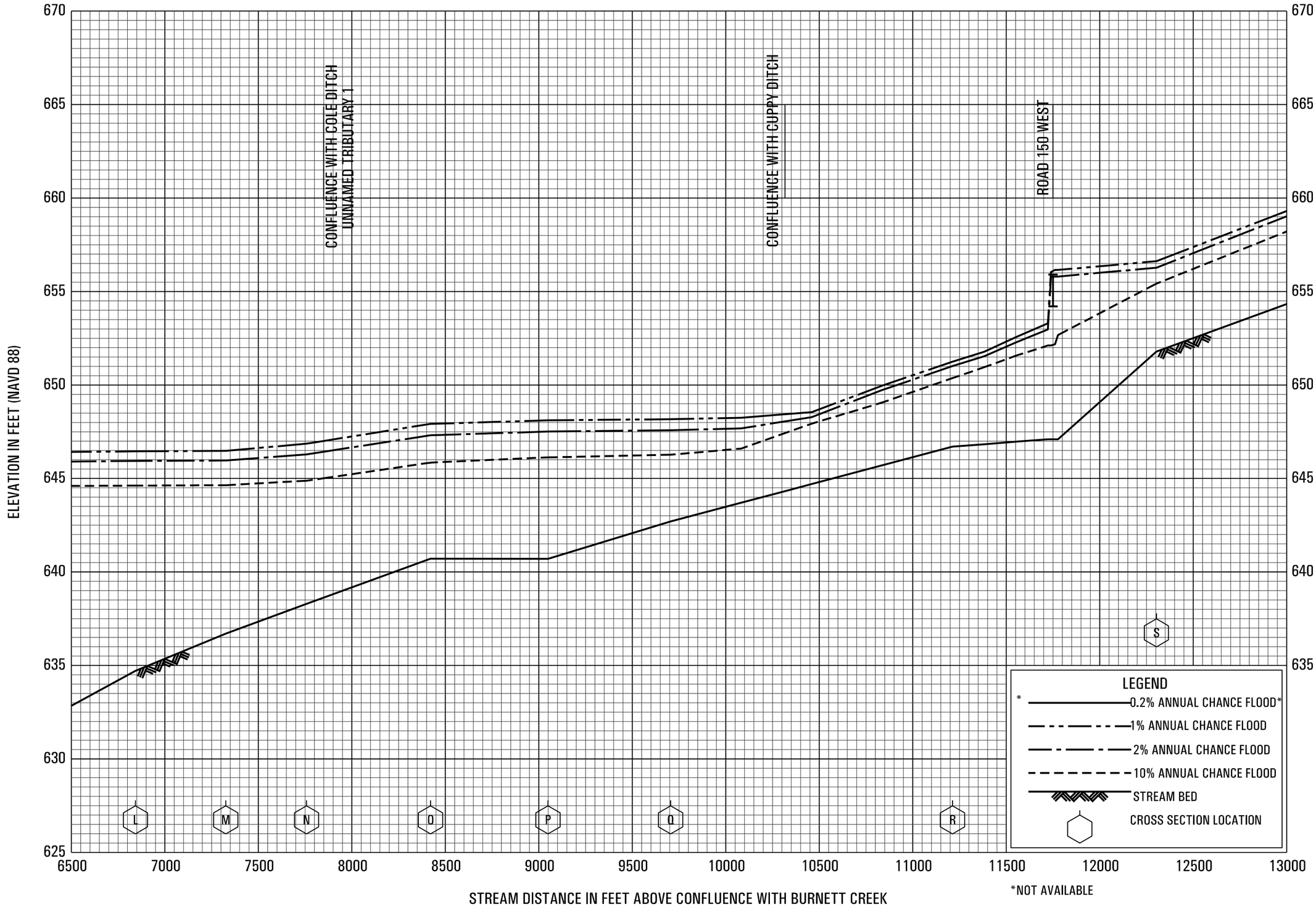
COLE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS

08P



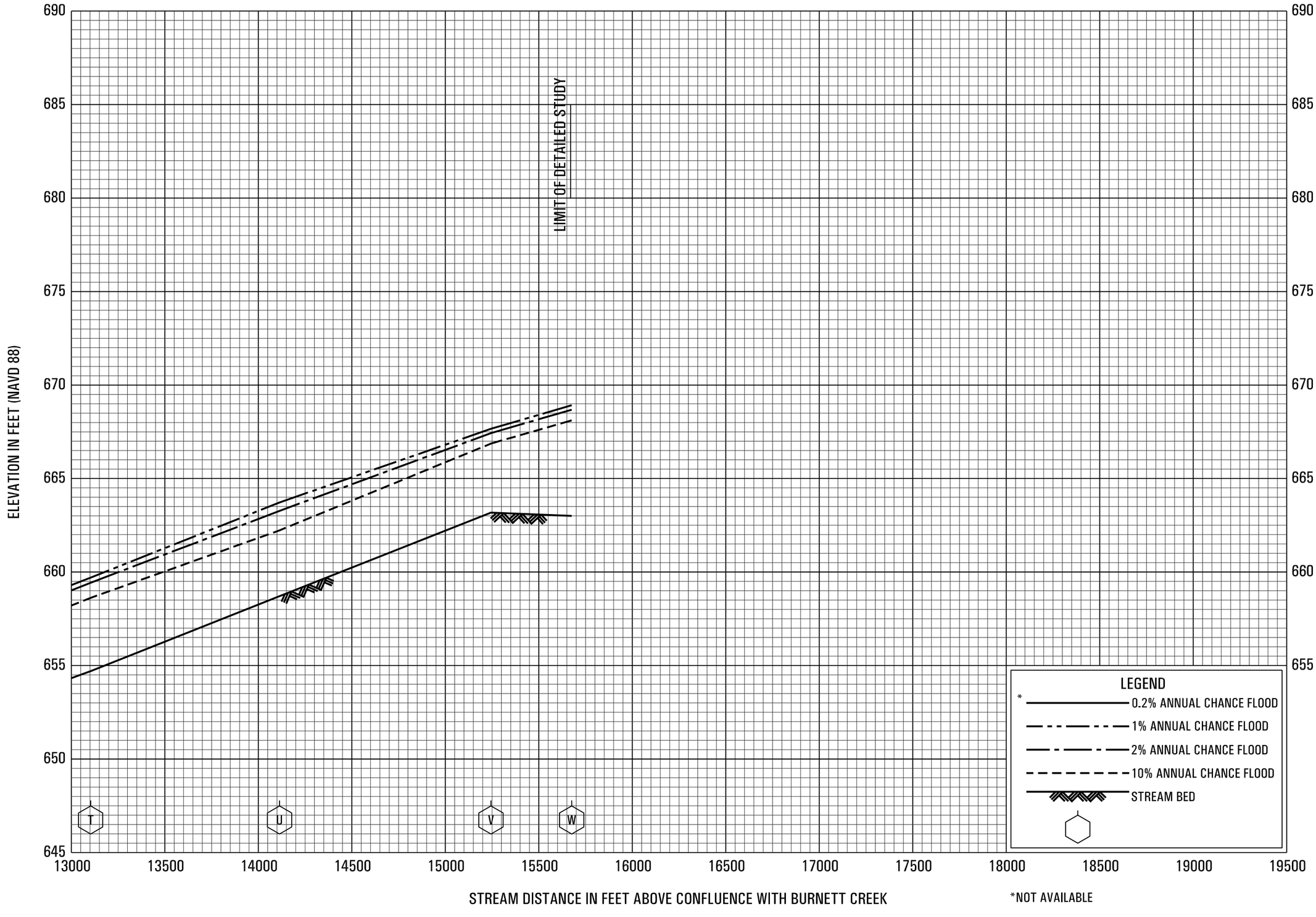
FLOOD PROFILES

COLE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



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FLOOD PROFILES

COLE DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

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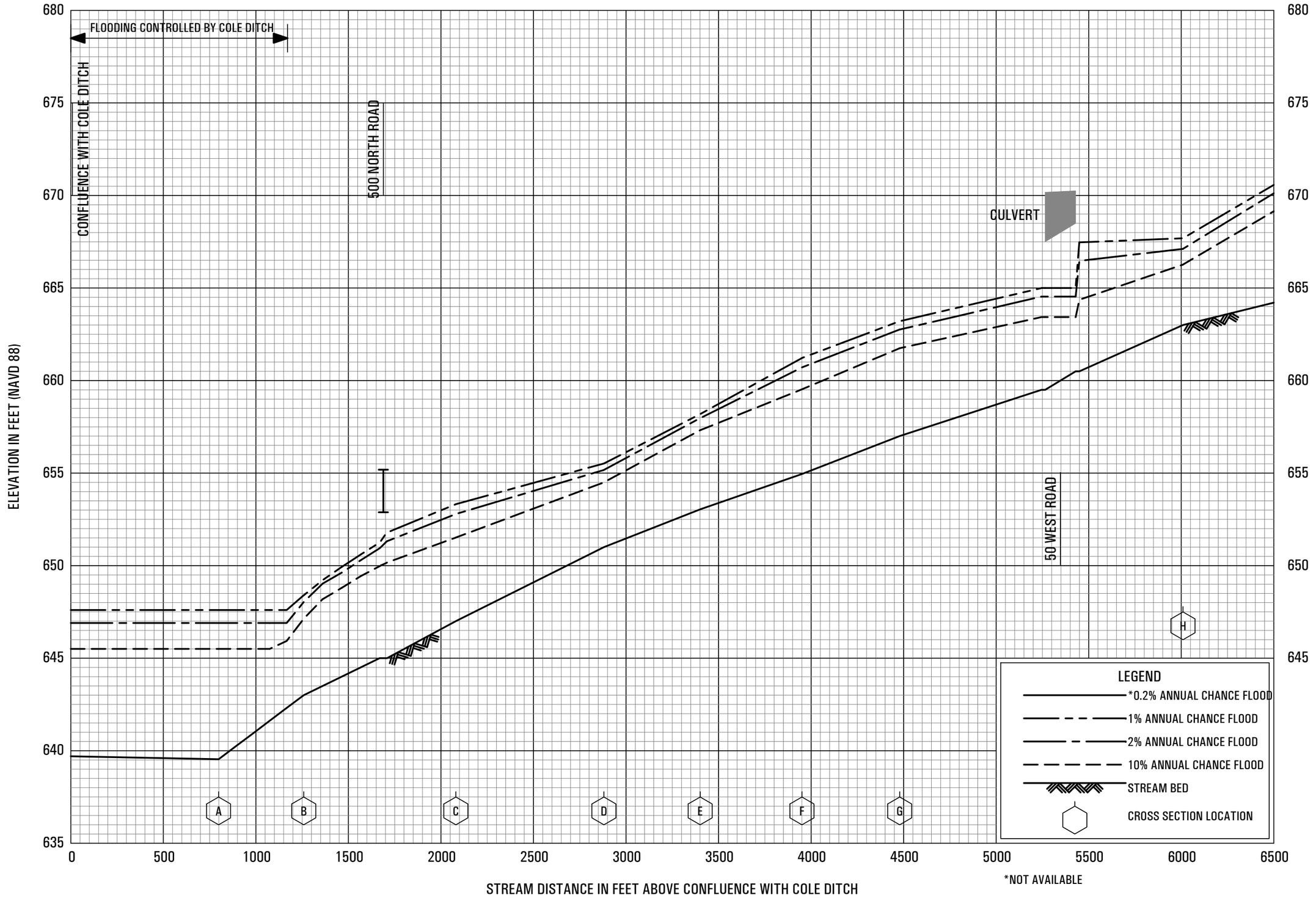


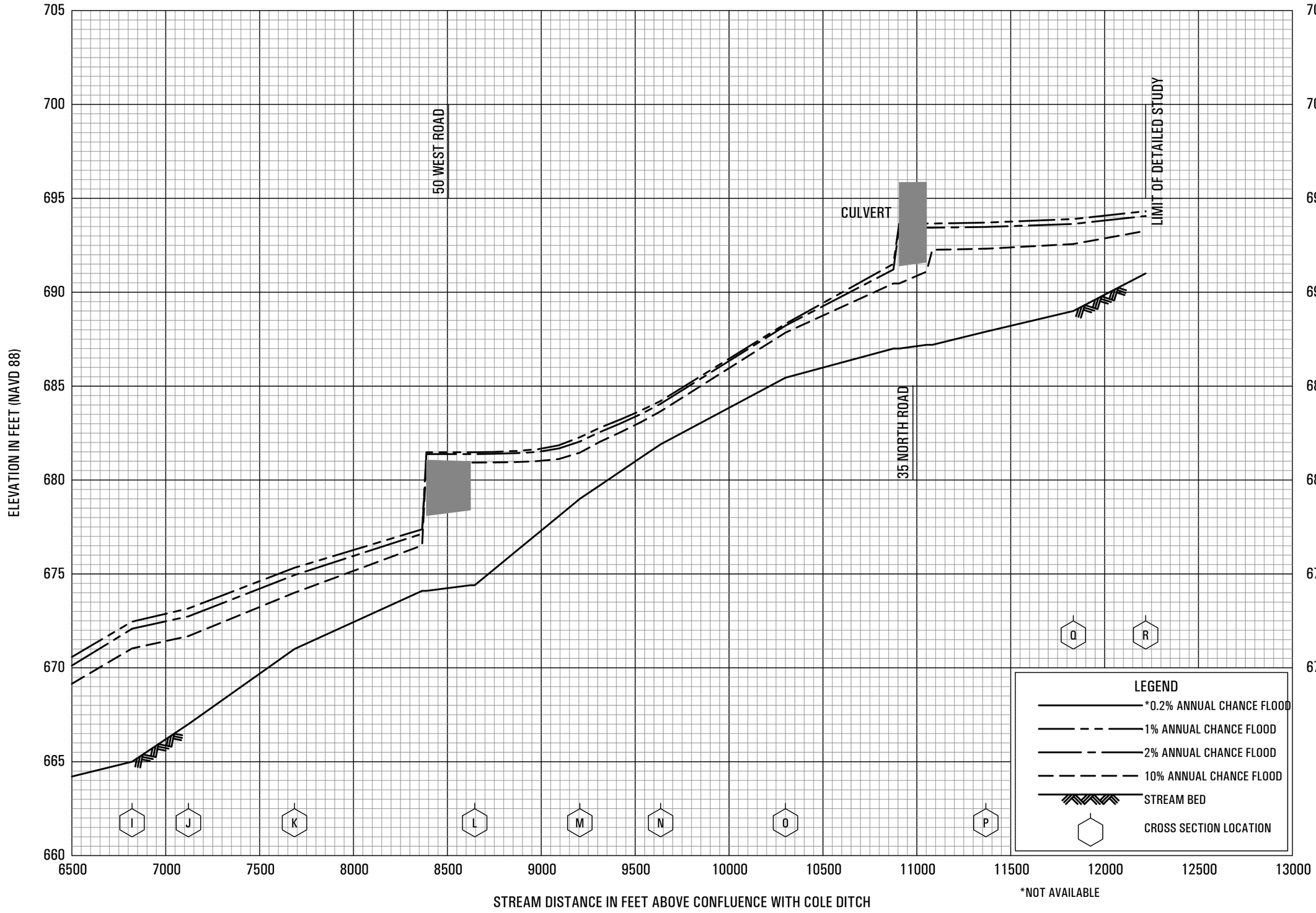
FLOOD PROFILES

COLE DITCH UNNAMED TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



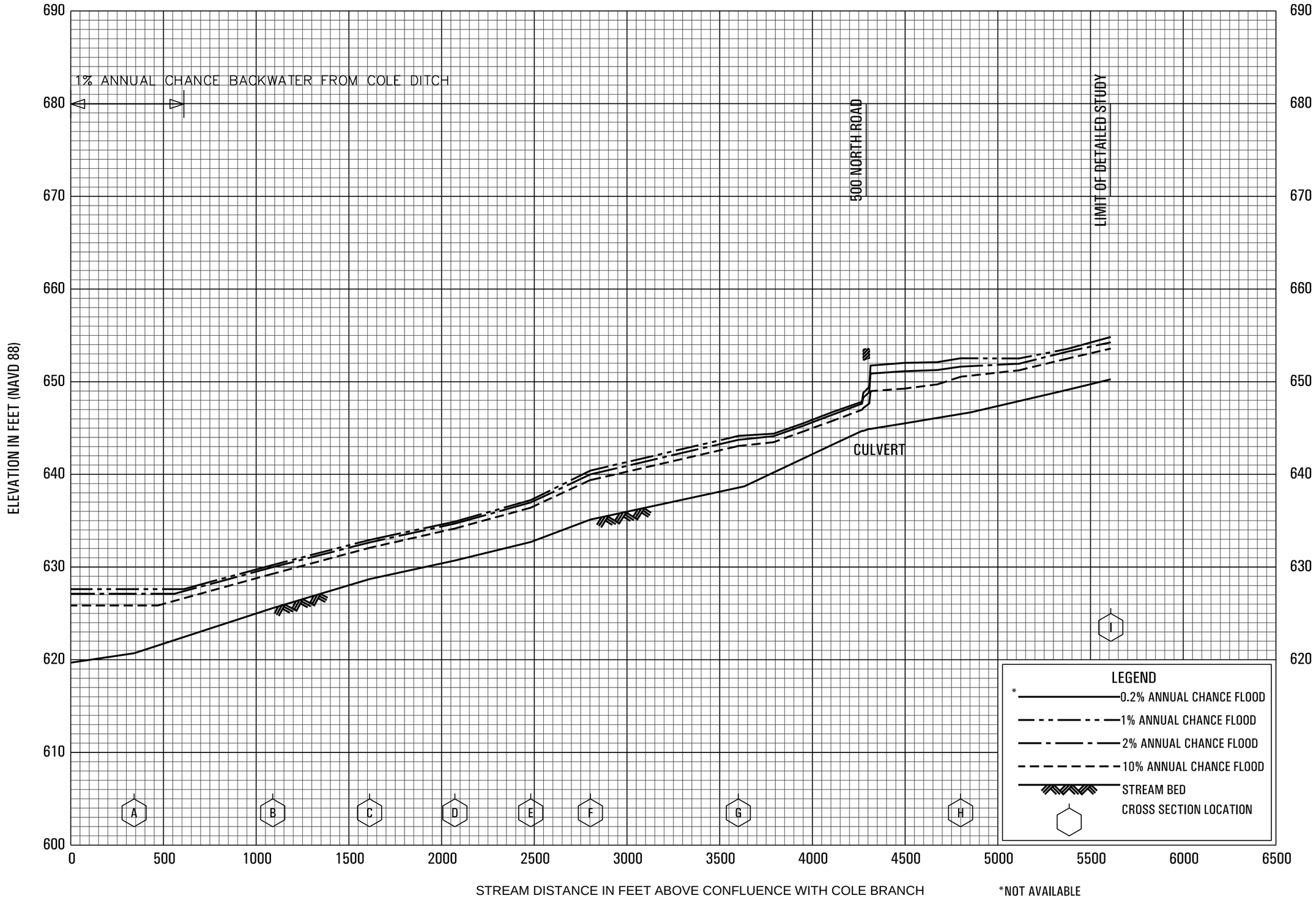
FLOOD PROFILES

COLE DITCH UNNAMED TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



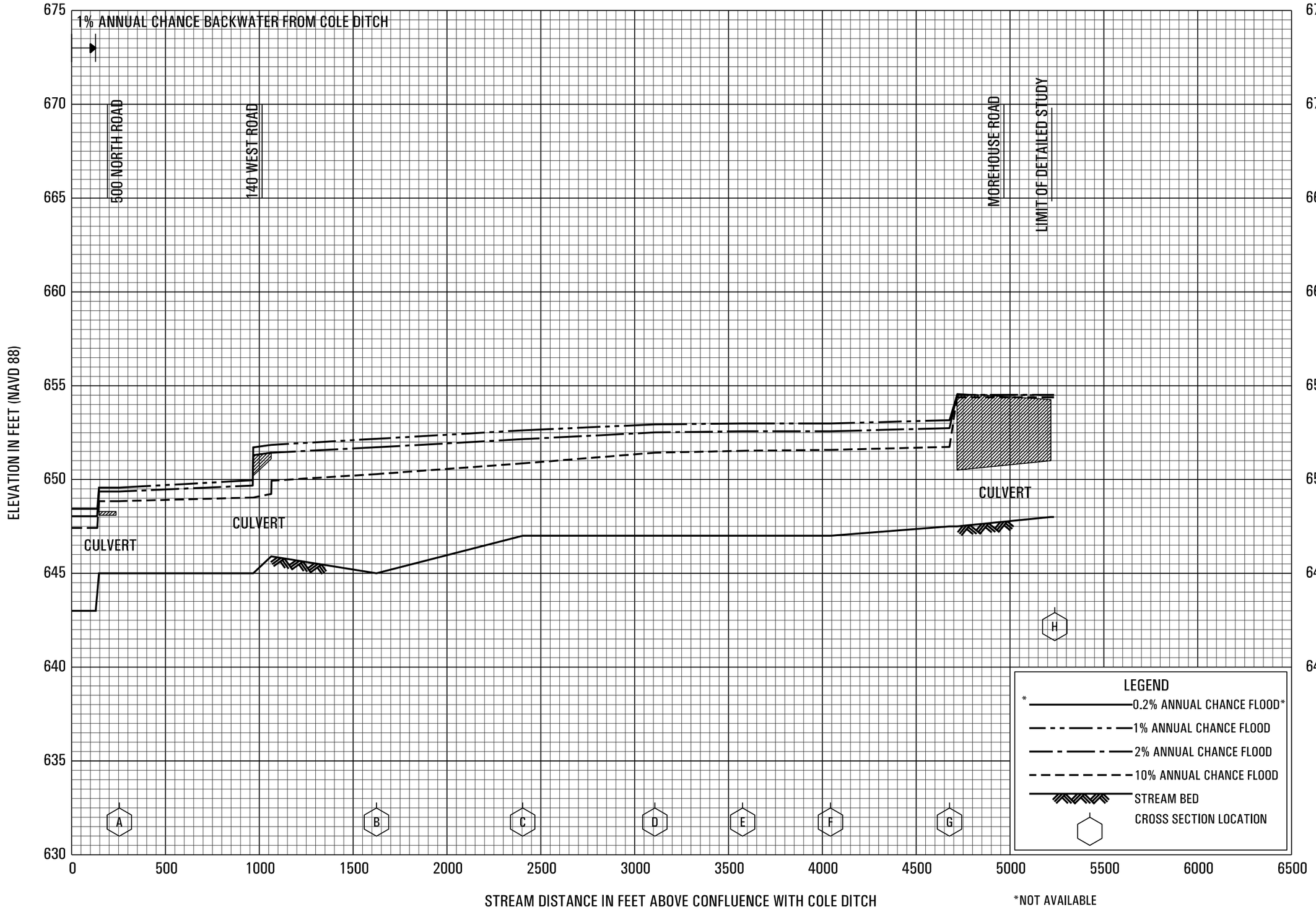
FLOOD PROFILES

COLE DITCH UNNAMED TRIBUTARY 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



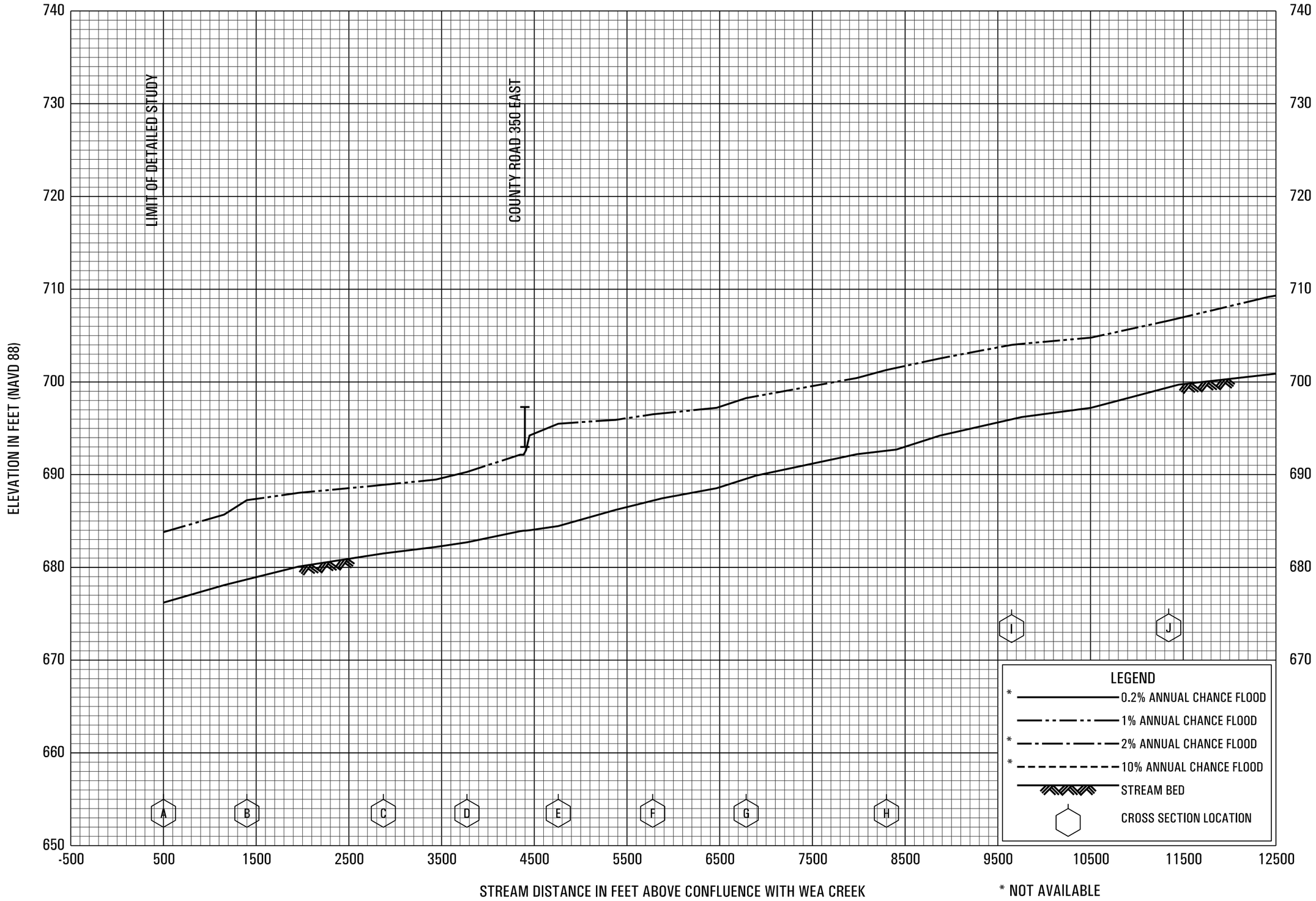
FLOOD PROFILES

CUPPY DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



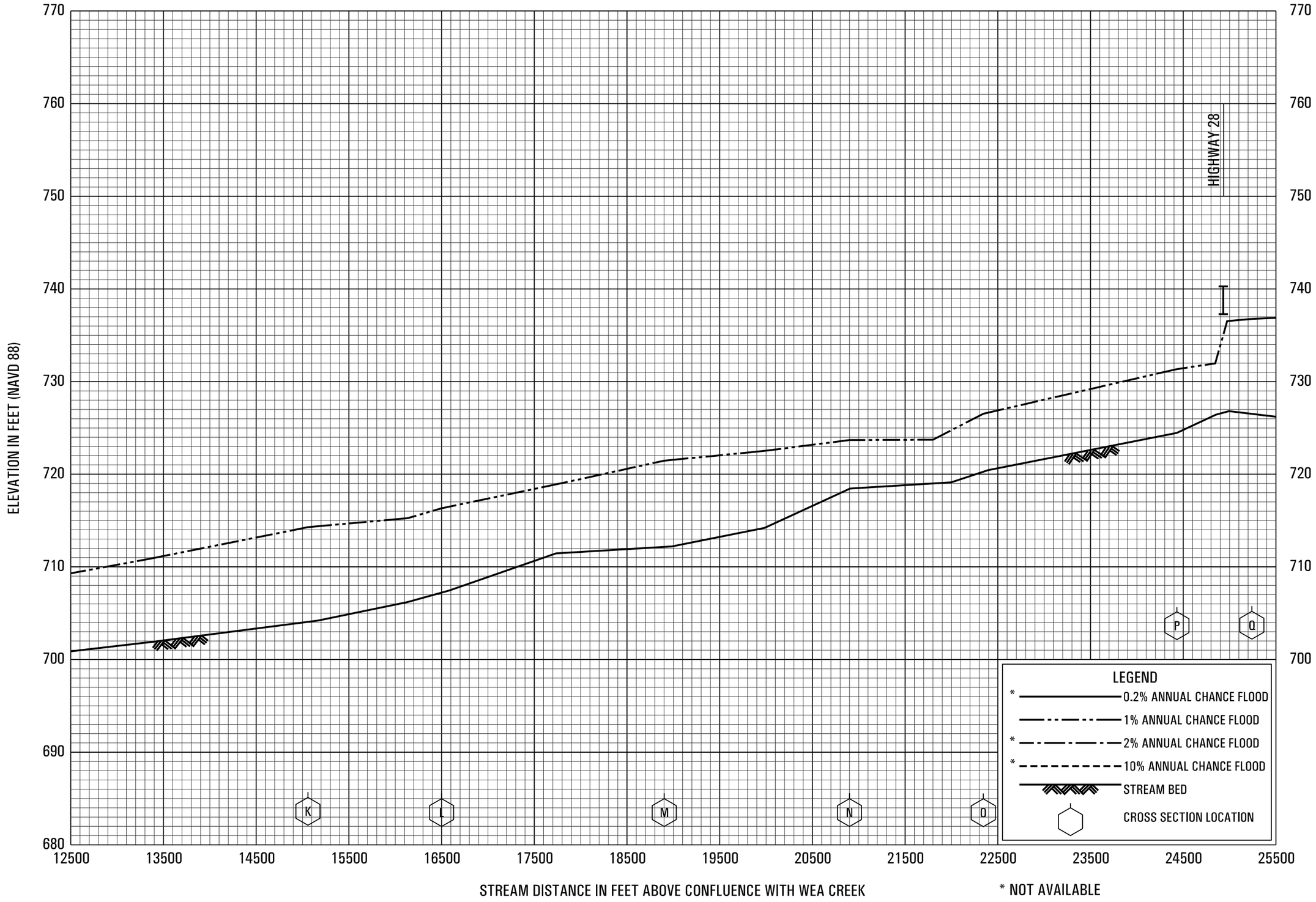
FLOOD PROFILES

EAST BRANCH WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



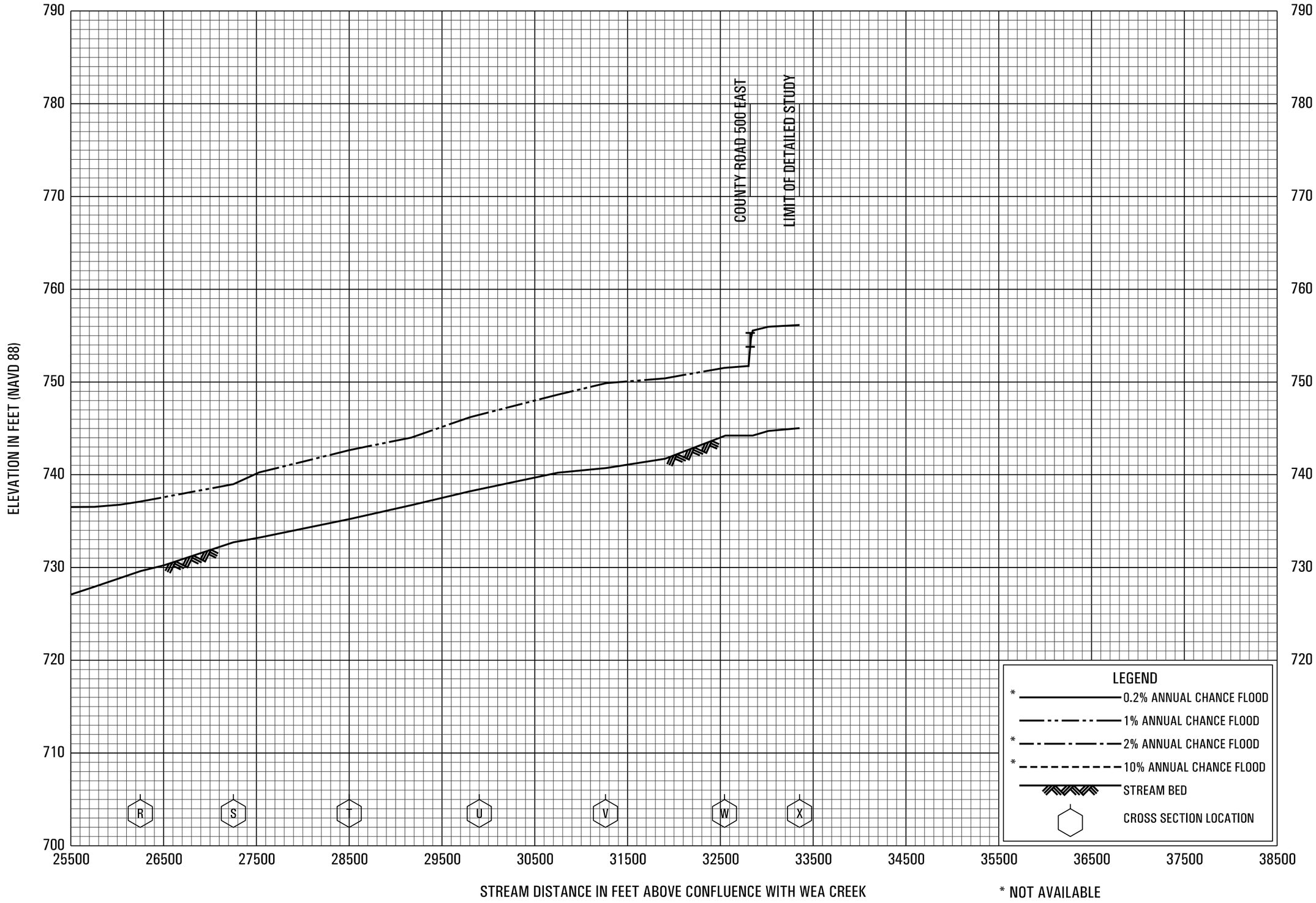
FLOOD PROFILES

EAST BRANCH WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



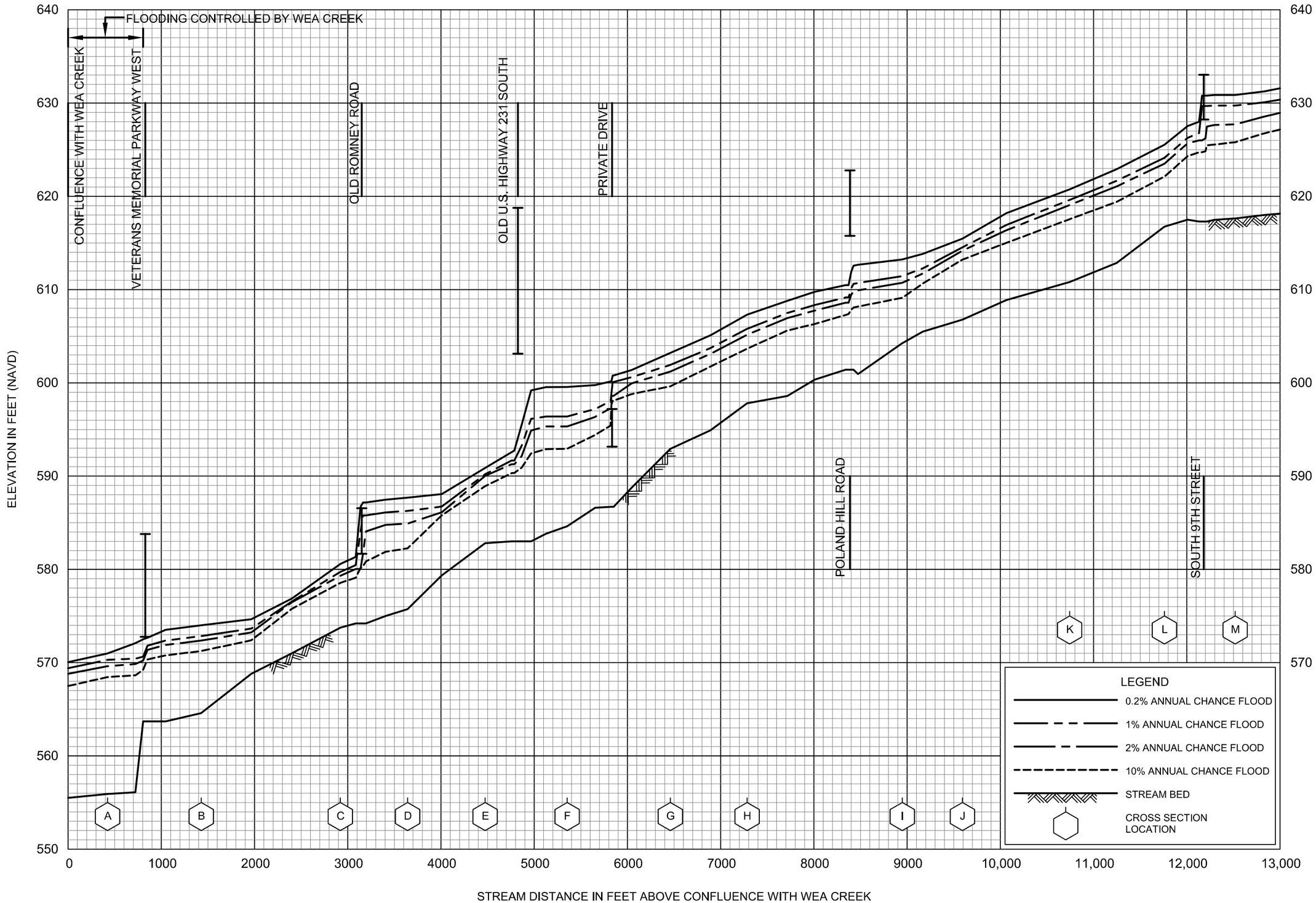
FLOOD PROFILES

EAST BRANCH WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



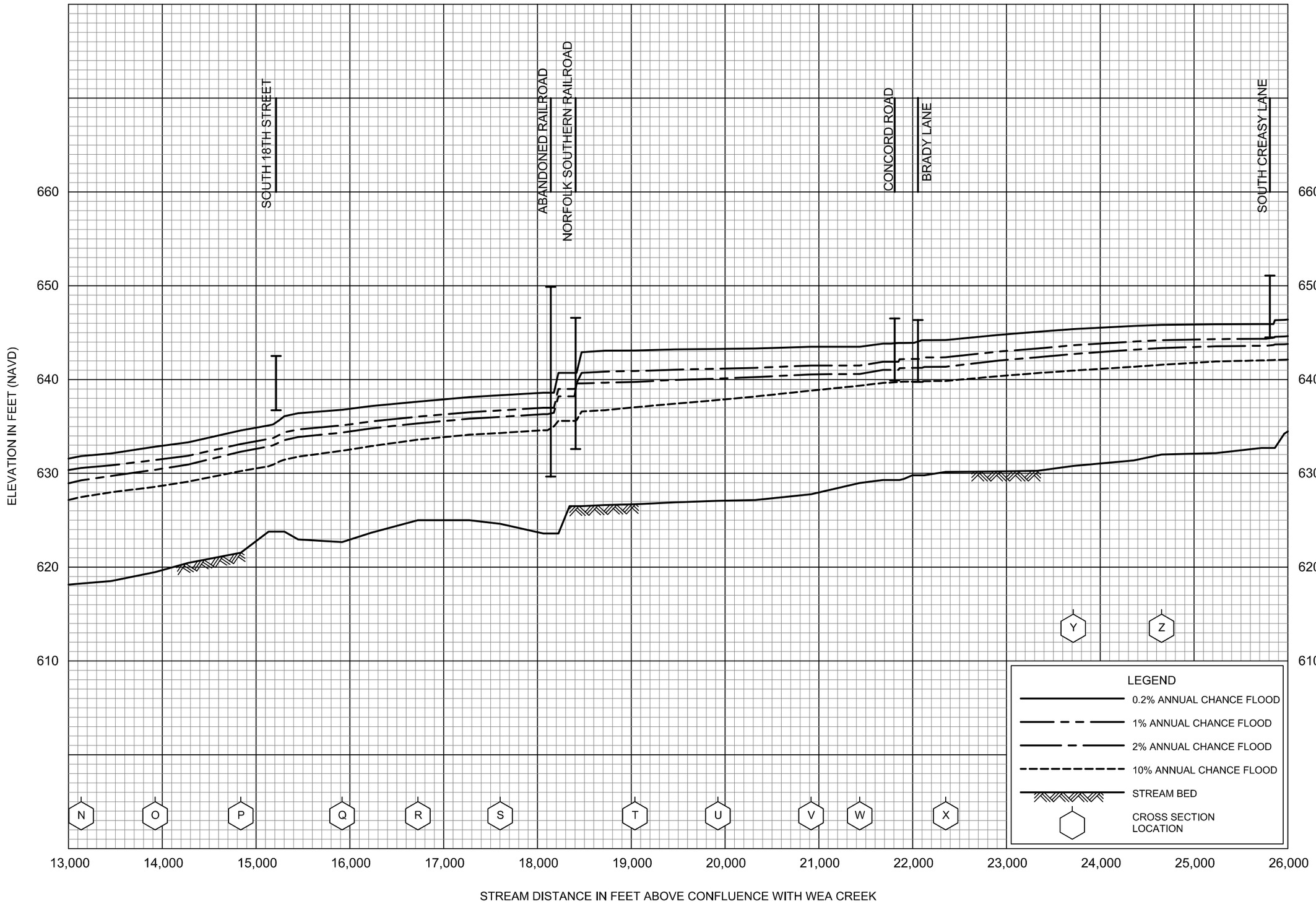
FLOOD PROFILES

ELLIOTT DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



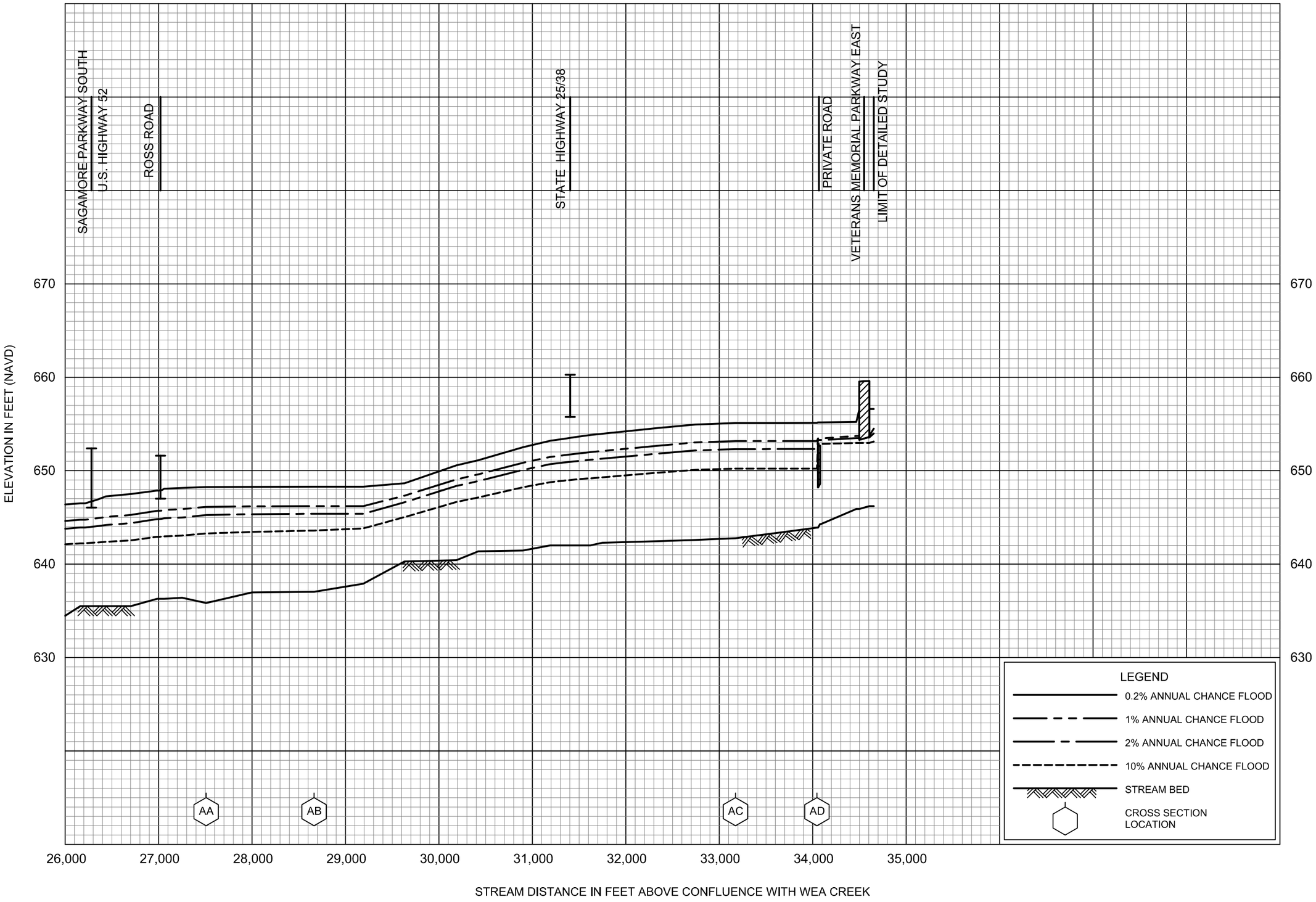
FLOOD PROFILES

ELLIOTT DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



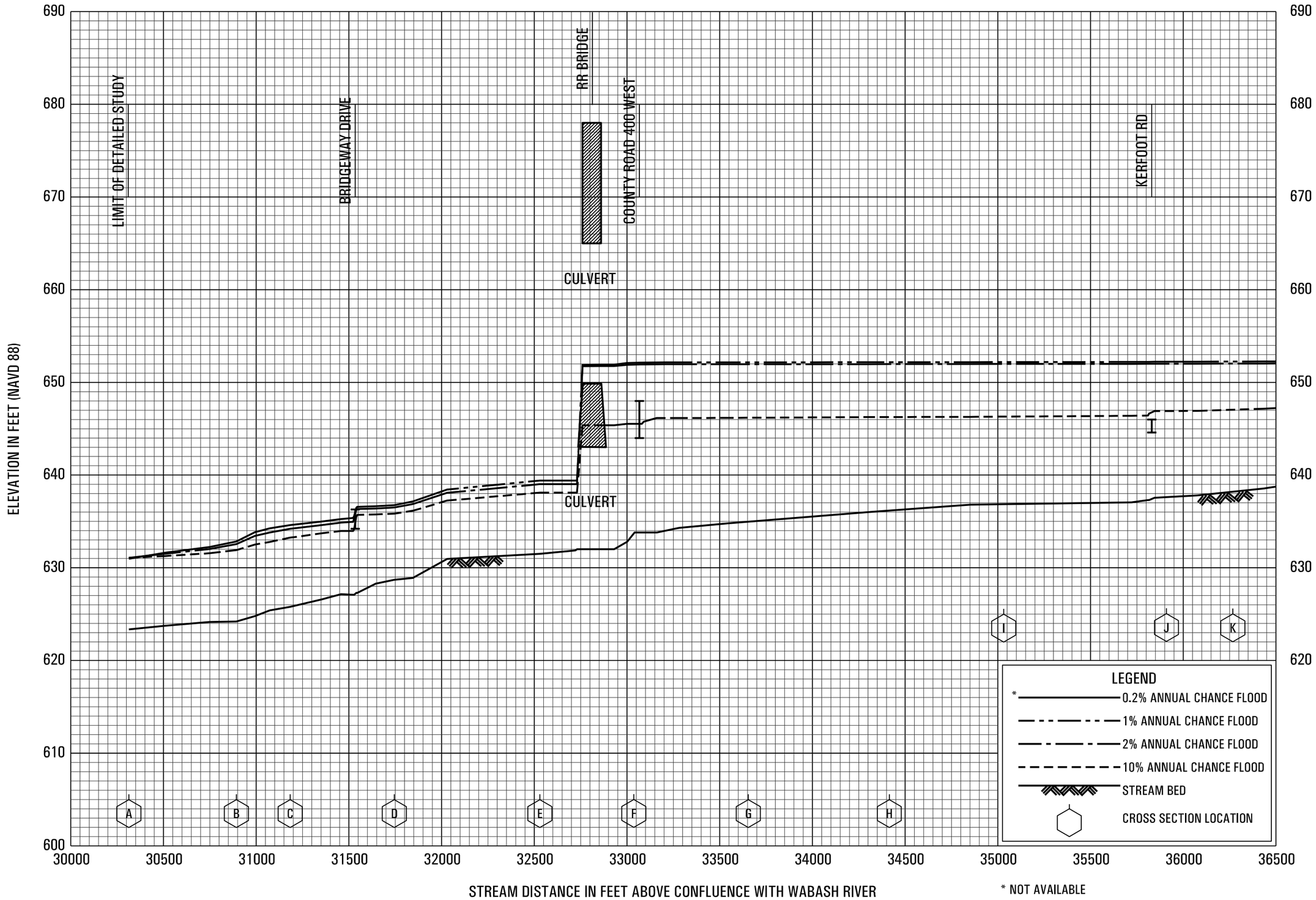
FLOOD PROFILES

ELLIOTT DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



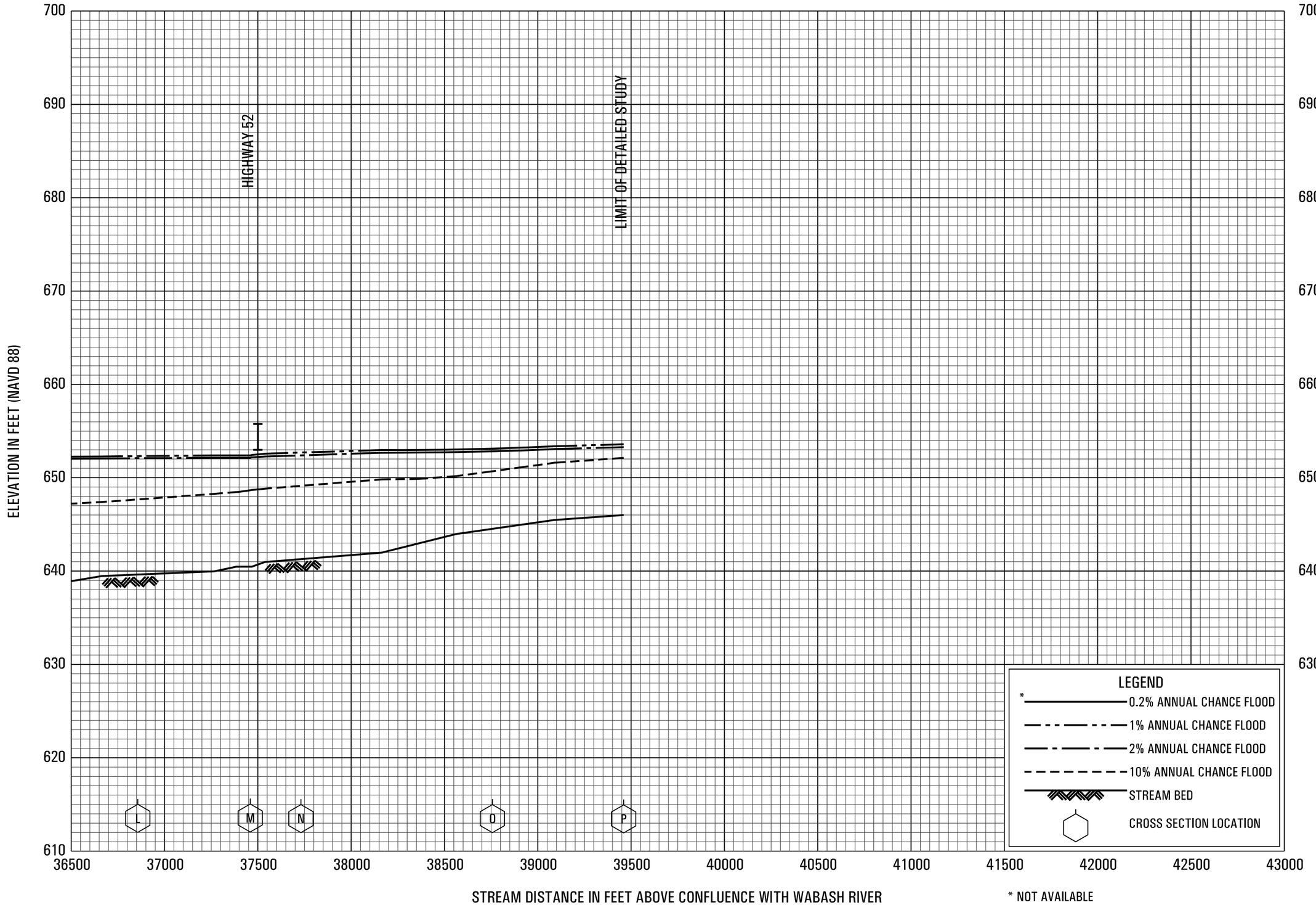
FLOOD PROFILES

INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



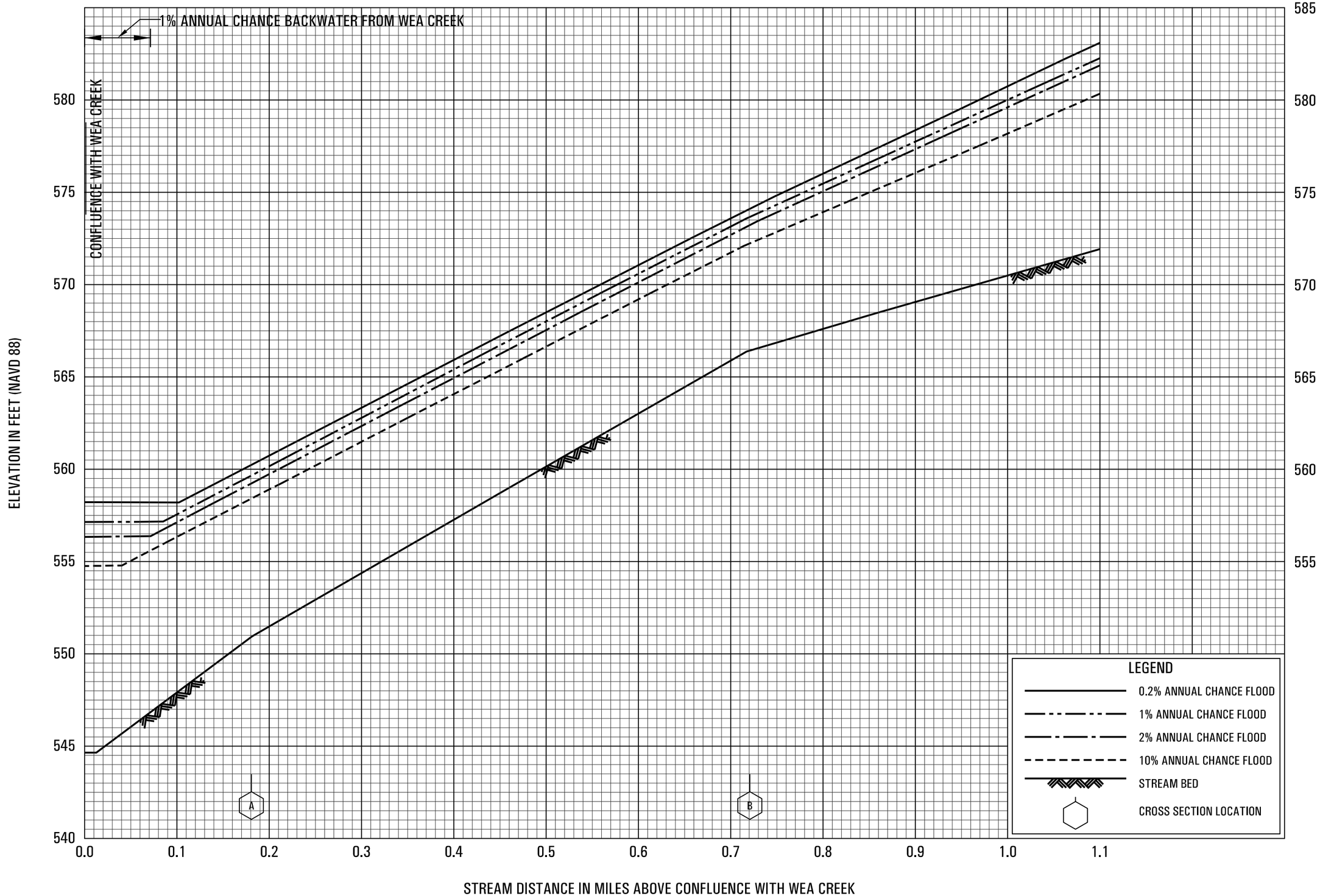
FLOOD PROFILES

INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



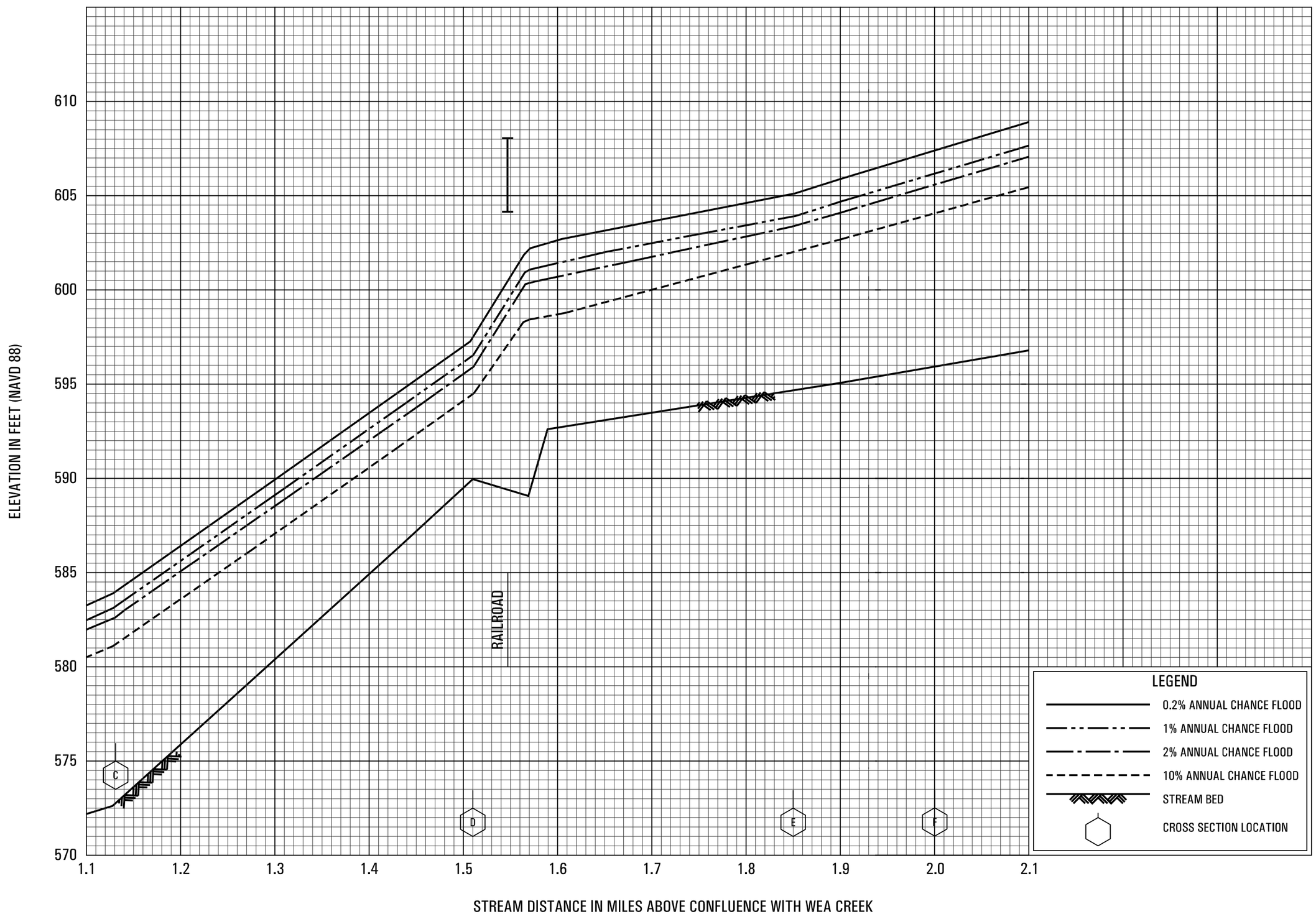
FLOOD PROFILES

LITTLE WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



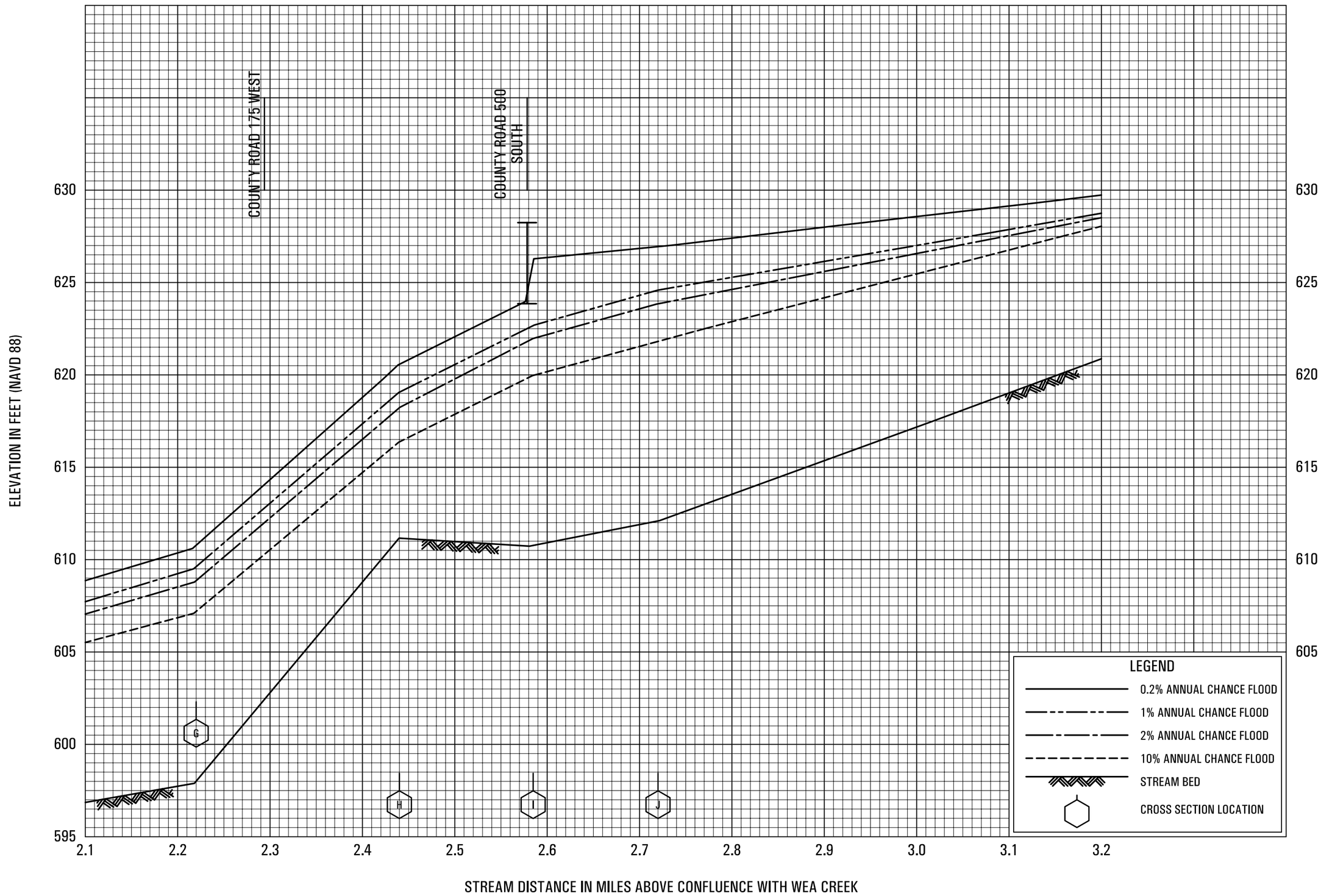
FLOOD PROFILES

LITTLE WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

LITTLE WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

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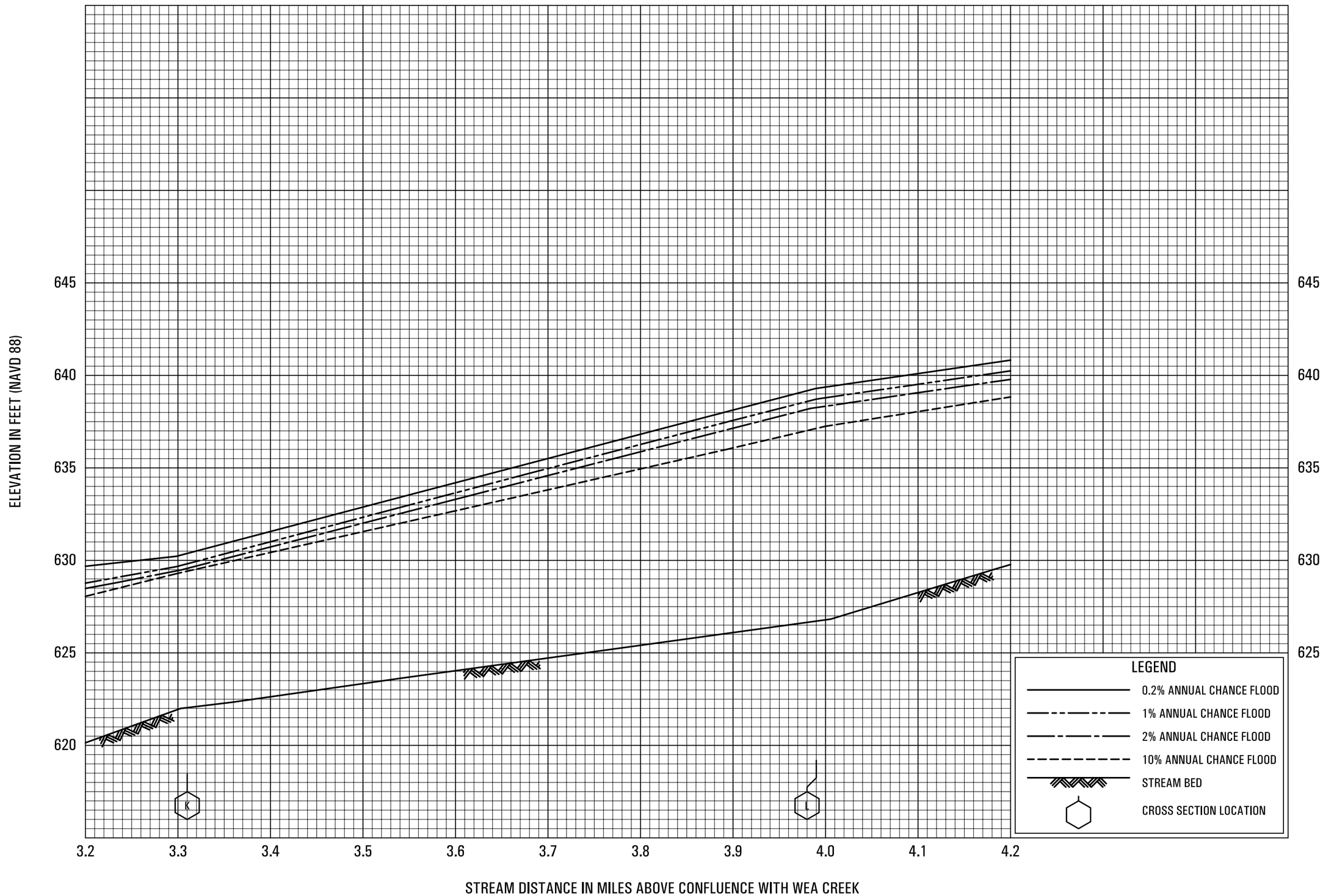


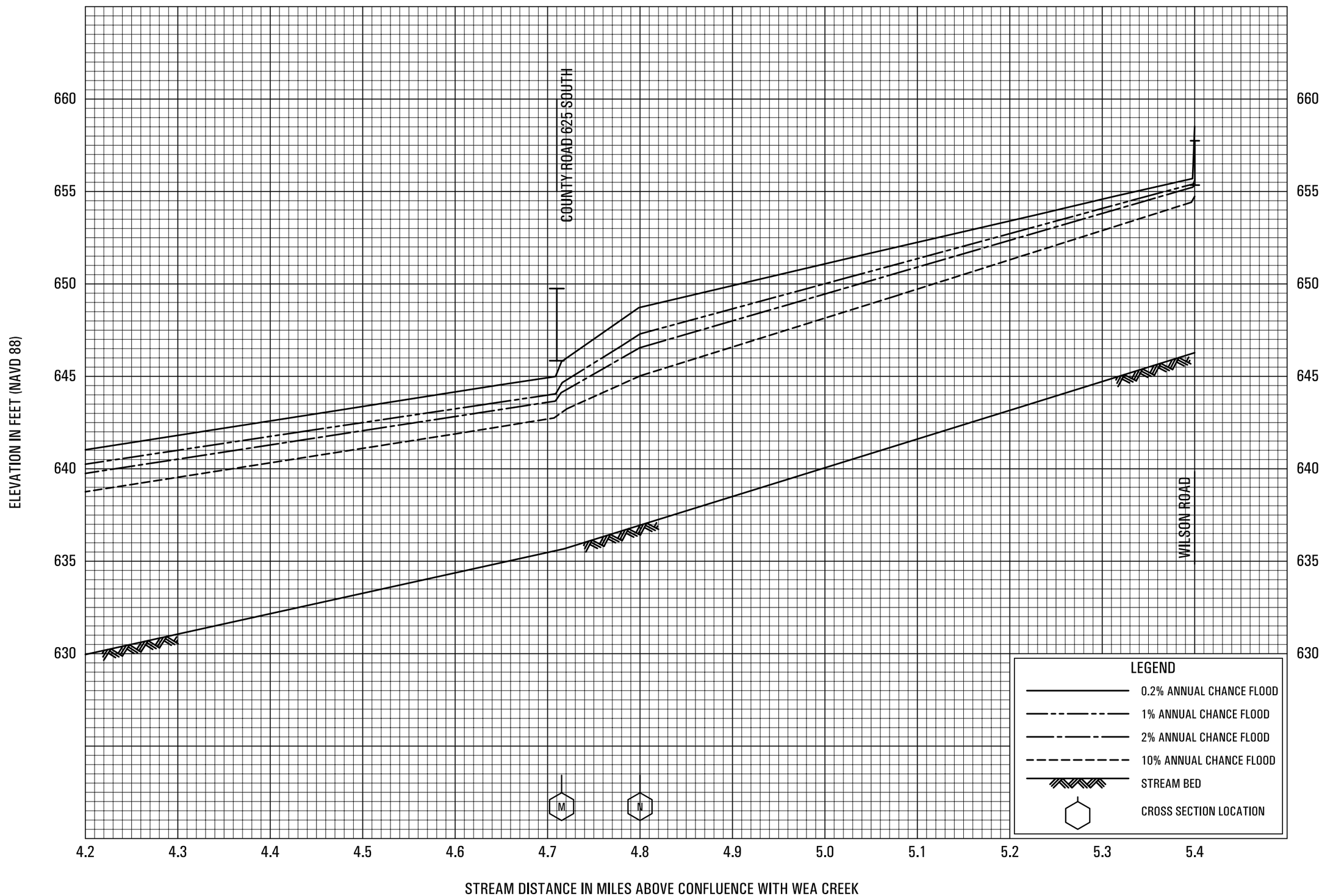
FLOOD PROFILES

LITTLE WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



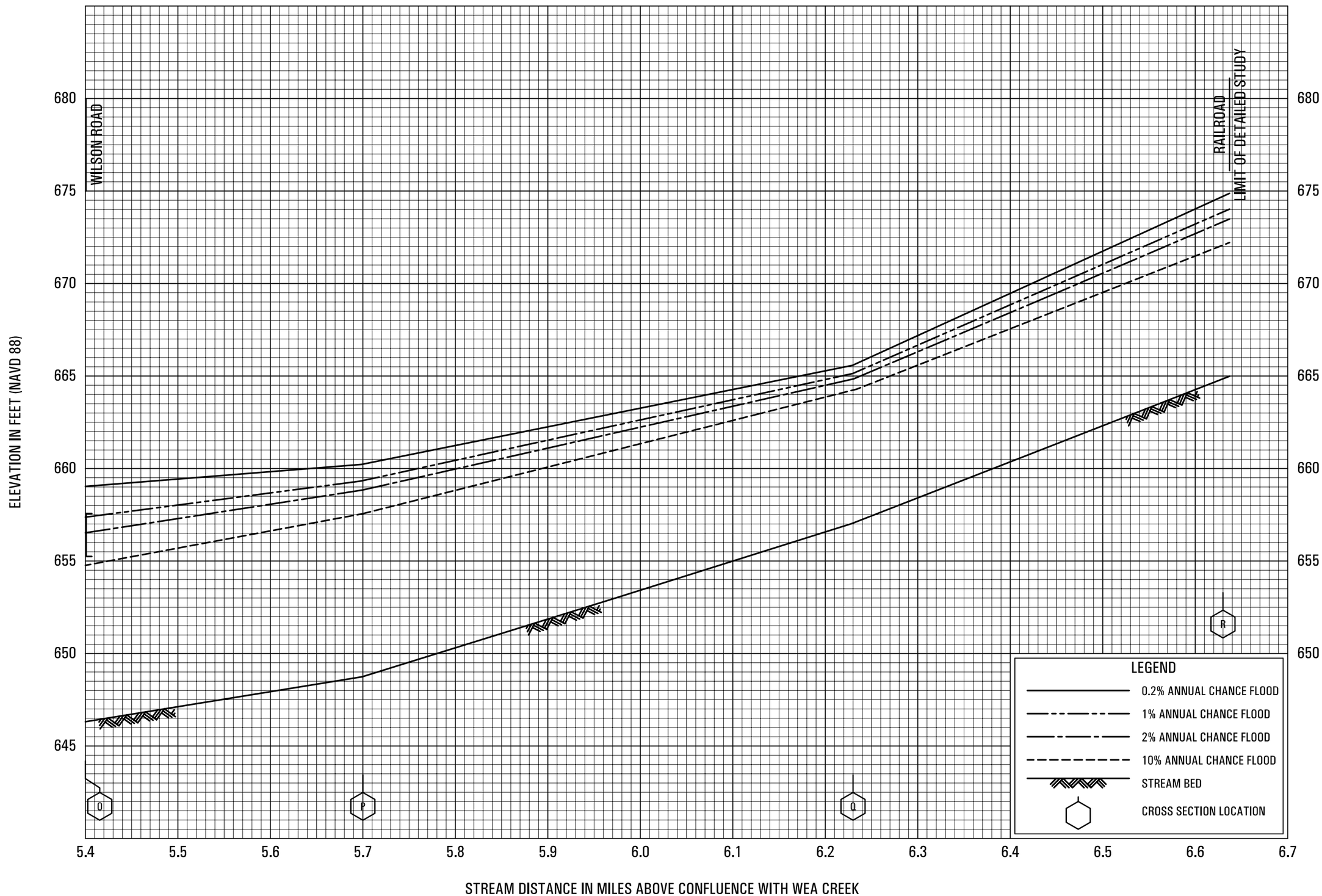
FLOOD PROFILES

LITTLE WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



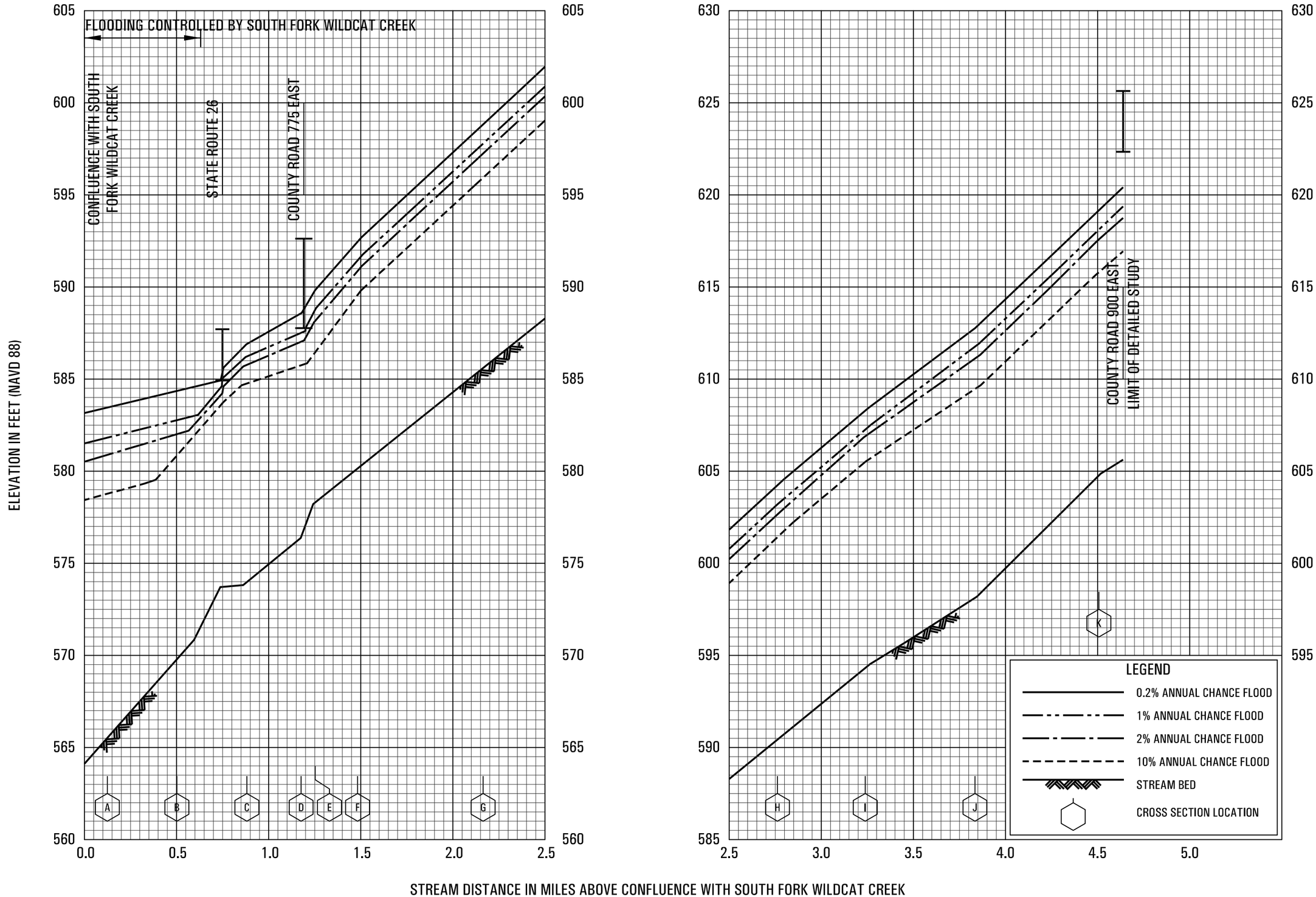
FLOOD PROFILES

LITTLE WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



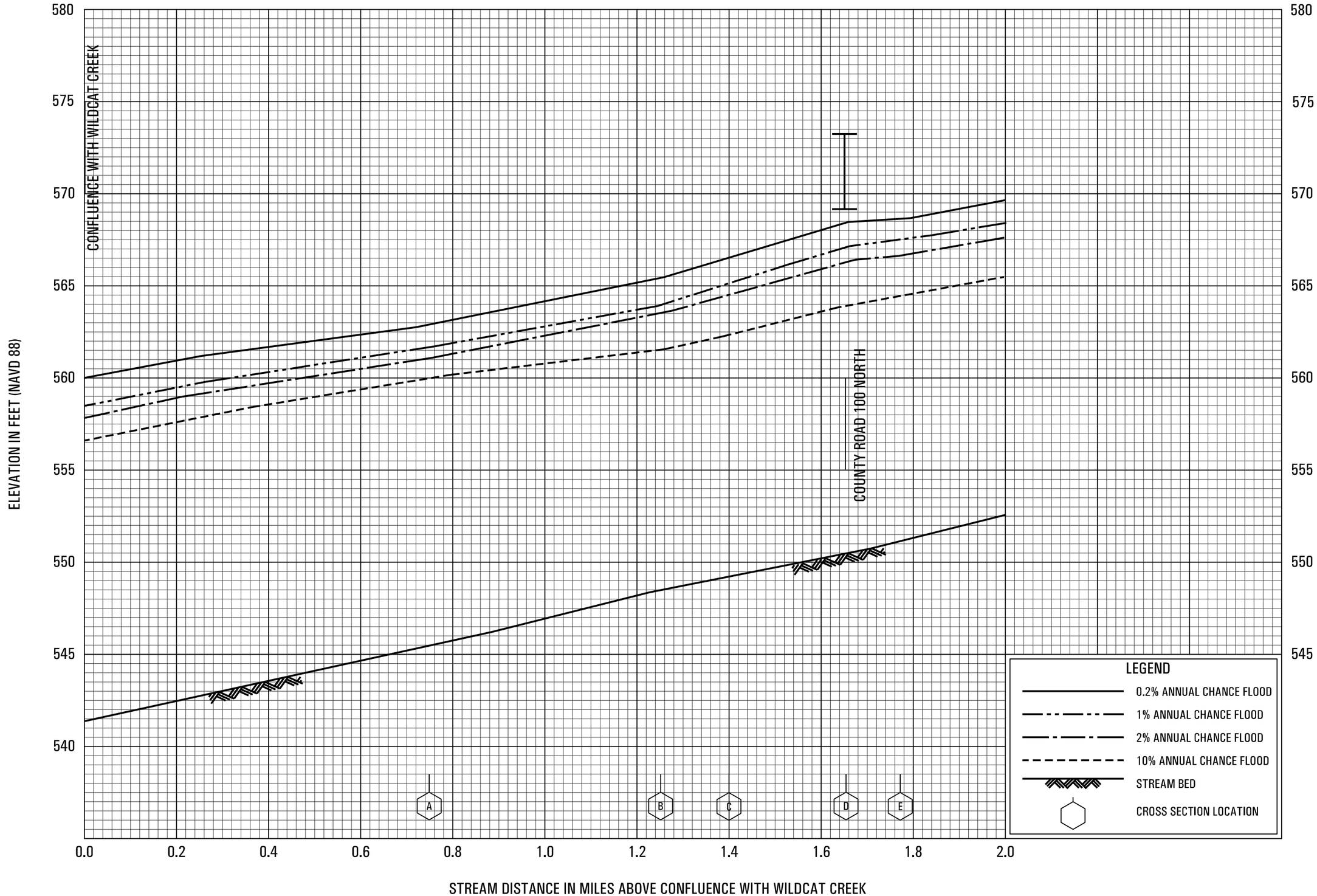
FLOOD PROFILES

MIDDLE FORK WILDCAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



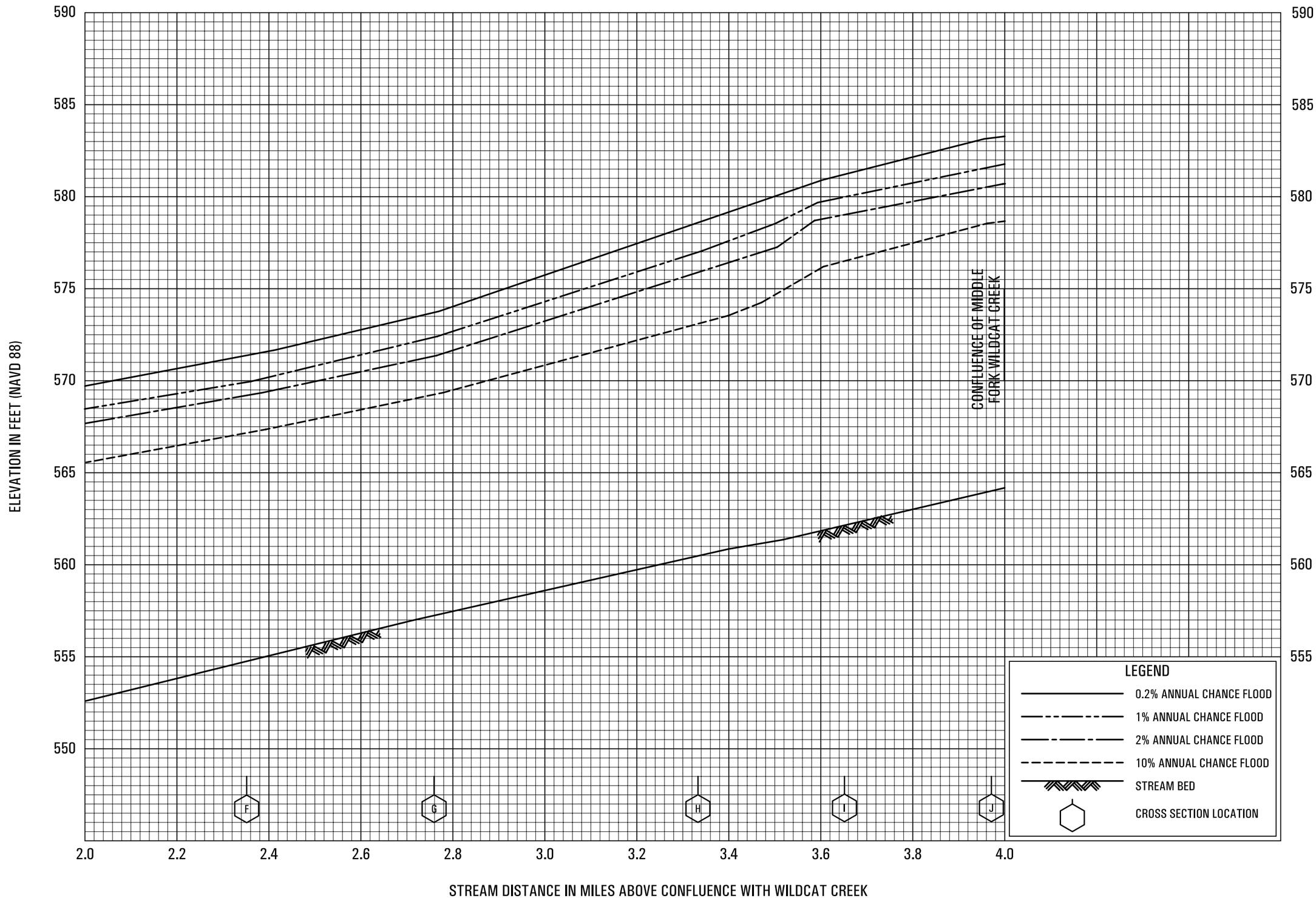
FLOOD PROFILES

SOUTH FORK WILDCAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



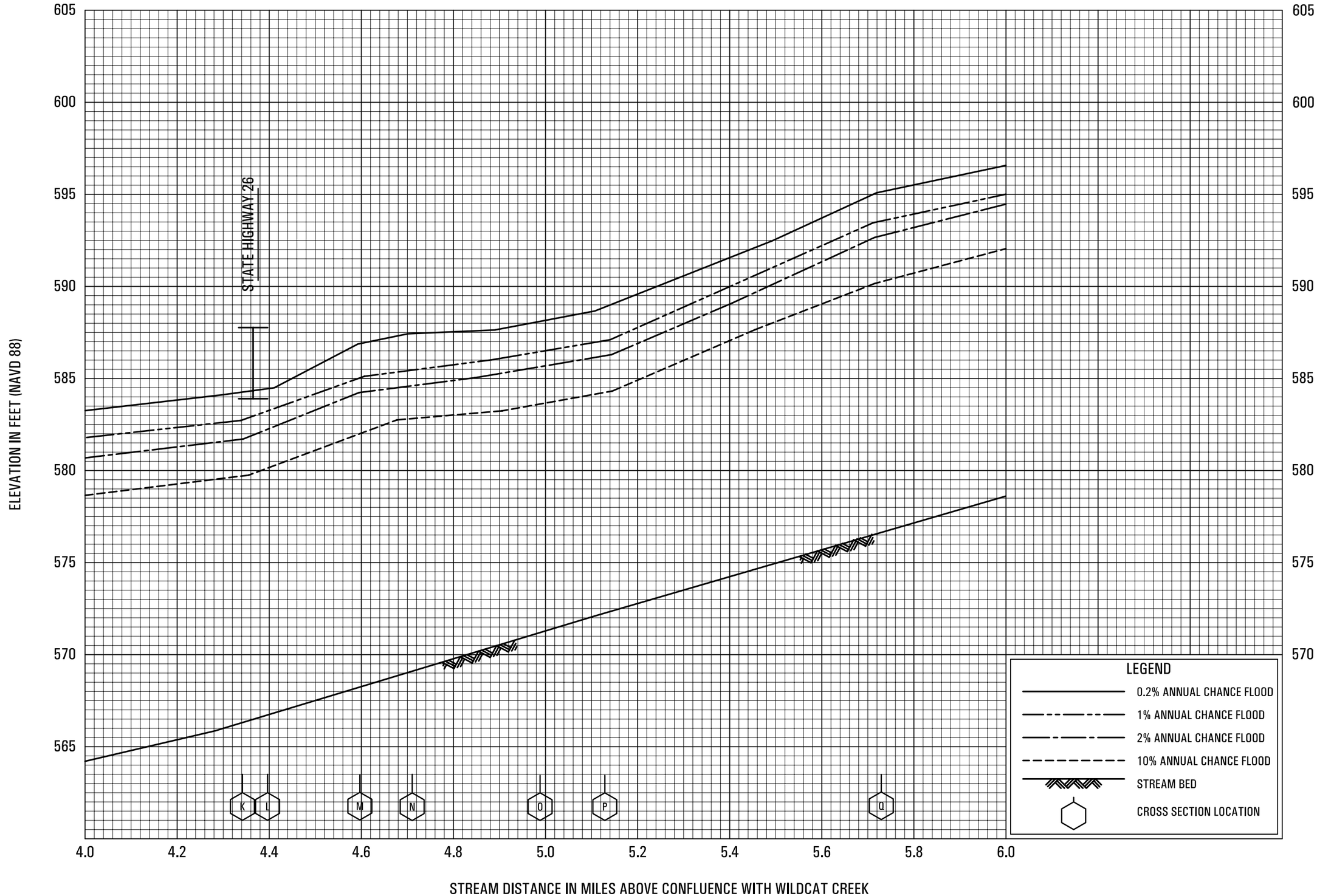
FLOOD PROFILES

SOUTH FORK WILDCAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



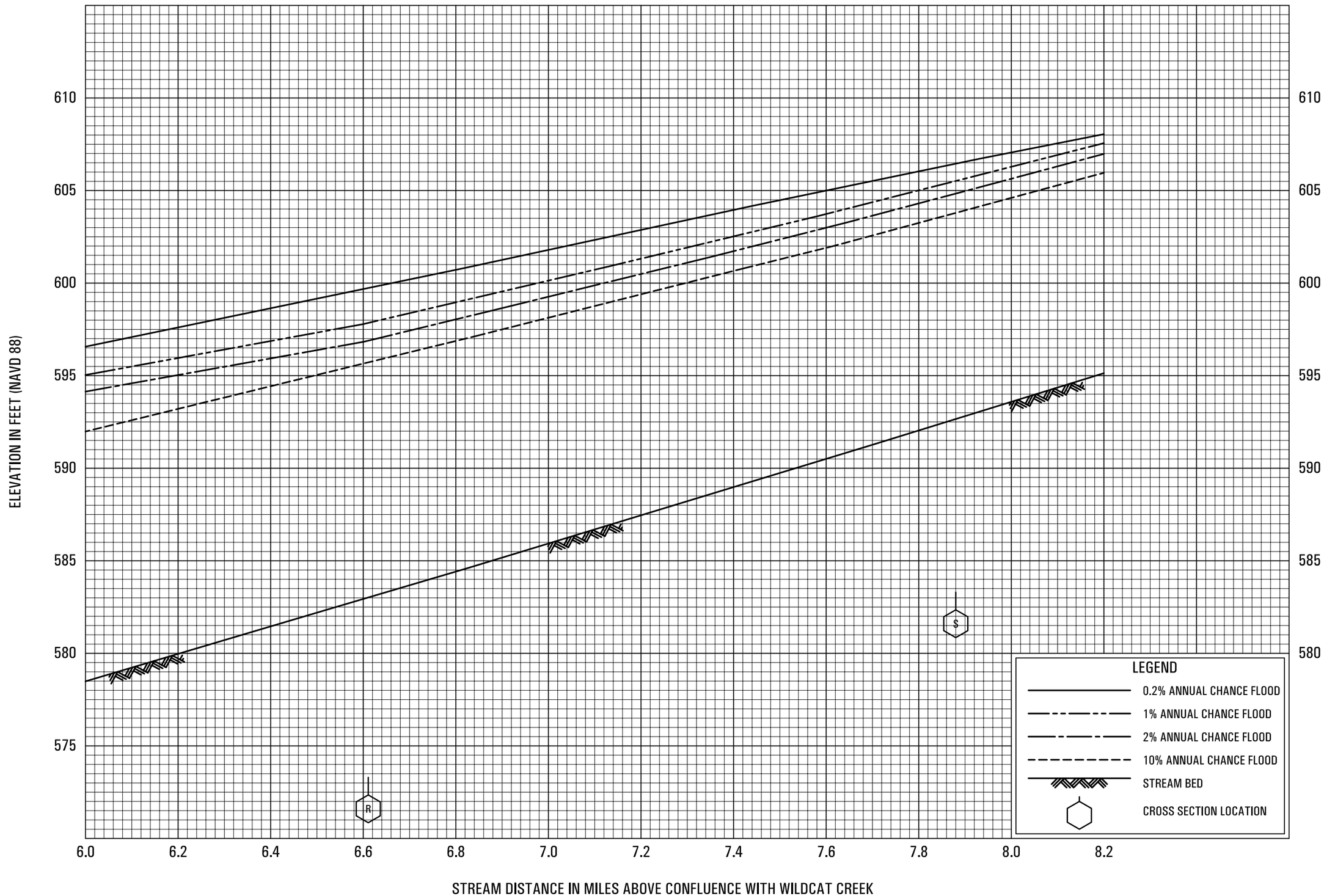
FLOOD PROFILES

SOUTH FORK WILDCAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



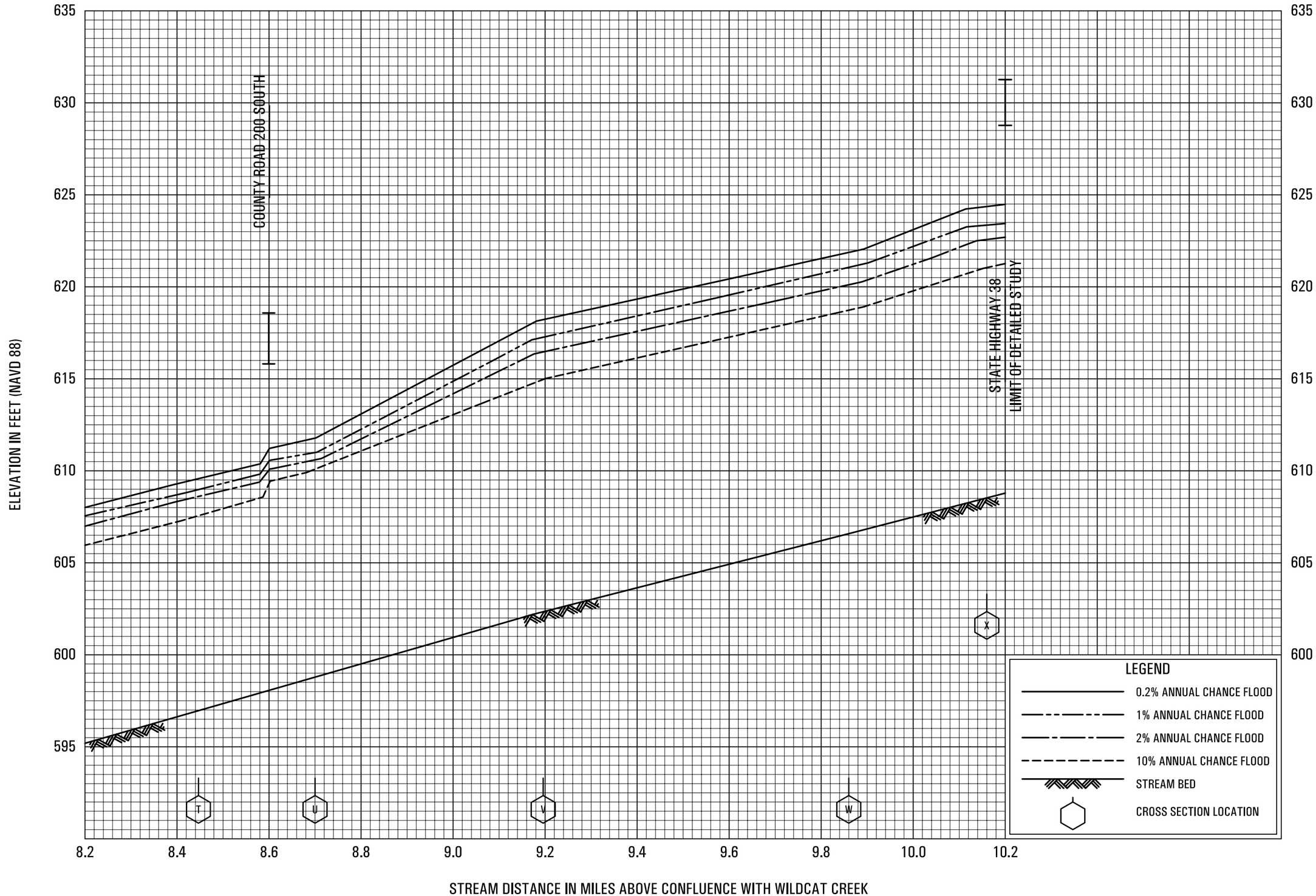
FLOOD PROFILES

SOUTH FORK WILDCAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



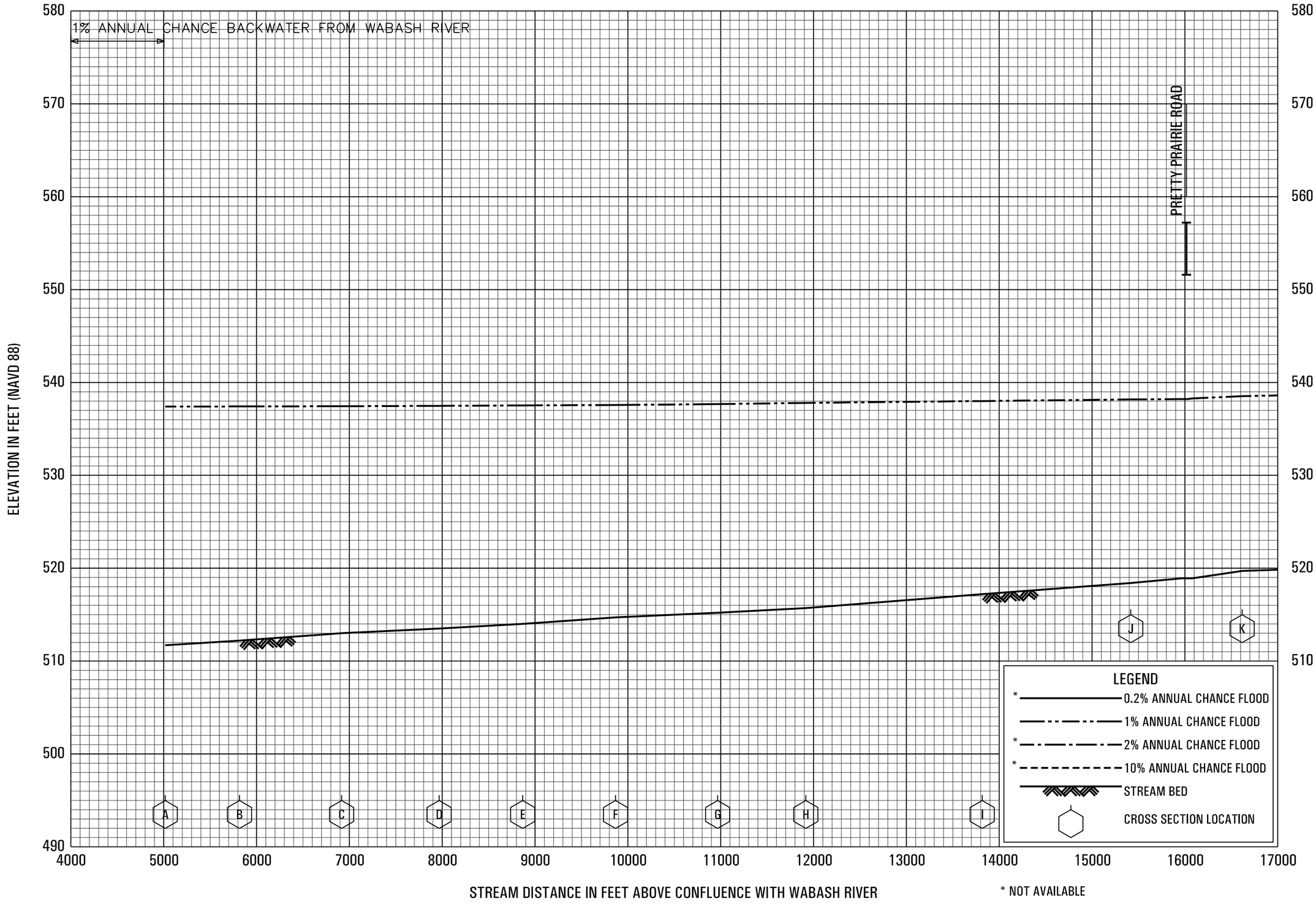
FLOOD PROFILES

SOUTH FORK WILDCAT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



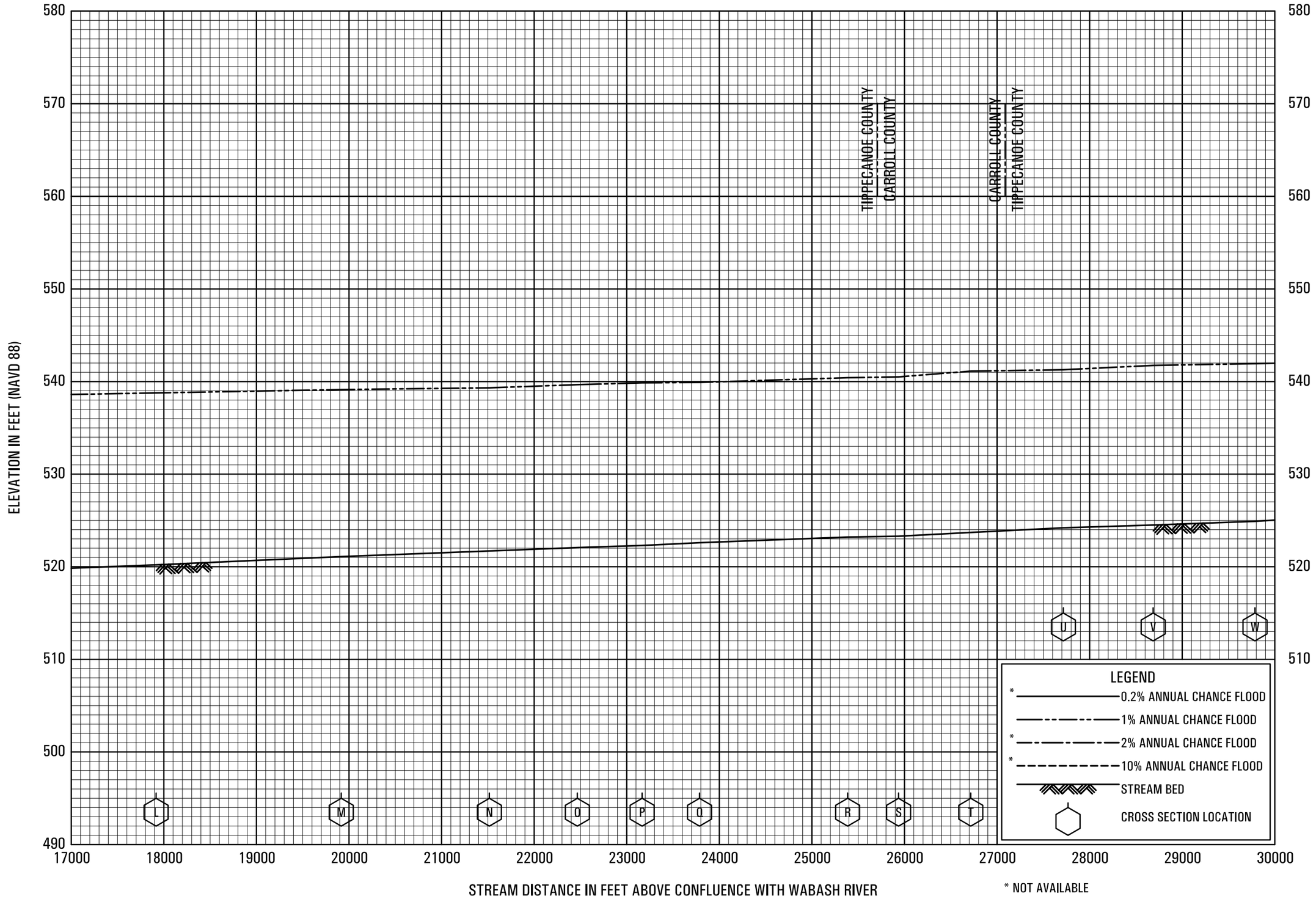
FLOOD PROFILES

TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



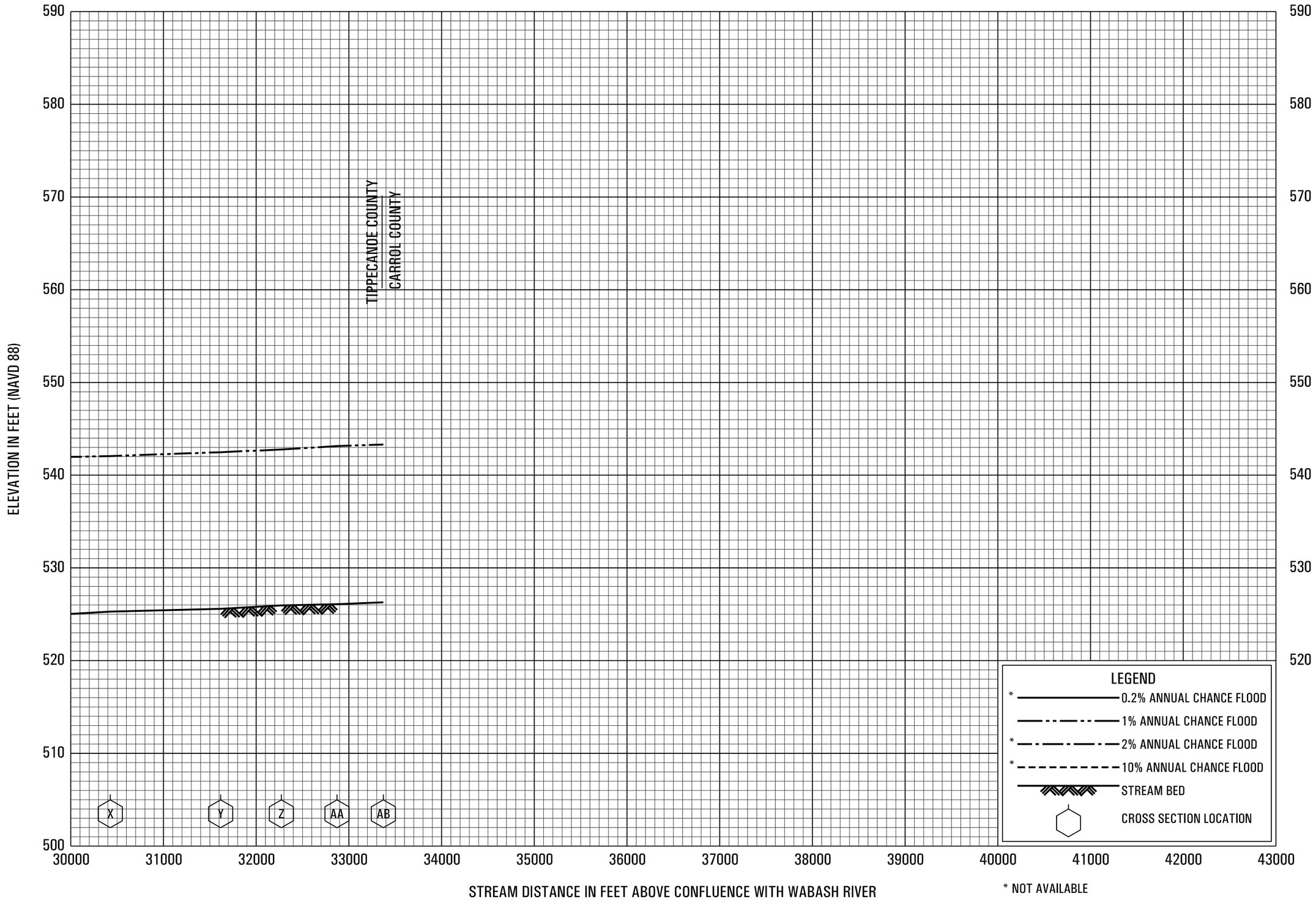
FLOOD PROFILES

TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



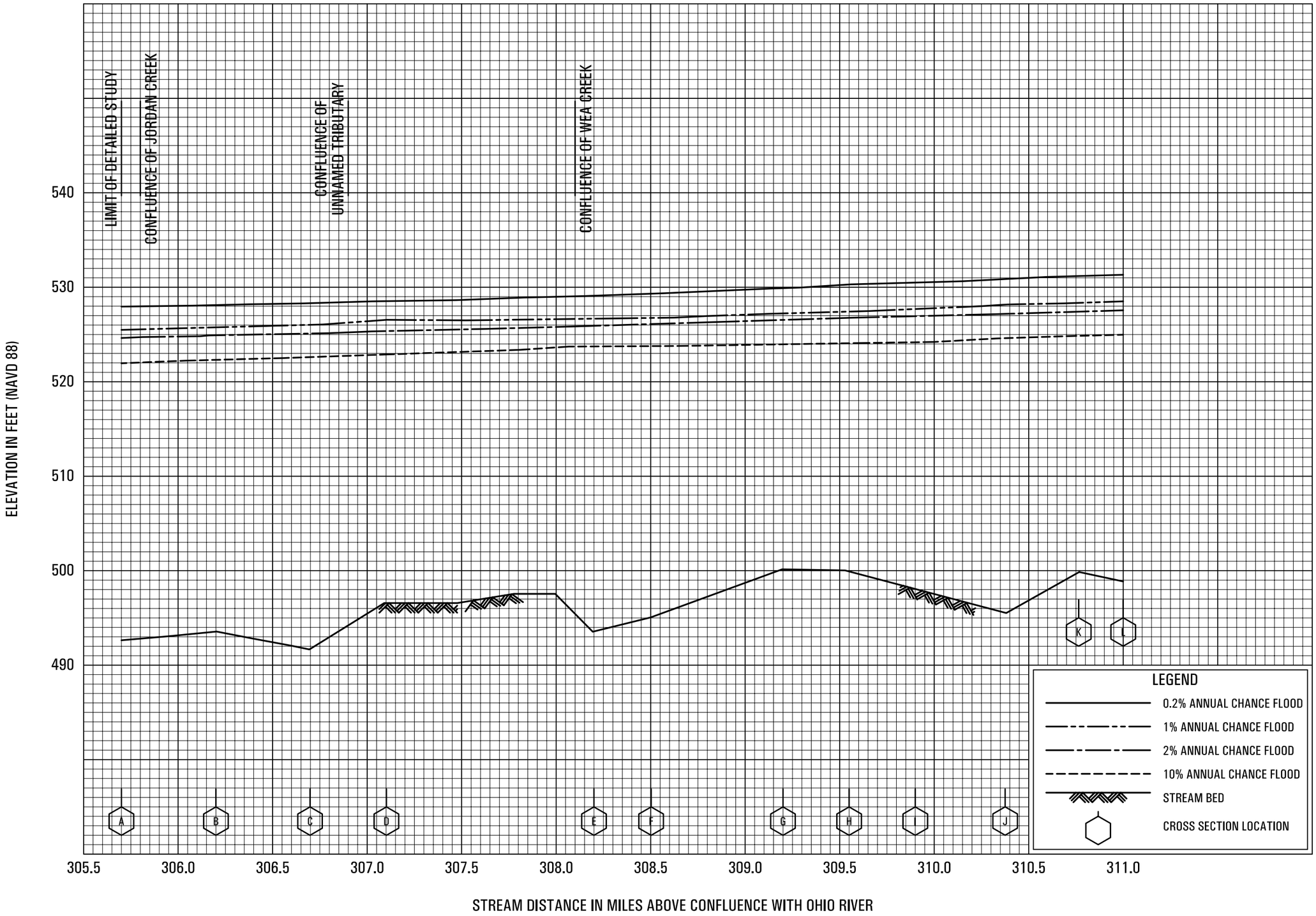
FLOOD PROFILES

TIPPECANOE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



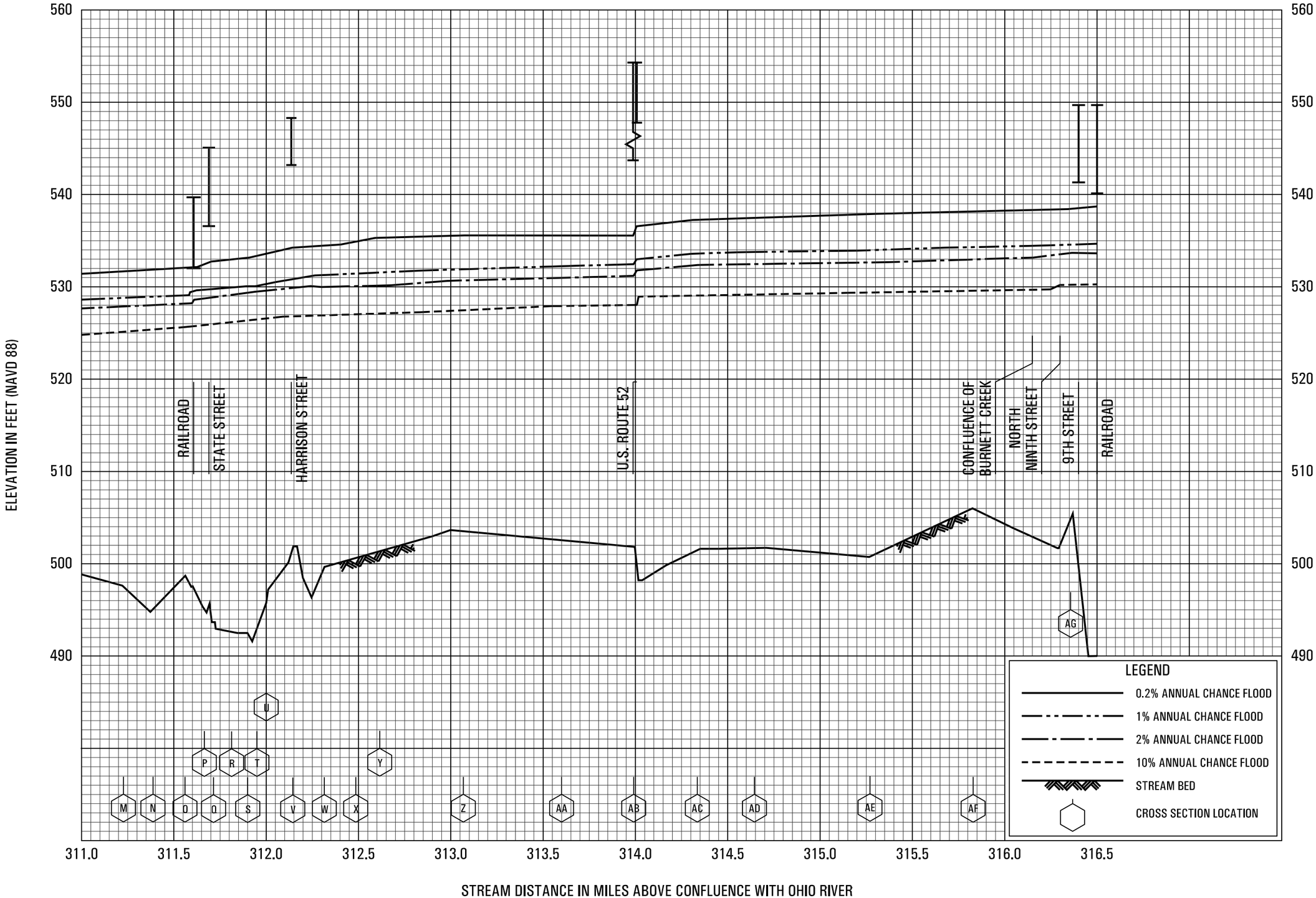
FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



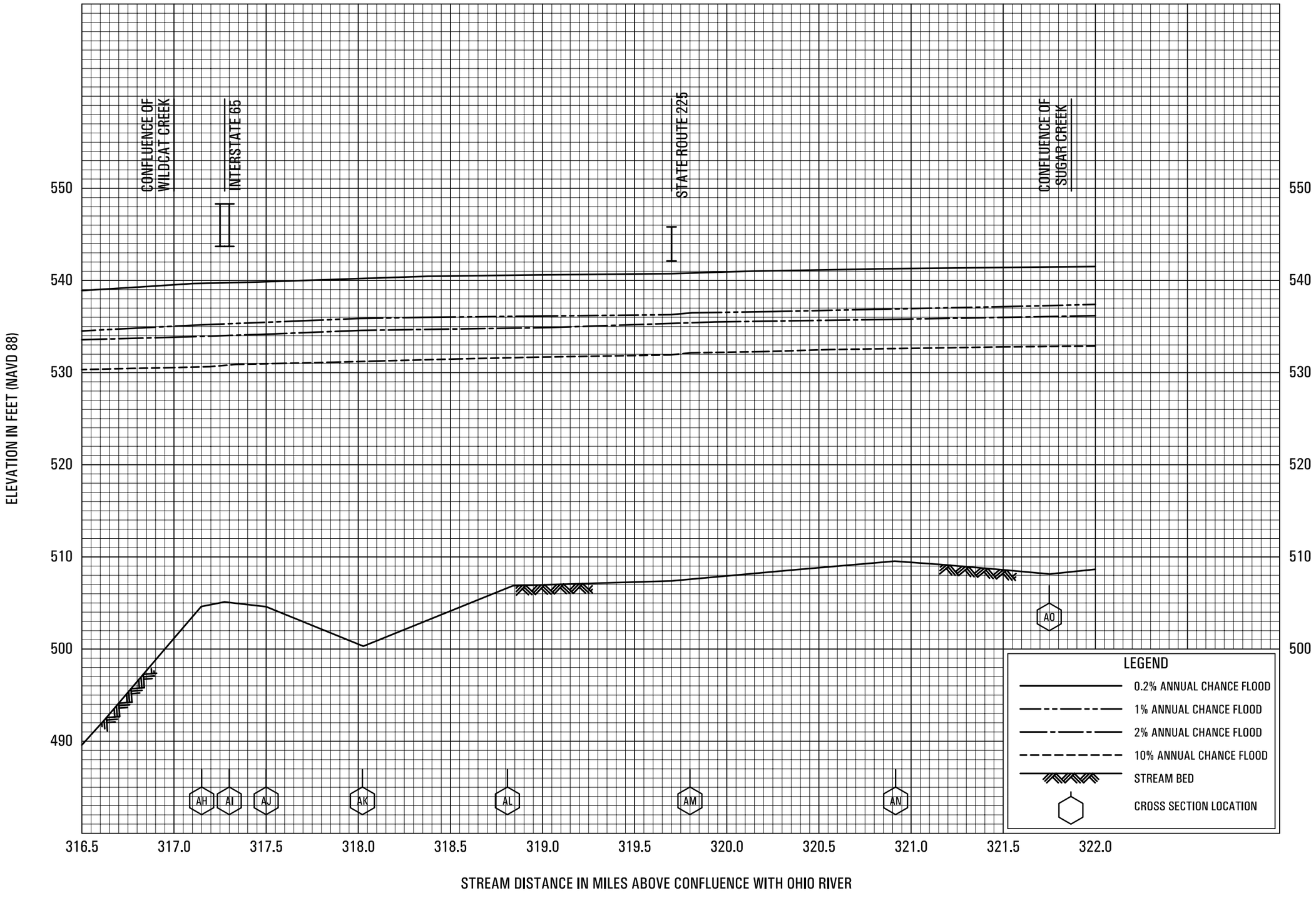
FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

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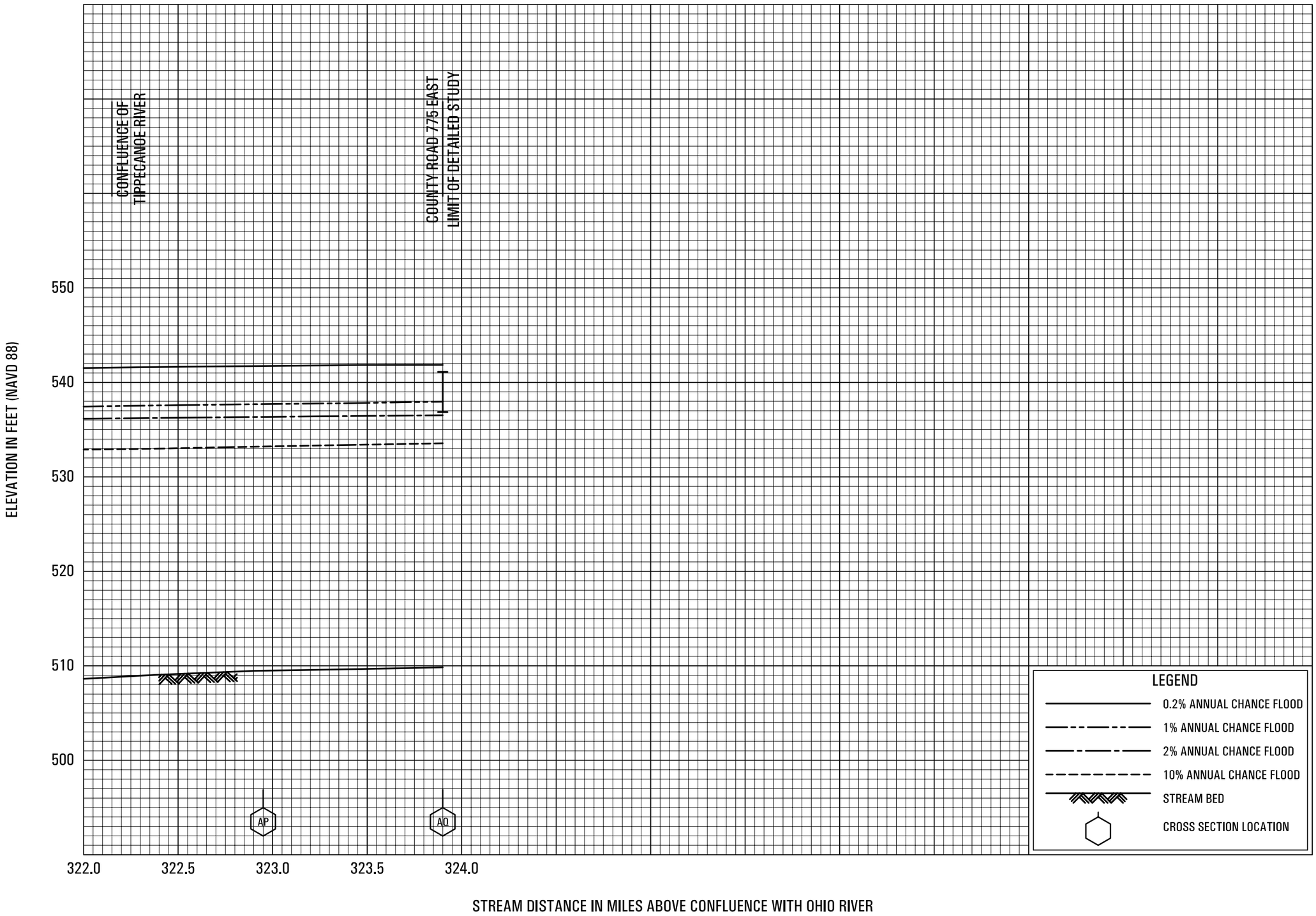

FLOOD PROFILES

WABASH RIVER

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TIPPECANOE COUNTY, IN

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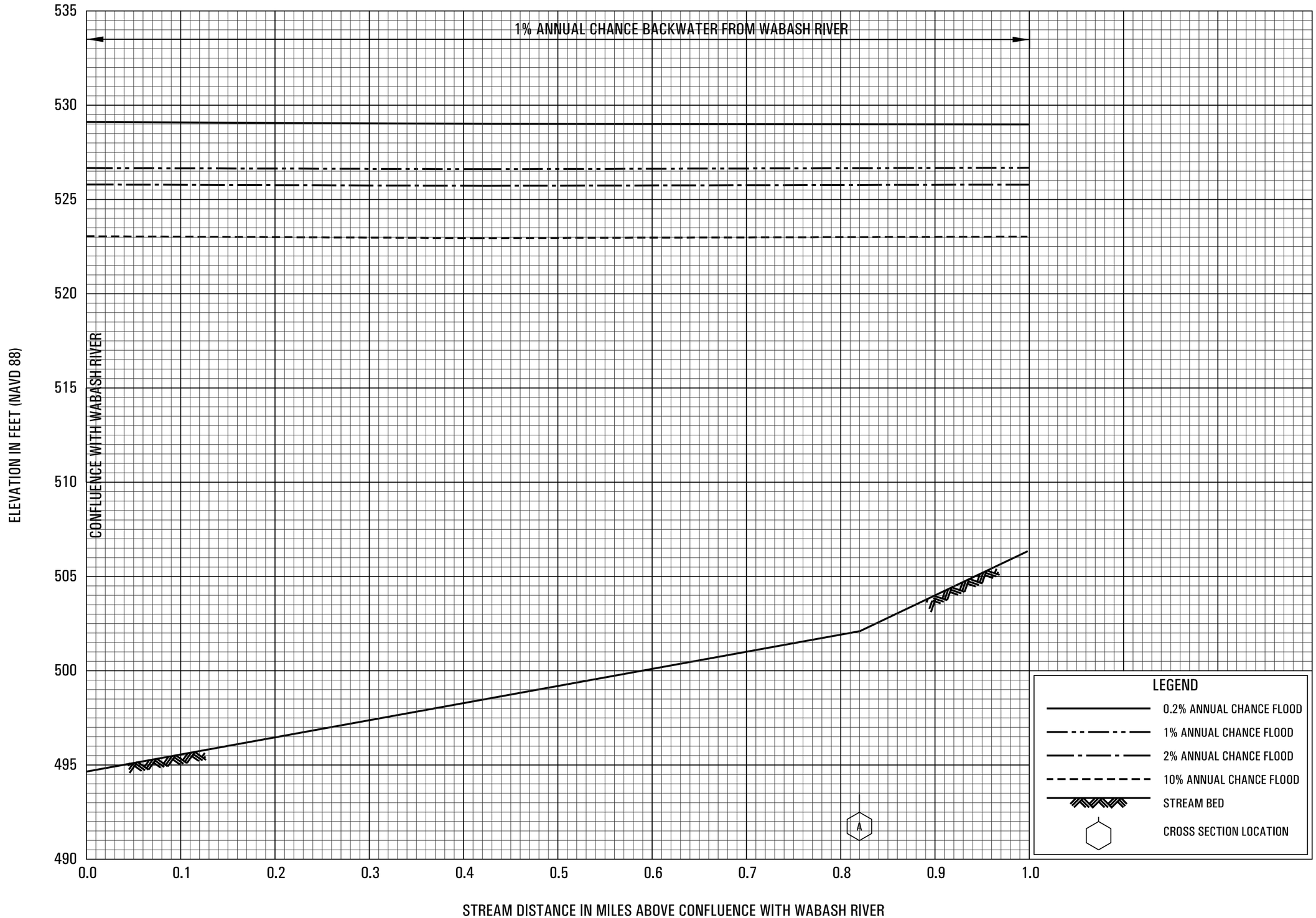


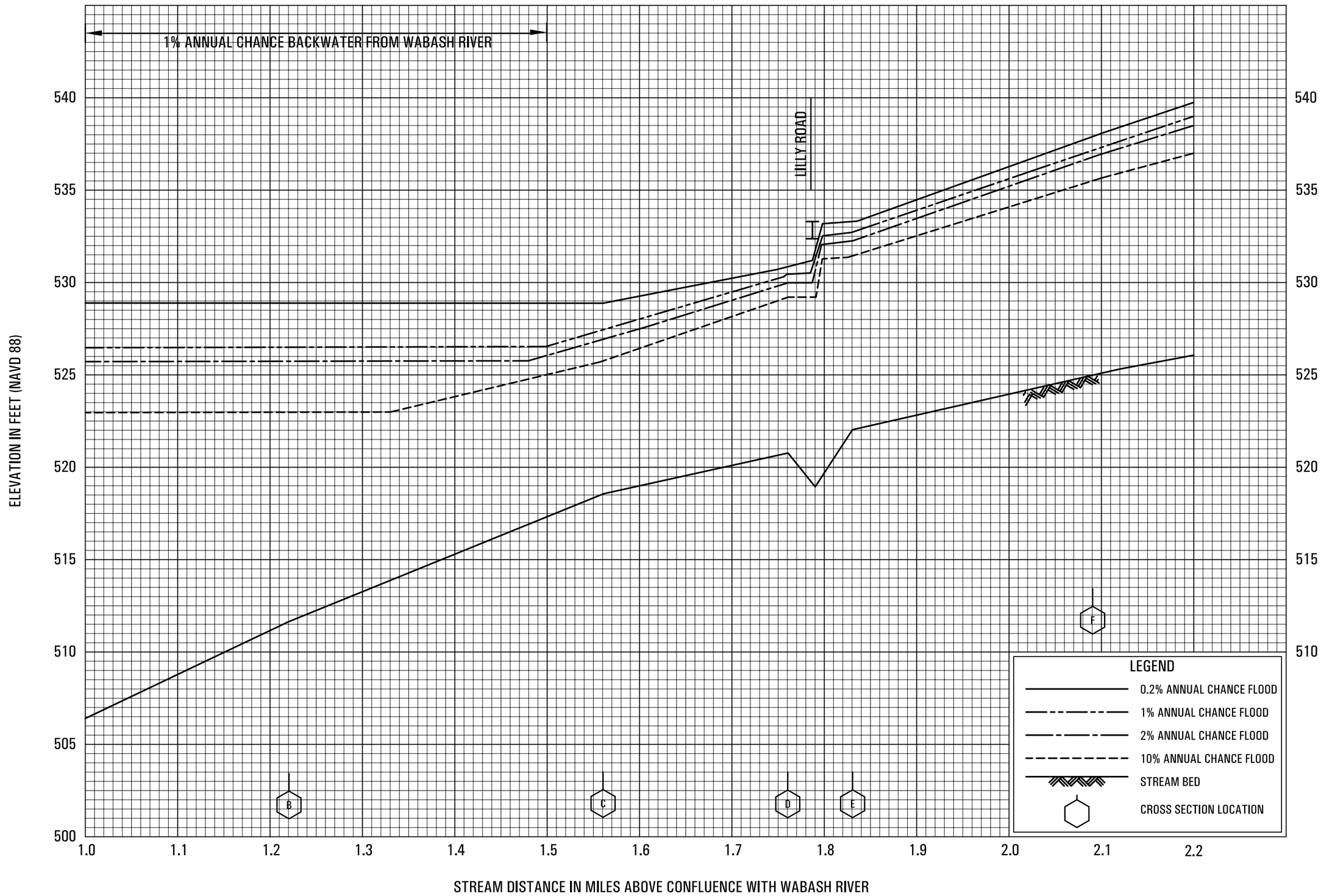
FLOOD PROFILES

WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

WEA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TIPPECANOE COUNTY, IN

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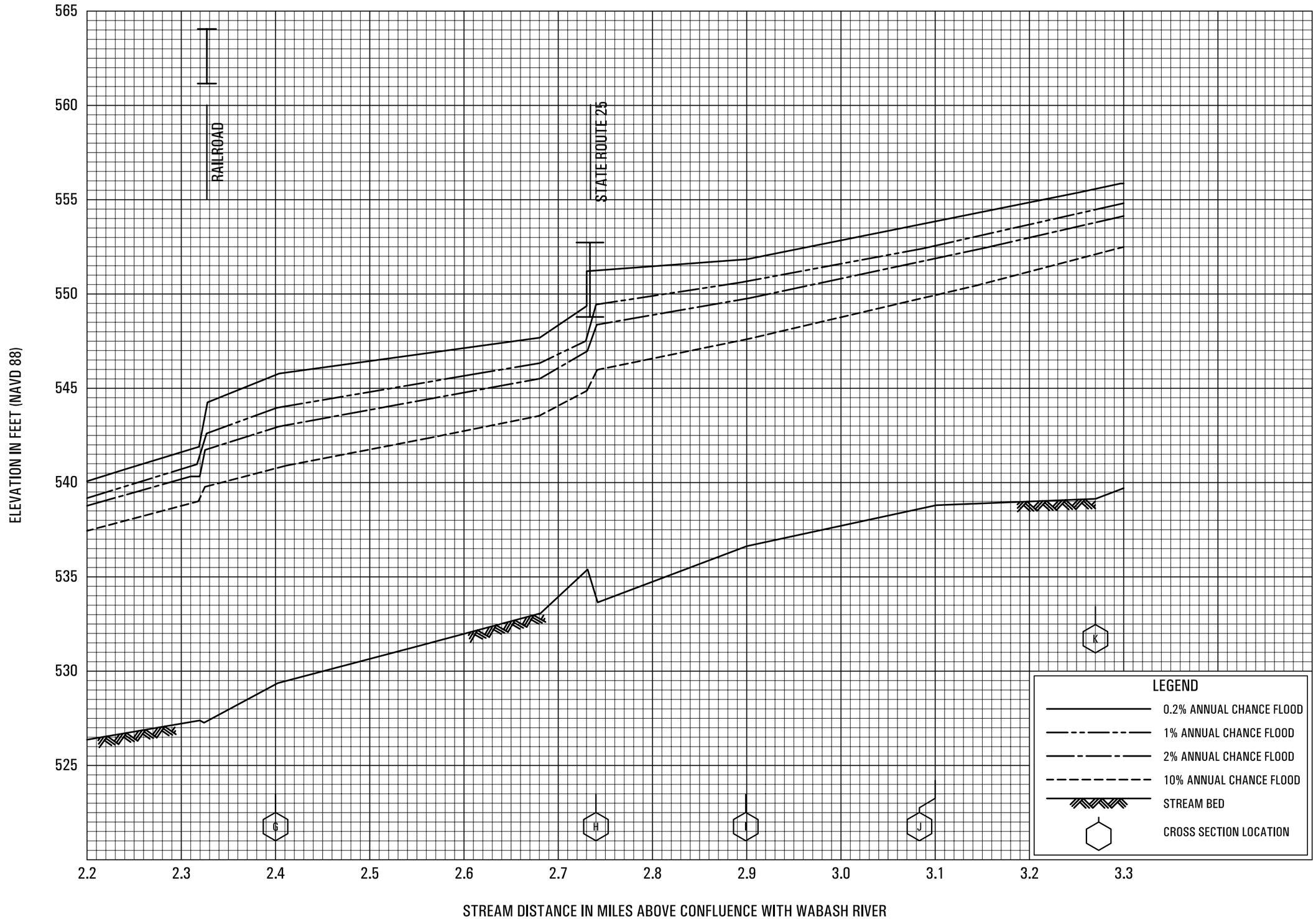

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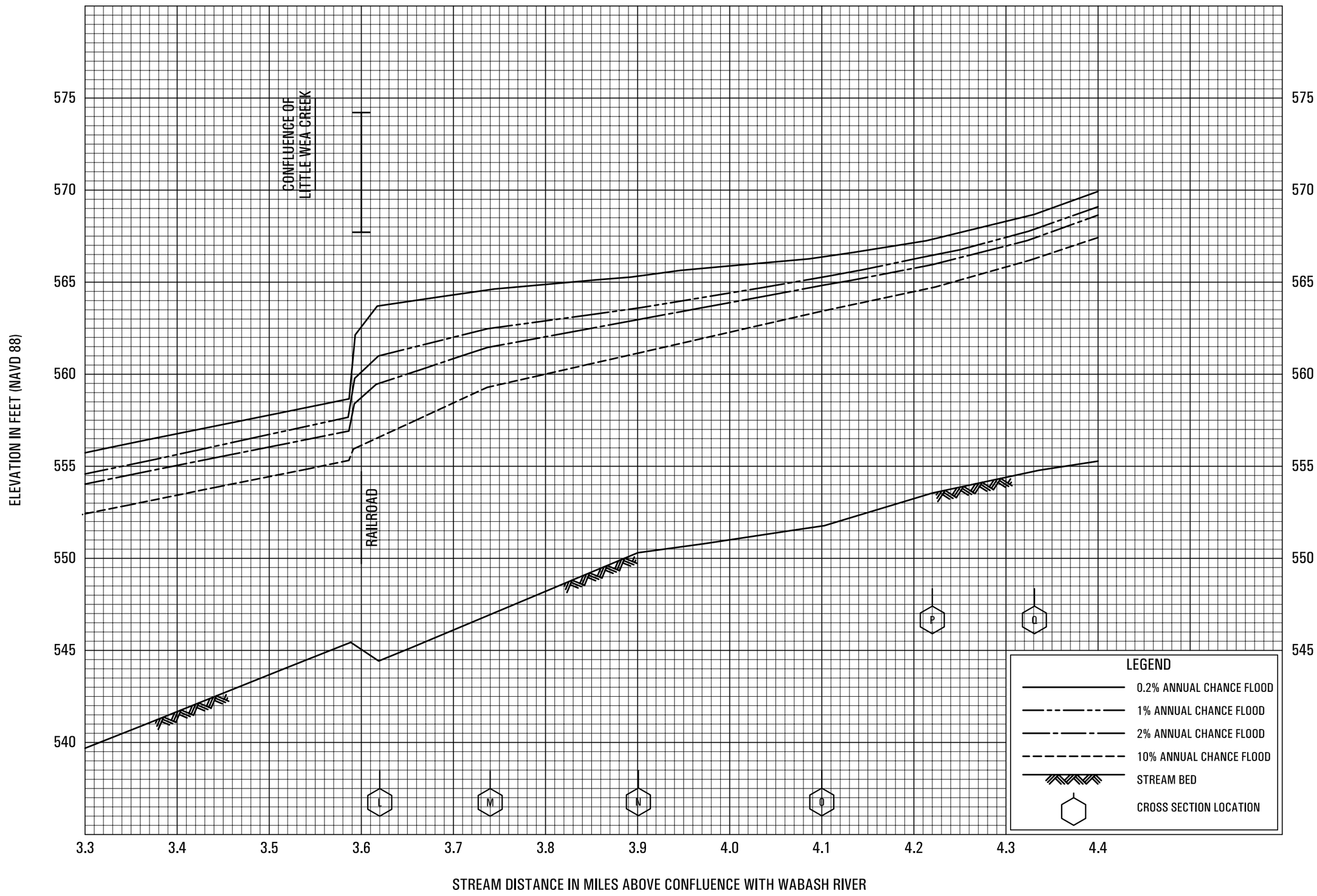

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WEA CREEK

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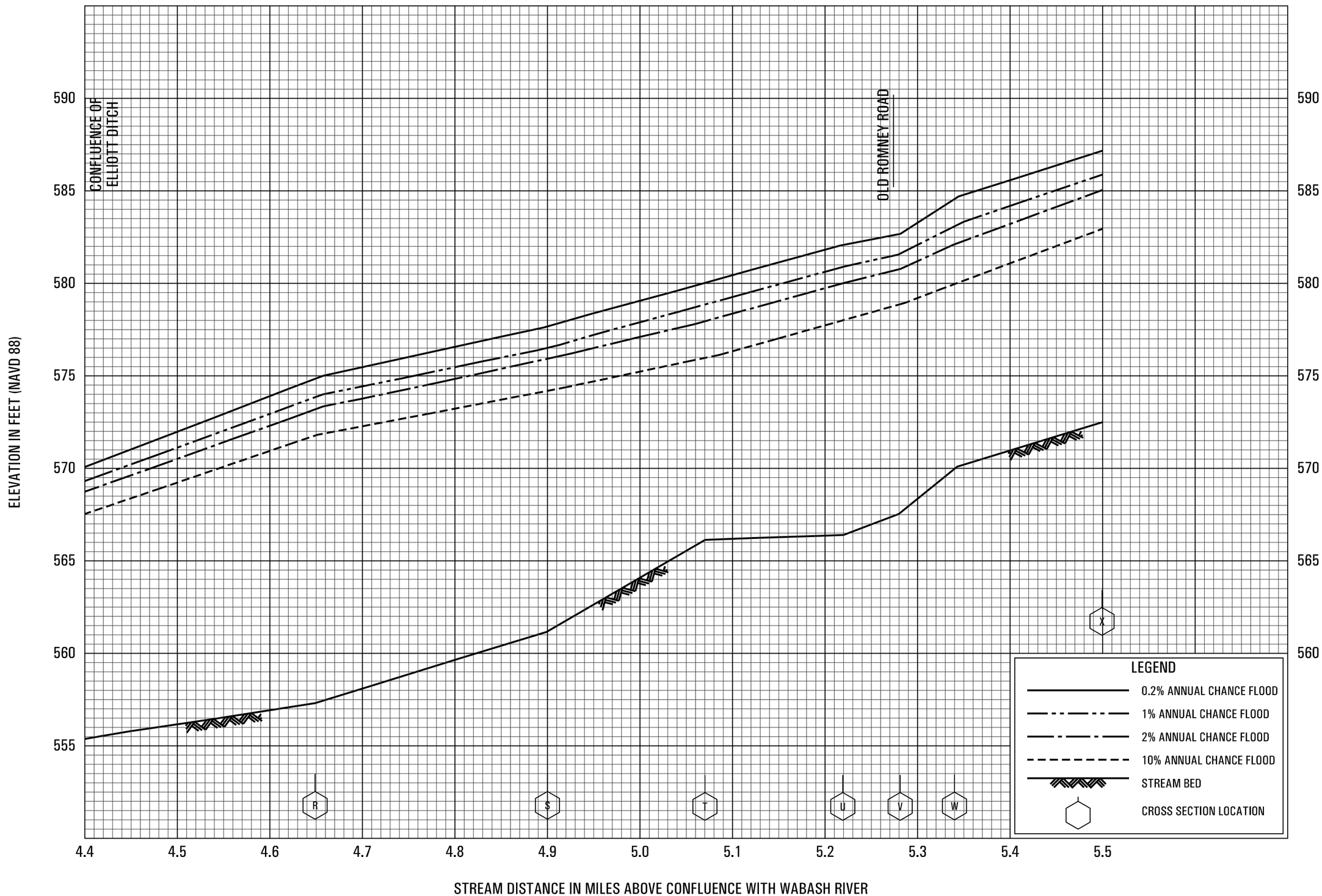

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WEA CREEK

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TIPPECANOE COUNTY, IN

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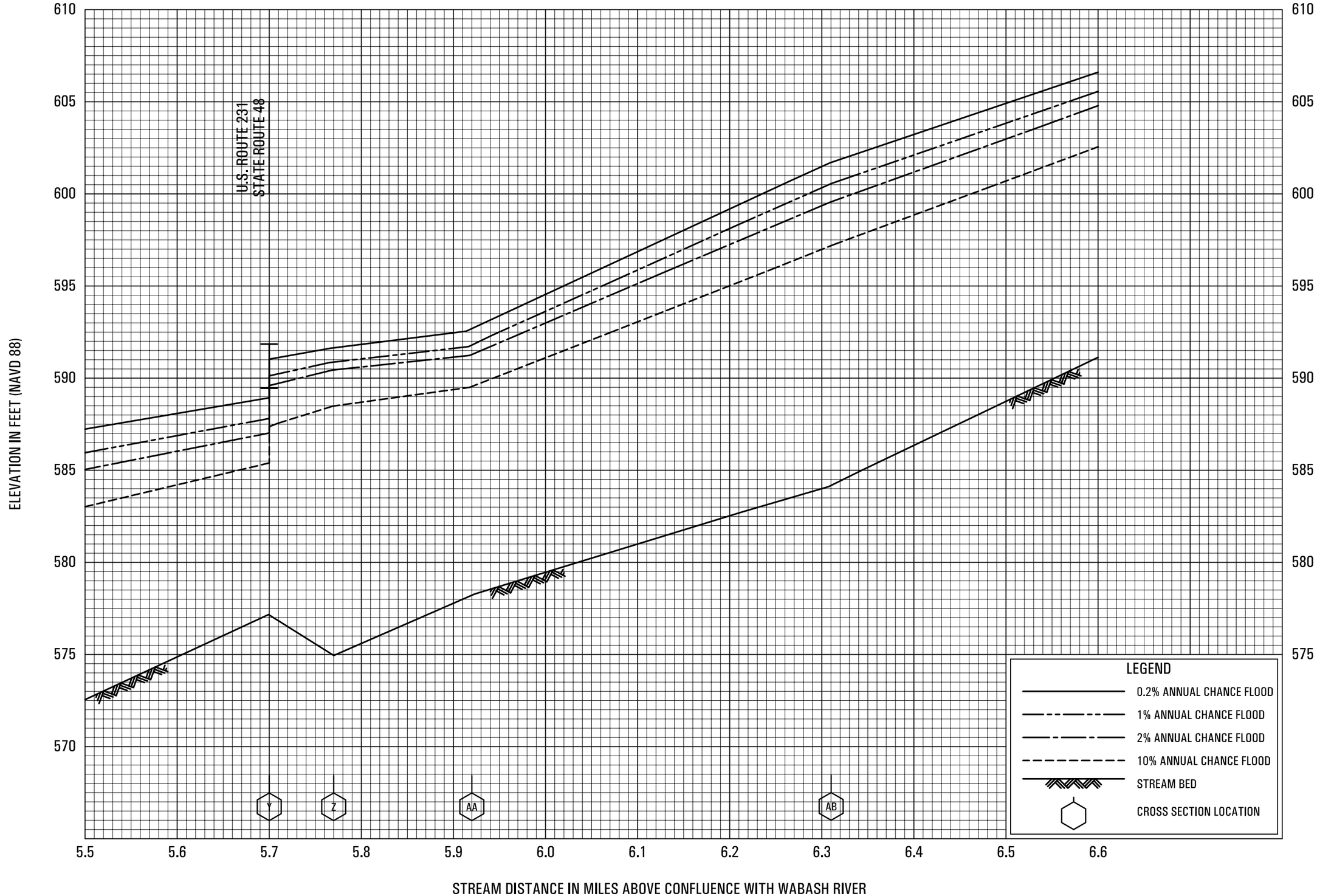

FLOOD PROFILES

WEA CREEK

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TIPPECANOE COUNTY, IN

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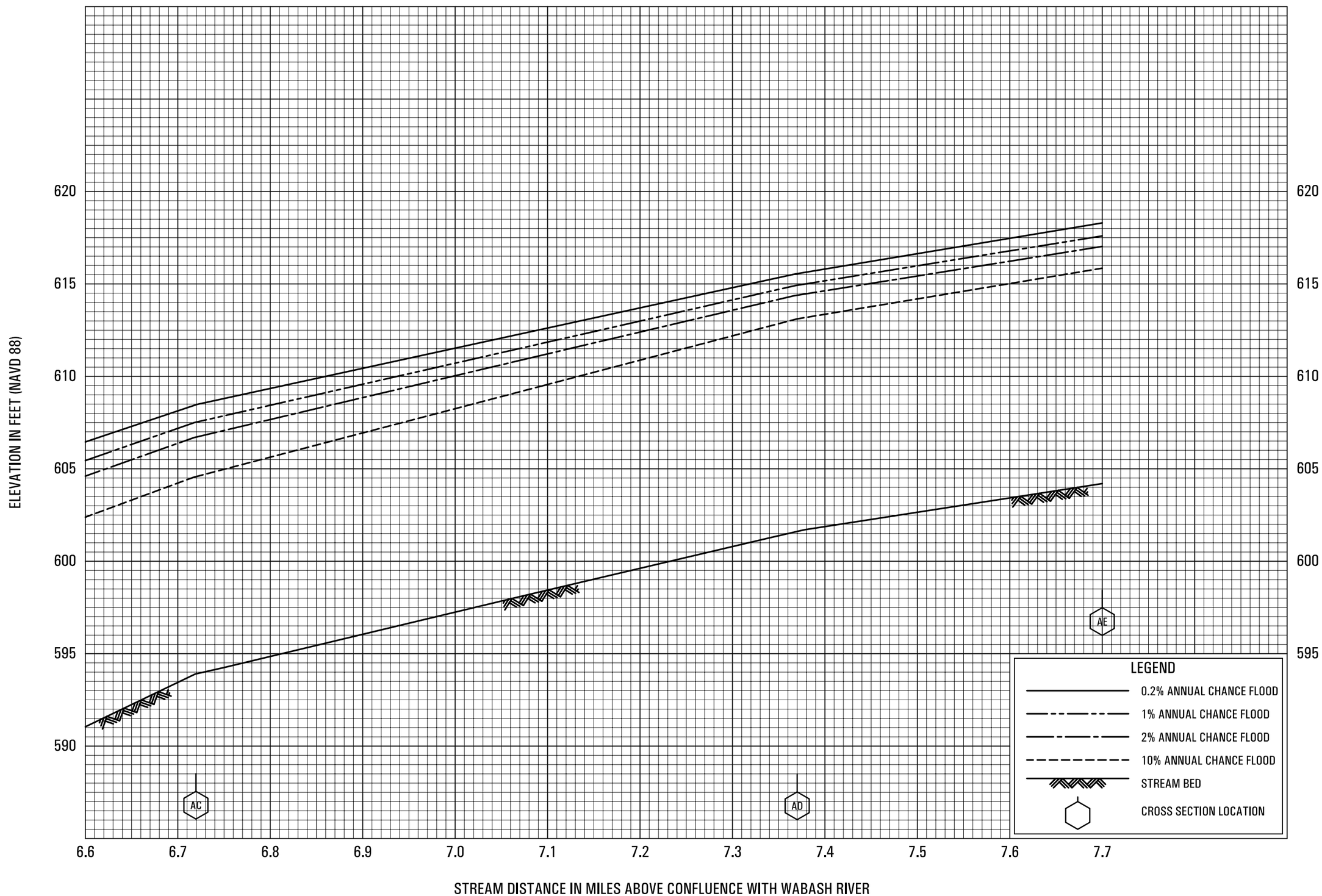

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TIPPECANOE COUNTY, IN

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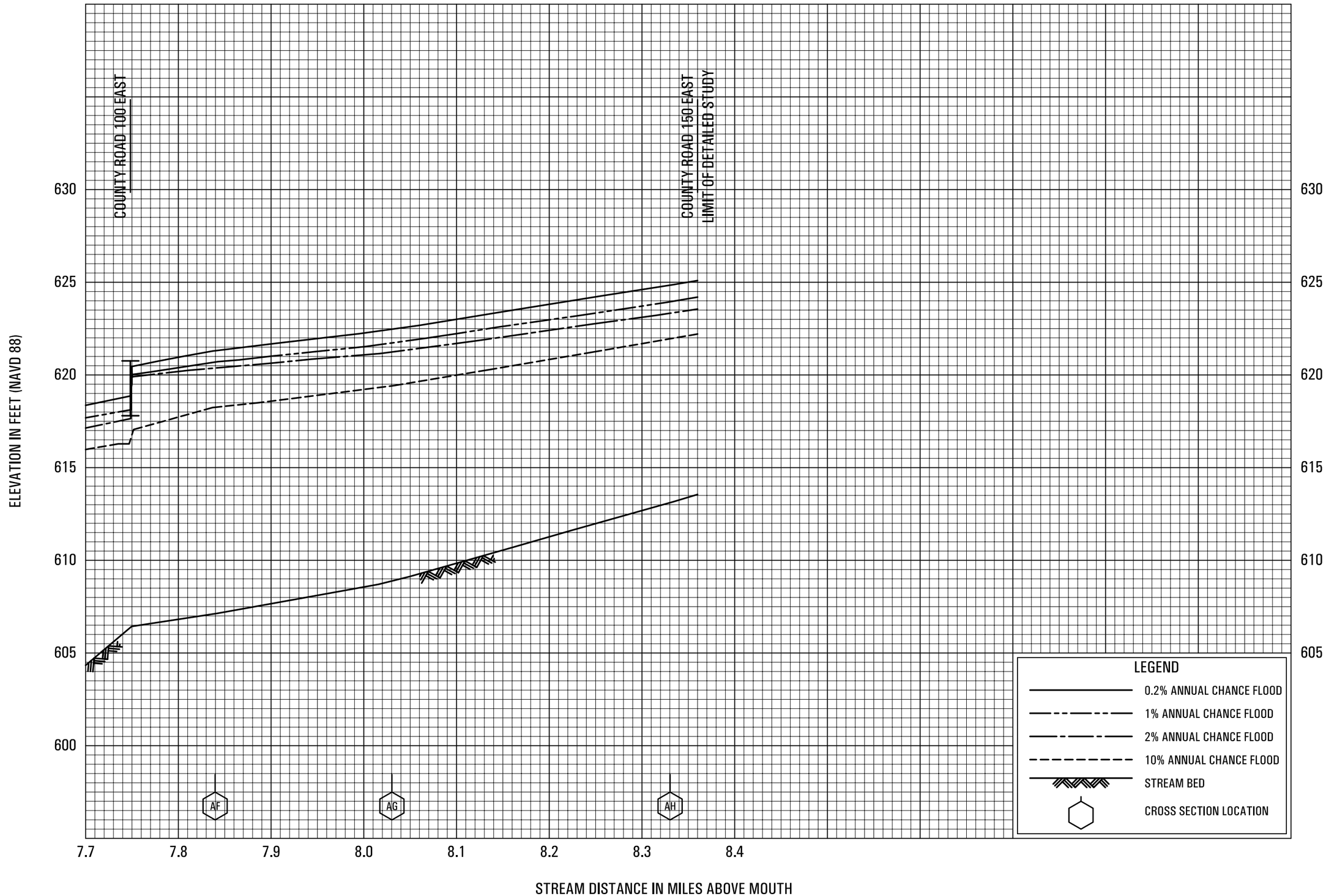

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WEA CREEK

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TIPPECANOE COUNTY, IN

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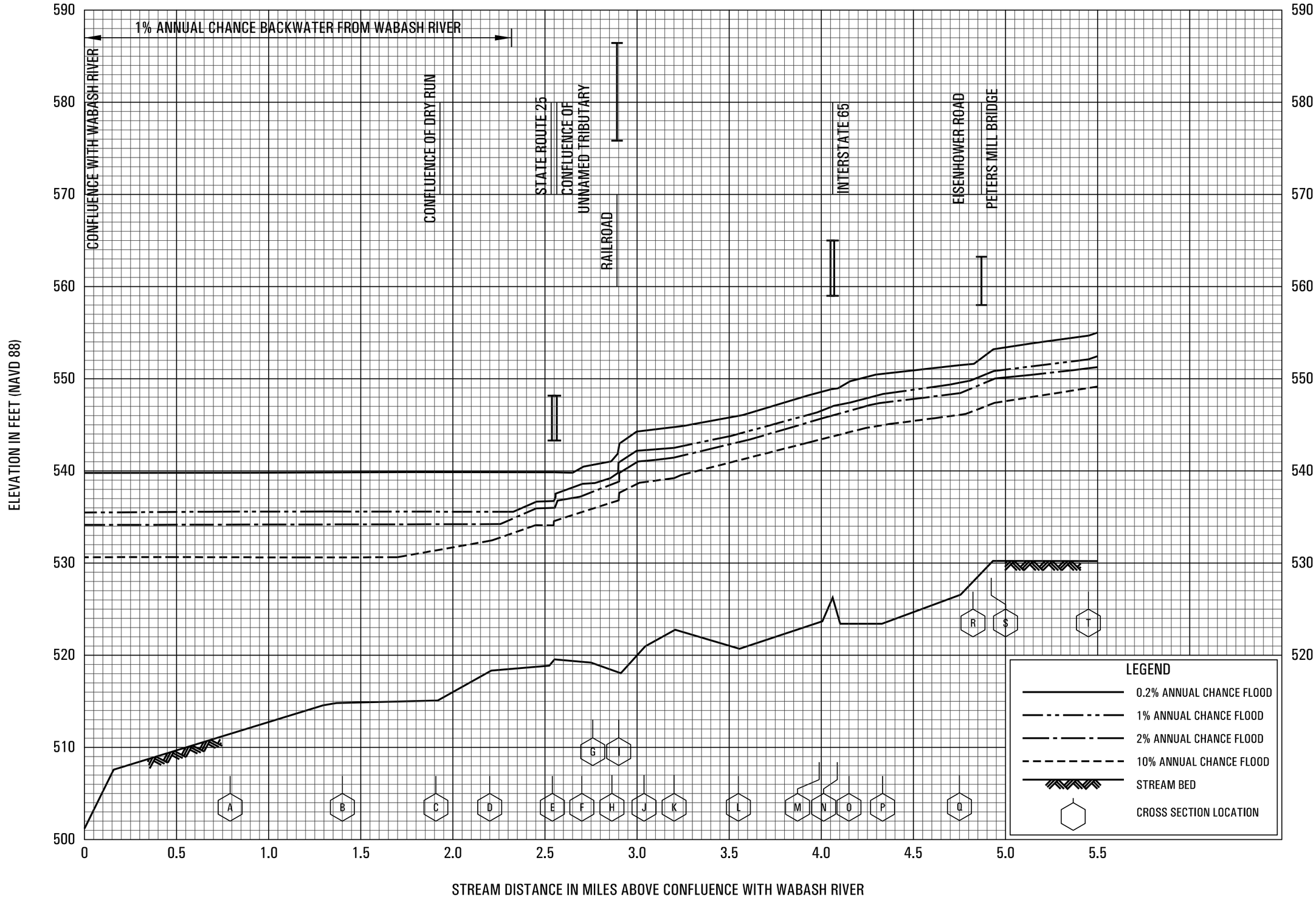

FLOOD PROFILES

WILDCAT CREEK

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TIPPECANOE COUNTY, IN

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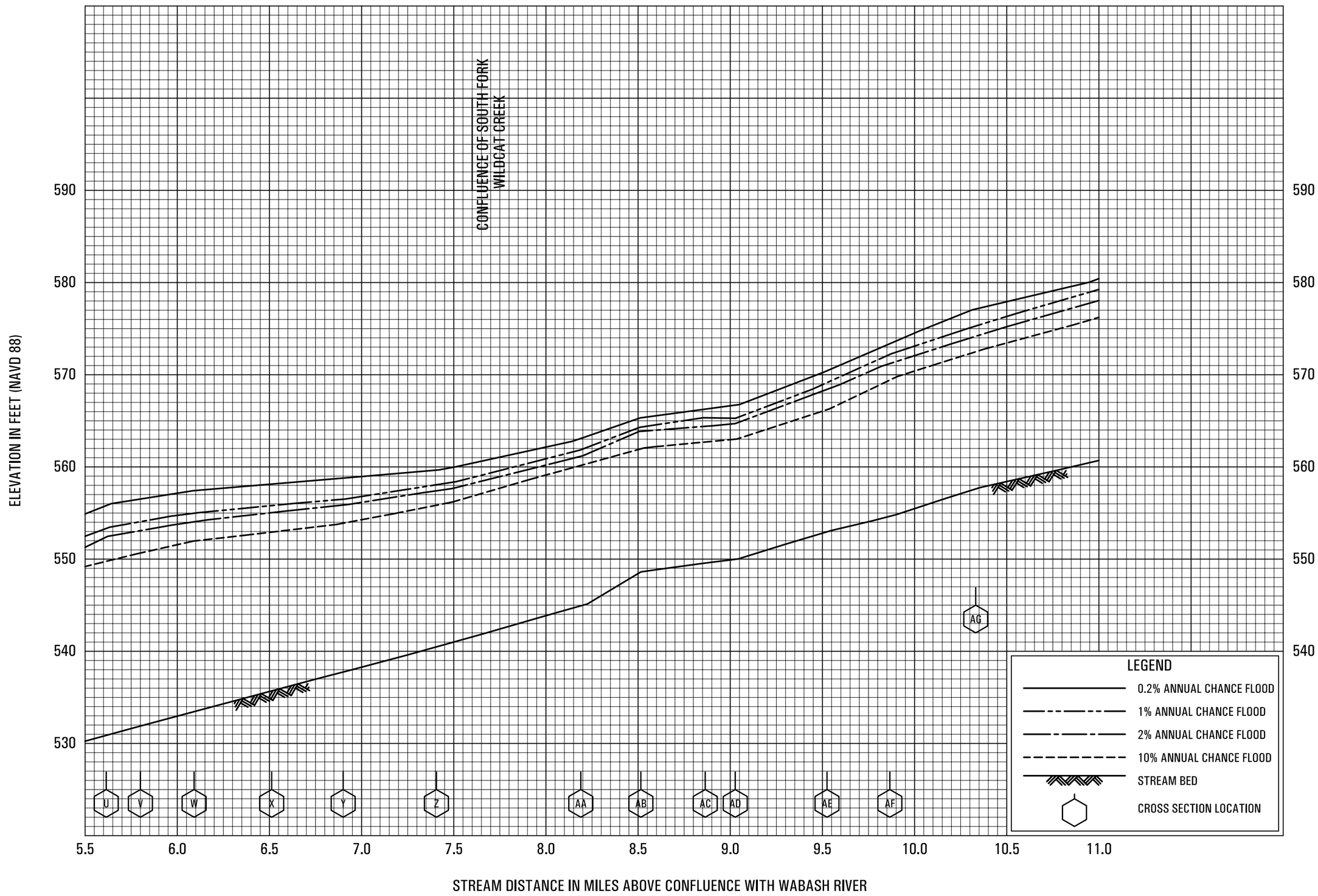

FLOOD PROFILES

WILDCAT CREEK

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TIPPECANOE COUNTY, IN

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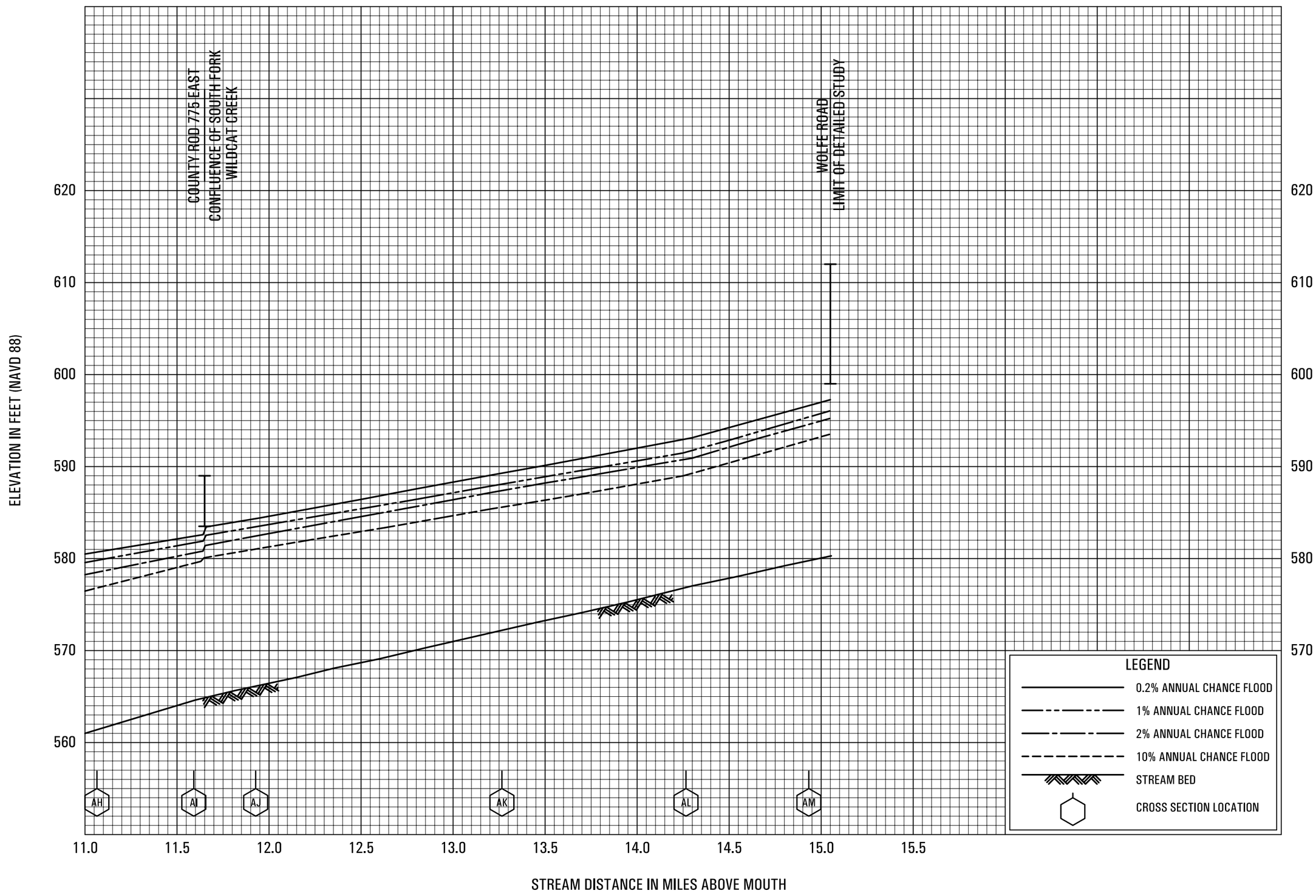

FLOOD PROFILES

WILDCAT CREEK

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TIPPECANOE COUNTY, IN

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