FLOOD INSURANCE STUDY

GRANT COUNTY, WISCONSIN

AND INCORPORATED AREAS

Community Name	*Community Number*
BAGLEY, VILLAGE OF	550145
BLOOMINGTON, VILLAGE OF	550146
BLUE RIVER, VILLAGE OF	550147
BOSCOBEL, CITY OF	550148
CASSVILLE, VILLAGE OF	555548
*CUBA CITY, CITY OF	550514
*DICKEYVILLE, VILLAGE OF	550520
*FENNIMORE, CITY OF	550504
GRANT COUNTY (UNINCORPORATED AREAS)	555557
*HAZEL GREEN, VILLAGE OF	550589
LANCASTER, CITY OF	550150
*LIVINGSTON, VILLAGE OF	550151
*MONTFORT, VILLAGE OF	550525
MOUNT HOPE, VILLAGE OF	550152
MUSCODA, VILLAGE OF	550153
*PATCH GROVE, VILLAGE OF	550528
PLATTEVILLE, CITY OF	550154
POTOSI, VILLAGE OF	550155
*TENNYSON, VILLAGE OF	550532
*WOODMAN, VILLAGE OF	550156

*No Special Flood Hazard Areas Identified

Grant County

September 2, 2011

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
55043CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) 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 FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report 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 Zone(s)	New Zone
Al through A30	AE
B	X
C	X

Initial Countywide FIS Effective Date: September 2, 2011

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FLOOD INSURANCE STUDY
GRANT COUNTY, WISCONSIN AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Grant County, including the Cities of Boscobel, Cuba City, Fennimore, Lancaster, Platteville; the Villages of Bagley, Bloomington, Blue River, Cassville, Dickeyville, Hazel Green, Livingston, Montfort, Mount Hope, Muscoda, Patch Grove, Potosi, Tennyson, Woodman; and the unincorporated areas of Grant County (referred to collectively herein as Grant County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. No special flood hazards have been identified for the Villages of Dickeyville, Hazel Green, Livingston, Montfort, Patch Grove, Tennyson, Woodman; Cities of Cuba City and Fennimore. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the Villages of Livingston, Montfort, Muscoda are geographically located in Iowa and Grant Counties; and the Village of Hazel Green and City of Cuba City are geographically located in Lafayette and Grant Counties. Only the portions located in Grant County are shown in this FIS. See the separately published FIS reports and Flood Insurance Rate Maps (FIRMs) for flood-hazard information.

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.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

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.

This FIS was prepared to include the unincorporated areas and incorporated communities within Grant County into a countywide FIS.

Information on the authority and acknowledgements for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below:

Blue River, Village of:	Hydrologic/hydraulic analyses for the Wisconsin River from a point 2.5 miles upstream of County Highway T to 1.0 mile downstream of County Highway T were completed by the USACE for the Federal Emergency Management Agency (FEMA) under Inter-Agency Agreement EMW-92-E-3842. The work was completed in February 1995 (References 1 and 2).
Boscobel, City of:	Hydrologic/hydraulic analyses for the Wisconsin River from a point approximately 1.9 miles downstream of US Highway 61 to a point approximately 1.1 miles upstream of US Highway 61 were completed by the USACE for the Federal Emergency Management Agency (FEMA) under Inter-Agency Agreement EMW-92-E-3842. The work was completed in March 1995 (Reference 3). Hydrologic/hydraulic analyses for Sanders Creek were prepared by the U.S. Army Corps of Engineers (USACE), St. Paul District, as part of a flood control project for the City of Boscobel. The work was completed in August 1995 (Reference 3).

Grant County (Unincorporated Areas): Measured high water marks along the Wisconsin River were used to estimate the flood hazard risk for the following reaches: from 0.2 miles upstream of its confluence with the Mississippi (the end of the Mississippi River backwater) to a point 1.1 miles upstream of US Highway 61, from a point 1.9 miles downstream of US Highway 61 to 2.5 miles upstream of County Highway T, from a point 1.0 mile downstream of County Highway T to 2.6 miles upstream of State Highway 80, and from a point 0.8 miles downstream of State Highway 80 to the Grant-Iowa County Boundary. The work was completed by the WDNR in December 1968 (Reference 4).

For Beetown Branch, Crooked Creek, Kieler Creek, Little Platte River, Louisburg Creek, Platte River, Rattlesnake Creek, and portions of Sanders Creek (December 19, 1984, FIS report, and June 19, 1985, FIRM, hereinafter referred to as the 1985 FIS), the hydrologic and hydraulic analyses were prepared by compiling existing technical and scientific data prepared by the Federal Emergency Management Agency (FEMA) for purposes of the NFIP and by other organizations for purposes other than the NFIP. The data were identified as the best available at the time of compilation of that FIS. FEMA performed a cursory review and accepted the data as valid for purposes of the study (Reference 5).

Muscoda, Village of: Hydrologic/hydraulic analyses for the Wisconsin River from a point 2.6 miles upstream of State Highway 80 to a point 0.8 miles downstream of State Highway 80 were completed by the USACE for the Federal Emergency Management Agency (FEMA) under Inter-Agency Agreement EMW-92-E-3842. The work was completed in March 1995 (Reference 2)

Platteville, City of: The hydrologic/hydraulic analyses for the Rountree Branch were obtained from an updated flood hazard investigation report prepared by Owen Ayres and Associates, Inc., for the U.S. Army Corps of Engineers (USACE), and completed in May 1979 (Reference 6).

The Cities of Cuba City, Fennimore, Lancaster and the Villages of Bagley, Bloomington, Dickeyville, Hazel Green, Livingston, Montfort, Mount Hope, Patch Grove, Potosi, Tennyson, Woodman have no previously printed FIS report. The flood insurance study report for the Villages of Blue River and Muscoda were previously printed on the August 9, 1999 Flood Insurance Rate Map (FIRM) panel.

This countywide FIS includes new hydrologic/hydraulic analyses completed by the U.S. Army Corps of Engineers (USACE), St. Paul District for the Mississippi River. All work was completed for FEMA under Contract No. EMW-2002-IA-0114. This work was completed in July 2004. All mapping was completed for FEMA by the WDNR under Contract No. EMW-2008-CA-7020. The work was completed in August 2009.

The projection used in the preparation of this map is Universal Transverse Mercator (UTM) Zone 15, and the horizontal datum used is North American Datum 1983 (NAD 83).

1.3 Coordination

An initial meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied or restudied. A final meeting is held with representatives from FEMA, the community, and the study contractor to review the results of the study.

The initial and final meeting dates for previous FIS reports for Grant County and its communities are listed in the following table:

Table 1 - Initial and Final CCO Meetings

Community	FIS Date	Initial Meeting	Final Meeting
Blue River, Village of	September 8, 1999	August 26, 1991	March 11, 1997
Boscobel, Village of	October 6, 1998	August 21, 1991	March 11, 1997
Cassville, Village of	August 4, 1988	*	September 17, 1987
Grant County (Unincorporated Areas)	December 19, 1984 December 20, 1999	* August 26, 1991	June 21, 1984 March 11, 1997
Muscoda, Village of	September 8, 1999	August 26, 1991	March 11, 1997
Platteville, City of	September 29, 1996	*	November 1, 1994

*Data not available

For this countywide FIS, the WDNR performed a cursory review of the previous effective FIS modeling and mapping. This included locating areas where new development has occurred, identifying structures that have been replaced, running available hydraulic and hydrologic modeling when possible, and checking flows for reasonableness. This information was provided at the initial countywide scoping meeting August 8, 2008. At that time the County and communities identified and prioritized areas needing to be studied and/or re-studied. A scope of work was provided to the County and communities by e-mail on September 2, 2008.

For this countywide study, the initial scoping meeting was held on August 8, 2008, and attended by the representatives from the WDNR, affected communities, and county. The results of the study were reviewed at the final CCO meeting held on November 17, 2009, and attended by representatives of WDNR and the communities. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

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

The following streams were studied by detailed methods in this FIS report:

Table 2 – Streams Studied by Detailed Methods

Beetown Branch	Platte River
Crooked Creek	Rattlesnake Creek
Kieler Creek	Rountree Branch
Little Platte River	Sanders Creek
Louisburg Creek	Wisconsin River
Mississippi River	

The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

The streams that were newly studied or entirely revised by detailed methods in this countywide FIS are listed in Table 3.

Table 3 - Streams Newly Studied or Entirely Revised by Detailed Methods

Stream	Reach
Mississippi River	From the Illinois-Wisconsin State Line to the confluence with the Wisconsin River at the northern county boundary.

The detailed studied streams that were redelineated in this countywide study are shown in Table 4.

Table 4 - Redelineated Streams

Stream	Reach
Beetown Branch	From the upstream side of County Highway U to approximately 0.9 miles downstream of Short Cut Road.
Crooked Creek	From its outlet to the Wisconsin River to the downstream side of United States Highway 61.
Kieler Creek	From the upstream side of Jimtown Road to the downstream side of County Highway H.
Little Platte River	From the upstream side of County Highway A to the downstream side of Cushman Road.
Louisburg Creek	From 1.3 miles upstream of Spring Valley Road to the downstream side of County Highway H.
Platte River	From approximately 0.1 miles downstream of State Highway 81 to 1.0 mile downstream of Ellenboro Road.
Rattlesnake Creek	From approximately 0.4 miles upstream of State Highway 133 to approximately 0.2 miles downstream of State Highway 133.
Rountree Branch	From 1.1 miles upstream of its confluence with the Platte River to the downstream side of Madison Street.
Sanders Creek	From its confluence with the Wisconsin River to approximately 0.1 miles downstream of Doc’s Lane.
Wisconsin River	From its outlet to the Mississippi River to the eastern county boundary.

Approximate analyses were used to study those areas having low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by FEMA and the communities. The approximate streams and lakes that were newly studied are shown in Table 5.

Table 5 - Newly Studied Streams by Approximate Methods

Austin Branch	Lane Creek
Beetown Branch	Little Grant River
Big Green River	Little Platte River
Big Spring	Martin Branch
Blake Fork	McAdam Branch
Blockhouse Creek	McPherson Branch
Blue River	Muskellunge Creek
Blue River Tributary No. 9	Pigeon Creek
Boice Creek	Platte River Tributary No. 49
Crooked Creek	Platte River
Crooked Creek Tributary No. 5	Rattlesnake Creek
Fennimore Fork	Rattlesnake Creek Tributary No. 2
Fennimore Fork Tributary No.2	Rountree Branch
Fennimore Fork Tributary No.7	Sanders Creek
Glass Creek	Sandy Creek
Glass Creek Tributary No.1	Sixmile Branch

Table 5 - Newly Studied Streams by Approximate Methods (cont'd)

Glass Creek Tributary No.2	Snowden Branch
Grant River	Studenburg Hollow Creek
Grant River Tributary No. 27	Little Grant River Tributary No. 1
Grant River Tributary No. 4	Pigeon Creek Tributary No. 1
Hackett Branch	Pigeon Creek Tributary No. 2
Hackett Branch Tributary No. 1	Willow Branch
Kuenster Creek Tributary No. 8	Young Branch

For this countywide FIS, the FIS report and FIRM were converted to countywide format, and the flooding information for the entire county, including both incorporated and unincorporated areas, is shown. Also, the vertical datum was converted from the National Geodetic Vertical Datum of 1929 (NGVD) to the North American Vertical Datum of 1988 (NAVD). The projection used in the preparation of this map is UTM Zone 15, and the horizontal datum used is NAD 83, GRS80 Spheroid.

2.2 Community Description

Grant County lies among the steeply chiseled bluffs and rugged valleys of the region known as the 'Driftless Area' of southwest Wisconsin. The county's unique topography is the result of escaping the land-flattening glaciers of the last ice age some 10,000 years ago. It is bordered on the north by the Wisconsin River (Crawford and Richland Counties, Wisconsin); on the east by the Iowa and Lafayette Counties, Wisconsin; on the west by the Mississippi River (Clayton and Dubuque Counties, Iowa); and on the south by Jo Daviess County, Illinois. The county is served by U.S. Highways 61, 151, and 18; State Highway Routes 11, 35, 133, and 80. Grant County has a total area of 1,183 sq. mi. (1,148 sq. mi. of it is land and 35 sq. mi. of it is water). Major rivers include the Big Green, Blue, Grant, Little Grant, Little Platte, Mississippi, Platte, Sinsinawa, and Wisconsin Rivers.

In 2000, the population of Grant County was reported by the U.S. Census Bureau to be 49,600 (Reference 7). The area experiences a temperate climate with both warm and cold season extremes. Winter months can bring occasional heavy snows, intermittent freezing precipitation or ice, and prolonged periods of cloudiness. While true blizzards are rare, winter storms impact the area on average about 3 to 4 times per season. Thunderstorms occur on average 30 to 50 times a year, mainly in the spring and summer months. Both river flooding and flash flooding can occur, along with urban-related flood problems. The terrain can lead to mud slides and generally increases the flash flood threat. Heat and high humidity is occasionally observed in June, July, or August (Reference 8). The mean monthly temperature varies from 24 degrees Fahrenheit (°F) in January to 66°F in July. The average annual precipitation is 31 inches with an average annual snowfall of 44 inches (Reference 9).

2.3 Principal Flood Problems

Grant County has an extensive flood history. On occasion, intense, heavy rain-producing thunderstorms or consecutive thunderstorms ("training") can bring excessive rainfall leading to flash flooding. The hilly terrain promotes rapid run-off and enhances the threat. Mud and landslides can occur in extreme cases, especially along the Mississippi River. June is the most common month for flash floods, but they can occur from May through September. They are most common in the evening hours, between 8-10 p.m., but can occur at other times and typically last from 3-6 hours.

Flood risk along the Mississippi River is highest in the spring with snowmelt, but the Wisconsin River can see flooding from snowmelt and warm season heavy rain patterns. Many of the other drainage areas can experience local ice jam issues with snowmelt, but more commonly can become dangerous from flash flooding spawned by heavy rain. The US Army Corps of Engineers maintains Lock and Dam (#10) at Guttenburg, IA and Lock and Dam (#11) at Dubuque, IA that is used to manage navigational water levels, not for flood control (Reference 8).

Since 1998, Grant County has been included in a FEMA Federal Disaster Declaration 6 times: 1998, 2000, 2001, 2004, 2007, and 2008 (Reference 8).

General:

May 16-17, 1999 –

2 to 5 inches of rainfall forced the evacuation of a trailer park near Platteville when several feet of water rushed under mobile homes. Coon Branch Creek near Benton flooded a nearby park, causing damage to a ball field, a concession stand and a couple of bridges. The flood waters also swept away a 500 gallon gasoline tank as well as a car, which floated nearly 100 yards down the creek before coming to rest in some trees (Reference 10).

May 31, 2000 to June 1, 2000 –

Thunderstorms dropped 4 to 8 inches of rain, causing extensive flash flooding. Several mudslides were reported by law enforcement officials, while numerous roads were closed and covered with water as much as 2 to 3 feet deep. One vehicle was swept away in Muscoda (Grant County) when the driver attempted to cross about one foot of moving water. The total damage caused by flood waters, which lasted into the morning hours of June 1, was estimated to be nearly 6.0 million dollars. Crawford, Grant, Richland and Vernon counties were declared a federal disaster area (Reference 10).

May 21, 2004 to May 23, 2004 –

2 to 4 inches of rain in two hours on May 21, 2004 and 2 to 4 inches of additional rain on May 23, 2004 caused flash flooding. Law enforcement officials and emergency managers reported several roads were either washed out or covered with water as much as 3 to 4 feet deep. Due to the damage from flash flooding, Crawford, Grant and Vernon County were declared disaster areas (Reference 10).

June 16, 2004 –

Excessive rainfall amounts of 3 to 6 inches in two hours or less caused extensive flash flooding. Law enforcement officials reported several roads were impassable, with water a foot deep in some places. Near Cassville, a bridge over McCartney Branch Creek was damaged by debris in the rain-swollen creek. Flooding also caused structural damage to the foundations of more than 40 homes in Grant County, half of which were in Lancaster (Reference 10).

July 18, 2007 –

During the evening hours of July 17, thunderstorms began forming over parts of northeast Iowa. These storms repeatedly tracked across the same area near the confluence of the Wisconsin and Mississippi Rivers during the early morning hours of July 18. This caused excessive rainfall with amounts totaling 7.31 inches at Prairie du Chien (Crawford County). Mud slides were also observed on many nearby county roads in the hilly terrain closer to the Mississippi River.

Hardest hit by the flash flooding was the town of Bagley (Grant County), where nearly 400 homes were flooded, as debris consisting of mud, rocks and trees built up along area bridges. This allowed flood waters to rise to as much as four feet deep (References 8, 10 and 11).

Figure 1: Flooding at Bagley - July 2007 (References 8 and 11)

August 18, 2007 to August 19, 2007 –

A warm front lifting northward into Iowa triggered round after round of thunderstorms leading to excessive rainfall across southwest Wisconsin during the evening and overnight hours of August 18-19. Total rainfall amounts of 10 to 15 inches were common. Flash flooding affected about 40 homes across parts of northern Grant County. One home was destroyed. Several bridges and roads were also damaged. In Grant County, about 415 people applied for FEMA assistance. Damage attributed to the heavy rainfall and subsequent flooding was estimated to be in the millions of dollars. Grant, La Crosse, Richland and Vernon counties were declared federal disaster areas (Reference 10).

April 25, 2008 –

Thunderstorms with heavy rain were triggered by an upper level disturbance moving across Iowa toward northern Illinois. Excessive rainfall amounts of 3 to 6 inches occurred during the late night of April 24 into the early morning of April 25, which caused flash flooding.

Runoff from excessive rainfall caused significant flooding of approximately 70 homes and several businesses. More than 20 roads were reported closed due to flash flooding. Many remained closed for over a week. In addition, numerous farm fields were made unusable due to erosion and/or standing water. Hardest hit were areas south of Highway 18 and north of Highway 151 including: Cassville, Ellenboro, Glenn Haven, Lancaster, Platteville and Potosi. Damage to homes, roads, bridges and cropland was estimated to be over two million dollars (References 10 and 12).

Figure 2:
Camel Ridge Road Overtopping, Waterloo Township -
April 25, 2008 Flood
(Reference 12)

June 7, 2008 to June 10, 2008 –

Flash flooding was reported in many of the steep valleys with creeks rising rapidly and water over some roads. Highways 18 and 35 were closed due to mudslides and debris. The heavy rainfall on June 8 enhanced the already dangerous flooding conditions across parts of southwest Wisconsin. Many roads were already closed from the June 7 rains due to water over the roadways, mudslides, or partial washouts. Conditions only worsened, leading to more road closures, sandbagging, and some evacuations. While the rain was tapering off and moving east Sunday night, June 8, the rivers continued to rise, and some rose extremely quickly. Some rivers responded with a foot per hour rises, while others eventually exceeded their river gages ability to record the river levels. All-time record crests were set at a few locations, with top 5 records at many others. Damage to infrastructure and crops was preliminarily estimated at 75 to 85 million dollars. As a result, Crawford, Grant, Juneau, Monroe, Richland and Vernon Counties in central and southwest Wisconsin were declared federal disaster areas (Reference 10).

June 12, 2008 –

A major flash flood hit Grant County during the afternoon of June 12th impacting the communities of Ellenboro, Lancaster, Potosi, Tennyson and other rural areas. Numerous rescues were performed on people trapped in cars, especially in the Potosi area where terrain enhanced the runoff from repeat thunderstorms. Several homes on Hippie Hollow Road in Potosi Township were destroyed along with damage to as many as 600 homes elsewhere in the region. Many highways and county roads suffered flood damage including major bridge and road infrastructure. Rainfall totals of 3 to 4 inches caused flash flooding across parts of southwest Wisconsin during the afternoon and evening of June 12 from repeat thunderstorms. Many county and secondary roads and bridges were washed out in the vicinity of the Platte River. Emergency Operation Centers and shelters were opened. A state of emergency was declared for the county (References 10 and 13).

Figure 3: Village of Potosi – Flash Flood June 12, 2008 (Reference 13)

Furnace Branch (City of Cassville):

June 4, 2002 –

Rainfall amounts of 3.5 to 5 inches produced flash flooding, with the Town of Cassville being hardest hit. Furnace Creek, which flows into the northwest part of the Town, was choked with so much debris that the flow of water was diverted into nearby homes and a park. 25 homes had to be evacuated, with 8 of these receiving significant damage. In fact, one home was completely destroyed when the basement collapsed. Local residents also reported cars floating in water 2 to 3 feet deep. Total damage due to the high water was estimated at nearly three-quarters of a million dollars (References 10 and 14).

Figure 4:
Cassville Flash Flood - June 3-4th, 2002
(Reference 14)

Grant River:

February 18-21, 1997 –

Rapid snowmelt caused the Grant River between Burton and Potosi to quickly rise out of its banks. Numerous roads in the area were underwater, and water crested just below the bridge at Burton. The river crested at 24.64 feet before slowly falling as colder air moved back in (Reference 10).

June 4, 2002 –

Runoff from flash flooding during the early morning hours continued to cause rivers, such as the Grant River, to flood extensive areas of nearby farm fields throughout much of the day (Reference 10).

May 10, 2003 –

Rainfall amounts of 2 to 4 inches in 1 to 2 hours caused flash flooding. Law enforcement officials reported mudslides along Highway P near Bagley and a road washout near Patch Grove (Reference 10).

August 22, 2007 –

The Grant River rose out of its banks. A cold front moved across southwest Wisconsin in the early evening hours of August 22, which triggered thunderstorms with heavy rainfall. Due to saturated soils, excessive rainfall amounts of 2 to 4 inches in less than two hours caused flash flooding (Reference 8).

June 5, 2008 –

The Grant River produced some flooding at Porter Bridge about five miles southwest of Lancaster (Reference 10).

Table 6 – Summary of Recorded Large Events on the Grant River at Burton, Wisconsin – USGS Gage No. 05413500 (References 15 and 16)

Date	Discharge (cfs)	Gage Height
07/16/1950	25,000	24.82
06/22/1954	23,800	24.45
01/25/1967	14,000	23.67
06/13/2008	13,000	23.31

Flood impacts at various gage heights at Burton, Wisconsin are listed as follows:

Gage Height (ft)	Flood Impact
25.5	Water begins flowing over the road.
24.0	Water reaches the bottom of the Highway N Bridge at Burton.
18.0	Minor flooding of lowland areas begins.

Mississippi River:

April 1965 –

At Prairie du Chien the Mississippi rose rapidly in early April and some residents of the city, built on islands and low-lying prairie, began evacuating on the 9th. Over the next two weeks, sandbagging commenced, shelters were set up, and highways closed, but all in vain. Residents eventually exchanged cars for boats and watched sheds, garages and other small buildings float away. On the 24th, the river crested at 25.4 feet, the highest level ever recorded in the city (Reference 17).

April 3-21, 1997 –

Several homes and businesses were damaged as the Mississippi River reached its third highest flood on record (Reference 10).

April 10, 2001 –

Heavy rains, combined with snow melt runoff, caused the Mississippi River to reach near record levels. In fact, at most locations the water reached levels second only to the all-time flood of record, which occurred in April 1965. Hardest hit was the Prairie du Chien, Crawford County area and points southward, where flood waters did considerable damage to businesses and homes. Overall damage due to the high water was estimated around 6 million dollars. This resulted in Buffalo, Crawford, Grant, La Crosse, Trempealeau and Vernon County receiving state and federal disaster relief funds. Water levels began dropping during the latter part of the month, but remained above flood stage through early May (Reference 10).

Mississippi River – Guttenburg, Iowa (Tailwater at Lock and Dam No. 10):

Table 7 – Summary of Recorded Large Events on the Mississippi River at Guttenburg, Iowa (Reference 18)

Date	Discharge (cfs)	Gage Height
04/24/1965	N/A	23.65
04/21/2001	N/A	21.68
06/30/1993	N/A	20.15
04/22/1969	N/A	19.84
04/24/1952	N/A	19.69
04/21/1951	N/A	19.63
05/05/1975	N/A	19.41
04/15/1997	N/A	19.4
04/10/1967	N/A	18.94
03/22/1973	N/A	18.59

Flood impacts at various gage heights near Lock and Dam No. 10 are listed as follows:

Gage Height (ft)	Flood Impact
29.6	The water begins to overtop the protective levee.
24.0	Water begins to flow over the lock walls and the protective earthen dikes.
23.7	Water levels reach the flood of record.
21.0	Flooding of some residential areas occurs. Lock and Dam No. 10 is closed to navigation.
20.0	Some basements may begin to experience flooding due to seepage...With most problems occurring on the approaches to town.
19.0	The water is over Island Road.
18.0	Sewer and street flooding begins to occur in Glen Haven, Wisconsin.
15.5	The water is over Marina Road.
15.0	Minor lowland flooding begins to occur.

Mississippi River – Dubuque, Iowa (Tailwater at Lock and Dam No. 11):

Table 8 – Summary of Recorded Large Events on the Mississippi River at Dubuque, Iowa (Reference 19)

Date	Discharge (cfs)	Gage Height
04/26/1965	N/A	25.69
04/21/2001	N/A	23.91
07/01/1993	N/A	22.32
04/23/1969	N/A	21.74
04/22/1951	N/A	21.64

Flood impacts at various gage heights near Lock and Dam No. 11 are listed as follows:

Gage Height (ft)	Flood Impact
22.0	Water affects Volunteer Drive leading to Lock and Dam No. 11.

Platte River:

August 22, 2007 –

The Platte River rose up to Oak Road near Dickeyville. A cold front moved across southwest Wisconsin in the early evening hours of August 22, which triggered thunderstorms with heavy rainfall. Due to saturated soils, excessive rainfall amounts of 2 to 4 inches in less than two hours caused flash flooding (Reference 10).

Table 9 – Summary of Recorded Large Events on the Platte River near Rockville, Wisconsin – USGS Gage No. 05414000 (Reference 20)

Date	Discharge (cfs)	Gage Height
07/16/1950	43,500	17.26
06/29/1990	19,000	14.85
06/12/2008	15,200	14.17

Flood impacts at various gage heights at Rockville, Wisconsin are listed as follows:

Gage Height (ft)	Flood Impact
22.7	Water is up to the bottom of the County Highway B bridge.
9.0	Minor flooding of lowland agricultural areas adjacent to the river begins.

Wisconsin River:

The greatest flood on record for the Wisconsin River occurred in September 1938 at Muscoda, Wisconsin.

Table 10 – Summary of Recorded Large Events on the Wisconsin River at Muscoda, Wisconsin – USGS Gage No. 05407000 (Reference 21 and 22)

Date	Discharge (cfs)	Gage Height
09/16/1938	80,800	11.48
06/11/1881	N/A	11.10
04/16/1922	72,100	10.60
03/20/1973	65,000	10.36
06/26/1993	59,600	10.34

Flood impacts at various gage heights at Muscoda, Wisconsin are listed as follows:

Gage Height (ft)	Flood Impact
13.8	The water reaches the low steel on the State Highway 80 bridge over the river.
11.0	Widespread lowland flooding is likely, but the Town of Muscoda should remain above the flood waters.
10.0	There is extensive lowland flooding. However, no flooding has been reported in Muscoda in previous years.
9.0	The river begins to go out of its banks in some locations with only minor flooding.

Figure 5: Wisconsin River at Grant County line near Muscoda – June 2008
(Reference 23)

2.4 Flood Protection Measures

The Mississippi River is navigable and the water level in the area is regulated by Lock and Dam Number 10 at Guttenburg, IA and Lock and Dam Number 11 at Dubuque, IA. However, this facility does not provide protection for Grant County from a major flooding event such as the 100-year flood.

3.0 ENGINEERING METHODS

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

3.1 Hydrologic Analyses

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

The following analyses have not changed from the previous countywide FIS. Study summaries have been compiled by waterway below:

Beetown Branch, Kieler Creek, Little Platte River, Louisburg Creek, Platte River, and Rattlesnake Creek (Reference 5):

Discharges were obtained from the 1978 U.S. Army Corps of Engineers Bluff Frequency Study.

Crooked Creek/ Sanders Creek (References 3 and 5):

For the detailed studies of Sanders Creek and Crooked Creek, two methods of hydrologic analyses were investigated. The first method utilized the methodology outlined by the U.S. Department of Agriculture, Soil Conservation Service (SCS). The second method utilized the multiple regression equation with the log-Pearson Type III statistical distribution of the 19 years of gage records since 1964 for Crooked Creek Gage No. 05407200 (Reference 11). The results of these hydrologic analyses were compared with data obtained from similar gaged basins.

Rountree Branch (Reference 6):

The hydrologic analysis for Rountree Branch was taken from an updated flood hazard investigation report prepared by Owen Ayres & Associates, Inc. for the U.S. Army Corps of Engineers. It was completed in May 1979 and submitted to FEMA by the Wisconsin Department of Natural Resources.

Wisconsin River (References 3, 4 and 24)

Due to regulation on the Wisconsin River and presence of significant overbank storage, drainage area transfer methods were not applicable for this study area. Instead, linear interpolation based on stream length between gage sites was used. An exception to this was made downstream of the confluence of the Kickapoo River (Crawford County) due to its large contributing area.

For this countywide FIS, the following new study was leveraged from the US Army Corps of Engineers:

Mississippi River (Reference 25) –

The Mississippi River hydrology was determined through an investigation of flood frequency distribution estimation methods and resulted in a recommendation by the Technical and Interagency Advisory Groups (TAG and IAG) to use the basic methodology described in Bulletin 17B for obtaining at-site estimates of flood distributions for the Upper Mississippi Basin Flood Frequency Study. The Bulletin recommends the log-Pearson III distribution with method of moments to estimate flood quantiles (e.g., the 1% chance annual peak flow). The TAG and IAG also recommended regionalization of the flood statistics to obtain consistent flood quantile estimates. Regional shape estimation also involves estimating average skew values for statistically homogenous regions and substituting this average value for the at-site value when estimating the flood frequency distribution. Flood regions may be defined by the confluence of major rivers (e.g., Kansas and Missouri, Illinois and Mississippi, Mississippi and Missouri), a change in climatology or some other feature that is manifested in the observed flow series. A statistical approach was proposed by the Technical Advisory Group (TAG) to obtain regional boundaries (see Hydrologic Engineering Center, 2000). The approach taken was to identify boundaries based on channel characteristics, statistical variation of flood characteristics, and climate across the study area. Once regions with statistically similar flood characteristics were defined, a regional skew coefficient (a regional shape parameter) was obtained as an average of the at-site gage estimates within the region. The flood frequency distribution is computed from the at-site mean and standard deviation combined with the regional skew coefficient used as the adopted skew coefficient. Flood distributions in between gages are obtained by a linear smoothing relationship of the mean flow and the standard deviation with drainage area.

Peak discharge-drainage area relationships for each flooding source studied in detail are shown in Table 11.

Table 11 - Summary of Discharges

		Peak Discharges (cubic feet per second)			
Flooding Source and Location	Drainage Area (square miles)	10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BEETOWN BRANCH					
At Beetown	2.7	1,890	*	3,510	4,950
CROOKED CREEK					
At Confluence with Wisconsin River	16.2	1,500	3,000	3,800	6,100

Table 11 - Summary of Discharges (*continued*)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
KIELER CREEK					
At Kieler	4.0	2,320	*	4,300	5,900
LITTLE PLATTE RIVER					
At Arthur	9.0	3,500	*	6,400	8,900
LOUISBURG CREEK					
At Louisburg	2.4	1,800	*	3,360	4,700
MISSISSIPPI RIVER					
At the Northern Grant County Boundary (RM 631.0)	*	167,500	226,000	251,000	309,000
At Southern Grant County Boundary (RM 580.9)	82,100	195,000	251,000	274,000	326,000
PLATTE RIVER					
At Ellenboro	117	12,850	*	32,100	55,000
RATTLESNAKE CREEK					
At North Andover	22.8	5,520	*	10,150	14,300
ROUNTREE BRANCH					
At Confluence with Little Platte River	13.8	3,100	6,000	7,700	12,400
SANDERS CREEK					
At Confluence Wisconsin River	17.1	1,550	3,050	3,800	6,200
WISCONSIN RIVER					
At outlet to the Mississippi River	12,000	62,700	80,400	86,900	110,700
Just upstream of confluence with Kickapoo River (Crawford County)	11,742	63,900	81,900	88,700	113,400
Just downstream of confluence with Kickapoo River (Crawford County)	10,974	56,100	71,100	77,100	97,600
Muscoda USGS Gaging Station 05407000	10,400	58,000	74,000	80,000	102,000

*Data not available

3.2 Hydraulic Analyses

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

The analyses for those stream reaches listed in Table 4 have not changed from the previous countywide FIS.

<u>Beetown Branch, Kieler Creek, Little Platte River, Louisburg Creek, Platte River and Rattlesnake Creek (Reference 5):</u>

Water-surface profiles were computed by hand, using Bernoulli's equation for determining water-surface elevations.

<u>Crooked Creek/ Sanders Creek (References 3 and 5):</u>

Cross-sections from the flooding sources studied by detailed methods were obtained from field surveys and topographic maps. All bridges, dams and culverts were field-surveyed to obtain elevation data and structural geometry. Water surface elevations were computed using the U.S. Army Corps of Engineers (USACE) HEC-2 step-backwater computer program (Reference 28). Starting water surface elevations were based on the Wisconsin River.

<u>Rountree Branch (Reference 6):</u>

Cross-sections from the flooding sources studied by detailed methods were obtained from field surveys and topographic maps. All bridges, dams, and culverts were field-surveyed to obtain elevation data and structural geometry. Water surface elevations were computed using the U.S. Army Corps of Engineers (USACE) HEC-2 step-backwater computer program (Reference 28). Starting water surface elevations were based on the slope/area method.

Wisconsin River:

Wisconsin River at the City of Boscobel (Reference 3)–

Cross sections were obtained from field surveys. Additional sections were synthesized from adjacent surveyed sections and topographic maps (References 27 and 28). For the portion of the Wisconsin River stretching from a point approximately 1.9 miles downstream of US Highway 61 to a point approximately 1.1 miles upstream of US Highway 61, water surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 23). Starting water surface elevations were based on historic flood profiles compiled by the Wisconsin Department of Natural Resources (WDNR). For this FIS, the Wisconsin River HEC-2 model was converted to the USACE HEC-RAS computer program version 3.1.3 (Reference 25) which resulted in minimal changes to published water surface elevations.

Wisconsin River at the Village of Blue River (Reference 1)–

Cross-section channel geometry was determined by field survey in 1993. Starting water surface elevations were based on historic flood profiles compiled by the Wisconsin Department of Natural Resources (WDNR). For the portion of the Wisconsin River from a point 2.5 miles upstream of County Highway T to 1.0 mile downstream of County Highway T, water surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 23).

Wisconsin River at the Village of Muscoda (Reference 2)–

Cross-section channel geometry was determined by field survey in 1993. Starting water surface elevations were based on historic flood profiles compiled by the Wisconsin Department of Natural Resources (WDNR). For the portion of the Wisconsin River from a point 2.6 miles upstream of State Highway 80 to a point 0.8 miles downstream of State Highway 80, water surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 23).

Wisconsin River All Other Reaches (References 4 and 24)–

For all other reaches of the Wisconsin River, flood profiles were based on historic high-water data. This information was obtained from USACE historic profiles (Reference 18), and a report published by the WDNR (Reference 19). The historic profiles were re-plotted to correct some distance inaccuracies between known landmarks using the mapped profile baseline.

For this countywide FIS, the following new study was leveraged from the US Army Corps of Engineers:

<u>Mississippi River (Reference 25)</u> –

The St. Paul District of the U.S. Army Corps of Engineers performed hydraulic modeling along the Mississippi and Black Rivers. This hydraulic model was created in the computer software UNET. This UNET model was then converted to a HEC-RAS model for the 0.1% chance flood hazard only. The hydraulic modeling starts at Anoka, Minnesota, at river mile (RM) 864.8, and continues downstream to Dubuque, Iowa, at RM 579.3. Even though the model extends to Dubuque, it is intended to provide results only for the reach at and upstream of Guttenberg, Iowa, at Lock and Dam 10. Guttenberg corresponds with the St. Paul District boundary with the Rock Island District. The extension of the model to Dubuque allows for a convergence reach taking care of any mathematical instability or errors introduced from the downstream boundary condition. The modeling effort for the Flow Frequency Study developed water surface profiles for the reach from the mouth of the St. Croix River near Hastings, Minnesota (River Mile 811.4) to the headwater of Lock and Dam 10 at Guttenberg, Iowa (River Mile 615.2).

The levee areas along the Mississippi-Missouri River systems are substantial. Breaching of levees results directly in flooding of areas meant to be protected by the levees. The water that floods those areas is stored for later return to the river. The modeling of this exchange and storage of water resulting from levee breaches is an important aspect of UNET. This feature is included in HEC-UNET (Ver. 4.0). A major effort was undertaken to provide the ability to simulate lock and dam operations with the UNET system (Barkau, 1996). The capability to use operating rule curves at navigation dams as internal boundary conditions was developed and implemented. Preparation of the input data necessary to describe these rule curves was accomplished by the District offices.

Aerial photography, airborne global positioning system (GPS) control, ground survey control, and aero triangulation were used in development of a digital terrain model (DTM) and digital elevation model (DEM) of the project area for the St. Paul District (Mississippi River from Anoka, Minnesota, to Lock and Dam 10 at Guttenberg, Iowa, RM 864.8 to 615.1). The aerial photography for the DTM was taken in April and May 1999 under the direction of the Scientific Assessment Study Team (SAST). The DTM data is composed of mass points and break lines that adequately define elevated roads, railroads, levees (features that would impede flow) and other major topographic changes required for accurate DEM development. The aerial mapping is based on surveyed ground control points.

These surveyed ground control points are very accurate, but the aerial mapping of well-defined features between the ground control points can vary by as much as 0.67 foot 67 percent of the time in accordance with the ASPRS Class I mapping standards. Ground surface elevations developed by the aerial mapping will be accurate to within 1.33 feet. This level of accuracy is much better than that used for previous hydraulic models along these rivers and is considered very good for the purposes of hydraulic modeling. Data below water surface elevation for the UNET model cross-sections are from various sources including xyz data obtained from Construction-Operations. Construction-Operations Division obtains sounding data for maintenance of the Navigation Channel for the Mississippi River. In areas that soundings were not available in the Navigation Channel, data from the Brown Surveys was utilized. The Brown Surveys are surveys taken in the early 1930’s across the Navigation Channel at approximately ½ mile increments. The Surveys were acquired from the St. Paul District map file archives. In the Overbank areas, data was obtained from the Upper Midwest Environmental Sciences Center (UMESC formerly the EMTC). In areas that the UMESC data was not available flowage surveys were utilized. The flowage surveys were taken in the early 1930’s prior to placement of the lock and dams. The Flowage Surveys were acquired from the St. Paul district map file archives. In areas that new geometry was not available previously developed geometry data was utilized from the Mississippi River UNET model.

Geometry data from the varying sources described above was imported into the GIS program ArcView 3.2. All geometry data was converted to horizontal UTM Coordinates, NAD 83, Zone 15, Feet and vertical NGVD 1929, US Survey Feet. Cross-sections, reach lengths, and overbank line shapefiles were created in ArcView 3.2. Each geometry data source was combined with the cross-sections shapefile and cross-sections were cut using an extension in ArcView 3.2 called Geo-RAS. By the use of Geo-RAS the cross-sections, reach lengths and overbank geometric data was imported into HEC-RAS 3.0 as a geometry file. A separate geometry file was created for each geometry data source. The geometry files were then combined in HEC-RAS 3.0 and a final geometry data file was created. The final geometry data file contains data from the DEM/DTM above WSEL and soundings data, UMESC data, Brown Surveys data, Flowage Surveys Data, and Old UNET data (listed in decreasing control) below WSEL. The channel roughness coefficients were assigned by use of UMESC supplied land use data. The land use data was imported into ArcView 3.2 and each landuse was assigned a roughness coefficient. The data was then imported into HEC-RAS 3.0 by use of the Geo-RAS extension.

The geometry data was completed in HEC-RAS with the addition of effective flow limits, bridges, control structures (locks and dams), and levees. Steady flow discharges were acquired from the hydrologic study. Calibration was then completed by the use of High Water Marks for the 1965, 1969, 1993, 1997 and 2001 floods. Rating curves were used for calibration at each Lock and Dam, at each control point between the Lock and Dams, and at the gaging stations at

Anoka, St. Paul, Winona and McGregor. The geometry for the Calibrated steady flow HEC-RAS model was then imported into UNET for an unsteady flow calibration.

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).

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen based on aerial photography, field observations, and Wisconsin land use data. The Manning's "n" values for all detailed studied streams are listed in the Table 11 below:

Table 12 - Manning's "n" Values for Detailed Study Streams

Stream	Channel "n"	Overbank "n"
Beetown Branch	*	*
Crooked Creek	0.040	0.080-0.100
Kieler Creek	*	*
Little Platte River	*	*
Louisburg Creek	*	*
Mississippi River	0.018-0.037	0.030-0.120
Platte River	*	*
Rattlesnake Creek	*	*
Rountree Branch	0.040-0.060	0.040-0.170
Sanders Creek	0.030-0.040	0.065-0.090
Wisconsin River	0.030-0.033	0.075-0.150

*Data not available

The profile baselines depicted on the FIRM represent the hydraulic modeling baselines that match the flood profiles on this FIS report. As a result of improved topographic data, in some cases the profile baseline may deviate significantly from the channel centerline or appear outside the Special Flood Hazard Area.

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

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was NGVD29.

With the finalization of NAVD88, many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD88. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities. Some of the data used in this study were taken from the prior effective FIS reports and adjusted to NAVD88. The average conversion factor that was used to convert the data in this FIS report to NAVD88 was calculated using the National Geodetic Survey's (NGS) VERTCON online utility (Reference 32). The data points used to determine the conversion are listed in Table 13.

Vertical Datum Conversion: NGVD -0.18 = NAVD

Table 13 - Vertical Datum Conversion

Quad Name	Corner	Latitude	Longitude	Conversion from NGVD to NAVD (feet)
Blue River	SW	43.124987	-90.625125	-0.18
Boscobel	SW	43.124985	-90.750126	-0.20
Mt. Zion	SW	43.249982	-90.750127	-0.13
Boaz	SW	43.249984	-90.625126	-0.16
Richland Center	SW	43.249986	-90.500125	-0.18
Muscoda	SW	43.124989	-90.500125	-0.22
Sextonville	SW	43.249988	-90.375124	-0.14
Avoca	SW	43.124991	-90.375124	-0.18
Crowley Ridge	SW	43.124983	-91.000127	-0.13
Wauzeka West	SW	42.999986	-91.000126	-0.15
Bridgeport	SW	42.999985	-91.125128	-0.16
Steuben	SW	43.124985	-90.875126	-0.19
Wauzeka East	SW	42.999988	-90.875126	-0.16
Long Hollow	SW	42.999988	-90.750126	-0.20
Castle Rock	SW	42.999990	-90.625125	-0.19
Highland West	SW	42.999992	-90.500125	-0.20
Highland East	SW	42.999994	-90.375123	-0.23
Prairie du Chien	SW	42.999986	-91.250131	-0.13
Bagley	SW	42.874988	-91.125129	-0.15
Clayton, Ia-Wi.	SW	42.874987	-91.250131	-0.11
Bloomington	SW	42.874989	-91.000127	-0.11
Mt. Hope	SW	42.874990	-90.875126	-0.16
Fennimore	SW	42.874991	-90.750126	-0.19
Stitzer	SW	42.874991	-90.625127	-0.22

Table 13 - Vertical Datum Conversion *(continued)*

Quad Name	Corner	Latitude	Longitude	Conversion from NGVD to NAVD (feet)
Montfort	SW	42.874992	-90.500127	-0.24
Linden	SW	42.874995	-90.375125	-0.27
Beetown	SW	42.749992	-91.000127	-0.13
Guttenberg	SW	42.749991	-91.125129	-0.15
Hurricane	SW	42.749993	-90.875126	-0.18
Lancaster	SW	42.749993	-90.750126	-0.18
Ellenboro	SW	42.749993	-90.625127	-0.21
Rewey	SW	42.749993	-90.500128	-0.24
Mifflin	SW	42.749995	-90.375127	-0.24
Cassville	SW	42.624995	-91.000129	-0.12
Balltown	SW	42.624996	-90.875127	-0.14
Potosi	SW	42.624998	-90.750127	-0.16
Dickeyville	SW	42.624998	-90.625127	-0.17
Platteville	SW	42.624998	-90.500128	-0.18
Belmont	SW	42.624999	-90.375127	-0.23
Kieler	SW	42.500003	-90.625127	-0.13
Dubuque North	SW	42.500003	-90.750127	-0.13
Cuba City	SW	42.500004	-90.500127	-0.16
New Diggings	SW	42.500004	-90.375127	-0.20
			Average:	**-0.18**

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

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

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

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

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance (100-year) flood elevations and delineations of the 1- and 0.2-percent-annual-chance (500-year) floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Table, and Summary of Stillwater Elevations Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

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

For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using USACE LiDAR data along the Mississippi (Reference 33); USACE 2-foot contour paper maps that were scanned to digital format by WDNR staff along the Rountree Branch (Reference 34) and Sanders Creek (Reference 35); and USGS digital raster graphics with intervals ranging from 10-20 feet for all other locations (References 36 through 59).

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, AE, and AH), 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). Streams mapped by approximate methods were also delineated using the contours from the USGS quadrangle maps (References 36 through 59), except in the City of Lancaster, which provided four-foot contours.

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 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies. However, the WDNR has established a policy that requires a 0.0 foot surcharge except for the waterways which were redelineated, where the surcharge from the effective study remains valid (Reference 60).

The floodways presented in this FIS report and on the FIRM were computed at representative cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 14). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either too close together or collinear, only the floodway boundary has been shown.

In the redelineation efforts, the floodways were not recalculated. As a result, there were areas where the previous floodway did not fit within the boundaries of the redelineated 1-percent-annual chance floodplain. In these areas, the floodway was reduced to coincide with the 1-percent-annual chance floodplain. Water surface elevations, with and without a floodway, the mean velocity in the floodway, and the location and area at each surveyed cross section as determined by the hydraulic methods can be seen in Table 14. The width of the floodway depicted by the FIRM panels and the amount of reduction to fit the floodway inside the 1-percent annual chance floodplain, if necessary, is also listed.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MISSISSIPPI RIVER								
A	580.87	428/2,653	77,365	3.5	610.7	610.7	610.7	0.0
B	581.78	2,7515,327	123,616	2.2	610.9	610.9	610.9	0.0
C	582.90	1,269/1,857	68,992	4.0	611.1	611.1	611.1	0.0
D	583.20	1,976/2,400	66,354	4.1	611.4	611.4	611.4	0.0
E	583.51	3,940/4,889	107,550	2.6	611.6	611.6	611.6	0.0
F	584.07	4,814/6,198	118,000	2.3	611.7	611.7	611.7	0.0
G	585.76	1,635/6,413	137,901	2.0	612.0	612.0	612.0	0.0
H	586.82	5,217/9,305	150,756	1.8	612.1	612.1	612.1	0.0
I	588.05	6,895/9,112	157,406	1.7	612.3	612.3	612.3	0.0
J	588.49	7,016/9,638	166,663	1.7	612.3	612.3	612.3	0.0
K	589.11	6,178/9,106	143,639	1.9	612.4	612.4	612.4	0.0
L	590.06	5,986/7,741	134,182	2.1	612.6	612.6	612.6	0.0
M	590.68	5,652/6,835	120,021	2.3	612.7	612.7	612.7	0.0
N	591.14	6,341/7,432	135,378	2.0	612.9	612.9	612.9	0.0
O	591.65	7,456/8,432	136,601	2.0	613.0	613.0	613.0	0.0
P	592.06	7,967/8,904	147,200	1.9	613.1	613.1	613.1	0.0
Q	592.56	8,110/8,875	134,556	2.1	613.2	613.2	613.2	0.0
R	594.04	6,889/7,871	123,434	2.2	613.5	613.5	613.5	0.0
S	596.01	6,569/7,454	115,995	2.4	614.1	614.1	614.1	0.0
T	597.50	6,000/6,606	97,315	2.8	614.5	614.5	614.5	0.0

[1]Stream distance in miles above confluence with Ohio River
[2]Width within Grant County/Total Width

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

MISSISSIPPI RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MISSISSIPPI RIVER (CONTINUED)								
U	599.00	5,994/6,795	116,417	2.4	615.2	615.2	615.2	0.0
V	599.91	6,268/6,961	111,823	2.5	615.4	615.4	615.4	0.0
W	600.75	5,383/6,763	91,753	3.0	615.7	615.7	615.7	0.0
X	601.92	3,419/7,138	99,447	2.8	616.2	616.2	616.2	0.0
Y	602.70	5,583/7,496	94,790	2.9	616.6	616.6	616.6	0.0
Z	604.38	3,832/6,110	84,659	3.3	617.3	617.3	617.3	0.0
AA	604.88	3,294/6,291	86,188	3.2	617.6	617.6	617.6	0.0
AB	605.48	3,050/6,668	89,911	3.1	617.8	617.8	617.8	0.0
AC	606.06	573/5,958	90,522	3.1	618.0	618.0	618.0	0.0
AD	606.82	492/7,060	98,620	2.8	618.3	618.3	618.3	0.0
AE	607.36	1,071/7,490	93,470	3.0	618.6	618.6	618.6	0.0
AF	607.93	2,310/7,798	107,890	2.6	619.0	619.0	619.0	0.0
AG	608.52	2,816/7,920	105,087	2.7	619.3	619.3	619.3	0.0
AH	609.96	1,927/8,303	149,243	1.9	620.0	620.0	620.0	0.0
AI	611.87	3,772/9,341	125,605	2.2	620.5	620.5	620.5	0.0
AJ	612.93	1,236/10,238	148,261	1.9	620.8	620.8	620.8	0.0
AK	614.75	642/3,268	74,785	3.7	621.2	621.2	621.2	0.0
AL	615.27	629/3,645	90,194	3.2	622.3	622.3	622.3	0.0
AM	616.08	584/7,212	138,352	2.1	622.5	622.5	622.5	0.0

[1]Stream distance in miles above confluence with Ohio River
[2]Width within Grant County/Total Width

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

MISSISSIPPI RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MISSISSIPPI RIVER (CONTINUED)								
AN	617.35	684/8,062	124,096	2.3	622.8	622.8	622.8	0.0
AO	618.34	698/8,105	129,412	2.2	623.1	623.1	623.1	0.0
AP	620.09	1,958/8,998	144,882	2.0	623.6	623.6	623.6	0.0
AQ	621.60	2,134/6,938	121,636	2.4	624.1	624.1	624.1	0.0
AR	622.12	2,755/5,600	105,455	2.8	624.5	624.5	624.5	0.0
AS	622.72	3,559/5,763	106,696	2.8	624.9	624.9	624.9	0.0
AT	623.29	5,558/7,430	123,237	2.4	625.2	625.2	625.2	0.0
AU	623.76	6,900/7,924	138,221	2.1	625.4	625.4	625.4	0.0
AV	624.26	7,995/8,569	135,821	2.2	625.4	625.4	625.4	0.0
AW	624.82	7,798/8,569	135,053	2.2	625.6	625.6	625.6	0.0
AX	626.17	3,108/8,753	157,130	1.9	626.3	626.3	626.3	0.0
AY	627.40	2,010/7,705	136,886	2.2	626.8	626.8	626.8	0.0
AZ	627.89	1,802/7,577	139,311	2.1	627.0	627.0	627.0	0.0
BA	629.56	3,505/7,071	124,710	2.4	627.5	627.5	627.5	0.0
BB	630.49	5,956/6,687	126,464	2.3	627.8	627.8	627.8	0.0

[1]Stream distance in miles above confluence with Ohio River
[2]Width within Grant County/Total Width

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

MISSISSIPPI RIVER

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)
ROUNTREE BRANCH								
A	10,953	486	1,406	5.1	843.8	843.8	843.8	0.0
B	12,447	454	1,624	4.4	852.0	852.0	852.0	0.0
C	12,872	528	2,379	3.0	853.3	853.3	853.3	0.0
D	13,044	537	1,245	5.8	854.5	854.5	854.5	0.0
E	13,167	520	3,672	2.0	858.8	858.8	858.8	0.0
F	13,812	410	1,611	4.3	859.6	859.6	859.6	0.0
G	15,141	278	1,167	5.9	865.6	865.6	865.6	0.0
H	17,768	200	1,610	4.1	880.2	880.2	880.2	0.0
I	18,255	220	1,512	4.4	881.0	881.0	881.0	0.0
J	18,602	60	658	9.8	881.8	881.8	881.8	0.0
K	18,696	60	684	9.4	882.2	882.2	882.2	0.0
L	18,981	115	796	8.1	884.2	884.2	884.2	0.0
M	19,829	250	1,722	3.4	888.6	888.6	888.6	0.0
N	20,057	40	498	11.7	891.1	891.1	891.1	0.0
O	20,109	127	1,260	4.6	893.1	893.1	893.1	0.0
P	20,522	77	591	9.9	895.0	895.0	895.0	0.0
Q	20,796	220	1,143	5.1	898.9	898.9	898.9	0.0
R	22,110	157	697	8.4	905.5	905.5	905.5	0.0
S	23,290	229	1,353	4.3	910.8	910.8	910.8	0.0
T	23,741	167	780	7.5	913.1	913.1	913.1	0.0

[1]Stream distance in feet above confluence with Little Platte River

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

ROUNTREE BRANCH

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)
ROUNTREE BRANCH (CONTINUED)								
U	24,566	260	1,929	2.9	921.0	921.0	921.0	0.0
V	25,319	257	695	7.9	922.1	922.1	922.1	0.0
W	25,529	325	1,659	3.3	925.1	925.1	925.1	0.0
X	26,709	286	686	6.1	931.1	931.1	931.1	0.0

[1]Stream distance in feet above confluence with Little Platte River

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

ROUNTREE BRANCH

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)
SANDERS CREEK								
A	1,340	618	893	4.3	656.5	655.3[2]	655.3[2]	0.0
B	1,866	611	1,693	2.2	659.8	659.8	659.8	0.0
C	2,510	295	889	4.3	662.3	662.3	662.3	0.0
D	2,843	75	595	6.4	663.7	663.7	663.7	0.0
E	2,994	216	937	4.1	664.1	664.1	664.1	0.0
F	3,195	268	1,190	3.2	664.5	664.5	664.5	0.0
G	3,610	70	497	7.6	664.9	664.9	664.9	0.0
H	3,801	102	612	6.2	665.6	665.6	665.6	0.0
I	4,072	97	780	4.9	666.5	666.5	666.5	0.0
J	4,289	106	554	6.9	666.5	666.5	666.5	0.0
K	4,455	124	702	5.4	667.2	667.2	667.2	0.0
L	4,628	179	1,070	3.6	667.6	667.6	667.6	0.0
M	4,787	116	887	4.3	667.7	667.7	667.7	0.0
N	5,016	94	554	6.9	667.6	667.6	667.6	0.0
O	5,164	111	744	5.1	668.5	668.5	668.5	0.0
P	5,377	114	623	6.1	668.6	668.6	668.6	0.0
Q	5,470	116	645	5.9	668.8	668.8	668.8	0.0
R	5,719	236	1,203	3.2	673.8	673.8	673.8	0.0
S	6,163	241	1,522	2.5	674.2	674.2	674.2	0.0
T	7,152	246	1,381	2.8	676.7	676.7	676.7	0.0

[1] Stream distance in feet above United States Highway 61
[2] Elevation computed without the consideration of backwater effects from Wisconsin River

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

SANDERS 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)
SANDERS CREEK (CONTINUED)								
U	7,644	295	1,481	2.6	677.3	677.3	677.3	0.0

[1]Stream distance in feet above United States Highway 61

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

SANDERS CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
WISCONSIN RIVER								
A	25.81	1,449/4,497	35,399	2.3	653.9	653.9	653.9	0.0
B	26.91	2,715/3,682	32,716	2.5	655.2	655.2	655.2	0.0
C	27.78	839/1,602	18,789	4.3	656.5	656.5	656.5	0.0
D	28.71	3,261/5,621	48,774	1.6	658.1	658.1	658.1	0.0
E	33.94	2,321/8,558	63,166	1.3	664.8	664.8	664.8	0.0
F	35.09	3,853/5,877	44,168	1.8	666.1	666.1	666.1	0.0
G	36.42	3,410/4,013	29,847	2.7	668.0	668.0	668.0	0.0
H	37.42	4,226/4,577	40,698	2.0	669.7	669.7	669.7	0.0
I	40.93	5,012/6,217	39,488	2.0	674.6	674.6	674.6	0.0
J	42.29	2,322/2,999	24,683	3.2	676.4	676.4	676.4	0.0
K	43.47	629/1,300	15,769	5.1	678.6	678.6	678.6	0.0
L	44.11	2,415/3,073	30,301	2.6	679.8	679.8	679.8	0.0

[1]Stream distance in miles above confluence with Mississippi River

[2]Width within Grant County/Total Width

TABLE 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

WISCONSIN 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 WSEL of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 6.

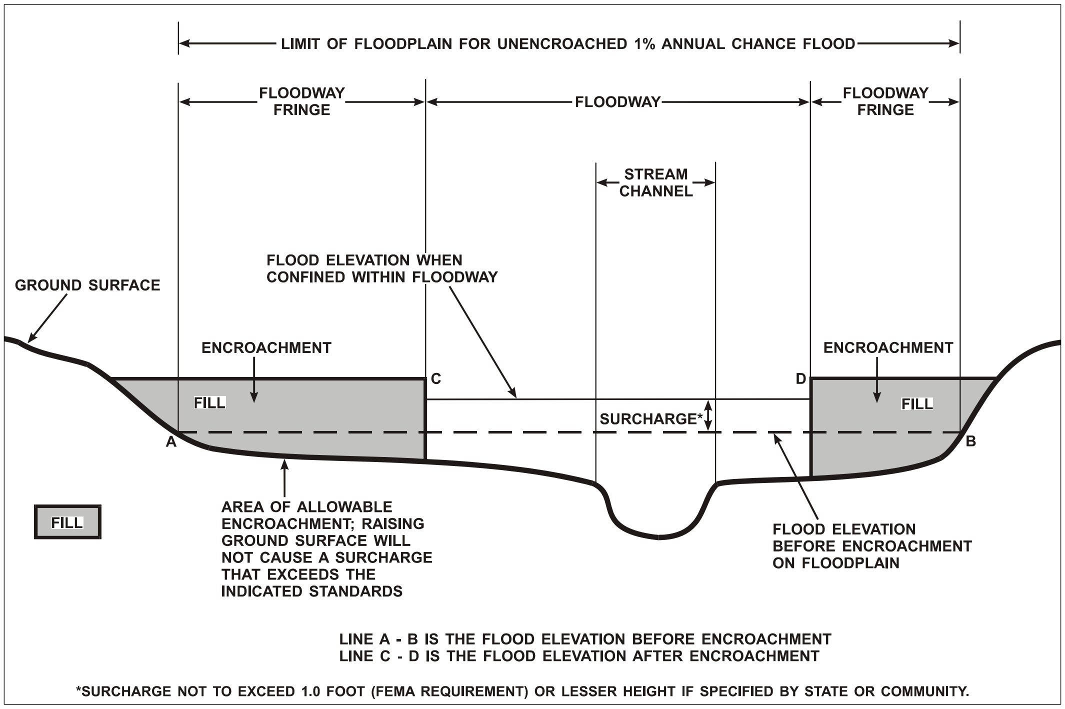

Figure 6 - Floodway Schematic

No floodways were computed for Beetown Branch, Crooked Creek, Kieler Creek, Little Platte River, Louisburg Creek, Platte River and Rattlesnake Creek.

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. These zones are as follows:

Zone A

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

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

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

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood 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 risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

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

The countywide FIRM presents flooding information for the entire geographic area of Grant County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 15.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	FIRM EFFECTIVE DATE	FIRM REVISION DATE
Bagley, Village of	August 30, 1974	May 21, 1976	June 17, 1986	None
Bloomington, Village of	June 28, 1974	May 28, 1976 July 7, 1978	August 19, 1986	None
Blue River, Village of	January 28, 1977	None	August 9, 1999	None
Boscobel, City of	December 17, 1973	May 14, 1976 November 30, 1979	November 4, 1981	October 6, 1998
Cassville, Village of	February 19, 1972	July 1, 1974	November 28, 1975	August 4, 1988
Cuba City, City of[1]	N/A	None	N/A	None
Dickeyville, Village of[1]	N/A	None	N/A	None
Fennimore, City of[1]	N/A	None	N/A	None
Grant County (Unincorporated Areas)	May 25, 1973	None	May 25, 1973	July 1, 1974 August 20, 1976 June 19, 1985 December 20, 1999
Hazel Green, Village of[1]	N/A	None	N/A	None
Lancaster, City of	May 31, 1974	August 29, 1975	August 5, 1986	None
Livingston, Village of[1]	N/A	None	N/A	None
Montfort, Village of[1]	N/A	None	N/A	None
Mount Hope, Village of	August 30, 1974	May 14, 1976	September 2, 2011	None
Muscoda, Village of	May 10, 1974	May 21, 1976	September 8, 1999	None
Patch Grove, Village of[1]	N/A	None	N/A	None
Platteville, City of	July 19, 1974	May 28, 1976	September 29, 1996	None
Potosi, Village of	December 28, 1973	May 28, 1976	September 2, 2011	None
Tennyson, Village of[1]	N/A	None	N/A	None
Woodman, Village of[1]	N/A	None	N/A	None

[1]No Special Flood Hazard Areas Identified (NSFHA)

TABLE 15

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Flood Insurance Studies (FISs) have been prepared for the Unincorporated Areas of Clayton County, Iowa (Reference 61); Unincorporated Areas of Dubuque County, Iowa (Reference 62); City of Dubuque, Iowa (Reference 63); Unincorporated Areas of Jo Daviess County, Illinois (Reference 64); City of East Dubuque, Iowa (Reference 65); Unincorporated Areas of Richland County, Wisconsin (Reference 66); Unincorporated Areas of Iowa County, Wisconsin (Reference 67); and Unincorporated Areas of Lafayette County, Wisconsin (Reference 68). The FIS for Crawford County and Incorporated Areas is in the process of being revised. Allamakee County, Iowa is a nonparticipating community; and therefore a FIS has not been published. Because it is based on more up-to-date analyses, this FIS supersedes the previously printed FIS for the Unincorporated Areas of Grant County (Reference 2); the Cities of Boscobel (Reference 3) and Platteville (Reference 6); and Villages of Cassville (Reference 69) and Muscoda (Reference 2).

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

8.0 LOCATION OF DATA

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

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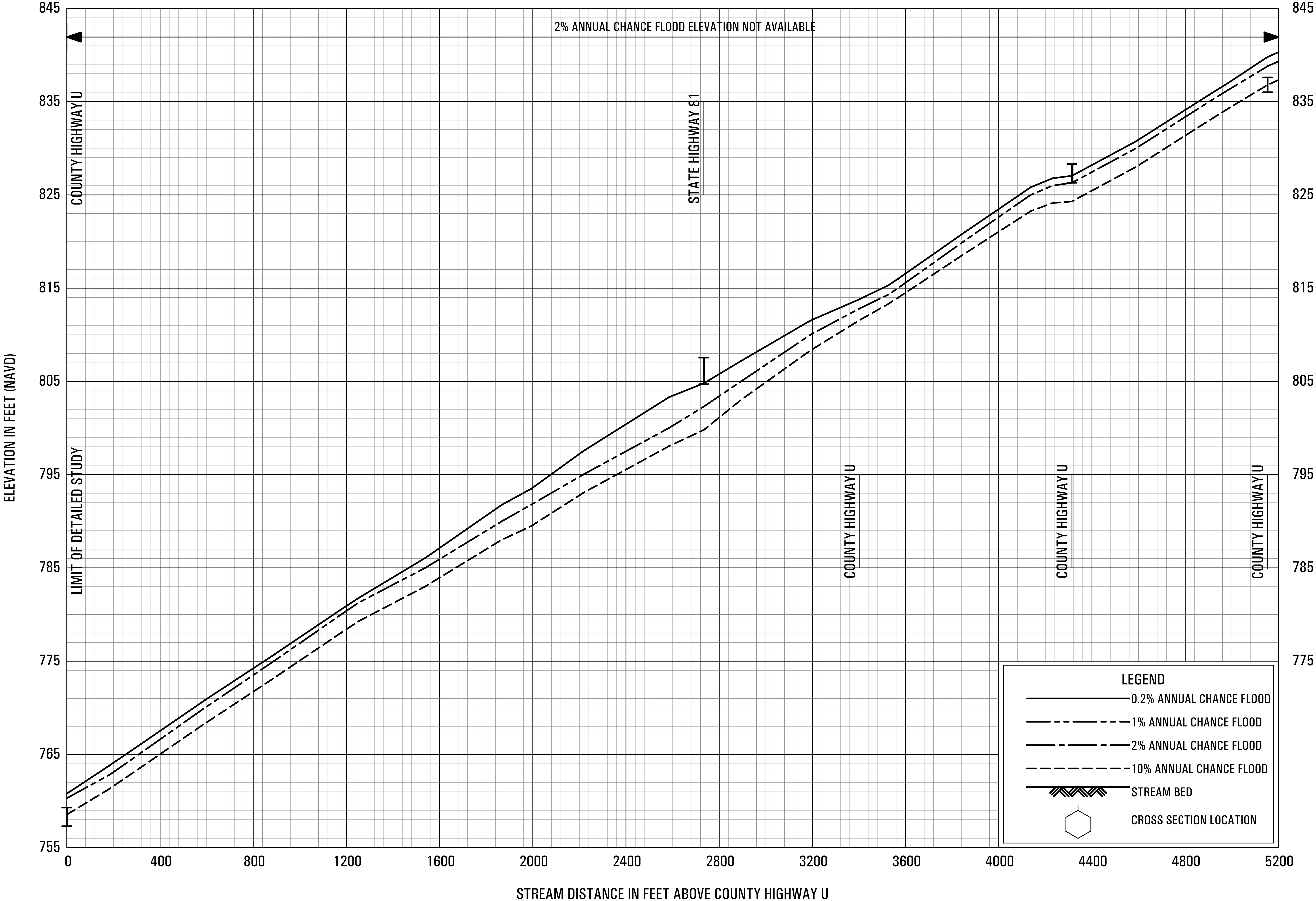


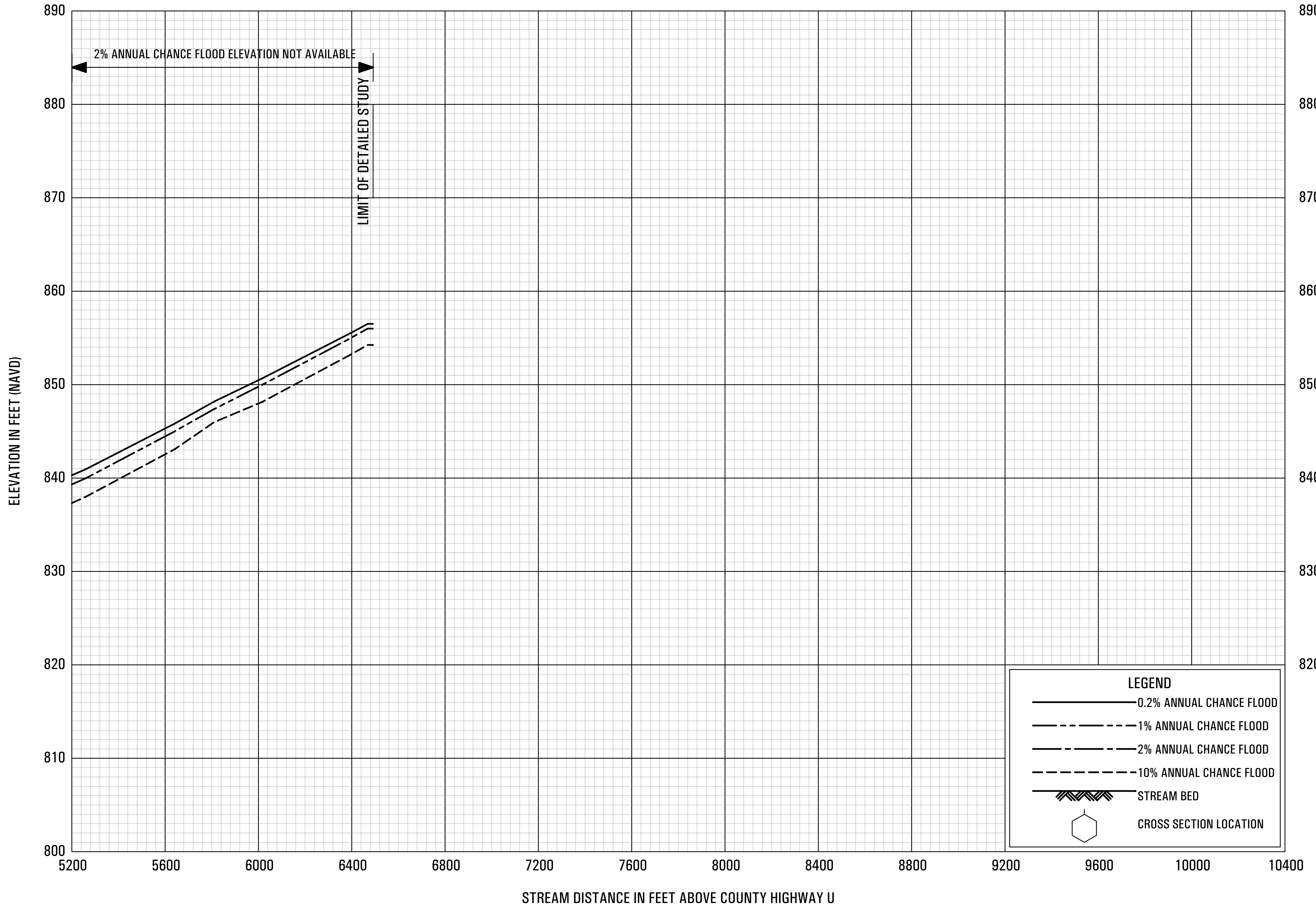
FLOOD PROFILES

BEETOWN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



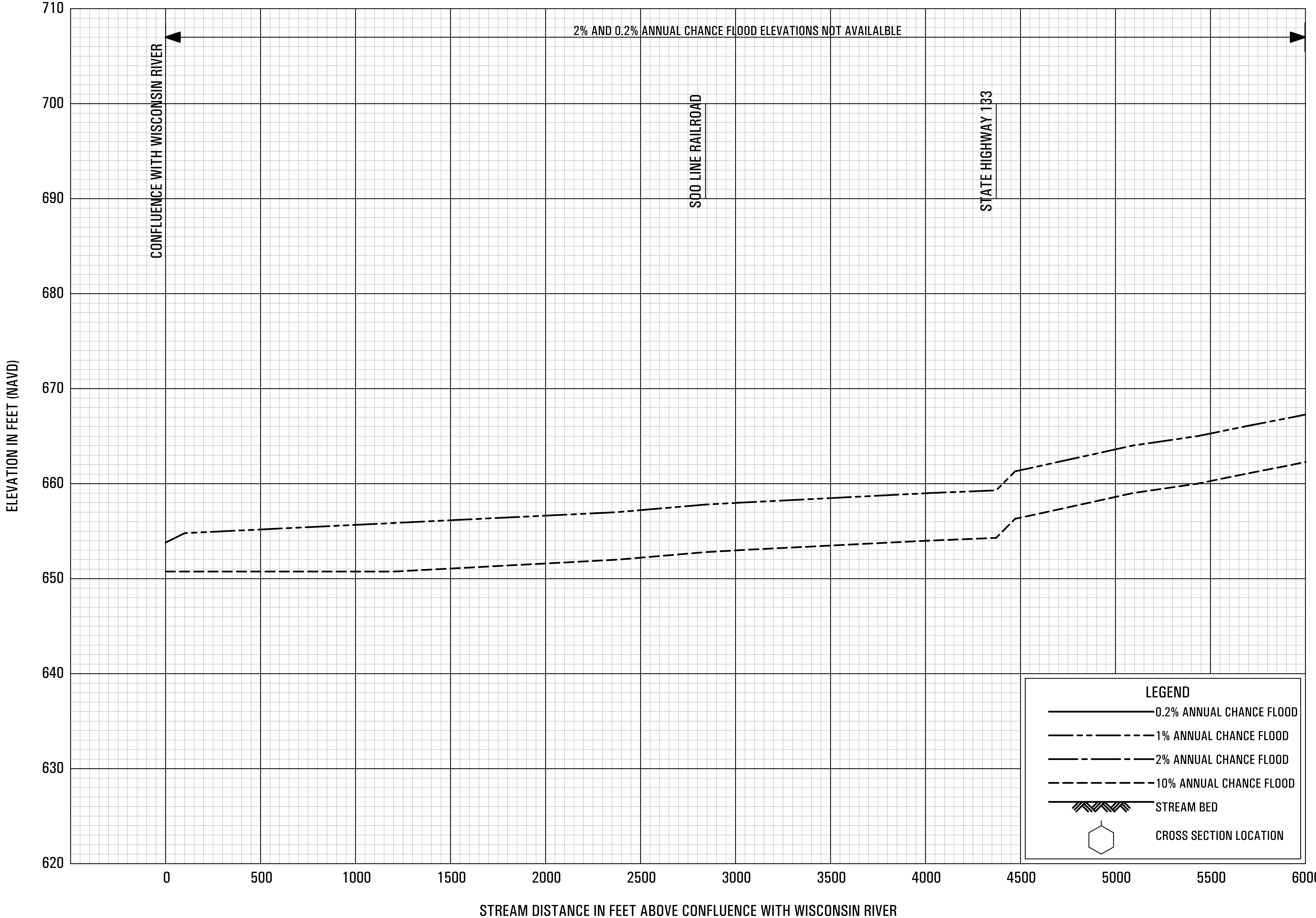
FLOOD PROFILES

BEETOWN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



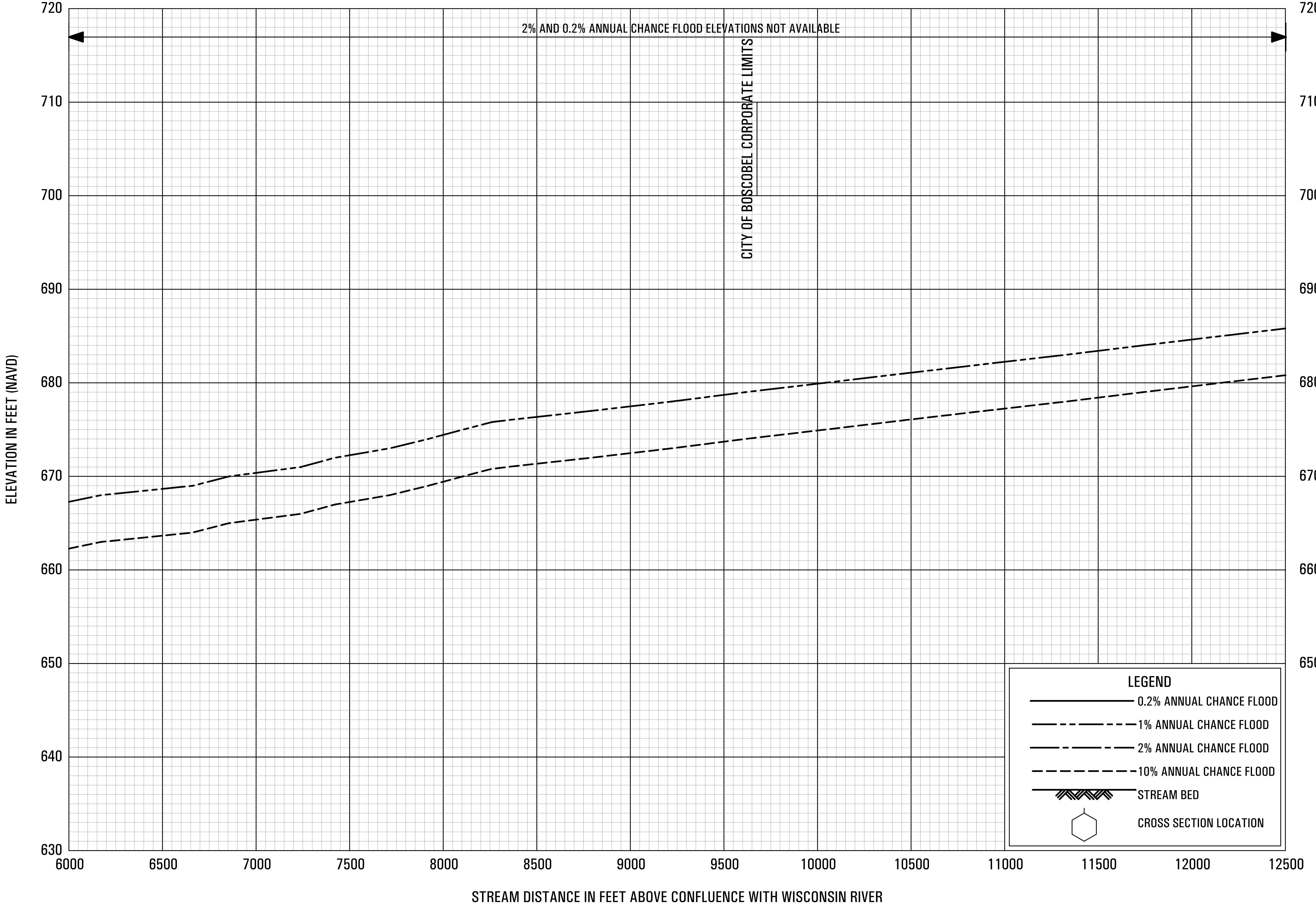
FLOOD PROFILES

CROOKED CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS

03P



FLOOD PROFILES

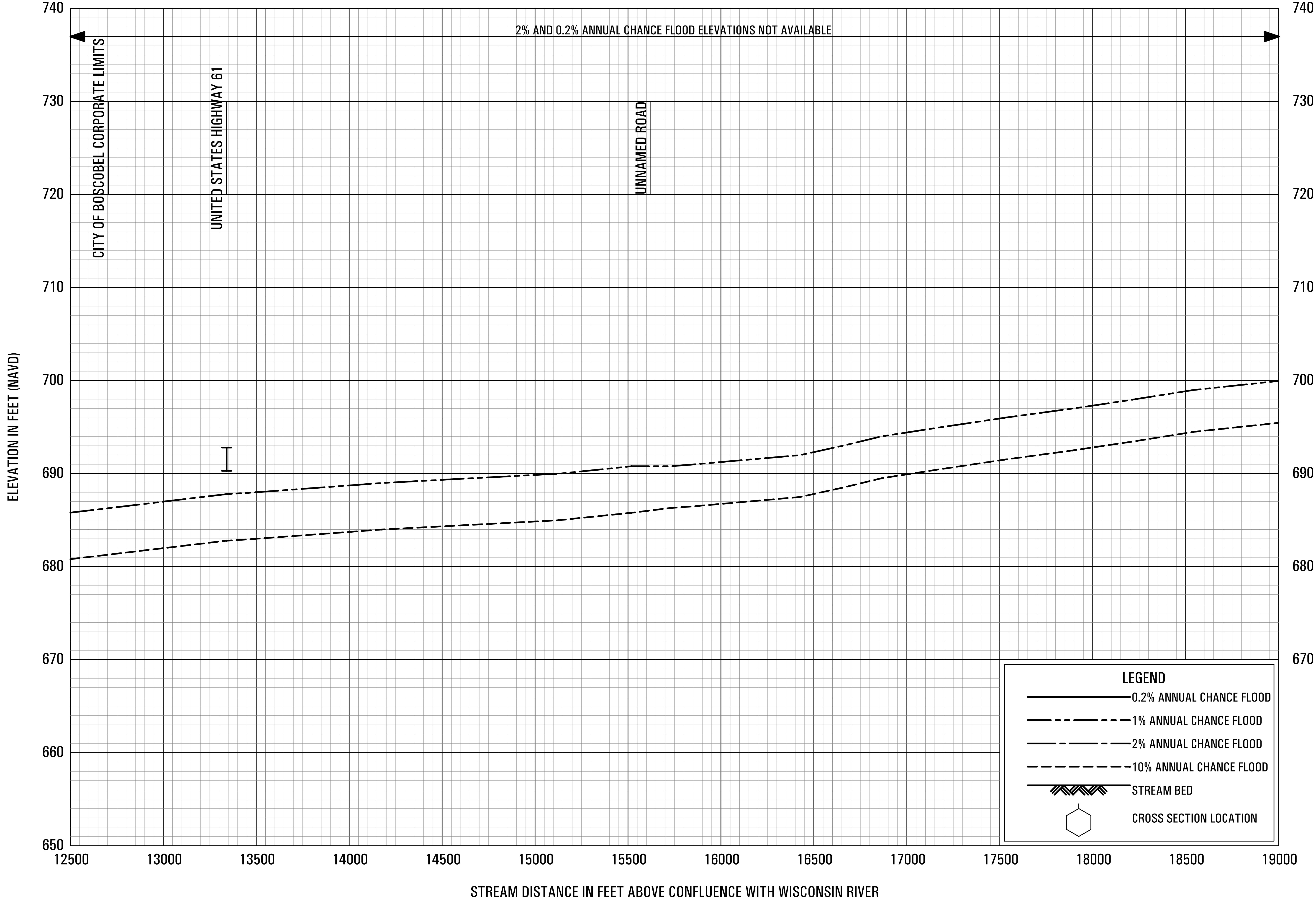
CROOKED CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

04P



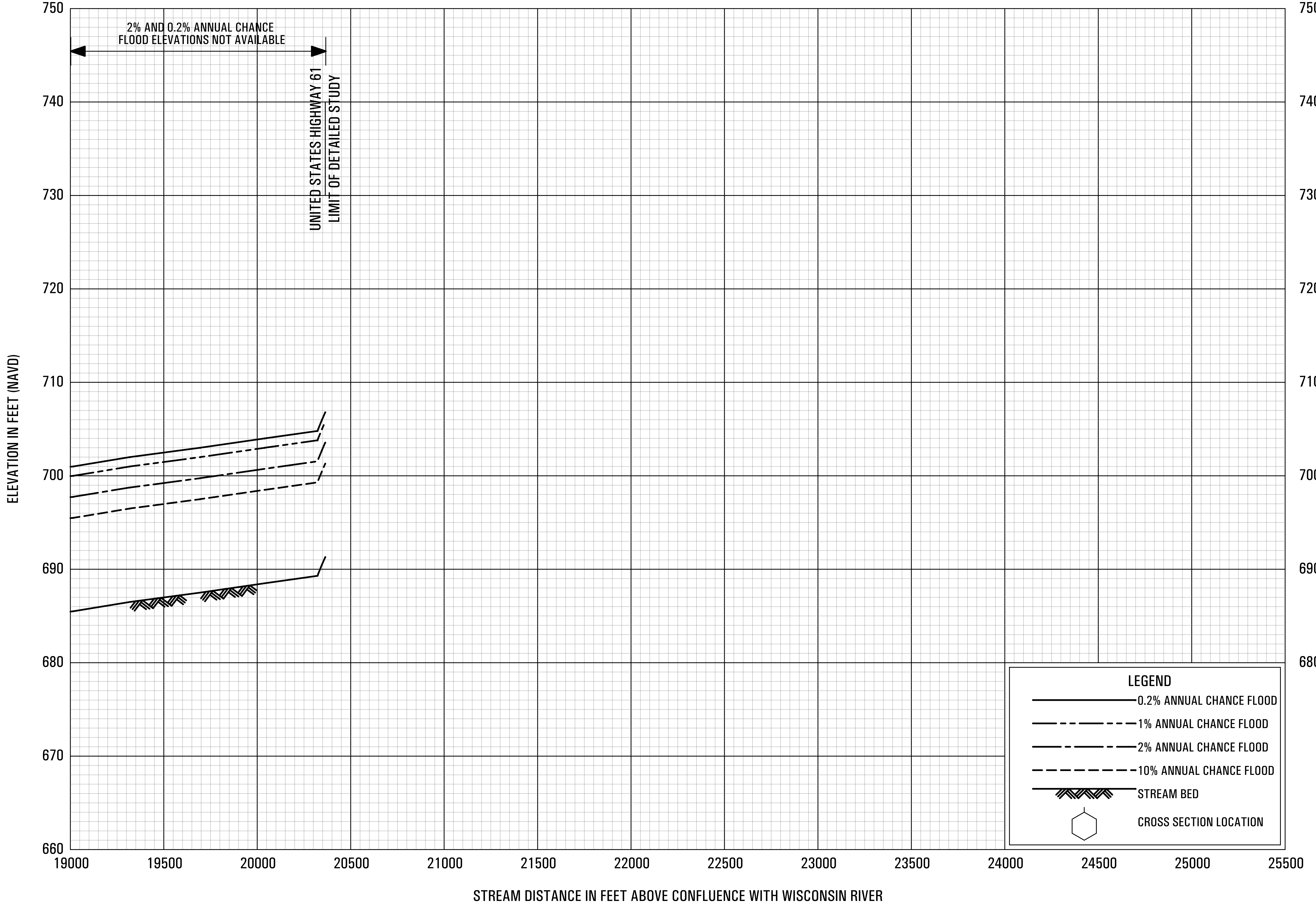
FLOOD PROFILES

CROOKED CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



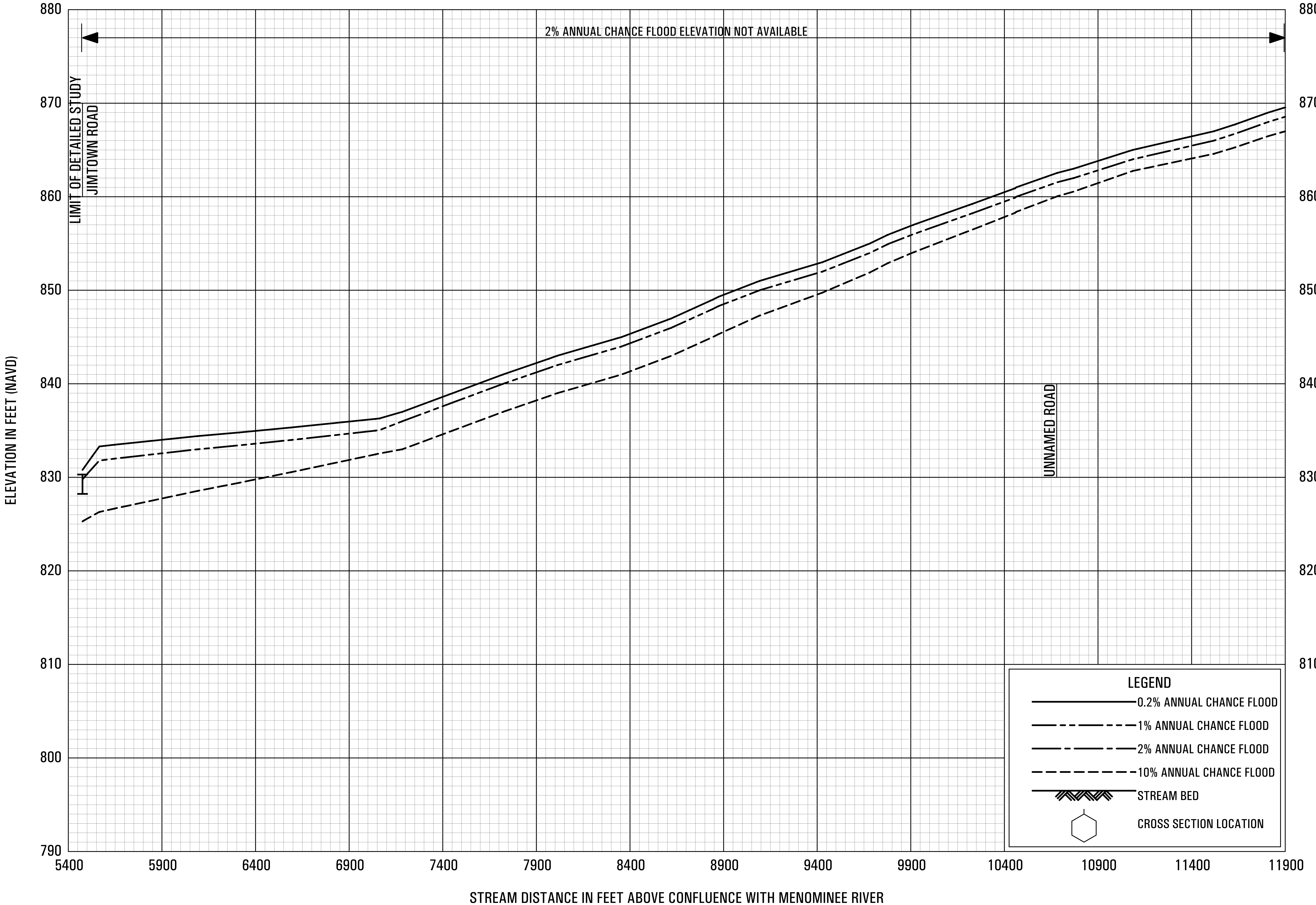
FLOOD PROFILES

CROOKED CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

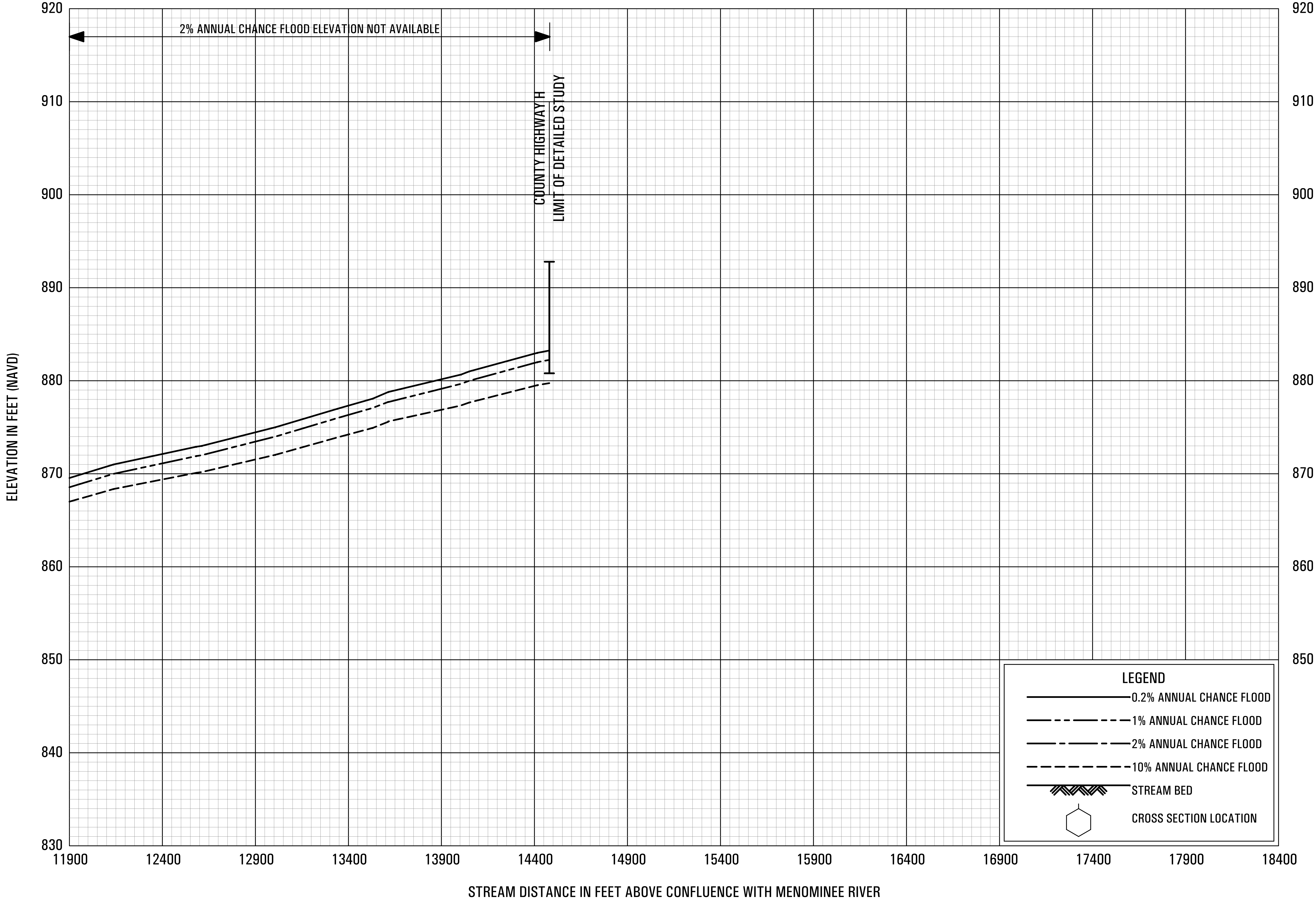
KIELER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

07P

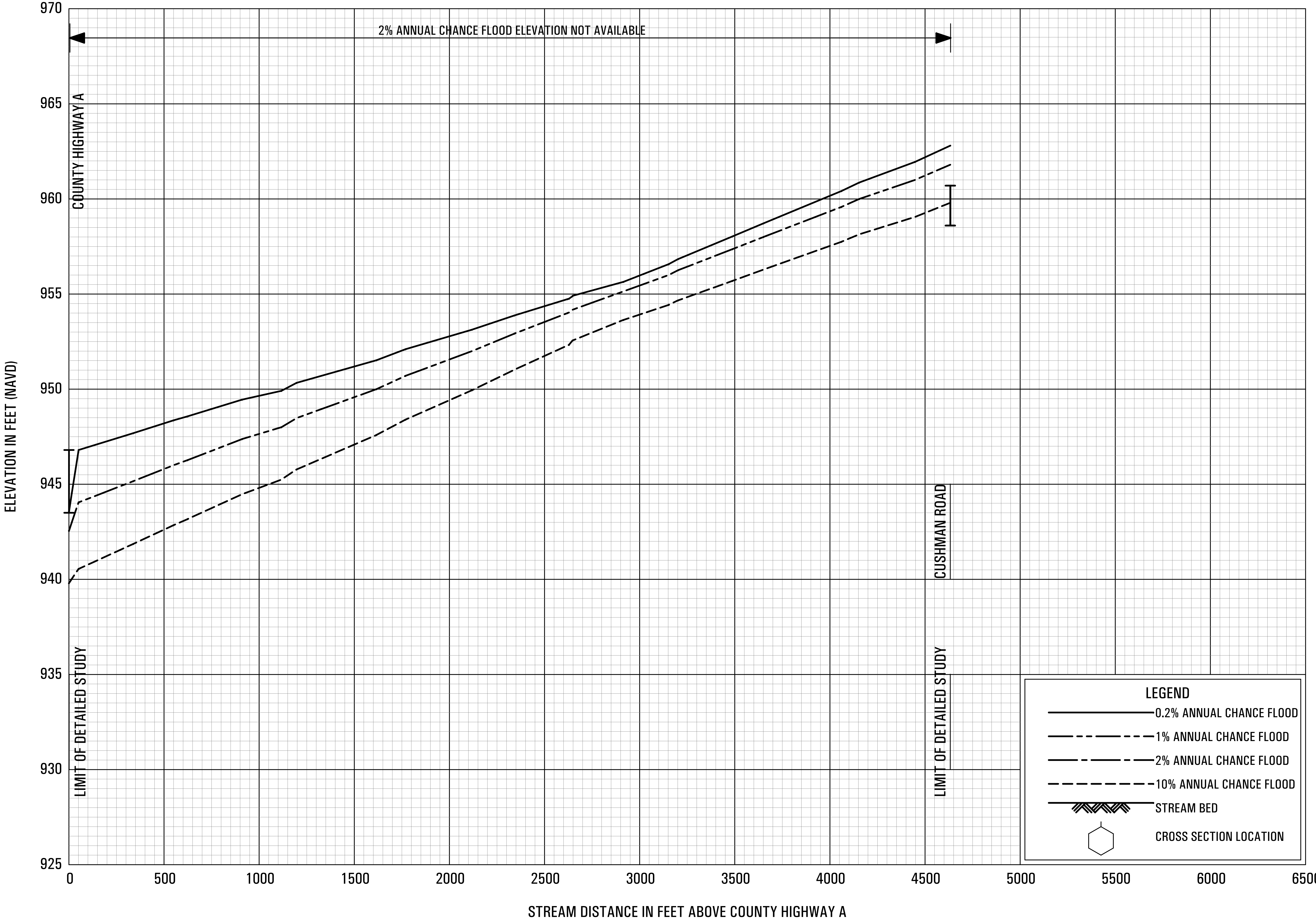


FLOOD PROFILES

KIELER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



FLOOD PROFILES

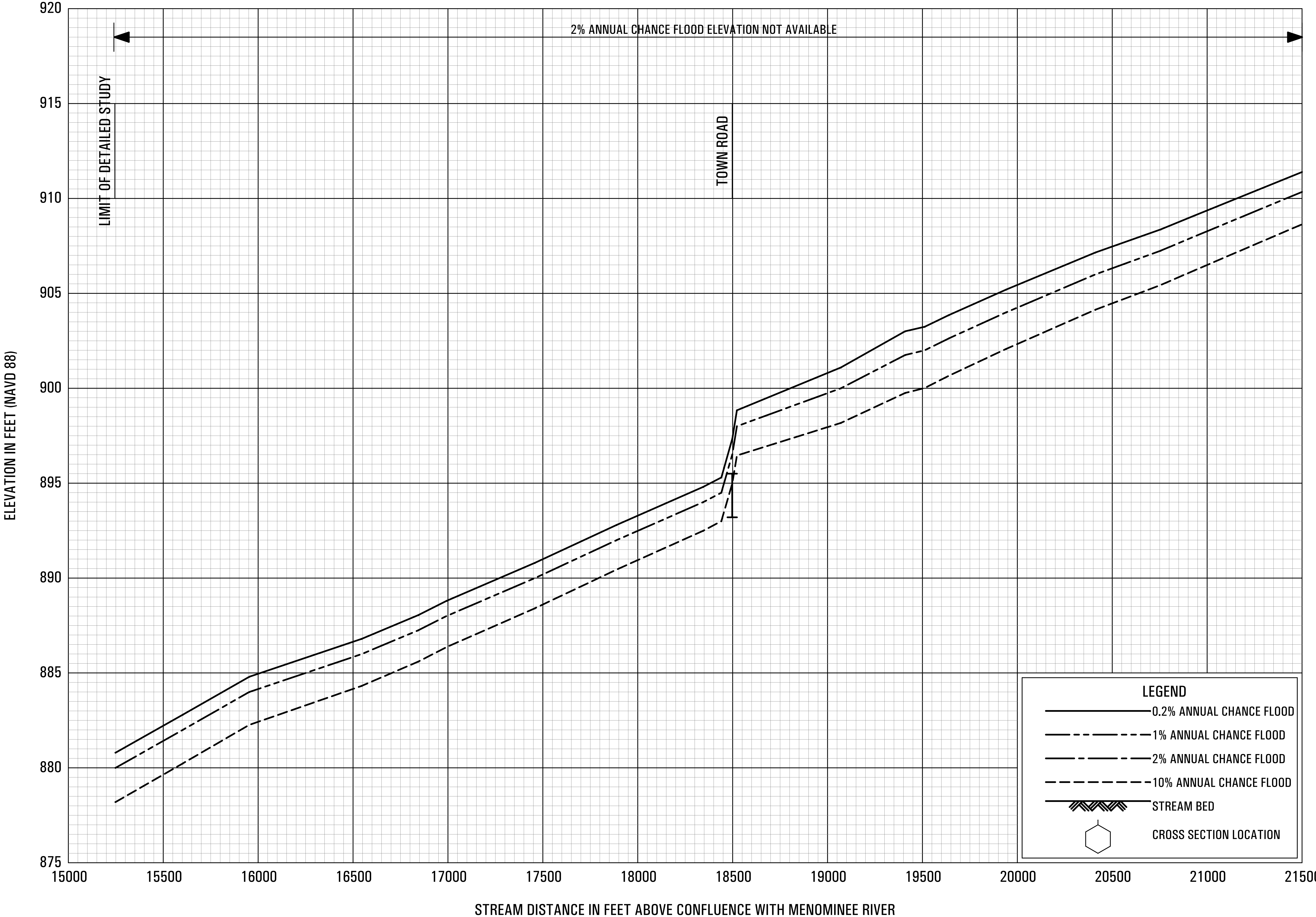
LITTLE PLATTE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

09P



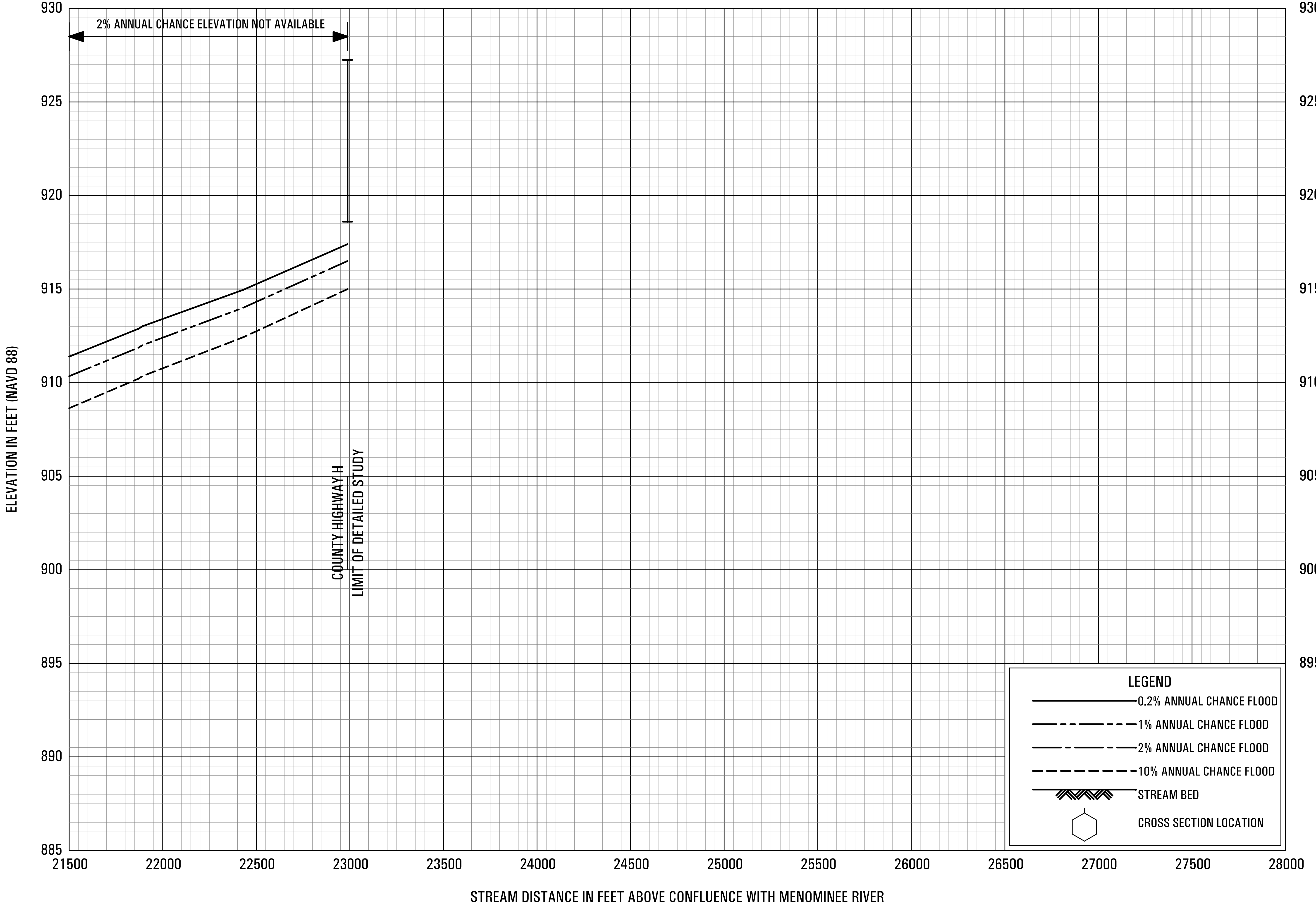
FLOOD PROFILES

LOUISBURG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

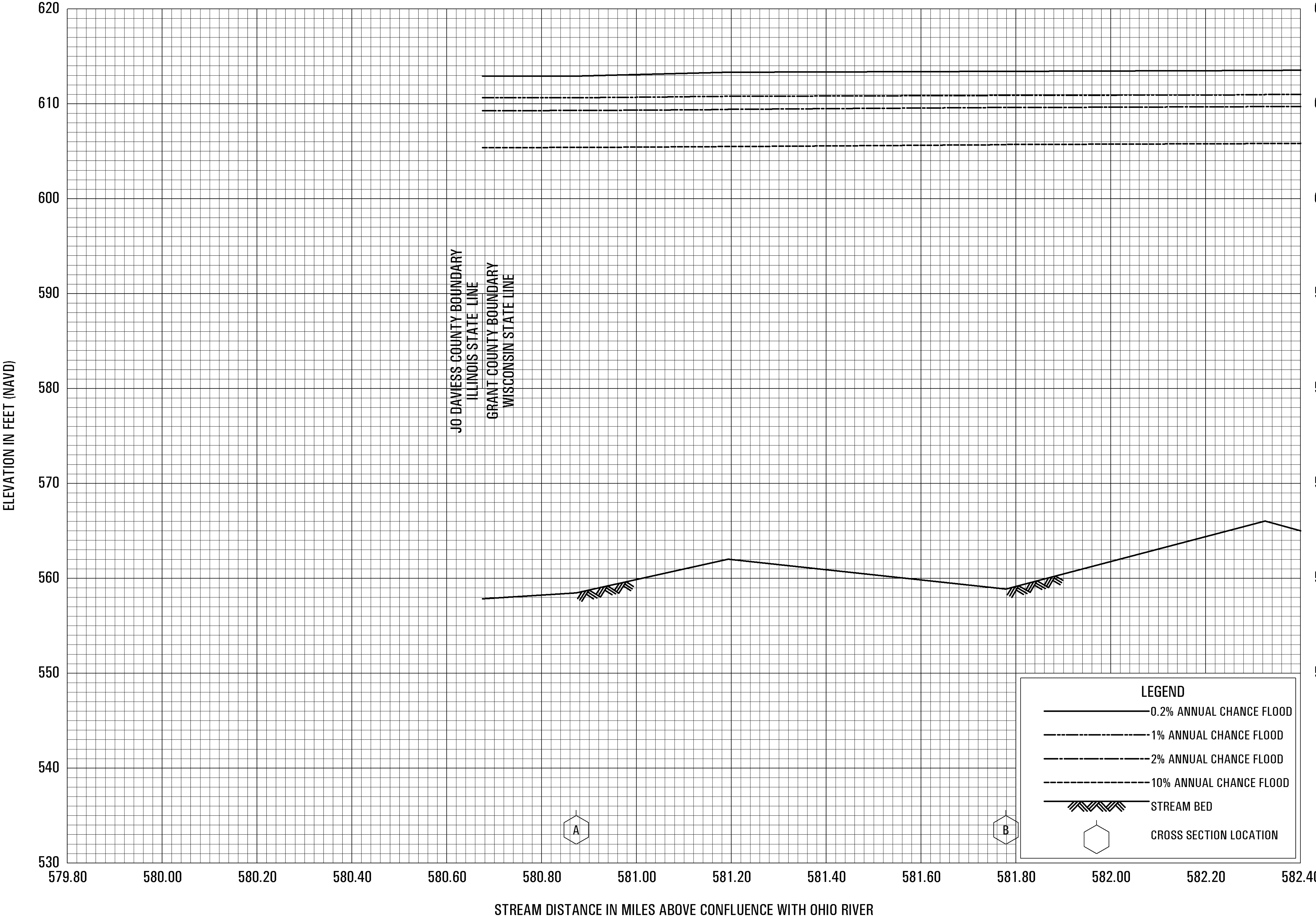


FLOOD PROFILES

LOUISBURG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



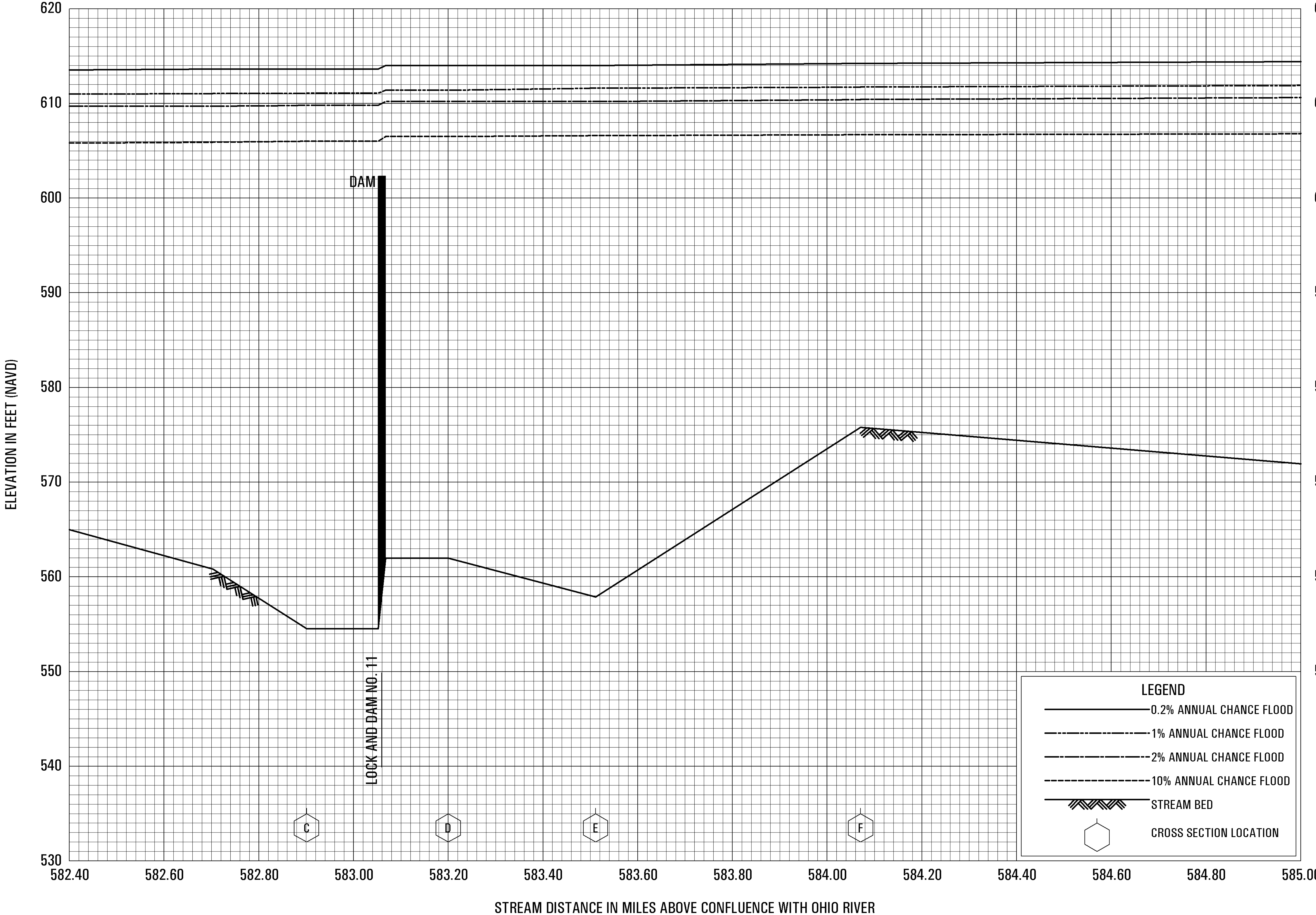
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

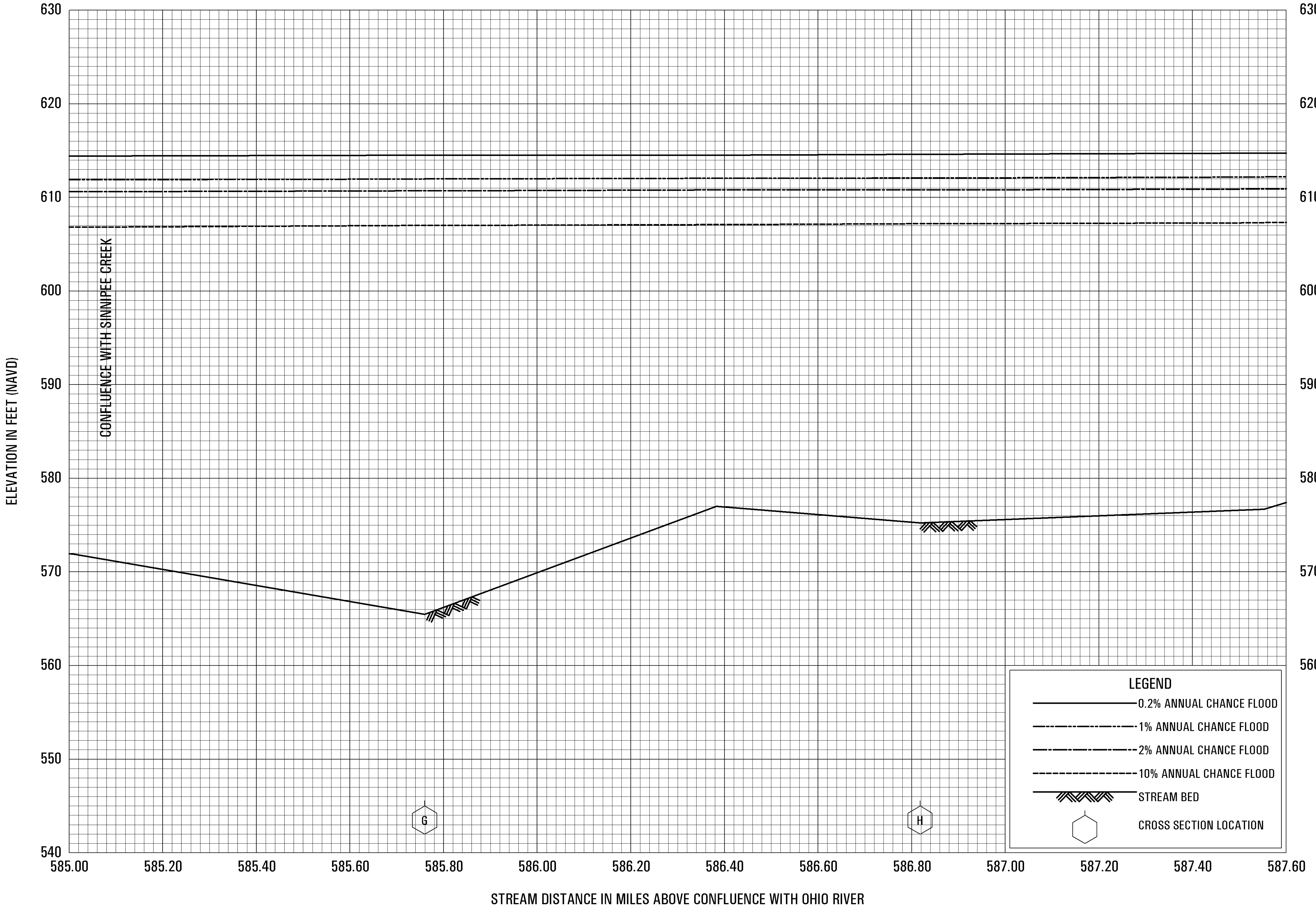


FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



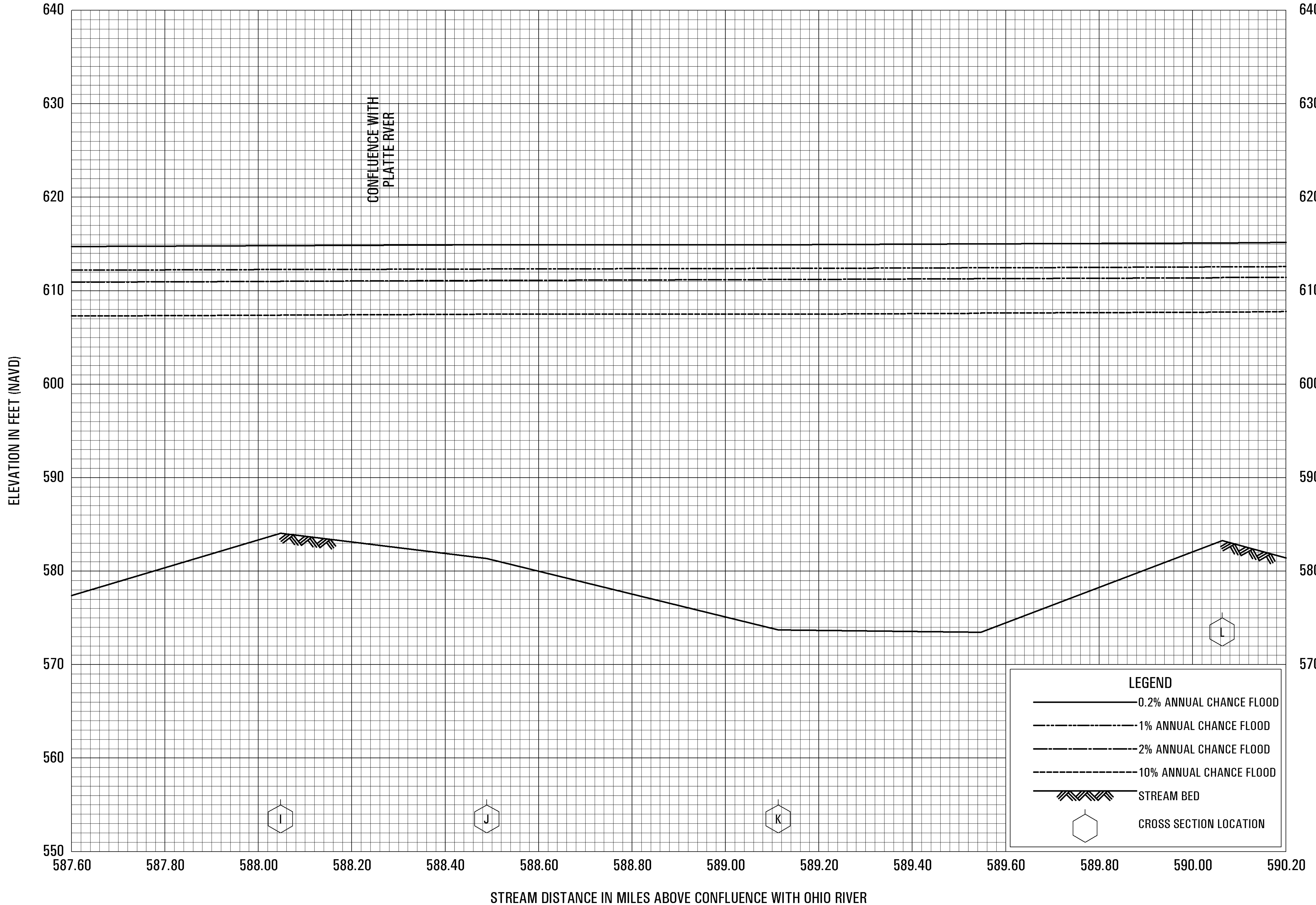
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



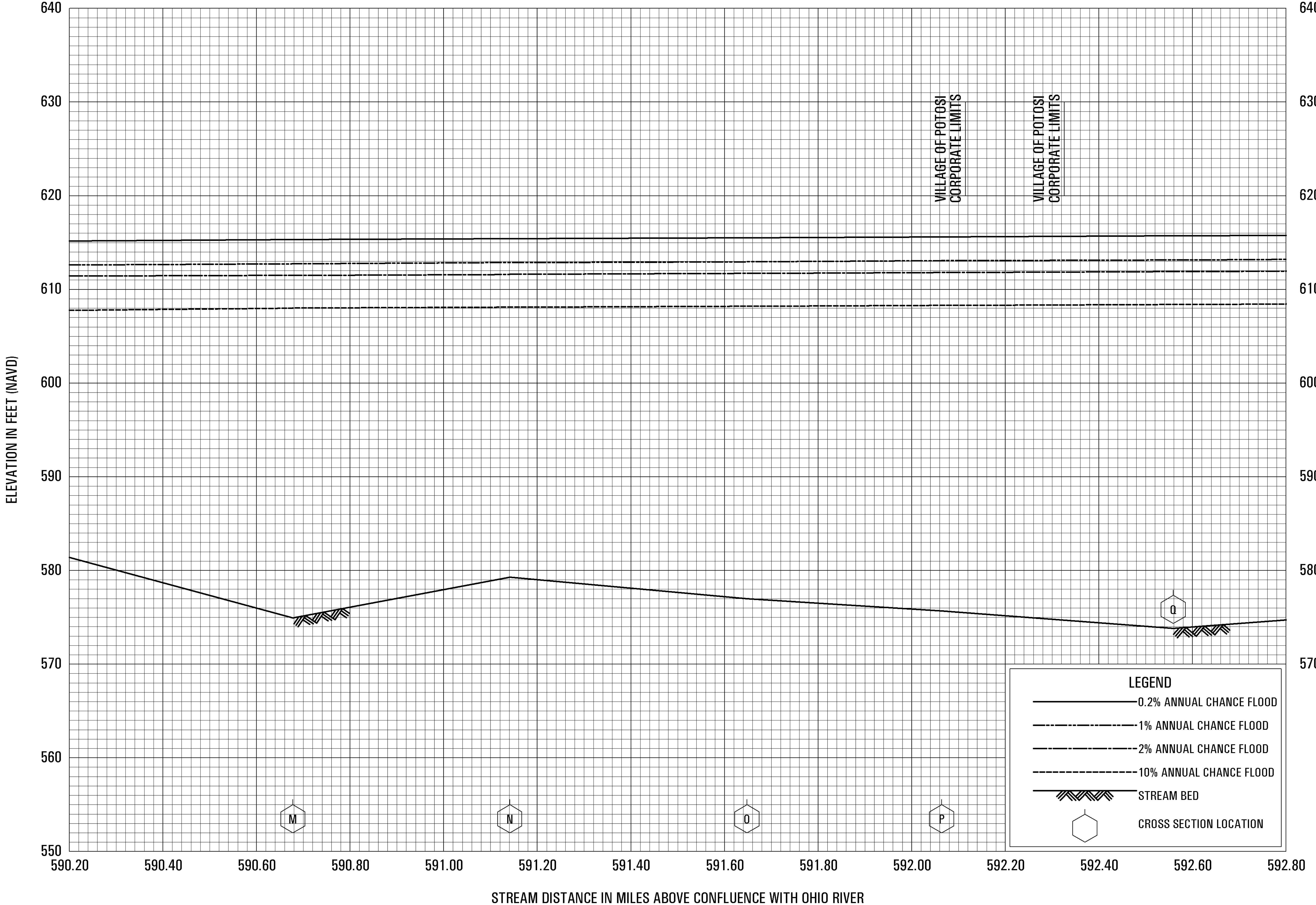
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

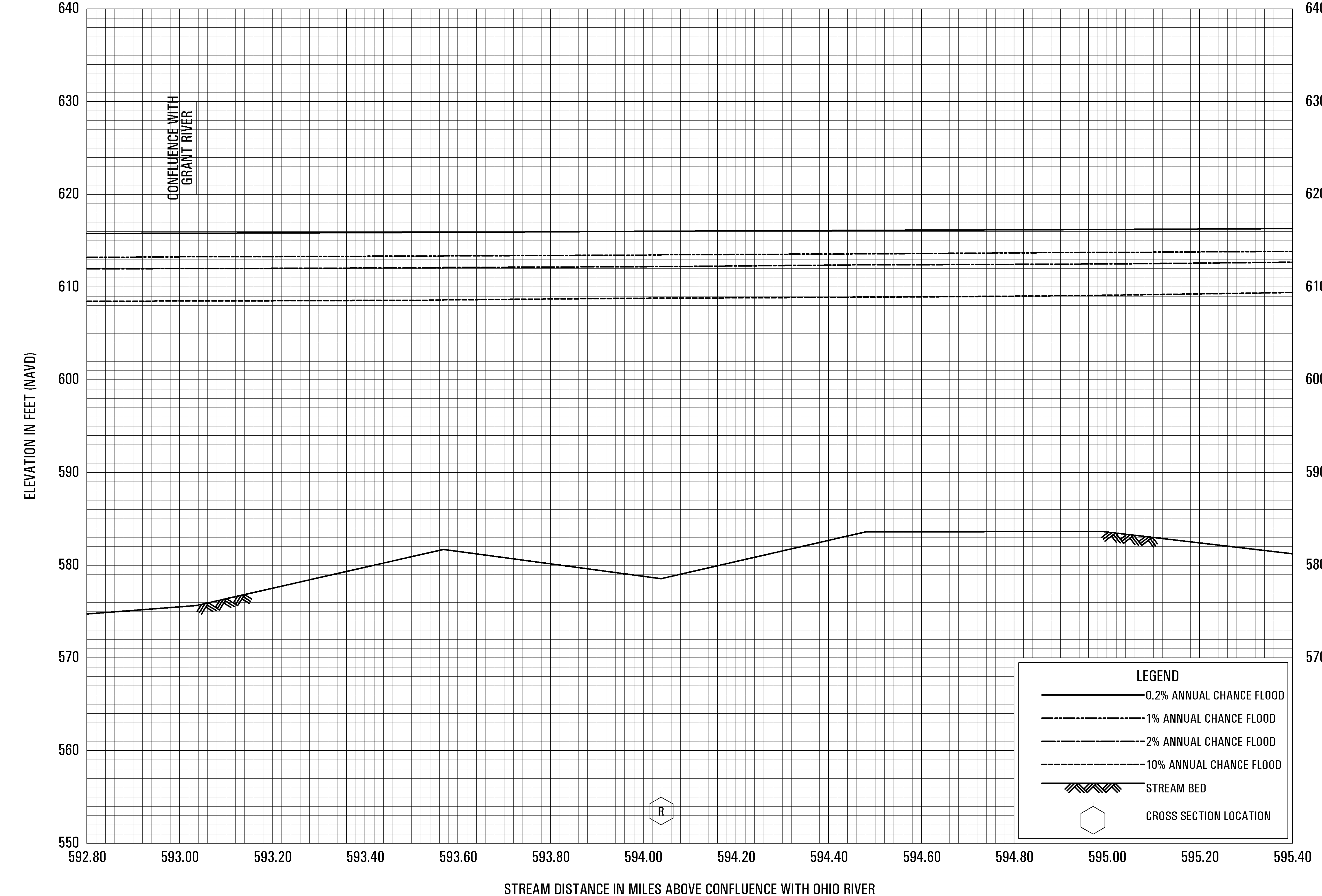
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

16P

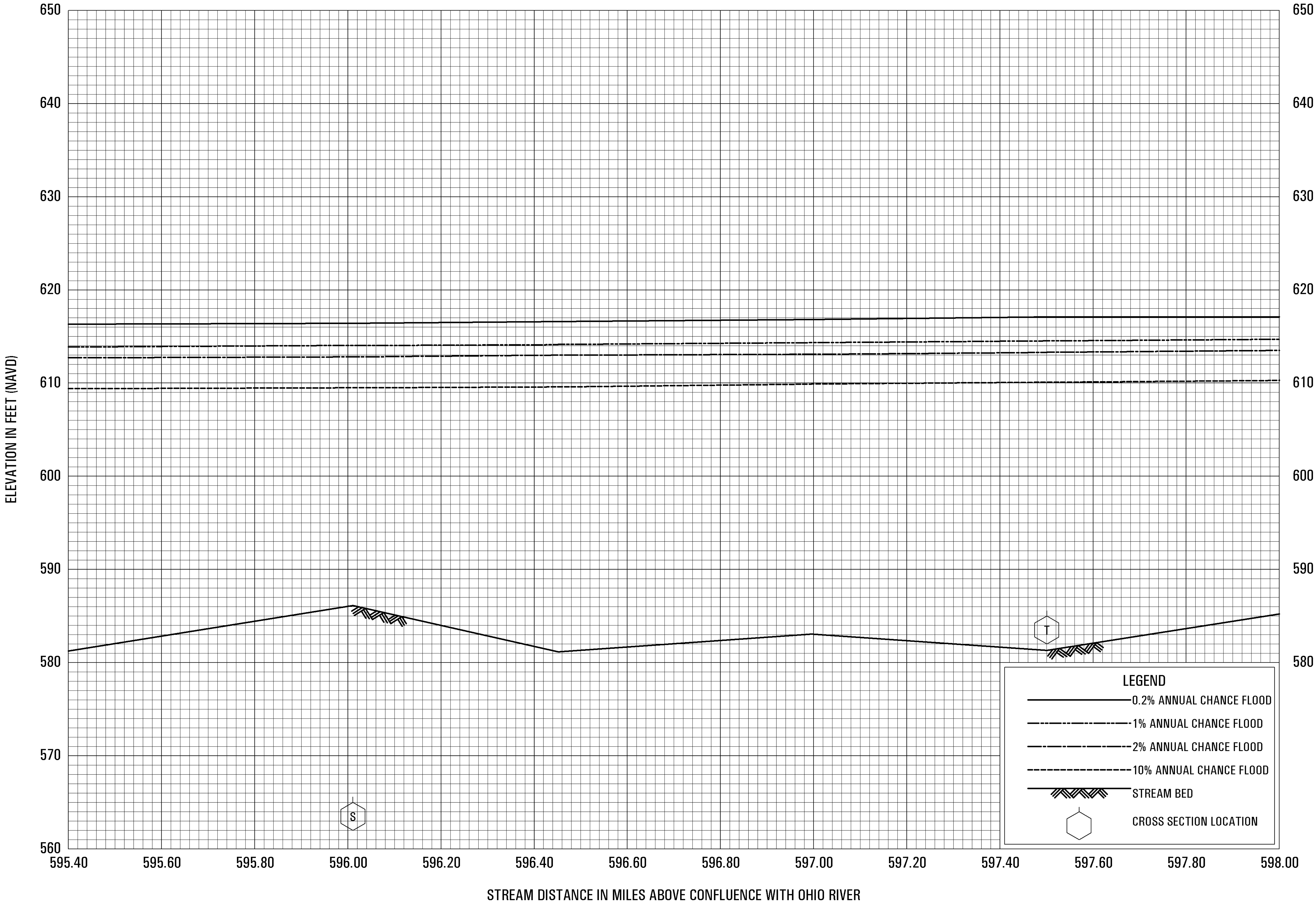


FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



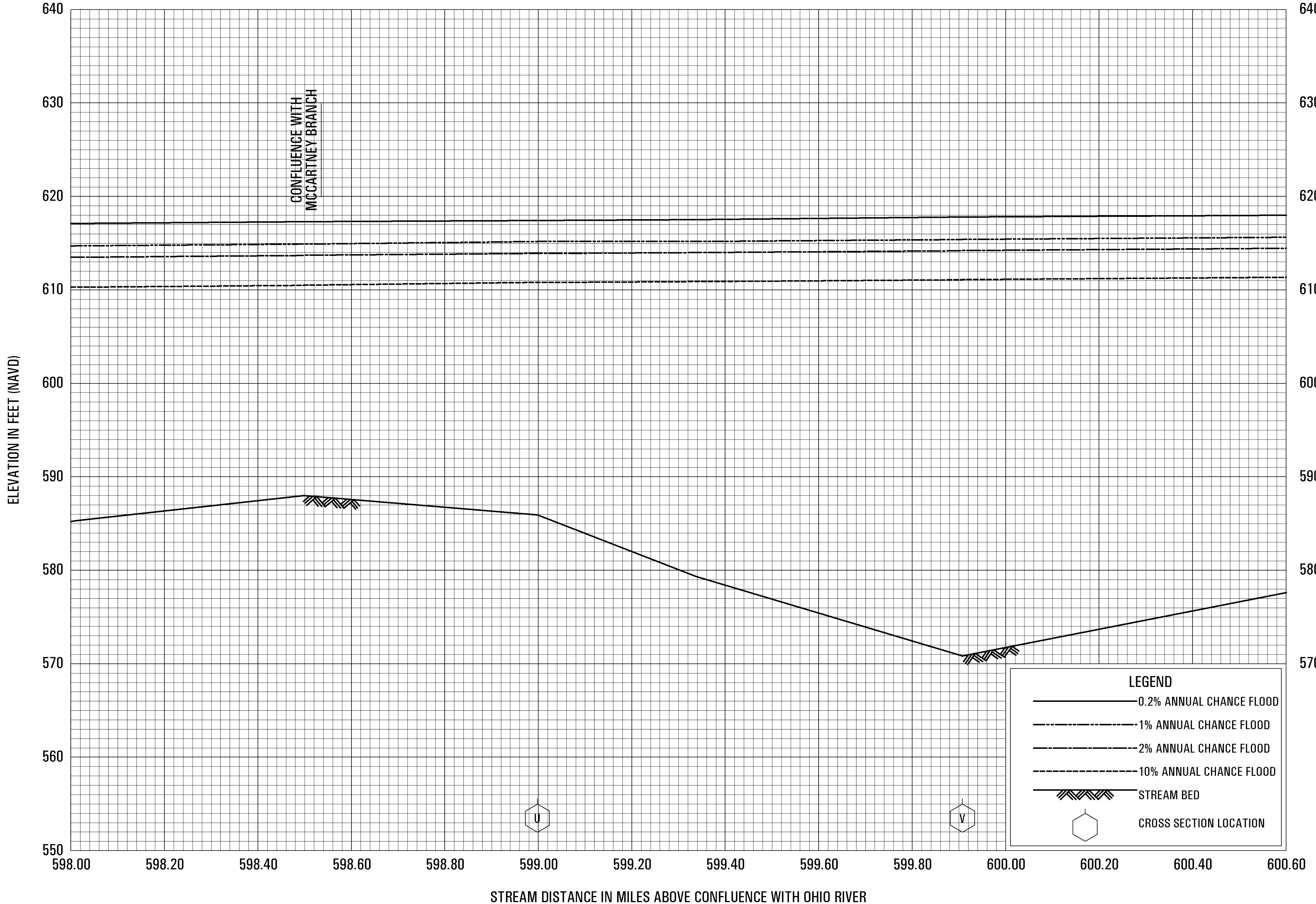
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



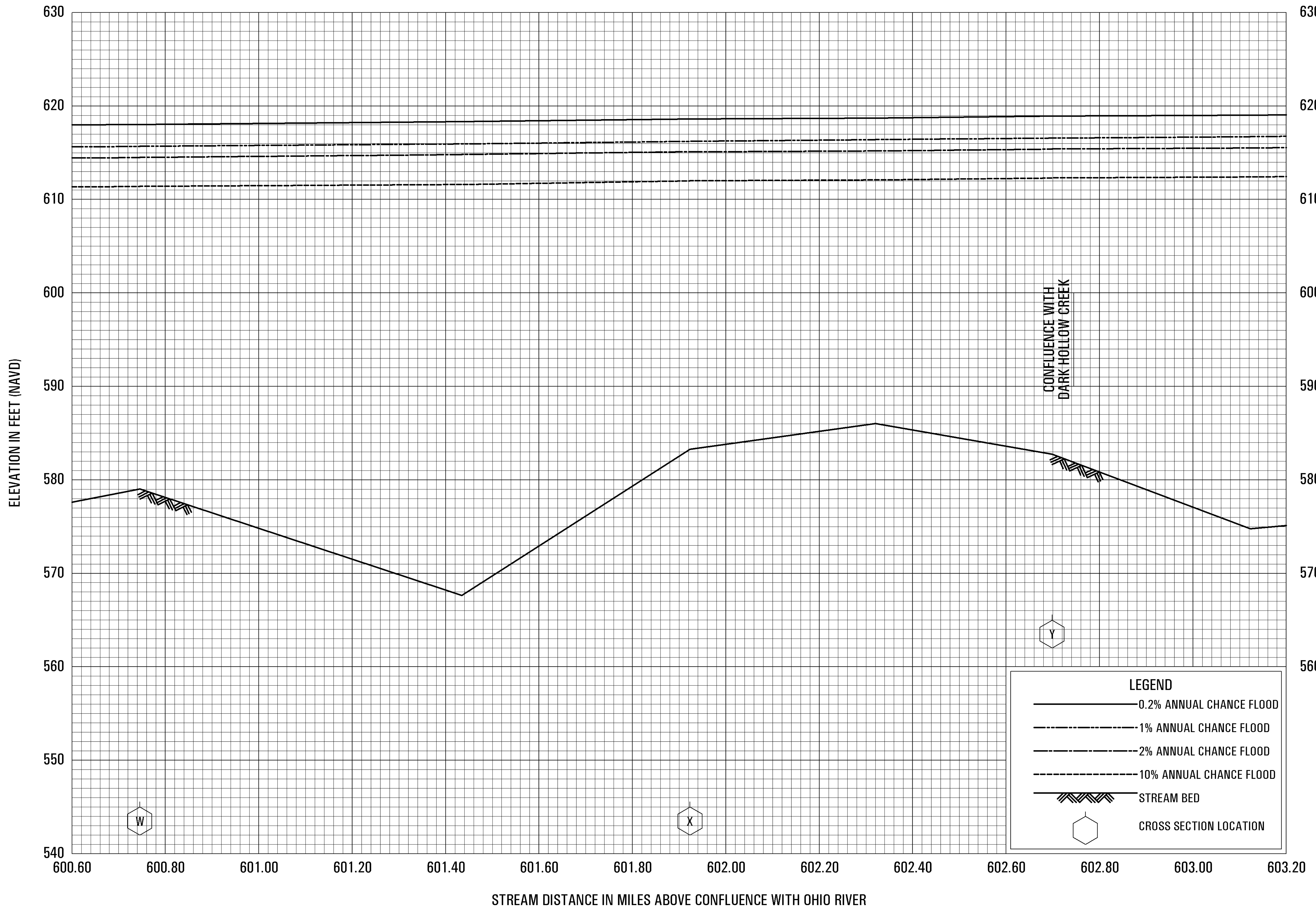
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



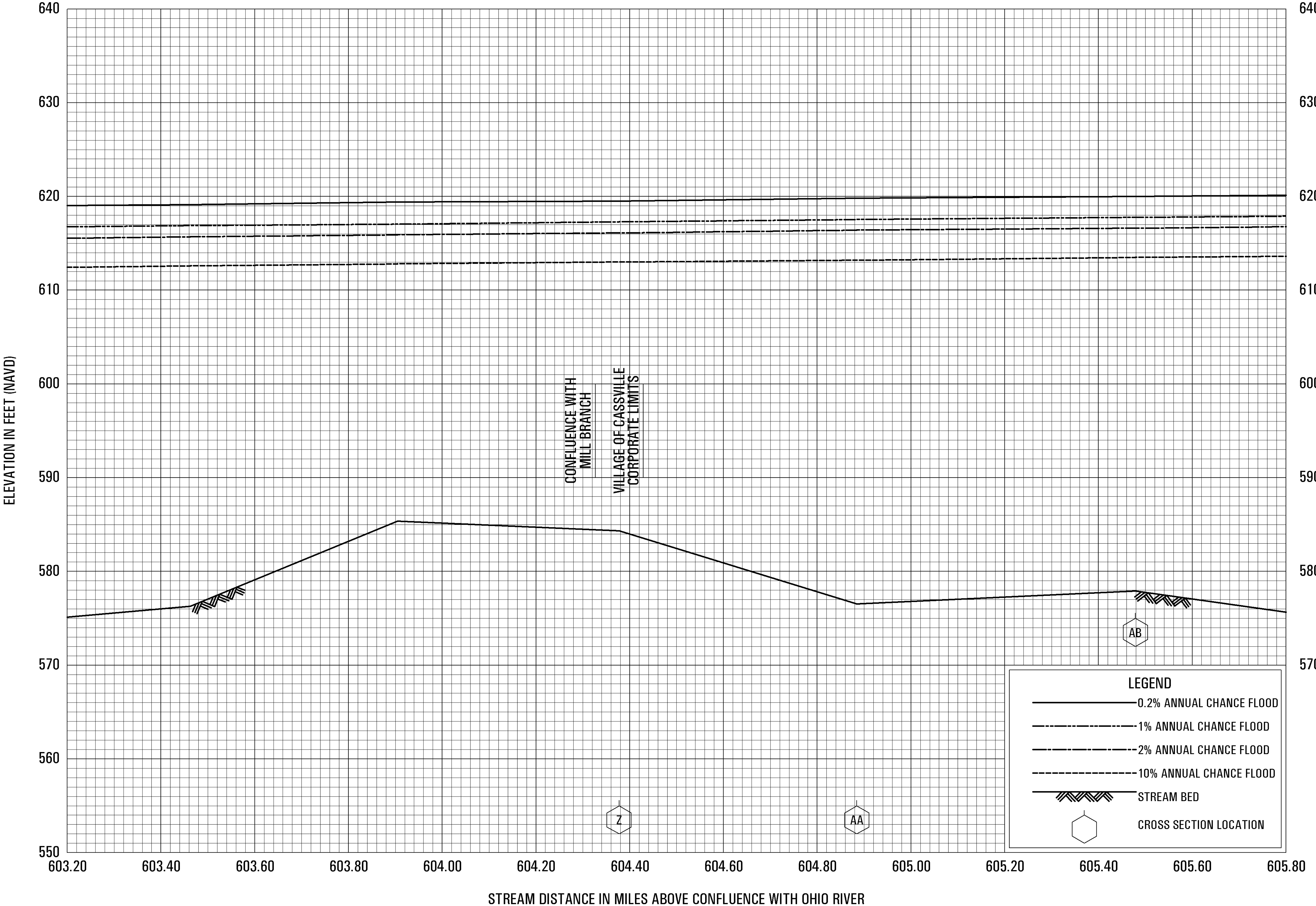
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

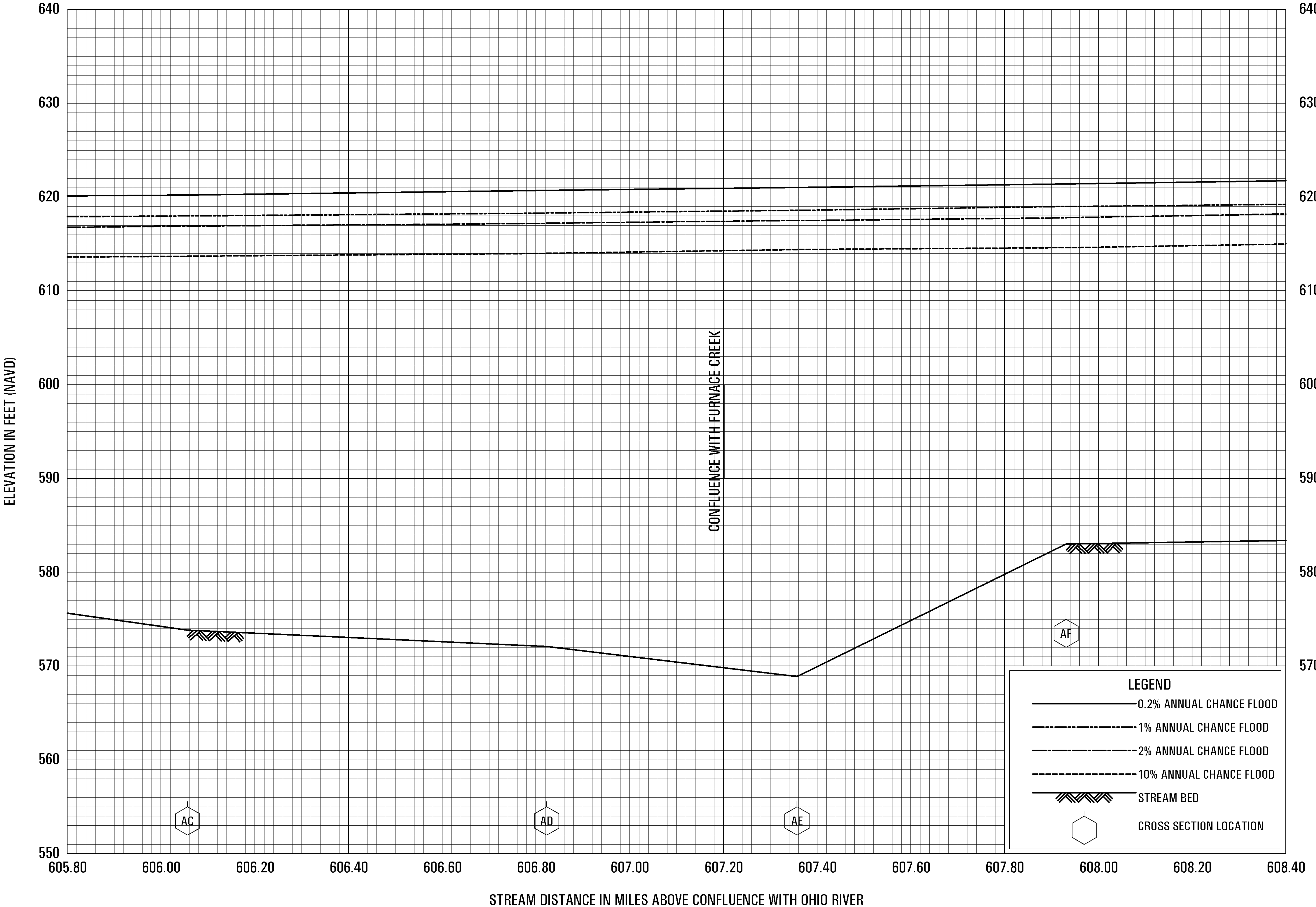


FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



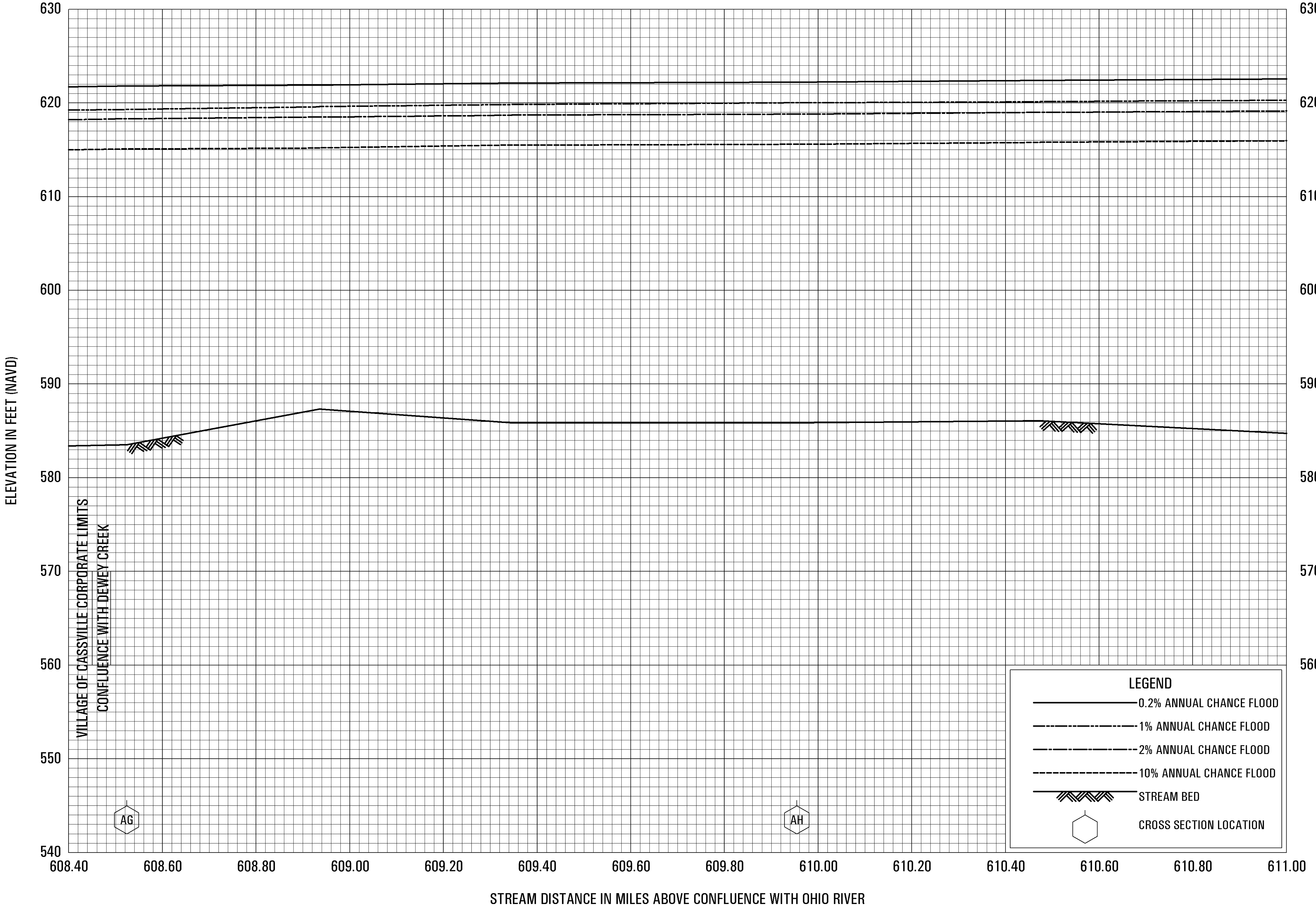
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



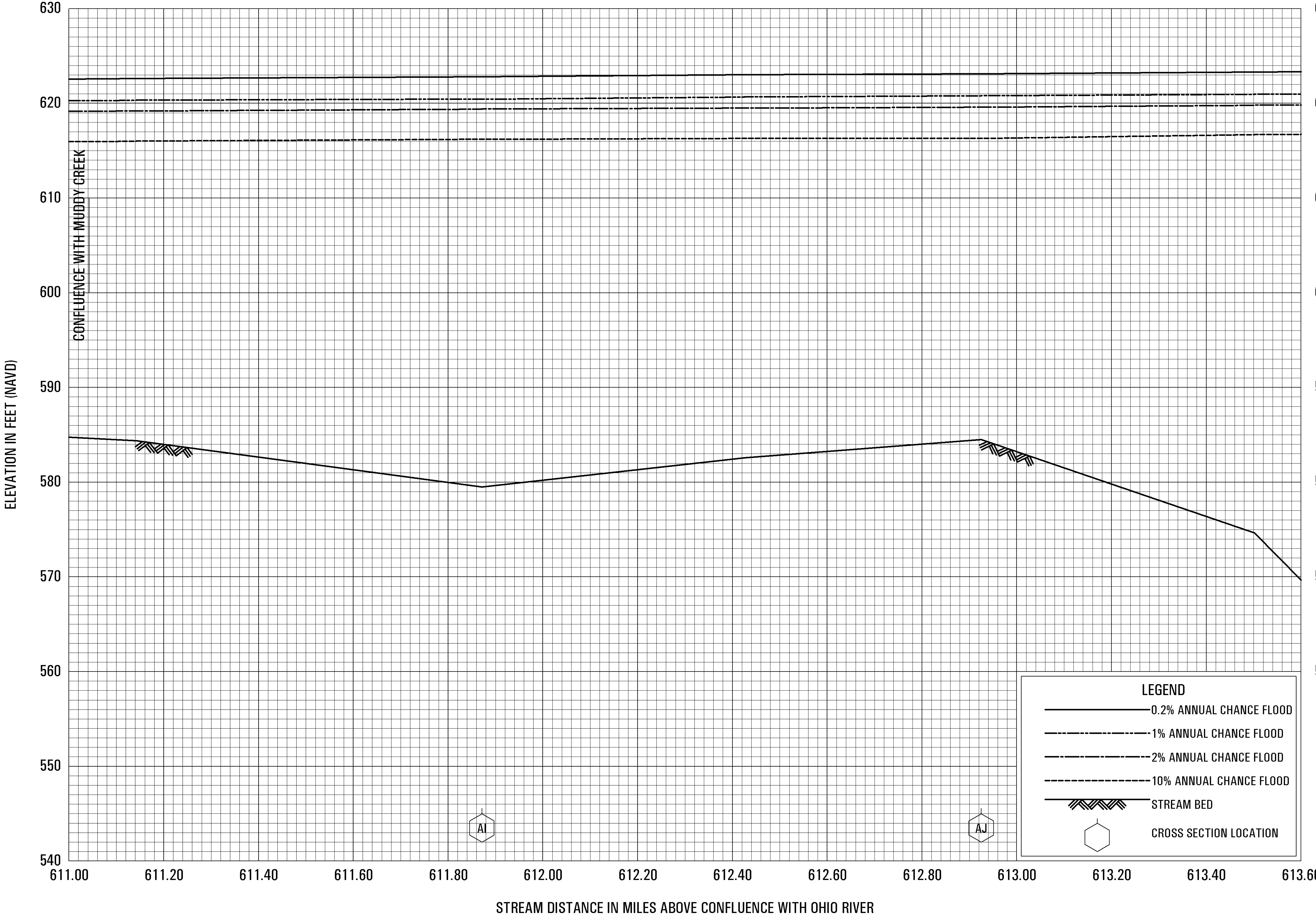
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



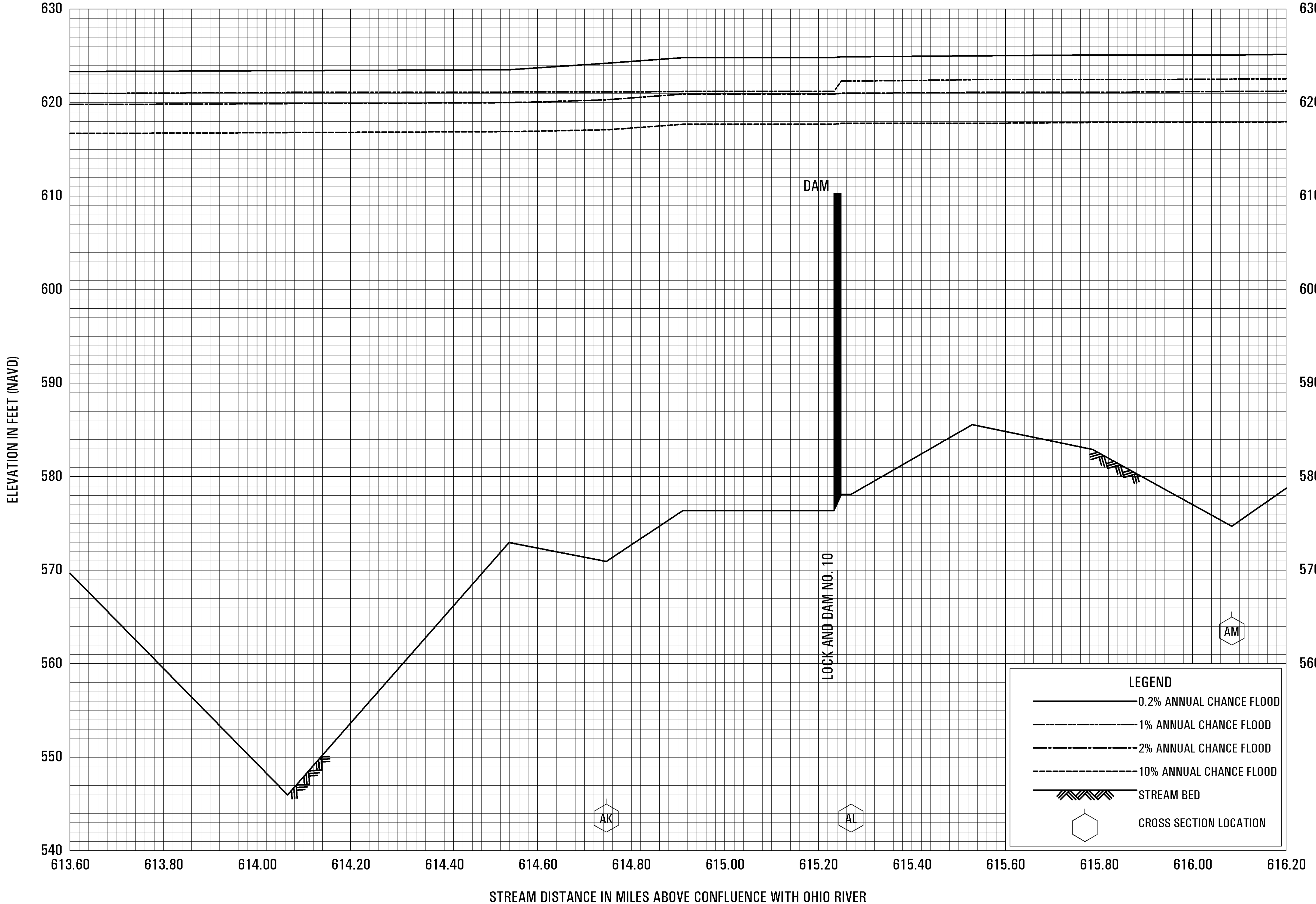
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



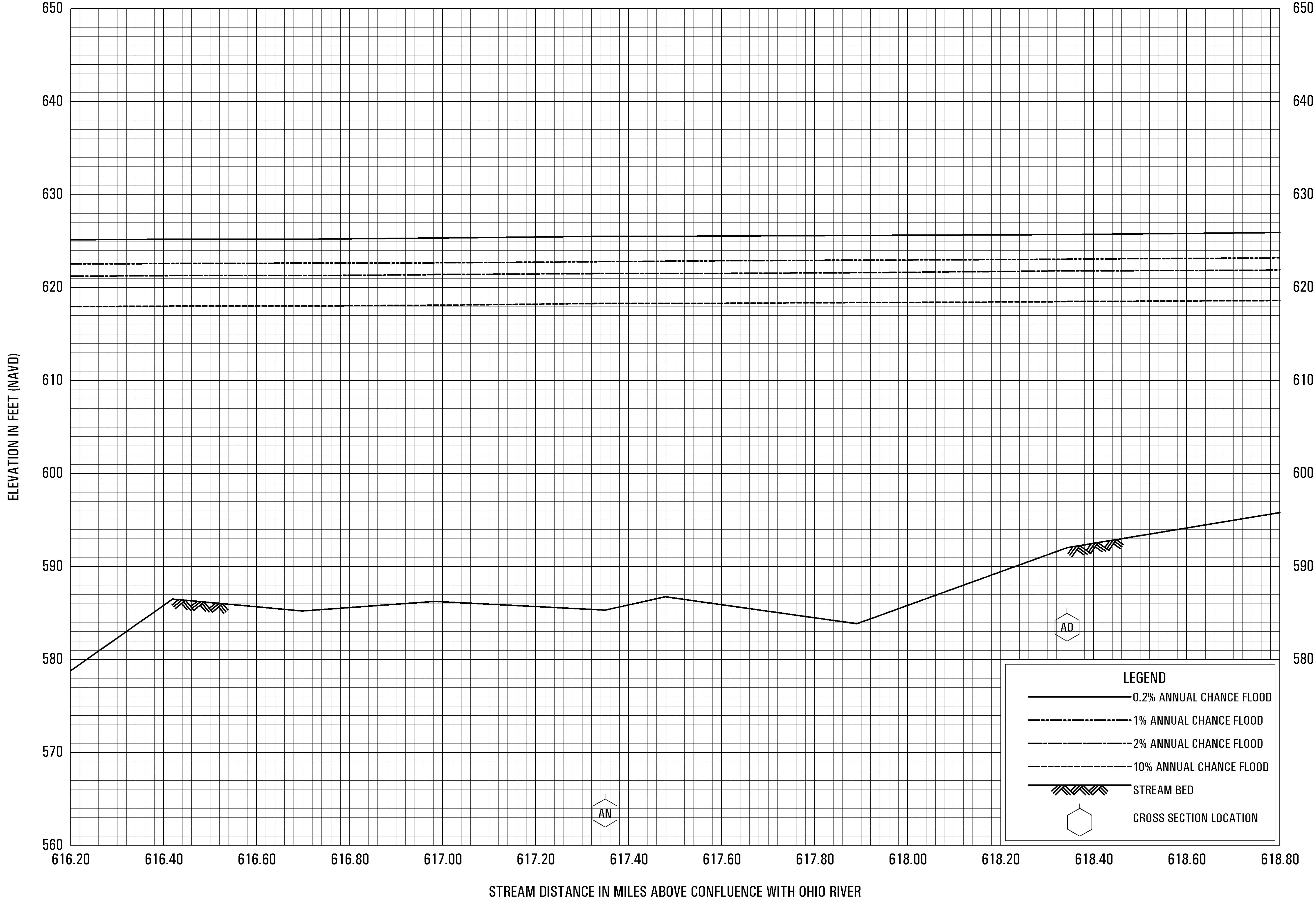
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

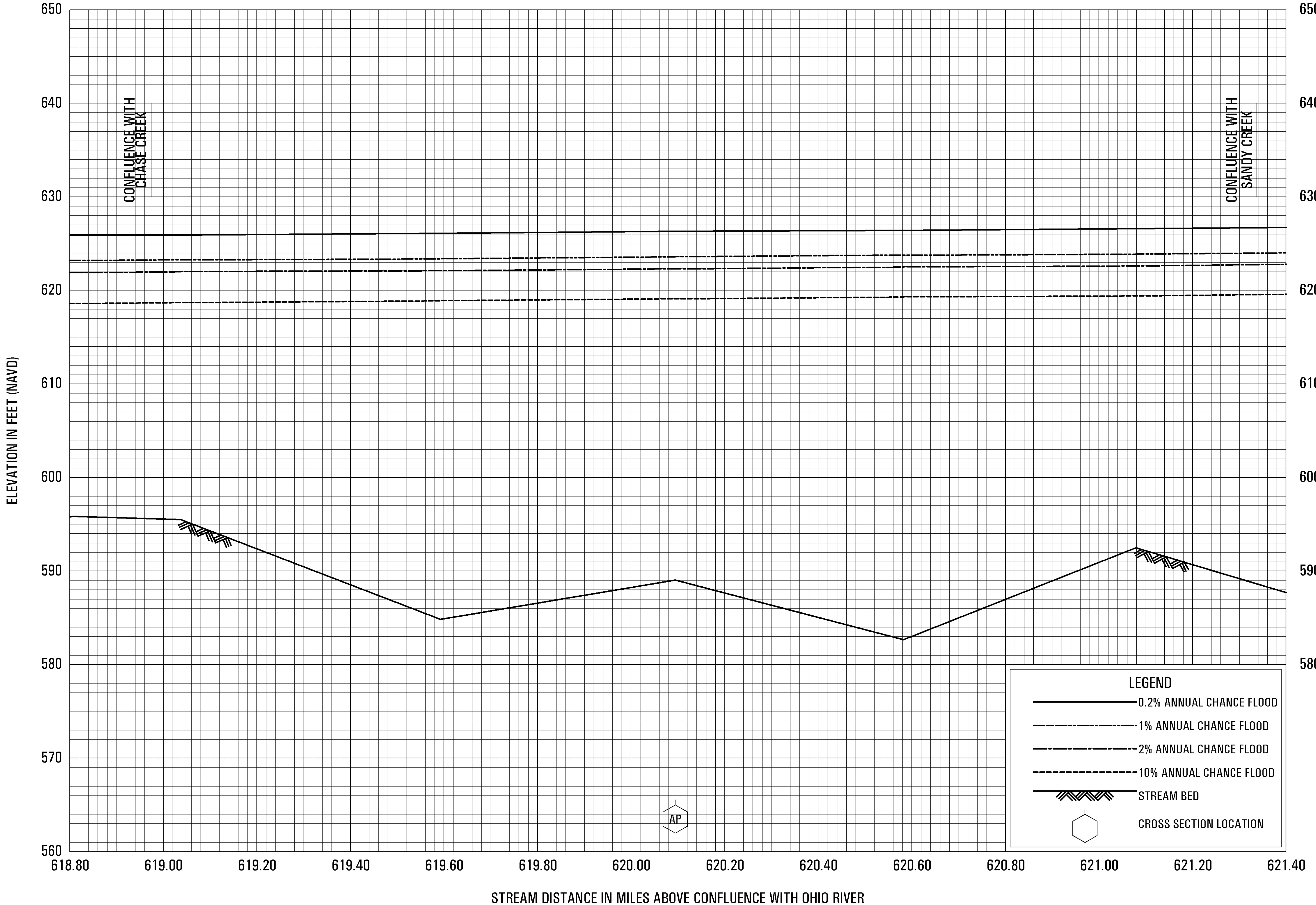
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

26P



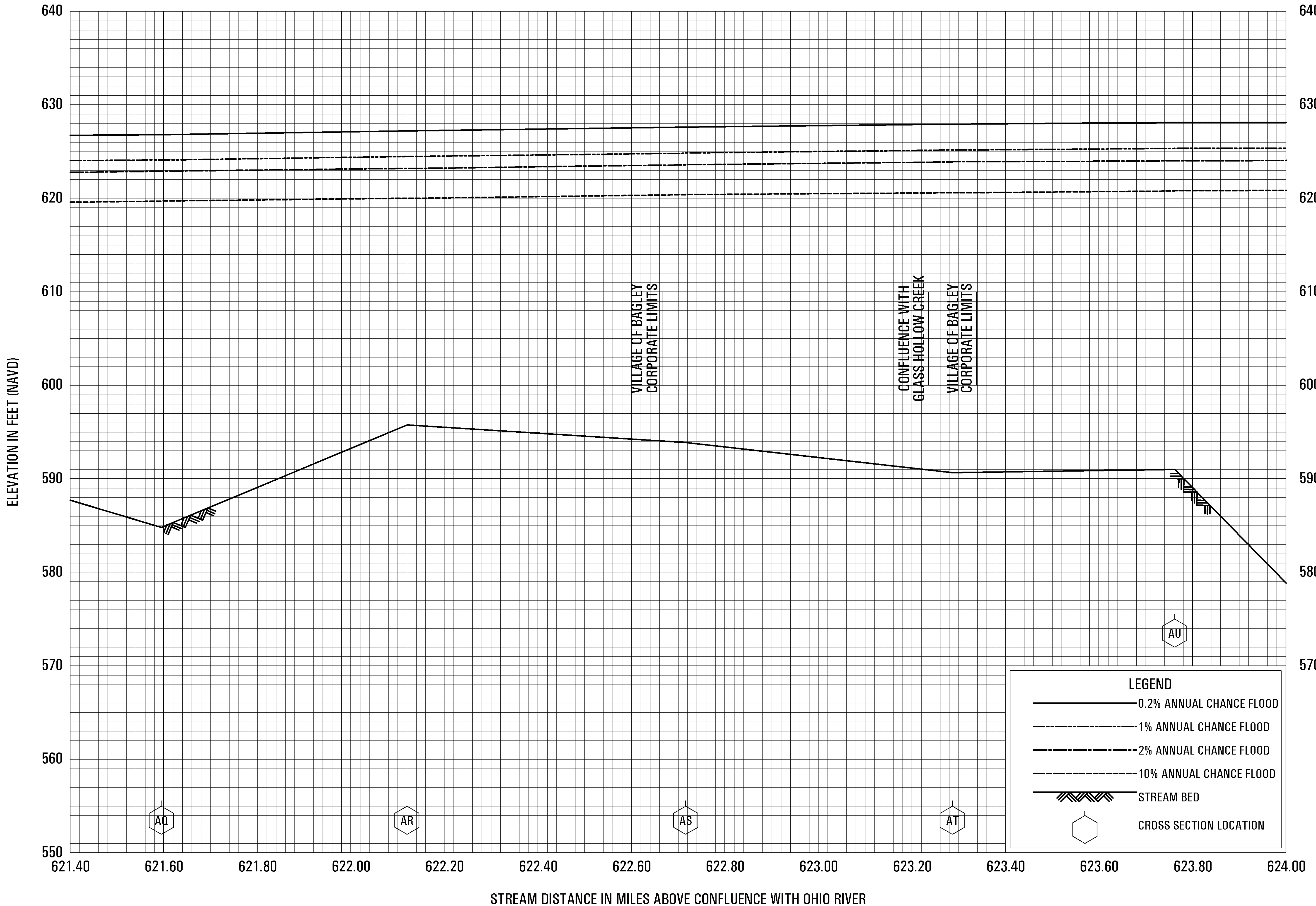
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



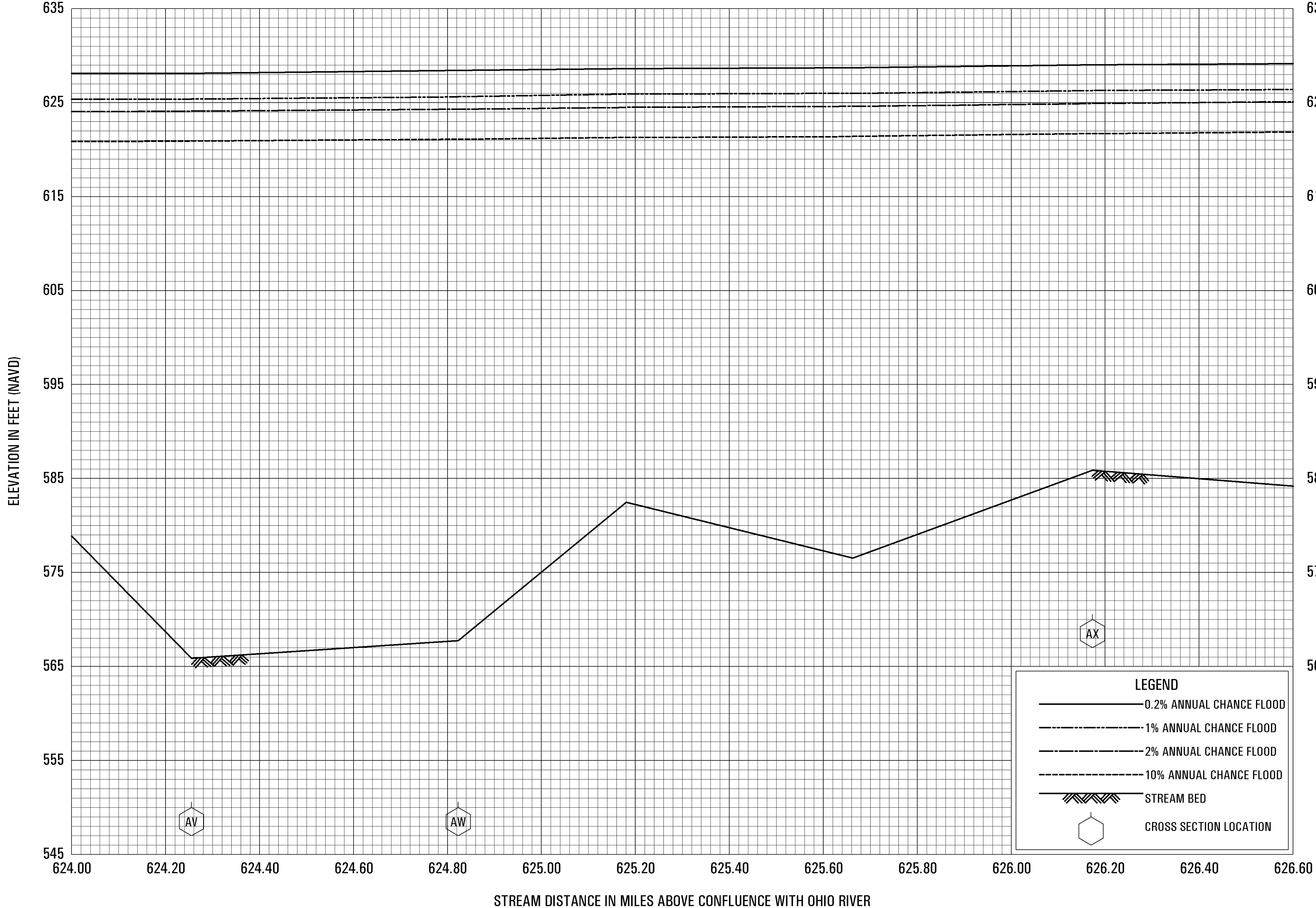
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



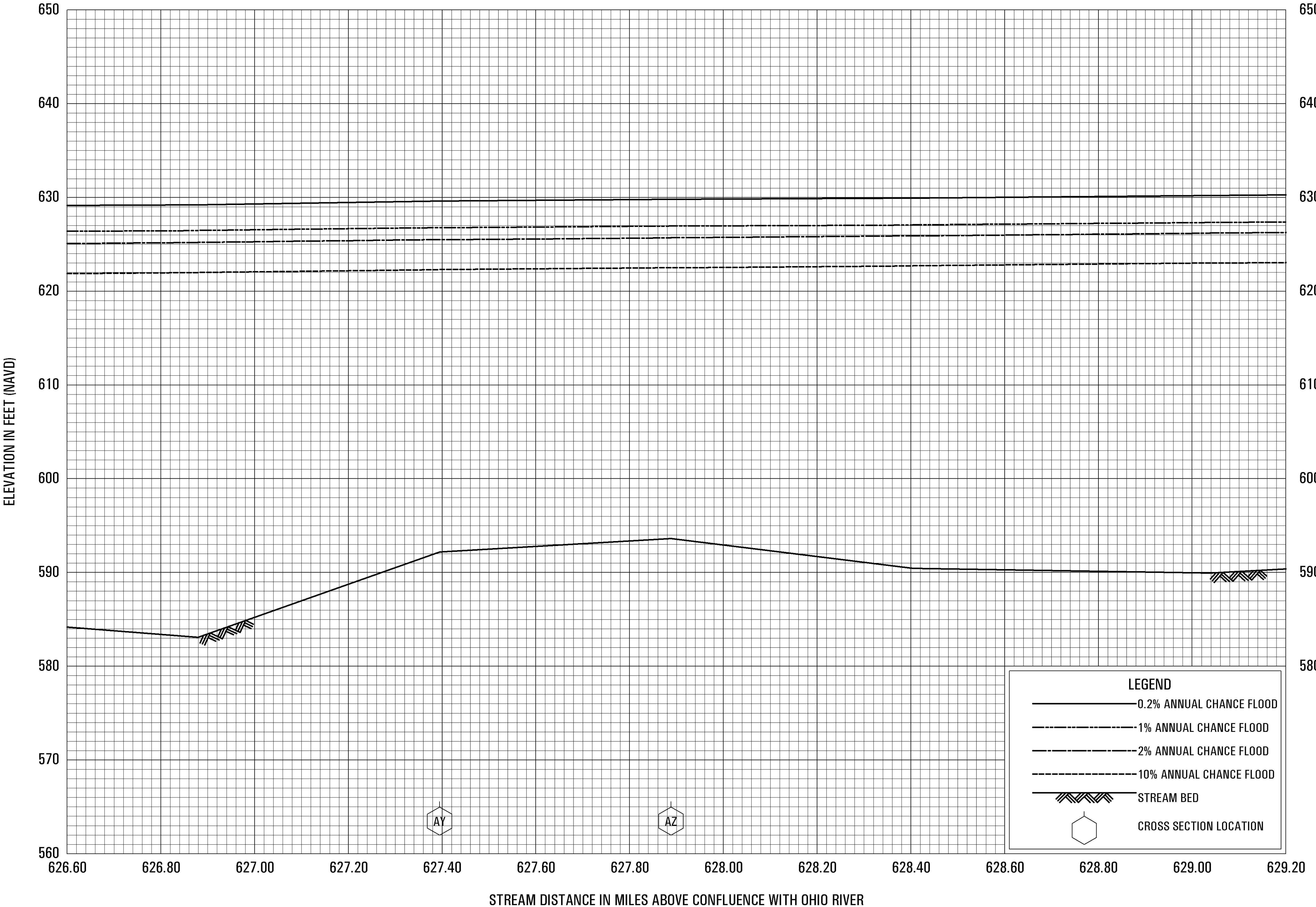
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



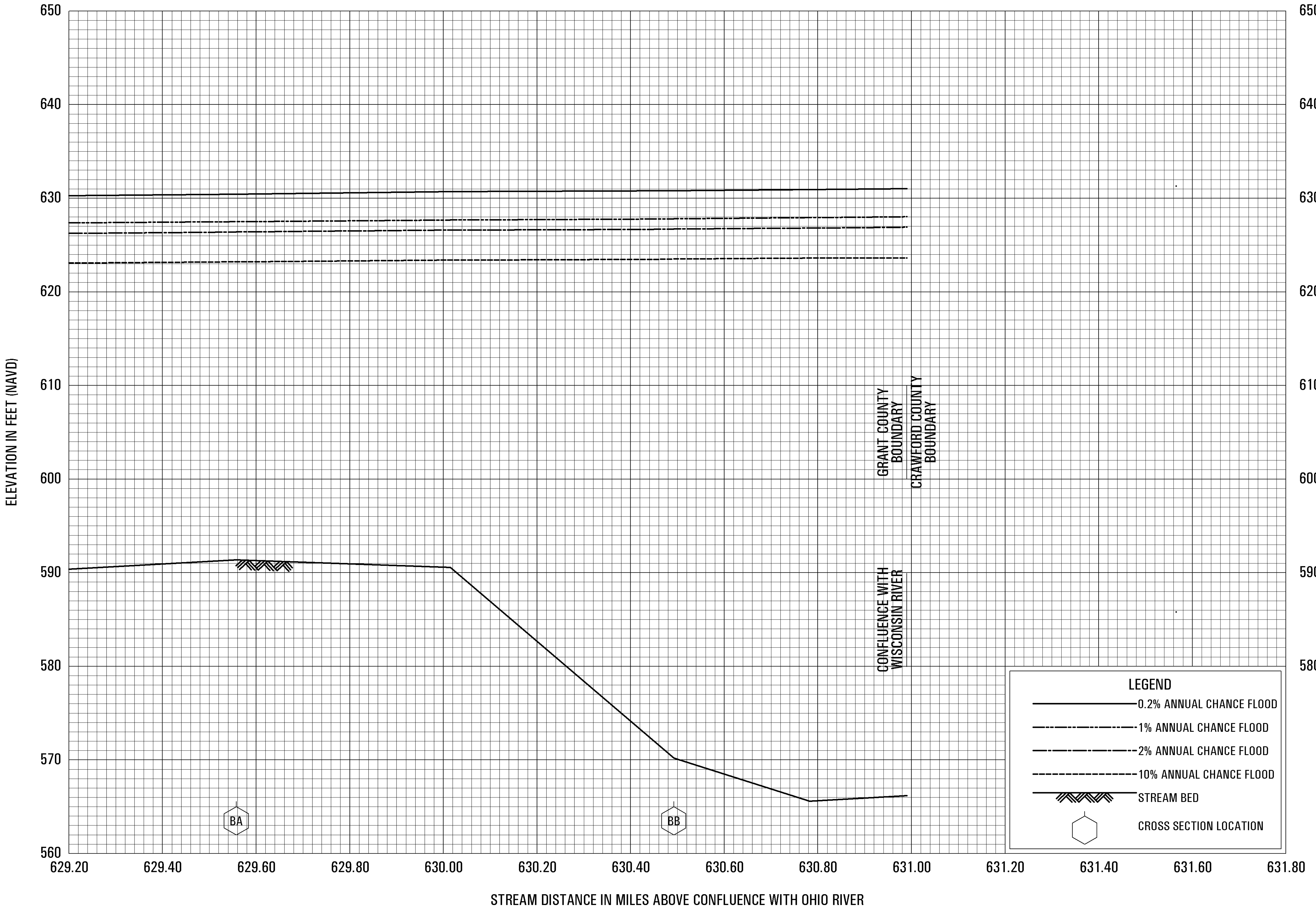
FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

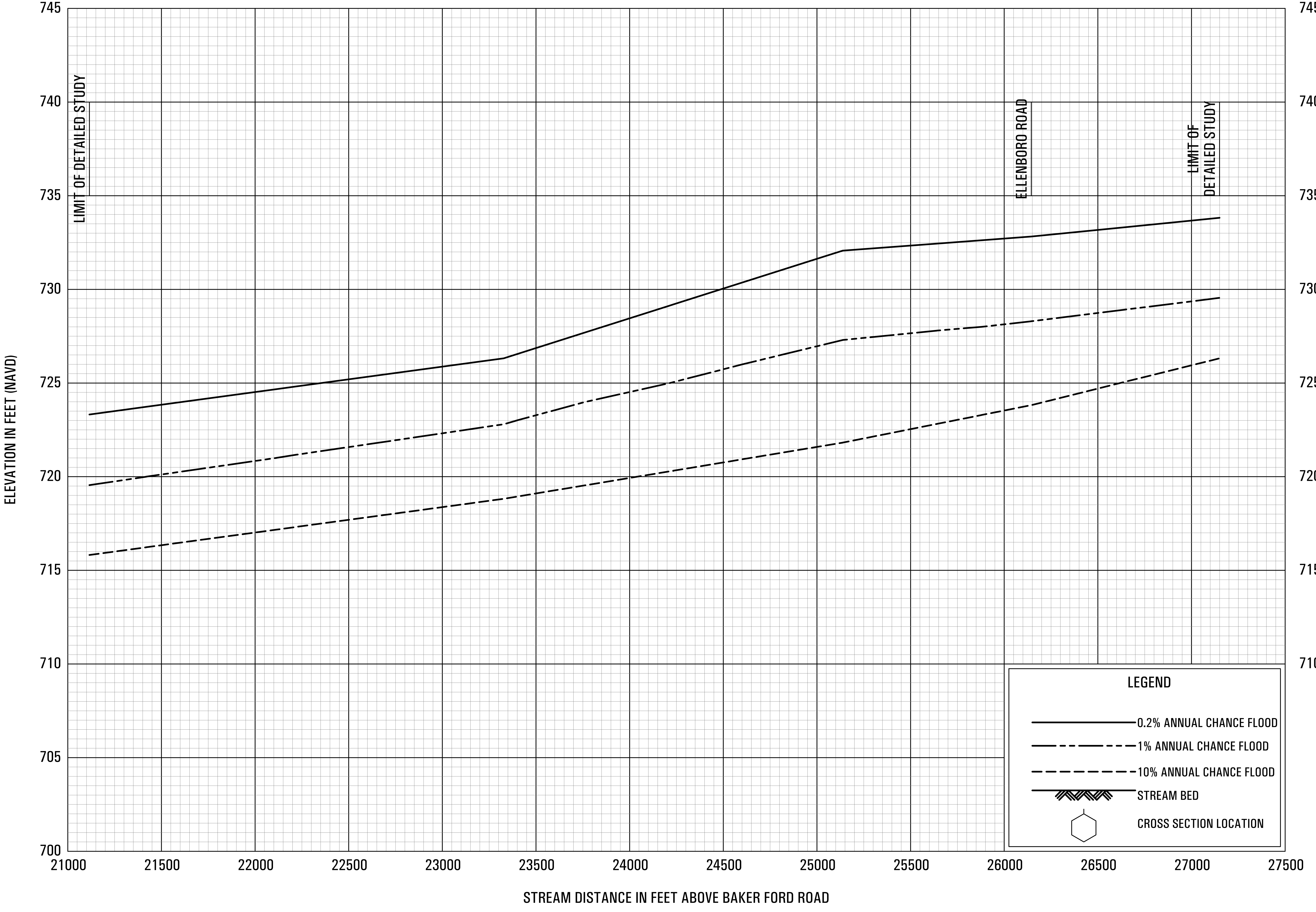
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

31P



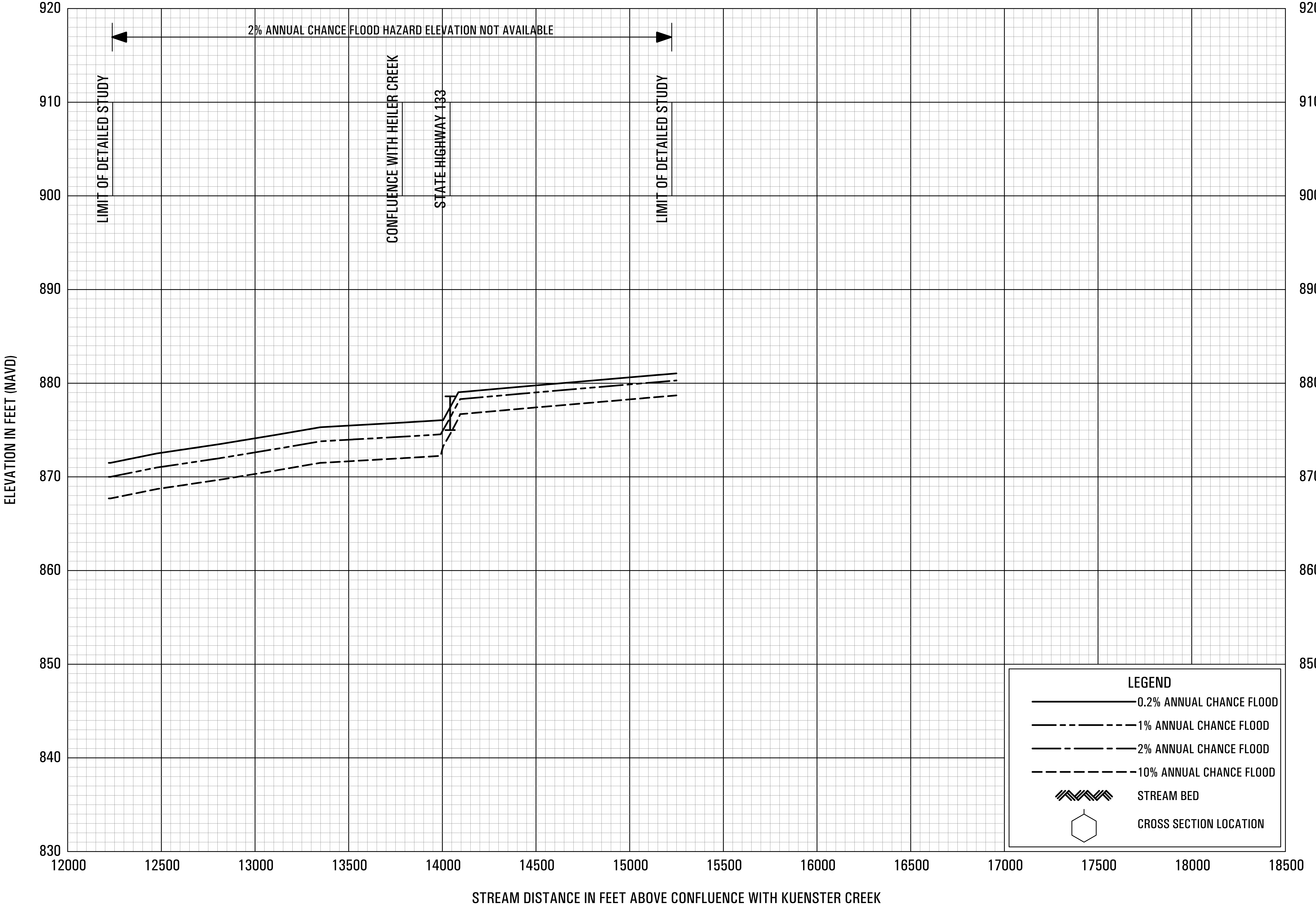
FLOOD PROFILES

PLATTE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



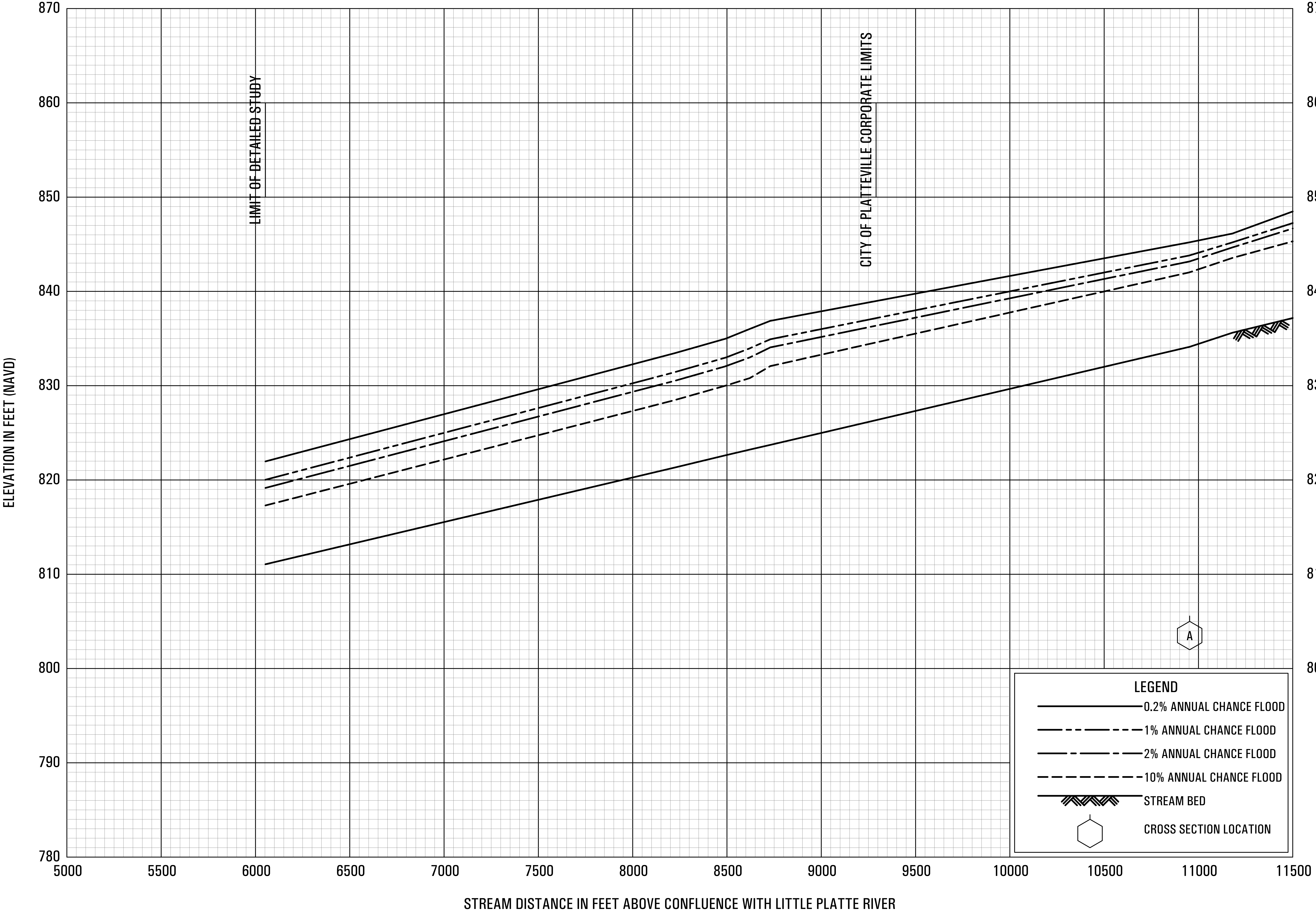
FLOOD PROFILES

RATTLESNAKE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



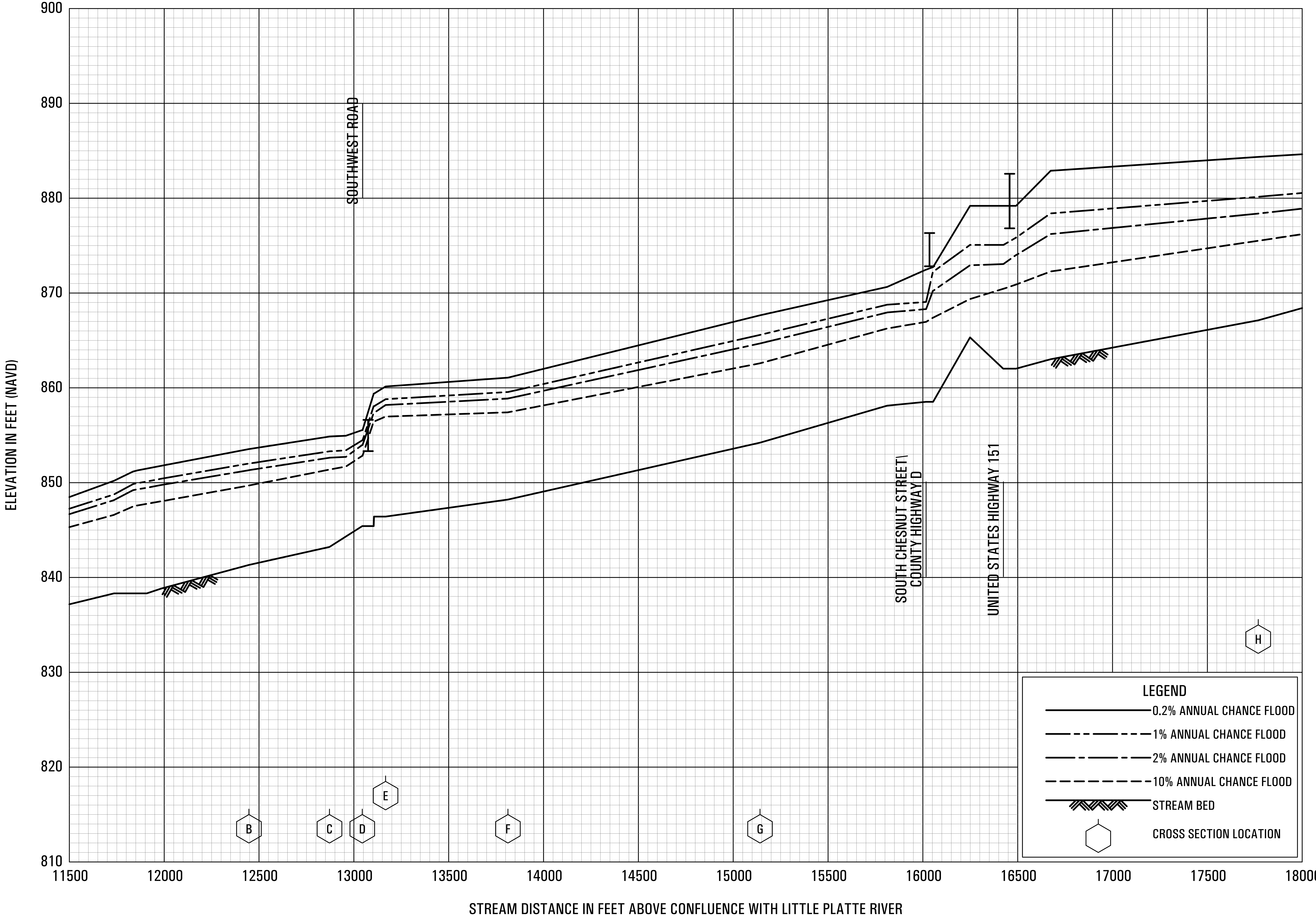
FLOOD PROFILES

ROUNTREE BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

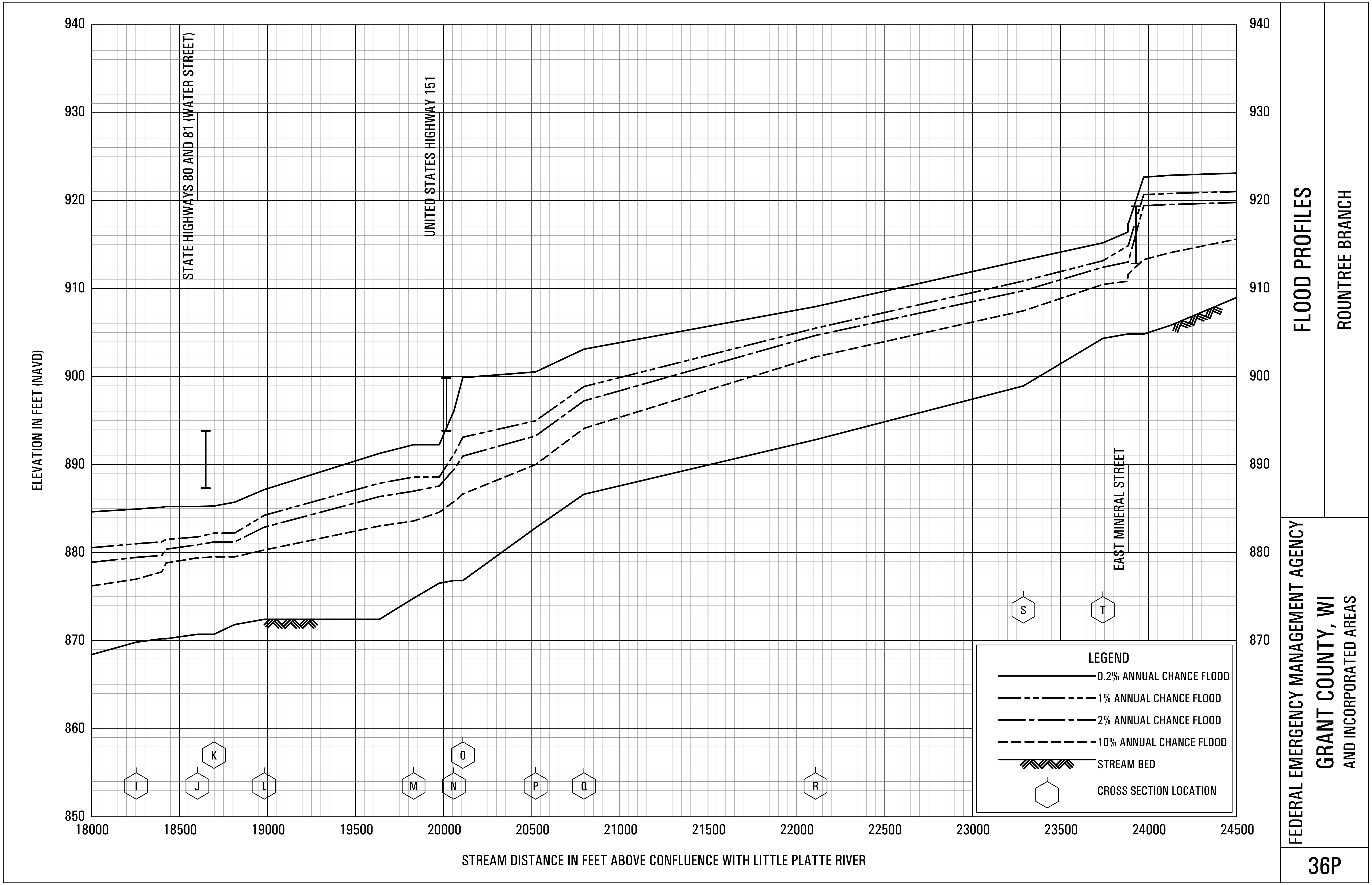


FLOOD PROFILES

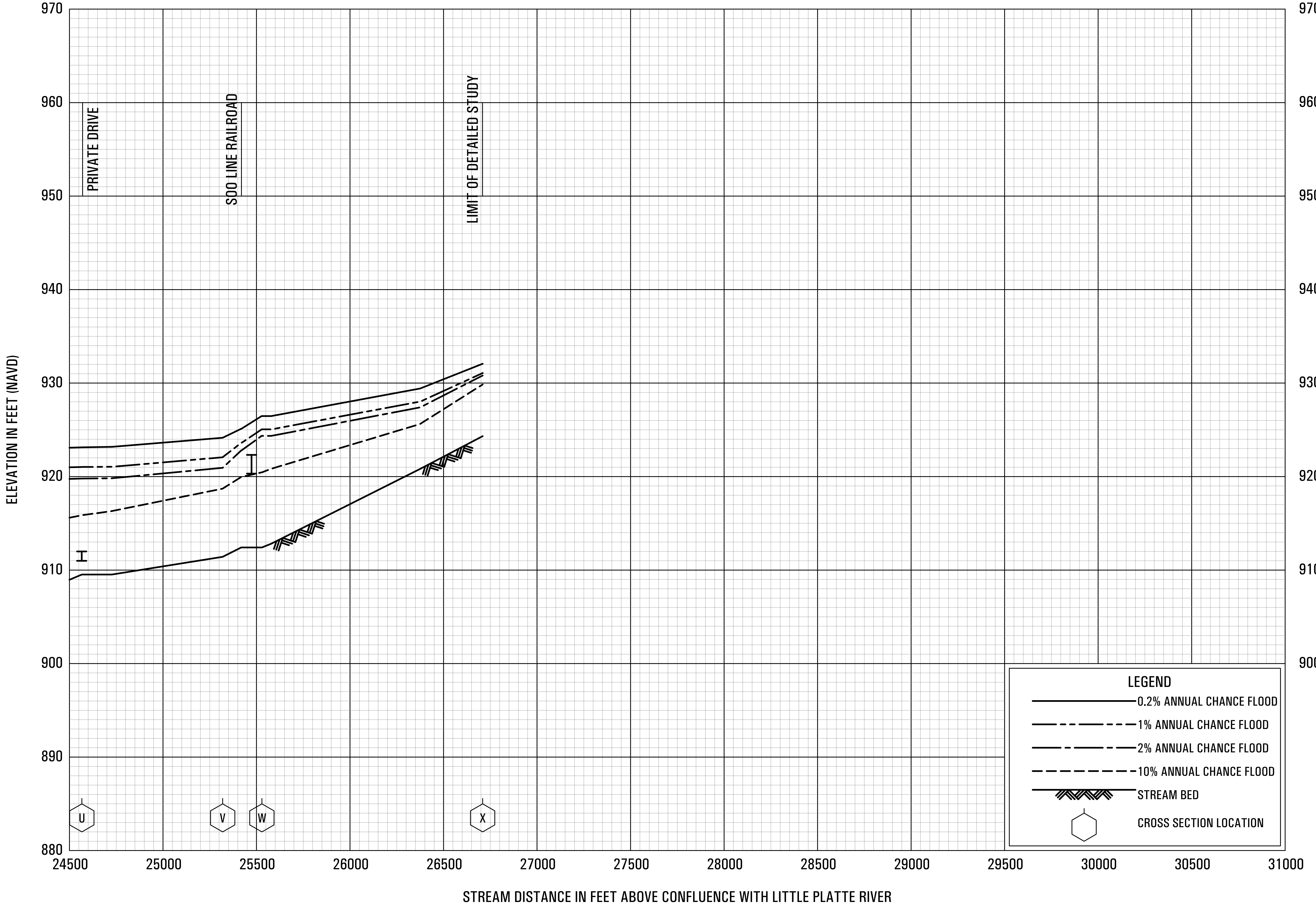
ROUNTREE BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LITTLE PLATTE RIVER
STATE HIGHWAYS 80 AND 81 (WATER STREET)
UNITED STATES HIGHWAY 151
EAST MINERAL STREET
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
ROUNTREE BRANCH
FEDERAL EMERGENCY MANAGEMENT AGENCY
GRANT COUNTY, WI
AND INCORPORATED AREAS
36P



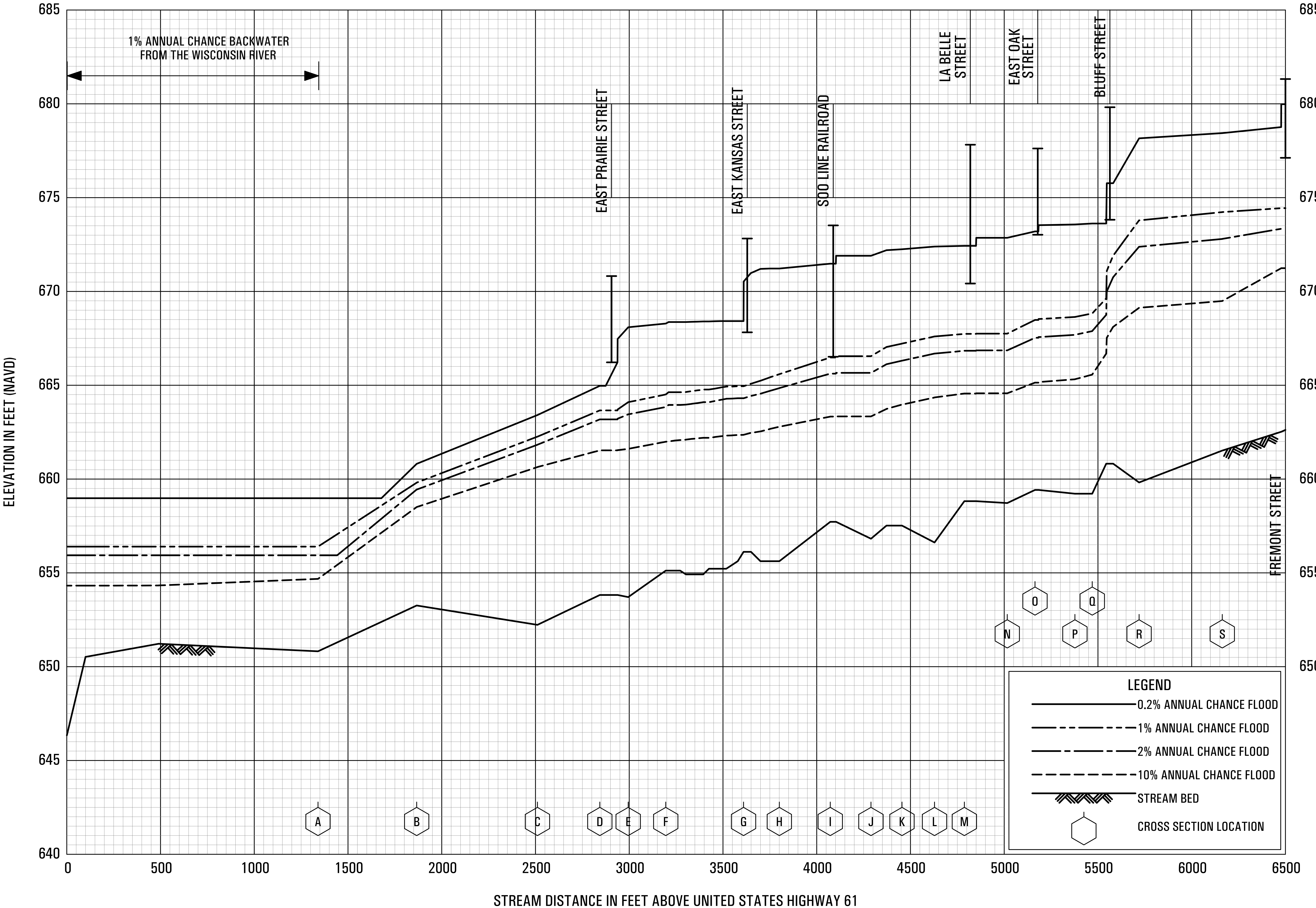
FLOOD PROFILES

ROUNTREE BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

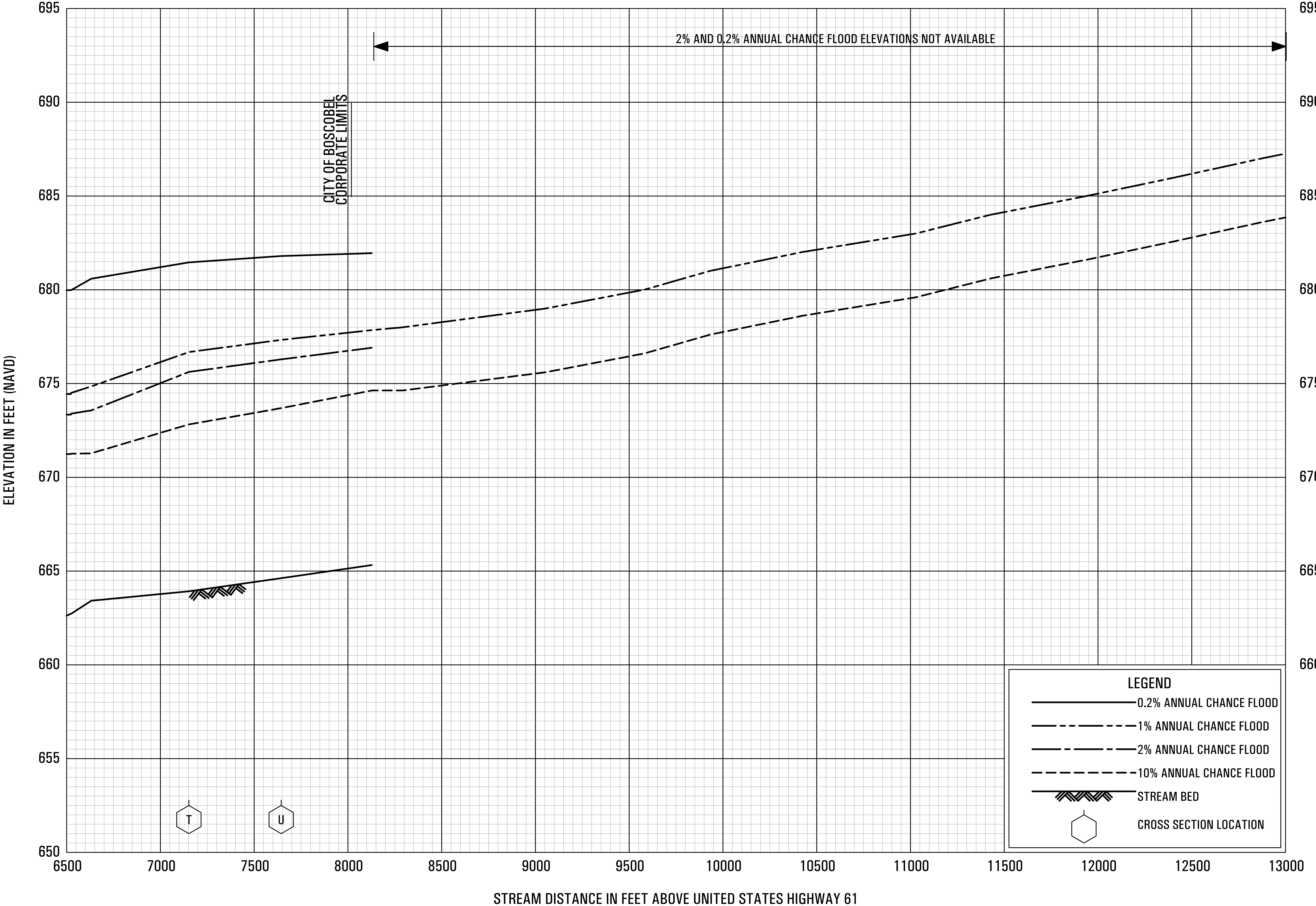


FLOOD PROFILES

SANDERS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI AND INCORPORATED AREAS

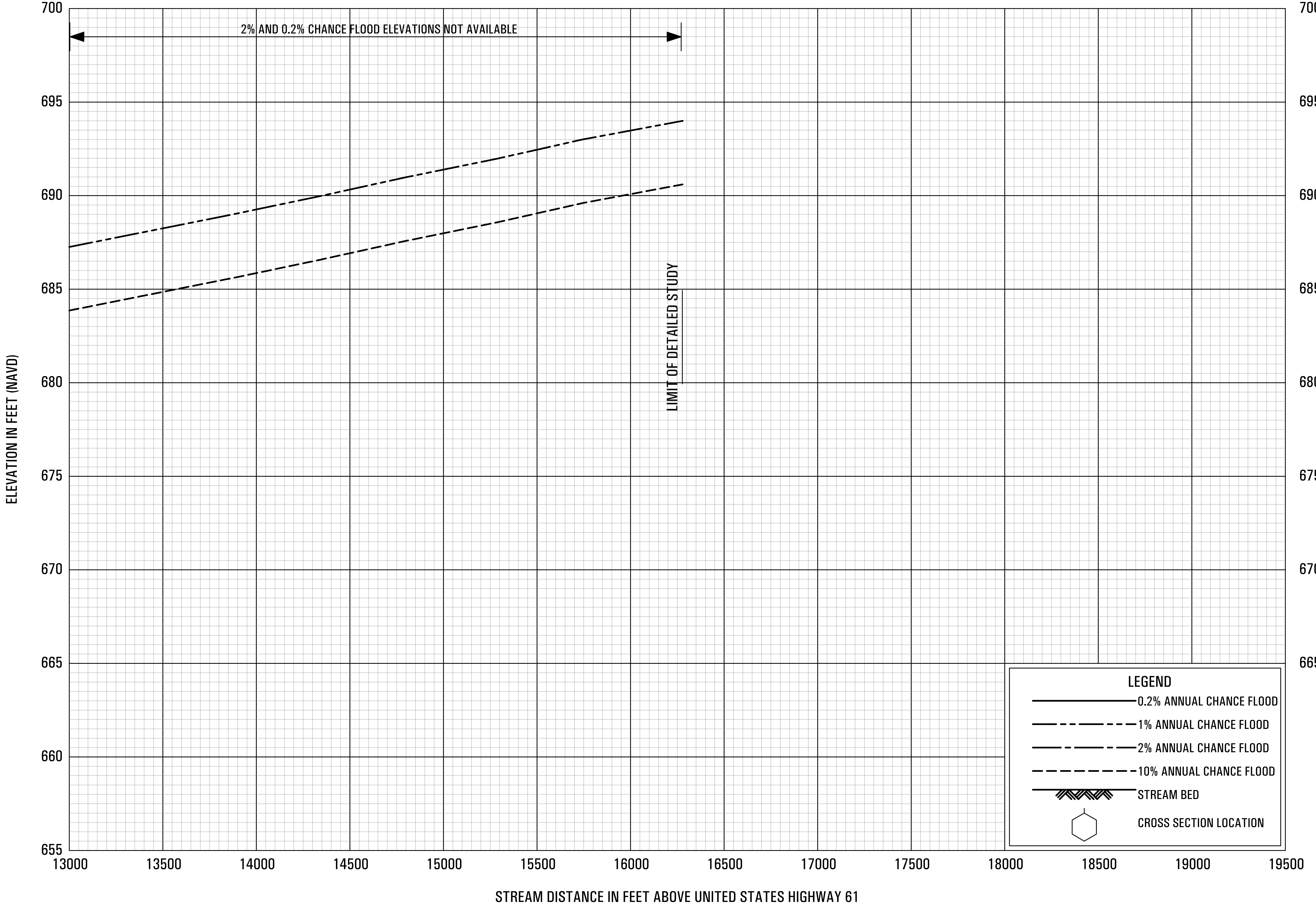


FLOOD PROFILES

SANDERS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI
AND INCORPORATED AREAS



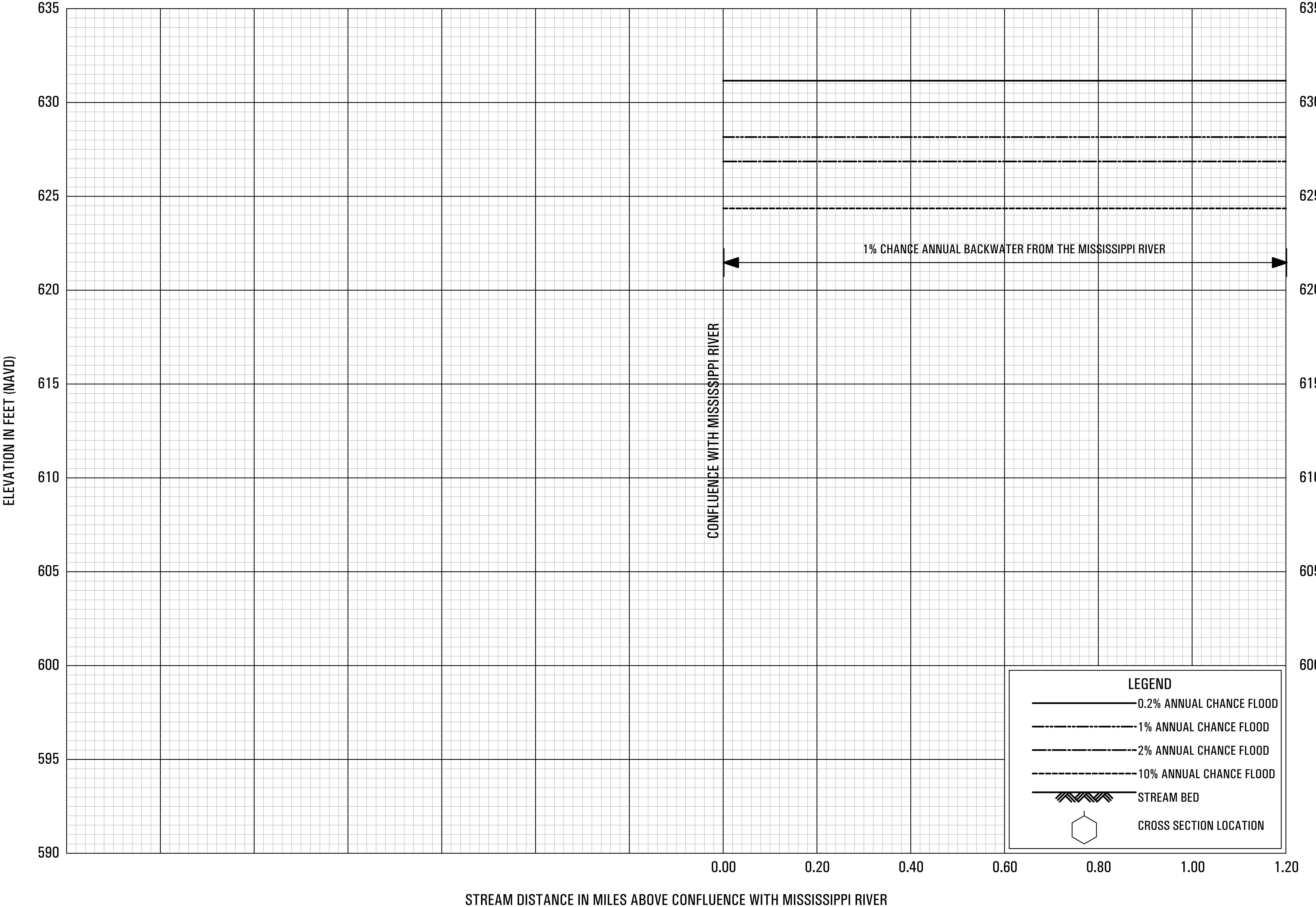
FLOOD PROFILES

SANDERS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY , WI
AND INCORPORATED AREAS

40P



FLOOD PROFILES

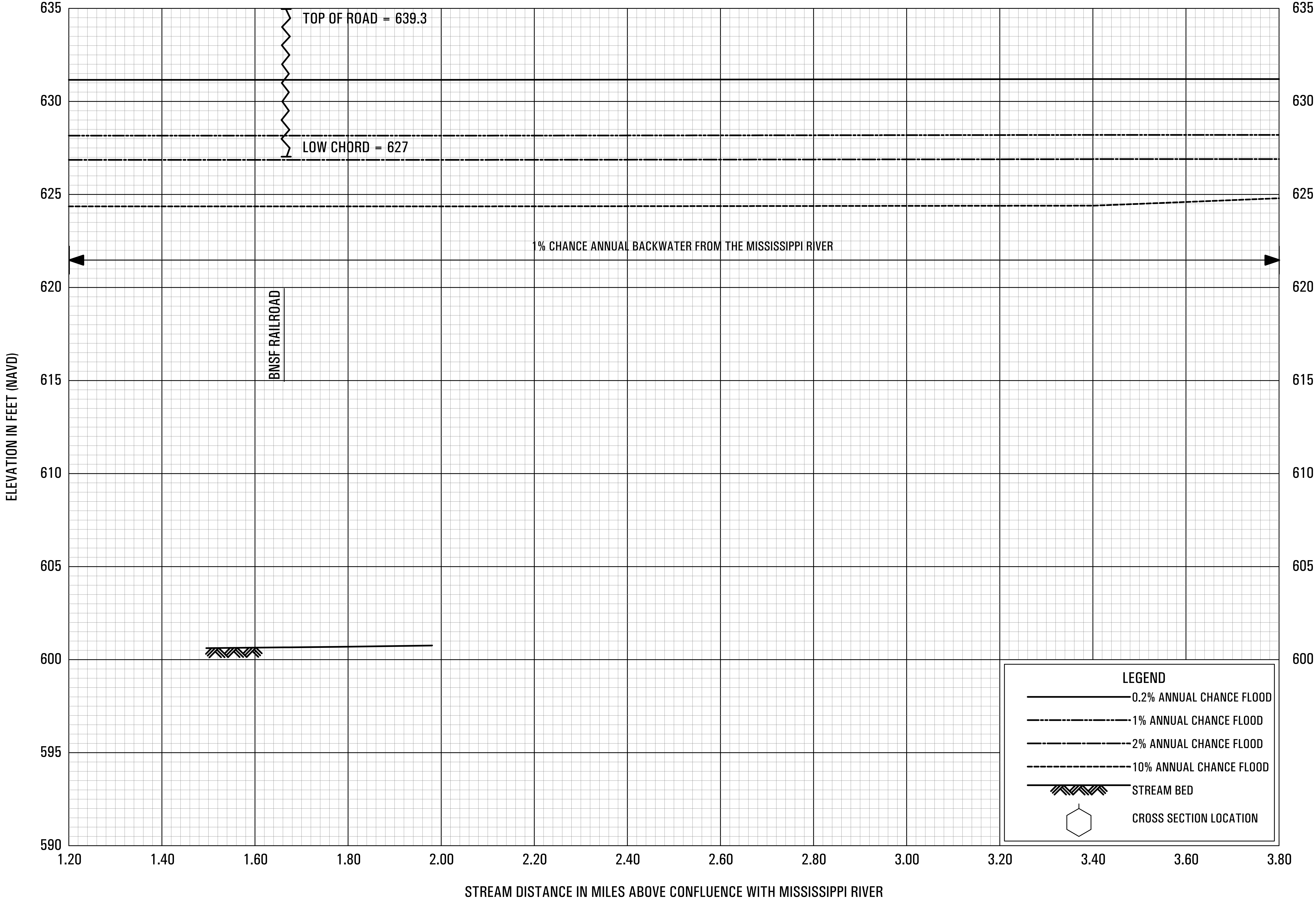
WISCONSIN RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS

41P



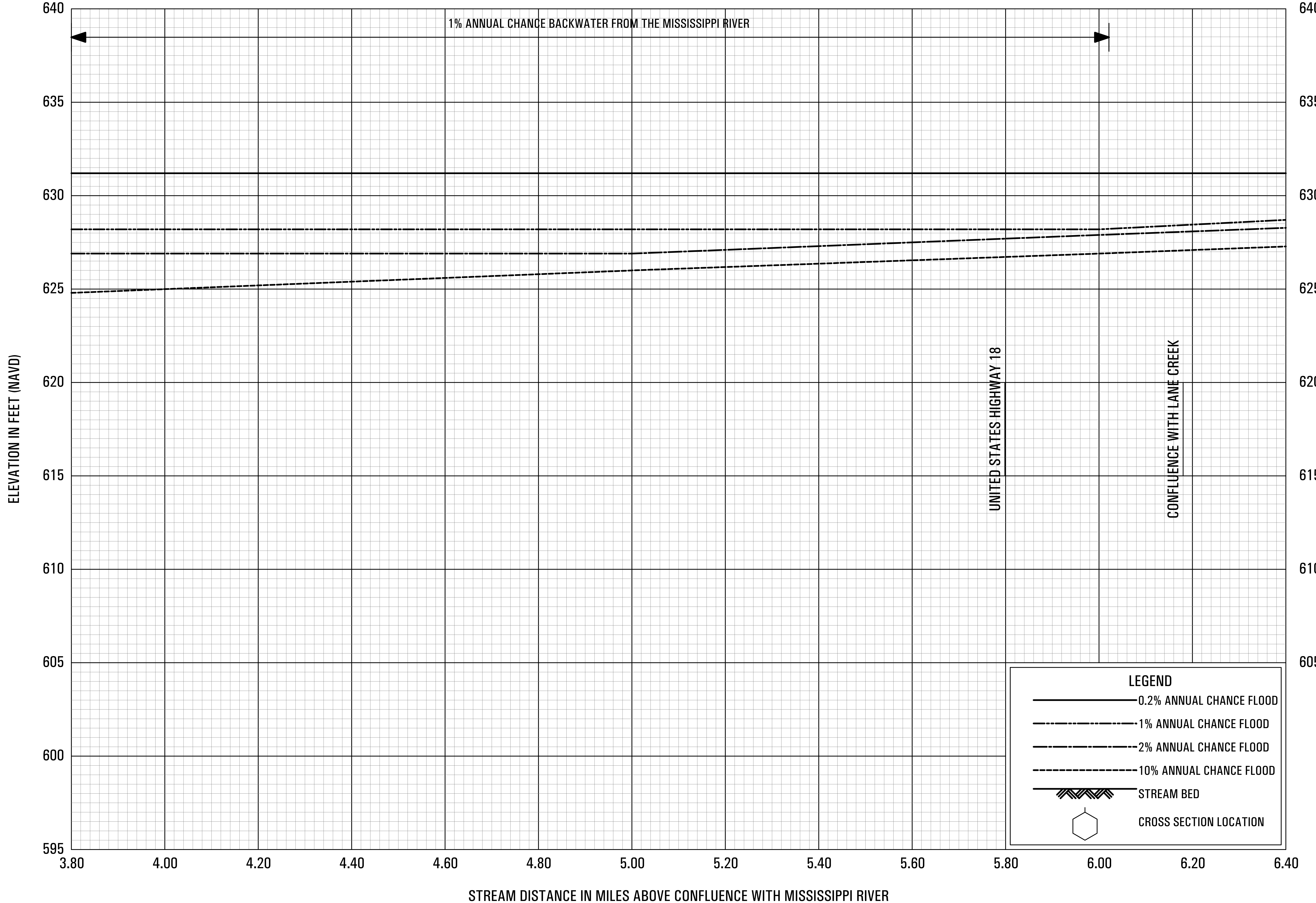
FLOOD PROFILES

WISCONSIN RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

AND INCORPORATED AREAS



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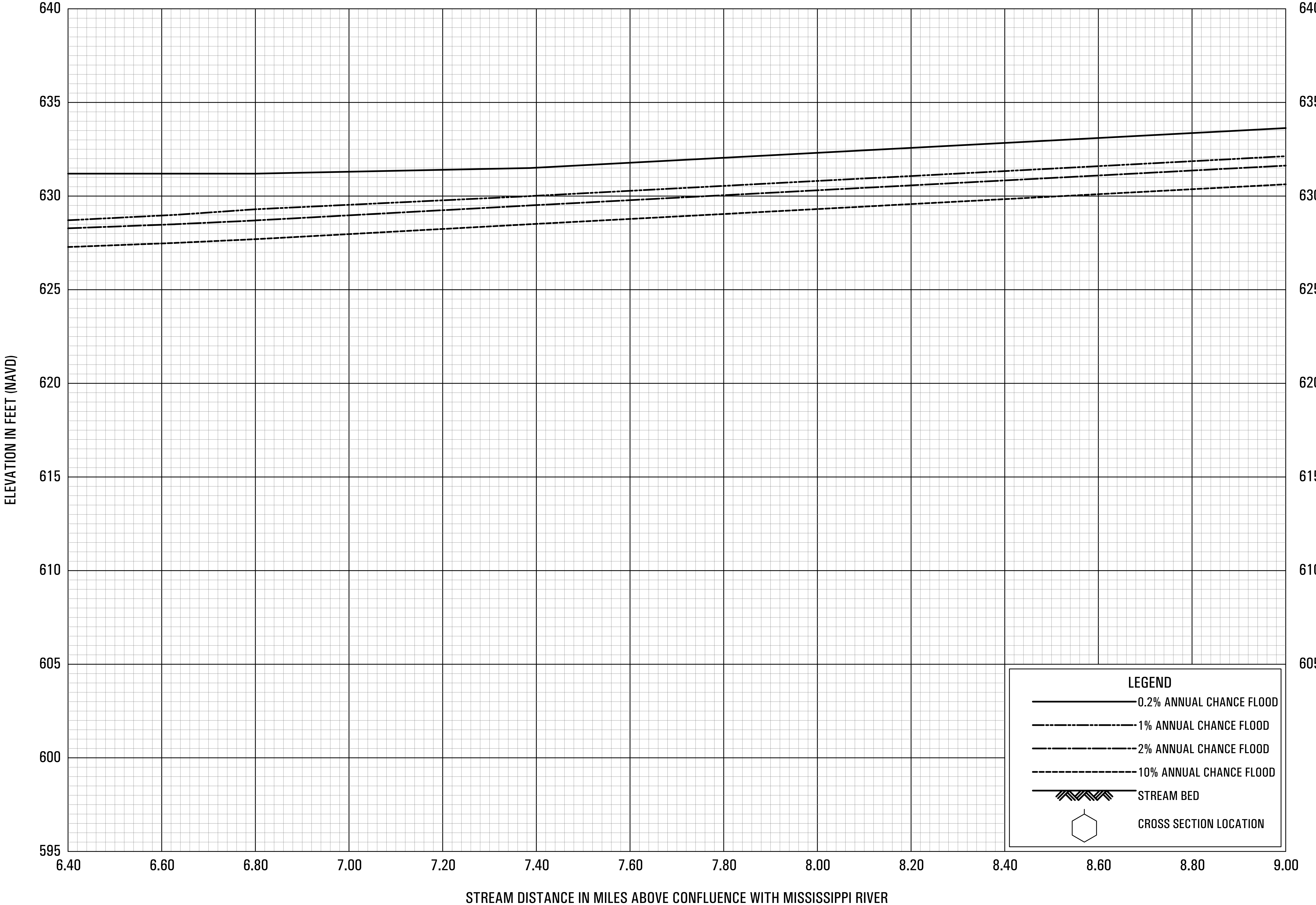

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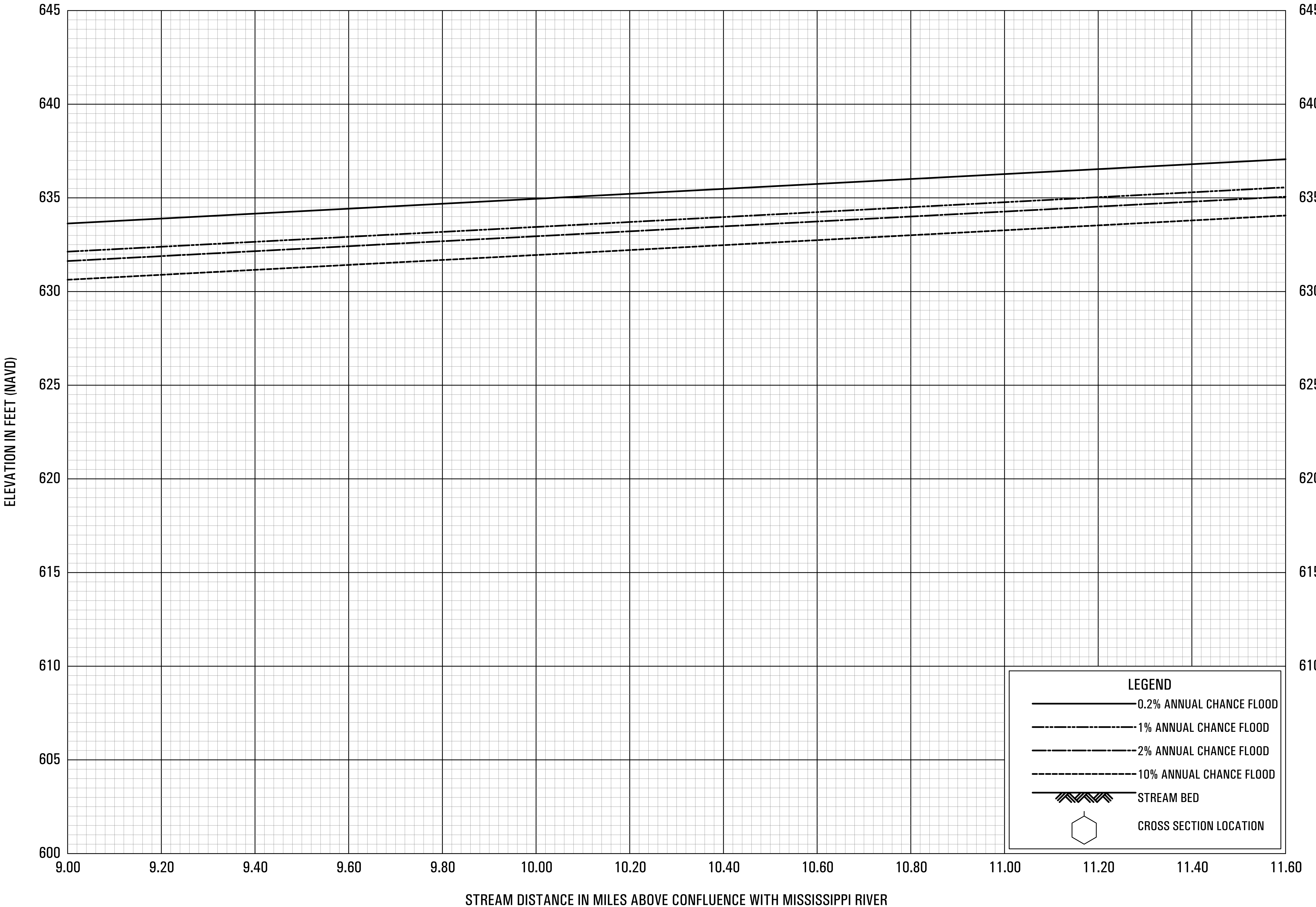

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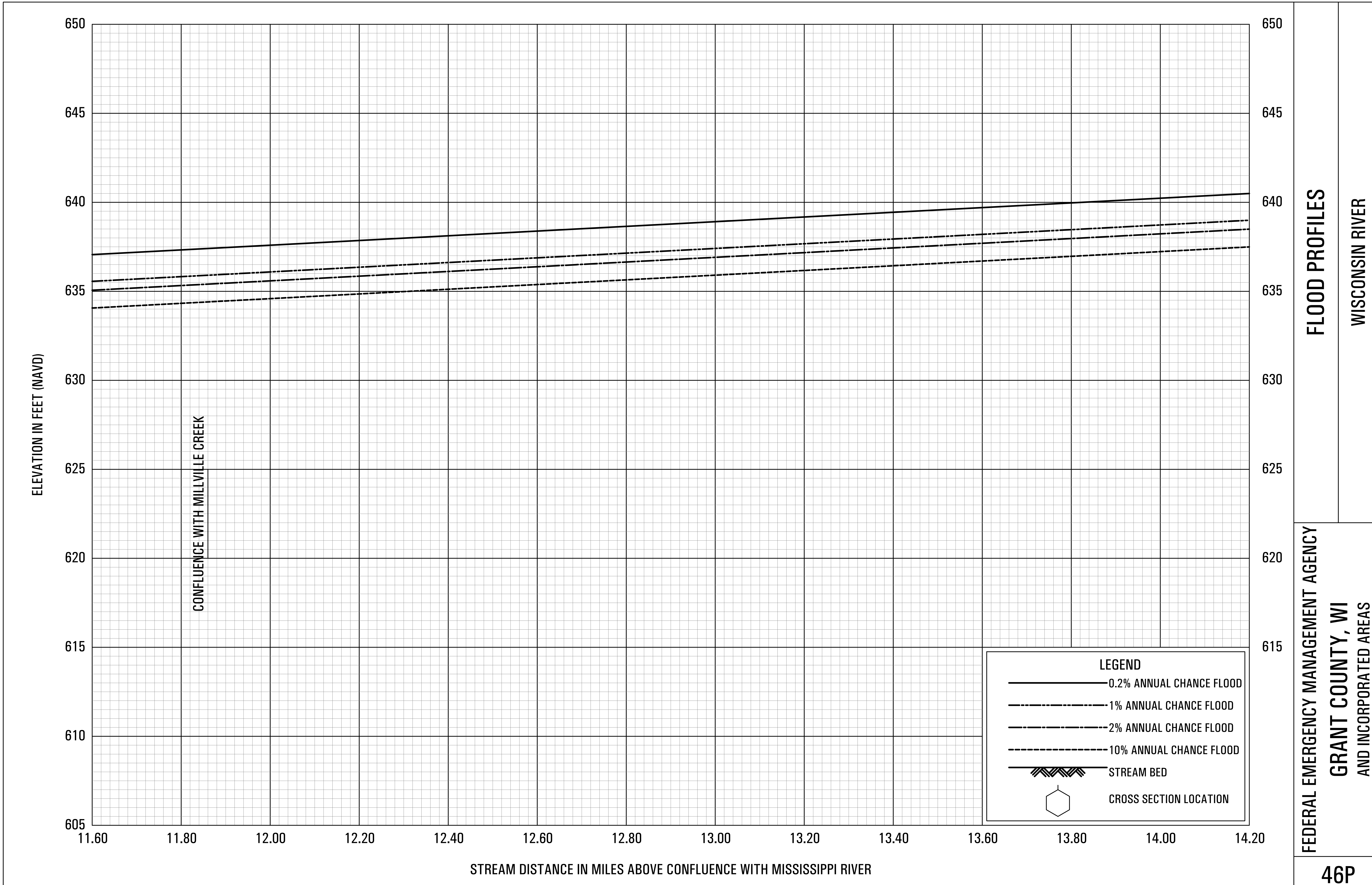
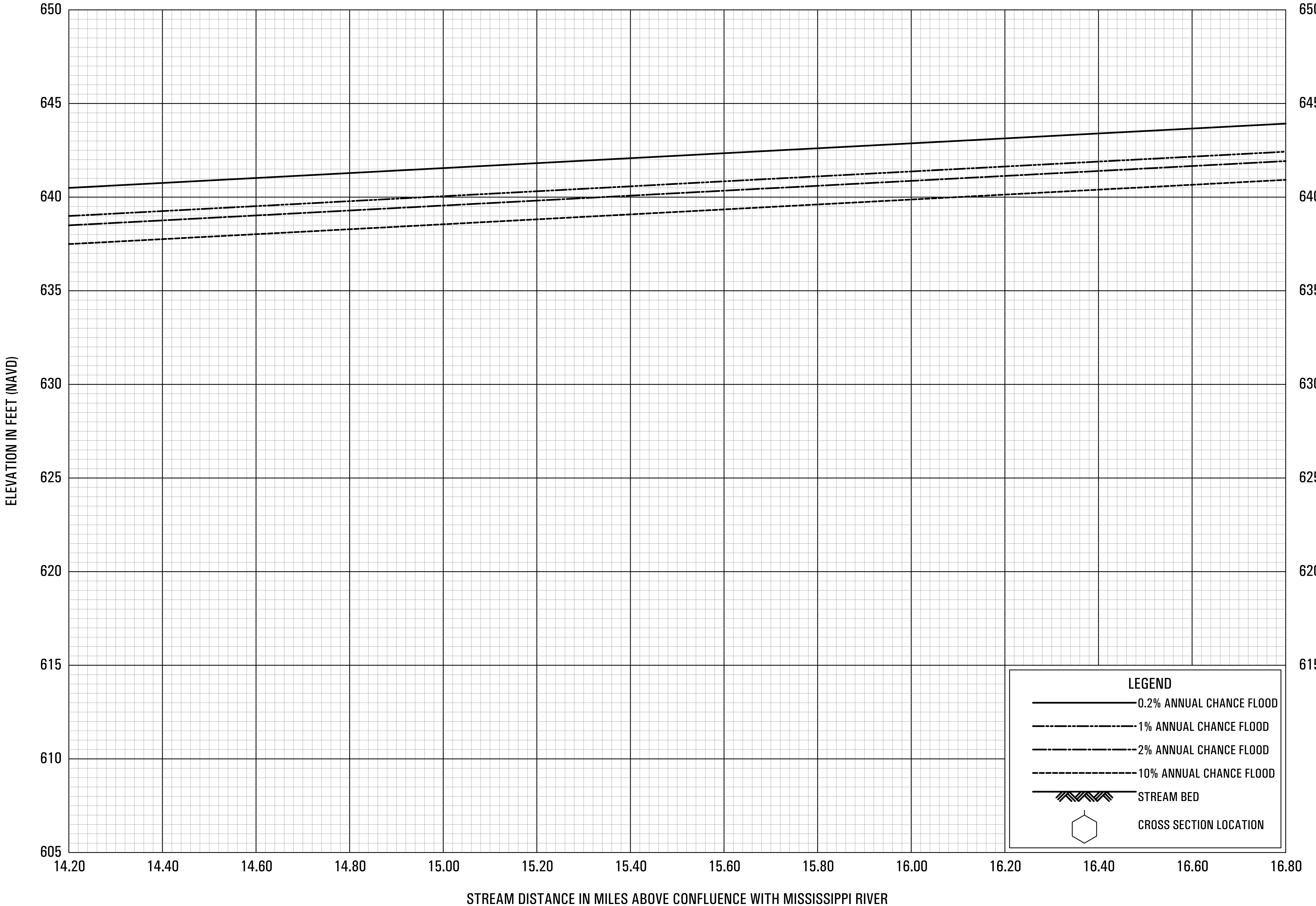


650
645
640
635
630
625
620
615
610
605
ELEVATION IN FEET (NAVD)
CONFLUENCE WITH MILLVILLE CREEK
11.60
11.80
12.00
12.20
12.40
12.60
12.80
13.00
13.20
13.40
13.60
13.80
14.00
14.20
STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH MISSISSIPPI RIVER
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
WISCONSIN RIVER
FEDERAL EMERGENCY MANAGEMENT AGENCY
GRANT COUNTY, WI
AND INCORPORATED AREAS
46P



FLOOD PROFILES

WISCONSIN RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

GRANT COUNTY, WI

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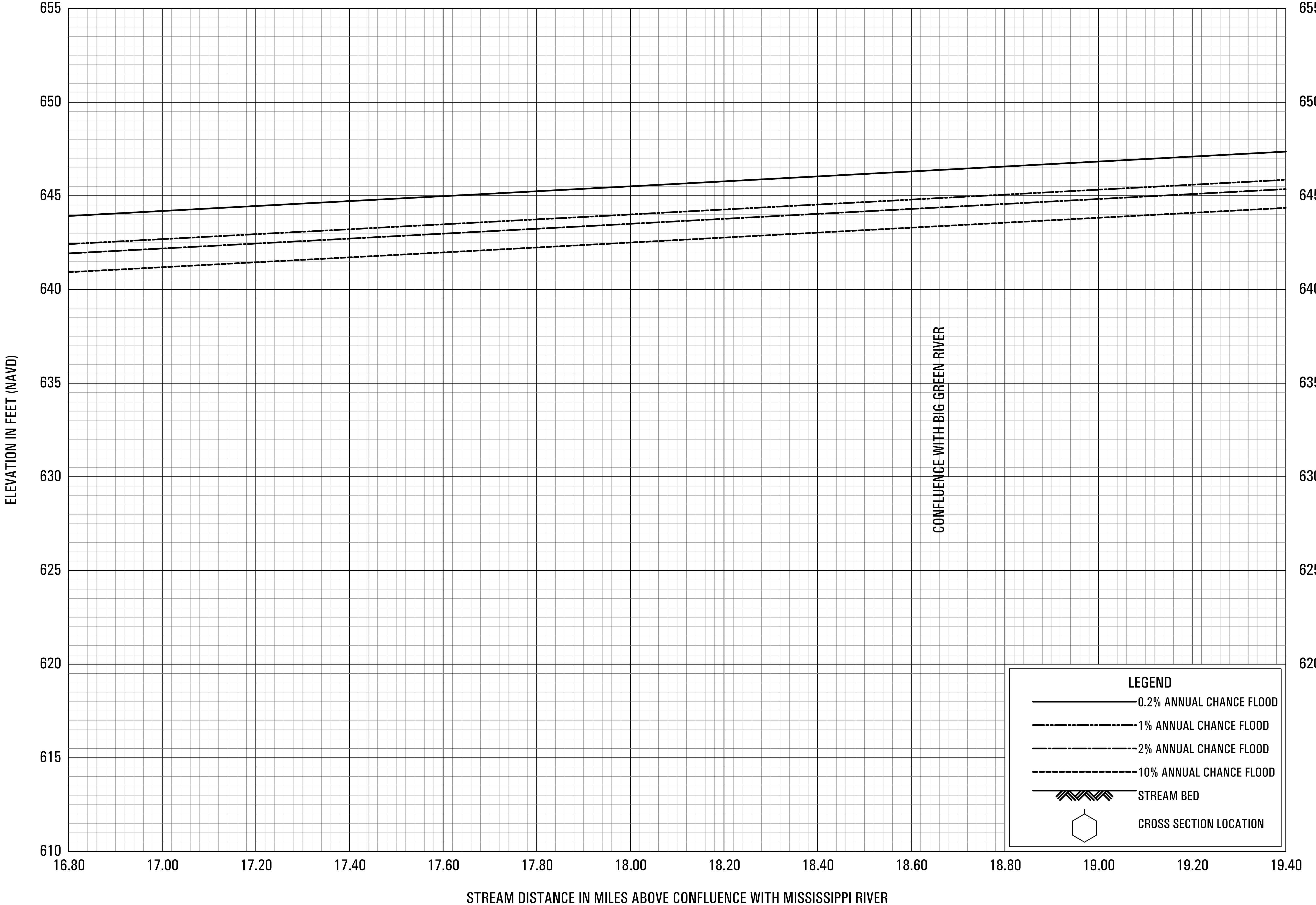

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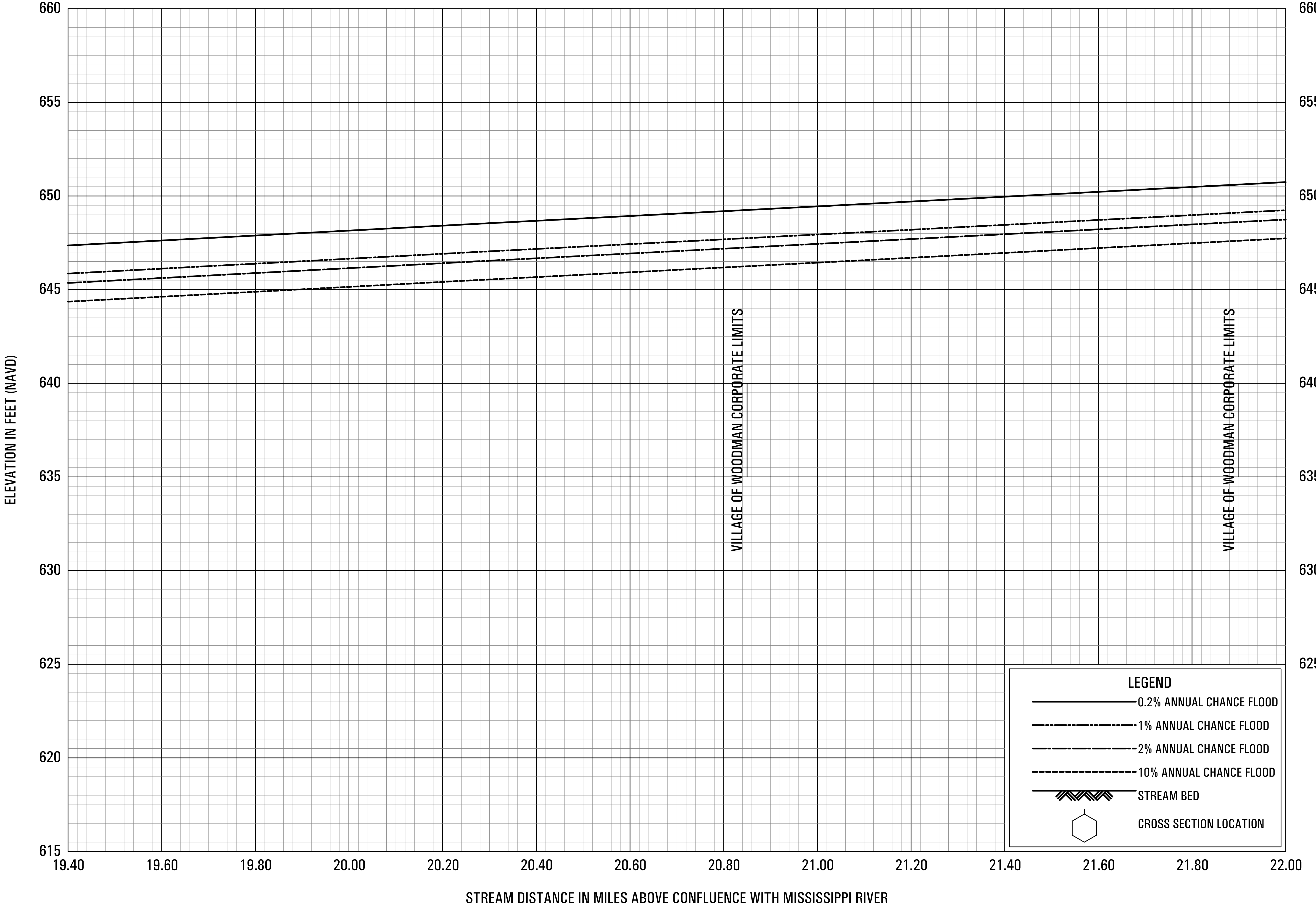

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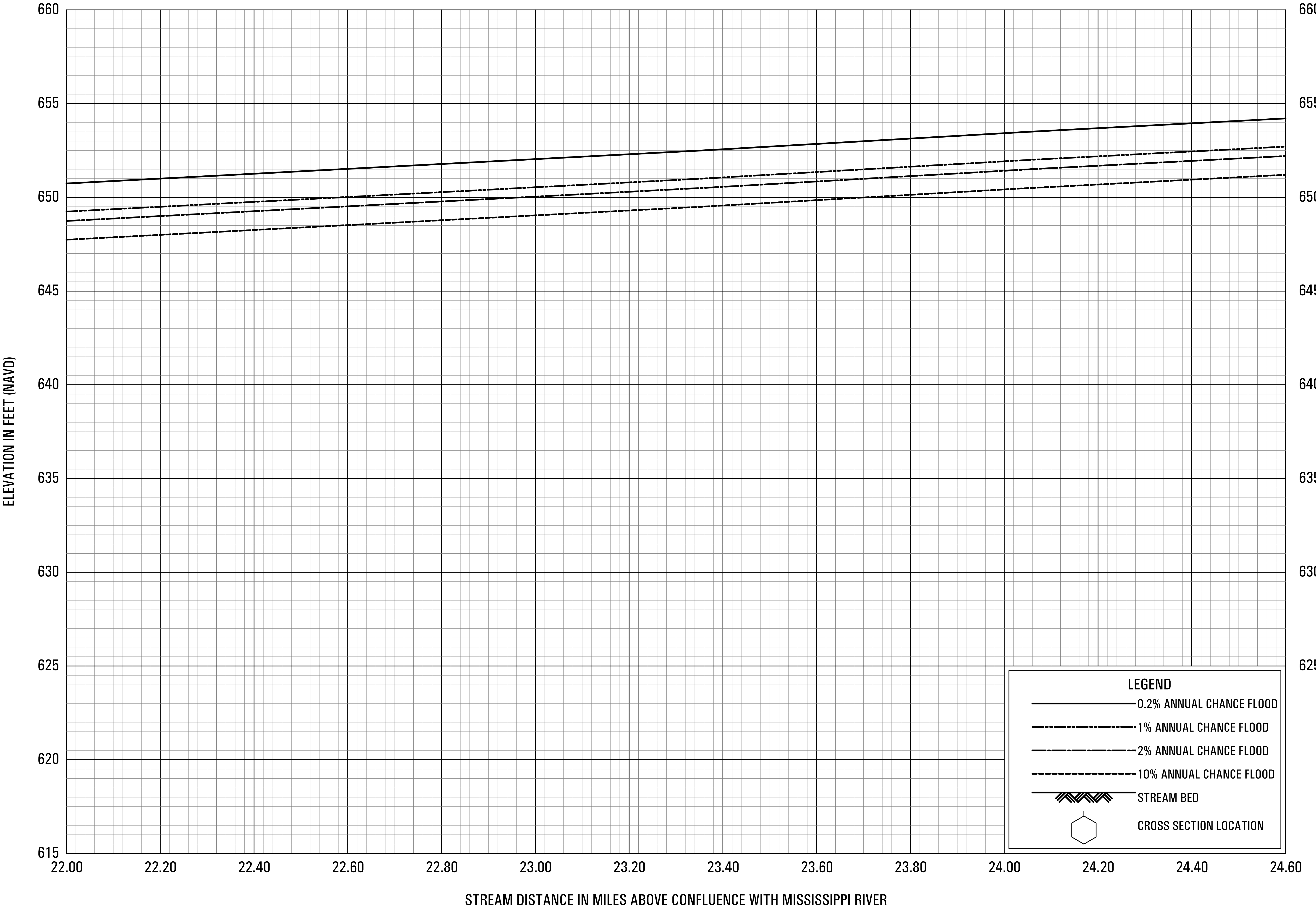

FLOOD PROFILES

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GRANT COUNTY, WI

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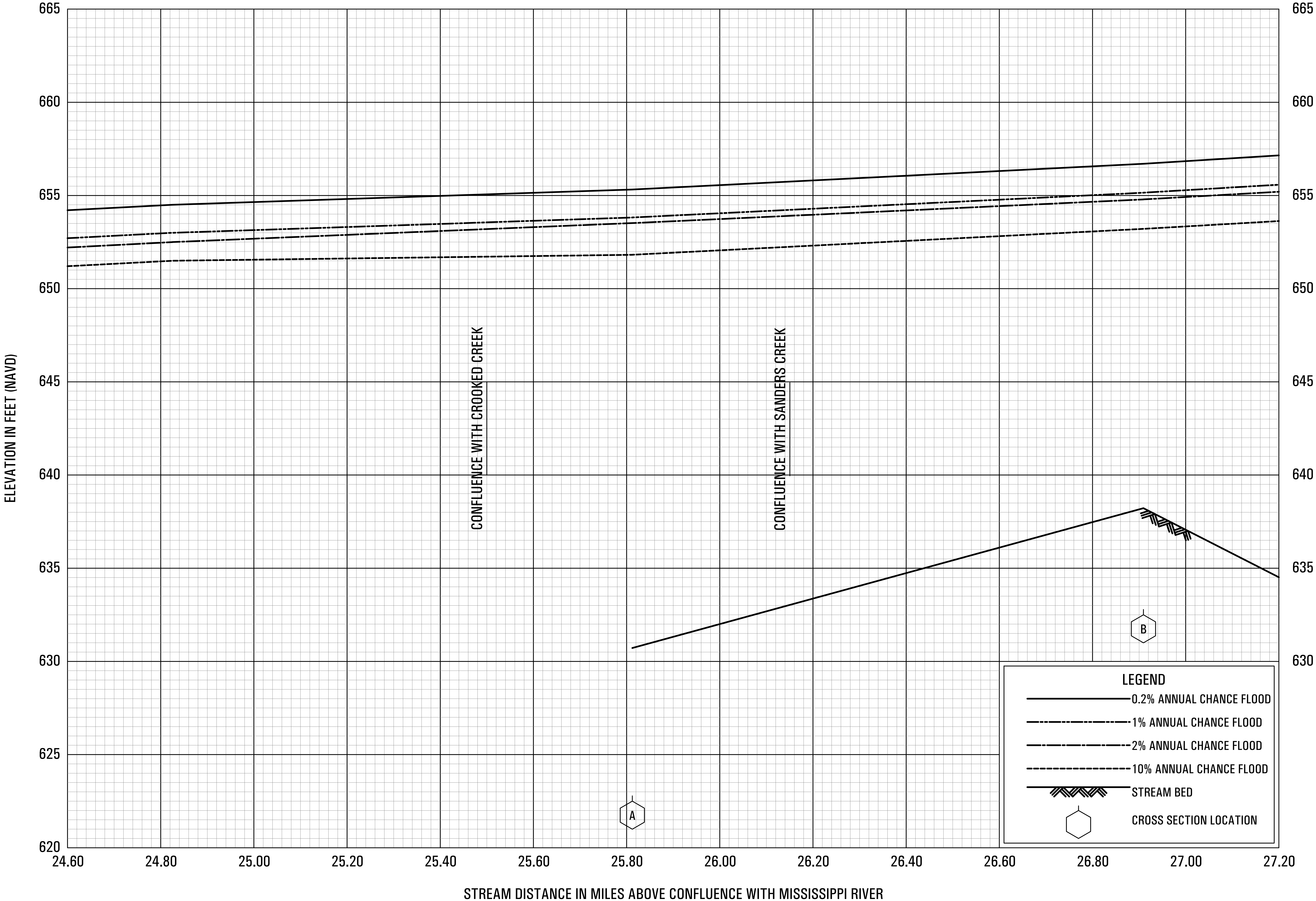
50P



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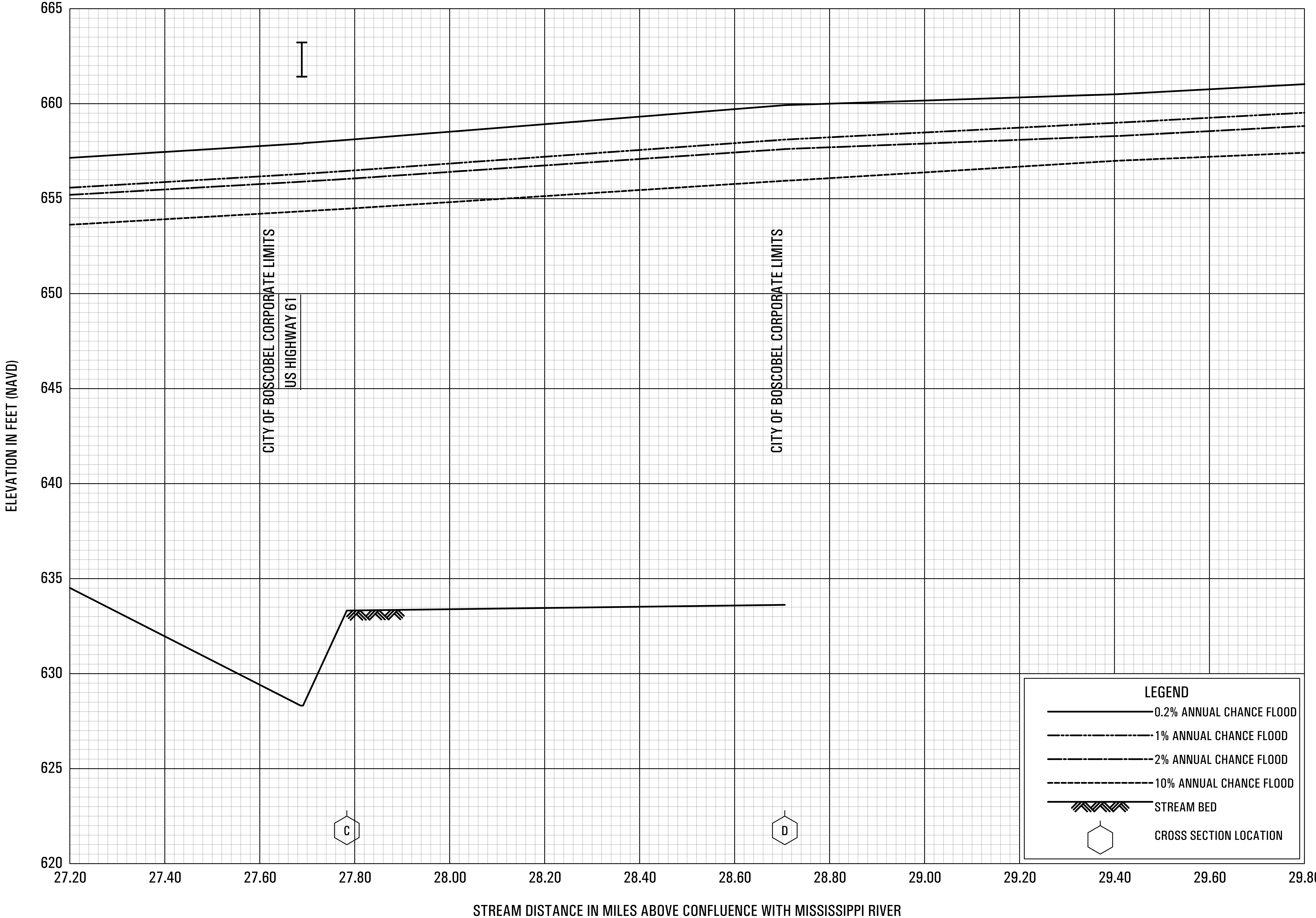

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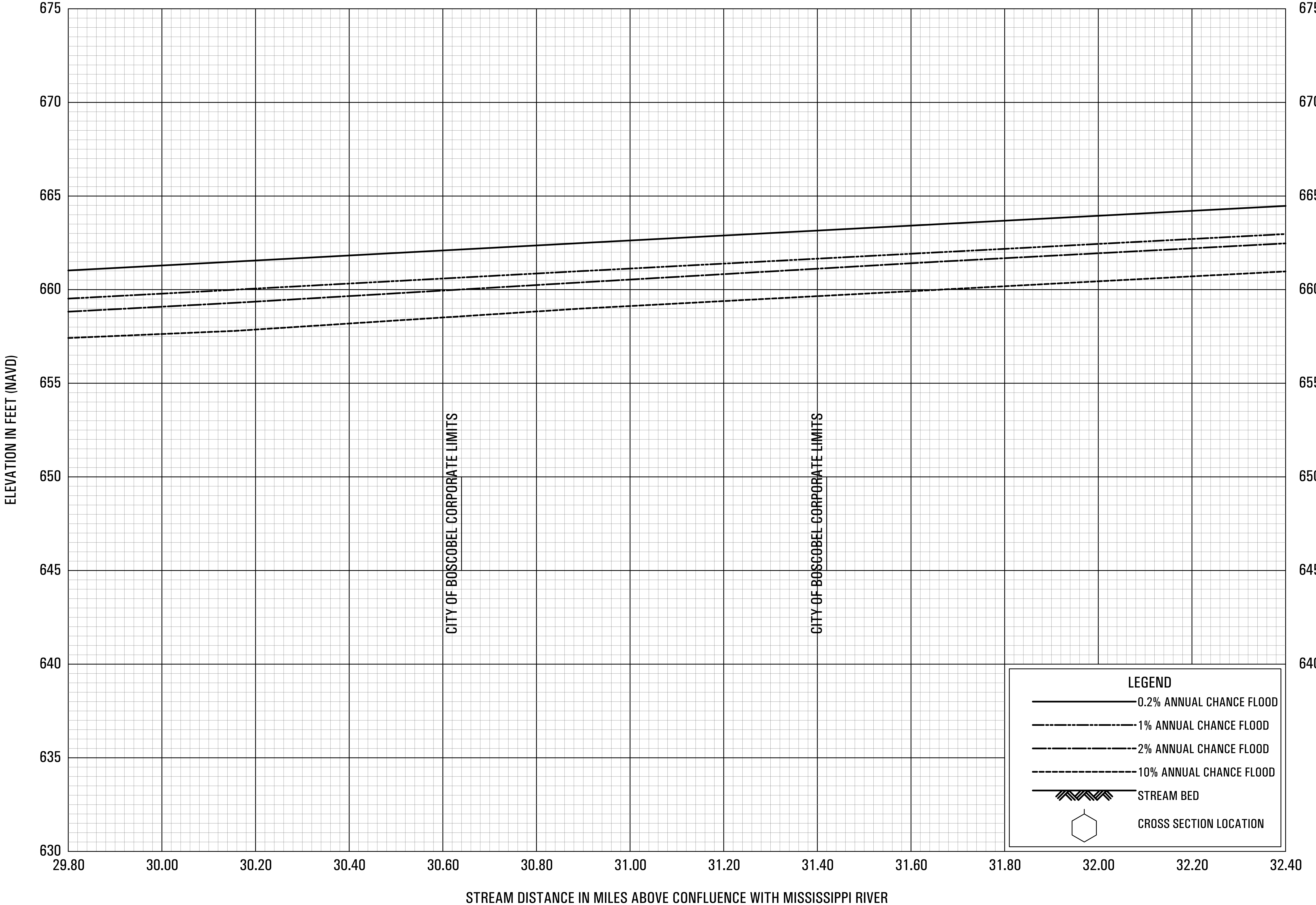

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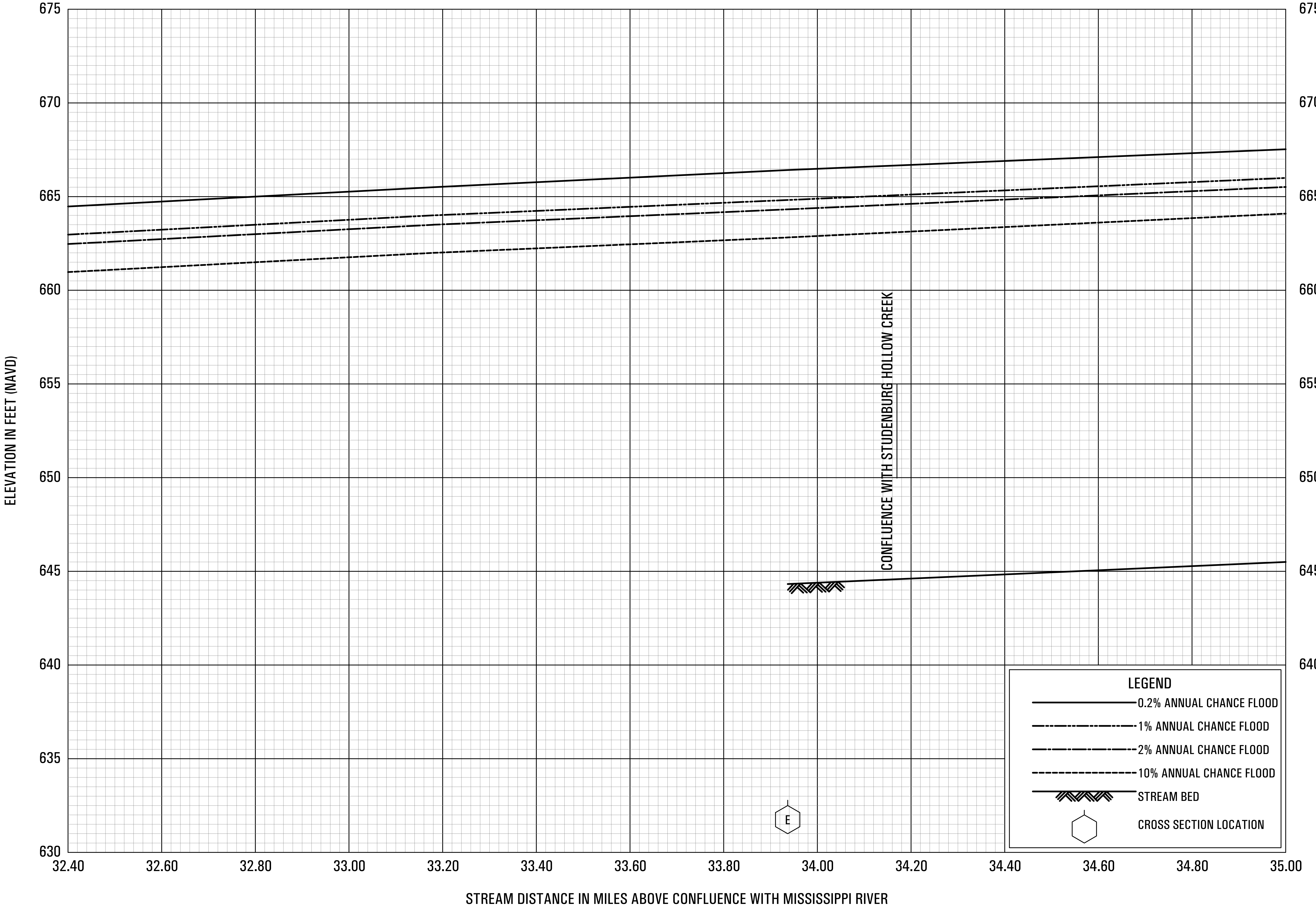

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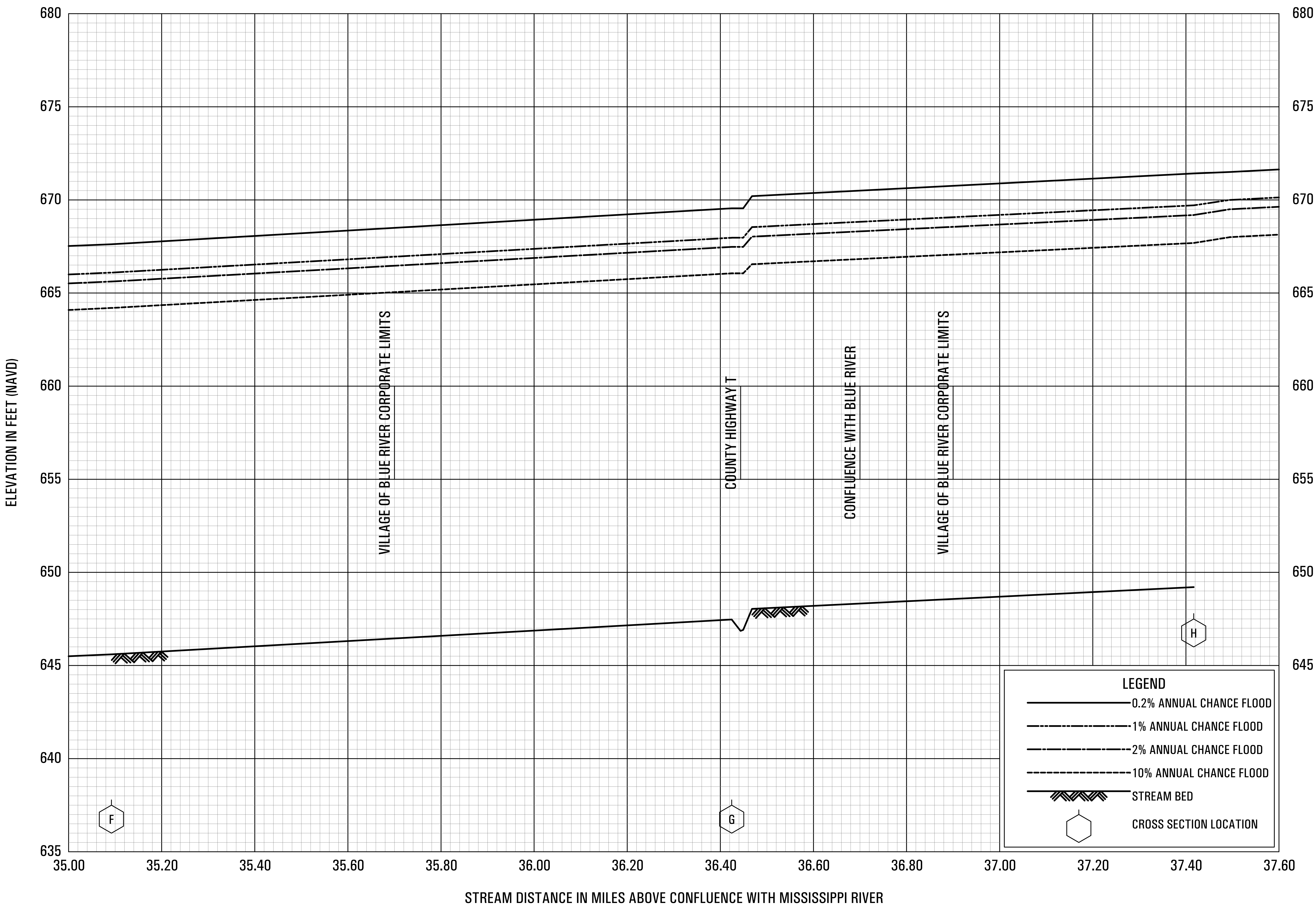

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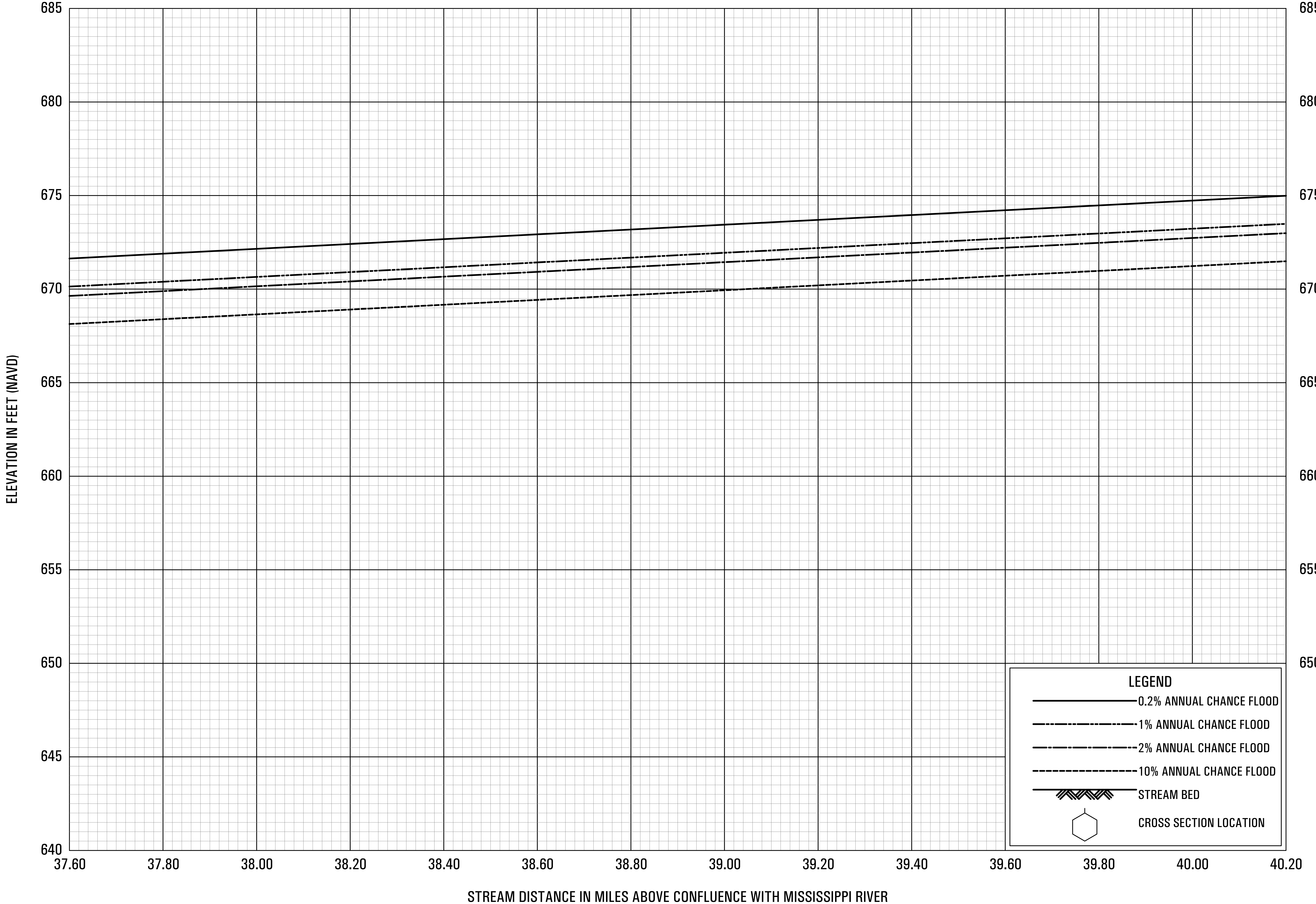

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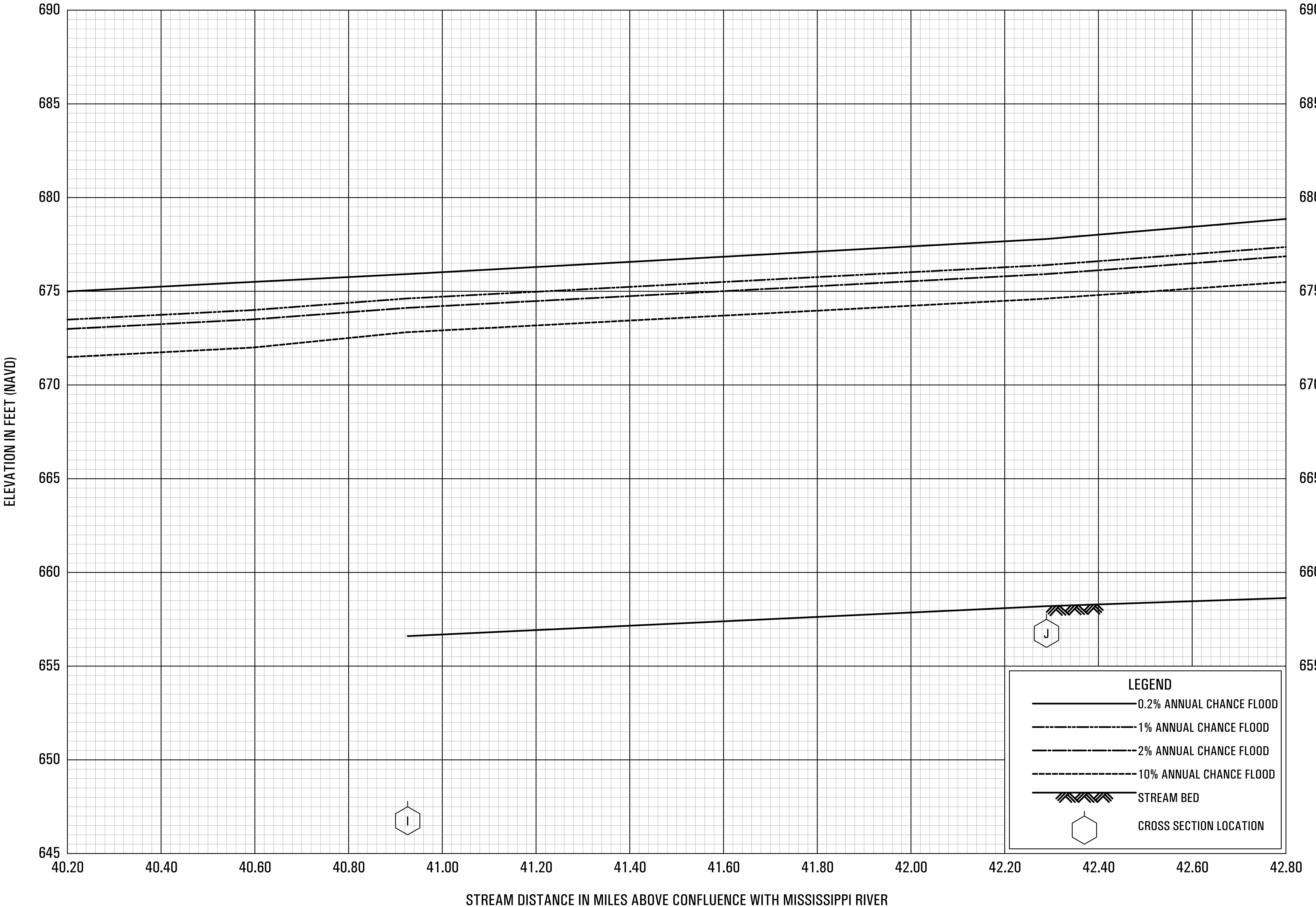

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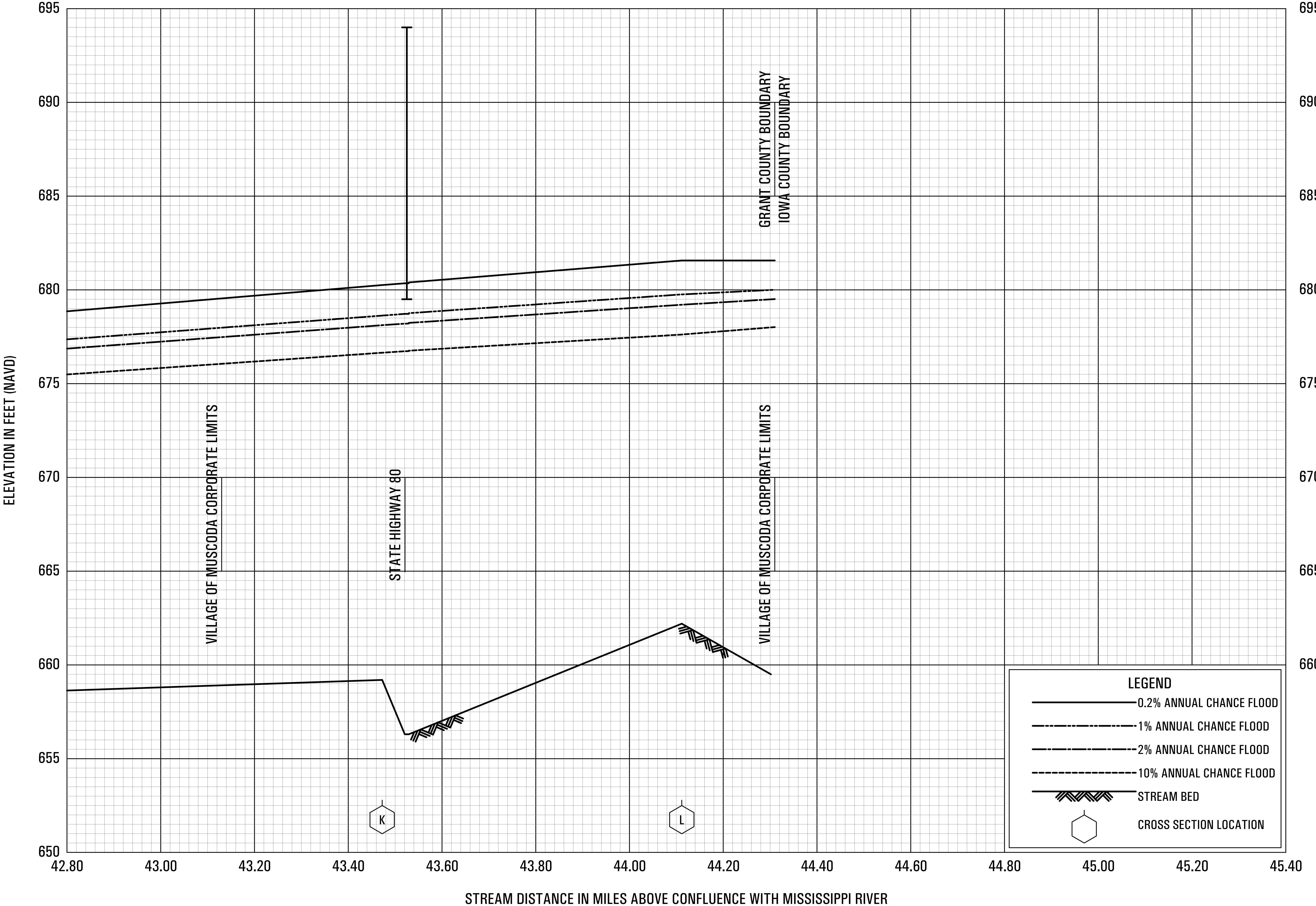

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