FLOOD INSURANCE STUDY

FOND DU LAC COUNTY, WISCONSIN,
AND INCORPORATED AREAS

Community Name	Community Number
Brandon, Village of	550132
Campbellsport, Village of	550133
Eden, Village of	550134
Fairwater, Village of	550135
Fond du Lac County (Unincorporated Areas)	550131
Fond du Lac, City of	550136
Kewaskum, Village of	550474
Mount Calvary, Village of	550137
North Fond du Lac, Village of	550138
Oakfield, Village of	550139
Ripon, City of	550140
Rosendale, Village of	550141
St. Cloud, Village of	550142
Waupun, City of	550108

Effective:
November 4, 2009

Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
55039CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this Preliminary FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult community officials and check the Community Map Repository to obtain the most current FIS components. Selected Flood Insurance Rate Map panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways and cross sections). In addition, former flood hazard zone designations have been changed as follows.

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

Initial Countywide FIS Effective Date: November 4, 2009

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FLOOD INSURANCE STUDY
FOND DU LAC COUNTY, WISCONSIN AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) revises and updates the FISs/Flood Insurance Rate Maps (FIRMs), for the geographic area of Fond du Lac County, Wisconsin, including the Cities of Fond du Lac, Ripon, and Waupun; the Villages of Brandon, Campbellsport, Eden, Fairwater, Mt. Calvary, North Fond du Lac, Oakfield, Rosendale, St. Cloud, and the unincorporated areas of Fond du Lac County (hereinafter referred to collectively as Fond du Lac County). The Village of Kewaskum is geographically located in Fond du Lac and Washington counties, and the City of Waupun is geographically located in Fond du Lac and Dodge counties. There is no Special Flood Hazard Area identified in the portion of the Village of Kewaskum that lies in Fond du Lac County. Also, the Villages of Brandon, Eden, Fairwater, Mt. Calvary, Oakfield, and St. Cloud did not have previous FISs.

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

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

1.2 Authority and Acknowledgments

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

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

Campbellsport, Village of:	The hydrologic and hydraulic analyses for the FIS dated November, 1977, were performed by Howard, Needles, Tammen, and Bergendoff for the Federal Insurance Administration (FIA), under Contract No. H-3968. That work was completed in April 1977 (Reference 1).
Fond du Lac, City of:	The hydrologic and hydraulic analyses for the FIS dated March 4, 1988, were performed by Owen Ayres and Associates, Inc. for the FIA, under Contract No. H-3805. This work was completed in January 1977 (Reference 2).
Fond du Lac County, Unincorporated Areas:	The hydrologic and hydraulic analyses for the January 19 1982, FIS, and the July 19, 1982, FIRM (hereinafter referred to as the 1982 FIS), were prepared by Howard, Needles, Tammen and Bergendoff for the Federal Emergency Management Agency (FEMA), under Contract No. H-3968. The hydraulic analyses and flood profiles were coordinated with those developed or being developed concurrently by the U.S. Geological Survey (USGS), Owen-Ayres and Associates, the U.S. Army Corps of Engineers (USACE), and the Southeastern Wisconsin Regional Planning Commission (SEWRPC). Approximate flood boundaries for the Eldorado Marsh (along the West Branch Fond du Lac River); the swampy area in the Horicon National Wildlife Refuge along the southern county boundary, east of the City of Waupun; and the upstream portion of De Neveu Creek were determined by Gannett, Fleming, Corddry and Carpenter, Inc., under contract to FEMA. That study was completed in May 1979. For the March 18, 1986, revision, the hydrologic and hydraulic analyses for De Neveu Creek were prepared by Donohue and Associates, Inc., and by a Technical Evaluation Contractor on Taycheedah and Luco Creeks, both for FEMA.

Fond du Lac, Unincorporated Areas (continued):	For the April 5, 1988, revision, the hydrologic and hydraulic analyses for De Neveu Creek were restudied by Howard, Needles, Tammen and Bergendoff in a flood insurance re-evaluation report (Howard, Needles, Tammen and Bergendoff, 1986). For the June 6, 2000, revision, the hydrologic and hydraulic analyses for De Neveu Creek, Unnamed Tributary to De Neveu Creek, Unnamed Tributary to Unnamed Tributary to De Neveu Creek, Sevenmile Creek, Lake De Neveu, and Kettle Moraine Lake were prepared by the USGS under Inter-Agency Agreement No. EMW-94-E-4372. That work was completed in August 1997. For the Fond du Lac FIS dated October 16, 2003, the hydrologic and hydraulic analyses for Anderson and Mosher Creeks were performed by the NRCS in cooperation with the Village of North Fond du Lac, Fond du Lac County, and the Wisconsin Department of Natural Resources (WDNR) for FEMA (Reference 3).
North Fond du Lac, Village:	For the original Village of Fond du Lac FIS, dated June 1979, the hydrologic and hydraulic analyses were performed by Howard, Needles, Tammen and Bergendoff for the FEMA, under Contract No. H-3968. The study was completed in April 1977 (FIA, June 1979) (Reference 4).
Ripon, City of:	The hydrologic and hydraulic analyses for the City of Ripon FIS dated February, 1980, were performed by the USGS for the FIA, under Inter-Agency Agreement No. IAA-H-9-77, Project Order No. 3. That work was completed in August 1978 (Reference 5).
Rosendale, Village:	The hydrologic and hydraulic analyses for the Village of Rosendale FIS dated September 29, 1989, were performed by the USGS, Water Resources Division for FEMA, under Inter-Agency Agreement No. EMW-85-E, Project Order No, 1823. That study was completed in January 1986 (Reference 6).

Waupun, City of:	The hydrologic and hydraulic analyses for the original City of Waupun FIS, were performed by Donohue & Associates, Inc., for the FIA, under Contract No.EMW-C-0287. That work was completed in May 1981 (Reference 7). For the April 2, 1991 revision, hydrologic and hydraulic analyses were performed by the WDNR.

For this countywide FIS, re-delineation of special flood hazard areas was performed by CDM Federal Programs Corporation (CDM), under contract HSFE05-05-D-0027/002. This work was completed October 31, 2006. The digital base mapping information was provided in digital format by the Fond du Lac County Planning Department and WDNR. The aerial photography was collected in 2005, and has 1-foot resolution. Users of this FIS should be aware that minor adjustments may have been made to specific base map features.

The coordinate system used for the production of this FIRM is Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD 83), GRS 80 spheroid. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

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

The dates of the initial and final CCO meetings held for Fond du Lac County and the incorporated communities within its boundaries are shown in Table 1, "Initial and Final CCO Meetings."

TABLE 1 - INITIAL AND FINAL CCO MEETINGS

Community Name	Initial CCO Date	Final CCO Date
Village of Campbellsport	March 12, 1976	March 29, 1977
City of Fond du Lac	February 1975	March 30, 1977
Fond du Lac, Unincorporated Areas[1]	March 11, 1976	November 20, 1980
Fond du Lac, Unincorporated Areas[2]	*	*
Fond du Lac, Unincorporated Areas[3]	*	*
Fond du Lac, Unincorporated Areas[4]	December 13, 1993	March 17, 1999
Village of North Fond du Lac[5]	*	November 21, 1978

*Information not available [1]January 19, 1982 FIS [2]March 18, 1986 revision [3]April 5, 1988 revision
[4]June 6, 2000 revision [5]Data for the original June 1979 FIS

TABLE 1 - INITIAL AND FINAL CCO MEETINGS (continued)

Community Name	Initial CCO Date	Final CCO Date
Village of North Fond du Lac[1]	*	*
City of Ripon	November 1975	August 1, 1979
Village of Rosendale	May 31, 1985	May 10, 1988
City of Waupun	November 29, 1978	December 2, 1981

*Information not available
[1] October 16, 2003 revision

For this countywide FIS, a pre-scoping report was prepared by Michael Baker Jr., Inc. dated March 2005. This report described work performed by WDNR to assemble the necessary information to perform the redelineation of special flood hazard areas based on improved topographic information. An initial coordination meeting was held July 26, 2005, and was attended by representatives of FEMA, WDNR, CDM and the community.

The results of the study were received at the final CCO meeting held on June 12, 2007 and attended by representatives of FEMA, WDNR, CDM and the community. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This countywide FIS covers the geographic area of Fond du Lac County, Wisconsin. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

All or portions of the flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," were previously studied by detailed methods. The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRMs (Exhibit 2).

TABLE 2 - FLOODING SOURCES STUDIED BY DETAILED METHODS

Flooding Source	Limits of Detailed Study
Anderson Creek	From its confluence with Lake Winnebago to immediately upstream of Melody Lane

TABLE 2 - FLOODING SOURCES STUDIED BY DETAILED METHODS (continued)

Flooding Source	Limits of Detailed Study
Clamshell Creek	From its confluence with Lake Winnebago to approximately one mile upstream of Lincoln Road
De Neveu Creek	From its confluence with Lake Winnebago to approximately 0.7 miles upstream of US Highway 45
East Branch Fond du Lac River	From its confluence with West Branch Fond du Lac River to approximately one mile upstream of River Road
East Branch Milwaukee River	From the Long Lake Dam to the Fond du Lac and Sheboygan county boundary
Fond du Lac River	From its confluence with Lake Winnebago to the confluence of West Branch Fond du Lac River.
Harris Creek	From its confluence with South Branch Rock River to approximately 0.1 miles upstream of Rock Avenue
Kettle Moraine Lake	Entire shoreline within the county
Lake De Neveu	Entire shoreline within the county
Lake Winnebago	Entire shoreline within the county
Luco Creek	From its confluence with Lake Winnebago to divergence from Taycheedah Creek
McDermott Creek	From its confluence with De Neveu Creek to approximately 1,800 ft upstream of Country Lane
Milwaukee River	From the Fond du Lac and Washington county boundary to approximately 1.4 miles upstream of Campbellsport Dam
Mosher Creek	From its confluence with Lake Winnebago to approximately 1,000 ft upstream of US Highway 41
Parsons Creek	From its confluence with East Branch Fond du Lac River to immediately upstream of County Highway B
Poplar Creek	From its confluence with Lake Winnebago to approximately 1 mile upstream of US Highway 45
Rush Lake	Entire shoreline within the county

TABLE 2 - FLOODING SOURCES STUDIED BY DETAILED METHODS (continued)

Sevenmile Creek	From approximately one mile downstream of Vielbig Road to County Route Y
Silver Creek	From the Fond du Lac-Green Lake County boundary to immediately upstream of Willow Road
South Branch Rock River	From its confluence with West Branch Rock River to approximately 0.8 miles upstream of North Brandon Street.
Supple Creek	From its confluence with Lake Winnebago to the Railroad upstream of State Highway 175
Taycheedah Creek	From its confluence with Lake Winnebago to County Highway T
Unnamed Creek	Approximately 0.4 miles downstream of Hill Road to Field Road
Unnamed Tributary to De Neveu Creek	From its confluence with De Neveu Creek to County Route UU
Unnamed Tributary to Unnamed Tributary to De Neveu Creek	From its confluence with Unnamed tributary to De Neveu Creek to immediate upstream of De Neveu Lane
West Branch Fond du Lac River	From its confluence with main stem Fond du Lac River to approximately one mile upstream of County Highway C
West Branch Milwaukee River	From Fond du Lac and Washington county boundary to Town Road
West Branch Rock River	From State Highway 49 to approximately 2.6 miles upstream of County Highway D
West Fork Clamshell Creek	From its confluence with Clamshell Creek to approximately 0.6 miles from this confluence.

This countywide FIS also incorporates names of streams, other than those used in the previously printed FIS reports for the communities in which they are located. The Main Stem Fond du Lac River is changed to Fond du Lac River and the Upper Milwaukee River is changed to Milwaukee River.

As part of this countywide FIS, updated analyses were included for the flooding sources shown in Table 3, "Scope of Revision."

TABLE 3 - SCOPE OF REVISION

Stream	Limits of Revised or New Detailed Study
McDermott Creek	From approximately 0.4 mile downstream of County Highway T to approximately 0.4 mile upstream of County Highway T
Mosher Creek	From the mouth at Lake Winnebago to just downstream of McKinley Street
Taycheedah Creek	From approximately 0.7 mile above the mouth at Lake Winnebago to just downstream of State Highway 23

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

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having low development potential or minimal flood hazards, and were shown as Zone A on the current map. These floodplains were re-delineated using the county's 2-foot contour terrain data, similar to the remapping done for the existing detailed studies. The scope and methods of study were proposed to, and agreed upon, by FEMA and Wisconsin DNR.

This FIS also incorporates the determinations of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR], Letter of Map Revision - based on Fill [LOMR-F], and Letter of Map Amendment [LOMA], as shown in Table 4, "Letters of Map Change".

TABLE 4 - LETTERS OF MAP CHANGE

Community	Flooding Source(s)/Project Identifier	Date Issued	Type
Unincorporated Areas of Fond du Lac County	South Branch Rock River/Front Edge and Woodland Hills Subdivision	March 8, 2005	LOMR
City of Fond du Lac	De Neveu Creek/Construction of National Avenue Bridge	June 22, 1998	LOMR
City of Waupun	South Branch Rock River/Front Edge and Woodland Hills Subdivision	March 9, 2005	LOMR

2.2 Community Description

Fond du Lac County is located in east-central Wisconsin at the southern end of Lake Winnebago. It is 54 miles northwest of Milwaukee and 51 miles northeast of Madison. The eastern county boundary is about 20 miles west of Lake Michigan. The county is surrounded by the Counties of Winnebago and Calumet to the north, Dodge and Washington to the south, Green Lake to the west, and Sheboygan to the east. U.S. Highways 42, 45, and 151 cross the county and intersect in and near the City of Fond du Lac. The 2000 Census lists the population of the county as 97,296, an increase of 8 percent over the 1990 population (Reference 8).

The climate of the county exhibits a tendency for extremes, and in general is marked by diurnal and seasonal variations typical of the mid-continental area. Summers are hot, relatively short, and humid. The month of June has the greatest number of thunderstorms and is the rainiest month of the year. The relatively cold and long winter season usually gives way to a mid-winter thaw in January and the spring thaw occurs in late March or early April. The spring thaw is characteristically gradual with a mixture of cold and warm days. The greatest rainfall amount recorded in 24 hours at Fond du Lac was the 5.30 inches that fell on August 4, 1924.

Natural features associated with the major river systems can be described collectively in two major groups; east and west of the Niagara Escarpment. The glacial advance from Green Bay to slightly beyond the Horicon Marsh cut into the soft Maquoketa Shale, in the central part of the county, to form the broad valley of Lake Winnebago and Horicon Marsh. The Silurian dolomite, to the east, resisted erosion and resulted in the formation of the ledge known as the Niagara Escarpment.

The area to the east of the ledge drains into Lake Michigan by the Manitowoc, Sheboygan, and Milwaukee Rivers and their tributaries. Geologically, the watersheds are characterized as youthful due to circuitous, underdeveloped, and inefficient cannel systems, which will stabilize in time with erosion and weathering. The topography in the northern part of this area is gently rolling with numerous hills and drumlins and some scattered level valleys. The southern part of this area consists of level-to-sloping outwash plains and the moraine area included in the Kettle Moraine State Forest. The Kettle Moraine area is a mass of ridges, kames, and kettles, many of which form ponds and lakes. Average land slopes are less than five percent. Soils in the eastern area are approximately 75 percent Hydrologic Soils Group B, with the remaining 25 percent predominately Group D (Reference 9). Vegetative cover is primarily crop and pastureland with small areas of forest. More than 40 percent of the county's total wetland acreage is found along the eastern edge of the county.

Immediately west of the Niagara Escarpment, the large flat plain in the north-central part of the county drains into Lake Winnebago by the Fond du Lac River, De Neveu, Taycheedah, and Anderson Creeks; and other small streams and

tributaries. Sandy Beach Creek, Minawa Beach Creek, and Taycheedah Creek have streambed slopes of 30 to 100 feet per mile where they flow down the ledge toward Lake Winnebago. This central plain area contains only about five percent of the county's wetland acreage. Soils in this area immediately surrounding Lake Winnebago and extending into the central and south-central part of the county are approximately 75 percent Hydrologic Soil Group C, 20 percent Group D, and 5 percent Group B. West of the plain, the topography becomes gently rolling and is drained by Silver Creek and the Grand River in the north and by the Rock River and its tributary streams in the south. The Rock River system drains into the Mississippi River. Soils in the western part of the county are generally 75 percent Hydrologic Soil Group B and 25 percent Group D. Land slopes in the western region are generally less than five percent. Vegetative cover is mostly crop and pastureland with small areas of forest and some major wetland acreages, especially within the Towns of Lamartine, Eldorado, and Waupun.

The most significant development pattern in Fond du Lac County is the rapid spread of urban residential developments into rural areas. Most of this development is within unincorporated communities along highways and in locations just outside of incorporated areas. Industrial and commercial developments are primarily centered within incorporated communities. However, unincorporated areas just outside the Cities of Fond du Lac and Ripon have experienced some industrial and commercial development and represent the greatest potential for future development of this type. Although agriculture is the primary economic base for unincorporated areas, the farm population has exhibited a decreasing trend.

Pasture, woodlands, wetlands, and recreational uses occupy the majority of the county's floodplain area. Croplands, roads, and farmsteads occupy most of the remaining floodplain area. Existing urban development in unincorporated communities, in areas adjacent to incorporated communities, and in scattered residential developments represents a very small percentage of floodplain land use. The strong trend toward future development of this type could increase this percentage unless sound floodplain management measures are utilized.

2.3 Principal Flood Problems

The history of flood problems in Fond du Lac County has been traced back to 1851 by the SCS. Floods causing the most significant damage occurred in 1869, 1902, 1905, 1912, 1915, 1924, 1937, 1949, 1960, and 1966. The 1924 flood on the Fond du Lac and Milwaukee Rivers is considered to be approximately equal in magnitude to the 1-percent-annual-chance. During the flood, minor damage to livestock, crops, bridges, and industrial plants was reported along the Milwaukee River system in Fond du Lac County. Severe agricultural cropland damage was noted along the Fond du Lac River.

Most of the flooding has occurred in the months of February through August. The major floods have generally occurred due to spring snowmelt, ice jams, and, less frequently, by intense rainfalls in summer and fall.

Soils within the study area are generally moderate to slowly permeable causing high runoff and increasing flood risk. The valuable wetland areas of the county serve as natural reservoirs, suppress the effects of intense rainfall and rapid runoff, and prevent peak flows. The Milwaukee River watershed particularly has a large capacity for floodwater storage in lakes and wetlands. Natural obstructions to flood flows such as trees and brush along stream banks exist in many of the watersheds. These tend to impede flood flow and increase flood height. Debris collects at restrictions and can finally break loose causing a wall of water to surge downstream, sometimes exceeding the structural capacity of bridges. Some bridges in the county provide only narrow waterway openings, which cause higher upstream water levels and are more subject to debris blockage.

In the Village of Campbellsport, significant peak discharges have been noted by local observers on the Upper Milwaukee River in the years 1924, 1936, and 1949, 1924 being the year of greatest magnitude. Structural damage was sustained by the Campbellsport Dam in 1924 and 1949. Major repairs were made on the dam after the 1949 flood and it is now considered sound enough to withstand major flood discharges. No significant property damage due to flooding is recalled by residents. There is no record of floodwaters ever topping the Main Street bridge roadway elevation, although it has been noted that in the spring of 1975, foam, assumed to be caused by chemical pollutants below dam turbulence, did top the Main Street bridge roadway.

In the City of Fond du Lac, various locations have been flooded in the past because of local runoff, rather than breaching of dikes, overtopping of dikes, or overbank flow from streams. Heavy rainfall can result in localized flooding due to interior drainage because of the flat topography. Numerous storm water pumping stations alleviate much flooding due to intense rainfall; but, if pumping units fail, extensive flooding can occur.

Ice in the Fond du Lac River is a problem. Thus, the City of Fond du Lac cuts the ice in the channels almost every spring to minimize ice jams and subsequent flood conditions. Numerous bridges in the area that impede ice flows or other debris compound this problem. High winds on Lake Winnebago often result in backwater on the Fond du Lac River and De Neveu Creek. When this occurs simultaneously with high river stages, the possibility of flooding in the city increases. Likewise, wind setup and wave runup have caused considerable damage along the lake.

Few records of flooding exist for the unincorporated areas of the county, but problems have been indicated in many areas. Hardest and most frequently hit by floods are low-lying agricultural croplands. Silt deposition on crops is a common cause of damage.

No major floods have occurred within the Village of North Fond du Lac. Flooding has been reported on Mosher Creek just upstream of the railroad yard due to debris buildup at the culverts. No significant property damage has been associated with this flooding. Many of the other bridges on Mosher Creek provide only narrow waterway openings and are readily subject to debris blockage. The

narrow banks of Mosher Creek magnify the effects of debris buildup and along with the flat topography, result in a wide floodplain area. Many residential structures are located within the floodplain along the banks of Mosher Creek, reducing the floodplain area available to effectively convey flood flows. All of these factors tend to impede flood flow and increase flood height. In addition, moderately permeable soils, paved roadways, and parking lots cause high runoff and increase flood risk. Flooding of the unnamed watercourse near the village park along Winnebago Street has resulted in minor property damage due to basement flooding. There have been no reports of damage due to flooding along Supple Creek.

In the City of Ripon, although flooding has not been a severe problem, the most serious factor influencing flood magnitudes in the area is the combination of snowmelt and rainfall runoff from frozen (impervious) ground. A factor which increases potential flood problems is the fact that the culverts in the City of Ripon cannot accommodate regional floods, so that water flows over the roads. As there have been no large recorded floods in recent years, estimated frequencies, elevations, and dates of damages of historic floods are not available.

Rosendale's flooding problems are due primarily to the overflow of the unnamed creek that flows through the village. The land, which borders the portion of the creek flowing through the village, is used for parkland, residential, and commercial purposes. In July 1984, the Village of Rosendale experienced a small flood. The closest hourly precipitation gage is located near the City of Portage, 43 miles southwest of Rosendale. The records from this station show that approximately 4 inches of rain fell on this area over a 6-day period. It is likely that the amount of rainfall in Rosendale was of the same magnitude. During this period, the maximum stage of the permanent pool located downstream of the State Highway 23 bridge was approximately 893.5 feet National Geodetic Vertical Datum of 1929 (NGVD). The private bridge between the State Highway 23 bridge and the Hill Road Bridge was overtopped. Subsequent to the flood, a board was removed at the small dam to lower the water-surface elevation of the permanent pool by approximately 0.5 foot.

The City of Waupun is most susceptible to flooding in spring due to a combination of rapid snowmelt, spring rains, and frozen ground, though heavy rains at times of high antecedent moisture conditions may cause flooding during the summer or fall. Ice and debris may jam at bridge constrictions and cause much higher flooding than would normally be expected during a flood. For the period of 1949-1969, the gaging station on the River Road Bridge recorded a peak water-surface elevation of the South Branch of the Rock River with a corresponding flow of 1,500 cubic feet per second (cfs) on April 3, 1959. This flow has an estimated recurrence interval of 11 years (Reference 10).

2.4 Flood Protection Measures

Levees have been constructed to confine floodwaters on De Neveu Creek and this channel can contain most flood flows, however, these levees do not meet FEMA standards for providing protection against significant flood events such as the 1%-

annual chance flood. Flooding due to intense rainfall or ice conditions can occur on the landward side of these levees. Storm water pumping stations have been constructed at various locations to minimize this problem.

In 1942, the USACE determined that the cost of flood protection for the Fond du Lac River watershed would exceed the prospective benefits; therefore, no significant flood protection exists for this river system. Significant structural flood protection measures have not been implemented and are not planned for the remainder of the unincorporated areas. However, as new bridges are constructed, a detailed analysis of flood flow conditions is required for review by the WDNR.

Within Fond du Lac County, there are six dams along the Milwaukee River watershed; these dams, however, do not significantly affect flood flows. Several miles of the perennial stream system of the Milwaukee River watershed have been intentionally modified in an attempt to improve their hydraulic characteristics. Channel improvements may consist of straightening, deepening, increasing the cross sectional area, improving the horizontal grade line, or diking, and generally involve all five phases. All of these phases result in increased velocity and decreased time of concentration.

Several minor structures have been placed along the South Branch of the Rock River to lessen the effects of flood flows. During high flows bulkheads partially protect each lot along the river on DeLynn Court and Riverview Court from erosion. Earth berms have been built-up along the wastewater treatment plant to protect it from high flood flows. A small dam, approximately five feet high, has been placed in the river 300 feet upstream of the Madison Street Bridge. The dam does not have sufficient storage to attenuate flood flows significantly. The main purpose of the dam is for aesthetic value. Nonstructural measures of flood protection include the development of land use regulations and zoning ordinances which restrict development in the flood plain (Reference 11).

In 1977, Supple Creek was channelized upstream from U.S. Highway 45 to reduce the effects of high water and to improve the flood flow characteristics.

3.0 ENGINEERING METHODS

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

conditions existing in the county at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

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

For each community within Fond du Lac County that had a previously printed FIS report, the hydrologic analyses described in those reports have been compiled and are summarized below.

Pre-Countywide Analyses

For the Village of North Fond du Lac FIS dated June 1979, for Anderson, Mosher, Poplar and Supple Creeks, three methods of hydrologic analysis were utilized to determine the peak discharge-frequency relationships for these streams. The first method utilized the flood frequency equations published by the USGS (Reference 12). These equations were developed by using a multiple regression analysis to define the relationship between flood discharge and 13 independent basin characteristics. This analysis defined the regression coefficients and regression constant, evaluated the significance of each basin characteristic, and provided a standard error of estimate. Data from 160 continuous record and 115 crest-stage partial-records gaging stations in Wisconsin and adjoining states were considered in developing the relationships.

The second method consisted of the development of drainage area-discharge relationships for gaged streams of various lengths on similar watersheds. Using the log-Pearson Type III analysis with zero skew, gage records from these similar watersheds were compared and plotted versus drainage area on log-log paper to yield a family of frequency-discharge curves for basins similar to those associated with streams studied (Reference 13). Gage records and basin characteristics were obtained from a report by the USGS (Reference 12).

The third method was developed by the SCS (Reference 14). The SCS method took into consideration watershed area, soil types, cover and land use types, slope, flow length, and surface roughness. The procedure required the calculation of a runoff curve number based on hydrologic soil groups and land use, and calculation of a time of concentration using the parameters of slope, land use, and velocity. These calculated values were then used to find the peak discharge per inch of runoff per unit area and the runoff depths for 4-, 2-, and 1-percent-annual-chance floods generated by the runoff from a 24-hour Type II storm distribution. Flood flows at the desired frequencies were then found by multiplying the peak discharge per inch of runoff per unit area by the runoff depth and the watershed area. The 10- and 0.2-percent-annual-chance peak discharge flows were extrapolated from a plot of the calculated values, using log-log paper. The three methods produced similar results for the streams studied in detail.

For the Village of North Fond du Lac 2003 revision, the NRCS studied the Anderson Creek and Mosher Creek watersheds and evaluated alternatives to reduce

flooding of residential properties. The hydrologic analyses for Anderson and Mosher Creeks were completed using the NRCS TR-20 computer program for project formulation hydrology model. The TR-20 hydrologic model was modified to reflect the estimated runoff condition and the rainfall distribution for the storm. This was accomplished by adjusting the runoff curve numbers to the midpoint between antecedent moisture conditions I and II, and estimating the rainfall distribution by interviewing local officials. Alternatives were formulated to address the flooding-related problems and concerns identified by the local planning committee. The various alternatives were evaluated in hydraulic and economic terms. The two alternatives that were selected and constructed were the Anderson Creek Diversion channel and the trash rack at the entrance to the Mosher Creek railroad culverts.

The Anderson Creek and Mosher Creek watersheds are relatively flat and drain to the east into Lake Winnebago. The land is further tipped south towards the Fond du Lac River. The conveyance channels or ditches are generally small and the larger storms spill out into the adjoining fields, roads, and lots. If the flow is too great for the system, the water will flow overland into the next drainage channel. This makes the hydrology modeling complicated, since development or disturbance may change the flow direction.

During the NRCS analysis of alternatives to reduce flooding, it was discovered that a drainage area that appeared from the USGS Quadrangle map, to drain into Anderson Creek, actually drained to Mosher Creek. Of this drainage area, 448 acres had drained toward Mosher Creek due to the lack of a road culvert under State Trunk Highway 175. Historically, this water had drained into Anderson Creek. Construction of State Trunk Highway 175 during the 1920s resulted in the disruption of the previously existing drainage patterns. The watershed west of U.S. Highway 41 has a split flow condition. A portion of the flow drains south along the west side of U.S. Highway 41 and into Mosher Creek. The rest of this 330-acre drainage area drains to the two 36-inch culverts under U.S. Highway 41 at the Flood Mobile Home Park. For the Anderson Creek hydrologic analysis, the discharge from these culverts was read into the model as a hydrograph. This hydrograph was calculated in the Mosher Creek hydrologic model with the analysis of the split flow at U.S. Highway 41.

The purpose of the Anderson Creek Diversion channel was to reduce the flooding in residential areas in the Village of North Fond du Lac by returning the Mosher Creek and Anderson Creek drainage area boundaries to as near their original locations as possible. The diversion project consisted of culverts under Highway 175 and a constructed channel directly upstream of Highway 175 continuing downstream of Highway 175 outletting into Anderson Creek. The culverts under Highway 175 were designed by the Wisconsin Department of Transportation to convey the 1-percent-annual-chance storm discharge. The diversion channel was designed by Robert E. Lee and Associates, Inc., to safely convey the 1-percent-annual-chance storm discharge to its outlet into Anderson Creek. In addition, the original hydrologic model was modified to include the modeling of a wetland area as a storage location. At this time, the diversion channel and culverts under Highway 175 at the diversion location were also modeled. The storage in the diversion

channel upstream of Highway 175 and the discharge through the Highway 175 culverts were modeled.

During the analysis of alternatives to reduce flooding along Mosher Creek, it was discovered that debris was a detrimental factor in past flood events. Debris would block the railroad culverts and increase the backup of floodwaters upstream of the railroad grade and cause increased flood damages to houses in the Village of North Fond du Lac. Therefore, in 1995, a trash rack was installed to reduce flooding of the houses due to the plugging of the downstream railroad culverts. In 1995, the Wisconsin Central Railroad also replaced several sections of the Mosher Creek culverts through the railroad. New 8-foot by 16-foot box culvert sections replaced the three 60-inch diameter culverts and the two 80-inch diameter culverts. The resulting culverts had significantly increased capacity.

For Clamshell, West Fork Clamshell, and Parsons Creeks, two methods of hydrologic analysis were utilized to determine the peak discharge-frequency relationships. The first method utilized the flood frequency equations published by the USGS (Reference 12). These equations were developed by using a multiple regression analysis to define the relationship between flood discharge and 13 independent basin characteristics. This analysis defined the regression coefficients and regression constant, evaluated the significance of each basin characteristic, and provided a standard error of estimate. Data from 160 continuous record and 115 crest-stage partial-record gaging stations in Wisconsin and adjoining states were considered in developing the relationships.

The second method consisted of the development of drainage area-discharge relationships for gaged streams on similar watersheds. Using log-Pearson Type III analysis with zero skew, gage records from these similar watersheds were compared and plotted versus drainage area on log-log paper to yield a family of frequency discharge curves for basins similar to those associated with the streams studied in detail. Gage records and basin characteristics were obtained from a report done by the USGS (Reference 12). Both methods produced similar results for the streams studied.

The hydrologic analysis of De Neveu Creek was performed in conjunction with a Flood Control Feasibility Study (Reference 15) prepared for the City of Fond du Lac. For that report, the selected recurrence interval discharge values (l0-, 4-, 2-, and 1-percent-annual-chance) were developed through the use of the USACE HEC-1 computer model (Reference 16) with a rainfall-runoff option designed to generate a dimensionless unit hydrograph that was then adjusted through the application of various hydrologic parameters. No hydrologic data were generated for the 0.2-percent-annual-chace flood event.

The 1-percent annual chance flood hydrograph for De Neveu Creek was also obtained from the feasibility study. The volume of the hydrograph above the discharge of 2,050 cfs was routed through the shallow flooding area west of De Neveu Creek, to determine the extent and depth of flooding. A modified puls routing technique was utilized.

A depth-volume relationship was established for the shallow flooding area west of De Neveu Creek as input for the routing analysis. The area cannot contain the hydrograph volume without overflowing at the low points in the profile of Winnebago Drive at Park Avenue. The routing is based on a stage-discharge relationship for this overflow. The stormwater pumping capacity associated with the shallow flooding area was determined by the city and was incorporated into the overflow values for the routing analysis.

The result of the routing analysis is that the area generally between the De Neveu Creek and Garfield Street floods to elevation 752 feet (NGVD 29). The area west of Garfield Street floods to elevation 750 feet (NGVD 29). The city has experienced similar shallow flooding as a result of past historic flood events.

For the March 18, 1986, Fond du Lac County revision, the hydrologic re-analysis of Taycheedah Creek was based on the development of multiple regression equations by the USGS methods outlined in "Estimating Magnitude and Frequency of Floods in Wisconsin" (Reference 12).

For the April 5, 1988, revision of the Fond du Lac County FIS, detailed hydrologic information added in areas de-annexed by the City of Fond du Lac along Luco Creek and Taycheedah Creek were taken from the FIS for the City of Fond du Lac, Fond du Lac County, Wisconsin, and were used without modification (References 17 and 18). In addition, the flood discharges used for the 1986 revision along De Neveu Creek were used in the 1988 revision.

The peak discharges for the main stem, East Branch and the West Branch Fond du Lac River were taken from the March 4, 1988, FIS for the City of Fond du Lac, Wisconsin. This report utilized information from a Flood Plain Information Report prepared by the USACE (Reference 20). This information included drainage areas, unit hydrographs, 1-percent-annual-chance flood peaks, and discharge-frequency curves. A drainage area-discharge relationship was used to determine the runoff peaks at the upstream locations. The discharges for the East Branch and West Branch Fond du Lac Rivers were determined by statistical analysis using the log normal distribution of records from discontinued gages on each stream. For the West Branch Fond du Lac River, discharges are reduced for the downstream reaches due to the storage effect of marsh areas.

The flood discharges obtained from these sources were compared to flows obtained through use of the USGS regional flood estimation technique (Reference 12), and to flows resulting from a log-Pearson Type III analysis (Reference 13) with zero skew, utilizing 15 years of East Branch Fond du Lac River and West Branch Fond du Lac River gaging station records (Reference 12). All three methods produced similar flows at the corresponding recurrence intervals.

Peak discharges for the Harris Creek were taken from the April 2, 1991, FIS for the City of Waupun, Wisconsin. Harris Creek is tributary to the South Branch of the Rock River within the Waupun corporate limits. The drainage area at the confluence with the South Branch of the Rock River is 4.9 square miles. Flood flow-frequency relationships were developed using the rational method (Reference 21) and checked with the MFFW equations. Data for both methods were taken from

preliminary USGS topographic mapping (Reference 22), City of Waupun topographic and street mapping (Reference 23), and field observations.

The rational method was used to develop two sets of flows. The first set of flows was for the entire drainage basin. The second set excluded the upper portion of the drainage basin consisting primarily of marsh and lowlands. The marsh area greatly increases the time of concentration, and thus offset the increased drainage area. Flow calculations excluding this upstream area produced peak flows higher in magnitude than the entire basin. These flows are more indicative of the maximum flows which could occur

The 1-percent-annual-chance elevation for Kettle Moraine Lake was determined using a HEC-1 model. There are no inflow streams, and surveying data for three culverts on the north end of the lake showed outflow to be insignificant, even for high stages. Therefore, the 1-percent-annual-chance lake level was assumed to be the result from the inflow of surface water only. An SCS curve number of 75 was determined for the contributing land drainage area. The starting water-surface elevation was assumed to be the maximum stage recorded (4 years of record) because little historical data exist for the lake. Rainfall amounts for the 10-, 4-, 2-, and 1-percent-annual-chance, 24-hour storms were taken from SCS TR-55, and a Type II rainfall distribution was used. The resulting maximum 1-percent-annual-chance water-surface elevation was determined to be close to that determined by the WDNR in 1987.

The hydrologic analysis for Milwaukee River was taken from the October 16, 2003, FIS for the unincorporated areas of Fond du Lac County (Reference 3). The comprehensive analysis by the SEWRPC (Reference 24) and the resultant flood flows are the basis for the discharges used for the hydrologic analysis of the East Branch Milwaukee River, the West Branch Milwaukee River, and the Upper Milwaukee River for the 1982 FIS. Gage records are available at Milwaukee for the Milwaukee River; however, watershed characteristics at the gaging station are significantly different from those in the upper reaches of the watersheds studied. The SEWRPC analysis was carried out by synthetic modeling of flood flows primarily for snowmelt events. The characteristics and magnitude of floods generated by melting snow were determined by assuming that soils were frozen during the melting period. All hydrologic subareas were assigned a runoff curve number of 100 (impervious soils) to adjust the mode to these conditions. Potential melt periods, snowmelts, and snow packs were determined by a systematic search of historic records. Further statistical analysis demonstrated that the 1-percent-annual-chance flood for the total Milwaukee River watershed could be entirely a snowmelt event.

Floods produced by rainfall were determined to be critical for only minor subwatersheds. The floods were synthesized by using a 24-hour rainstorm distribution based on information published by the U.S. Weather Bureau (Reference 25) and on rainfall patterns observed during major storms in the vicinity of the City of Milwaukee. Analysis of the 1-percent-annual-chance summer rainfall event on a representative watershed resulted in a flood peak with an indicated recurrence interval of only approximately 20 to 25 years.

Floods for 1990 land use conditions were synthesized for snowmelt and snowmelt rainfall events using the same rainfall amounts and snowmelt volumes used to develop flood flows for present land use conditions. The effects of urbanization on snowmelt and snowmelt-rainfall floods in the Milwaukee River were calculated to be minimal. Additionally, discharges in the lower reaches of the Milwaukee River are reduced by the storage effect of Campbellsport Dam.

The peak flood flows derived by the SEWRPC were compared with flows derived through application of a regional flood estimation technique developed by the USGS (Reference 12) at the State Highway 67 Bridge on the Milwaukee River. In addition, the SEWRPC compared its flows with flows derived from an earlier USGS regional technique (Reference 26) at 16 locations in the watershed. In both cases, it was determined that application of regional flood analysis methods may be expected to yield peak flood flows which are as much as 50 percent below the values derived from the SEWRPC's flood flow simulation model. The difference can be attributed to the fact that the SEWRPC model permits consideration of more factors that affect flood flows than do the regional flood analysis techniques, including variations in the capacity of channel reaches, soils, and land uses. The SEWRPC flood-frequency relation was extrapolated to the 0.2-percent-annual-chance recurrence interval on log-probability paper.

For Rush Lake, hydrologic information was prepared by the U.S. Department of Agriculture, Soil Conservation Service in April 1982, using TR-20 (Reference 27). This information was published in the March 17, 2003, FIS for Winnebago County, Wisconsin.

Flood discharges for Sevenmile Creek were determined by calculating the weighted average of two independent estimates of discharge: USGS Regional Regression Equations and a Log-Pearson Type III analysis of a USGS gage on the North Branch of the Little River near Coleman, Wisconsin (Reference 28). Comparison with other nearby USGS gaging stations revealed that the low soil permeability, low channel slope, and high storage potential of Sevenmile Creek is unusual for this region of the state, and comparison with the North Branch of the Little River would provide the best results. Discharges were then calculated for various drainage areas using a basin area transfer, with 0.6 as the power of the drainage area ratio. The 0.2-percent-annual-chance discharge was determined by extrapolation.

Peak discharges for Silver Creek were taken from the February 1980, FIS for the City of Ripon, Wisconsin. Flood discharges for Silver Creek were calculated from regional relationships using regional regression equations versus drainage area, slope, lake and marsh area, and mean annual snowfall (Reference 12). The peak discharges were then compared to those calculated using the SCS's Peak Rate Equation (Reference 29). The comparisons, using drainage area versus discharge, were reasonable in each case.

Estimates of flood magnitudes were coordinated with Howard, Needles, Tammen, and Bergendoff and then reviewed and approved in written communication by the WDNR (July 1977).

The flows for the South Branch Rock River and the West Branch Rock River were developed using the hydrologic method described by the U.S. Water Resources Council (Reference 13). Records from the gaging station on the South Branch Rock River at Waupun, and from the gaging station on the West Branch Rock River near Waupun, were used in the log-Pearson Type III analysis with zero skew. These flows were used for the hydraulic analysis upstream and downstream of the City of Waupun.

Hydrologic analyses conducted for this study included a log-Pearson Type III analysis with a natural skew coefficient of -0.7 and application of regional equations in "Estimating Magnitude and Frequency of Floods in Wisconsin" (MFFW), by Duane H. Conger (Reference 12). The natural skew log-Pearson analysis of the USGS flow data produced a discharge-frequency relationship significantly lower than those developed using a zero skew coefficient. The regional equations in MFFW were applied using the following data taken from preliminary USGS topographic mapping.

Drainage Area:	63.6 square miles
Ground Cover:	predominantly agricultural
Lake and Marsh:	8.25%
Channel Slope:	8.33 feet per mile

The resulting flows, including the standard error of estimate, produced a discharge-frequency relationship slightly lower than those derived by HNTB from stream flow records using zero skew.

Based on comparison of the results from these methods, the flows developed for the Fond du Lac County FIS are applicable for the lower reaches of Waupun. The flows based on the zero skew flow-frequency analysis were used in the Waupun FIS at the downstream study limit. Peak flows at the upstream study limit were prorated based on tributary area. These flows were reviewed and approved by the WDNR.

Peak discharges for the Unnamed Creek were taken from the September 29, 1989, FIS for the Village of Rosendale. The hydrologic analyses for Unnamed Creek were based upon flood-frequency equations developed for rural streams in Wisconsin (Reference 30) that relate flood magnitude-frequency characteristics to basin characteristics.

Discharges for the 10-, 2-, and 1-percent-annual-chance frequencies for Unnamed Tributary to De Neveu Creek were extracted from the model for De Neveu Creek, and the 0.2-percent-annual chance discharge was determined by extrapolation.

Flood discharges for Unnamed Tributary to Unnamed Tributary to De Neveu Creek and the 1-percent-annual-chance water-surface elevation for Lake De Neveu were determined using an outflow-elevation-storage relationship. This was determined using a step-backwater analysis of the tributary stream extending from the mouth at the confluence with Unnamed Tributary to De Neveu Creek to a cross section surveyed at the outlet of Lake De Neveu.

This Countywide Analysis

No hydrologic analyses were conducted for the streams within Fond du Lac County as part of this countywide revision.

A summary of the drainage area-peak discharge relationships for all of the streams studied by detailed methods is shown in Table 5, "Summary of Discharges".

TABLE 5 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
ANDERSON CREEK					
At Highway 45 (and at mouth)	7.54	1,200	1,709	1,948	2,490
At Minnesota Street (and Railroad)	6.82	1,196	1,703	1,943	2,472
Downstream of State Hwy 175	5.41	1,178	1,646	1,886	2,420
At State Hwy 175	4.90	1,088	1,549	1,785	2,314
CLAMSHELL CREEK AND WEST FORK CLAMSHELL CREEK					
At mouth	3.80	305	645	840	1,430
At Lincoln Road	3.20	282	590	770	1,300
DE NEVEU CREEK					
At mouth	21.00	1,640	2,530	3,140	*
Upstream of confluence with McDermott Creek	19.00	1,480	2,270	2,850	*
At County Highway V	16.30	1,340	2,040	2,580	3,520
EAST BRANCH FOND DU LAC RIVER					
At mouth	81.80	1,750	3,000	3,630	5,350
At the City of Fond du Lac corporate limits	77.90	1,600	2,700	3,300	4,950
Upstream of U.S. Highway 41	66.00	1,600	2,700	3,300	4,950
At Hickory Road	62.00	1,500	2,600	3,200	4,750
EAST BRANCH MILWAUKEE RIVER					
At County Highway F	24.50	121	380	556	1,270
FOND DU LAC RIVER					
At mouth	172.00	2,500	4,200	5,100	7,400
At confluence of East and West Branches	168.30	2,480	4,160	5,050	7,330

*Data not available

TABLE 5 - SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
HARRIS CREEK					
Upstream of confluence	4.90	225	300	335	410
MCDERMOTT CREEK					
At mouth	1.30	230	380	450	*
MILWAUKEE RIVER					
At Fond du Lac County boundary	70.80	1,661	2,500	2,928	3,900
At U.S. Highway 45	53.40	1,619	2,900	3,563	5,400
At Campbellsport Dam	48.00	1,863	3,200	3,922	5,600
At private bridge located at river mile 88.20	46.31	1,654	2,850	3,473	5,300
MOSHER CREEK					
At mouth	3.58	467	574	586	721
At Broadway Street	2.90	411	566	583	700
At Minnesota Street	2.84	355	448	533	676
At Highway 175	2.60	323	426	474	603
At the East Frontage Road of Highway 41	2.11	297	402	448	556
At Highway 41	1.09	144	203	228	288
PARSONS CREEK					
At County Highway B	7.55	680	1,420	1,850	3,150
POPLAR CREEK					
At mouth	4.10	445	835	1,040	1,630
SEVENMILE CREEK					
At mouth	20.80	455	665	755	940
At Veilbig Road	19.80	440	645	735	915
At County Highway Y at Lamartine	18.50	425	620	705	875
SILVER CREEK					
At County Boundary	36.80	1,160	1,840	2,190	3,020
At State Highway bridge in Arcade	36.00	1,160	1,840	2,190	3,020
At Ripon sewage treatment Plant	26.70	960	1,340	1,590	2,120
At Gothic Mill Pond Dam	23.20	790	1,140	1,290	1,620
At Douglas Road	22.20	790	1,140	1,290	1,620
At Silver Creek Road	14.60	780	1,400	1,800	2,800

*Data not available

TABLE 5 - SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
SOUTH BRANCH ROCK RIVER					
At confluence with West Branch Rock River	69.70	1,453	2,982	3,843	6,424
River Road bridge	63.60	*	*	2,850	4,125
Upstream of confluence of Harris Creek	55.80	*	*	2,550	4,125
SUPPLE CREEK					
At North Fond du Lac Village Limits (0.9 mile from mouth)	3.10	330	660	850	1,400
At Highway 175 bridge	2.30	260	510	640	1,100
TAYCHEEDAH CREEK AND LUCO CREEK					
At Lake Winnebago	17.10	1,100	2,400	2,800	5,000
At downstream crossing of County Highway T	6.60	650	1,100	1,275	1,800
At County Highway UU	4.30	450	750	850	1,300
At upstream crossing of County Highway T	3.10	160	255	300	415
UNNAMED CREEK					
Just downstream of State Highway 26	3.9	*	*	290	*
UNNAMED TRIBUTARY TO DE NEVEU CREEK					
Upstream of confluence with De Neveu Creek	7.70	535	945	1,250	1,860
Upstream of Mill Road	5.80	375	665	885	1,320
Upstream of tributary near Marblehead quarry	2.30	155	270	355	530
UNNAMED TRIBUTARY TO UNNAMED TRIBUTARY TO DE NEVEU CREEK					
At confluence with Unnamed Tributary to De Neveu Creek	0.86	9	15	17	25

*Data not available

TABLE 5 - SUMMARY OF DISCHARGES
(continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
WEST BRANCH FOND DU LAC RIVER					
At mouth	87.60	1,400	2,100	2,400	3,200
At State Highway 23	85.40	1,200	1,750	2,000	2,650
At County Trunk Highway "T"	58.60	1,200	1,750	2,000	2,650
Upstream of Eldorado Marsh	56.00	1,260	2,550	3,300	5,500
WEST BRANCH MILWAUKEE RIVER					
At confluence with Milwaukee River	119.50	3,904	6,400	7,667	11,100
At Rustic Drive	48.70	2,245	3,900	4,740	7,100
At Town Road	35.80	1,635	2,800	3,400	5,000
WEST BRANCH ROCK RIVER					
At State Highway 49	114.20	2,512	4,796	5,938	9,707
At confluence with South Branch Rock River	44.50	970	2,173	2,889	5,142

The stillwater elevations have been determined for the 10-, 2-, 1-, and 0.2-percent annual chance floods for the flooding sources studied by detailed methods and are summarized in Table 6, "Summary of Stillwater Elevations."

TABLE 6 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NAVD) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
KETTLE MORAINE LAKE				
Entire shoreline within Fond du Lac County	*	*	1,0254.9	*
LAKE DE NEVEU				
Entire shoreline within Fond du Lac County	863..1	863.5	863.6	864.2
LAKE WINNEBAGO				
Entire shoreline within Fond du Lac County	748.8	749.2	749.4	750.1
RUSH LAKE	822.5	822.9	823.1	823.6

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

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

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

For each community within Fond du Lac County that has a previously printed FIS report, the hydraulic analyses described in those reports have been compiled and are summarized below.

Pre-Countywide Analyses

The NRCS performed the hydraulic analysis for a portion of Anderson Creek from 18,470 feet upstream of Lake Winnebago to the mouth at Lake Winnebago, using the WSP2 computer program. FEMA performed the hydraulic analysis by extending the NRCS analysis upstream along Anderson Creek to 23,490 feet upstream of Lake Winnebago, using the USACE HEC-RAS 2.2 computer program.

For the original City of Fond du Lac FIS water-surface profiles for De Neveu Creek were computed using the USACE HEC-2 step-backwater computer program. During the 1988 revision, the city provided detailed mapping (References 33 and 58), which was used to modify the HEC-2 hydraulic computer model for De Neveu Creek. The model was revised to include additional cross sections developed from the detailed mapping and to correct computer cross sections which were inconsistent with the mapping. The De Neveu Creek hydraulic model used the 1985 City of Fond du Lac FIS revision (Reference 32) as its basis and included cross sections which were developed to artificially constrain the floodplain This constraint resulted in a narrow floodplain for the creek generally downstream of East Johnson Street and flood elevations which were higher than actual topography in the area The city's observation that these flood elevations are not consistent with the detailed mapping was verified.

For the June 6, 2000, revision of the Fond du Lac County FIS, the hydraulic analysis for De Neveu Creek, from approximately 420 feet downstream of County Highway V to approximately 0.36 mile upstream of County Highway V, was based in part on the FIS for the City of Fond du Lac (References 17 and 18). The

HEC-2 hydraulic model was revised to include additional cross sections obtained from field survey and topographic mapping and to correct cross sections that were inconsistent with detailed mapping provided by the City of Fond du Lac (References 31 and 32). The starting water-surface elevations were taken as the normal elevations on Lake Winnebago.

Cross sections data for the East Branch and West Branch Fond du Lac River were obtained from the USACE (Reference 20). All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. These data were supplemented by updated maps (Reference 33). All stream distances were determined using the new maps in accordance with standard procedures (Reference 34). Cross sections on the West Branch Fond du Lac River were continued from the main stem Fond du Lac River for consistency with the published Flood Plain Information report.

For the 1982 FIS, starting water-surface elevations for the East Branch Fond du Lac River and the West Branch Fond du Lac River were taken from the FIS for the City of Fond du Lac, Wisconsin (Reference 35). Elevations at the upstream end of Silver Creek at the City of Ripon corporate limits were obtained from the FIS for the City of Ripon (References 36 and 37).

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 model (References 38 and 31). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Flood profiles for streams draining into Lake Winnebago were developed with an analysis of both stream and lake flooding conditions. The simultaneous occurrence of both events has a very low probability-the product of the individual probabilities. Flood profile elevations for each recurrence interval on a stream were compared to the corresponding event on Lake Winnebago. The higher value controls and takes precedence on the flood profiles.

Water surface profiles were developed using the HEC-2 model. The hydraulic model utilized in the Flood Plain Information report was updated to reflect changes in methodology and new improvements. Profiles were determined for the 10-, 2-, 1-, and 500-year floods. Differences in computed water-surface elevations between the Flood Plain Information report and this study were due to updated mapping and HEC-2 coding techniques, especially at bridges.

Starting elevations used in the backwater computations for the main stem and West Branch Fond du Lac Rivers. Reviews of areas serviced by storm pumping stations were made. However, no attempts were made to evaluate their capacities as affected by rainfall runoff or stream flooding due to an event of the 1-percent annual chance magnitude. Storm sewers not controlled by lift stations could result in significant flooding due to riverine backup, but only two uncontrolled storm sewers, both entering the East Branch Fond du Lac River, are expected to need protection. Due to the low head on the storm manholes (approximately 1.5 feet) and duration of storm, these sewers are expected to be sandbagged successfully for the 1-percent annual chance flood event.

Water-surface elevations for streams in the Milwaukee River system were obtained from a comprehensive basin plan by the SEWRPC (Reference 24). Water-surface elevations for the lake upstream of the dam at Campbellsport on the Milwaukee River were obtained from the FIS for Campbellsport (Reference 3).

Cross section data for the Upper Milwaukee River were obtained by field survey. The dam and two bridges were surveyed to obtain elevation data and structural geometry. Water-surface profiles were developed to an accuracy of 0.5 foot using the HEC-2 model (Reference 38). Starting water-surface elevations were input to the computer on the basis of flood profiles for the adjacent unincorporated areas of Fond du Lac County. These in turn were calculated starting at an estimated normal depth for each flood discharge. Profiles were determined for the l0-, 2-, l-, and 0.2-percent annual chance floods (Exhibit 1). Very close correlation was found between the HEC-2 profiles and the profiles determined by SEWRPC (Reference 24) using USACE's computer program (Reference 39). SEWRPC's model had been calibrated to match known stage-discharge relationships wherever they existed.

For Mosher Creek, in the FIS dated June 1979, cross section data for the streams were obtained by field survey. Cross sections were located at close intervals above and below bridges and culverts in order to compute any significant backwater effects. All bridges were identified by field inspection. Only one small footbridge that lies south of Marcoe Street on Mosher Creek was evaluated as unstable under flood conditions and insignificant in producing backwater effects. All structures were surveyed to obtain elevation data and structural geometry.

The starting water surface elevation for Mosher Creek was obtained from the FIS by the Study Contractor for the adjacent unincorporated areas of Fond du Lac County (Reference 3).

For the October 16, 2003 revision, the NRCS performed the hydraulic analysis of Mosher Creek from 12,977 feet upstream of Lake Winnebago to the mouth at Lake Winnebago, using the NRCS WSP2 computer program. Cross section data were obtained from the Village of North Fond du Lac Storm Water Study completed by Robert E. Lee and Associates, Inc. This cross section data was supplemented by using the Village of North Fond du Lac's mapping (Reference 4) 1-foot contour interval and 1 inch = 100 feet scale, prepared by Air Maps Inc.).

During the NRCS analysis of alternatives to reduce flooding in the Village of North Fond du Lac, a discrepancy was noted between the Village of North Fond du Lac's benchmark elevations and the USGS benchmark elevation. The Village of North Fond du Lac's datum was found to be 1.3 feet higher than the USGS datum. This discrepancy effects the elevations on the North Fond du Lac 1-foot contour mapping. All of the computer modeling was adjusted to the USGS datum based on this 1.3-foot elevation change. The flood boundaries delineated on the mapping also accounted for this change.

The starting water-surface elevation for the 1-percent-annual-chance flood on Sevenmile Creek at the mouth is from the 10-percent-annual-chance water-

surface elevation of the East Branch of the Fond du Lac River; the starting water-surface elevations for the 10-, 2-, and 0.2-percent-annual-chance events are normal water, 10-, and 1-percent-annual-chance elevations, respectively.

Stream channels, dam, and bridge geometry were field surveyed by the USGS. Overbank data were obtained from large-scale topographic maps (Reference 40). Starting water-surface elevations for Silver Creek were obtained from the FIS for Fond du Lac County, Wisconsin (Reference 41). Water-surface elevations for the 10-, 2-, 1-, and 0.2-percent annual chance floods on Silver Creek in Ripon were determined using the USGS J 635 digital-computer program model (Reference 42). All culverts in the city and the Gothic Mill Pond Dam were evaluated using indirect methods (References 43 and 44). Input to the above analyses consisted of stream valley cross sections, bridge and dam geometry, surface roughness, and peak-discharge data. Flood profiles were drawn showing water-surface elevations to accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Cross sections for the South Branch of the Rock River and Harris Creek were obtained from field surveys and 1:4800 scale, 2-foot contour, topographic mapping obtained from aerial photography (Reference 45). The dam, bridges, and culverts were field surveyed to obtain elevation data and structural geometry. Below water sections were estimated based on field surveyed structural data and available topographic mapping.

Starting water surface elevations for both of the waterways were determined using the slope-area method. Water surface elevations for floods of the selected recurrence intervals on both waterways were computed through the use of the HEC-2 model.

During the conduct of the original Waupun FIS, the City of Waupun removed the River Road Bridge at river mile 2.66. The hydraulic effect of this bridge removal on the flood profiles was evaluated by the WDNR. This study reflects the hydraulic characteristics of the South Branch of the Rock River without the River Road Bridge.

For the April 2, 1997 revision of the City of Waupun FIS, the HEC-2 step-backwater program was used with the revised discharges to determine water-surface elevation for the 1- and 0.2-percent annual chance floods for South Branch Rock River. Channel roughness values were not changed from those used in the original Waupun FIS.

Harris Creek south of Main Street to the city limits was studied with approximate methods. A backwater analysis on two representative sections taken from field measurements produced 1-percent annual chance flow depths and flood widths. The floodplain for the rest of the reach was then approximately delineated using USGS quadrangle mapping (Reference 22) and field photographs (Reference 46).

For Supple Creek, flood elevations at the North Fond du Lac village limits were obtained from the FIS for the Village of North Fond du Lac (References 47 and 48). The starting water surface elevation used in the hydraulic analysis for Supple

Creek was based on a normal depth analysis by the HEC-2 computer program and verified by hand calculations (Reference 38). The flood profile for Supple Creek was developed with an analysis of stream flooding conditions. Water surface profiles were developed using the HEC-2 computer step-backwater model (Reference 38). Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of 10-, 2-, 1-, and 0.2-percent-annual-chance recurrence.

For the March 18, 1986, revision, the HEC-2 re-analyses of Luco and Taycheedah Creeks were based in part on the information presented in the 1982 FIS. Minor adjustments to cross section information and hydraulic parameters were made for the re-analyses, which was based on the reduced peak discharge values. As a result of new topographic information, some areas along Taycheedah Creek were designated as an AH Zone.

The starting water-surface elevation for Unnamed Tributary to De Neveu Creek was taken from the flood profile for De Neveu Creek at the confluence due to the assumption of coincident peaks of the 1-percent-annual-chance floods based on discharges of the two streams at the confluence.

The starting water-surface elevations for the 1-percent-annual-chance flood on Unnamed Tributary to Unnamed Tributary to De Neveu Creek at the mouth is from the 10-percent-annual-chance water-surface elevation of cross section "A" for Unnamed Tributary to De Neveu Creek; the elevations for the 10-, 2-, and 0.2-percent-annual-chance events were normal water, 10-percent-annual-chance, and 1-percent-annual-chance elevations respectively.

Analysis of levels on Lake Winnebago was based on lake data obtained from the USACE, Chicago District (References 38 and 49), and the Oshkosh gage.

Analysis of flooding caused by Lake Winnebago was based on computed and published frequency data (Reference 20) as shown in Figure 1, "Elevation Frequency Curve." Elevations given are a combination of short-term stillwater levels reflecting general lake fluctuations and differential elevations due to wind setup and/or seiche activity. Figure 2, 'Wind Setup, Wave Runup', depicts this relationship.

Figure 2 also depicts the addition of runup to the storm water-surface caused by wind-generated waves. This simultaneous occurrence of storm water lake levels and wind-wave action was used for all runup computations. It should be noted that the floodplain delineation for Lake Winnebago does not include flooding resulting from wave runup, in accordance with NFIP guidelines. Such flooding could be significant due to the flat topography along the lake shore.

Predictions of wave runup were based on breaking wave criteria. Surveyed lake shore cross sections were utilized in determining breaking wave heights and equivalent deepwater wave heights. A wave period of 3.5 seconds was assumed to represent typical storm waves on Lake Winnebago. Wave runup at the City of

Fond du Lac is based on procedures set forth in the USACE's Shore Protection Manual (Reference 50).

Winds from the north were considered to produce the most severe wave conditions at Fond du Lac. The height of breaking waves approximately 50 feet offshore was estimated based on lake bathymetry. Using this breaking wave height together with the assumed wave period, the equivalent deepwater wave height was obtained. Wave runup was then estimated through the surveyed lake cross sections and the Shore Protection Manual (Reference 50). Pertinent wave runup data can be found in Table 7, "Wave Runup Data". Wave heights and runups shown in this table have no frequency attached to them. Runup computed at each cross section represents the effects of lake bottom and shoreline topography at the specific cross section location. Runup in other areas may vary slightly due to varying topography between cross sections.

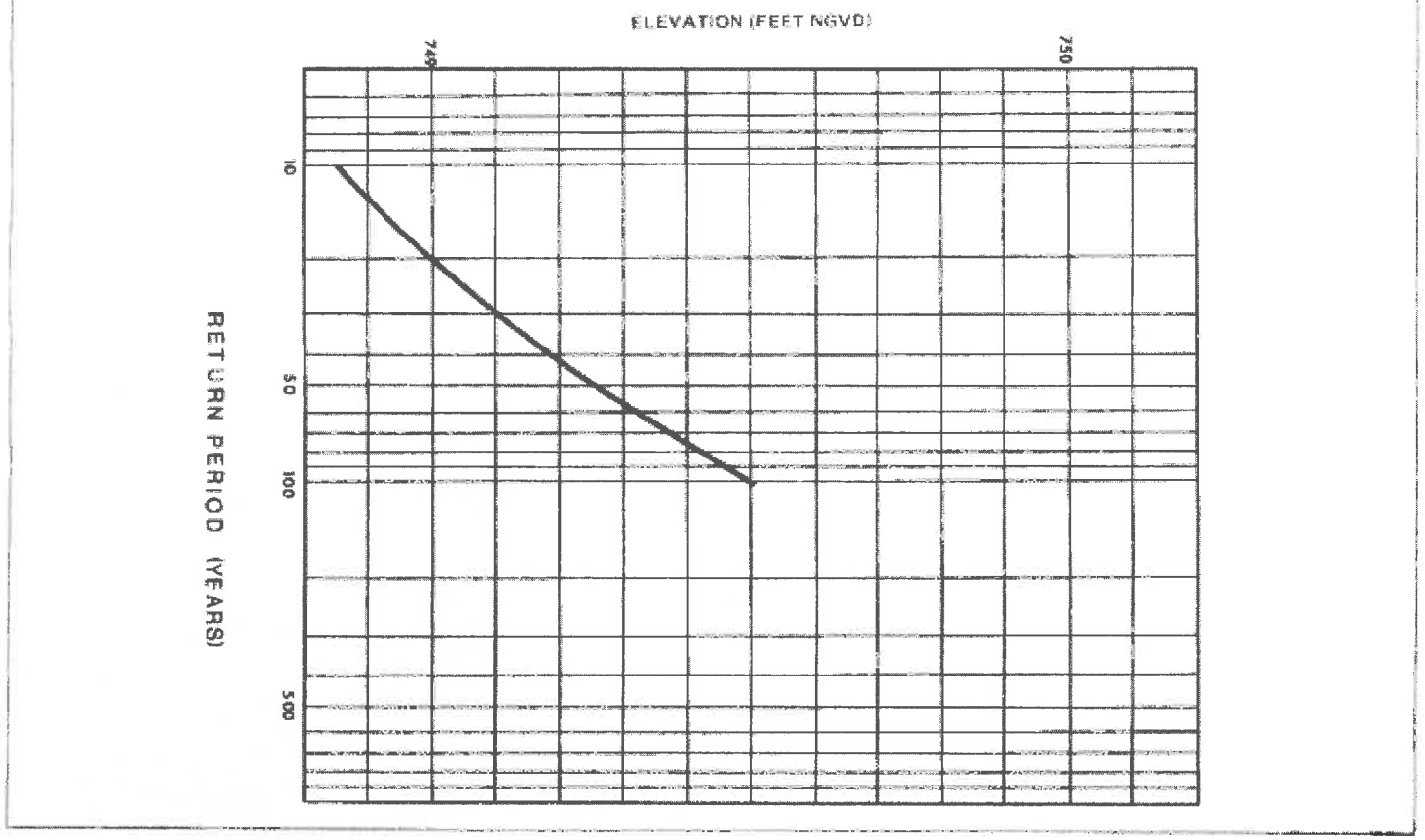


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI
(AND INCORPORATED AREAS)

ELEVATION FREQUENCY CURVE

LAKE WINNEBAGO

FIGURE 2- WIND SETUP, WAVE RUNUP

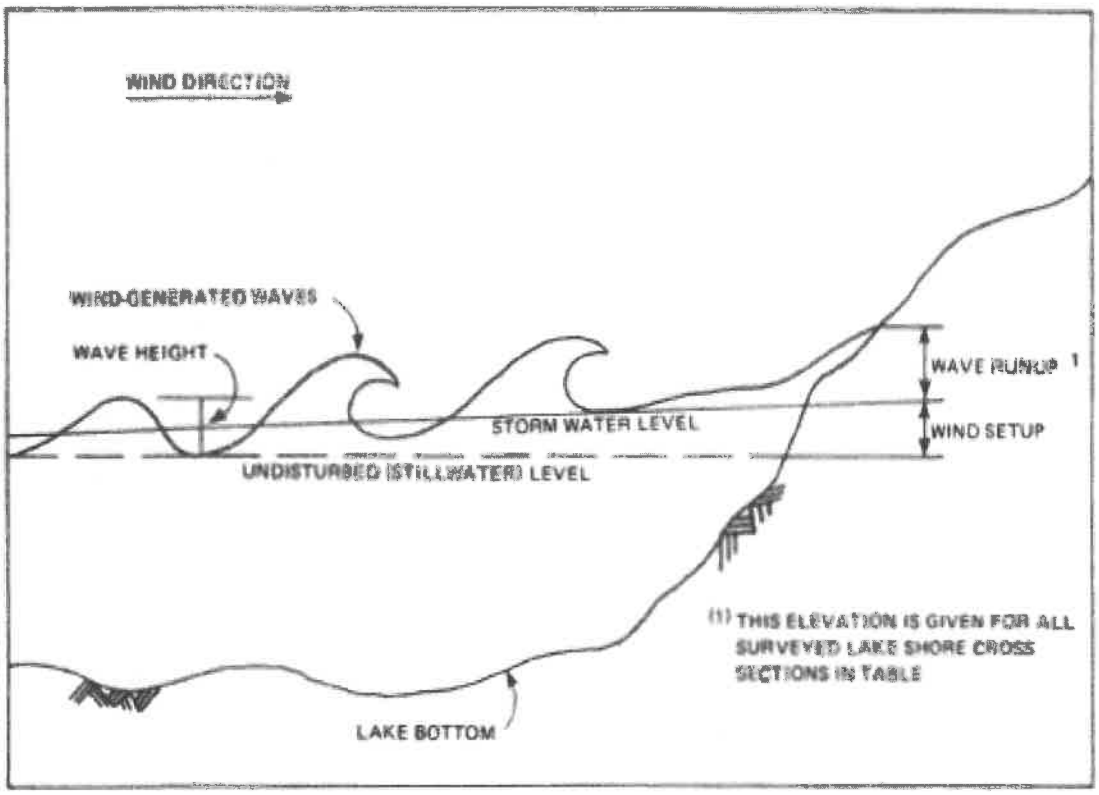


TABLE 7 - WAVE RUNUP DATA

Cross Section Identification	Direction	Effective Fetch (nautical miles)	Equivalent Deepwater Wave Height (feet)	Wave Period (seconds)	Wave Runup (feet)	Comments
1	N	11	3.1	3.5	1.4	Runup will be dissipated on riprap bank.
2	N	11	2.6	3.5	1.1	Runup will be dissipated on riprap mound, flooding would occur behind riprap mound.
3	N	11	2.7	3.5	1.3	Runup will over-top riprap bank and cause shore-line flooding.

Flood elevations for Rush Lake were established using the flows established in the Eight Mile Creek Flood Hazard Study published by the SCS in April 1982. The flood elevations were computed using the SCS WSP-2 step-backwater program (Reference 51). An analysis of the capacity of the control structure based on gates closed conditions was used to establish flood elevations on the lake.

This Countywide Analysis

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

For McDermott Creek, McMahon Engineering's original HEC-2 model was updated by the WDNR to include reconstructed CTH "T" Culvert pipe crossing (Reference 52). Cross sections were obtained from field surveys. The dimensions of hydraulic structures were obtained from as-built plans. Starting water surface elevations were based on a normal depth condition (Reference 53).

For Mosher Creek, the original NRCS study was converted from WSP2 to HEC-RAS model. A topographic survey of the stream restoration project area was performed by Robert E. Lee & Associates. From this surveyed data, cross sections, bridge geometry, and roughness factors were obtained, and then inserted into the converted model to create an existing condition (Reference 54). 10-year elevation of receiving body of water (Lake Winnebago) was used as the starting WSEL in HEC-RAS model.

For Taycheedah Creek, the original HEC-2 hydraulic model was updated to include new bridge across Taycheedah Creek (Reference 55). The dimensions of hydraulic structures were obtained from the Wisconsin Department of Transportation (WDOT) as-built plans. Starting water surface elevations were based on a normal depth condition (Reference 53).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and floodplain areas. Roughness factors for all streams studied by detailed methods are shown in Table 8, "Manning's "n" Values."

TABLE 8 - MANNING'S "N" VALUES

Stream	Channel "n"	Overbank "n"
Anderson Creek	0.013-0.046	0.030-0.120
Clamshell Creek	0.020-0.046	0.030-0.120
De Neveu Creek	0.030-0.100	0.030-0.125
East Branch Fond du Lac River	0.020-0.100	0.030-0.120
East Branch Milwaukee River	0.020-0.046	0.030-0.120
Fond du Lac River	0.030-0.100	0.030-0.100

TABLE 8 - MANNING'S "N" VALUES (continued)

Stream	Channel "n"	Overbank "n"
Harris Creek	0.040-0.055	0.030-0.100
Luco Creek	0.025-0.030	0.045-0.100
McDermott Creek	0.040-0.045	0.050-0.080
Milwaukee River	0.020-0.046	0.030-0.120
Mosher Creek	0.013-0.046	0.030-0.130
Parsons Creek	0.020-0.046	0.030-0.120
Poplar Creek	0.020-0.046	0.030-0.120
Sevenmile Creek	0.030-0.050	0.045-0.095
Silver Creek	0.020-0.055	0.030-0.130
South Branch Rock River	0.020-0.055	0.030-0.120
Supple Creek	0.013-0.046	0.030-0.120
Taycheedah Creek	0.025-0.050	0.030-0.100
Unnamed Creek	0.035-0.050	0.015-0.100
Unnamed Tributary to De Neveu Creek	0.035-0.059	0.040-0.125
Unnamed Tributary to Unnamed Tributary to De Neveu Creek	0.035-0.059	0.040-0.125
Upper Milwaukee River	0.029-0.044	0.035-0.070
West Branch Fond du Lac River	0.020-0.100	0.030-0.120
West Branch Milwaukee River	0.020-0.046	0.030-0.120
West Branch Rock River	0.020-0.046	0.030-0.120
West Fork Clamshell Creek	0.020-0.046	0.030-0.120

Except where ice-jam analyses were performed, the hydraulic analyses were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88. The datum conversion factor from NGVD 29 to NAVD 88 in Fond du Lac County is -0.1 feet (0.0 feet NGVD 29 = -0.1 feet NAVD 88).

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

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

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent annual chance flood elevations; delineations of the 1-percent annual chance and 0.2-percent annual chance floodplains; and 1-percent annual chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (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.

For unrevised streams in Fond du Lac County, data was used from previously printed FISs for each individual community and are compiled below.

Pre-countywide Analysis

For the 1982 Fond du Lac County FIS, the floodplain boundaries were interpolated between cross sections, using topographic maps at a scale of 1:62,500 with a contour interval of 20 feet (Reference 56), and more detailed flood maps from other studies where applicable (References 24 and 20). The delineation of the 1-percent-annual-chance approximate floodplain boundary was based on mapping that existed at the time (References 24, 20, and 57).

For the March 18, 1986, revision of the Fond du Lac County FIS, the detailed flood boundaries along Luco Creek, De Neveu Creek, and Taycheedah Creek (from the mouth to approximately river mile 3.0) and the approximate 1-percent-annual-chance floodplain boundary along McDermott Creek, a tributary to De Neveu Creek and a tributary to Taycheedah Creek were re-delineated using updated topographic mapping at a scale of 1:1,200 with a 2-foot contour interval (Reference 58). For the remaining flooding sources studied by detailed or approximate methods, the floodplain boundaries were re-delineated and added using topographic mapping at a scale of 1:24,000 and a contour interval of 10 feet (Reference 59).

For the April 5, 1988, revision of the Fond du Lac County FIS, the floodplain boundaries for De Neveu Creek, Luco Creek, Taycheedah Creek, and McDermott Creek were taken directly from the work maps used in preparing the October 15, 1985, FIS for the City of Fond du Lac (Reference 58 and Reference 60).

For the June 6, 2000 revision of the Fond du Lac County FIS the floodplain boundaries were interpolated between cross sections, using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 61).

For the October 16, 2003, revision of the Fond du Lac County FIS, the floodplain boundaries were interpolated between cross sections, using topographic maps at a scale of 1:1,200 with a contour interval of 1 foot.

The delineation of 1-percent-annual-chance approximate boundaries was based on mapping that existed at the time the 1982 FIS was done. A comprehensive watershed report by the SEWRPC covered areas studied in the Milwaukee River basin (Reference 24). A floodplain report prepared by the USACE covered areas just outside the City of Fond du Lac corporate limits at De Neveu Creek (Reference 20). USGS Floodprone Area Maps covered the Lake Winnebago shoreline and areas in the Rock River basin (Reference 56). The Flood Hazard Boundary Map covered areas studied on the South Branch of the Manitowoc River near Johnsburg (Reference 3). In addition, the county Floodprone Area Map provided coverage of all unincorporated areas studied (Reference 62). For Sandy Beach Creek and Minawa Beach Creek, approximate floodplain boundaries were established by determining the 1-percent annual chance floodplain discharges and utilizing detailed aerial mapping and the HEC-2 backwater analysis (Reference 38).

For the Village of Campbellsport the floodplain boundaries were interpolated using topographic maps at scale of 1:62,500, with a contour interval of 20 feet (Reference 63). Plat mapping at a scale of 1:3600 provided by the Village of Campbellsport (Reference 64) serves as the base map for both the Flood Boundary and Floodway Map and the Flood Insurance Rate Map.

For the City of Fond du Lac the floodplain boundaries were interpolated using topographic maps at a scale of 1:2400, with a contour interval of 2 feet (Reference 65), and/or orthophotographic maps at a scale of 1:1200, with a contour interval of 1 foot (Reference 33).

For the Village of North Fond du Lac the floodplain boundaries were interpolated using topographic maps at a scale of 1:24,000, with a contour interval of 10 feet (Reference 66).

For the City of Ripon the floodplain boundaries were interpolated using a topographic map at a scale of 1:2400, with a contour interval of two feet (Reference 40). Approximate flood boundaries were determined using the Flood Hazard Boundary Map (Reference 5).

The floodplain boundaries for the Village of Rosendale were interpolated using topographic maps at a scale of 1:2400 with a contour interval of 10 feet (Reference 67).

For the City of Waupun the floodplain boundaries were interpolated using 1:4800 scale, 2 foot contour mapping developed from aerial photography (Reference 15). For the areas studied by approximate methods, the boundaries of the 1-percent annual chance flood were estimated using USGS topographic mapping (Reference 22) and field survey data.

Flood boundaries on Lake Winnebago are based on maximum Stillwater elevations with wind setup only. Table 7 should be referred to for typical wave heights at selected locations.

This Countywide Analysis

For this countywide FIS, flood boundaries for flooding sources studied by both detailed and approximate analysis were redelineated using digital topographic contours provided by the Fond du Lac County Planning Department, with contour intervals of 2 feet in areas around most municipalities, and 4 feet in all other areas. Floodplain boundaries within the City of Fond du Lac were not redelineated because the existing boundaries were based on better, 1-foot contour, topography.

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-perent

annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. However, Wisconsin has established a more strict policy and does not allow any increase in the regional flood height for flood fringe developments (Reference 68). The increase shown in Table 9, "Floodway Data" for certain stream segments were calculated before this policy went into effect, and are shown as the regulatory elevation to remain in compliance with the current regulation. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 9, Floodway Data). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

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. 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 hydraulic methods can be seen in Table 9, Floodway Data Table. 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.

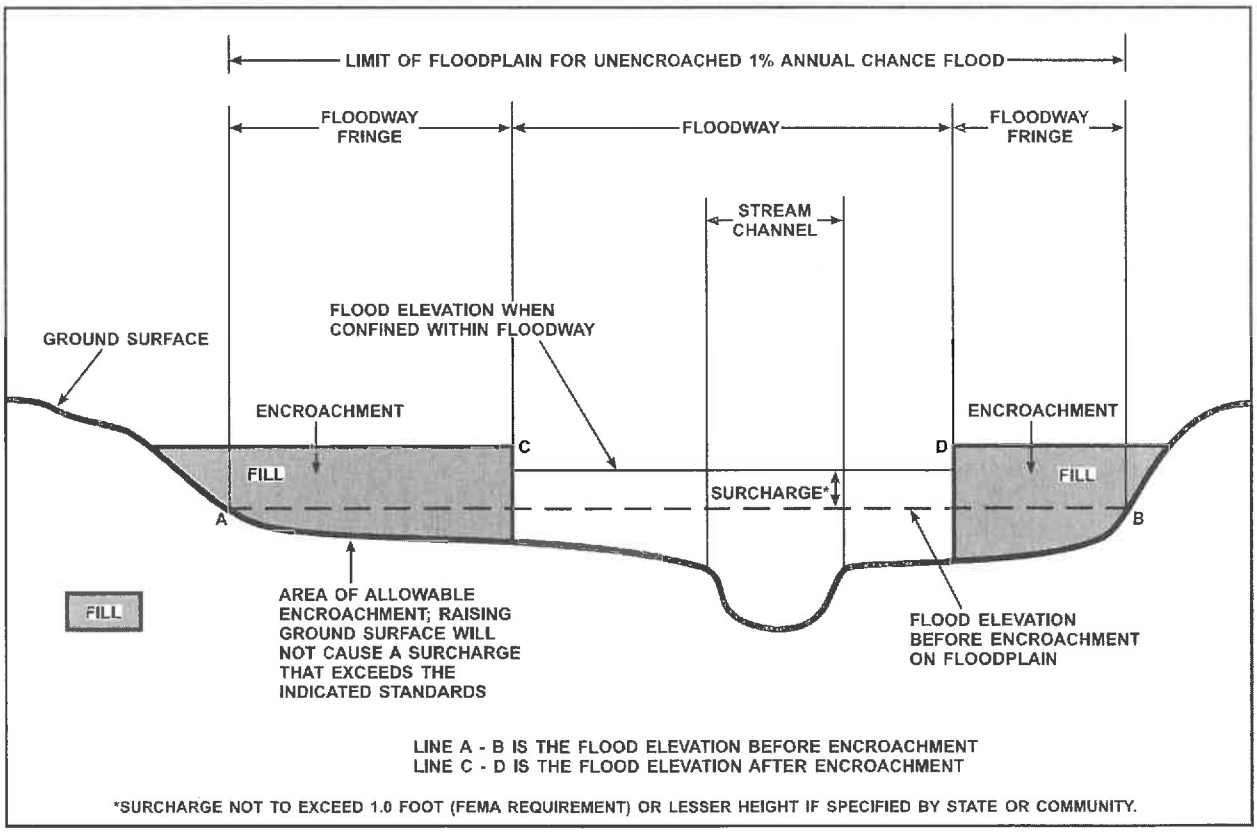
The floodway shared by Luco Creek and Taycheedah Creek represents an administrative floodway agreed upon by the City of Fond du Lac and the State of Wisconsin for during the March 18, 1986 revision to the Fond du Lac County (Unincorporated Areas) FIS.

The delineation of a floodway for Long Lake and Lake Bernice is not appropriate and is not shown on the FIRM.

Portions of the floodway for Silver Creek extend beyond the county boundary. Gothic Mill Pond has no significant impoundment effect on the 1-percent annual chance flood.

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 3, "Floodway Schematic."

FIGURE 3 - FLOODWAY SCHEMATIC



FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
DE NEVEU CREEK									
A	0.10	89	381	5.4	0	749.4	748.1[2]	748.1	0.0
B	0.16	88	355	5.8	0	749.4	748.6[2]	748.6	0.0
C	0.24	102	484	4.2	0	749.6	749.6	749.6	0.0
D	0.29	71	312	6.6	0	749.9	749.9	749.9	0.0
E	0.46	85	459	4.5	0	751.7	751.7	751.7	0.0
F	0.71	78	426	6.5	0	753.1	753.1	753.1	0.0
G	0.78	310	725	3.8	0	754.4	754.4	754.4	0.0
H	0.97	73	321	8.9	0	755.7	755.7	755.7	0.0
I	1.04	297	751	3.8	0	757.9	757.9	757.9	0.0
J	1.17	79	427	6.7	0	758.7	758.7	758.7	0.0
K	1.26	71	361	7.9	0	759.6	759.6	759.6	0.0
L	1.37	62	417	6.8	0	761.0	761.0	761.0	0.0
M	1.55	128	470	6.1	0	763.1	763.1	763.1	0.0
N	1.68	61	397	7.2	0	764.7	764.7	764.7	0.0
O	1.77	68	420	6.8	0	765.9	765.9	765.9	0.0
P	2.02	70	441	6.5	0	770.8	770.8	770.8	0.0
Q	2.19	438	1,095	2.6	213	773.1	773.1	773.1	0.0
R	2.32	228	601	4.7	104	774.4	774.4	774.4	0.0
S	2.41	158	630	4.5	75	775.6	775.6	775.6	0.0
T	2.61	163	692	4.1	0	780.8	780.8	780.8	0.0
U	2.73	200	586	4.9	0	782.1	782.1	782.1	0.0
V	2.83	114	335	8.5	0	784.5	784.5	784.5	0.0
W	3.04	270	642	4.0	78	790.0	790.0	790.0	0.0
X	3.24	415	906	2.8	0	793.3	793.3	793.3	0.0
Y	3.48	251	609	4.2	0	795.6	795.6	795.6	0.0
Z	3.64	308	604	4.3	156	798.1	798.1	798.1	0.0
AA	3.89	270	551	4.7	0	802.9	802.9	802.9	0.0

[1]MILES ABOVE MOUTH [2] ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM LAKE WINNEBAGO

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

DE NEVEU CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
DE NEVEU CREEK (CONTINUED)									
AB	4.28	601	791	3.3	0	808.5	808.5	808.5	0.0
AC	4.55	247	1,607	1.6	121	810.8	810.8	810.8	0.0
AD	4.69	278	538	4.8	0	814.7	814.7	814.7	0.0
AE	4.95	257	980	2.6	0	820.4	820.4	820.4	0.0
AF	5.42	48	189	6.5	0	825.9	825.9	825.9	0.0
EAST BRANCH FOND DU LAC RIVER									
A	1.59	265	1,030	3.5	0	752.0	751.9	752.0	0.1
B	1.67	90	640	5.7	0	752.3	752.1	752.3	0.2
C	1.70	120	870	4.2	0	752.7	752.5	752.7	0.2
D	1.78	140	880	4.1	0	752.9	752.8	752.9	0.1
E	1.79	115	840	4.3	0	753.2	753.0	753.2	0.2
F	1.92	75	700	5.2	0	753.5	753.3	753.5	0.2
G	1.98	75	660	5.5	0	753.8	753.6	753.8	0.2
H	2.06	100	850	4.3	0	754.2	754.2	754.2	0.0
I	2.15	75	620	5.8	0	754.4	754.2	754.4	0.2
J	2.19	70	610	6.0	0	754.5	754.4	754.5	0.1
K	2.20	100	730	5.0	0	754.7	754.6	754.7	0.1
L	2.25	120	990	3.7	0	755.0	754.9	755.0	0.1
M	2.31	70	630	5.8	0	755.0	754.9	755.0	0.1
N	2.38	60	680	5.4	0	755.4	755.2	755.4	0.2
O	2.44	65	650	5.6	0	755.7	755.6	755.7	0.1
P	2.49	120	790	4.6	0	756.0	755.9	756.0	0.1
Q	2.60	70	600	6.0	0	756.4	756.2	756.4	0.2
R	2.70	70	640	5.7	0	757.3	757.1	757.3	0.2

[1]MILES ABOVE MOUTH

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

DE NEVEU CREEK - EAST BRANCH FOND DU LAC RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
EAST BRANCH FOND DU LAC RIVER (CONTINUED)									
S	2.73	70	640	5.7	0	757.4	757.3	757.4	0.1
T	2.78	90	910	4.0	0	757.8	757.7	757.8	0.1
U	2.87	135	840	4.3	0	757.9	757.8	757.9	0.1
V	2.97	60	560	6.5	0	758.2	758.2	758.2	0.0
W	2.98	120	800	4.5	0	758.5	758.4	758.5	0.1
X	3.04	110	670	5.4	0	758.8	758.7	758.8	0.1
Y	3.14	90	690	5.2	0	759.8	759.7	759.8	0.1
Z	3.21	100	730	4.9	0	760.4	760.3	760.4	0.1
AA	3.25	60	470	7.7	0	760.5	760.4	760.5	0.1
AB	3.27	75	520	7.0	0	760.7	760.7	760.7	0.0
AC	3.39	310	1,730	2.1	0	762.2	762.1	762.2	0.1
AD	3.48	385	2,170	1.7	0	762.4	762.4	762.4	0.0
AE	3.59	80	500	7.3	0	762.4	762.4	762.4	0.0
AF	3.61	80	580	6.3	0	762.9	762.9	762.9	0.0
AG	3.67	75	440	8.2	0	763.0	763.0	763.0	0.0
AH	3.79	125	770	4.7	0	765.7	765.7	765.7	0.0
AI	3.90	130	720	5.1	0	766.8	766.8	766.8	0.0
AJ	4.03	105	600	6.0	0	768.5	768.4	768.5	0.1
AK	4.12	140	870	4.2	0	769.8	769.8	769.8	0.0
AL	4.14	100	570	6.3	0	769.9	769.8	769.9	0.1
AM	4.17	70	650	5.6	0	770.5	770.4	770.5	0.1
AN	4.29	136	878	3.8	0	770.6	770.6	770.6	0.0
AO	4.44	275	1,010	3.6	0	773.8	773.6	773.8	0.2
AP	5.01	83	479	6.9	0	780.5	780.5	780.5	0.0
AQ	7.17	310	1,184	2.8	0	799.9	799.9	799.9	0.0

[1]MILES ABOVE MOUTH

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

EAST BRANCH FOND DU LAC RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
EAST BRANCH FOND DU LAC RIVER (CONTINUED)									
AR	7.57	307	875	3.8	0	805.1	805.1	805.1	0.0
AS	7.71	93	698	4.7	0	808.6	808.6	808.6	0.0
AT	8.01	90	704	4.7	0	810.3	810.3	810.3	0.0
AU	8.70	300	947	3.5	0	815.8	815.8	815.8	0.0
AV	8.83	260	1,830	1.8	0	818.2	818.2	818.2	0.0
AW	9.60	350	1,731	1.9	0	819.4	819.4	819.4	0.0
AX	10.28	329	2,426	1.3	71	820.8	820.8	820.8	0.0
AY	10.45	102	637	5.0	0	820.9	820.9	820.9	0.0
AZ	10.50	422	1,500	2.1	0	821.7	821.7	821.7	0.0
BA	10.97	370	1,570	2.0	0	824.0	824.0	824.0	0.0
BB	11.07	215	1,292	2.5	0	824.8	824.8	824.8	0.0
BC	11.18	348	1,782	1.8	0	825.1	825.1	825.1	0.0
BD	11.55	201	1,654	1.9	47	826.5	826.5	826.5	0.0
BE	12.52	330	1,877	1.7	0	828.0	828.0	828.0	0.0
EAST BRANCH MILWAUKEE RIVER									
A	92.02	67	207	2.7	0	998.7	998.7	998.7	0.0
B	92.22	135	256	2.2	0	1,005.2	1,005.2	1,005.2	0.0

[1]MILES ABOVE MOUTH

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

EAST BRANCH FOND DU LAC RIVER - EAST BRANCH MILWAUKEE RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
FOND DU LAC RIVER									
A	0.09	250	1,690	3.0	0	749.4	747.2[2]	747.2	0.0
B	0.16	175	890	5.7	0	749.4	747.2[2]	747.2	0.0
C	0.32	205	1,630	3.1	0	749.4	748.0[2]	748.0	0.0
D	0.39	165	1,420	3.6	0	749.4	748.0[2]	748.0	0.0
E	0.53	220	1,960	2.6	0	749.4	748.3[2]	748.3	0.0
F	0.66	140	1,110	4.6	0	749.4	748.3[2]	748.3	0.0
G	0.72	155	880	5.8	0	749.4	748.5[2]	748.5	0.0
H	0.75	105	760	6.7	0	749.4	748.8[2]	748.8	0.0
I	0.79	245	1,730	3.0	0	749.8	749.8	749.8	0.0
J	0.87	250	1,410	3.6	0	749.9	749.9	749.9	0.0
K	0.96	210	1,080	4.7	0	750.1	750.1	750.1	0.0
L	1.02	245	1,300	3.9	0	750.6	750.6	750.6	0.0
M	1.15	155	1,290	3.9	0	751.0	751.0	751.0	0.0
N	1.19	170	1,300	3.9	0	751.1	751.1	751.1	0.0
O	1.30	140	1,120	4.5	0	751.3	751.3	751.3	0.0
P	1.38	240	1,290	3.9	0	751.5	751.5	751.5	0.0
WEST BRANCH FOND DU LAC RIVER									
Q	1.61	120	950	2.5	0	752.1	752.0	752.1	0.1
R	1.66	140	840	2.8	0	752.1	752.0	752.1	0.1
S	1.69	90	590	4.1	0	752.2	752.1	752.2	0.1
T	1.73	80	640	3.7	0	752.4	752.3	752.4	0.1
U	1.86	75	610	4.0	0	752.6	752.6	752.6	0.0
V	1.87	85	610	3.9	0	752.6	752.6	752.6	0.0
W	1.96	90	680	3.5	0	752.9	752.9	752.9	0.0
X	2.10	140	1,080	2.2	0	753.1	753.0	753.1	0.1

[1]MILES ABOVE MOUTH [2]ELEVATION COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM LAKE WINNEBAGO

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

FOND DU LAC RIVER - WEST BRANCH FOND DU LAC RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
WEST BRANCH FOND DU LAC RIVER (CONTINUED)									
Y	2.16	95	900	2.7	0	753.3	753.2	753.3	0.1
Z	2.23	65	490	4.9	0	753.3	753.2	753.3	0.1
AA	2.25	105	890	2.7	0	753.6	753.5	753.6	0.1
AB	2.30	105	770	3.1	0	753.6	753.6	753.6	0.0
AC	2.33	105	790	3.0	0	754.1	754.0	754.1	0.1
AD	2.44	80	780	3.1	0	754.3	754.2	754.3	0.1
AE	2.53	140	980	2.4	0	754.4	754.3	754.4	0.1
AF	2.63	270	1,060	2.3	0	754.7	754.6	754.7	0.1
AG	2.68	155	850	2.8	0	754.9	754.7	754.9	0.2
AH	2.73	60	480	5.0	0	755.2	755.0	755.2	0.2
AI	2.79	105	440	5.4	0	755.6	755.6	755.6	0.0
AJ	2.85	145	590	4.1	0	756.8	756.3	756.8	0.5
AK	2.90	50	310	7.7	0	757.5	757.3	757.5	0.2
AL	2.91	105	530	4.5	0	758.2	758.1	758.2	0.1
AM	3.06	320	971	2.1	0	760.2	760.2	760.2	0.0
AN	3.38	107	407	4.9	0	765.6	765.6	765.6	0.0
AO	3.78	114	537	3.7	50	768.8	768.8	768.8	0.0
AP	4.22	349	673	3.0	0	771.4	771.4	771.4	0.0
AQ	4.90	257	485	4.1	0	775.9	775.9	775.9	0.0
AR	4.99	343	831	2.4	0	778.6	778.6	778.6	0.0
AS	5.18	343	862	2.3	0	779.7	779.7	779.7	0.0
AT	5.27	383	952	2.1	51	780.7	780.7	780.7	0.0
AU	5.95	183	423	4.7	0	790.7	790.7	790.7	0.0
AV	6.00	151	355	6.2	0	791.8	791.8	791.8	0.0
AW	6.93	353	1,210	1.7	78	804.1	804.1	804.1	0.0

[1]MILES ABOVE MOUTH

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY
FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

WEST BRANCH FOND DU LAC RIVER

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
WEST BRANCH FOND DU LAC RIVER (CONTINUED)									
AX	7.79[1]	276	637	3.1	0	812.2	812.2	812.2	0.0
AY	7.91[1]	209	869	2.3	0	815.3	815.3	815.3	0.0
AZ	9.30[1]	227	577	3.5	0	836.9	836.9	836.9	0.0
BA	9.63[1]	200	722	2.8	0	844.2	844.2	844.2	0.0
BB	10.10[1]	290	1,340	1.5	0	845.6	845.6	845.6	0.0
BC	15.80[1]	131	865	3.8	91	854.0	854.0	854.0	0.0
BD	16.36[1]	284	949	3.5	0	858.2	858.2	858.2	0.0
BE	16.58[1]	200	1,455	2.3	0	863.9	863.9	863.9	0.0
BF	16.89[1]	172	1,120	3.0	0	864.2	864.2	864.2	0.0
BG	17.54[1]	111	615	5.4	0	868.9	868.9	868.9	0.0
HARRIS CREEK									
A	0.27[2]	67	228	1.5	0	886.4	886.4	886.4	0.0
B	0.37[2]	85	179	2.2	0	887.5	887.5	887.5	0.0
LUCO CREEK									
A	0.80[1]	250	1,287	2.1	0	750.6	750.6	750.6	0.0

[1]MILES ABOVE MOUTH [2]MILES ABOVE CONFLUENCE WITH SOUTH BRANCH ROCK RIVER

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY
FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

WEST BRANCH FOND DU LAC RIVER - HARRIS CREEK - LUCO CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
MCDERMOTT CREEK									
A	1,696	89	153	2.9	0	758.3	758.3	758.3	0.0
B	2,359	127	221	2.0	0	760.3	760.3	760.3	0.0
C	3,379	63	189	2.4	0	763.5	763.5	763.5	0.0
D	4,920	51	131	3.4	0	768.2	768.2	768.2	0.0
E	5,885	220	267	1.7	0	771.7	771.7	771.7	0.0
F	6,285	122	108	4.2	0	772.2	772.2	772.2	0.0
G	7,479	431	317	1.4	0	776.6	776.6	776.6	0.0
H	7,944	439	205	2.1	0	778.1	778.1	778.1	0.0
I	8,139	461	289	1.5	0	779.3	779.3	779.3	0.0
J	8,389	197	122	3.5	0	780.4	780.4	780.4	0.0
K	8,639	80	103	3.8	0	781.8	781.8	781.8	0.0
L	8,929	24	66	6.0	0	783.2	783.2	783.2	0.0
M	9,054	18	81	4.9	0	784.6	784.6	784.6	0.0
N	9,055	20	111	3.6	0	785.6	785.6	785.6	0.0
O	9,214	42	79	5.0	32	787.1	787.1	787.1	0.0
P	9,299	42	79	5.0	43	788.9	788.9	788.9	0.0
Q	9,449	48	189	2.1	55	790.0	790.0	790.0	0.0
R	9,554	72	88	4.3	0	792.6	792.6	792.6	0.0
S	9,749	136	150	2.5	0	794.5	794.5	794.5	0.0
T	9,844	180	177	2.2	0	796.4	796.4	796.4	0.0
U	9,864	228	249	1.5	0	797.0	797.0	797.0	0.0
V	10,219	162	116	3.3	0	798.0	798.0	798.0	0.0
W	10,464	51	138	2.8	0	800.4	800.4	800.4	0.0
X	10,744	119	104	3.6	92	802.5	802.5	802.5	0.0
Y	11,084	115	140	2.7	0	805.6	805.6	805.6	0.0
Z	11,399	133	145	2.6	0	807.5	807.5	807.5	0.0

[1]FEET ABOVE CONFLUENCE WITH DE NEVEU CREEK

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

MCDERMOTT CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TAYCHEEDAH CREEK									
A	3,801	1,700[2]	1,302	2.4	0	751.0	751.0	751.0	0.0
B	5,801	800	2,603	1.9	0	756.1	756.1	756.1	0.0
C	6,121	595	1,515	1.9	0	756.5	756.5	756.5	0.0
D	6,721	417	1,799	1.7	0	756.8	756.8	756.8	0.0
E	6,841	234	1,267	2.2	0	756.8	756.8	756.8	0.0
F	6,961	281	1,353	2.1	0	756.9	756.9	756.9	0.0
G	7,041	275	1,727	1.7	0	758.3	758.3	758.3	0.0
H	7,591	265	1,315	3.6	0	758.6	758.6	758.6	0.0
I	8,641	467	1,555	4.3	0	761.6	761.6	761.6	0.0
J	9,011	691	4,783	1.8	0	763.0	763.0	763.0	0.0
K	9,171	612	4,913	2.1	0	763.1	763.1	763.1	0.0
L	9,287	428	818	4.0	0	763.1	763.1	763.1	0.0
M	9,421	530	1,994	2.1	0	764.4	764.4	764.4	0.0
N	9,502	536	1,781	2.7	0	764.5	764.5	764.5	0.0
O	10,037	258	1,396	4.3	0	765.7	765.7	765.7	0.0
P	10,367	198	467	6.2	0	767.2	767.2	767.2	0.0
Q	10,472	190	1,232	3.0	0	768.9	768.9	768.9	0.0
R	12,197	600	1,330	2.0	0	770.7	770.7	770.7	0.0
S	15,999	220	644	4.0	0	786.2	786.2	786.2	0.0
T	20,012	132	1,441	1.8	73	808.1	808.1	808.1	0.0
U	25,239	119	3,995	6.6	0	845.9	845.9	845.9	0.0
V	26,981	24	166	7.7	0	870.3	870.3	870.3	0.0
W	28,829	155	1,188	1.1	0	899.6	899.6	899.6	0.0
X	29,780	53	490	2.6	51	901.9	901.9	901.9	0.0
Y	30,255	86	193	6.6	0	909.8	909.8	909.8	0.0
Z	31,364	104	826	1.5	0	925.0	925.0	925.0	0.0
AA	34,373	68	923	0.9	119	947.6	947.6	947.6	0.0

[1]FEET ABOVE MOUTH [2]ADMINISTRATIVE FLOODWAY WIDTH

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY
FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

FLOODWAY DATA

TAYCHEEDAH CREEK

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WIDTH REDUCED FROM PRIOR STUDY (FEET)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
TAYCHEEDAH CREEK (CONTINUED)									
AB	40,762[1]	61	157	5.6	0	978.7	978.7	978.7	0.0
AC	41,396[1]	71	198	1.5	0	980.5	980.5	980.5	0.0
AD	44,089[1]	140	336	0.9	0	985.7	985.7	985.7	0.0
AE	46,465[1]	23	51	5.9	0	986.1	986.1	986.1	0.0
AF	48,101[1]	102	112	2.7	0	990.3	990.3	990.3	0.0
UNNAMED TRIBUTARY TO DE NEVEU CREEK									
A	0.50[2]	289	860	1.5	80	826.5	826.5	826.5	0.0
B	0.98[2]	259	596	2.1	0	832.9	832.9	832.9	0.0
C	1.23[2]	239	728	1.7	99	838.0	838.0	838.0	0.0
D	1.59[2]	222	403	3.1	106	848.1	848.1	848.1	0.0
E	2.10[2]	408	670	1.9	0	860.7	860.7	860.7	0.0
F	2.81[2]	334	609	2.1	44	874.1	874.1	874.1	0.0
G	3.38[2]	151	232	5.4	0	888.6	888.6	888.6	0.0
H	3.91[2]	282	573	2.2	29	912.5	912.5	912.5	0.0
I	4.41[2]	163	392	2.3	0	931.2	931.2	931.2	0.0
J	4.79[2]	363	595	1.5	0	936.5	936.5	936.5	0.0
K	5.08[2]	508	912	1.0	0	939.5	939.5	939.5	0.0
L	5.32[2]	784	1,617	0.5	94	939.8	939.8	939.8	0.0
M	5.85[2]	108	225	1.6	60	946.6	946.6	946.6	0.0
N	6.26[2]	71	112	3.2	0	955.4	955.4	955.4	0.0

[1]FEET ABOVE MOUTH [2]MILES ABOVE CONFLUENCE WITH DE NEVEU CREEK

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOODWAY DATA

TAYCHEEDAH CREEK - UNNAMED TRIBUTARY TO DE NEVEU 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. The zones are as follows:

Zone A

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

Zone AE

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

Zone AH

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

Zone X

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

6.0 FLOOD INSURANCE RATE MAP

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

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

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent annual chance floodplains. Floodways and the locations of selected cross

sections used in the hydraulic analyses and floodway computations are shown where applicable.

The countywide FIRM presents flooding information for the entire geographic area of Fond du Lac County. Previously, separate FHBMs and/or FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as floodprone. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community, up to and including this countywide FIS, are presented in Table 10 "Community Map History."

7.0 OTHER STUDIES

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

The countywide studies for Dodge and Green Lake counties are in progress and might impact the information presented in this countywide FIS report.

FISs have been prepared for adjacent communities, and were reviewed and are in agreement with this FIS.

8.0 LOCATION OF DATA

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

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Brandon, Village of	May 17, 1974	May 14, 1976	August 15, 1989	None
Campbellsport, Village of	May 24, 1974	July 25, 1975	May 15, 1978	None
Eden, Village of	November 4, 2009	None	November 4, 2009	None
Fairwater, Village of	November 8, 1974	October 10, 1975 January 30, 1976 January 5, 1979	September 4, 1985	None
Fond du Lac County (Unincorporated Areas)	December 13, 1974	None	July 19, 1982	March 18, 1986 April 5, 1988 June 6, 2000 October 16, 2003
Fond du Lac, City of	February 8, 1970	None	January 3, 1979	October 15, 1985 March 4, 1988 November 4, 1988
Kewaskum, Village of (Dual County Community) (Washington County)	December 21, 1973	April 23, 1976 March 11, 1977	January 6, 1982	None
Mt. Calvary, Village of	November 4, 2009	None	November 4, 2009	None
North Fond du Lac, Village of	January 9, 1974	May 28, 1976	December 4, 1979	October 16, 2003
Oakfield, Village of	May 24, 1974	April 11, 1975	September 30, 1988	None
Ripon, City of	May 24, 1974	May 28, 1976	August 15, 1980	None

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Rosendale, Village of	November 8, 1974	None	September 29, 1989	None
St. Cloud, Village of	December 28, 1973	May 21, 1976	July 1, 1987	None
Waupun, City of (Dual County Community) (Dodge County)	January 9, 1974	June 25, 1976 June 9, 1978 February 23, 1979	August 15, 1984	April 2, 1991

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

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1% ANNUAL CHANCE BACKWATER FROM LAKE WINNEBAGO

CONFLUENCE WITH LAKE WINNEBAGO
RAILROAD
U.S. HIGHWAY 151
EAST SCOTT STREET
STOW STREET
CONFLUENCE OF MCDERMOTT CREEK
STATE HIGHWAY 23
EAST MERRILL AVENUE
EAST DIVISION STREET
EAST SECOND STREET
FOURTH STREET

ELEVATION IN FEET (NAVD 88)

780
770
760
750
740

A B C D E F G H I J K L M N O P Q

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2

STREAM DISTANCE IN MILES ABOVE MOUTH

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

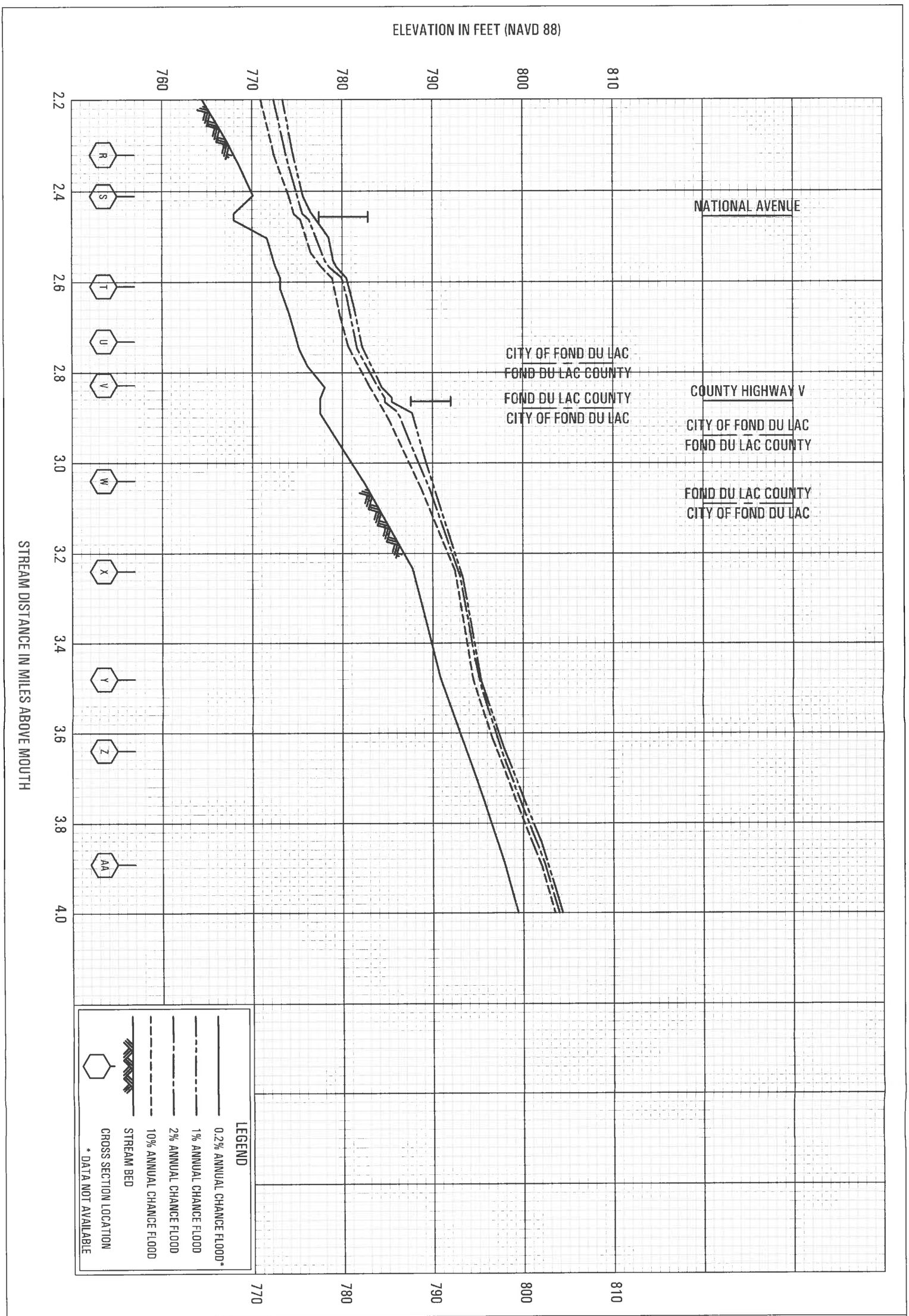
* DATA NOT AVAILABLE

FLOOD PROFILES

DE NEVEU CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

03P



04P

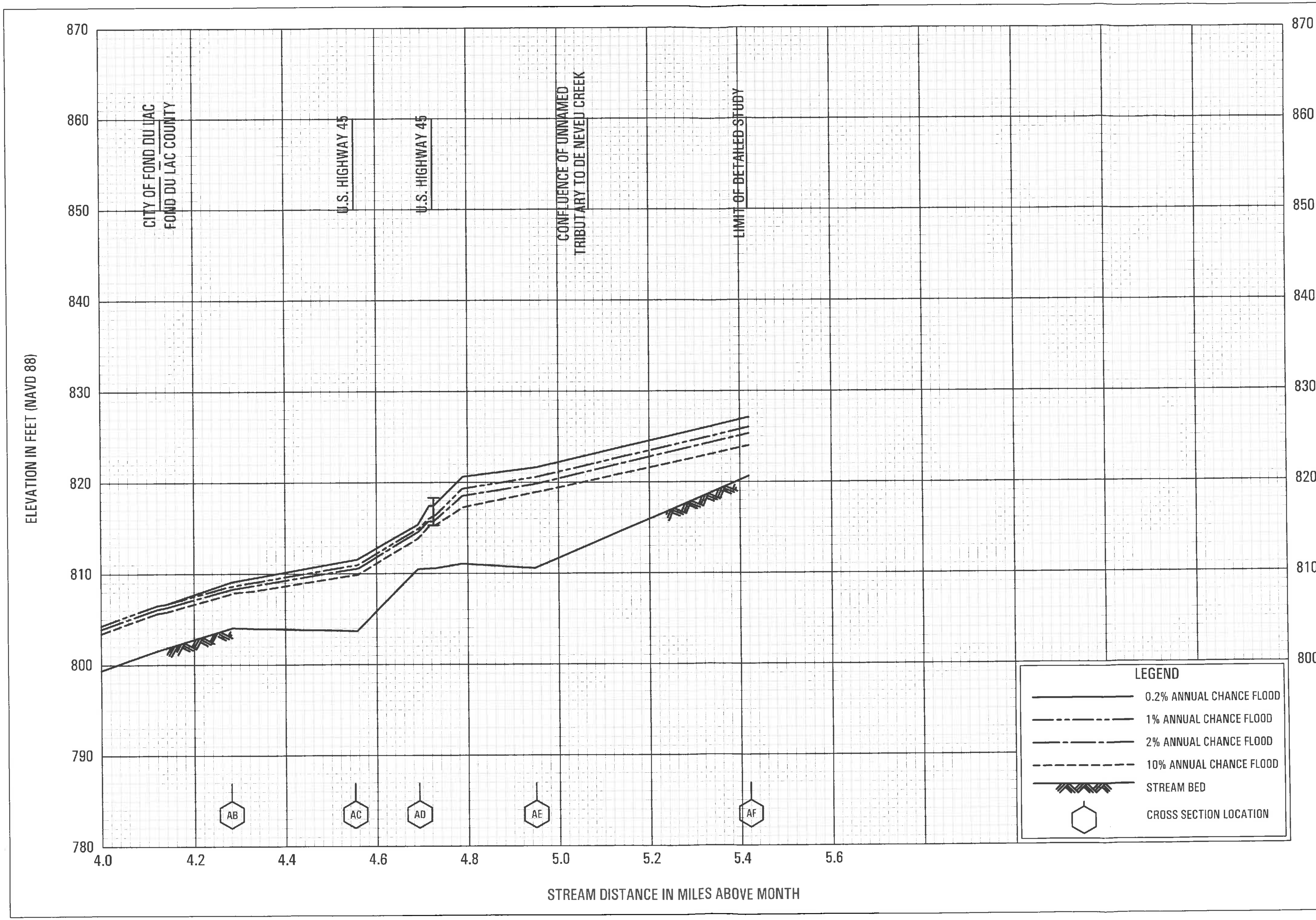
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

DE NEVEU CREEK



FLOOD PROFILES

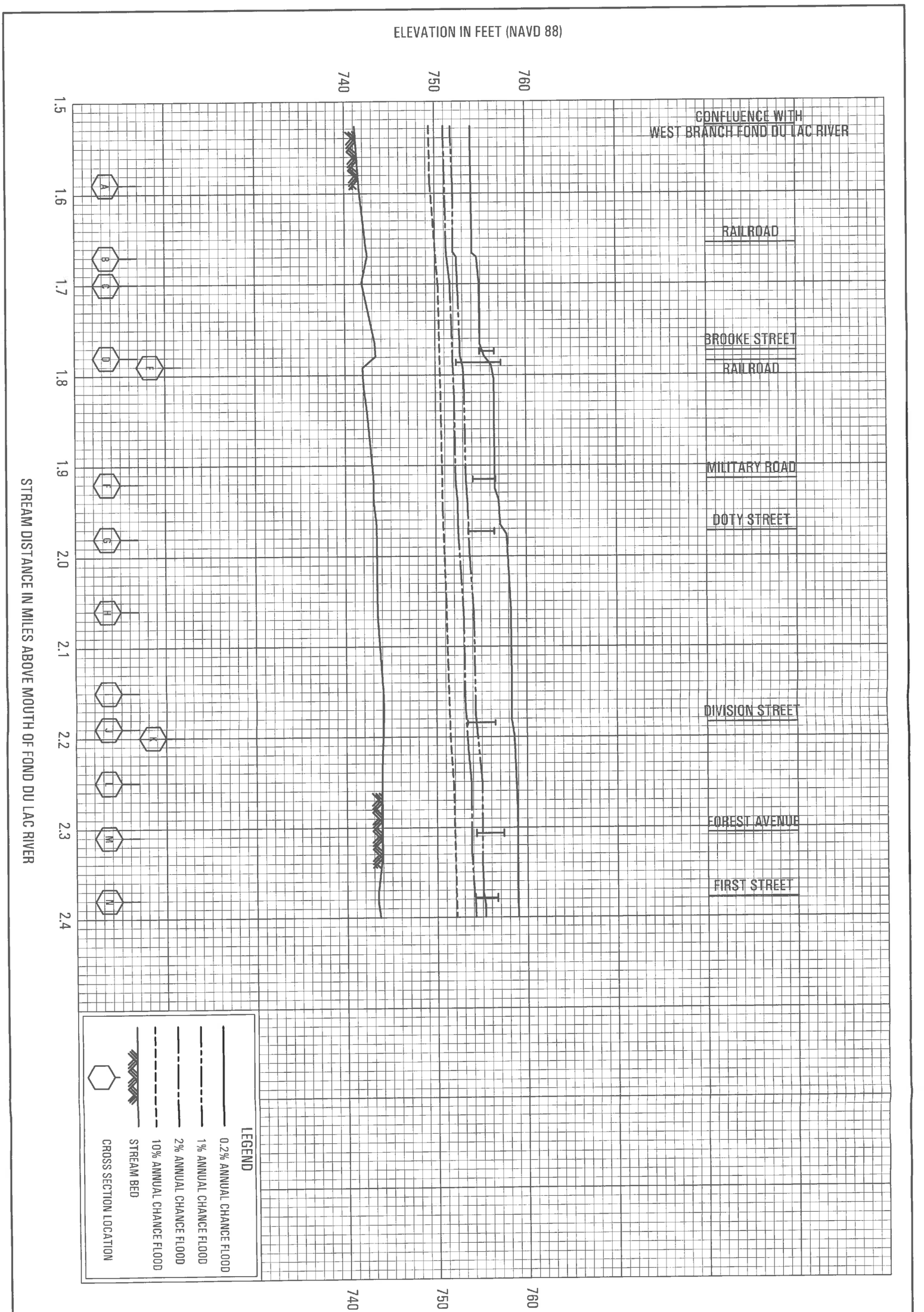
DE NEVEU CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

05P



06P

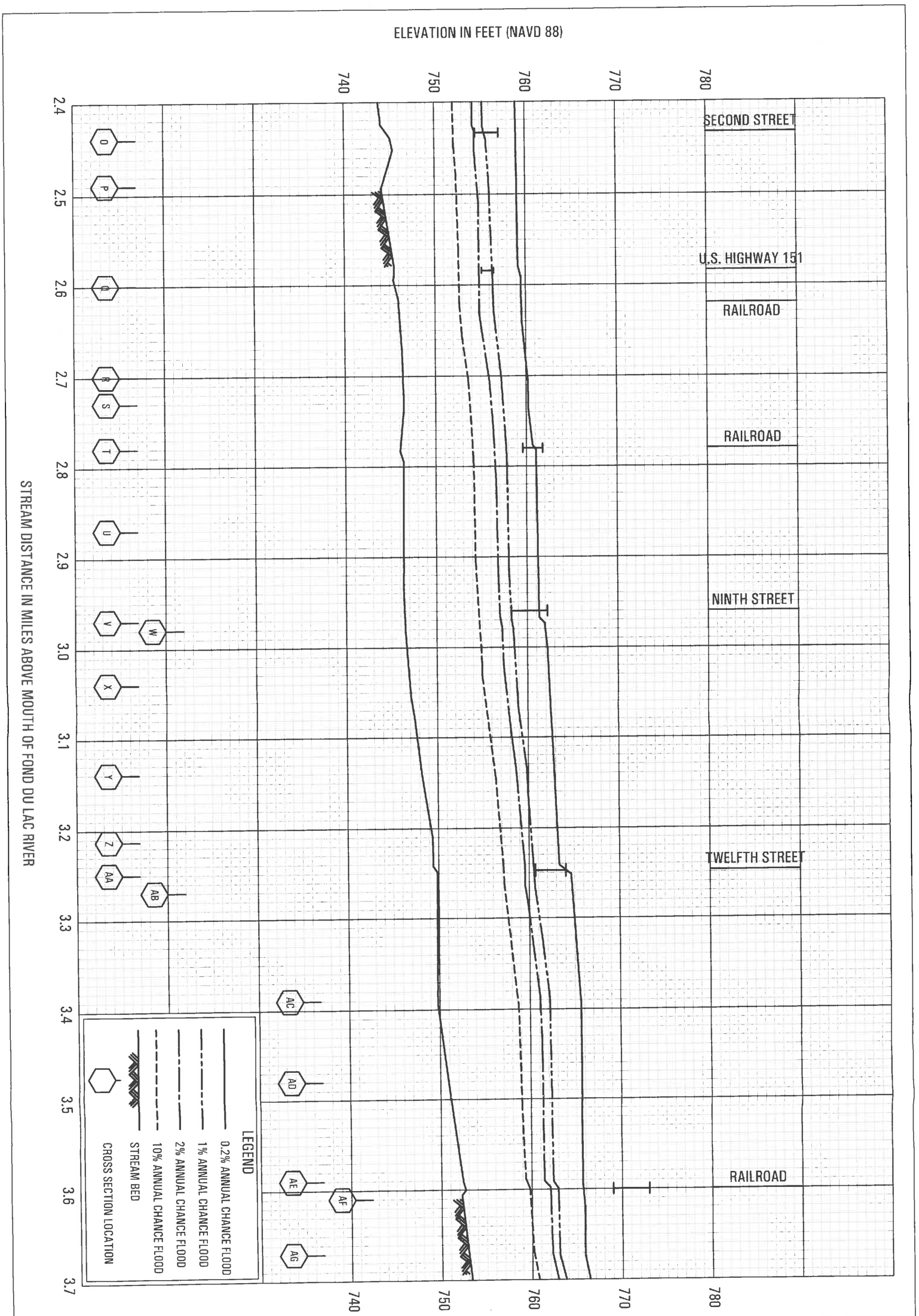
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

EAST BRANCH FOND DU LAC RIVER



07P

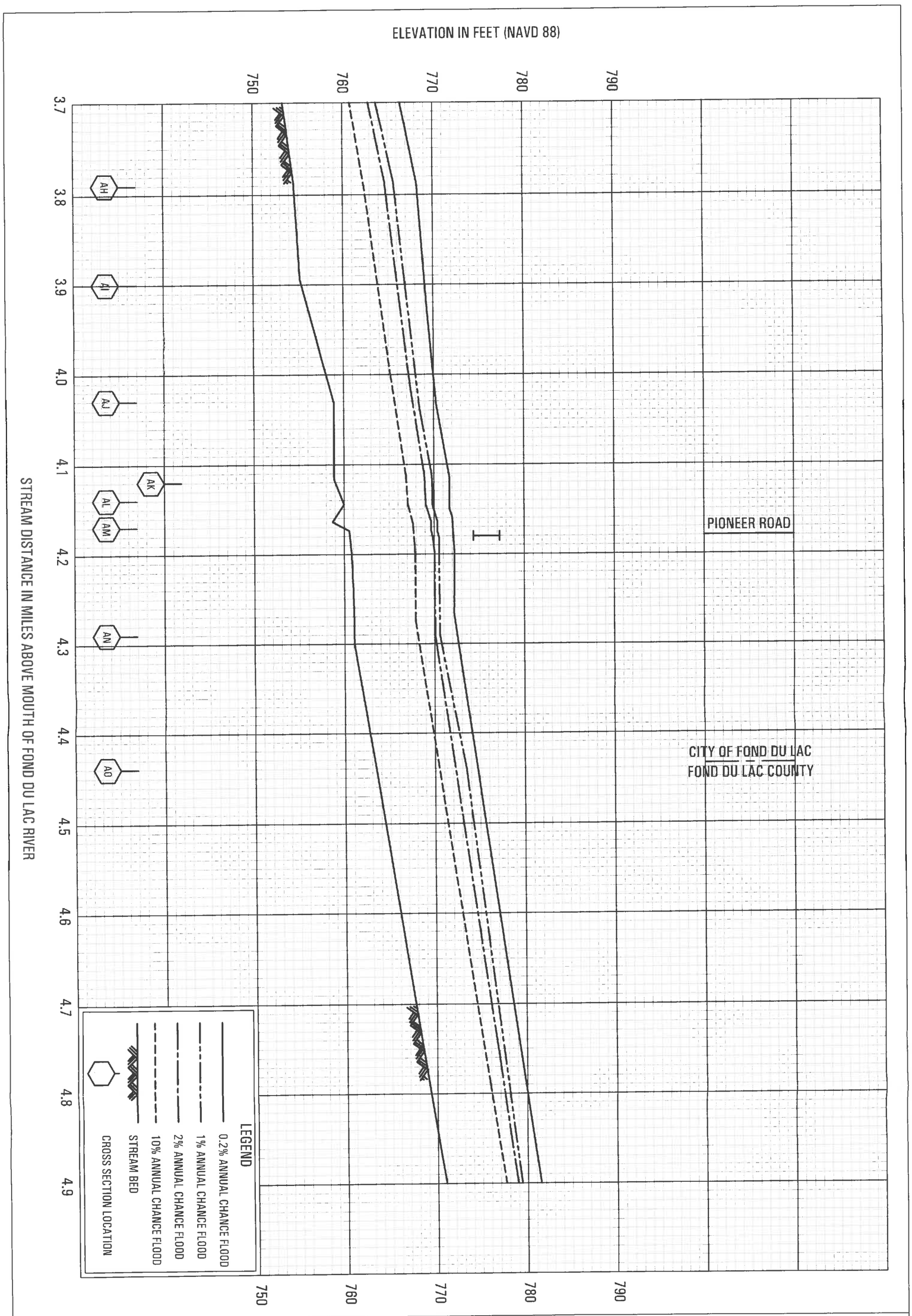
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

EAST BRANCH FOND DU LAC RIVER



08P

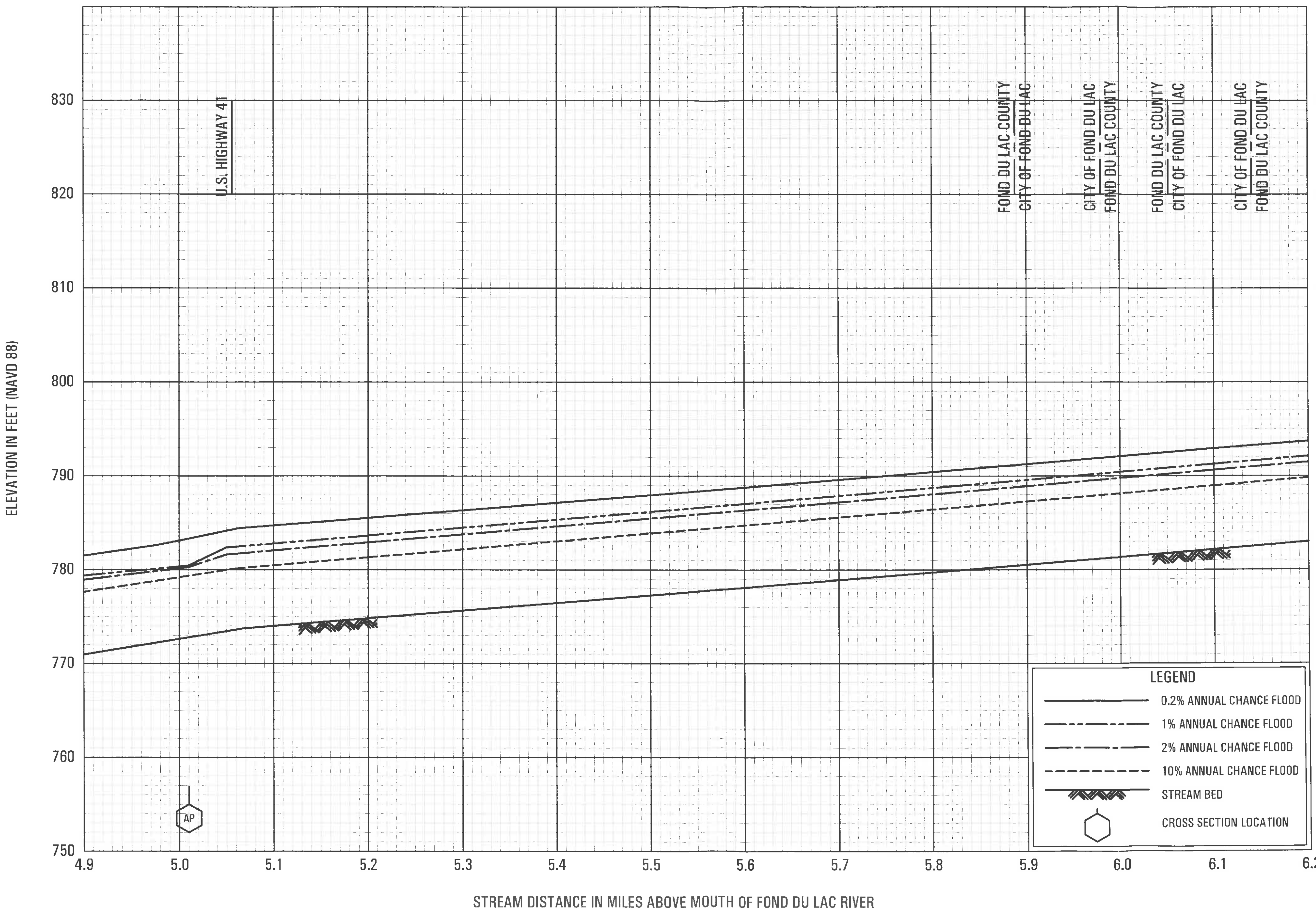
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

EAST BRANCH FOND DU LAC RIVER



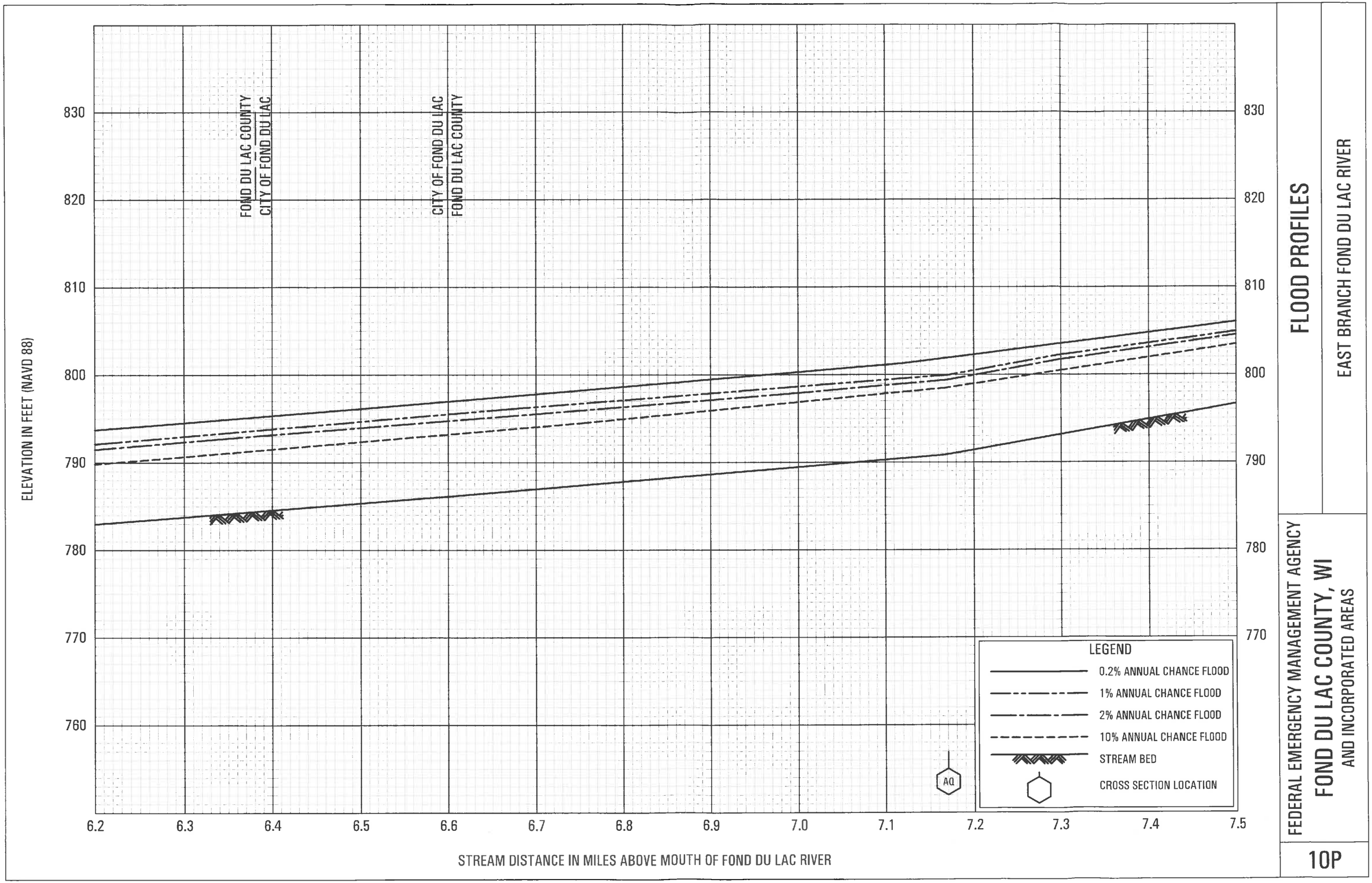
FLOOD PROFILES

EAST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

EAST BRANCH FOND DU LAC RIVER

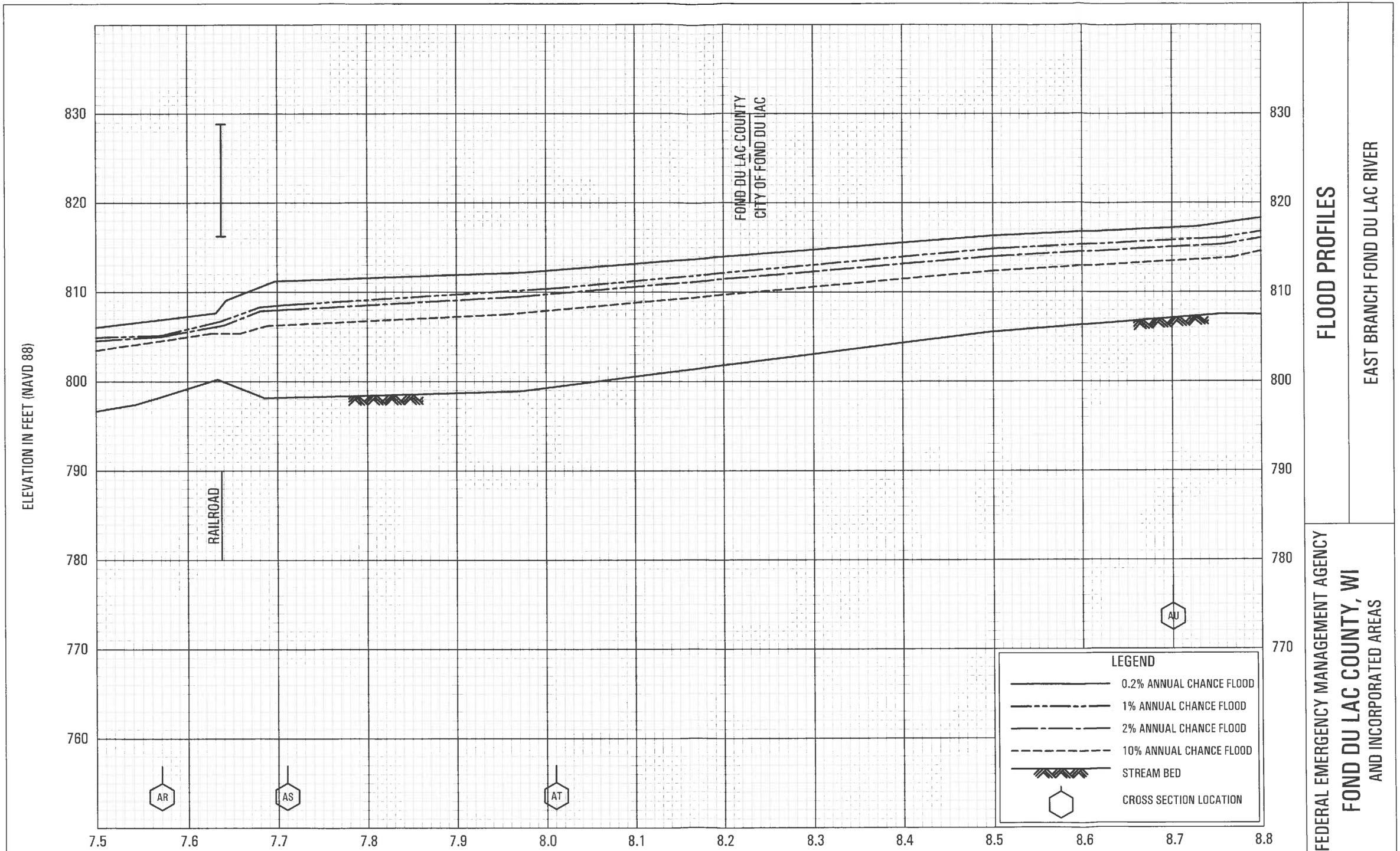
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

10P

FLOOD PROFILES

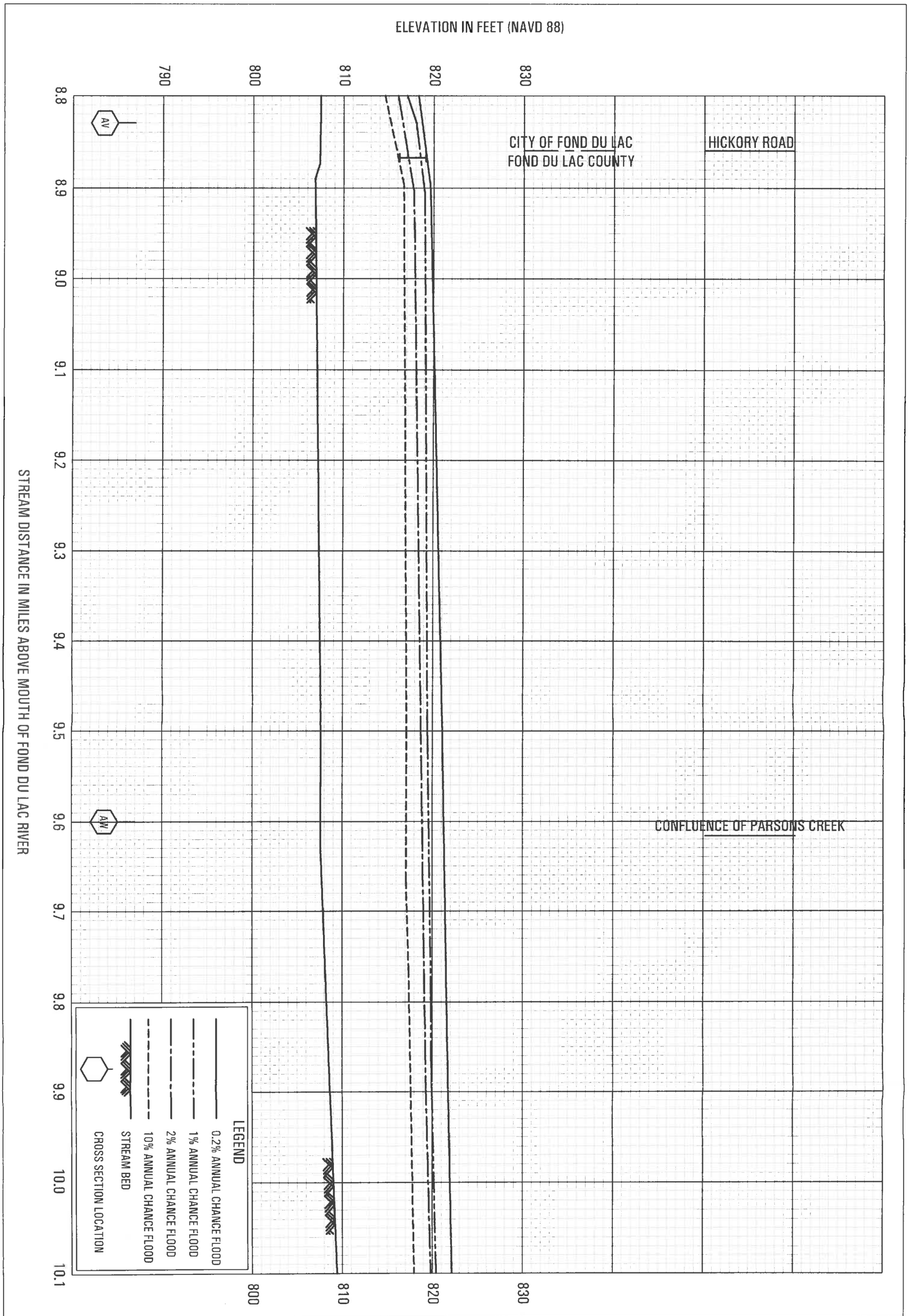
EAST BRANCH FOND DU LAC RIVER



FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



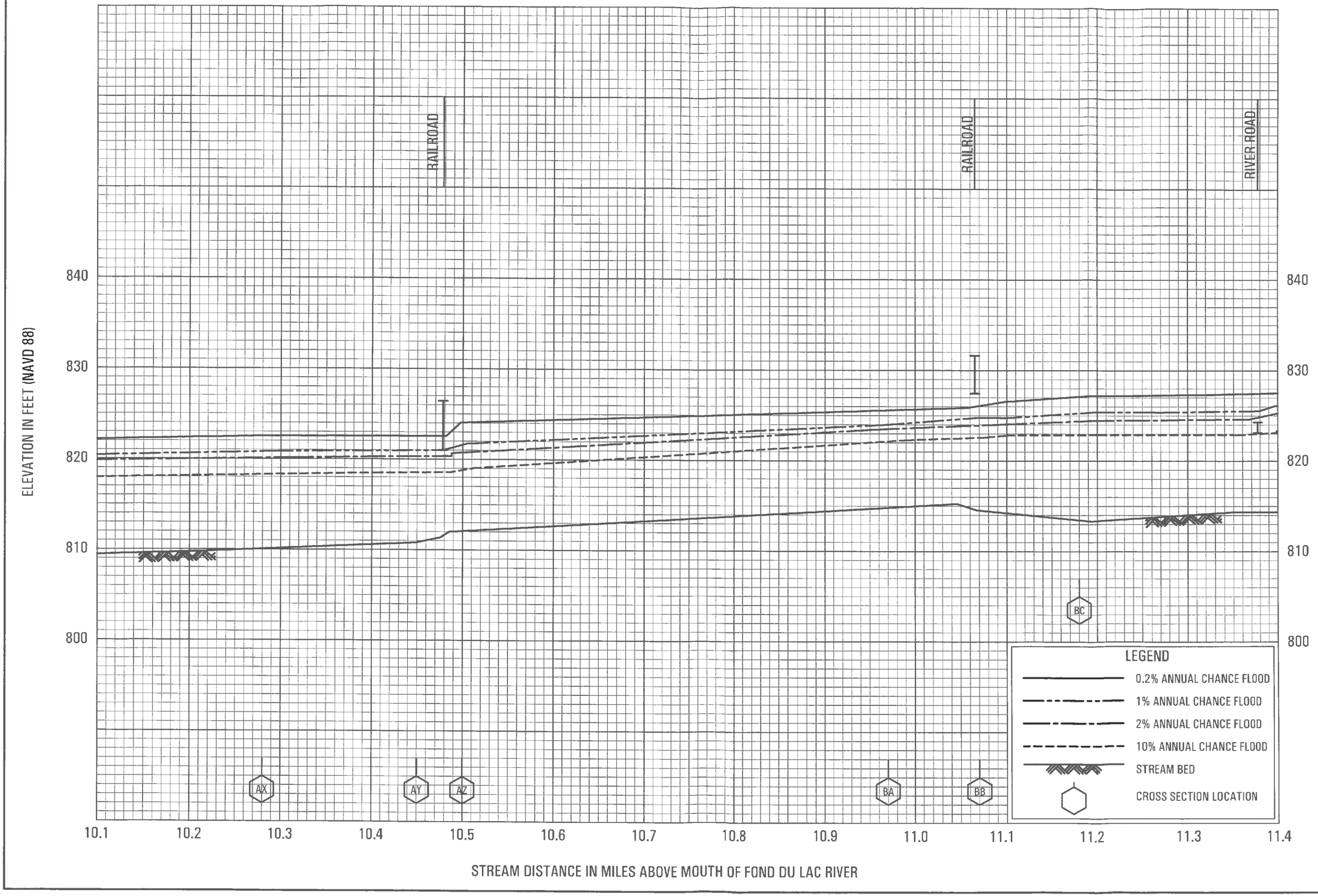
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

EAST BRANCH FOND DU LAC RIVER



FLOOD PROFILES

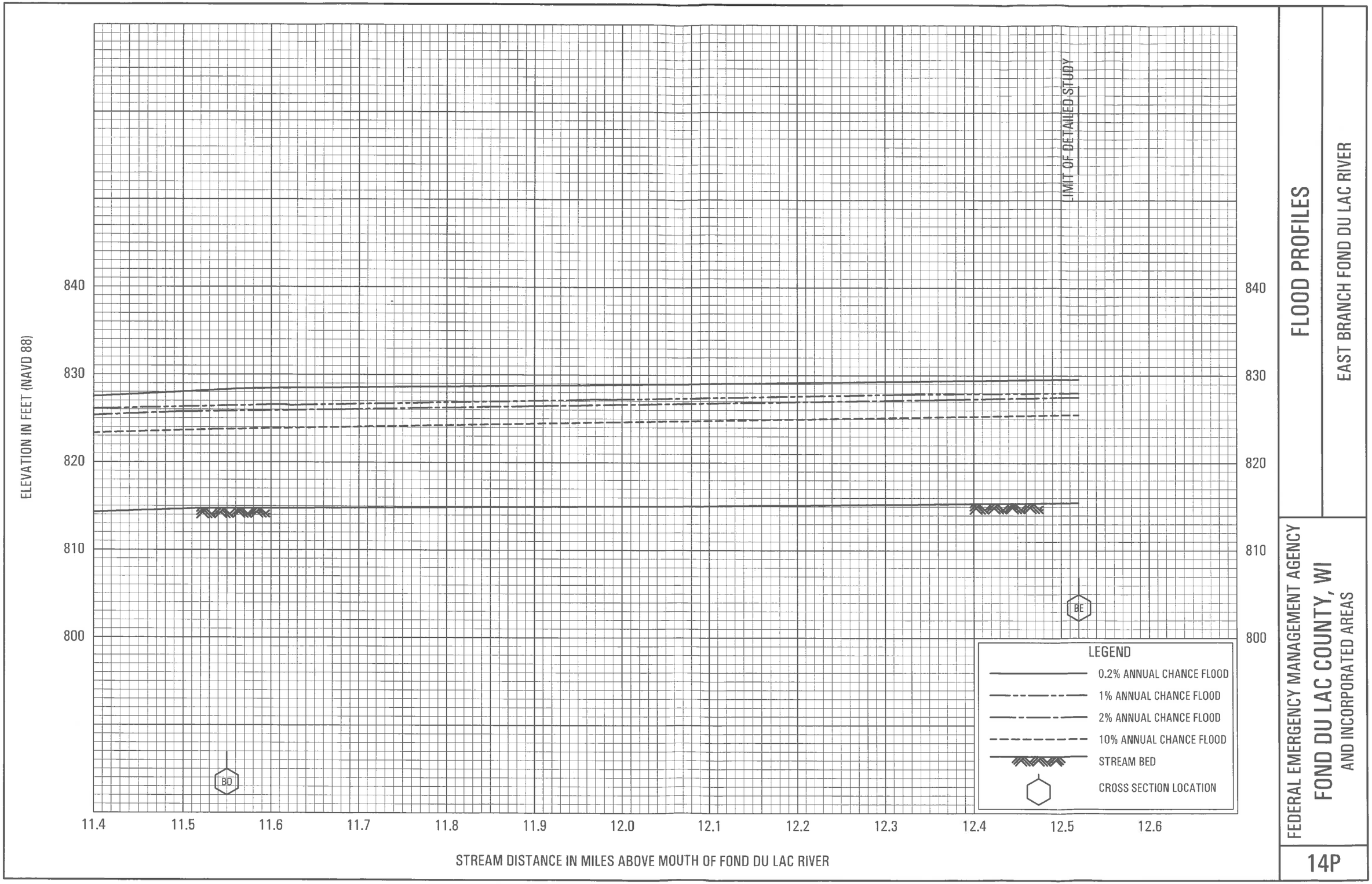
EAST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

13P



FLOOD PROFILES

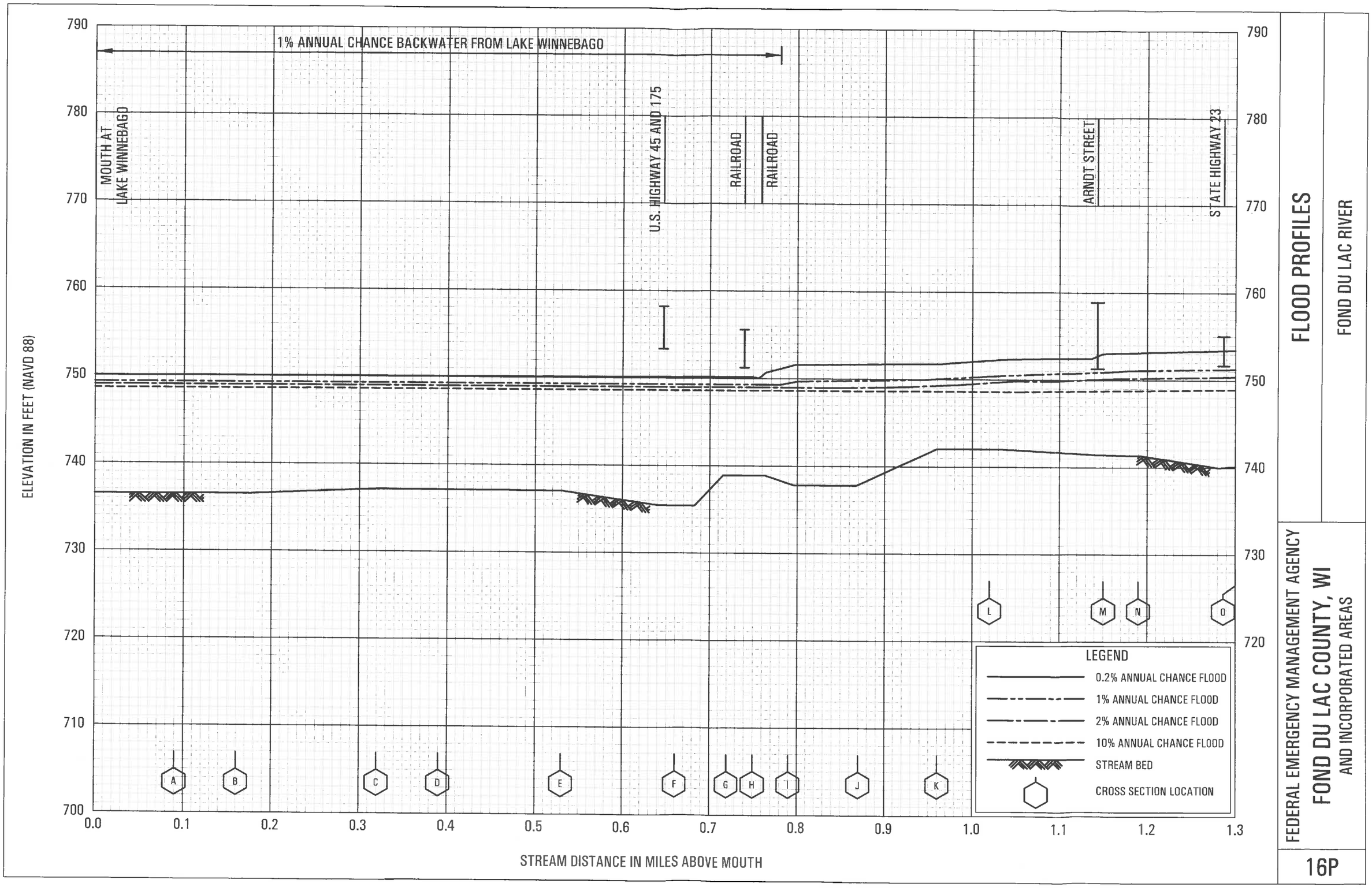
EAST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

14P



FLOOD PROFILES

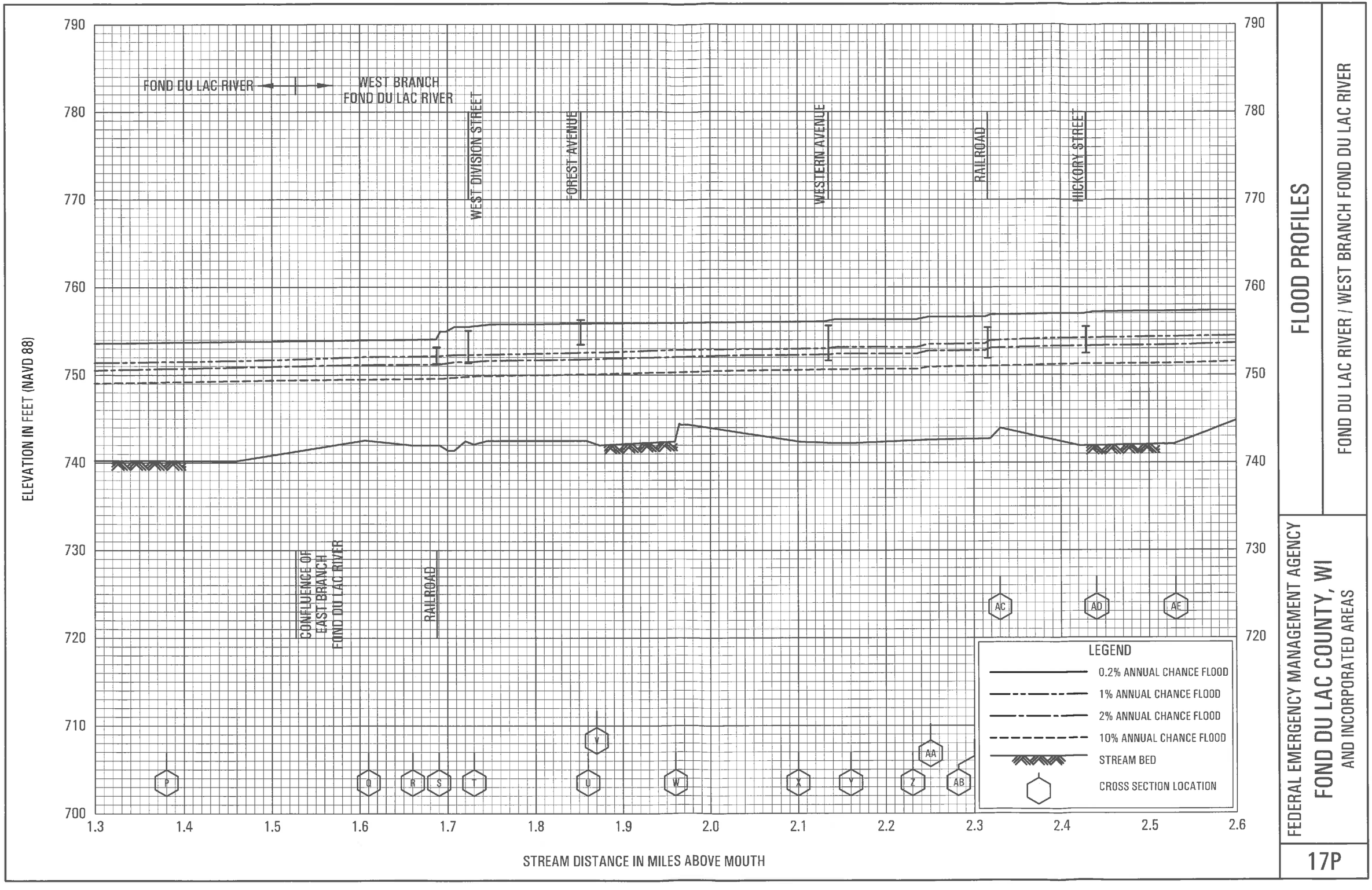
FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

16P



FLOOD PROFILES

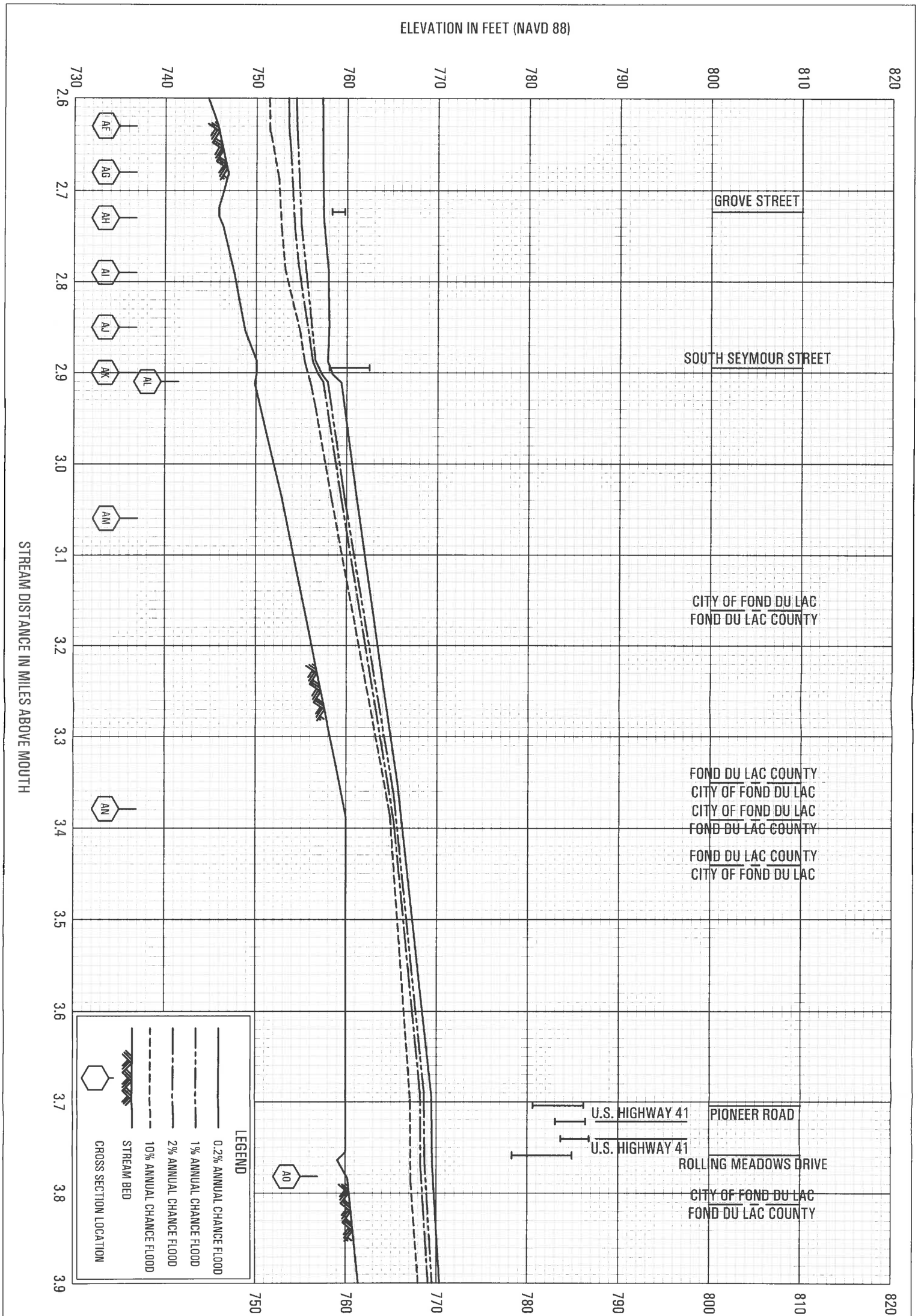
FOND DU LAC RIVER / WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

17P



18P

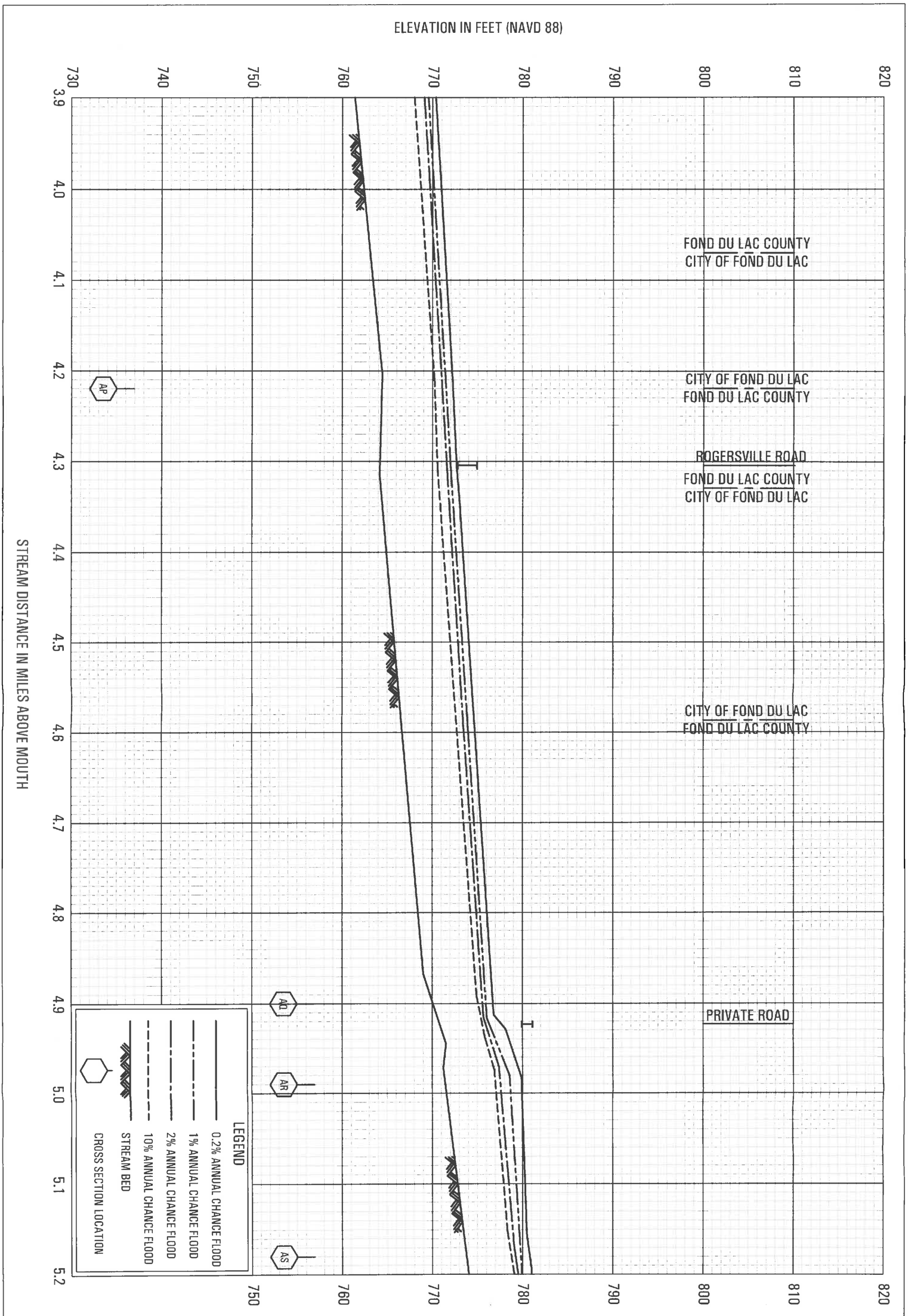
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

WEST BRANCH FOND DU LAC RIVER



19P

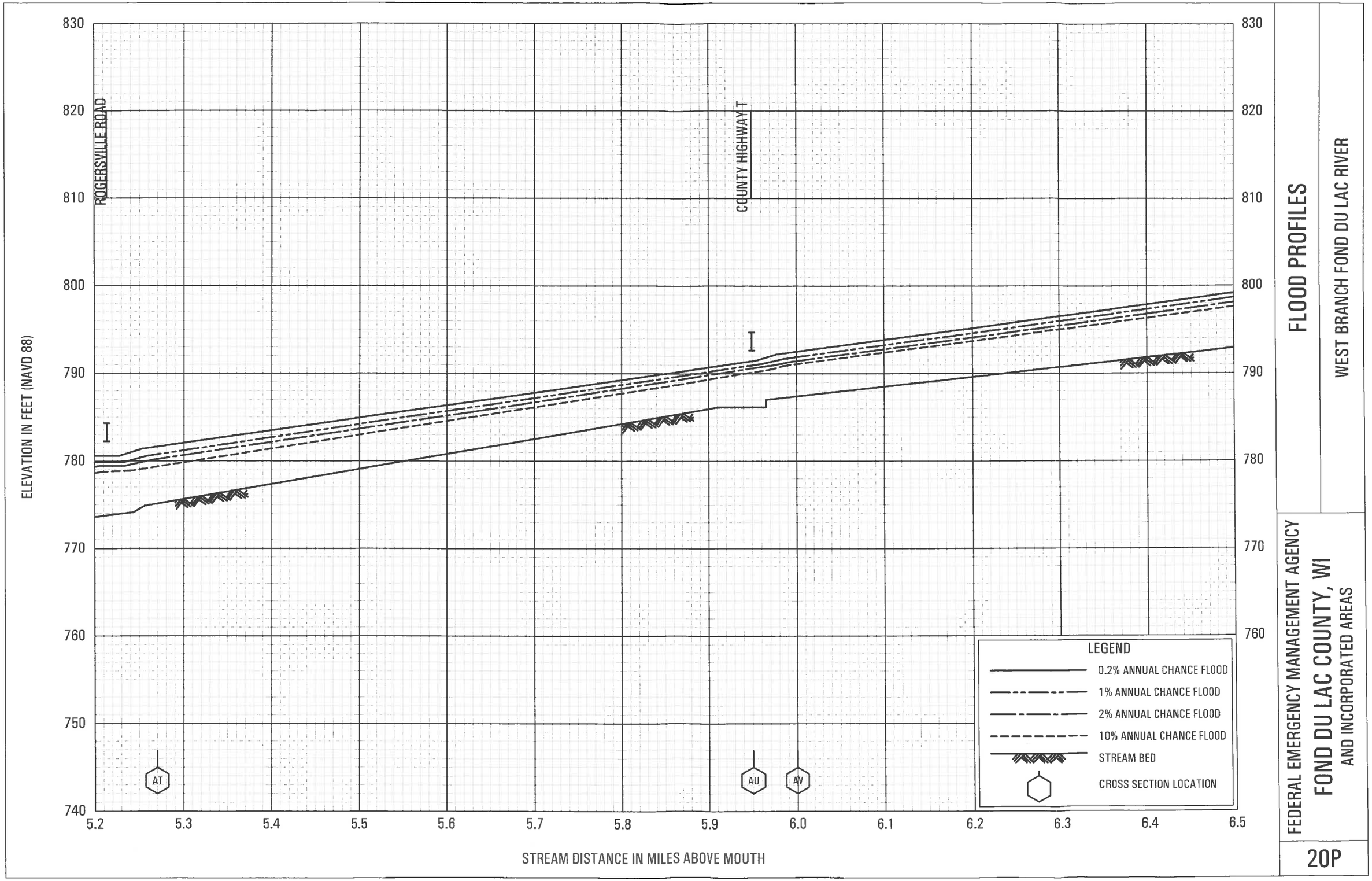
FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

FLOOD PROFILES

WEST BRANCH FOND DU LAC RIVER



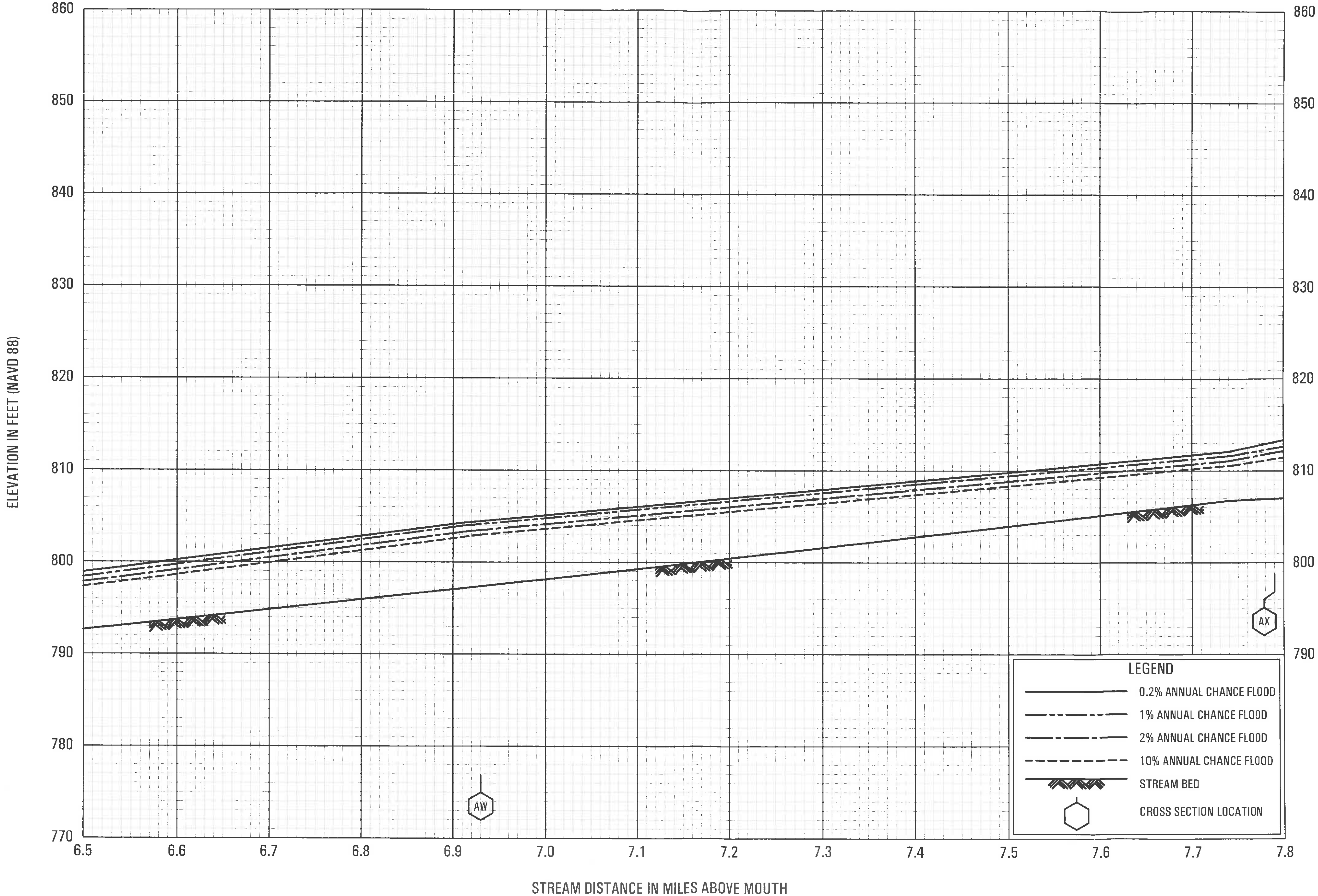
FLOOD PROFILES

WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



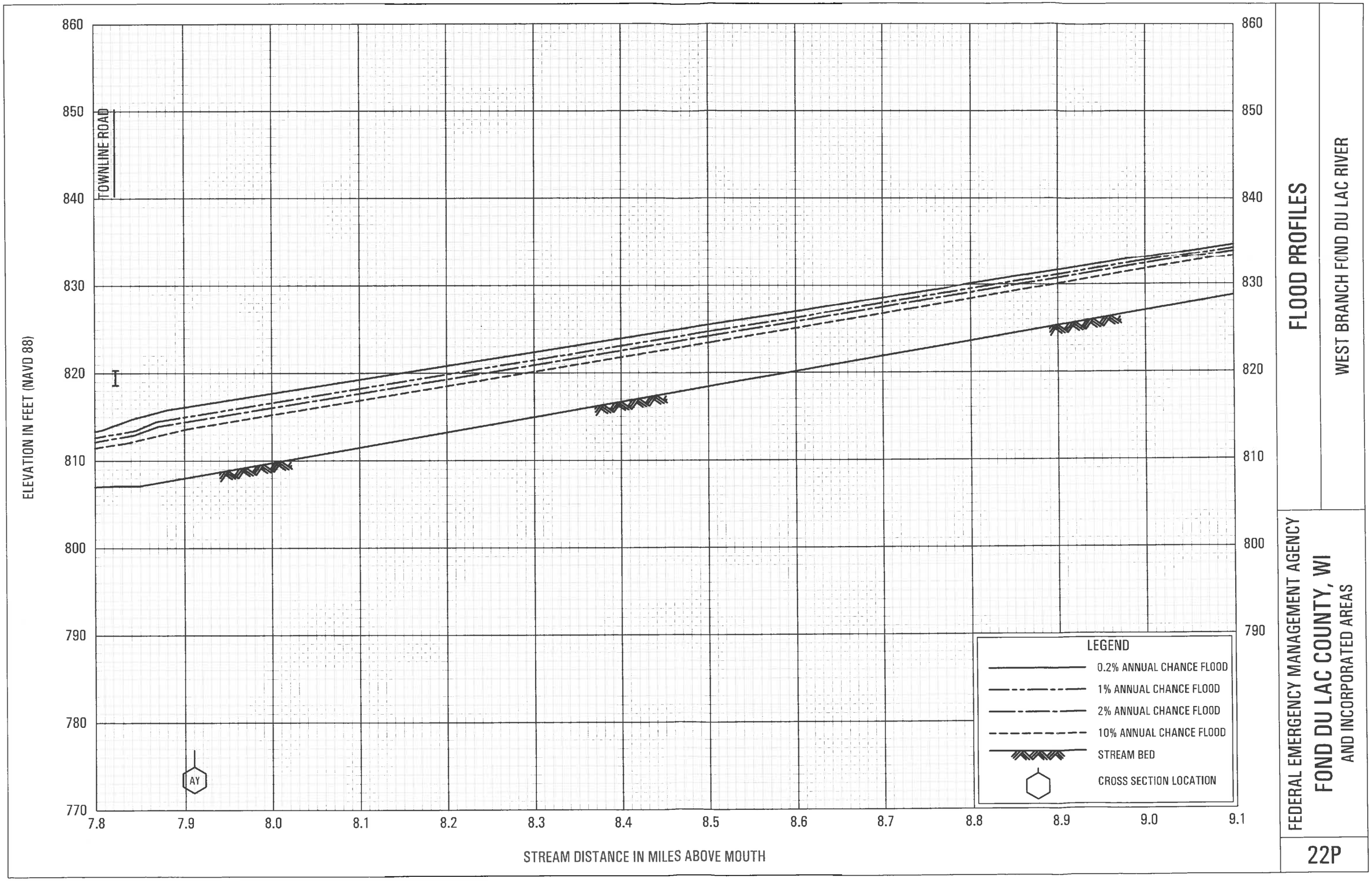
FLOOD PROFILES

WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



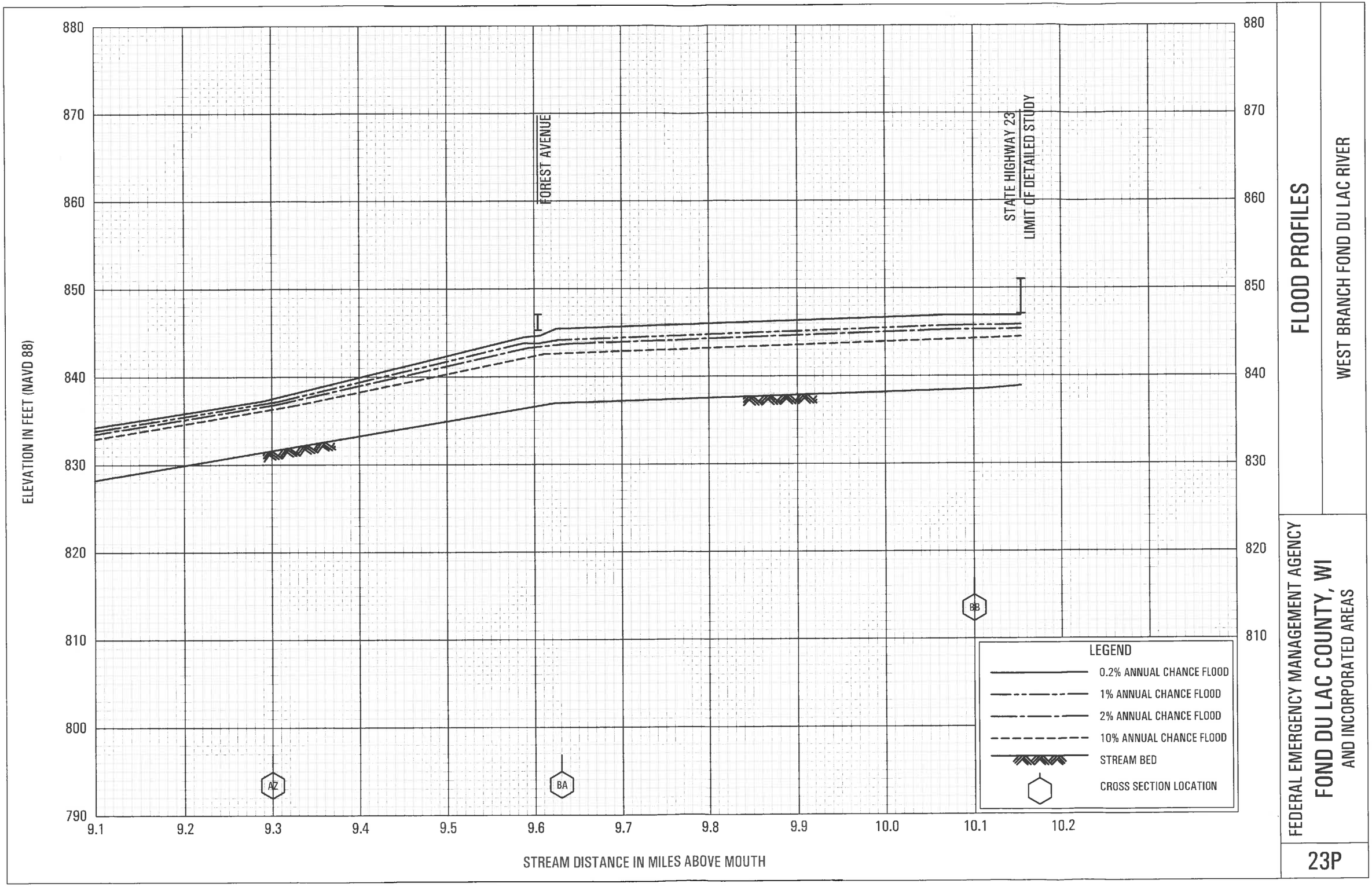
FLOOD PROFILES

WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



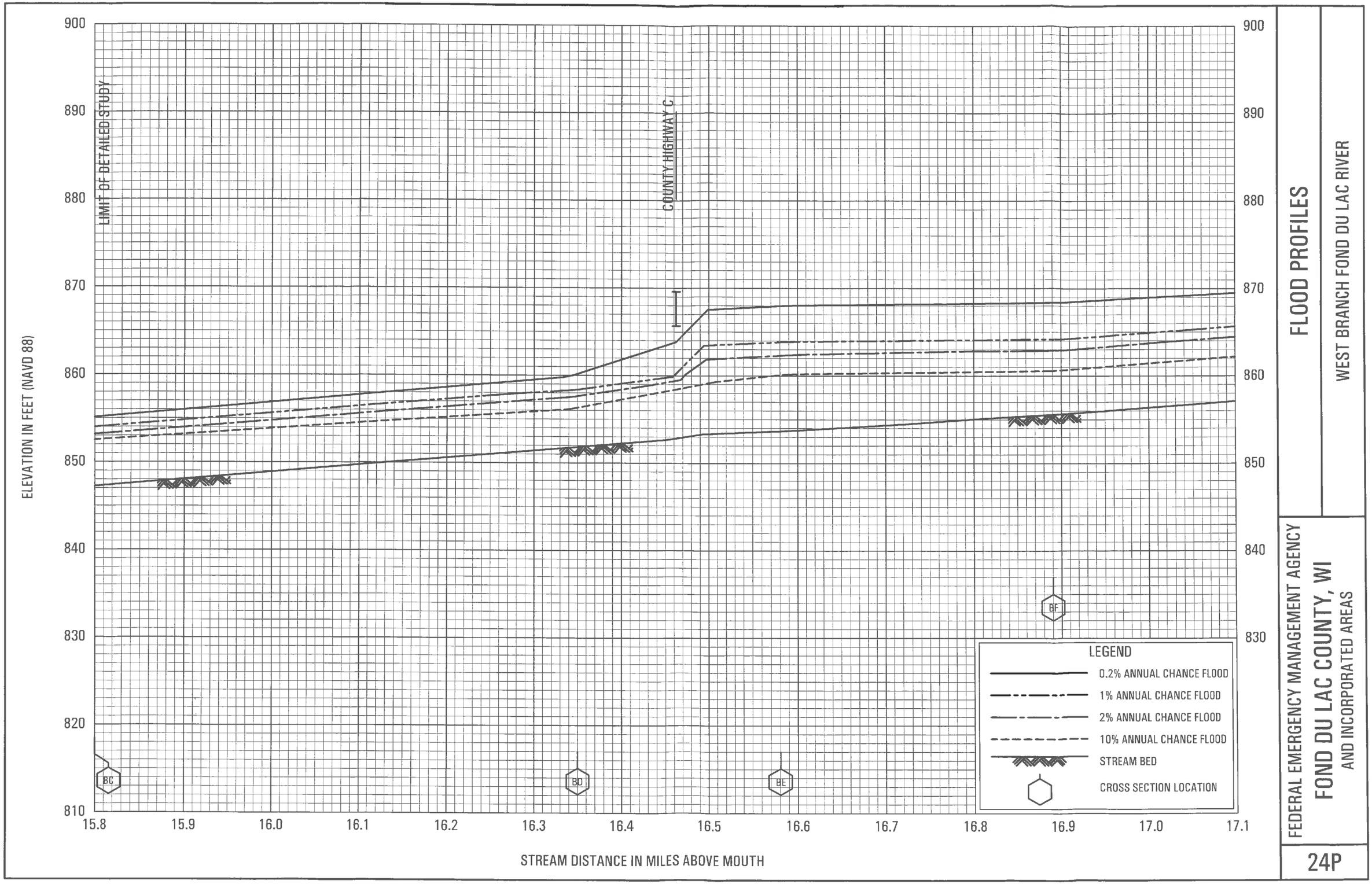
FLOOD PROFILES

WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI
AND INCORPORATED AREAS

23P



FLOOD PROFILES

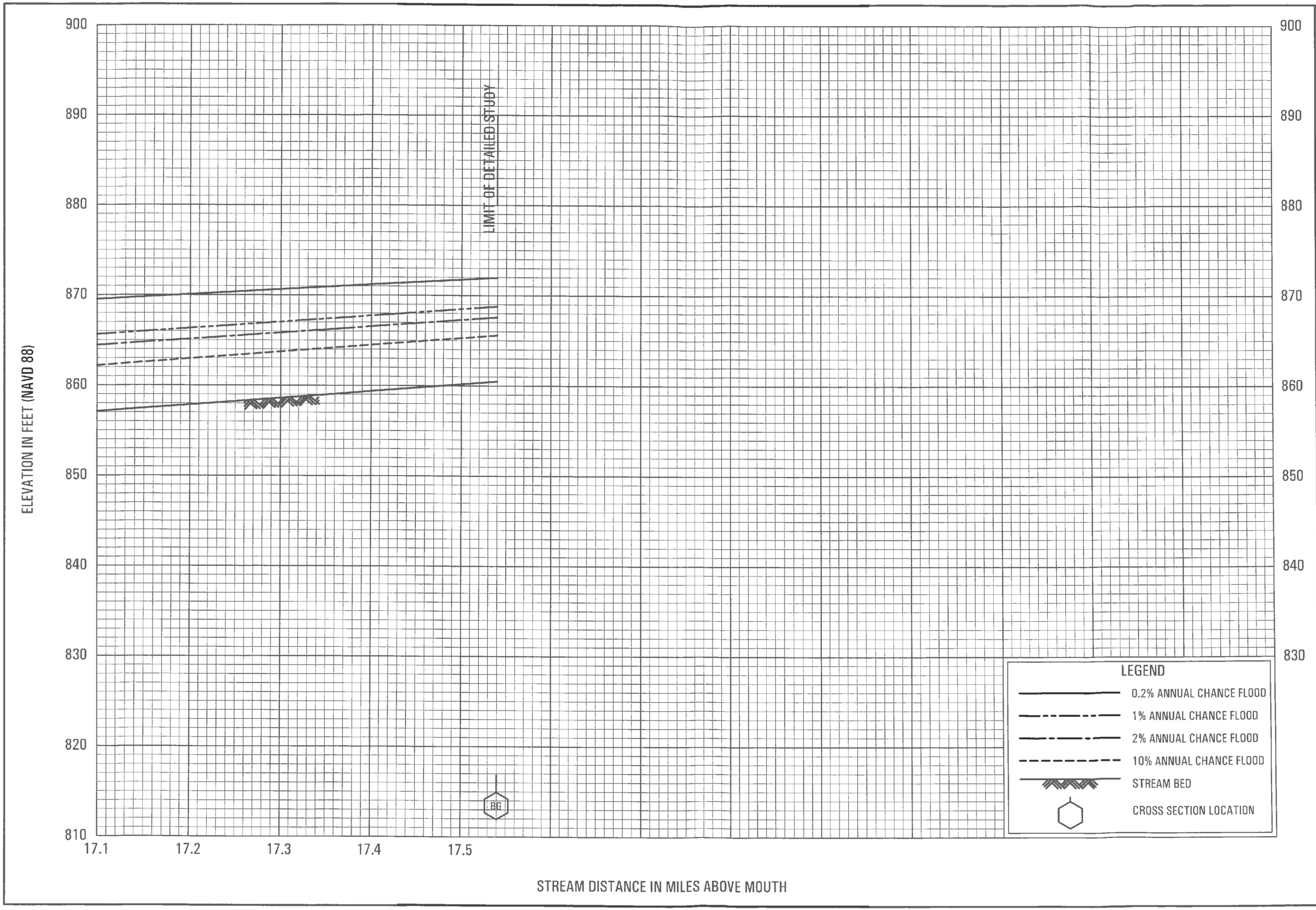
WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

24P



FLOOD PROFILES

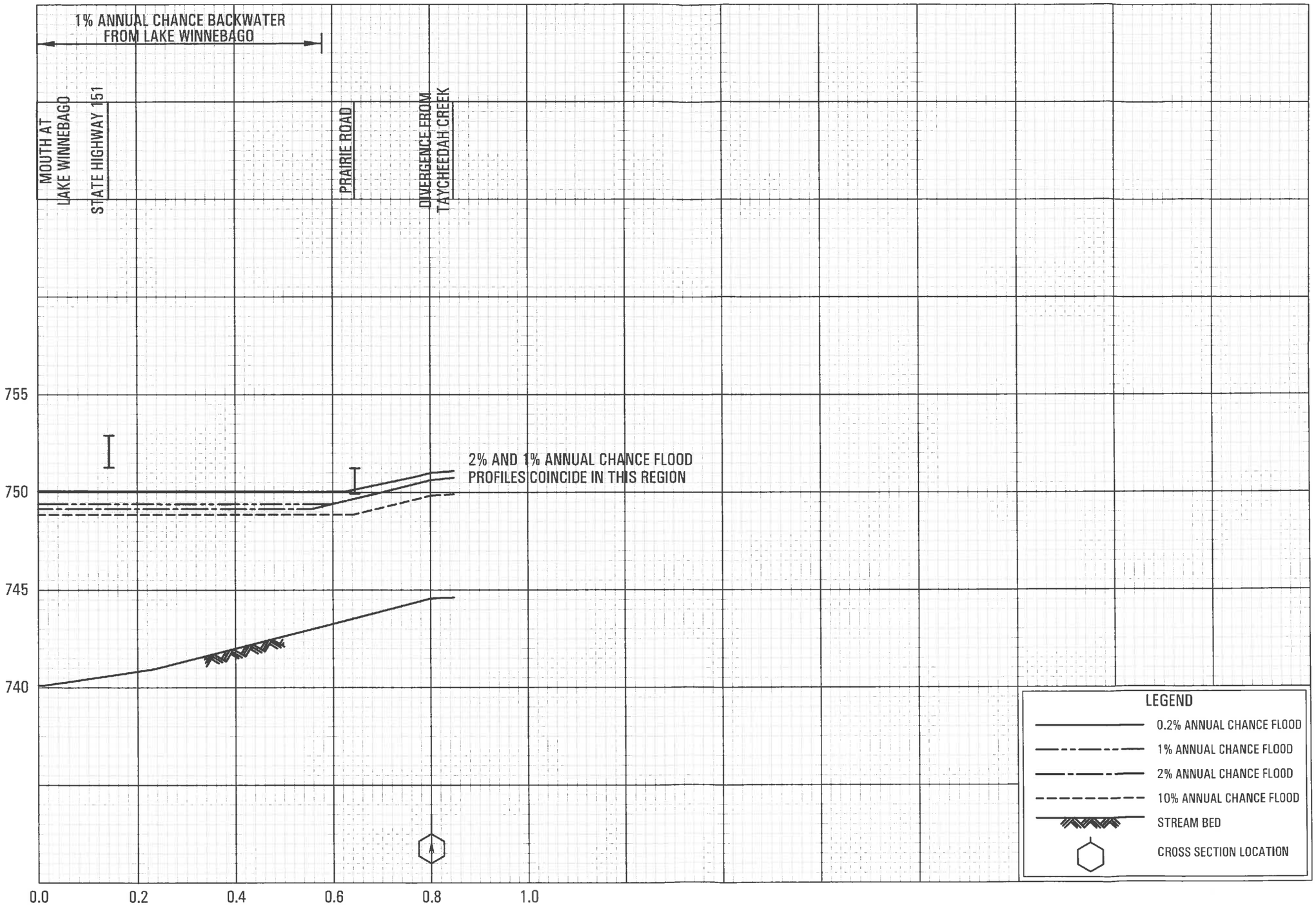
WEST BRANCH FOND DU LAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

25P



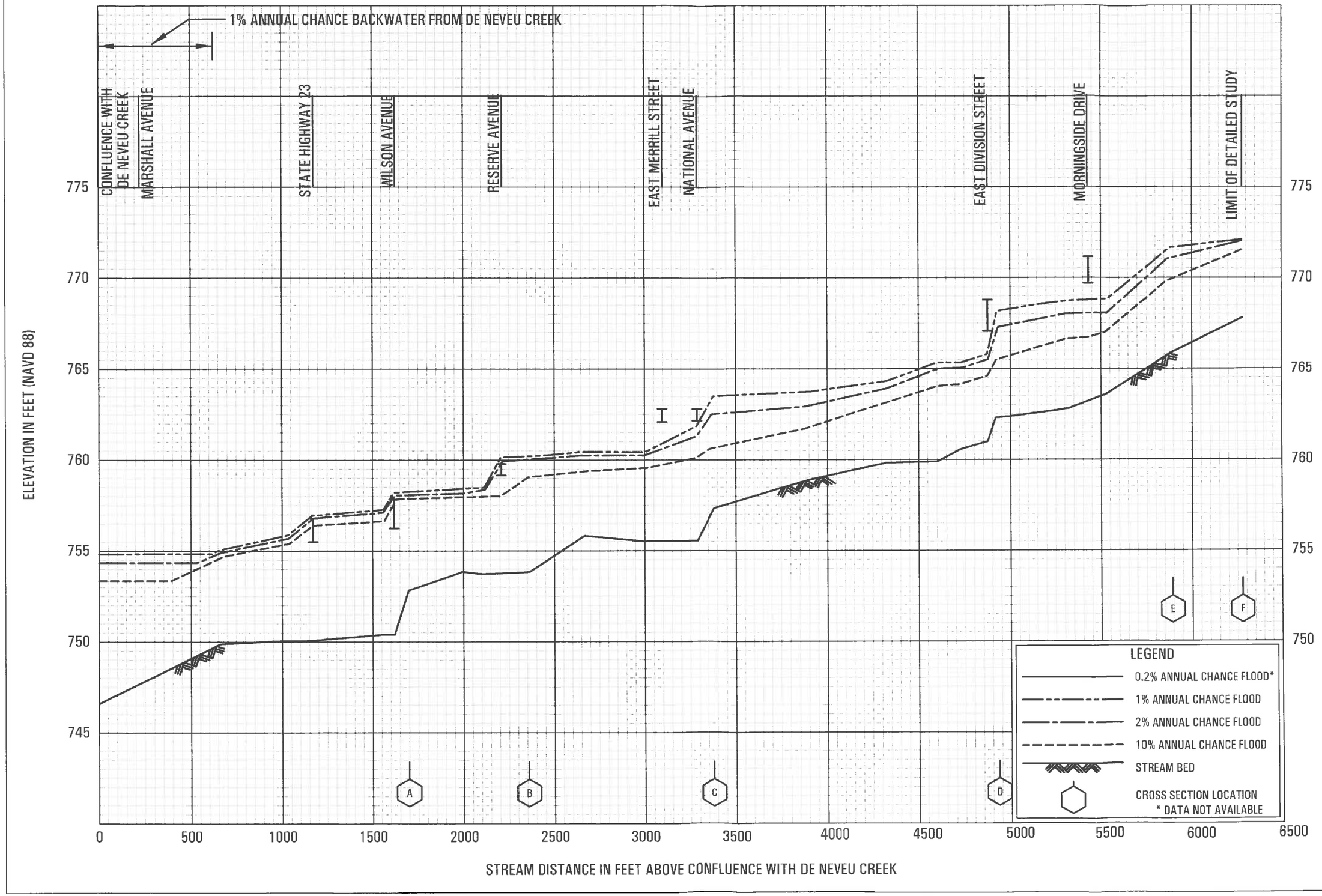
FLOOD PROFILES

LUCO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

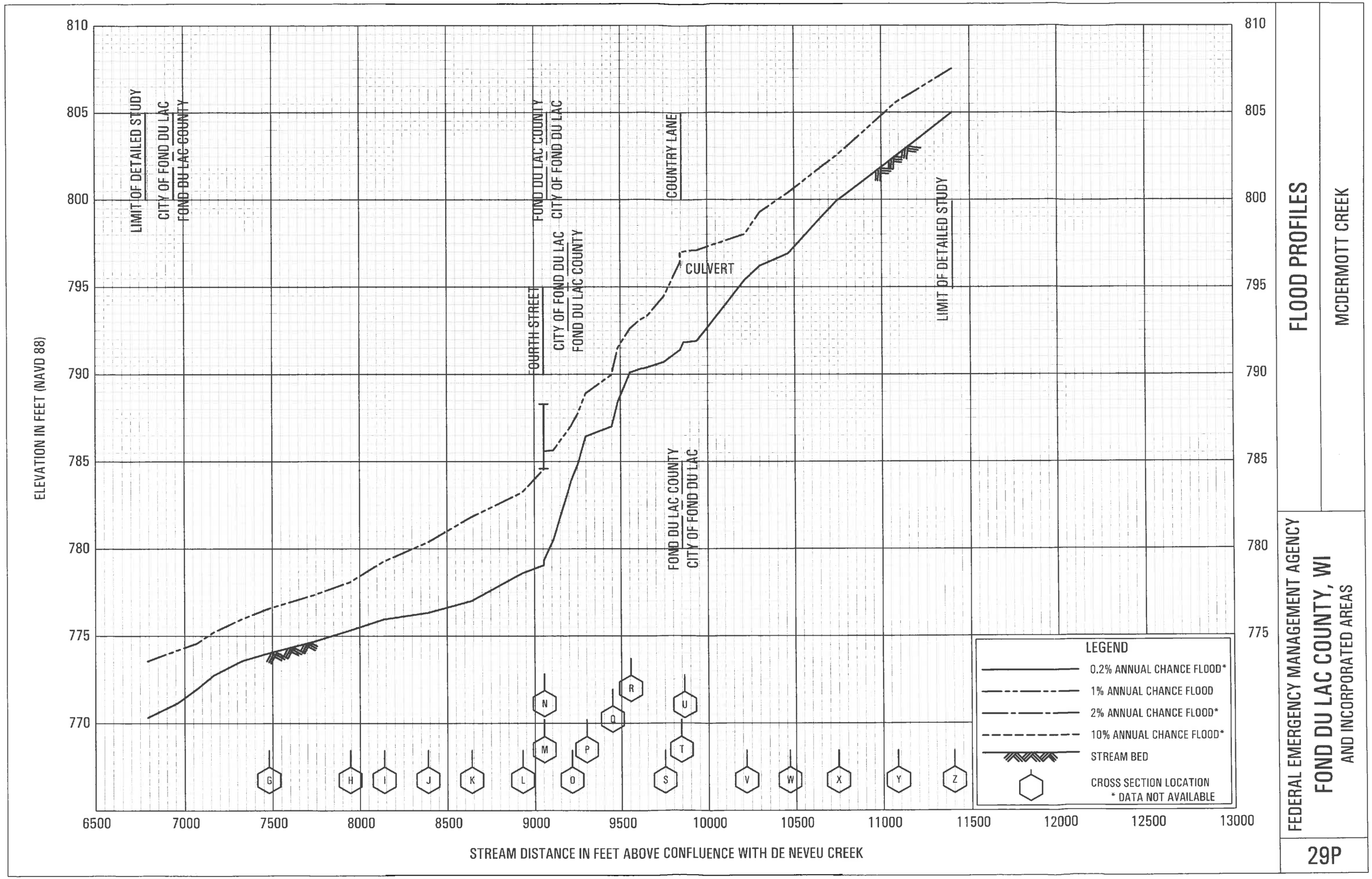
MCDERMOTT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

28P



FLOOD PROFILES

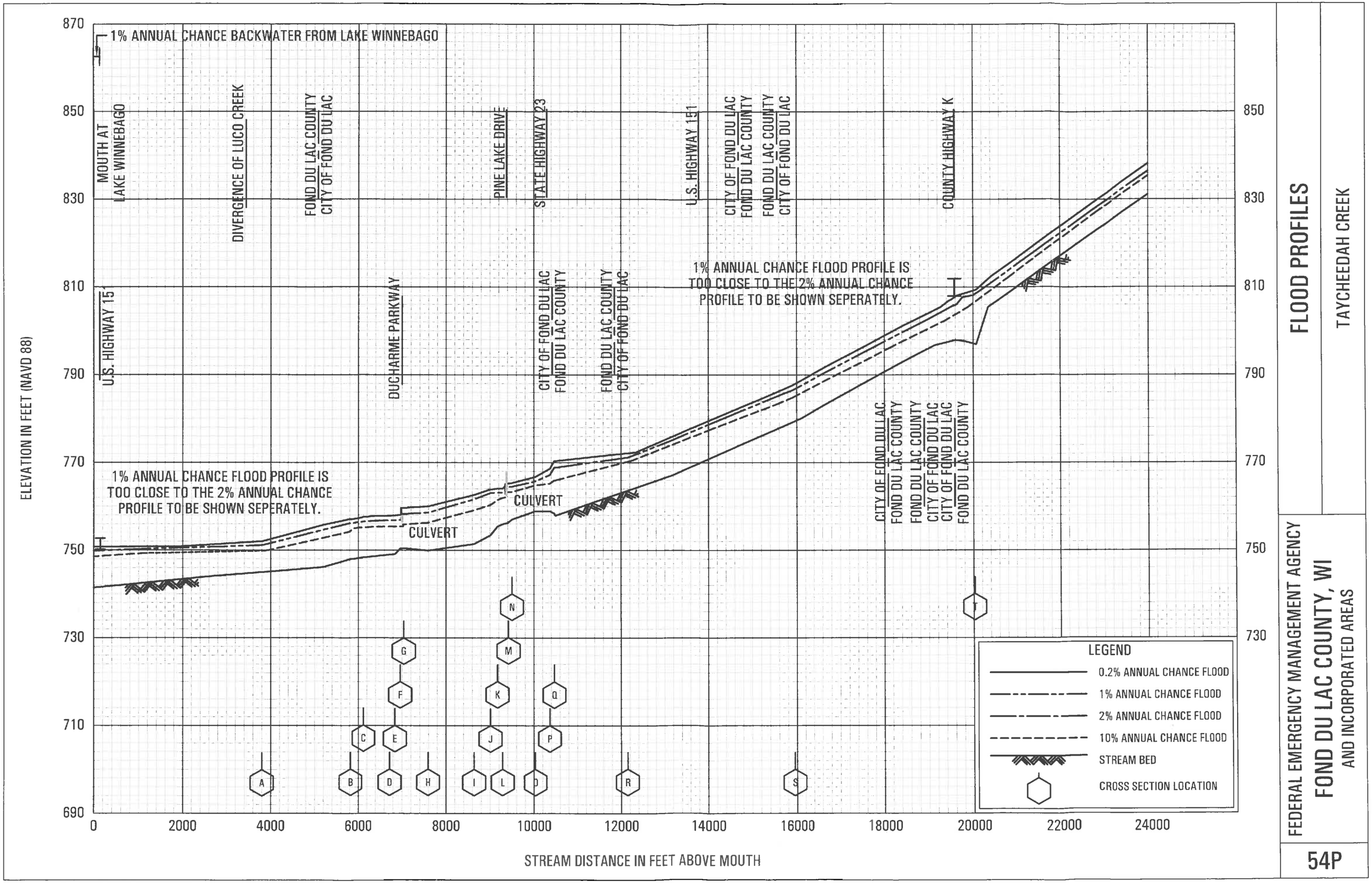
MCDERMOTT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

29P



FLOOD PROFILES

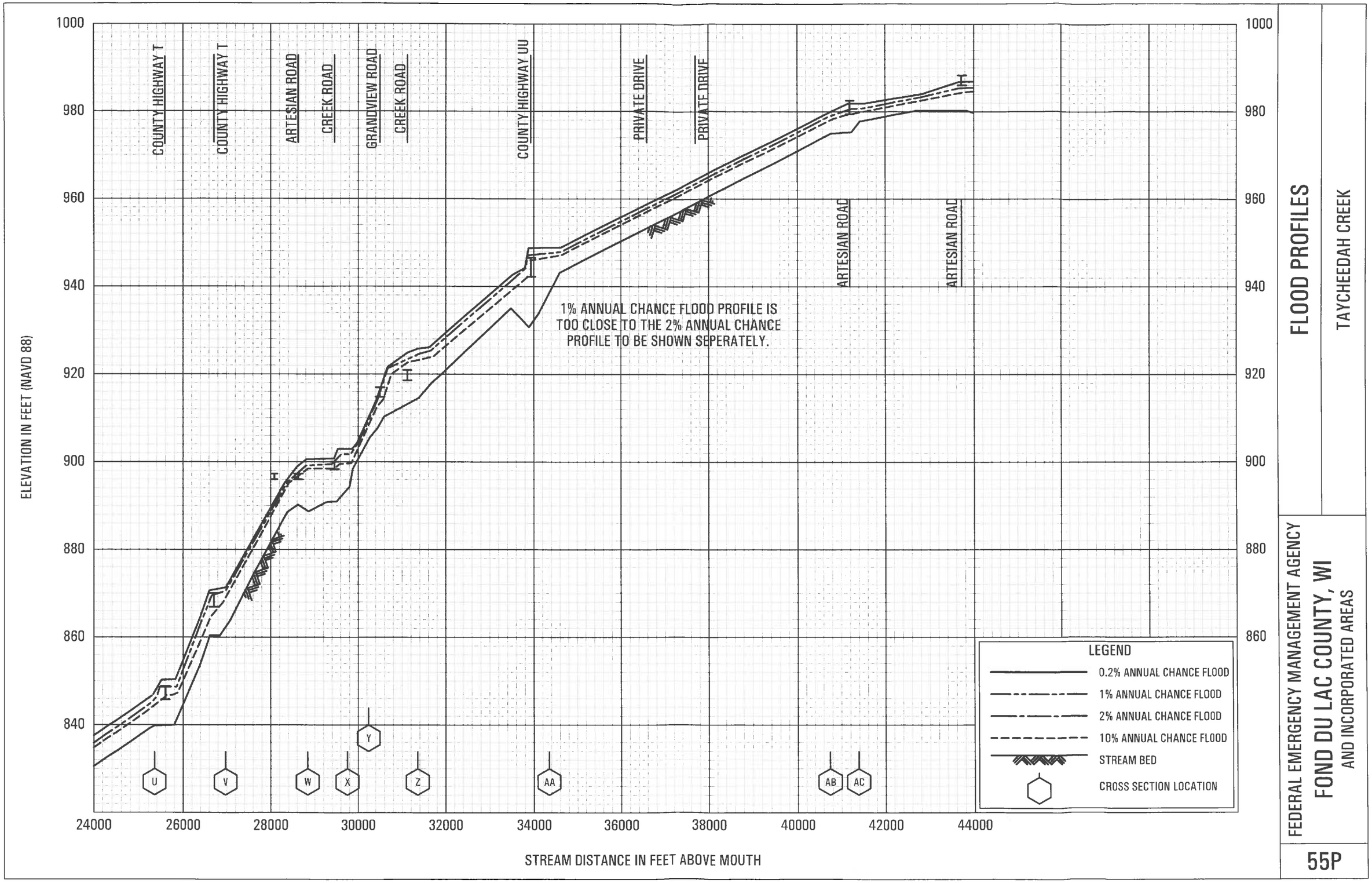
TAYCHEEDAH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS

54P



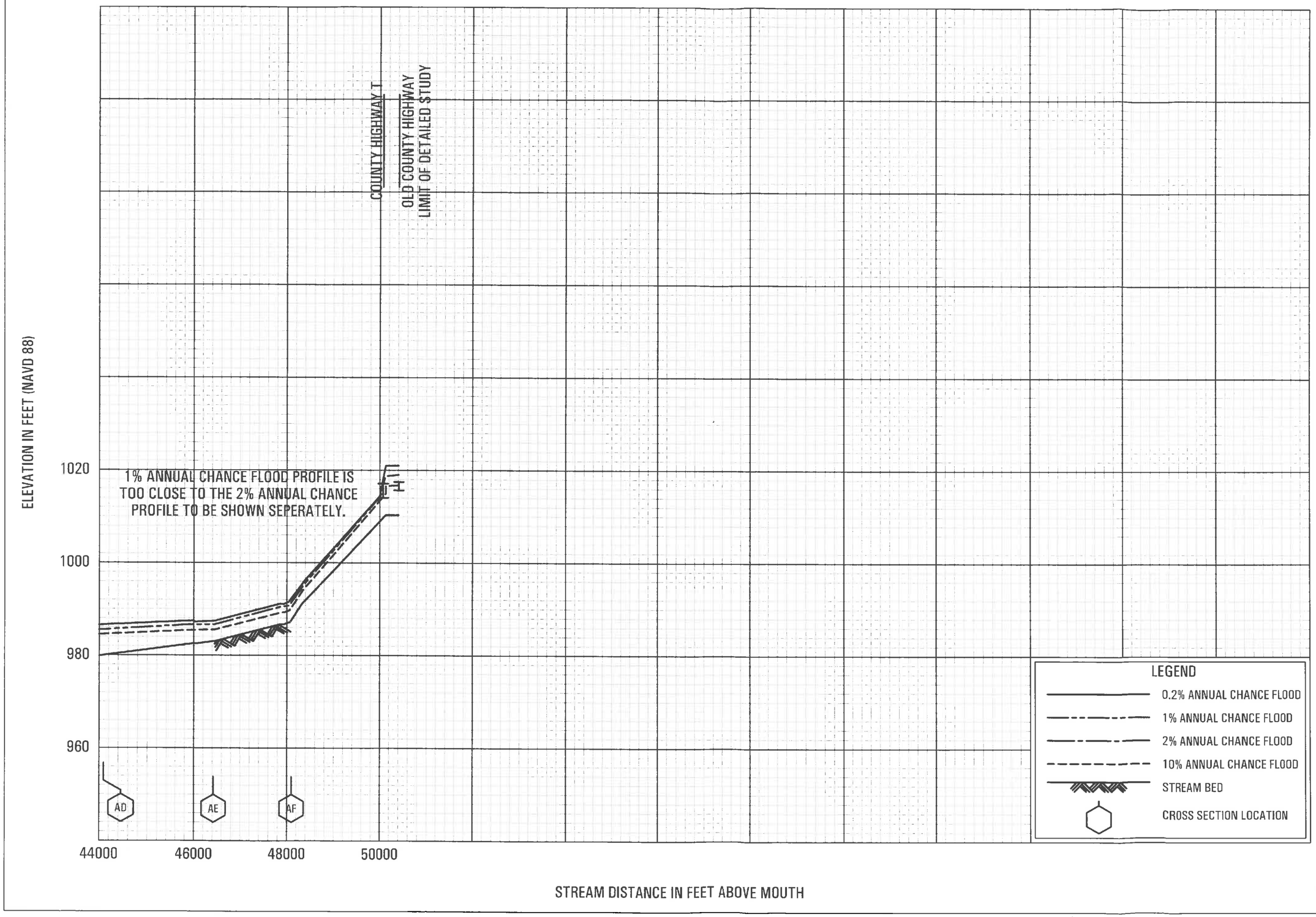
FLOOD PROFILES

TAYCHEEDAH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS



FLOOD PROFILES

TAYCHEEDAH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FOND DU LAC COUNTY, WI

AND INCORPORATED AREAS