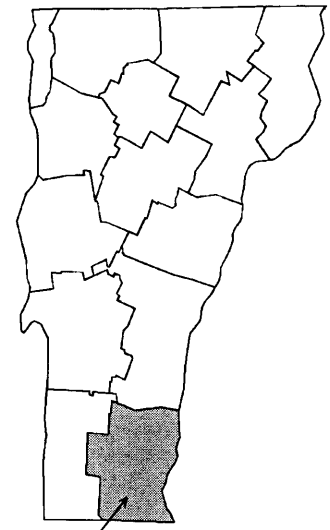
FLOOD INSURANCE STUDY

VOLUME 1 OF 2

WINDHAM COUNTY, VERMONT
(ALL JURISDICTIONS)

COMMUNITY NAME	COMMUNITY NUMBER
ATHENS, TOWN OF	500279
BELLOWS FALLS, VILLAGE OF	500125
BRATTLEBORO, TOWN OF	500126
BROOKLINE, TOWN OF	500280
DOVER, TOWN OF	500127
DUMMERSTON, TOWN OF	500128
GRAFTON, TOWN OF	500129
GUILFORD, TOWN OF	500130
HALIFAX, TOWN OF	500281
JAMAICA, TOWN OF	500131
LONDONDERRY, TOWN OF	500132
MARLBORO, TOWN OF	500283
NEWFANE, TOWN OF	500133
PUTNEY, TOWN OF	500134
ROCKINGHAM, TOWN OF	500135
SOMERSET, TOWN OF	500287
STRATTON, TOWN OF	500321
TOWNSHEND, TOWN OF	500136
VERNON, TOWN OF	500137
WARDSBORO, TOWN OF	500138
WESTMINSTER, TOWN OF	500139
WHITINGHAM, TOWN OF	500141
WILMINGTON, TOWN OF	500142
WINDHAM, TOWN OF	500290



SEPTEMBER 28, 2007

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
50025CV001A

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

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

Initial Countywide FIS Effective Date: September 28, 2007

Revised Countywide FIS Dates:

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FLOOD INSURANCE STUDY
WINDHAM COUNTY, VERMONT (ALL JURISDICTIONS)

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in or, revises and updates a previous FIS/Flood Insurance Rate Map (FIRM) for the geographic area of Windham County, including the Village of Bellows Falls and the Towns of Athens, Brattleboro, Brookline, Dover, Dummerston, Grafton, Guilford, Halifax, Jamaica, Londonderry, Marlboro, Newfane, Putney, Rockingham, Somerset, Stratton, Townshend, Vernon, Wardsboro, Westminster, Whitingham, Wilmington, and Windham (hereinafter referred to collectively as Windham County).

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 Windham 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 incorporated communities within Windham County into a countywide FIS. Information on the authority and acknowledgments for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below:

Bellows Falls, Village of:	the hydrologic and hydraulic analyses for the original 1979 FIS report were prepared by Dufresne-Henry Engineering Corporation for the Federal Insurance Administration (FIA), under Contract No. H-4020. This work was completed in January 1978. For the FIS report dated December 20, 1999, an

	ice jam analysis for the Connecticut River was prepared by the USACE as part of a mission assignment under disaster number DR-1101-VT. This work was completed in April 1998.
Brattleboro, Town of:	the hydrologic and hydraulic analyses for the FIS report dated December 4, 1985, were prepared by Dufresne-Henry, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-C-0683. This work was completed in November 1983.
Dummerston, Town of:	the hydrologic and hydraulic analyses for the FIS report dated June 17, 1991, were prepared by U.S. Army Corps of Engineers (USACE), New England Division, for FEMA, under Inter-Agency Agreement No. EMW-E-0941. This work was completed in February 1987.
Grafton, Town of:	the hydrologic and hydraulic analyses for the FIS report dated August 4, 1987, were prepared by the U.S. Soil Conservation Service for a Flood Plain Management Study for the town.
Jamaica, Town of:	the hydrologic and hydraulic analyses for the original FIS were prepared by Dufresne-Henry, Inc., for FEMA, under Contract H-4576. This work was completed in January 1979. The hydrologic and hydraulic analyses for the FIS report dated May 17, 1988, were prepared by Dufresne-Henry, Inc., for FEMA, under Contract No. EMW-C-5097. This work was completed in January 1986.
Londonderry, Town of:	the hydrologic and hydraulic analyses for the FIS report dated January 3, 1997, were prepared by the New England Division of the USACE for FEMA. This work was completed on June 27, 1994.
Newfane, Town of:	the hydrologic and hydraulic analyses for the FIS report dated June 5, 1989, were prepared by the U.S. Geological Survey (USGS) for FEMA, under Inter-Agency

	Agreement No. EMW-85-E-1823, Project Order No. 20. This work was completed in July 1987.
Rockingham, Town of:	the hydrologic and hydraulic analyses for the original 1979 FIS report were prepared by Dufresne-Henry Engineering Corporation for the Federal Insurance Administration (FIA), under Contract No. H-4020. This work was completed in January 1978. For the FIS report dated December 20, 1999, an ice jam analysis for the Connecticut River was prepared by the USACE as part of a mission assignment under disaster number DR-1101-VT. This work was completed in April 1998.
Vernon, Town of:	the hydrologic and hydraulic analyses for the FIS report dated September 27, 1991, were prepared by Environmental Engineers, Inc., for FEMA, under Contract No. H-4590, during the preparation of the FIS for the Town of Hinsdale. This work was completed in December 1978.
Wardsboro, Town of:	the hydrologic and hydraulic analyses for the FIS report dated January 1980 were prepared by Dufresne-Henry Engineering Corporation for the FIA, under Contract No. H-4576. This work was completed in January 1979.
Westminster, Town of:	the hydrologic and hydraulic analyses for the FIS report dated January 3, 1985, were prepared by Environmental Engineers, Inc., for FEMA during the FIS for the Town of Walpole, New Hampshire. This work was completed in October 1980.
Wilmington, Town of:	the hydrologic and hydraulic analyses for the FIS report dated November 1977 were prepared by Anderson-Nichols and Co., Inc., for FEMA, under Contract No. H-3862. This work was completed in January 1977.

The authority and acknowledgments for the Towns of Athens, Brookline, Dover, Guilford, Halifax, Marlboro, Putney, Somerset, Stratton, Townshend,

Whitingham, and Windham are not available because no FIS reports were ever published for those communities.

For this countywide, the hydrologic and hydraulic analyses for the Connecticut River were prepared by ENSR International, East Coast Mapping, CR Environmental, Green International, Cold Regions Research and Engineering Laboratory for FEMA, under Contract No. EMB-2001-CO-0627. This work was completed in October 2003.

The coordinate system used for the production of this FIRM is Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD 83), GRS80 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the UTM projection, NAD 83. Differences in the datum, spheroid, projection, or UTM zones 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.

Base map information shown on this FIRM was provided in digital format by the Vermont Department of Taxes Mapping Program. This information was compiled at a scale of 1:5,000 from digital orthophotography dated 1994.

1.3 Coordination

The purpose of an initial Consultation Coordination Officer's (CCO) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study.

The dates of the initial and final CCO meetings held for Windham County and the incorporated communities within its boundaries are shown in Table 1, "CCO Meeting Dates for Precountywide FISs."

TABLE 1 - CCO MEETING DATES FOR PRECOUNTYWIDE FISs

Community Name	Initial CCO Date	Final CCO Date
Village of Bellows Falls	August 11, 1998	*
Town of Brattleboro	June 1981	January 25, 1985
Town of Dummerston	July 20, 1983	January 19, 1990
Town of Grafton	June 12, 1986	July 28, 1986
Town of Jamaica	April 1984	October 31, 1986
Town of Londonderry	October 6, 1983	April 14, 1995
Town of Newfane	February 26, 1985	January 13, 1988
Town of Rockingham	August 11, 1998	*
Town of Vernon	October 10, 1989	December 21, 1990
Town of Wardsboro	June 22, 1977	July 5, 1979
Town of Westminster	*	July 13, 1983
Town of Wilmington	September 1975	March 22, 1977

*Data not available

For this revision, an initial CCO meeting was held on November 1, 2001. The meeting was attended by the State NFIP Coordinator, and representatives of ENSR International, Dewberry, and FEMA.

A final CCO meeting was held on February 1, 2006, and was attended by representatives of FEMA, the State, Dewberry, Watershed Concepts, Town of Brattleboro, Town of Dummerston, Town of Grafton, Town of Jamaica, Town of Newfane, Town of Putney, Town of Wardsboro, Town of Westminster, Town of Wilmington, and Town of Windham.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Windham County, Vermont.

All or portions of the flooding sources listed in Table 2, "Streams Studied by Detailed Methods," were studied by detailed methods.

TABLE 2 – STREAMS STUDIED BY DETAILED METHODS

Ames Hill Brook
Ball Mountain Brook
Beaver Brook
Bill Brook
Binney Brook
Cold Brook
Connecticut River
Cook Brook
Deerfield River
Dover Brook
Ellis Brook
Hinkley Brook
Lowell Lake Brook
North Branch Deerfield River
Rock River
Saxtons River
Smith Brook
South Branch Saxtons River
South Wardsboro Brook
Utley Brook
Wardsboro Brook
Weaver Brook
West River
West River Auxiliary Channel
Whetstone Brook – Halladay Brook
Williams River
Winhall River

Ball Mountain Reservoir and Lowell Lake were also studied by detailed methods for their entire shorelines within Windham County.

For this revision, the portion of the Connecticut River from approximately 80 feet downstream of Vernon Dam to the Windham County-Windsor County boundary was restudied by detailed methods (ENSR, 2003). The study area includes the Connecticut River and its backwater affecting portions of Broad Brook, Saxtons River, Wardsboro Brook, West River, Whetstone Brook, and Williams River, extending approximately 0.95 mile upstream of their confluences with the Connecticut River.

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

Numerous flooding sources were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, agreed upon by, FEMA and the individual communities within Windham County.

2.2 Community Description

Windham County is located in southeastern Vermont. In Windham County, there are 24 communities. The Towns of Brattleboro, Dummerston, Guilford, Halifax, Marlboro, Vernon, Whitingham, and Wilmington are located in the southern portion of the county. The Towns of Athens, Grafton, Jamaica, Londonderry, Rockingham, Townshend, Westminster, Windham, and the Village of Bellows Falls are located in the northern portion of the county. The Towns of Brookline, Dover, Newfane, Putney, Somerset, Stratton, and Wardsboro are located in the center of Windham County.

Windham County is bordered to the north by the Towns of Andover, Chester, Springfield, and Weston in Windsor County. To the west, the county is bordered by the Towns of Glastenbury, Landgrove, Readsboro, Searsburg, Sunderland, Winhall, and Woodford in Bennington County. It is bordered to the east by the Towns of Chesterfield, Hinsdale, Walpole, and Westmoreland in Cheshire County, New Hampshire; and the Town of Charlestown in Sullivan County, New Hampshire. To the south, the county is bordered by the Towns of Bernardston, Colrain, Heath, Leyden, Monroe, Northfield, and Rowe in Franklin County, Massachusetts.

According to the 2000 U.S. Census, the land area in Windham County was 789 square miles and the estimated population of Windham County was 44,231 in 2000.

The topography of Windham County is characteristic of the Vermont Piedmont, a rolling to rough plateau with numerous steep-sided valleys cut by streams and eroded by glaciation. This feature is formed by the Green Mountains, Berkshires and the White Mountains. As in much of Vermont, development occurs along the flatland adjacent to rivers and streams. For agricultural purposes, these areas are more suitable for cultivation. For commercial purposes, they are easily accessible to highways and railroads.

The climate of the county is continental, with warm summers, extended autumns, and cold winters. The average summer and winter temperatures are 69 degrees Fahrenheit (°F) and 22°F, respectively. The average annual precipitation is 41 inches, with an average annual snowfall of 70 inches, and may be considerably more at higher elevations (U.S. Department of Commerce, 1980).

The main flooding sources in Windham County are the Connecticut River, Saxtons River, Wardsboro Brook, and the West River.

2.3 Principal Flood Problems

Floods have occurred in the area during all seasons of the year, but spring and fall have historically produced those with greater magnitude and effect. The most severe floods have been caused by storms of tropical origin, such as hurricanes, usually occurring in late summer and early fall. Winter and spring flooding is commonly caused by transcontinental storms in combination with snowmelt or ice jams. Mid-spring and fall thunderstorms can also produce limited local flooding.

The Connecticut River originates at the Connecticut Lakes in northern New Hampshire, near the Canadian border. As it flows towards the south, it forms a natural boundary between Vermont and New Hampshire. Flooding conditions along the Connecticut River have been historically aggravated by the effects of ice jams. USACE indicates that ice jams are almost an annual occurrence on the Connecticut River upstream of Bellows Falls Dam.

Damaging floods along the Connecticut River have been recorded since the 1700s. The major floods in recent history have occurred in June 1973, March 1968, June 1952, September 1938, March 1936, November 1927, and March 1913. The most recent flood of June 1973 occurred when a moist, tropical air mass became stationary over much of New England, causing heavy rainfall. More than 8 inches of rain fell in the mountainous regions of southern Vermont, creating a peak floodflow on the Connecticut River of approximately a 20-year recurrence level.

Flooding caused by the September 1938 hurricane produced the highest known water levels on the Saxtons River since October 1869. The Cambridgeport Road above the Village of Saxtons River caved in, and a mill dam in Saxtons River washed away. The peak flood discharge has approximately a 230-year recurrence interval. Flooding along the Williams River was the greatest ever known. Along the Saxtons and Williams Rivers, the most recent notable flooding occurred on August 10, 1976. A tropical storm caused moderate to heavy rainfall over most of the New England area. Peak discharges on the Saxtons and Williams Rivers had approximately 45- and 50-year recurrence intervals, respectively.

Wardsboro Brook rises in the Town of Stratton on the eastern side of the divide with the Deerfield River. The brook flows east for approximately 8 miles to the Village of Wardsboro where it turns to the northeast and flows 3 miles to the West River in Jamaica. The slope of Wardsboro Brook, approximately 100 feet per mile, is nearly constant throughout its length. Little floodplain area exists along the brook.

The West River originates in the southeastern Green Mountains near South Mountain. The steepness of the West River and its lack of natural storage in lakes and swamps can cause it to rise from normal stages to extreme flood peaks in a short period of time. The duration of flooding depends on the duration of rainfall producing runoff. During all major floods, high-velocity flows and hazardous conditions exist in the main stream channels and some portions of the floodplain. The flood of November 1927 was the result of heavy rain, caused by a tropical storm that fell upon previously saturated ground. For almost three days, an average rainfall of six inches fell throughout the State of Vermont. Ten bridges in

the West River valley were washed out, and most town roads were flooded. At a 26-foot high hydro-electric plant in West Dummerston, elevations 13 to 14 feet higher than the dam were reported.

2.4 Flood Protection Measures

Three hydroelectric dams are located within the study area: Vermont, Wilder, and Bellows Falls. Four additional dams (First Connecticut Lakes, Moore, Comerford, and McIndoes) are located upstream of the study area. Five USACE flood control projects affect the study area. These projects were installed in the early 1960s and control approximately 15 percent of the watershed to the study area. There are also dams located on many of the tributaries that reduce potential flood damage (ENSR, 2003).

Peak flows on the West River are modified by the effects of Ball Mountain Dam and Townshend Dam, built in 1961. The Ball Mountain Dam on the West River was completed as a part of an overall flood control system for the headwaters of the Connecticut River. The primary purpose of Ball Mountain Dam is to store discharges from the West River during regional flood for gradual release when flood peaks from uncontrolled portions of the Connecticut River Basin have passed (USACE, 1976). The channel capacity downstream of Ball Mountain Dam is approximately 5,000 cubic feet per second (cfs). The flowage easement of the Townshend Dam, located on the West River approximately 19.5 miles upstream of the Connecticut River, at an elevation of 553 feet prevents development below that elevation along the West River in the Town of Jamaica.

There are no flood protection measures existing at this time which affect flooding along Whetstone Brook and its tributaries, Rock River, Smith Brook, Deerfield River, North Branch Deerfield River, Binney Brook, Bill Brook, Beaver Brook, Cold Brook, and Ellis Brook.

3.0 ENGINEERING METHODS

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

this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

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

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

Precountywide Analyses

In the Town of Brattleboro, free-flowing discharges for the West River were obtained from the attenuation afforded by Townshend and Ball Mountain Reservoirs (USACE, 1981). Discharges associated with ice jams on the West River were not evaluated beyond the point of determining that the upstream regulation has significantly reduced ice jam problems. Free-flowing discharges for Whetstone Brook and Ames Hill Brook were adopted from a detailed investigation by the SCS in 1977 (U.S. Department of Agriculture, 1977).

These flows were adjusted to account for the modifying effects of the flood control reservoirs located upstream of the town. Both free-flowing discharges and those associated with ice jams were considered in the computation of peak discharge frequency relationships.

In the Town of Dummerston, peak discharge frequencies for the West River were taken from the Flood Plain Information Report on the Connecticut and West Rivers, prepared by the USACE, and the FIS for the Town of Brattleboro (USACE, April 1977). These flows were adjusted to account for the modifying effects of the flood control reservoirs located upstream of the town. Both free-flowing flood discharges and those associated with ice jams were considered in the computation of peak discharge-frequency relationships.

In the Town of Grafton, flood runoff volumes and flow rates were developed along the Saxtons River, the South Branch Saxtons River, and Hinkley Brook using the SCS Technical Release No. 20 computer model (U.S. Department of Agriculture, Soil Conservation Service, 1982). Flow-frequency values from this hydrologic model were adjusted as necessary in analyzing them along with values from similar gaged watersheds.

In the Towns of Londonderry and Newfane, discharges for Utley Brook and the West River were adopted from a 1977 USACE report (USACE, June 1977). These discharges were developed by statistical analysis of recorded flow data in the region. Data from the USGS gaging station located on the West River (No. 01156000) within the Town of Newfane, which has a 57-year period of record for a drainage area of 308 square miles, were used in this analysis. Statistical analyses were performed at that gaging station using annual peak flows in a log-

Pearson Type III distribution (U.S Department of the Interior, 1981 and U.S. Department of the Interior, 1984). Computed statistics at this gage had a mean log of 4.124, and a standard deviation of 0.2160 with a skew of 1.0. The adopted discharges were then transferred from the gage to selected locations along the streams in the Town of Londonderry by ratio of their respective drainage areas to the 0.8 exponential power. Discharges for Cook and Lowell Lake Brooks were developed by using the adopted discharge frequencies for the West River and transferring the discharges by ratio of their respective drainage areas to the 0.8 exponential power.

Discharges for the Winhall River were taken from the FIS for the Town of Jamaica. These values, taken at the Londonderry-Jamaica corporate limits, were transferred to other points along the river by drainage area ratio to the 0.8 exponential power.

It is noted that downstream sections of the West and Winhall Rivers and Cook and Lowell Lake Brooks are within the limits of Ball Mountain Reservoir, a USACE flood control reservoir which was placed in operation in 1961. The Ball Mountain Reservoir peak stages for various frequencies were developed by statistical analysis of recorded reservoir stage data. The dam, located on the West River in Jamaica, Vermont, has a 172-square mile drainage area, with 32-years of systematic peak stage data available. Also available were the results of analysis of the March 1936 flood, which was considered a historic peak for the storage-frequency analysis. Statistical analysis was preformed using data in a log-Pearson Type III distribution (U.S. Department of the Interior, 1981). Computed statistics at the gage had a mean of 136.36 and standard deviation of 33.47, with a skew of 0.6. However, with only one recorded stage above spillway crest, the annual series curve was adopted only up to the spillway crest elevation (approximately a 50-year event). For less frequent events, the curve was graphically determined, based on analysis of the spillway design characteristics and design floods, to better represent stage frequencies above spillway crest.

In the Town of Jamaica, peak discharge computed for free floods on the West River were based on a HEC-1 computer analysis of a flood hydrograph developed by the USACE (USACE, 1973). Peak discharge computations for the West River Auxiliary Channel, the Winhall River, Wardsboro River, and Ball Mountain Brook were based on a regional method developed by the USGS, which relates flood flows to drainage areas, hydrologic areas, and flood-frequency regions by the statistical manipulation of known discharges along selected rivers (U.S. Department of the Interior, 1965).

Discharges associated with ice jam flooding along the West River are significantly less than peaks of free-flowing floods. When a severe jam occurs, the USACE has the ability to effectively eliminate flow contributed above Ball Mountain Dam. Because Ball Mountain Brook is the primary source of flow during ice jams, the discharges computed using USGS regional equations for more frequent events were selected for use as ice jam flood flows. Specifically, the average annual peak free flow on Ball Mountain Brook was assumed to occur as the 10-percent annual chance ice jam flow on the West River; the 20-percent

annual chance free flow was used as the 2-percent annual chance ice jam flow; the 4-percent annual chance free flow as the 1-percent annual chance ice jam flow; and the 2-percent annual chance free flow as the 0.2-percent annual chance ice jam flow. The validity of these assumptions was checked against historical data available for other streams. An unpublished analysis of average daily flows during ice jam season for 16 gages in New Hampshire and Vermont indicated that ice jam flows associated with a particular recurrence interval are, on the average, from 40 to 60 percent less than peaks for free-flowing floods. The flood discharges at the jam site adopted for the West River ice jams fall within the range. Also, previous analyses have indicated that the 1981 ice jam was approximately a 2-percent annual chance ice jam for many Vermont streams. The discharge experienced on the nearby Williams River, transposed to the West River, closely approximates the discharge adopted for the 2-percent annual chance ice jams.

In the Town of Newfane, the 1-percent annual chance flood discharges for Smith Brook and the Rock River were based on equations developed from a report on flood magnitude and frequency of Vermont streams (U.S. Department of the Interior, 1974). The regional method relates drainage area, area of lakes and ponds, snow depth, and 24-hour rainfall intensity values to the peak discharge by regression equations.

In the Town of Rockingham and the Village of Bellows Falls, peak discharge-frequency relationships for the Saxtons River and the Williams River were based on an analysis of annual peak discharges recorded at USGS gaging station Nos. 01154000 and 01153500. Station No. 01154000 is located approximately 0.8 miles east of the community of Saxtons River and 3.6 miles upstream from the Saxtons River's confluence with the Connecticut River. Station No. 01153500 is located in Brockways Mills on Williams River. Both gages have been in continuous operation since June 1940. In addition, an estimated peak discharge for the September 1938 flood, and comparative information on historic floods dating back to 1753, are available. Peak discharges for the selected recurrence intervals were obtained by fitting a log-Pearson Type III distribution to the historically weighted annual peaks, using methods outlined by the U.S. Water Resources Council (Water Resources Council, 1976). Generalized skew coefficients of 0.46 for Saxtons River and 0.48 for Williams River were used in the analysis. No adjustment was made for expected probability. Peak discharges were assumed to be in the same ratio as the 0.75 power of the drainage area within the communities (U.S. Department of the Interior, 1962).

In the Town of Rockingham and the Village of Bellows Falls, peak discharges for floods of the selected recurrence intervals on Weaver Brook were computed using a regional flood-frequency method developed for the New England area (U.S. Department of the Interior, 1962). This method related flood peaks to topographic and climatic factors through statistical and multiple regression techniques. Discharges were computed for floods having 10-, 2-, and 1-percent annual chance recurrence intervals and extrapolated on a log-probability plot to include the 0.2-percent annual chance flood discharge.

In the Town of Wardsboro, peak discharge computations for Wardsboro Brook, South Wardsboro Brook, and Dover Brook were based on a regional method developed by the USGS. This method relates flood flows to drainage areas, hydrologic areas, and flood-frequency regions by statistical manipulation of known discharges along selected rivers (U.S. Department of the Interior, 1962).

In the Town of Wilmington, discharges of the Deerfield River were modified by the storage capacity of Somerset Reservoir. This capability was determined by computing a reservoir routing of the Somerset Reservoir; a numerical iteration method (Viessman, 1972) was used in conjunction with hydrologic data developed by the New England Power Service Company (New England Power Service Company, 1962).

Countywide Analyses

For this revision, hydrologic analyses were conducted to establish the peak discharge frequency relationships for floods of the selected recurrence intervals for the Connecticut River within the study area.

A log-Pearson Type III flood frequency analysis was performed for each of the USGS gage stations on the Connecticut River within the study area in accordance with the procedures outlined in Bulletin 17B. Since several significant flood control projects were constructed within the study area watershed in the late 1950s and early 1960s, only annual gage records for the period after 1960 were used in this analysis. However, historic peak data prior to 1960 (flood of 1913, 1927, 1936, and 1938) were used in the flood frequency analyses. Peak flows for these historic events were adjusted to account for the effect of upstream flood control devices, based on studies performed by the USACE. Adjusted flows that exceeded the high outlier threshold from the post-1960 systematic record were incorporated in the flood frequency analysis as historic peaks in accordance with Bulletin 17B. For all stations, a weighted skew value was used in accordance with Bulletin 17B, based on the station skew and the regional skew calculated during analysis.

Results of the flood frequency analysis predict that peak flows for the 1-percent annual chance return frequency are approximately 9 percent lower than those predicted by previous studies, primarily due to a more rigorous evaluation of the effect of multiple flood control projects installed within the Connecticut River watershed by the USACE (ENSR, 2002).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 3, "Summary of Discharges."

TABLE 3 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
AMES HILL BROOK					
At confluence with Whetstone Brook	4.7	480	1,944	2,400	3,730
Below Hinesburg Road	3.9	400	1,630	2,010	3,125
BALL MOUNTAIN BROOK					
At confluence with West River	33.7	5,100	9,300	11,500	19,000
Above confluence of North Branch	15.8	2,540	5,495	7,060	10,600
Above brook from Forester Pond	10.4	1,990	4,495	5,770	8,850
BEAVER BROOK					
At confluence with North Branch Deerfield River	8.50	974	2,265	2,798	5,200
At Gage Station No. 01167800	6.47	856	2,046	2,528	4,700
Approximately 1,400 feet upstream of Fifth State Route 9 Crossing (near Molly Stark State Forest)	1.60	259	712	879	1,800
BILL BROOK					
At confluence with North Branch Deerfield River	7.50	529	1,245	1,539	2,750
Lake Raponda Road	5.44	454	1,104	1,364	2,575
BINNEY BROOK					
At confluence with North Branch Deerfield River	3.79	603	1,520	1,878	3,650
At Breached Dam	3.30	561	1,433	1,770	3,330
At confluence of Binney and Rose Brooks	2.62	435	1,139	1,407	2,830
COLD BROOK					
At confluence with North Branch Deerfield River	8.83	1,553	3,596	4,442	8,000
At Cold Brook Road	6.00	1,292	3,109	3,842	6,400
At the Wilmington-Dover corporate limits	2.80	557	1,500	1,853	3,775

TABLE 3 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
CONNECTICUT RIVER					
At Hinsdale-Northfield corporate limits	6,765	91,300	126,000	144,000	191,700
Vernon Gage (No. 01156500)	6,266.0	95,400	115,400	121,200	135,000
Confluence of Whetstone Brook	6,180.0	94,500	114,500	120,500	134,700
Confluence of West River	6,151.0	94,200	114,100	120,300	134,600
Confluence of Sackets Brook	5,685.0	89,300	108,900	116,300	132,900
Confluence of Saxtons and Cold Rivers	5,555.0	88,000	107,500	115,200	132,500
Bellows Gage (No. 01154500)	5,493.0	87,300	106,800	114,600	132,300
Confluence of Williams River	5,367.0	85,800	105,400	113,400	131,300
COOK BROOK					
At confluence with Winhall River	13.5	2,620	4,685	5,860	10,500
Upstream of confluence of Eddy Brook	9.3	1,940	3,480	4,350	7,800
At Londonderry-Jamaica corporate limits	4.9	1,165	2,080	2,600	4,670
DEERFIELD RIVER					
At confluence with Harriman Reservoir	102.05	6,098	11,684	14,677	24,000
At Wilmington-Dover corporate limit	100.34	5,972	11,514	14,502	23,000
DOVER BROOK					
At confluence with Wardsboro Brook	1.4	388	830	1,080	1,750
ELLIS BROOK					
At confluence with North Branch Deerfield Branch	9.9	1,054	2,477	3,060	5,700
At Wilmington-Dover corporate limit	2.3	455	1,207	1,491	3,000
HINKLEY BROOK					
At confluence with Saxtons River	1.7	*	*	712	*

*Data not available

TABLE 3 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
LOWELL LAKE BROOK					
At confluence with West River	8.9	1,730	3,085	3,870	6,940
Downstream of Thompsonburg Road	4.5	1,000	1,790	2,245	4,020
At confluence of Lowell Lake	1.2	350	620	780	1,400
NORTH BRANCH DEERFIELD RIVER					
At confluence with Harriman Reservoir	57.94	4,066	7,801	9,639	15,200
Downstream confluence of Binney Brook	56.38	3,996	7,687	9,498	15,100
Upstream confluence of Binney Brook	52.59	3,887	7,528	9,303	14,900
Downstream confluence of Beaver Brook	51.88	3,834	7,437	9,190	14,800
Upstream confluence of Beaver Brook	43.38	3,761	7,428	9,178	14,600
Downstream confluence of Cold Brook	40.19	3,544	7,051	8,713	14,500
Upstream confluence of Cold Brook	31.36	2,735	5,578	6,892	11,800
Downstream confluence of Bill Brook	30.57	2,691	5,503	6,800	11,600
Upstream confluence of Bill Brook	23.07	2,572	5,411	6,686	11,500
Downstream confluence of Ellis Brook	21.15	2,514	5,334	6,590	11,300
Upstream confluence of Ellis Brook	11.24	1,358	3,109	3,841	7,100
At Wilmington-Dover corporate limits	10.84	1,336	3,029	3,742	6,600
ROCK RIVER					
At confluence with West River	58.9	*	*	15,600	*
Upstream of cross section E	41.5	*	*	11,000	*
Upstream of cross section N	26.4	*	*	7,000	*

*Data not available

TABLE 3 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
SAXTONS RIVER					
At Athens- Grafton corporate limits	43.4	*	*	10,332	*
At Interstate 91	76.3	5,510	9,250	11,250	17,100
At corporate limits of Town of Rockingham and Village of Bellows Falls	73.3	5,350	8,980	10,900	16,600
At Hall Bridge Road	72.2	5,290	8,880	10,800	16,400
At State Route 121 (Main St.)	70.0	5,170	8,680	10,550	16,000
Upstream of Pleasant Valley Brook	68.4	5,080	8,530	10,370	15,750
Upstream of Westminster West Road Tributary	61.7	4,700	7,890	9,600	14,580
Upstream of Leach Road Tributary	59.1	4,550	7,640	9,300	14,110
Upstream of Bull Creek	46.8	3,820	6,410	7,800	11,850
Upstream of Weaver Brook	43.2	3,600	6,040	7,350	11,160
SMITH BROOK					
At confluence with West River	12.6	*	*	3,000	*
SOUTH BRANCH SAXTONS RIVER					
At confluence with Saxtons River	19.8	*	*	9,679	*
SOUTH WARDSBORO BROOK					
At confluence with Wardsboro Brook	4.3	845	1,650	2,050	3,100
UTLEY BROOK					
At confluence with West River	29.0	4,700	8,400	10,500	18,800
At county boundary	22.3	3,810	6,810	8,510	15,240
WARDSBORO BROOK					
At confluence with West River	35.1	4,800	8,600	10,600	16,200
At Wardsboro-Jamaica corporate limits	34.5	4,200	7,300	9,000	13,200
Above Waite Brook	22.1	3,459	6,400	7,700	10,400

*Data not available

TABLE 3 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
WEAVER BROOK					
At confluence with Saxtons River	3.4	260	600	860	2,000
WEST RIVER					
At confluence with Connecticut River	423.0	12,000	20,000	30,000	53,000
At Dummerston-Brattleboro Corporate limits	418.0	12,000	20,000	30,000	53,000
At Newfane-Dummerston Corporate limits	408.0	*	*	30,000	*
At USGS gaging station No. 01156000	308.0	*	*	12,700	*
At Jamaica-Townshend Corporate limits	269.2	11,736	21,555	26,555	41,832
Above confluence of Wardsboro Brook	233.8	6,984	13,041	15,975	25,794
Above confluence of Turkey Mountain Brook	218.8	5,566	10,125	12,573	25,000
Above confluence of Ball Mountain Brook	182.1	5,000	6,000	7,000	25,000
At Jamaica-Londonderry Corporate limits	170.6	17,800	31,800	39,850	71,200
Upstream of confluence of Winhall River	101.0	11,700	20,900	26,200	46,800
Upstream of confluence of Lowell Lake Brook	90.1	10,680	19,075	23,910	42,715
Downstream of confluence of Utley Brook	68.0	8,800	15,700	19,700	35,300
Upstream of confluence Of Utley Brook	40.0	5,300	9,200	11,500	20,100
At Londonderry-Weston Corporate limits	35.0	4,760	8,270	10,335	18,060
WEST RIVER AUXILIARY CHANNEL					
Above confluence of Turkey Mountain Brook	218.8	5,566	10,125	12,573	25,000

*Data not available

TABLE 3 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
WHETSTONE BROOK					
At confluence with Connecticut River	28.0	3,397	6,399	7,900	12,277
Downstream of Guilford St.	25.7	3,182	5,994	7,400	11,500
Upstream of confluence of Ames Hill Brook	22.7	2,193	4,131	5,100	7,925
Upstream of confluence of unnamed tributary from Pleasant Valley Reservoir	15.7	1,935	3,645	4,500	6,993
WILLIAMS RIVER					
At confluence with Connecticut River	117.8	8,120	13,030	15,570	22,820
At Brockways Mill Road	103.0	7,340	11,780	14,980	20,630
At Lower Bartonsville Road	96.7	7,000	11,240	13,430	19,680
WINHALL RIVER					
At confluence of West River	61.6	9,400	17,500	21,600	34,500
At Londonderry-Jamaica corporate limits	43.3	7,100	13,200	16,300	26,000

In this revision, for the portion of the West River above Ball Mountain Dam in the Town of Jamaica, a stillwater elevation was added using the stillwater elevation from the Town of Londonderry for the entire area within Ball Mountain Reservoir.

The stillwater elevations have been determined for the 1-percent annual chance floods for the flooding sources studied by detailed methods and are summarized in Table 4, "Summary of Stillwater Elevations."

TABLE 4 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (FEET NAVD*) 1-PERCENT
BALL MOUNTAIN RESERVOIR	
Entire shoreline	1,020.1
LOWELL LAKE	
Entire shoreline	1,354.6

*North American Vertical Datum of 1988

A summary of peak discharges for ice jam floods are shown in Table 5, "Summary of Ice Jam Discharges."

TABLE 5 - SUMMARY OF ICE JAM DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
WEST RIVER					
At Jamaica-Townshend Corporate limits	269.2	4,850	7,500	14,500	18,800
Above confluence of Wardsboro Brook	233.8	2,925	4,510	8,800	11,350
Above confluence of Turkey Mountain Brook	218.8	2,400	3,700	7,200	9,300
WHETSTONE BROOK					
Upstream of confluence of Ames Hill Brook	22.7	725	1,310	1,610	2,440
Upstream of confluence of an unnamed tributary from Pleasant Valley Reservoir	15.7	636	1,149	1,412	2,140

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). All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

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

The hydraulic analyses for this FIS were based on unobstructed flow, with the exception of Connecticut River, West River, and Whetstone Brook which have ice jam effects. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

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

Precountywide Analyses

Historically, ice jam flooding has been a major problem on the West River. The head of the jam would form where the West River enters the Retreat Meadows area and could extend for several miles upstream. However, since the completion of the Townshend and Ball Mountain Dams in the upper portion of the West River basin, flood damage from ice jams on the West River has been reduced (USACE, 1972 and Ormand, 1981).

Ice jams were evaluated using the option available for that purpose in the HEC-2 program. Ice of varying thickness was inserted at the cross-section through the island approximately 1,250 feet downstream of French Bridge. The ice was assumed to occupy the river to the upstream side of the bridge. A wide range of thicknesses were evaluated to determine which combinations caused the best approximation of conditions that have actually been experienced. These selected thicknesses vary in the channel for selected recurrence intervals. Specifically, ice thicknesses in the channel were 5 feet for the 10-percent annual chance ice jam, 6 feet for the 2-percent annual chance ice jam, 7 feet for the 1-percent annual chance ice jam, and 10 feet for the 0.2-percent annual chance ice jam. Ice jam thicknesses were assumed to be 3 feet of ice in the overbanks for all floods. The results were compared to ice jams that have actually occurred. The adopted 1-percent annual chance ice jam closely approximates the worst that has been experienced to date. The free-flowing flood elevations and ice jams elevations were combined to determine a composite elevation for specific recurrence intervals.

Ice jams on Whetstone Brook have historically occurred at a sharp bend downstream of the Country Drive bridge near the confluence of the unnamed stream from Pleasant Valley Reservoir. The best available information indicates that ice jams creating significant flooding have occurred at this location every 1 out of 2 years (Edward, 1983; Ormand, 1981; USACE, 1980). The resulting flooding usually extends from the jam site upstream to the Mountain Drive bridge and sometimes across State Route 9. The hydraulic analysis of the ice jams at this location consisted of calibrating the HEC-2 model to observed elevations for the 1976 and 1979 ice jams and using the resulting ice jam parameters with discharges estimated for the 10-, 2-, 1-, and 0.2-percent annual chance ice jams. The results indicated that, for recurrence interval elevations reached by ice jam-related flooding, the elevations are approximately 2 feet higher than free-flowing floods at and immediately upstream of the jam site.

Cross sections for Ames Hill Brook, Ball Mountain Brook, Beaver Brook, Bill Brook, Binney Brook, Cold Brook, Cook Brook, Deerfield River, Dover Brook, Ellis Brook, Lowell Lake Brook, North Branch Deerfield River, Rock River, Saxtons River, Smith Brook, South Wardsboro Brook, Utley Brook, Wardsboro

Brook, Weaver Brook, West River Auxiliary Channel, Williams River, and Winhall River, which were studied by detailed methods, were obtained from field surveys.

Cross sections for the West River were obtained from the USACE Flood Plain Information report for Brattleboro, supplemented by depth soundings and surveys taken in 1982 (USACE, 1972), and obtained for topographic maps compiled by photogrammetric methods (USACE, 1984). The below water sections were obtained by field measurements, the use of topographic maps and engineering judgment. Starting water-surface elevations for West River in Brattleboro, were calculated using the water surface for a higher frequency flood on the Connecticut River. The starting water-surface elevation for West River in Dummerston was taken from the FIS for the Town of Brattleboro.

The overbank portions of cross sections for Binney Brook, Beaver Brook, Cold Brook, Ellis Brook, Deerfield River, and North Branch Deerfield River were obtained from contour maps at a scale of 1:2,400, with a contour interval of 5 feet (State of Vermont Department of Highways, May 1966, April 1966).

Cross sections for the backwater analysis of Whetstone Book were obtained from the USACE Flood Plain Information report for Brattleboro and an SCS study (USACE, 1972 and U.S. Department of Agriculture). Also, several sections were supplied by Southern Vermont Engineering. Photogrammetrically determined cross sections, supplemented by field surveys, provided data for the backwater analysis for Ames Hill Brook (Lockwood Support Services, 1982).

For the Town of Newfane, flood profiles for the West River were drawn using the stream bed elevation and 1-percent annual chance flood elevations at USGS gaging station No. 01156000 and from the FIS for the Town of Dummerston.

Cross-section data on the Williams River were obtained photogrammetrically; below-water channel sections were determined by field survey (Vermont Department of Highways). Cross sections on the Saxtons River and Weaver Brook were field surveyed.

Water-surface elevations of floods of the selected recurrence intervals were computed using the HEC-2 step-backwater computer program (USACE, 1984; 1979; 1973) for Ames Hill Brook, Ball Mountain Brook, Beaver Brook, Bill Brook, Binney Brook, Cold Brook, Cook Brook, Deerfield River, Dover Brook, Ellis Brook, Lowell Lake Brook, North Branch Deerfield River, Rock River, Saxtons River, Smith Brook, South Wardsboro Brook, Utley Brook, Wardsboro Brook, Weaver Brook, West River, West River Auxiliary Channel, Whetstone Brook, Williams River, and Winhall River.

Water-surface elevations of floods of the selected recurrence intervals were computed using the SCS WSP-2 standard step method computer program (U.S. Department of Agriculture, 1982) for Hinkley Brook, Saxtons River, and South Branch Saxtons River.

For the Town of Newfane, the water-surface elevations determined were then used along with the USGS topographic map to determine the extent of flooding. Flood profiles were drawn showing the computed water-surface elevations for the 1-percent annual chance flood.

In the Town of Wilmington, starting water-surface elevations for the Deerfield River and the North Branch Deerfield River were calculated by a routing analysis of the Harriman Reservoir using a numerical iteration method (Viessman, 1972). Starting water-surface elevations for Binney Brook, Beaver Brook, Cold Brook, Bill Brook, and Ellis Brook were taken from the North Branch Deerfield River flood profiles. At various locations along the study streams in Wilmington, supercritical flow conditions may exist. Because of the instability of such conditions, the critical flow has been assumed for this study.

For the Town of Wardsboro, the analyses of Dover Brook determined that the 0.2-percent annual chance flood would overtop the channel banks.

Starting water-surface elevations were determined using the slope/area method for Ball Mountain Brook, Cook Brook, Dover Brook, Lowell Lake Brook, Rock River, Smith Brook, South Wardsboro Brook, Utley Brook, Wardsboro Brook, Weaver Brook, West River, West River Auxiliary Channel, Williams River, and Winhall River.

Starting water-surface elevations for portions of West River were taken from the FIS for the Town of Brattleboro.

In the Town of Londonderry, one river crossing on the West River and at three river crossings on Lowell Lake Brook, dams were modeled with discharge ratings input into the computer program using an X5 card. The discharge ratings were computed using the conventional weir and orifice formulas with the values shown in the following tabulation.

Stream	Station	Values		
West River	372+40	$c = 3.2$	$L_1 = 85$ feet	$L_2 = 22.0$ feet
Lowell Lake Brook	133+40	$c = 3.2$	$L_1 = 8$ feet	$L_2 = 29.7$ feet
	209+20	$c = 3.2$	$L = 25$ feet	

Countywide Analyses

Cross sections for the hydraulic model for the Connecticut River were developed using GIS-based automated modeling techniques from a digital terrain model of the study area. The floodplain digital terrain model was developed from aerial photogrammetric topographic survey of the above water areas and boat-based bathymetric transect survey of the under water areas (ENSR, 2003).

Along the newly-revised portions of the Connecticut River, a profile base line is shown on the maps to represent channel distances as indicated on the flood profiles and floodway data tables.

For water-surface elevations for the Connecticut River, 10-, 2-, 1-, and 0.2-percent annual chance flood stages were determined using a steady flow step-backwater hydraulic model, HEC-RAS version 3.1.1. Starting water-surface elevations downstream of Vernon Dam were taken from the Vernon Vermont FIS dated September 27, 1991 (ENSR, 2003).

The effects of ice jams on flooding in the study area of the Connecticut River were evaluated using the Modified Indirect Method of Ice Jam Analysis, which was developed by the USACE Cold Regions Research and Engineering Laboratory (CRREL). Based on a review of historic data, three general ice jam locations were identified within the study reach:

- downstream of Windsor, Vermont,
- upstream of the Bellows Falls Dam, and
- upstream of the Vernon Dam (in the vicinity of Brattleboro, Vermont).

Two of the ice jam locations (upstream of Bellows Falls Dam, and upstream of Vernon Dam) are located in Windham County. Historic flow and temperature data were received to identify conditions associated with formation of ice jams at each identified ice jam location. All probable historic ice jams at these locations were then tabulated along with the date they occurred, the pre-breakup ice thickness, length of jam, and volume of ice. Each identified historic ice jam event was modeled using HEC-RAS to identify the associated flood elevation. Model results were tabulated to develop an ice-affected stage-frequency plot for each impacted cross section. Overall, (combined ice-jam and open water) 10-, 2-, 1-, and 0.2-percent annual chance flood stages were then determined by statistically combining ice-affected and open-water elevation frequency curves using the following formula:

$$P_C = P_I = P_{OW} - (P_I)(P_{OW}),$$ where

P_C = probability of stage being equaled or exceeded by either an ice-effected or an open water event

P_I = probability of stage being equaled or exceeded by an ice-affected event

P_{OW} = probability of stage being equaled or exceeded by an open water event

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 6, "Manning's "n" Values."

TABLE 6 – MANNING'S "n" VALUES

Stream	Channel "n"	Overbank "n"
Ames Hill Brook	0.055	0.035-0.090
Ball Mountain Brook	0.020-0.065	0.015-0.150
Beaver Brook	0.030-0.060	0.080-0.150
Bill Brook	0.030-0.060	0.080-0.150
Binney Brook	0.030-0.060	0.080-0.150
Cold Brook	0.030-0.060	0.080-0.150
Connecticut River	0.030–0.095	0.010-0.130
Cook Brook	0.050	0.100
Deerfield River	0.030-0.060	0.080-0.150
Dover Brook	0.040-0.065	0.015-0.100
Ellis Brook	0.030-0.060	0.080-0.150
Hinkley Brook	*	*
Lowell Lake Brook	0.050	0.100
North Branch Deerfield River	0.030-0.060	0.080-0.150
Rock River	*	*
Saxtons River	0.035-0.060	0.030-0.100
Smith Brook	*	*
South Branch Saxtons River	*	*
South Wardsboro Brook	0.055-0.065	0.015-0.100
Utley Brook	0.050	0.100
Wardsboro Brook	0.030-0.070	0.015-0.150
Weaver Brook	0.035-0.075	0.036-0.090
West River	0.030-0.050	0.015-0.150
West River Auxiliary Channel	0.035	0.015-0.100
Whetstone Brook	0.040-0.060	0.060-0.120
Williams River	0.030-0.050	0.030-0.080
Winhall River	0.030-0.065	0.015-0.150

*Data not available

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)

- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)

- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

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

It is important to note that 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 this FIS and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Vertical Datum

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

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in base flood elevations across the corporate limits between the communities.

As noted above, the elevations shown in the FIS report and on the FIRM for Windham County are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor. The conversion factor from NGVD 29 to NAVD 88 is -0.4.

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, users that wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood

Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/June 1992, or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://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- 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 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 unrevised streams in Windham County, data was taken from previously printed FISs for each individual community and are compiled below.

In the Town of Brattleboro FIS, the boundaries were interpolated between cross sections, using topographic maps (Lockwood, 1982; USACE, 1972; State of Vermont Agency of Transportation; Moore Survey and Mapping Coordination, 1966; Jack Ammon Photographic Engineers, 1952).

In the Town of Dummerston FISs, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:4,800 with a contour interval of 5 feet (USACE, 1984).

In the Towns of Grafton and Newfane FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:62,500 with a contour interval of 20 feet (U.S. Department of the Interior, 1957).

In the Town of Jamaica FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:2,400 with a contour interval of 5 feet (Lockwood, 1985).

In the Town of Londonderry FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:24,000 with a contour interval of 6 meters (U.S. Department of the Interior, 1986).

In the Town of Rockingham and Village of Bellows Falls FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:2,400 with a contour interval of five feet, and at a scale of 1:62,500 enlarged to a scale of 1:9,600, with a contour interval of 20 feet (U.S. Department of the Interior, 1954; Vermont Department of Highways).

In the Town of Vernon FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:24,000 with a contour interval of 20 feet (U.S. Department of the Interior, 1958).

In the Town of Wardsboro FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:31,680 enlarged to 1:9,600 with a contour interval of 20 feet (U.S. Department of Agriculture, 1975).

In the Town of Westminster FIS, the boundaries of the 1- and 0.2-percent annual chance floods were taken from aerial photographs prepared by the Vermont Department of Water Resources at a scale of 1:5,000 (State of Vermont, 1974).

In the Town of Wilmington FIS, the boundaries were interpolated between cross sections, using topographic maps at a scale of 1:2,400 with a contour interval of five feet (State of Vermont Department of Highways, 1966), with the exception of the upper reach of Bill Brook; a topographic map, photo-enlarged to a scale of 1:2,400, with a contour interval of 20 feet was used for its flooding boundary interpolation (U.S. Department of the Interior, 1954).

For this revision, the Connecticut River floodplain boundaries were interpolated between cross sections using automated procedures and a digital terrain model, created to 2-foot contour map standards (ENSR, 2003).

In this revision, a portion of the West River above Ball Mountain Dam was redelineated using topographic maps at a scale of 1:24,000 with a contour interval of 6 meters (U.S. Department of the Interior, 1986).

For this revision, an approximate (Zone A) floodplain around Sunset Lake was added to the Town of Dummerston to match the existing Zone A floodplain around Sunset Lake in the Town of Marlboro. A Zone A floodplain in the Town of Brattleboro was delineated in order to match the Zone A floodplain in the Town of Guilford for an unnamed stream. For the Town of Halifax, small Zone A floodplains were added for Hinesburg Brook and Green River in order to match the Zone A floodplain from the Town of Guilford. For the Town of Westminster, a Zone A floodplain was added to an unnamed ponding area east of East Putney Brook in order to match the Zone A floodplain in the Town of Putney. For the Town of Guilford, a Zone A floodplain was added to West Brook in order to match the approximate floodplain in the Town of Bernardston, Franklin County, Massachusetts. For the Town of Vernon, a Zone A floodplain was added to East

Wait Brook in order to match the Zone A floodplain in the Town of Northfield, Franklin County, Massachusetts. These floodplains were delineated using topographic maps at a scale of 1:24,000 and a contour interval of 20 feet (U.S. Department of the Interior, 1932; U.S. Department of the Interior, 1954, et al).

For the streams studied by approximate methods, the 1-percent annual chance floodplain boundaries were taken from the previously printed FIS/FIRM for the Towns of Brattleboro (FEMA, 1985), Dummerston (FEMA 1991), Grafton (FEMA, 1987), Jamaica (FEMA, 1988), Londonderry (FEMA, 1997), Newfane (FEMA, 1989), Rockingham and Village of Bellows Falls (FEMA, 1999) the Towns of Vernon (FEMA, 1991), Wardsboro (FEMA, 1980), Westminster (FEMA, 1985), and Wilmington (FEMA, 1978).

The 0.2-percent annual chance flood on Dover Brook is not completely contained in the channel.

The 1- and 0.2-percent annual chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

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

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this 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 for the unrevised streams 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 (Table 7). 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.

For this revision, floodways presented in this FIS for the Connecticut River were computed using the project steady flow step-backwater hydraulic model, HEC-RAS. A preliminary floodway encroachment was established using the model's equal conveyance reduction option and a maximum water surface of one foot. Floodway encroachment stations were then manually refined to produce a smoothed and uniform floodway (ENSR, 2002). Portions of the floodway for the Connecticut River extend beyond the county boundary.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 7, "Floodway Data." To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

A floodway for Dover Brook is not shown because the 1-percent annual chance flood is contained within the channel.

No floodways were calculated for Rock River, Smith Brook, and West River within the Town of Newfane.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 7 for certain downstream cross sections of Beaver Brook, Binney Brook, Cold Brook, Ellis Brook, Weaver Brook, West River, Whetstone Brook, and Williams River are lower than the regulatory flood elevations in that area, which must take into account the 1-percent annual chance flooding due to backwater from other sources.

Portions of the floodway widths for the Connecticut River and Utley Brook extend beyond the county boundary.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Ames Hill Brook								
A	325	64	283	8.5	457.6	457.6	458.4	0.8
B	461	21	203	11.8	464.3	464.3	464.3	0.0
C	570	81	572	4.2	466.9	466.9	467.1	0.2
D	1,235	103	310	7.8	476.7	476.7	477.2	0.5
E	1,810	107	344	7.0	489.5	489.5	489.9	0.4
F	3,095	51	208	11.6	524.7	524.7	524.7	0.0
G	3,990	44	208	11.5	548.9	548.9	549.4	0.5
H	4,180	59	230	10.4	562.0	562.0	562.5	0.5
I	4,490	60	221	10.8	579.1	579.1	579.1	0.0
J	5,020	85	288	8.3	587.6	587.6	587.9	0.3
K	5,170	50	169	14.2	594.3	594.3	594.3	0.0
L	5,250	76	580	4.1	595.4	595.4	596.2	0.8
M	6,750	47	203	11.9	614.5	614.5	614.5	0.0
N	7,775	170	550	4.4	623.0	623.0	623.9	0.9
O	7,945	55	338	7.1	623.4	623.4	624.3	0.9
P	8,560	188	730	3.3	630.6	630.6	631.4	0.8
Q	8,875	225	432	5.5	633.2	633.2	633.4	0.2
R	9,447	381	401	5.0	640.0	640.0	640.8	0.8
S	9,495	400	1,013	2.0	640.7	640.7	641.5	0.8
T	10,510	54	188	10.7	651.5	651.5	651.5	0.0
U	10,644	125	292	6.9	660.4	660.4	660.9	0.5
V	11,034	100	517	3.9	665.2	665.2	666.1	0.9
W	11,250	57	191	10.5	667.5	667.5	667.7	0.2
X	11,920	57	213	9.4	683.0	683.0	683.0	0.0
Y	12,475	65	190	10.6	697.6	697.6	697.6	0.0
Z	12,640	95	293	6.9	709.2	709.2	709.9	0.7
AA	12,700	62	357	5.6	710.0	710.0	710.6	0.6

[1]Feet above confluence with Whetstone Brook

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

AMES HILL BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Ball Mountain Brook								
A	1,075	103	747	15.4	680.4	680.4	680.4	0.0
B	1,300	128	806	14.3	688.9	688.9	688.9	0.0
C	1,525	80	688	16.7	692.9	692.9	692.9	0.0
D	2,050	85	700	16.4	704.5	704.5	704.5	0.0
E	2,785	88	712	16.1	720.9	720.9	720.9	0.0
F	3,150	78	694	16.6	730.0	730.0	730.0	0.0
G	3,815	117	951	12.1	744.6	744.6	745.5	0.9
H	4,480	115	835	13.8	756.8	756.8	756.8	0.0
I	5,675	85	701	16.4	784.7	784.7	784.7	0.0
J	6,790	86	727	15.8	812.3	812.3	812.6	0.3
K	7,350	149	892	12.9	828.3	828.3	828.3	0.0
L	7,650	145	1,158	9.9	835.3	835.3	835.3	0.0
M	8,460	153	855	13.5	853.5	853.5	853.5	0.0
N	10,390	105	754	15.3	892.7	892.7	892.7	0.0
O	11,790	95	729	15.8	929.5	929.5	929.5	0.0
P	12,835	104	808	14.2	950.8	950.8	951.4	0.6
Q	13,805	113	770	14.9	977.8	977.8	977.9	0.1
R	14,535	128	963	11.9	993.5	993.5	994.2	0.7
S	15,310	103	744	15.5	1,010.9	1,010.9	1,010.9	0.0
T	15,530	91	717	16.0	1,014.4	1,014.4	1,014.4	0.0
U	15,885	85	505	14.0	1,022.9	1,022.9	1,022.9	0.0
V	16,320	219	693	10.2	1,034.4	1,034.4	1,034.4	0.0
W	16,690	128	579	12.2	1,043.2	1,043.2	1,043.2	0.0
X	17,260	108	549	12.9	1,057.1	1,057.1	1,057.1	0.0
Y	17,695	203	619	11.4	1,069.1	1,069.1	1,069.5	0.4
Z	18,530	275	793	8.9	1,088.2	1,088.2	1,089.0	0.8
AA	18,920	109	576	12.3	1,096.9	1,096.9	1,096.9	0.0
AB	19,525	168	761	9.3	1,109.6	1,109.6	1,110.0	0.4

[1]Feet above confluence with West River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

BALL MOUNTAIN BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Ball Mountain Brook (continued)								
AC	19,855	232	654	10.8	1,118.8	1,118.8	1,119.0	0.2
AD	20,330	151	635	11.1	1,130.2	1,130.2	1,130.8	0.6
AE	20,640	76	489	14.4	1,136.5	1,136.5	1,136.5	0.0
AF	21,125	87	621	11.4	1,145.9	1,145.9	1,145.9	0.0
AG	22,295	96	527	13.4	1,169.6	1,169.6	1,169.6	0.0
AH	23,310	79	492	14.3	1,202.6	1,202.6	1,202.7	0.1
AI	24,480	141	673	10.5	1,230.2	1,230.2	1,230.9	0.7
AJ	25,260	123	582	12.1	1,247.9	1,247.9	1,247.9	0.0
AK	25,920	100	542	13.0	1,268.2	1,268.2	1,268.2	0.0
AL	26,250	120	539	13.1	1,275.5	1,275.5	1,275.5	0.0
AM	26,370	130	902	7.8	1,281.4	1,281.4	1,281.4	0.0
AN	26,820	114	562	12.6	1,289.9	1,289.9	1,290.2	0.3
AO	27,745	73	480	14.7	1,313.0	1,313.0	1,313.0	0.0
AP	28,810	68	474	14.9	1,343.7	1,343.7	1,343.9	0.2
AQ	29,480	69	472	14.9	1,360.4	1,360.4	1,360.4	0.0
AR	29,840	98	530	13.3	1,370.0	1,370.0	1,370.0	0.0
AS	30,500	140	680	10.4	1,382.7	1,382.7	1,383.7	1.0
AT	31,820	134	591	12.0	1,419.7	1,419.7	1,419.7	0.0
AU	32,785	101	535	13.2	1,448.4	1,448.4	1,448.4	0.0
AV	33,565	66	466	15.2	1,468.1	1,468.1	1,468.1	0.0
AW	34,015	94	557	12.7	1,478.1	1,478.1	1,478.1	0.0
AX	34,445	69	471	15.0	1,489.9	1,489.9	1,489.9	0.0
AY	35,385	88	488	11.8	1,515.7	1,515.7	1,516.0	0.3
AZ	35,565	100	445	13.0	1,521.4	1,521.4	1,521.4	0.0
BA	36,455	76	426	13.5	1,536.3	1,536.3	1,536.3	0.0
BB	37,455	95	730	7.9	1,547.2	1,547.2	1,547.5	0.3

[1]Feet above confluence with West River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

BALL MOUNTAIN BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Beaver Brook								
A	110	50	196	13.6	1,510.6	1,502.6[2]	1,502.7	0.1
B	240	50	415	6.4	1,510.6	1,506.2[2]	1,506.9	0.7
C	2,325	130	621	4.3	1,511.4	1,509.4[2]	1,509.8	0.4
D	2,445	165	839	3.2	1,511.6	1,509.9[2]	1,510.7	0.8
E	3,550	50	319	8.3	1,511.9	1,511.9	1,512.9	1.0
F	3,686	75	462	5.8	1,513.8	1,513.8	1,514.7	0.9
G	6,245	60	288	9.2	1,531.9	1,531.9	1,532.2	0.3
H	6,365	30	200	13.3	1,536.8	1,536.8	1,536.8	0.0
I	7,930	40	248	10.7	1,560.0	1,560.0	1,560.3	0.3
J	8,030	35	382	7.0	1,564.3	1,564.3	1,564.3	0.0
K	9,500	50	291	5.8	1,567.0	1,567.0	1,567.5	0.5
L	9,632	35	216	7.9	1,568.0	1,568.0	1,568.2	0.2
M	11,440	30	155	11.0	1,581.3	1,581.3	1,581.7	0.4
N	13,570	25	129	13.2	1,616.1	1,616.1	1,616.1	0.0
O	15,150	310	771	2.2	1,625.7	1,625.7	1,626.6	0.9
P	15,278	70	328	5.2	1,629.5	1,629.5	1,629.5	0.0
Q	16,660	40	177	9.6	1,667.6	1,667.6	1,667.6	0.0
R	19,275	75	260	6.5	1,766.6	1,766.6	1,766.8	0.2
S	19,375	40	474	3.6	1,775.3	1,775.3	1,775.3	0.0
T	20,080	35	159	10.7	1,777.7	1,777.7	1,777.9	0.2
U	20,202	30	299	5.7	1,784.0	1,784.0	1,784.0	0.0
V	20,540	55	188	9.0	1,784.6	1,784.6	1,784.8	0.2
W	20,670	60	270	6.3	1,789.4	1,789.4	1,789.4	0.0
X	21,280	185	297	5.7	1,790.2	1,790.2	1,790.8	0.6
Y	21,750	25	136	12.5	1,798.7	1,798.7	1,798.7	0.0
Z	22,960	75	219	7.8	1,826.6	1,826.6	1,827.3	0.7
AA	23,088	25	142	12.0	1,835.6	1,835.6	1,835.6	0.0
AB	24,420	35	168	10.1	1,886.3	1,886.3	1,886.5	0.2

[1]Feet above confluence with North Branch Deerfield River
[2]Elevation computed without consideration of backwater effects from North Branch Deerfield River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

BEAVER BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Bill Brook								
A	290	60	174	8.3	1,566.3	1,566.3	1,566.8	0.5
B	2,330	35	149	9.7	1,592.6	1,592.6	1,592.6	0.0
C	2,880	35	158	9.2	1,599.1	1,599.1	1,599.4	0.3
D	2,984	20	215	6.7	1,608.9	1,608.9	1,608.9	0.0
E	5,890	95	236	6.1	1,640.1	1,640.1	1,640.1	0.0
F	6,010	75	150	9.7	1,643.4	1,643.4	1,643.4	0.0
G	10,010	30	139	10.4	1,704.0	1,704.0	1,704.0	0.0
Binney Brook								
A	85	90	200	9.1	1,497.0	1,492.0[2]	1,492.0	0.0
B	210	90	286	6.4	1,497.0	1,492.8[2]	1,493.7	0.9
C	975	130	523	3.5	1,503.5	1,503.5	1,503.6	0.1
D	1,100	135	528	3.4	1,503.8	1,503.8	1,503.9	0.1
E	2,245	75	236	7.7	1,524.8	1,524.8	1,525.0	0.2
F	2,665	40	185	8.6	1,536.7	1,536.7	1,536.9	0.2
G	3,650	55	196	8.1	1,551.1	1,551.1	1,551.6	0.5
H	4,300	30	133	12.0	1,565.2	1,565.2	1,565.3	0.1
I	4,460	45	483	3.3	1,577.6	1,577.6	1,577.6	0.0
J	6,310	25	133	12.0	1,609.4	1,609.4	1,609.4	0.0

[1]Feet above confluence with North Branch Deerfield River
[2]Elevation computed without consideration of backwater effects from North Branch Deerfield River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

BILL BROOK – BINNEY BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Cold Brook								
A	0[1]	65	375	11.0	1,551.6	1,551.1[3]	1,551.6	0.0
B	130[1]	100	519	8.0	1,556.5	1,556.5	1,556.5	0.0
C	2,130[1]	50	351	11.8	1,608.8	1,608.8	1,608.8	0.0
D	3,400[1]	50	319	13.0	1,640.6	1,640.6	1,640.6	0.0
E	3,516[1]	80	653	6.3	1,645.4	1,645.4	1,645.4	0.0
F	6,030[1]	100	445	9.3	1,671.6	1,671.6	1,671.9	0.3
G	6,151[1]	80	1,041	4.0	1,679.8	1,679.8	1,679.8	0.0
H	7,030[1]	150	1,078	3.8	1,680.1	1,680.1	1,680.4	0.3
I	7,130[1]	150	1,144	3.6	1,680.3	1,680.3	1,680.9	0.6
J	9,490[1]	40	231	12.3	1,703.7	1,703.7	1,703.9	0.2
K	11,460[1]	65	273	10.4	1,739.6	1,739.6	1,739.6	0.0
L	11,630[1]	20	240	11.9	1,745.1	1,745.1	1,745.1	0.0
M	13,140[1]	35	216	13.2	1,763.0	1,763.0	1,763.2	0.2
N	13,260[1]	30	312	9.1	1,770.4	1,770.4	1,770.4	0.0
O	14,660[1]	65	289	9.9	1,803.6	1,803.6	1,803.9	0.3
Cook Brook								
A	2,600[2]	52	400	14.7	1,036.0	1,036.0	1,036.1	0.1
B	6,250[2]	103	560	10.5	1,103.9	1,103.9	1,104.9	1.0
C	13,100[2]	225	1,499	3.9	1,157.7	1,157.7	1,158.7	1.0
D	16,300[2]	258	653	9.0	1,197.4	1,197.4	1,198.4	1.0
E	19,850[2]	141	1,673	2.6	1,247.1	1,247.1	1,248.0	0.9
F	21,150[2]	193	1,783	2.4	1,248.3	1,248.3	1,249.3	1.0
G	23,100[2]	127	657	6.6	1,265.7	1,265.7	1,266.7	1.0

[1]Feet above confluence with North Branch Deerfield River
[2]Feet above confluence with Winhall River
[3]Elevation computed without consideration of backwater effects from North Branch Deerfield River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

COLD BROOK - COOK BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Connecticut River								
A	4,460	915[2]	29,085	5.0	209.4	209.4	210.4	1.0
B	12,560	726[2]	28,165	5.1	211.3	211.3	212.3	1.0
C	16,260	1,092[2]	34,774	4.1	212.5	212.5	213.5	1.0
D	19,660	739[2]	22,973	6.0	212.8	212.8	213.8	1.0
E	24,410	1,838[2]	48,616	2.8	214.0	214.0	215.0	1.0
F	27,210	642[2]	23,718	5.8	214.1	214.1	215.1	1.0
G	30,280	998/104[3]	39,541	3.1	225.8	225.8	226.0	0.2
H	31,339	1,543/820[3]	37,075	3.3	226.1	226.1	226.3	0.2
I	34,529	2,511/1,142[3]	51,774	2.3	226.5	226.5	226.6	0.1
J	36,151	3,818/1,180[3]	56,793	2.2	226.6	226.6	226.7	0.1
K	38,760	2,676/1,175[3]	49,344	2.4	226.8	226.8	226.9	0.1
L	41,794	2,459/1,386[3]	45,445	2.7	227.0	227.0	227.1	0.1
M	42,781	1,302/769[3]	31,262	3.9	227.0	227.0	227.1	0.1
N	46,250	1,734/106[3]	34,017	4.2	227.5	227.5	227.6	0.1
O	47,751	1,141/71[3]	30,664	3.9	227.8	227.8	227.9	0.1
P	52,750	828/75[3]	24,394	4.9	228.6	228.6	228.8	0.2
Q	57,649	583/38[3]	21,940	5.5	229.2	229.2	229.6	0.4
R	58,903	698/51[3]	23,046	5.2	229.6	229.6	230.0	0.4
S	62,253	1,349/67[3]	33,215	3.6	230.3	230.3	230.7	0.4
T	63,985	1,732/50[3]	38,382	3.3	231.0	231.0	231.4	0.4
U	65,750	493/43[3]	17,945	6.7	230.8	230.8	231.2	0.4
V	71,750	458/29[3]	16,489	7.1	232.8	232.8	233.3	0.5
W	75,596	395/45[3]	14,252	8.2	233.4	233.4	234.1	0.7
X	79,250	567/37[3]	20,209	5.8	235.4	235.4	236.0	0.6
Y	83,753	687/41[3]	24,348	4.8	236.4	236.4	237.0	0.6
Z	86,250	895/36[3]	26,239	4.4	236.9	236.9	237.5	0.6

[1]Feet above county boundary
[2]Width extends beyond county boundary
[3]Width/width within county boundary

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

CONNECTICUT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)[2]	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Connecticut River (continued)								
AA	88,602	574/35	20,401	5.7	237.2	237.2	237.9	0.7
AB	90,755	635/47	23,717	4.9	237.8	237.8	238.5	0.7
AC	96,251	473/48	19,814	5.9	238.7	238.7	239.3	0.6
AD	100,250	663/79	24,146	4.8	239.8	239.8	240.6	0.8
AE	101,749	514/121	21,821	5.3	240.0	240.0	240.8	0.8
AF	106,250	610/48	26,938	4.3	240.9	240.9	241.9	1.0
AG	110,756	829/141	29,638	3.9	241.6	241.6	242.5	0.9
AH	114,754	699/39	26,509	4.4	242.1	242.1	243.0	0.9
AI	117,750	556/51	23,396	4.9	242.4	242.4	243.3	0.9
AJ	123,751	567/47	25,294	4.6	243.3	243.3	244.2	0.9
AK	126,750	1,002/115	30,586	3.8	243.6	243.6	244.6	1.0
AL	128,250	578/95	22,172	5.2	243.8	243.8	244.8	1.0
AM	129,749	1,009/426	29,341	3.9	244.3	244.3	245.2	0.9
AN	132,250	742/122	25,792	4.5	244.6	244.6	245.5	0.9
AO	134,746	522/52	18,368	6.3	245.0	245.0	245.9	0.9
AP	141,244	4,046/3248	52,890	2.2	246.3	246.3	247.3	1.0
AQ	148,749	716/76	24,554	4.7	246.9	246.9	247.9	1.0
AR	153,250	698/116	25,400	4.5	247.9	247.9	248.8	0.9
AS	157,250	893/100	29,821	3.9	248.6	248.6	249.5	0.9
AT	161,749	673/64	25,688	4.5	249.2	249.2	250.2	1.0
AU	166,250	676/77	24,590	4.7	250.0	250.0	251.0	1.0
AV	170,756	1,285/740	29,019	4.0	251.0	251.0	251.8	0.8
AW	173,251	1,971/1,242	31,500	3.7	251.2	251.2	252.2	1.0
AX	176,589	1,399/998	26,442	4.4	251.7	251.7	252.6	0.9
AY	176,751	1,394/957	28,803	4.0	251.9	251.9	252.8	0.9
AZ	182,726	1,521/71	29,011	4.0	253.0	253.0	254.0	1.0

[1]Feet above county boundary
[2]Width/width within county boundary

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

CONNECTICUT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Connecticut River (continued)								
BA	186,753	1,515/1,014[2]	28,061	4.1	253.8	253.8	254.8	1.0
BB	189,750	915/314[2]	19,264	6.0	254.3	254.3	255.2	0.9
BC	192,403	585/98[2]	19,071	6.0	255.5	255.5	256.3	0.8
BD	194,560	629/73[2]	26,816	4.3	256.9	256.9	257.9	1.0
BE	196,238	769/61[2]	41,769	2.7	257.1	257.1	258.1	1.0
BF	197,961	235/60[2]	7,419	15.3	265.5	265.5	265.5	0.0
BG	198,124	321/89[2]	9,262	12.8	279.9	279.9	279.9	0.0
BH	198,268	352/125[2]	10,348	11.0	284.9	284.9	284.9	0.0
BI	199,835	619/335[2]	15,244	7.4	289.0	289.0	289.0	0.0
BJ	200,499	604/116[2]	16,328	7.0	289.5	289.5	289.5	0.0
BK	200,635	665	19,360	5.9	295.2	295.2	295.2	0.0
BL	201,060	552/22[2]	15,907	7.1	295.2	295.2	295.2	0.0
BM	205,250	960	23,375	4.9	296.8	296.8	296.8	0.0
BN	207,253	840/34[2]	21,891	5.2	297.2	297.2	297.2	0.0
BO	209,251	1,517/33[2]	29,249	3.9	300.1[3]	297.5	297.7	0.2
BP	212,748	778/34[2]	22,793	5.0	300.8[3]	298.0	298.2	0.2
BQ	214,730	1,971/317[2]	34,504	3.3	301.4[3]	298.4	298.6	0.2
BR	217,750	898/81[2]	21,127	5.3	302.9[3]	298.7	299.0	0.3
BS	221,835	653/46[2]	21,055	5.3	303.5[3]	299.6	300.1	0.5
BT	223,252	1,647/313[2]	34,884	3.2	303.6[3]	299.9	300.5	0.6
BU	227,251	658/47[2]	21,205	5.3	303.7[3]	300.2	300.8	0.6
BV	230,750	972/61[2]	23,520	4.8	303.9[3]	300.8	301.5	0.7
BW	234,753	1,445/59[2]	30,146	3.7	304.2[3]	301.5	302.4	0.9
BX	239,750	1,261/137[2]	29,203	3.8	305.1[3]	302.7	303.5	0.8

[1]Feet above county boundary
[2]Width/width within county boundary
[3]Elevation computed considering ice jam effects

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

CONNECTICUT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Deerfield River								
A	2,550[1]	500	2,885	5.1	1,496.8	1,496.8	1,497.8	1.0
B	2,945[1]	285	2,097	7.0	1,498.0	1,498.0	1,498.6	0.6
C	4,255[1]	160	1,127	13.0	1,509.5	1,509.5	1,509.5	0.0
D	4,365[1]	160	1,216	12.0	1,512.9	1,512.9	1,512.9	0.0
E	5,915[1]	165	1,058	13.8	1,524.1	1,524.1	1,524.6	0.5
Ellis Brook								
A	1,550[2]	170	343	6.6	1,589.4	1,588.5[5]	1,588.6	0.1
B	2,450[2]	80	278	8.2	1,598.3	1,598.3	1,598.5	0.2
Hinkley Brook								
A	438[3]	52	108	6.6	868.7	868.7	869.7	1.0
Lowell Lake Brook								
A	4,890[4]	57	358	10.8	1,087.5	1,087.5	1,087.8	0.3
B	7,180[4]	75	362	10.7	1,132.0	1,132.0	1,133.0	1.0
C	11,950[4]	87	288	7.8	1,193.9	1,193.9	1,194.9	1.0
D	16,130[4]	32	170	13.2	1,267.2	1,267.2	1,267.2	0.0

[1]Feet above confluence with Harriman Reservoir
[2]Feet above confluence with North Branch Deerfield River
[3]Feet above confluence with Saxtons River
[4]Feet above confluence with West River
[5]Elevation computed without consideration of backwater effects from North Branch Deerfield River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

DEERFIELD RIVER – ELLIS BROOK – HINKLEY BROOK – LOWELL LAKE BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
North Branch Deerfield River								
A	890	555	15,361	0.6	1,496.8	1,496.8	1,497.8	1.0
B	4,890	135	2,156	4.4	1,496.9	1,496.9	1,497.9	1.0
C	8,440	100	1,447	6.4	1,506.7	1,506.7	1,507.6	0.9
D	9,670	95	1,509	6.1	1,509.3	1,509.3	1,510.3	1.0
E	9,910	75	1,093	8.5	1,510.0	1,510.0	1,510.8	0.8
F	10,210	60	978	9.5	1,511.7	1,511.7	1,511.7	0.0
G	10,355	45	841	10.6	1,513.6	1,513.6	1,514.2	0.6
H	15,740	310	1,669	5.4	1,527.5	1,527.5	1,528.1	0.6
I	18,970	120	1,100	8.1	1,533.9	1,533.9	1,534.4	0.5
J	19,108	130	1,130	7.9	1,534.7	1,534.7	1,535.5	0.8
K	23,975	80	520	13.2	1,546.2	1,546.2	1,546.4	0.2
L	25,000	120	964	7.1	1,552.4	1,552.4	1,553.1	0.7
M	27,945	120	1,481	4.6	1,557.0	1,557.0	1,557.9	0.9
N	28,073	150	1,438	4.8	1,557.2	1,557.2	1,558.0	0.8
O	30,840	365	1,559	4.3	1,562.7	1,562.7	1,563.3	0.6
P	33,560	270	1,557	4.3	1,574.5	1,574.5	1,575.2	0.7
Q	33,723	270	1,309	5.1	1,575.2	1,575.2	1,575.5	0.3
R	34,970	440	1,864	3.6	1,578.0	1,578.0	1,578.8	0.8
S	37,850	80	687	9.7	1,609.1	1,609.1	1,609.3	0.2

[1]Feet above confluence with Harriman Reservoir

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

NORTH BRANCH DEERFIELD RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Rock River								
A	12,000	*	*	*	495.8	495.8	*	*
B	12,100	*	*	*	499.1	499.1	*	*
C	12,600	*	*	*	506.3	506.3	*	*
D	13,550	*	*	*	518.0	518.0	*	*
E	13,850	*	*	*	530.9	530.9	*	*
F	14,000	*	*	*	533.9	533.9	*	*
G	16,200	*	*	*	548.0	548.0	*	*
H	16,300	*	*	*	550.9	550.9	*	*
I	17,800	*	*	*	566.3	566.3	*	*
J	19,000	*	*	*	583.7	583.7	*	*
K	20,600	*	*	*	604.2	604.2	*	*
L	21,500	*	*	*	612.5	612.5	*	*
M	22,400	*	*	*	621.5	621.5	*	*
N	22,600	*	*	*	622.4	622.4	*	*
O	23,700	*	*	*	640.6	640.6	*	*
P	25,100	*	*	*	658.5	658.5	*	*
Q	26,600	*	*	*	688.9	688.9	*	*
R	28,100	*	*	*	714.4	714.4	*	*
S	30,700	*	*	*	748.2	748.2	*	*
T	31,050	*	*	*	752.1	752.1	*	*
U	31,100	*	*	*	755.5	755.5	*	*
V	34,300	*	*	*	818.2	818.2	*	*
W	34,550	*	*	*	822.0	822.0	*	*

[1]Feet above confluence with West River
*Data not available

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

ROCK RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Saxtons River								
A	500	200	1,203	9.1	377.8	377.8	378.5	0.7
B	2,000	200	1,239	8.8	386.3	386.3	386.3	0.0
C	2,400	200	1,195	9.1	388.0	388.0	388.0	0.0
D	2,800	200	2,839	3.6	396.4	396.4	396.6	0.2
E	4,060	200	967	11.3	398.5	398.5	398.5	0.0
F	5,760	180	1,592	6.9	408.4	408.4	409.0	0.6
G	5,980	100	1,143	9.5	409.2	409.2	409.4	0.2
H	8,300	100	982	11.0	419.5	419.5	420.0	0.5
I	10,500	100	1,001	10.8	431.2	431.2	431.6	0.4
J	11,100	100	840	12.6	434.0	434.0	434.4	0.4
K	11,300	100	976	10.8	436.6	436.6	436.6	0.0
L	11,500	75	868	12.2	440.4	440.4	440.4	0.0
M	12,300	150	1,302	8.1	444.4	444.4	444.4	0.0
N	13,280	130	764	13.8	448.3	448.3	448.3	0.0
O	13,360	110	724	14.6	462.4	462.4	462.4	0.0
P	13,700	120	741	14.2	468.9	468.9	468.9	0.0
Q	15,460	120	1,161	8.9	486.0	486.0	486.7	0.7
R	17,200	120	834	11.5	496.6	496.6	497.5	0.9
S	19,360	120	1,057	9.1	513.1	513.1	513.2	0.1
T	20,700	100	697	13.8	520.9	520.9	520.9	0.0
U	21,500	100	720	12.9	527.8	527.8	527.9	0.1
V	23,750	100	693	13.4	546.9	546.9	546.9	0.0
W	23,920	150	1,503	6.2	552.1	552.1	552.8	0.7
X	25,400	150	737	12.6	557.7	557.7	557.7	0.0
Y	26,800	150	839	11.1	568.4	568.4	568.8	0.4
Z	28,100	250	1,314	7.1	574.9	574.9	575.6	0.7
AA	30,400	483	2,022	5.2	590.0	590.0	591.0	1.0
AB	31,408	143	2,360	4.4	595.0	595.0	596.0	1.0

[1]Feet above Rockingham-Westminster corporate limits (corporate limits are approximately 2,690 feet downstream of Barbers Park Road)

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

SAXTONS RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Saxtons River (continued)								
AC	39,070[1]	152	1,505	6.7	676.2	676.2	677.2	1.0
AD	40,887[1]	169	1,466	6.9	692.1	692.1	692.6	0.5
AE	41,035[1]	198	1,444	7.0	695.4	695.4	695.9	0.5
AF	42,862[1]	213	1,543	6.5	712.7	712.7	713.2	0.5
AG	47,470[1]	205	1,600	6.1	755.0	755.0	756.0	1.0
AH	55,945[1]	74	537	6.6	847.1	847.1	848.1	1.0
AI	57,850[1]	61	518	5.9	876.9	876.9	877.9	1.0
AJ	58,970[1]	82	537	5.6	889.7	889.7	890.7	1.0
AK	60,195[1]	109	481	6.2	907.0	907.0	907.5	0.5
AL	62,662[1]	98	444	6.3	933.8	933.8	934.8	1.0
AM	62,922[1]	188	410	6.8	939.1	939.1	939.6	0.5
AN	64,404[1]	51	420	6.6	949.0	949.0	950.0	1.0
AO	65,364[1]	73	387	6.5	962.6	962.6	963.6	1.0
AP	65,444[1]	79	427	5.9	964.3	964.3	965.3	1.0
AQ	67,619[1]	80	375	6.5	992.2	992.2	992.7	0.5
AR	67,704[1]	81	382	6.4	997.4	997.4	998.4	1.0
AS	69,404[1]	58	361	6.8	1,014.1	1,014.1	1,015.1	1.0
AT	71,487[1]	82	422	5.8	1,048.2	1,048.2	1,049.2	1.0
South Branch Saxtons River								
A	1,400[2]	233	1,328	4.5	826.9	826.9	827.9	1.0
B	3,336[2]	153	947	6.3	852.5	852.5	853.5	1.0
C	4,929[2]	159	1,399	4.3	867.4	867.4	868.4	1.0
D	7,046[2]	187	838	7.1	878.6	878.6	879.1	0.5
E	9,975[2]	317	881	6.5	902.6	902.6	903.6	1.0

[1]Feet above Rockingham-Westminster corporate limits (corporate limits are approximately 2,690 feet downstream of Barbers Park Road)
[2]Feet above confluence with Saxtons River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

SAXTONS RIVER – SOUTH BRANCH SAXTONS RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Wardsboro Brook								
A	180[1]	50	268.2	7.6	1,012.6	1,012.6	1,013.6	1.0
B	438[1]	100	286.8	7.1	1,015.7	1,015.7	1,016.1	0.4
C	454[1]	100	404.9	5.1	1,016.5	1,016.5	1,017.3	0.8
D	534[1]	100	280.1	7.3	1,017.1	1,017.1	1,017.5	0.4
E	1,234[1]	60	239.5	8.6	1,026.8	1,026.8	1,027.1	0.3
F	1,834[1]	85	309.9	6.6	1,036.3	1,036.3	1,036.8	0.5
G	2,374[1]	70	217.7	9.4	1,047.6	1,047.6	1,047.8	0.2
H	2,954[1]	45	196.3	10.4	1,065.1	1,065.1	1,065.1	0.0
Smith Brook								
A	2,000[2]	*	*	*	405.4	405.4	*	*
B	2,100[2]	*	*	*	409.8	409.8	*	*
C	3,000[2]	*	*	*	427.1	427.1	*	*
D	4,100[2]	*	*	*	454.7	454.7	*	*
E	4,175[2]	*	*	*	458.4	458.4	*	*
F	5,900[2]	*	*	*	479.1	479.1	*	*
G	7,400[2]	*	*	*	495.9	495.9	*	*
H	7,480[2]	*	*	*	498.5	498.5	*	*
I	9,400[2]	*	*	*	524.1	524.1	*	*
J	9,520[2]	*	*	*	530.2	530.2	*	*
K	10,200[2]	*	*	*	538.1	538.1	*	*
L	10,270[2]	*	*	*	538.7	538.7	*	*
M	11,650[2]	*	*	*	560.3	560.3	*	*
N	12,700[2]	*	*	*	578.4	578.4	*	*
O	13,800[2]	*	*	*	605.4	605.4	*	*
P	13,920[2]	*	*	*	607.3	607.3	*	*

[1]Feet above confluence with Wardsboro Brook
[2]Feet above confluence with West River
*Data not available

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

SOUTH WARDSBORO BROOK – SMITH BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Utley Brook								
A	2,640	333	1,602	6.6	1,148.9	1,148.9	1,149.7	0.8
B	4,770	603	2,642	3.2	1,156.5	1,156.5	1,157.5	1.0
C	7,250	294	1,132	7.5	1,173.0	1,173.0	1,174.0	1.0
D	11,500	113	665	12.8	1,229.2	1,229.2	1,230.1	0.9
E	15,730	381	1,707	5.0	1,287.6	1,287.6	1,288.6	1.0
F	17,610	275	1,037	8.2	1,332.1	1,332.1	1,333.1	1.0
G	19,200	56[2]	509	16.7	1,369.4	1,369.4	1,370.4	1.0
Wardsboro Brook								
A	360	470	1,329	8.0	555.9	555.9	556.2	0.3
B	425	420	2,679	4.0	559.0	559.0	559.9	0.9
C	525	341	2,512	4.2	559.0	559.0	560.0	1.0
D	1,205	77	643	16.5	566.0	566.0	566.0	0.0
E	1,885	78	647	16.4	576.0	576.0	576.1	0.1
F	3,235	127	757	14.0	607.5	607.5	607.5	0.0
G	4,125	104	712	14.9	629.0	629.0	629.0	0.0
H	4,885	82	691	15.3	642.1	642.1	642.3	0.2
I	5,825	95	688	15.4	660.7	660.7	660.7	0.0
J	6,520	79	648	16.4	672.1	672.1	672.1	0.0
K	6,960	107	813	13.0	681.3	681.3	681.4	0.1
L	7,665	168	830	12.8	695.4	695.4	695.4	0.0
M	9,065	96	730	14.5	718.3	718.3	718.3	0.0
N	10,205	280	1,099	9.6	740.5	740.5	740.7	0.2
O	11,665	82	654	16.2	766.8	766.8	766.8	0.0
P	12,955	112	722	14.7	787.6	787.6	787.6	0.0
Q	13,800	84	661	16.0	802.6	802.6	802.6	0.0

[1]Feet above confluence with West River
[2]Width extends beyond corporate limits

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT
(ALL JURISDICTIONS)

FLOODWAY DATA

UTLEY BROOK – WARDSBORO BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wardsboro Brook (continued)								
R	15,000	111	722	14.7	831.7	831.7	831.7	0.0
S	16,865	122	852	12.4	869.3	869.3	869.3	0.0
T	17,480	79	649	16.3	886.1	886.1	886.2	0.1
U	18,690	110	985	10.8	902.1	902.1	902.9	0.8
V	20,570	107	642.1	14.0	928.4	928.4	928.4	0.0
W	21,710	100	766.5	11.7	943.8	943.8	944.0	0.2
X	22,410	125	672.9	13.4	953.7	953.7	953.7	0.0
Y	22,810	106	722.4	12.5	960.3	960.3	960.4	0.1
Z	23,910	120	784.3	11.5	977.1	977.1	977.1	0.0
AA	24,537	103	1,087.1	8.3	986.9	986.9	986.9	0.0
AB	24,737	106	639.7	14.1	989.6	989.6	989.6	0.0
AC	25,197	100	705.7	12.8	998.7	998.7	999.3	0.6
AD	26,377	100	670.1	13.4	1,018.2	1,018.2	1,018.2	0.0
AE	27,957	76	736.7	12.2	1,037.7	1,037.7	1,038.1	0.4
AF	28,797	104	636.0	14.2	1,057.5	1,057.5	1,057.5	0.0
AG	29,757	100	772.6	11.6	1,071.8	1,071.8	1,072.5	0.7
AH	30,917	250	987.0	9.1	1,088.7	1,088.7	1,088.9	0.2
AI	31,617	175	703.4	12.8	1,102.6	1,102.6	1,102.6	0.0
AJ	32,069	200	1,582.2	5.7	1,111.8	1,111.8	1,111.8	0.0
AK	32,789	200	555.2	16.2	1,120.3	1,120.3	1,120.3	0.0
AL	33,569	200	999.0	9.0	1,136.2	1,136.2	1,136.4	0.2
AM	34,349	200	783.8	11.5	1,153.5	1,153.5	1,153.5	0.0
AN	34,949	200	880.1	10.2	1,170.9	1,170.9	1,170.9	0.0
AO	36,609	200	972.7	9.3	1,192.4	1,192.4	1,192.7	0.3
AP	37,349	200	922.0	9.8	1,209.8	1,209.8	1,209.9	0.1
AQ	37,949	100	630.4	14.3	1,223.6	1,223.6	1,223.6	0.0

[1]Feet above confluence with West River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WARDSBORO BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wardsboro Brook (continued)								
AR	38,889[1]	114	1,004.9	9.0	1,239.3	1,239.3	1,239.5	0.2
AS	40,685[1]	100	555.8	13.9	1,268.5	1,268.5	1,268.5	0.0
AT	41,705[1]	305	795.0	9.7	1,299.8	1,299.8	1,299.8	0.0
AU	43,145[1]	245	890.0	8.7	1,326.6	1,326.6	1,326.6	0.0
AV	43,985[1]	300	1,116.0	6.9	1,353.7	1,353.7	1,353.7	0.0
AW	44,965[1]	64	487.3	15.8	1,372.1	1,372.1	1,372.1	0.0
AX	45,725[1]	100	617.0	12.5	1,389.9	1,389.9	1,390.2	0.3
AY	46,305[1]	98	561.7	13.7	1,412.1	1,412.1	1,412.1	0.0
AZ	46,468[1]	150	1,263.9	6.1	1,420.1	1,420.1	1,420.1	0.0
BA	46,548[1]	150	721.0	10.7	1,422.1	1,422.1	1,422.3	0.2
Weaver Brook								
A	580[2]	70	258	3.3	577.4	575.6[3]	576.6	1.0
B	910[2]	70	138	6.2	577.7	577.7	577.7	0.0
C	1,500[2]	50	120	7.2	585.6	585.6	585.6	0.0
D	1,720[2]	70	380	2.3	590.7	590.7	590.8	0.1
E	2,620[2]	300	773	1.1	594.1	594.1	594.1	0.0
West River Auxiliary Channel								
A	1,730[1]	180	927	5.2	613.2	613.2	613.4	0.2
B	4,630[1]	200	523	9.2	633.8	633.8	634.4	0.6
C	5,160[1]	175	714	6.7	637.8	637.8	638.3	0.5
D	5,895[1]	94	404	11.9	644.7	644.7	644.7	0.0

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

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WARDSBORO BROOK – WEAVER BROOK - WEST RIVER AUXILIARY CHANNEL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Andover Branch								
A	620[1]	100	686	4.9	857.4	857.4	857.8	0.4
B	1,000[1]	70	289	11.6	860.2	860.2	860.2	0.0
C	1,820[1]	73	294	11.4	873.7	873.7	873.7	0.0
D	3,370[1]	80	302	11.1	899.0	899.0	899.4	0.4
E	4,420[1]	54	298	9.7	912.5	912.5	913.1	0.6
F	5,320[1]	100	345	6.3	930.3	930.3	930.8	0.5
G	5,640[1]	100	408	6.3	934.3	934.3	935.3	1.0
H	6,010[1]	100	288	8.9	940.7	940.7	940.7	0.0
I	6,140[1]	200	1,113	2.3	948.5	948.5	949.4	0.9
J	6,770[1]	80	255	10.0	955.5	955.5	956.0	0.5
K	8,030[1]	80	233	11.0	981.2	981.2	981.3	0.1
L	8,670[1]	54	221	11.6	994.6	994.6	994.6	0.0
Barnard Brook								
A	970[2]	70	770	9.4	668.8	668.8	668.8	0.0
B	1,075[2]	85	980	7.3	672.7	672.7	672.7	0.0
C	3,240[2]	125	860	8.4	675.4	675.4	675.8	0.4
D	3,360[2]	100	1,165	6.2	679.1	679.1	679.1	0.0
E	3,670[2]	75	1,100	6.5	679.4	679.4	679.4	0.0
F	3,780[2]	150	1,065	6.8	689.2	689.2	689.2	0.0
G	5,920[2]	225	1,650	4.4	692.8	692.8	693.1	0.3
H	6,570[2]	180	1,160	6.2	693.7	693.7	694.2	0.5
I	10,140[2]	200	1,715	2.5	695.9	695.9	696.7	0.8
J	10,950[2]	250	2,140	2.0	696.0	696.0	696.9	0.9
K	11,070[2]	320	2,315	1.8	696.1	696.1	697.0	0.9

[1]Feet above confluence with Middle Branch Williams River
[2]Feet above confluence with Ottauquechee River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDSOR COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

ANDOVER BRANCH – BARNARD BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
West River								
A	0[1]	411	10,103	3.0	232.0	231.8[2]	231.8	0.0
B	90[1]	298	6,163	4.9	232.0	231.8[2]	231.8	0.0
C	320[1]	360	8,211	3.7	232.0	231.8[2]	231.8	0.0
D	780[1]	586	11,717	2.6	232.0	231.8[2]	233.0	0.0
E	2,300[1]	1,330	20,240	1.5	232.0	231.8[2]	233.1	0.0
F	3,865[1]	700	10,859	2.8	232.0	231.8[2]	233.1	0.0
G	4,910[1]	295	4,502	6.7	232.0	231.8[2]	233.1	0.0
H	5,420[1]	390	5,779	5.2	232.0	231.8[2]	233.5	0.1
I	7,585[1]	212	2,795	10.7	233.2	233.2	233.3	0.1
J	9,600[1]	255	3,536	8.5	237.4	237.4	238.4	1.0
K	10,850[1]	350	4,479	6.7	239.7	239.7	240.3	0.6
L	13,160[1]	299	3,116	9.6	241.5	241.5	242.5	1.0
M	15,280[1]	323	2,596	11.6	247.0	247.0	247.0	0.0
N	17,450[1]	220	3,659	8.2	258.2	258.2	259.2	1.0
O	19,825[1]	175	3,398	8.8	261.3	261.3	262.2	0.9
P	23,475[1]	188	2,694	11.1	263.4	263.4	264.1	0.7
Q	25,975[1]	170	1,918	15.6	270.3	270.3	270.5	0.2
R	28,475[1]	279	3,971	7.6	276.9	276.9	277.4	0.5
S	31,000[1]	198	1,799	16.7	277.5	277.5	277.6	0.1
T	33,455[1]	272	2,057	14.6	296.9	296.9	297.2	0.3
U	34,960[1]	251	3,383	8.9	306.1	306.1	306.2	0.1
V	38,125[1]	211	1,851	16.2	311.1	311.1	311.2	0.1
W	39,940[1]	323	3,902	7.7	320.3	320.3	320.5	0.2
X	42,900[1]	214	1,808	16.6	327.4	327.4	327.4	0.0
Y	45,850[1]	405	2,448	12.3	349.2	349.2	349.7	0.5
Z	2,000[3]	218	1,660	16.0	545.7	545.7	546.1	0.4

[1]Feet above confluence with Connecticut River
[2]Elevation computed without consideration of backwater effects from Connecticut River
[3]Feet above Townshend-Jamaica corporate limits (approximately 2,840 feet downstream of Vermont Route 100)

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WEST RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
West River (continued)								
AA	3,070[1]	290	2,419	6.6	551.9	551.9	552.7	0.8
AB	6,270[1]	370	2,107	6.0	567.4	567.4	568.1	0.7
AC	8,185[1]	366	1,200	10.5	580.8	578.5[3]	578.5	0.0
AD	9,350[1]	196	1,481	8.5	587.9	583.5[3]	583.5	0.0
AE	9,515[1]	176	1,257	10.0	588.3	583.5[3]	583.5	0.0
AF	9,915[1]	218	1,354	9.3	588.8	585.2[3]	585.2	0.0
AG	11,300[1]	116	823	15.3	595.3	595.3	595.3	0.0
AH	12,990[1]	174	988	7.9	610.1	610.1	610.1	0.0
AI	15,335[1]	278	797	9.8	629.1	629.1	629.1	0.0
AJ	16,275[1]	383	1,700	4.6	634.9	634.9	634.9	0.0
AK	17,250[1]	201	716	10.9	643.5	643.5	643.5	0.0
AL	18,100[1]	194	868	9.0	653.7	653.7	653.7	0.0
AM	18,960[1]	100	801	8.7	658.7	658.7	658.7	0.0
AN	17,000[2]	139	1,344	17.8	1,032.4	1,032.4	1,032.4	0.0
AO	20,420[2]	378	6,038	4.0	1,051.3	1,051.3	1,052.0	0.7
AP	21,630[2]	364	5,219	4.6	1,052.3	1,052.3	1,053.3	1.0
AQ	23,265[2]	541	6,856	3.5	1,054.5	1,054.5	1,055.4	0.9
AR	25,020[2]	464	3,706	6.5	1,057.2	1,057.2	1,058.2	1.0
AS	31,250[2]	122	1,133	17.4	1,113.8	1,113.8	1,113.8	0.0
AT	34,600[2]	330	3,385	5.8	1,132.7	1,132.7	1,133.7	1.0
AU	39,870[2]	643	7,873	1.5	1,153.9	1,153.9	1,154.8	0.9
AV	41,650[2]	279	2,027	5.7	1,154.4	1,154.4	1,155.4	1.0
AW	45,370[2]	91	1,471	7.8	1,167.8	1,167.8	1,168.8	1.0
AX	47,620[2]	1,061	7,587	1.5	1,170.0	1,170.0	1,171.0	1.0
AY	49,780[2]	1,432	11,322	1.0	1,170.5	1,170.5	1,171.4	0.9

[1]Feet above Townshend-Jamaica corporate limits (corporate limits are approximately 2,840 feet downstream of Vermont Route 100)
[2]Feet above Jamaica-Londonderry corporate limits (corporate limits are approximately 16,500 feet upstream of Ball Mountain Dam)
[3]Elevation computed without consideration of ice jam

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WEST RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Whetstone Brook								
A	145	88	876	9.0	230.7	226.9[2]	226.9	0.0
B	315	62	492	16.1	233.0	233.0	233.0	0.0
C	465	50	678	11.6	242.8	242.8	242.8	0.0
D	512	81	738	10.7	251.3	251.3	251.3	0.0
E	562	75	884	8.9	252.0	252.0	252.1	0.1
F	782	46	447	17.7	252.6	252.6	252.6	0.0
G	1,102	54	862	9.2	258.2	258.2	258.3	0.1
H	1,697	100	858	9.2	259.4	259.4	260.1	0.7
I	1,757	85	732	10.8	259.6	259.6	260.1	0.5
J	1,885	73	676	11.7	261.8	261.8	261.9	0.1
K	2,050	115	1,064	7.4	263.5	263.5	263.7	0.2
L	2,605	168	1,122	7.0	265.4	265.4	265.8	0.4
M	3,200	270	1,171	6.7	268.0	268.0	268.7	0.7
N	3,580	78	518	15.2	272.2	272.2	272.2	0.0
O	3,795	76	708	11.2	274.0	274.0	274.8	0.8
P	3,997	76	676	11.7	275.3	275.3	276.0	0.7
Q	4,085	88	663	11.9	276.2	276.2	276.6	0.4
R	4,325	69	509	15.5	279.5	279.5	279.5	0.0
S	4,465	67	720	11.0	281.4	281.4	281.9	0.5
T	5,370	73	604	13.1	287.2	287.2	288.0	0.8
U	5,930	85	950	8.3	292.4	292.4	292.5	0.1
V	6,313	120	786	10.0	294.5	294.5	294.7	0.2
W	6,430	140	1,153	6.8	304.9	304.9	305.8	0.9
X	6,480	114	966	8.2	305.0	305.0	305.7	0.7
Y	6,832	59	503	15.7	306.4	306.4	306.6	0.2
Z	6,955	96	744	10.6	310.5	310.5	310.6	0.1

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

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WHETSTONE BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Whetstone Brook (continued)								
AA	7,055	114	1,172	6.7	312.5	312.5	312.5	0.0
AB	7,695	95	565	14.0	315.1	315.1	315.1	0.0
AC	7,795	78	530	14.9	318.1	318.1	318.1	0.0
AD	7,918	99	960	8.2	323.0	323.0	323.0	0.0
AE	8,898	82	537	14.7	334.0	334.0	334.0	0.0
AF	11,048	63	615	12.8	366.4	366.4	366.4	0.0
AG	11,153	48	455	17.4	370.3	370.3	370.3	0.0
AH	11,703	61	488	16.2	392.1	392.1	392.1	0.0
AI	11,808	103	936	8.4	397.3	397.3	397.5	0.2
AJ	12,483	83	516	14.3	403.3	403.3	403.3	0.0
AK	12,613	106	1,129	6.6	409.7	409.7	409.7	0.0
AL	13,453	227	1,277	5.8	412.8	412.8	413.2	0.4
AM	13,773	219	1,417	5.2	414.3	414.3	415.3	1.0
AN	13,953	130	975	7.6	415.1	415.1	416.0	0.9
AO	14,081	123	1,320	5.6	419.5	419.5	420.2	0.7
AP	14,211	123	1,306	5.7	419.8	419.8	420.6	0.8
AQ	14,611	117	1,035	7.2	420.2	420.2	421.2	1.0
AR	15,506	150	1,013	7.3	424.1	424.1	424.9	0.8
AS	15,681	140	651	11.4	424.9	424.9	425.0	0.1
AT	15,816	102	744	9.9	429.0	429.0	429.0	0.0
AU	16,281	80	680	10.9	431.9	431.9	432.1	0.2
AV	16,956	152	758	9.8	437.3	437.3	438.2	0.9
AW	17,132	185	1,515	4.9	442.5	442.5	442.9	0.4
AX	17,492	182	1,384	5.3	442.8	442.8	443.5	0.7
AY	17,902	204	1,176	6.3	443.8	443.8	444.6	0.8
AZ	18,147	226	1,049	7.1	445.3	445.3	445.7	0.4

[1]Feet above confluence with Connecticut River

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT
(ALL JURISDICTIONS)

FLOODWAY DATA

WHETSTONE BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Whetstone Brook (continued)								
BA	19,142	260	1,450	5.1	451.5	451.5	452.5	1.0
BB	20,322	235	757	6.7	457.7	457.7	457.7	0.0
BC	20,518	220	1,816	2.8	460.8	460.8	461.7	0.9
BD	22,143	164	519	9.8	466.2	466.2	466.4	0.2
BE	23,133	160	711	7.2	477.9	477.9	478.7	0.8
BF	23,283	170	899	5.7	480.0	480.0	480.4	0.4
BG	23,408	195	1,367	3.7	480.8	480.8	480.8	0.0
BH	24,453	459	906	5.6	487.4	487.4	487.4	0.0
BI	25,108	440	915	5.6	497.1	495.6[2]	496.1	0.5
BJ	25,233	410	1,098	4.1	499.0	497.2[2]	498.0	0.8
BK	25,423	374	1,022	4.4	500.8	498.8[2]	499.7	0.9
BL	25,578	330	726	6.2	502.6	500.8[2]	501.3	0.5
BM	25,708	300	1,330	3.4	504.7	503.9[2]	504.8	0.9
BN	25,843	257	724	6.2	506.8	505.3[2]	505.3	0.0
Halladay Brook								
BO	26,123	230	886	5.1	507.6	507.6	507.9	0.3
BP	26,488	156	368	6.0	510.5	510.5	510.7	0.2
BQ	26,798	190	500	4.4	513.9	513.9	514.2	0.3
BR	27,048	145	497	4.4	515.1	515.1	515.8	0.7
BS	27,238	181	379	5.8	519.6	519.6	519.6	0.0
BT	27,344	177	475	4.6	521.7	521.7	522.7	1.0
BU	27,899	300	478	4.6	528.8	528.8	529.5	0.7
BV	28,589	90	334	6.6	536.4	536.4	537.2	0.8
BW	28,751	46	189	11.6	543.4	543.4	543.4	0.0

[1]Feet above confluence with Connecticut River
[2]Elevation computed without consideration of ice jam effects

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT
(ALL JURISDICTIONS)

FLOODWAY DATA

WHETSTONE BROOK – HALLADAY BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Williams River								
A	1,900	2,130	5,991	2.6	301.4	291.9[2]	291.9	0.0
B	3,400	500	1,948	8.0	301.4	293.5[2]	293.5	0.0
C	3,760	220	1,137	13.7	301.4	294.4[2]	294.4	0.0
D	4,100	500	5,697	2.7	301.5	301.5	301.5	0.0
E	4,360	500	5,805	2.7	301.6	301.6	301.6	0.0
F	4,960	200	2,422	6.4	301.6	301.6	301.6	0.0
G	5,200	140	1,733	9.0	301.6	301.6	301.6	0.0
H	5,400	300	3,809	4.1	302.9	302.9	302.9	0.0
I	5,860	500	4,455	3.5	303.1	303.1	303.1	0.0
J	7,100	230	2,275	6.8	303.5	303.5	303.6	0.1
K	23,630	114	882	16.0	442.5	442.5	442.5	0.0
L	23,740	120	1,870	7.5	452.0	452.0	452.0	0.0
M	24,400	120	1,741	8.1	452.1	452.1	452.1	0.0
N	24,970	120	1,470	9.6	453.0	453.0	453.0	0.0
O	25,360	120	1,743	8.1	456.4	456.4	456.4	0.0
P	26,400	120	1,526	9.2	457.9	457.9	458.1	0.2
Q	27,300	120	1,788	7.9	460.2	460.2	460.3	0.1
R	28,700	300	2,899	4.9	462.0	462.0	462.4	0.4
S	30,200	300	1,309	10.8	463.5	463.5	463.9	0.4
T	30,970	300	2,262	6.2	467.5	467.5	467.9	0.4
U	31,200	300	2,792	5.0	468.7	468.7	469.2	0.5
V	31,340	300	2,909	4.8	468.8	468.8	469.3	0.5
W	31,640	300	3,430	4.1	469.4	469.4	470.1	0.7
X	32,130	300	3,582	3.9	469.6	469.6	470.4	0.8
Y	33,600	700	4,967	2.8	470.8	470.8	471.5	0.7
Z	35,900	300	1,247	10.8	473.4	473.4	473.7	0.3

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

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WILLIAMS RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Williams River (continued)								
AA	36,700[1]	300	2,211	6.1	477.4	477.4	478.4	1.0
AB	37,040[1]	100	962	14.0	477.5	477.5	478.4	0.9
AC	37,740[1]	100	1,210	11.1	483.0	483.0	483.1	0.1
AD	38,200[1]	100	1,422	9.5	484.8	484.8	485.2	0.4
AE	39,540[1]	100	863	15.6	492.6	492.6	492.8	0.2
AF	40,220[1]	100	901	14.9	500.2	500.2	500.9	0.7
AG	42,320[1]	150	1,537	8.7	511.1	511.1	511.9	0.8
Winhall River								
A	7,500[2]	84	1,132	14.4	1,028.7	1,028.7	1,029.6	0.9
B	8,700[2]	239	1,404	11.6	1,051.6	1,051.6	1,052.2	0.6
C	9,275[2]	262	2,205	7.4	1,062.6	1,062.6	1,063.3	0.7
D	9,700[2]	216	5,434	3.0	1,067.0	1,067.0	1,068.0	1.0
E	10,400[2]	250	1,739	9.4	1,075.0	1,075.0	1,075.0	0.0
F	11,480[2]	236	1,574	10.4	1,083.8	1,083.8	1,084.4	0.6
G	12,780[2]	232	1,636	10.0	1,098.0	1,098.0	1,098.0	0.0
H	14,320[2]	305	1,709	9.5	1,116.4	1,116.4	1,116.8	0.4
I	15,400[2]	285	2,417	6.7	1,136.1	1,136.1	1,136.9	0.8
J	15,985[2]	236	1,383	11.8	1,140.8	1,140.8	1,140.9	0.1
K	17,980[2]	205	2,097	7.8	1,173.5	1,173.5	1,174.4	0.9
L	18,440[2]	213	1,584	10.3	1,175.4	1,175.4	1,176.1	0.7
M	19,680[2]	124	1,055	15.4	1,192.0	1,192.0	1,192.3	0.3
N	20,510[2]	150	1,537	10.6	1,206.4	1,206.4	1,206.4	0.0
O	20,925[2]	106	1,572	10.4	1,218.6	1,218.6	1,219.2	0.6
P	22,500[2]	157	1,266	12.9	1,234.7	1,234.7	1,234.7	0.0

[1]Feet above confluence with Connecticut River
[2]Feet above confluence with West River

TABLE 7

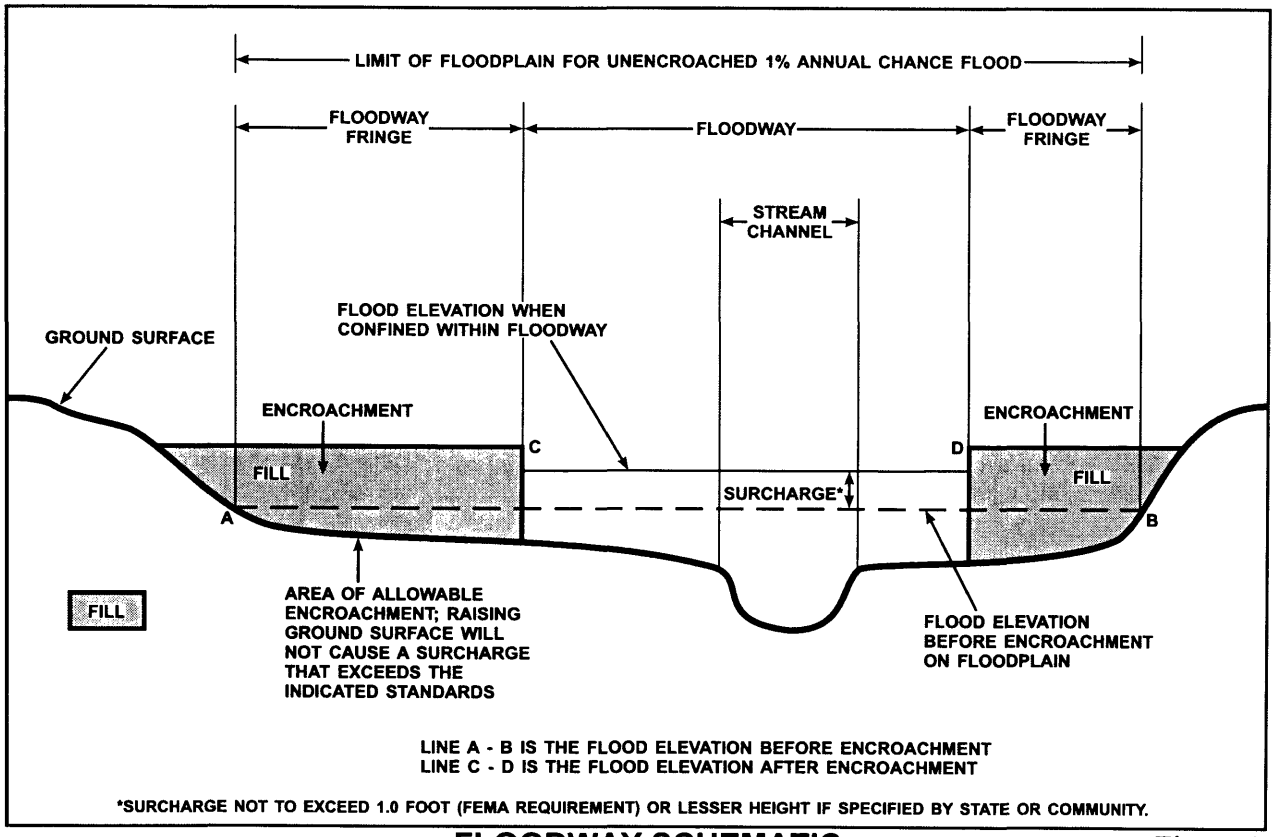
FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT (ALL JURISDICTIONS)

FLOODWAY DATA

WILLIAMS RIVER – WINHALL RIVER

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



FLOODWAY SCHEMATIC Figure 1

5.0 INSURANCE APPLICATIONS

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

Zone A

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

Zone AE

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

Zone AH

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

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Area of special flood hazard formerly protected from the 1-percent annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 1-percent annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. 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 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.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

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. On selected FIRM panels, floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Windham County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each identified flood-prone incorporated community. 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 8, "Community Map History."

7.0 OTHER STUDIES

FISs have been prepared for adjacent communities, and county jurisdictions were reviewed and are in agreement with this FIS. These include reports prepared for Windsor County, Vermont (All Jurisdictions) (currently being revised); Northfield, Massachusetts (FEMA, September 1980), Bernardston, Massachusetts (FEMA, July 1980), Leyden, Massachusetts (FEMA, February 1975) Colrain, Massachusetts (FEMA, July 1980), Rowe, Massachusetts (FEMA, August 1976), Monroe, Massachusetts (FEMA, December 1985), Searsburg (FEMA, November 1974) and Readsboro, Vermont (FEMA, September

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Athens, Town of	December 6, 1974	None	September 28, 2007	
Bellows Falls, Village of	August 16, 1974	May 10, 1977	July 16, 1979	December 20, 1999 September 28, 2007
Brattleboro, Town of	February 8, 1974	February 18, 1977	December 4, 1985	September 28, 2007
Brookline, Town of	December 6, 1974	None	September 4, 1985	September 28, 2007
Dover, Town of	August 2, 1974	October 22, 1976 January 30, 1981	July 1, 1991	September 28, 2007
Dummerston, Town of	August 30, 1974	September 10, 1976	June 17, 1991	September 28, 2007
Grafton, Town of	February 21, 1978	None	August 4, 1987	September 28, 2007
Guilford, Town of	July 19, 1974	December 10, 1976	June 3, 1986	September 28, 2007
Halifax, Town of	January 31, 1975	None	September 4, 1985	September 28, 2007
Jamaica, Town of	June 28, 1974	May 10, 1977	May 5, 1981	May 17, 1988 September 28, 2007
Londonderry, Town of	June 28, 1974	October 3, 1976	April 1, 1992	January 3, 1997 September 28, 2007
Marlboro, Town of	December 27, 1974	December 24, 1976	September 18, 1985	September 28, 2007
Newfane, Town of	June 28, 1974	April 15, 1977	June 5, 1989	September 28, 2007

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT
(ALL JURISDICTIONS)

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Putney, Town of	June 21, 1974	November 5, 1976	September 18, 1985	September 28, 2007
Rockingham, Town of	June 21, 1974	April 22, 1977	May 15, 1980	December 20, 1999 September 28, 2007
Somerset, Town of	November 22, 1974	None	September 28, 2007	
Stratton, Town of	January 31, 1975	None	September 28, 2007	
Townshend, Town of	August 2, 1974	December 10, 1976 June 14, 1977	September 18, 1985	September 28, 2007
Vernon, Town of	June 28, 1974	February 20, 1976 July 25, 1980	September 27, 1991	September 28, 2007
Wardsboro, Town of	December 27, 1974	June 14, 1977	July 16, 1980	September 28, 2007
Westminster, Town of	August 16, 1974	April 15, 1977	January 3, 1985	September 28, 2007
Whitingham, Town of	August 9, 1974	February 11, 1977	September 18, 1985	September 28, 2007
Wilmington, Town of	May 31, 1974	March 4, 1977	May 1, 1978	September 28, 2007
Windham, Town of	September 6, 1977	None	September 28, 2007	

TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT
(ALL JURSIDICTIONS)

COMMUNITY MAP HISTORY

1985) Woodford, Vermont (FEMA, September 1985), Sunderland, Vermont (FEMA, November 1985), Winhall, Vermont (FEMA, June 1989), Landgrove, Vermont (FEMA, September 1985), Weston, Vermont (FEMA, January 1997), Andover, Vermont (FEMA, August 1985), Chester, Vermont (FEMA, February 1982), Springfield, Vermont (FEMA, December 1999), Charlestown, New Hampshire (FEMA, May 2000), Walpole, New Hampshire (FEMA, May 2000), Westmoreland, New Hampshire (FEMA, April 1986), Chesterfield, New Hampshire (FEMA, April 1986), and Hinsdale, New Hampshire (FEMA, April 1981). FISs have not been prepared for the contiguous communities of the Towns of Glastenbury, Vermont, and Heath, Massachusetts.

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Windham County has been compiled in this FIS. This includes the report "Flood Insurance Study: Connecticut River-Vernon Dam to the corporate limits of Hartland, VT" (ENSR). Therefore, this FIS supersedes all previously printed FIS reports, FHBMs, FIRMs, and or FBFMs for all of the incorporated jurisdictions within Windham County.

This is a multi-volume FIS. Each volume may be revised separately, in which case it supersedes the previously printed volume. Users should refer to the Table of Contents in Volume 1 for the current effective date of each volume; volumes bearing these dates contain the most up-to-date flood hazard data.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, 99 High Street, 6th Floor, Boston, Massachusetts 02110.

9.0 BIBLIOGRAPHY AND REFERENCES

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Federal Emergency Management Agency. (June 3, 1986). Flood Insurance Rate Map, Town of Guilford, Windham County, Vermont. Washington, D.C.

Federal Emergency Management Agency. (April 2, 1986). Flood Insurance Rate Map, Town of Chesterfield, Cheshire County, New Hampshire. Washington, D.C.

Federal Emergency Management Agency. (April 2, 1986). Flood Insurance Rate Map, Town of Westmoreland, Cheshire County, New Hampshire. Washington, D.C.

Federal Emergency Management Agency. (December 4, 1985). Flood Insurance Study, Town of Brattleboro, Windham County, Vermont. Washington, D.C.

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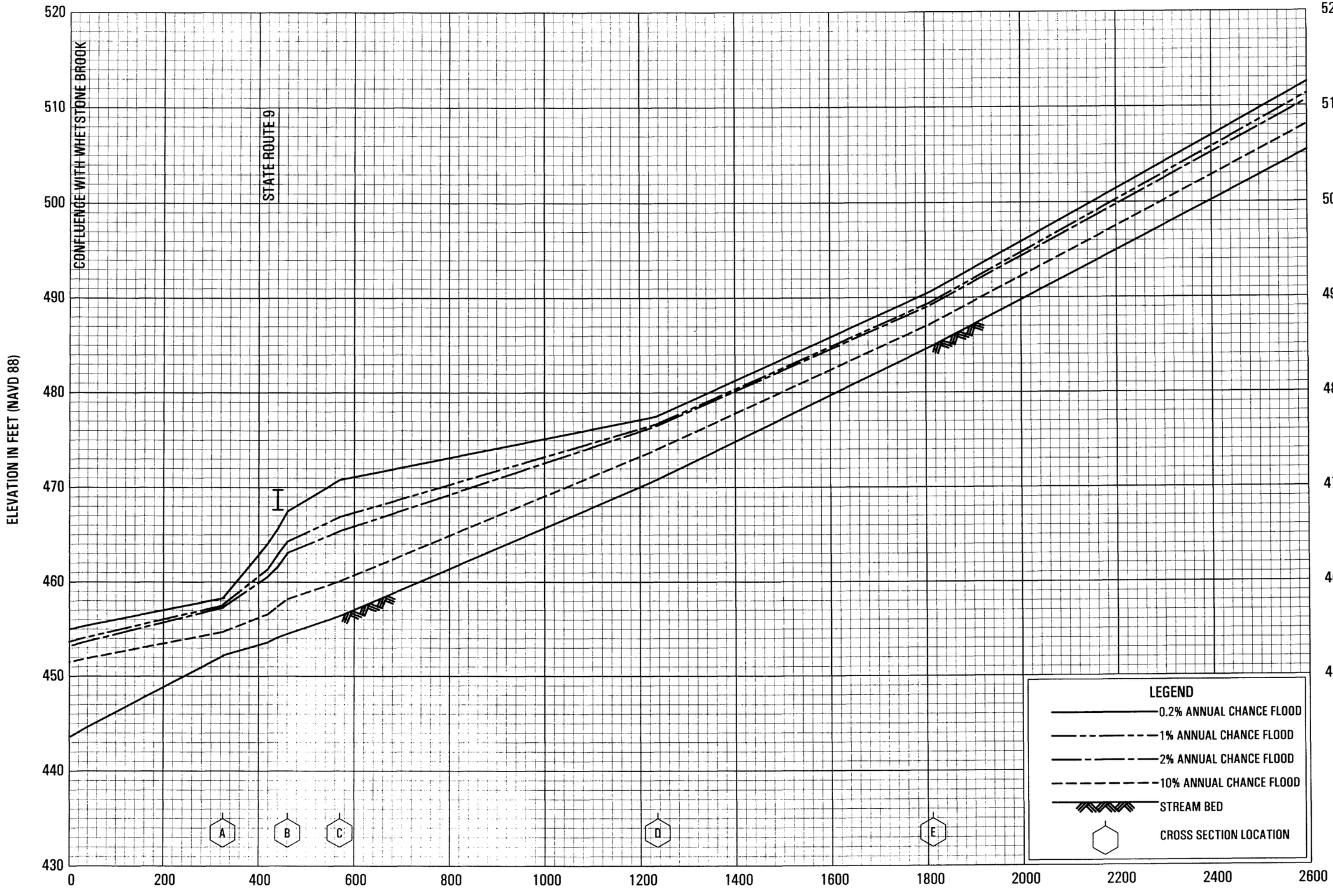

FLOOD PROFILES

AMES HILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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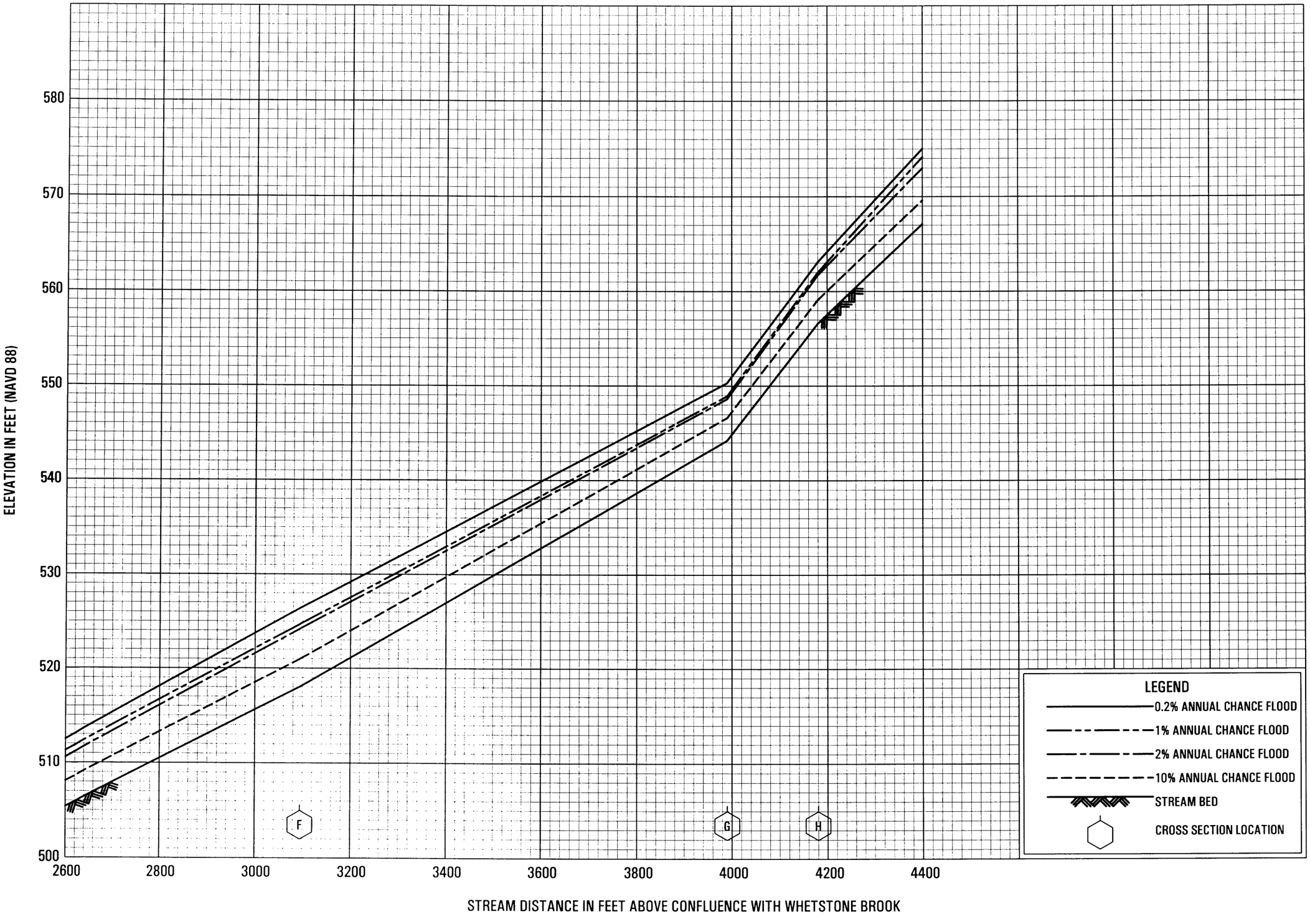

FLOOD PROFILES

AMES HILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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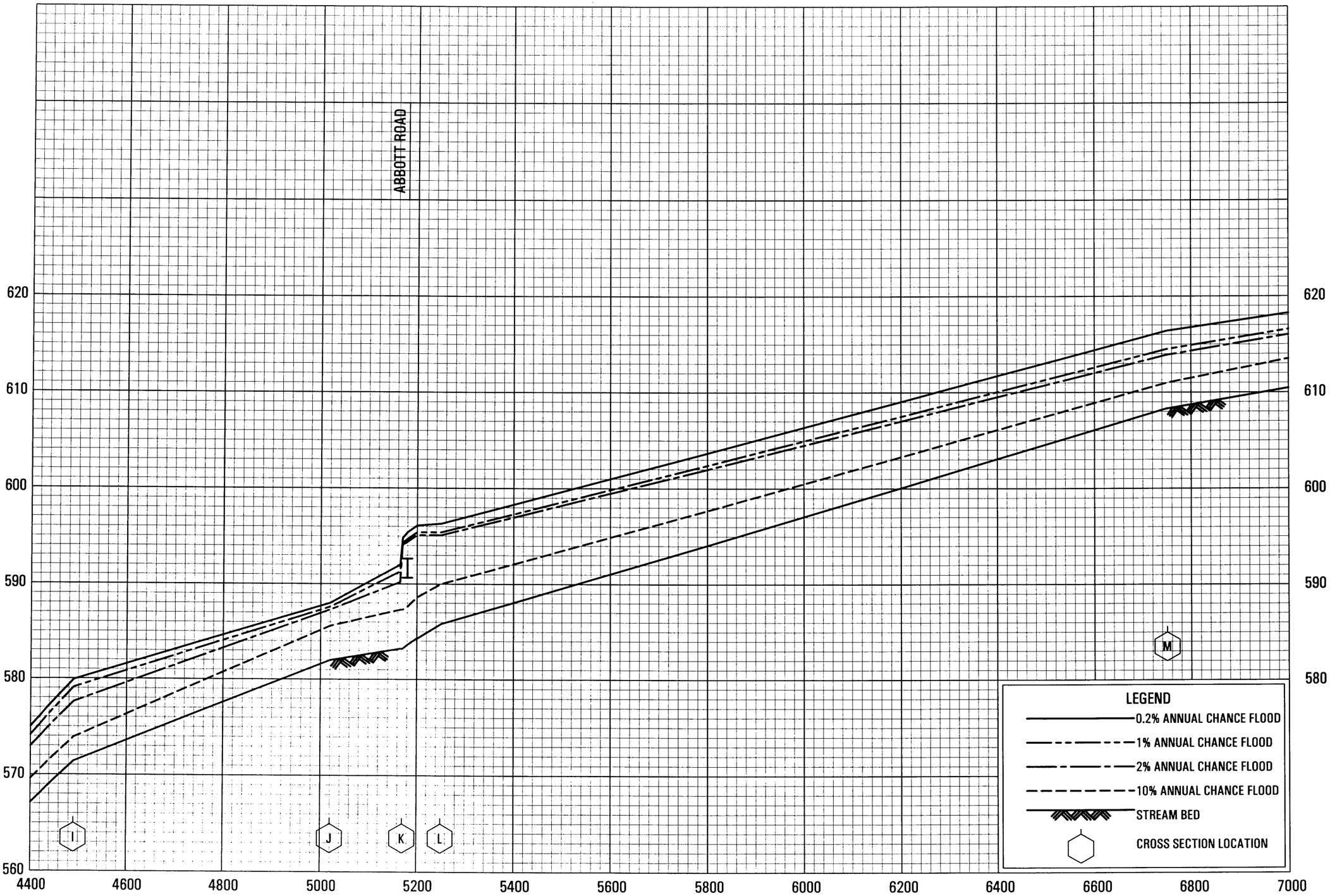


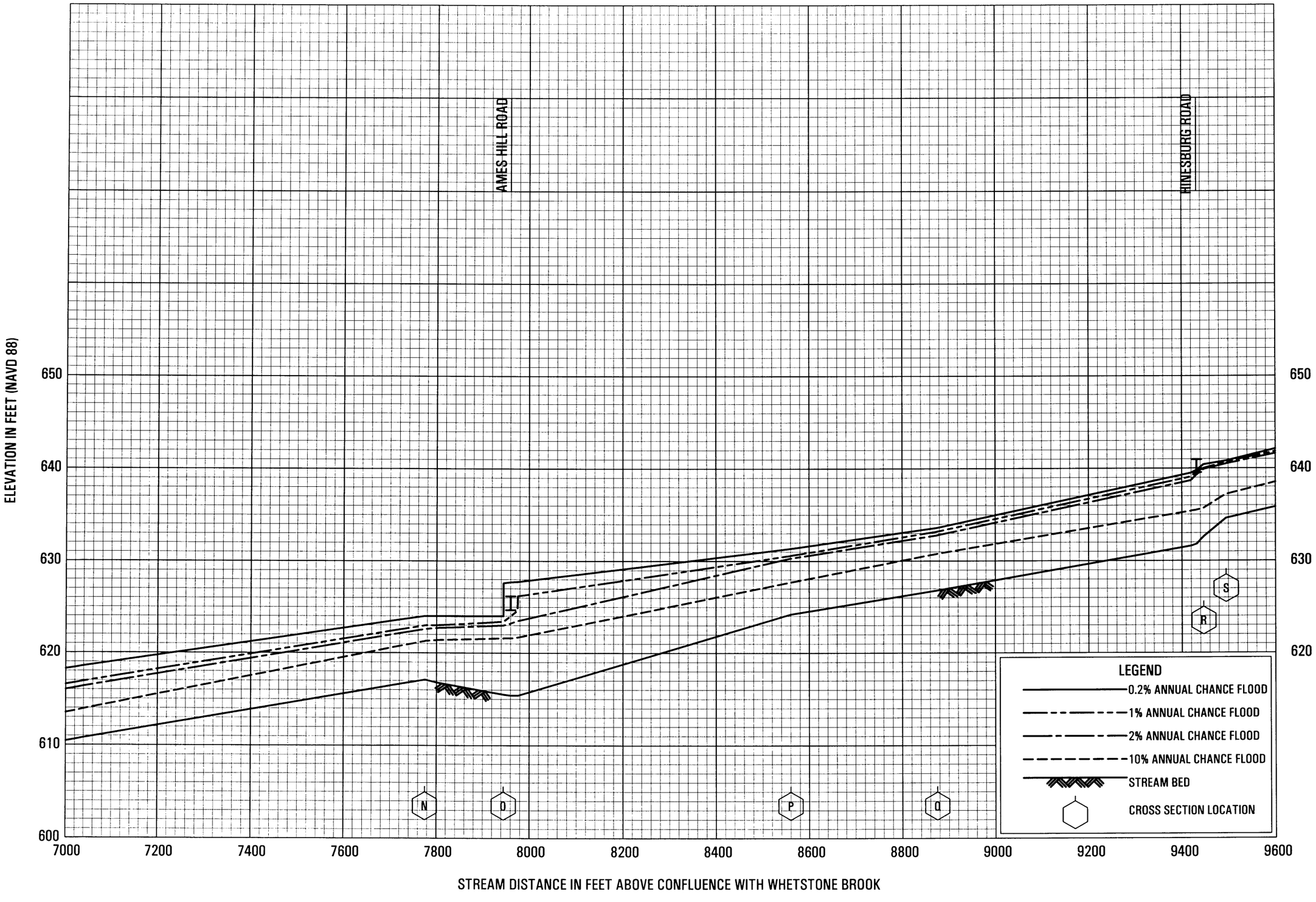
FLOOD PROFILES

AMES HILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

AMES HILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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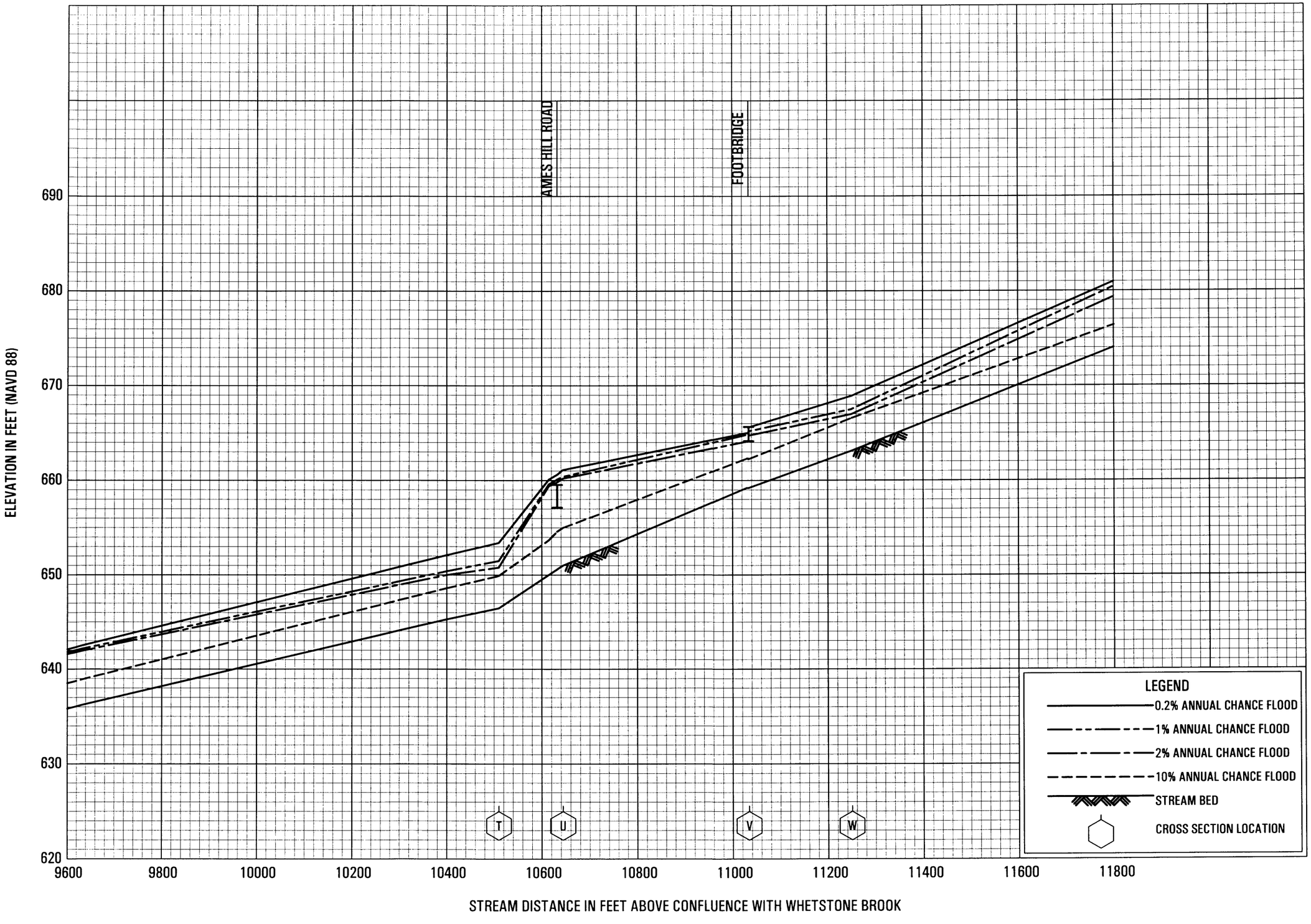

FLOOD PROFILES

AMES HILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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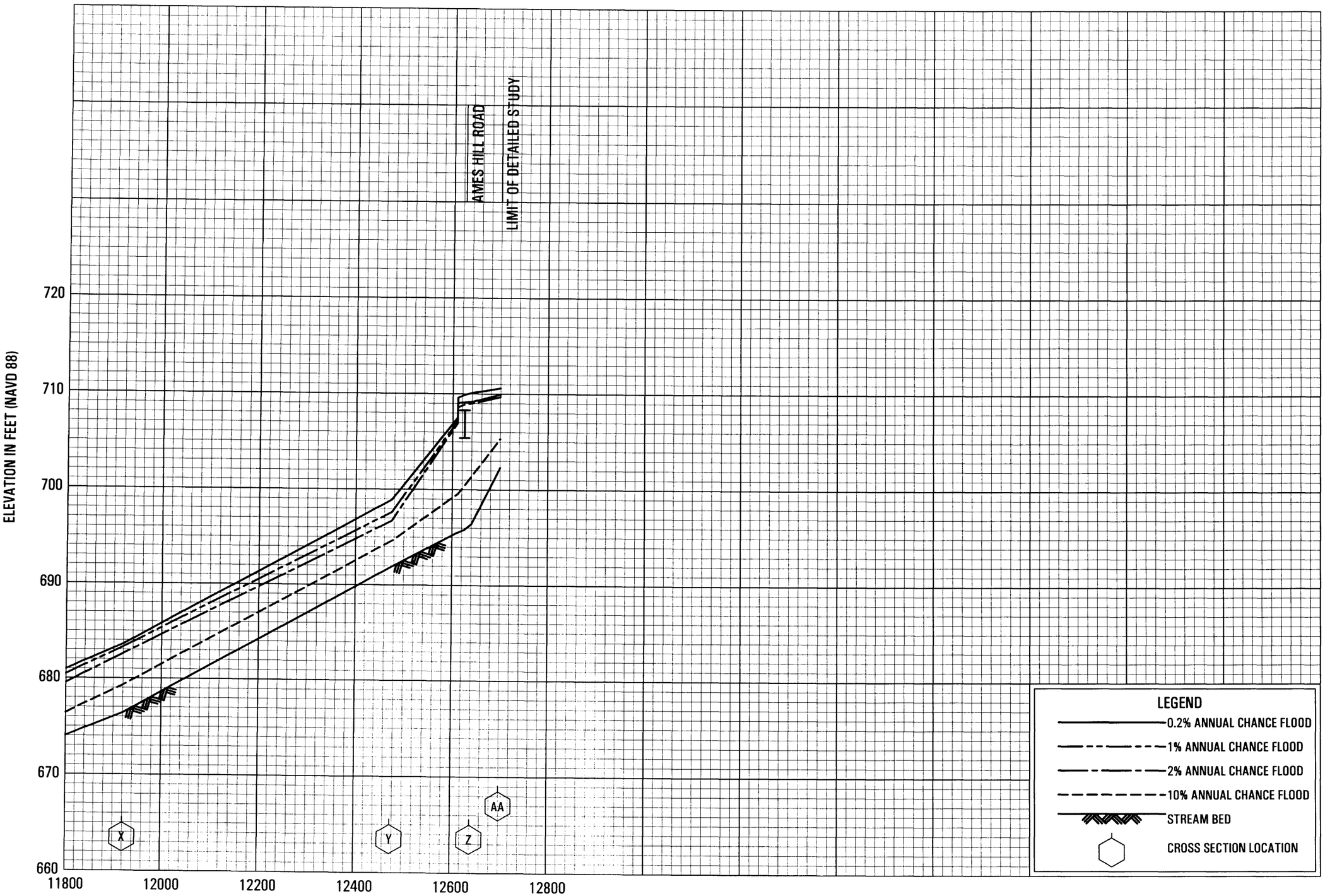

FLOOD PROFILES

AMES HILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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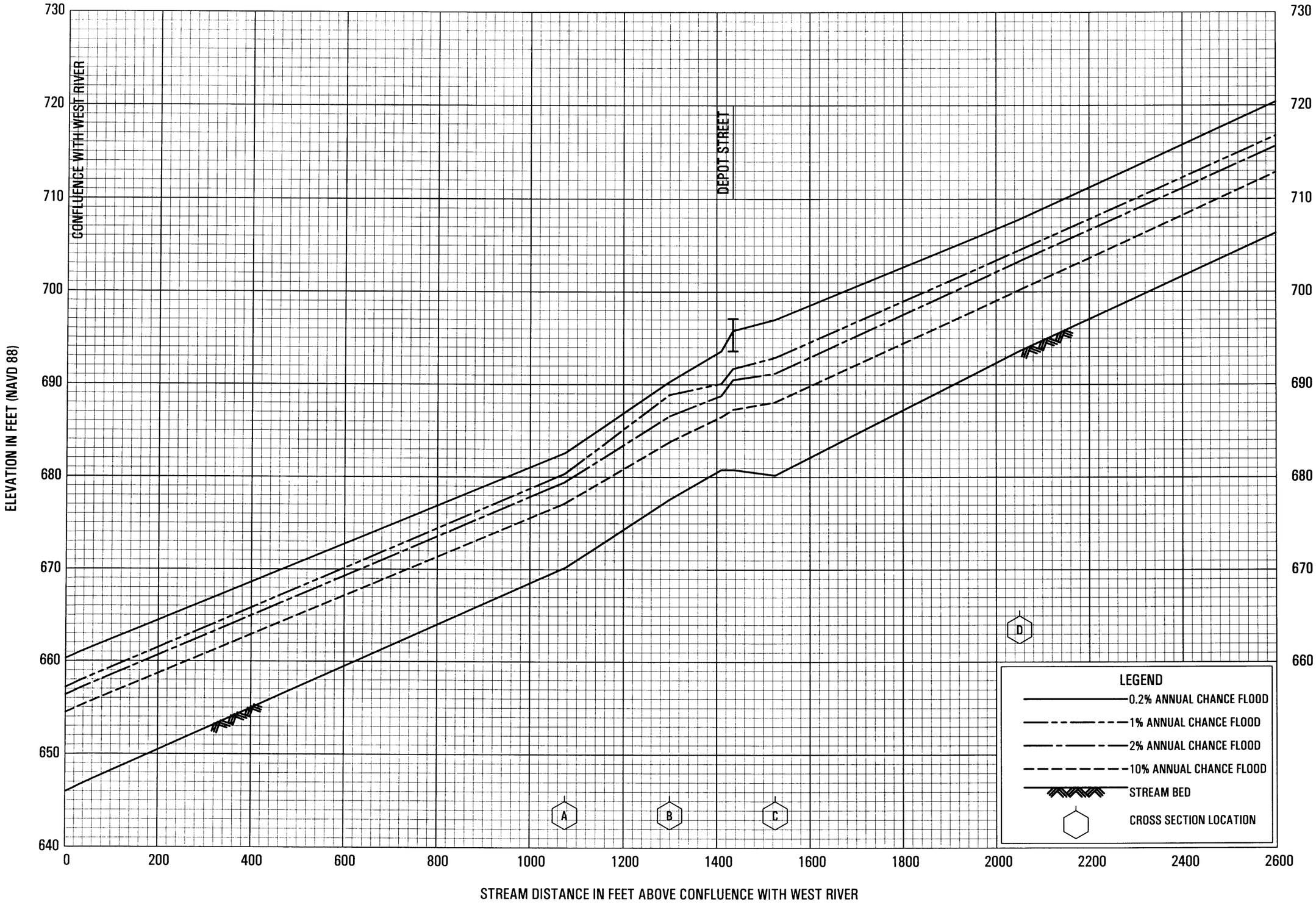

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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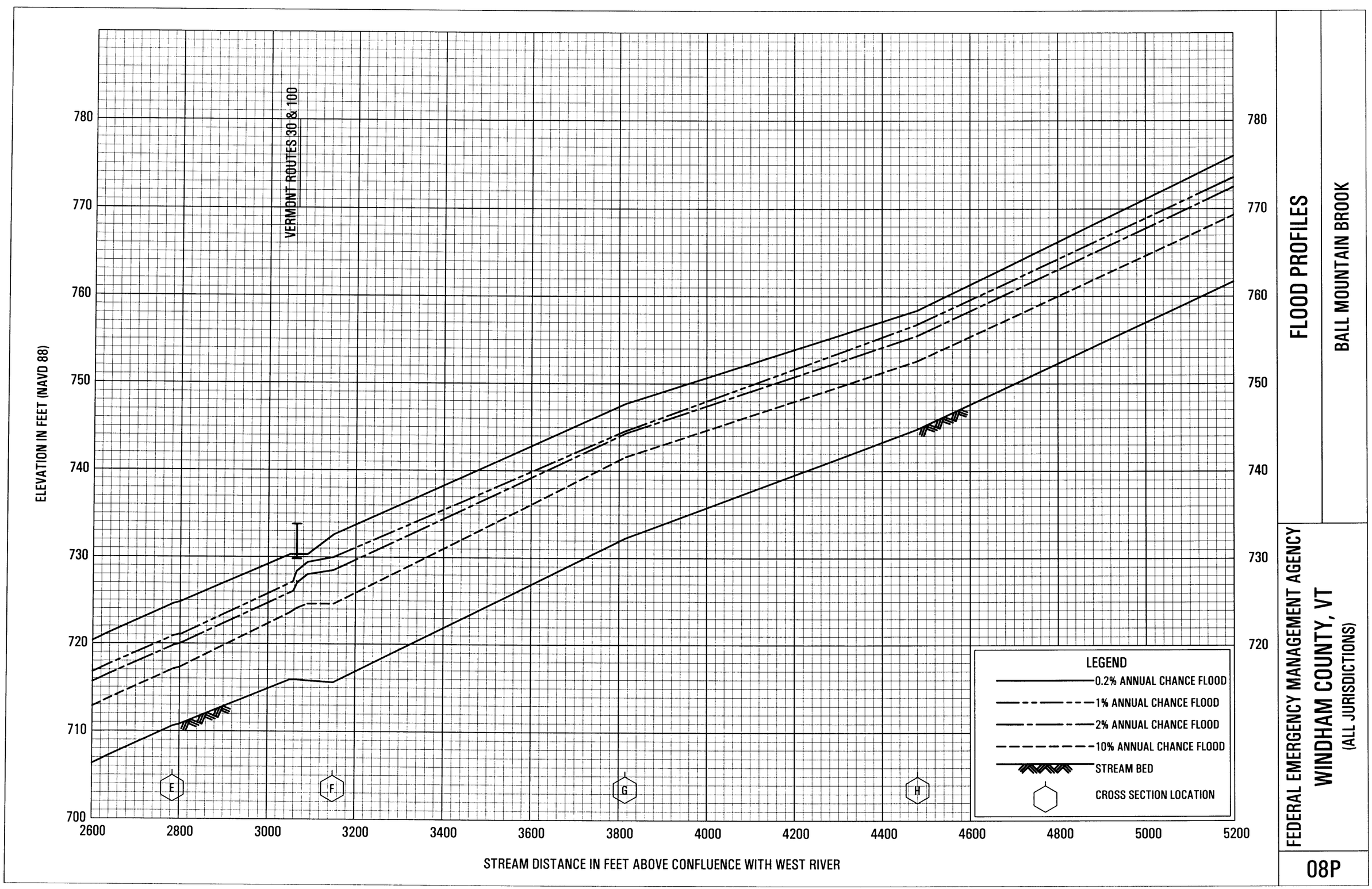

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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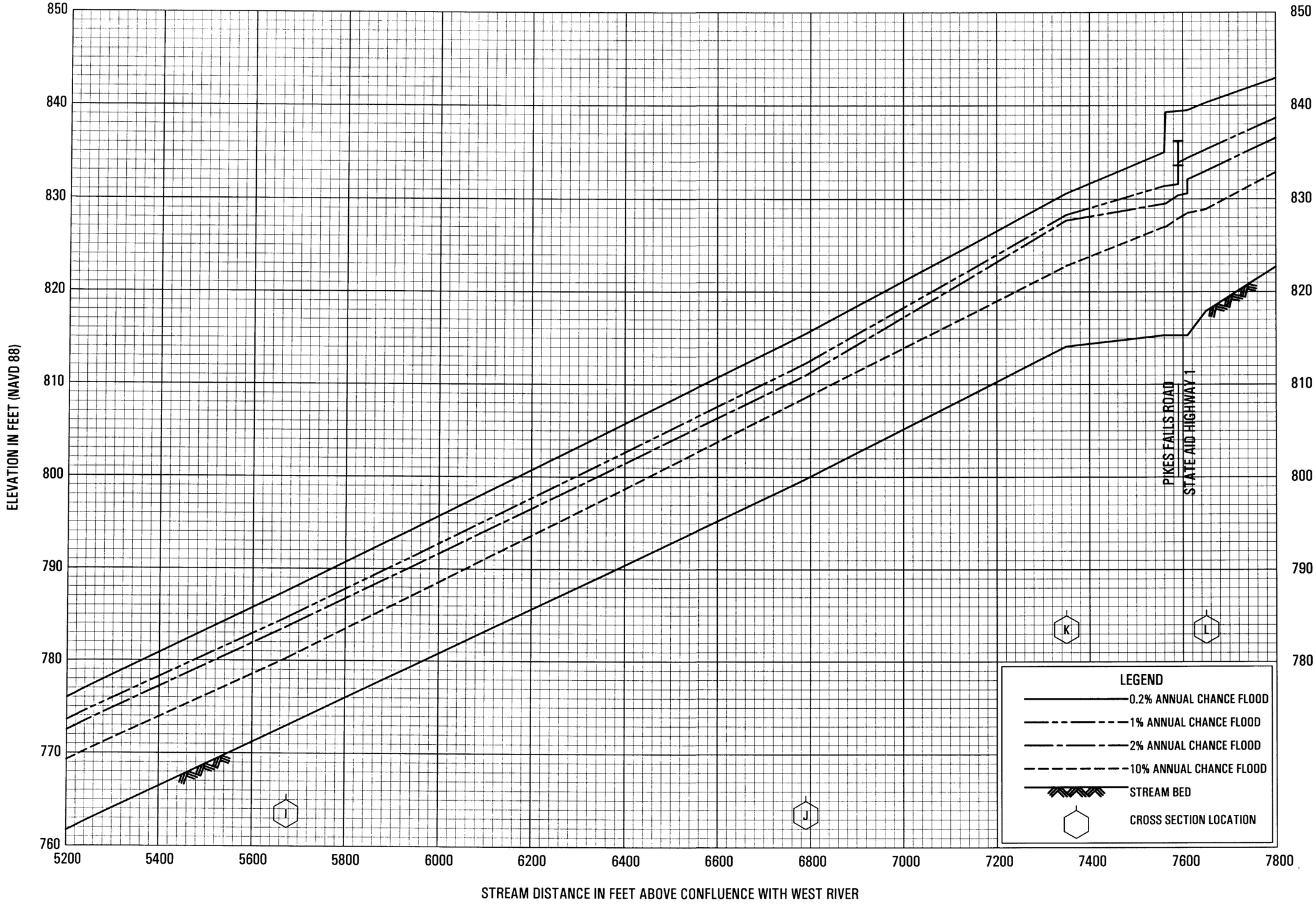

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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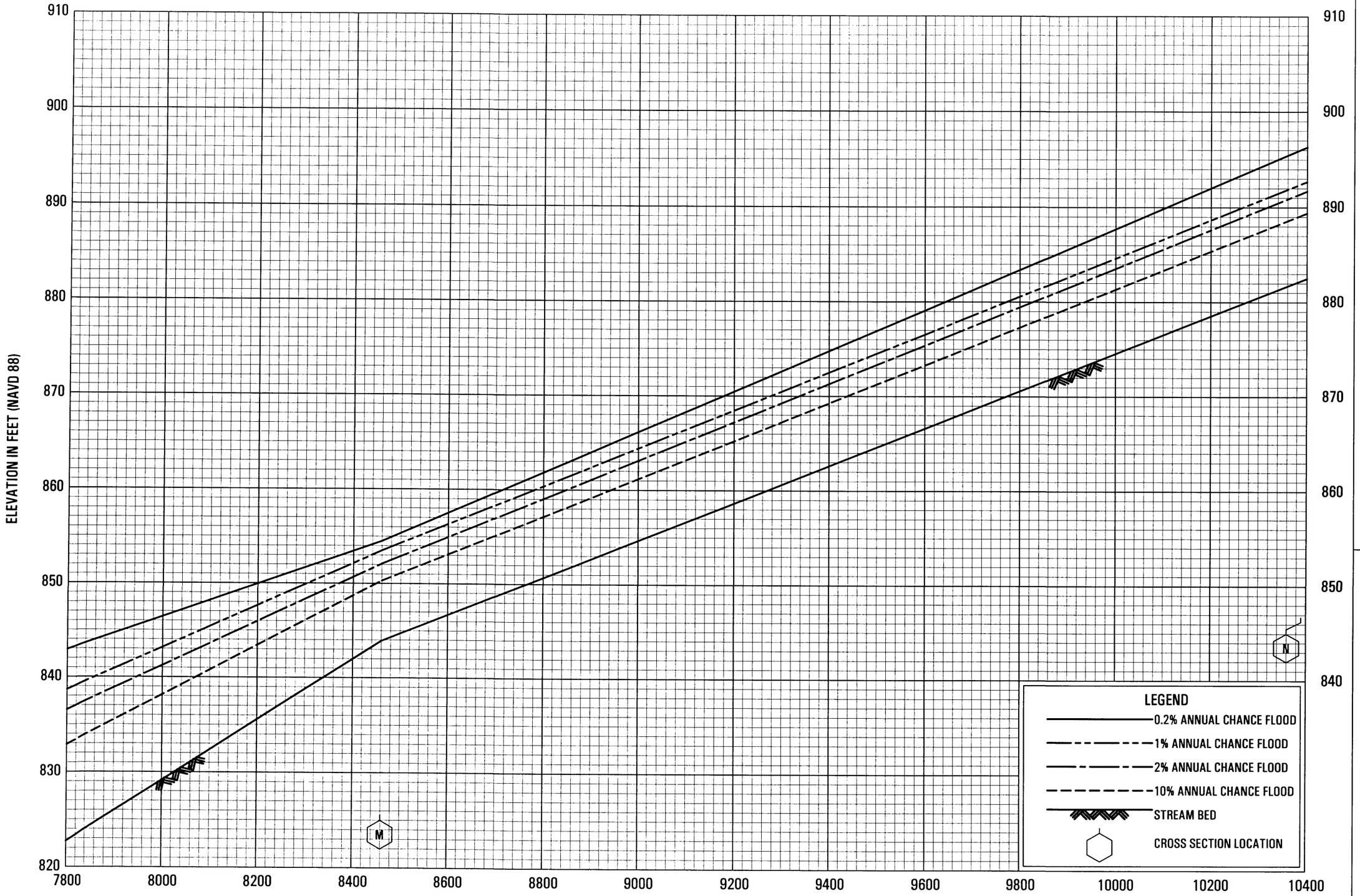

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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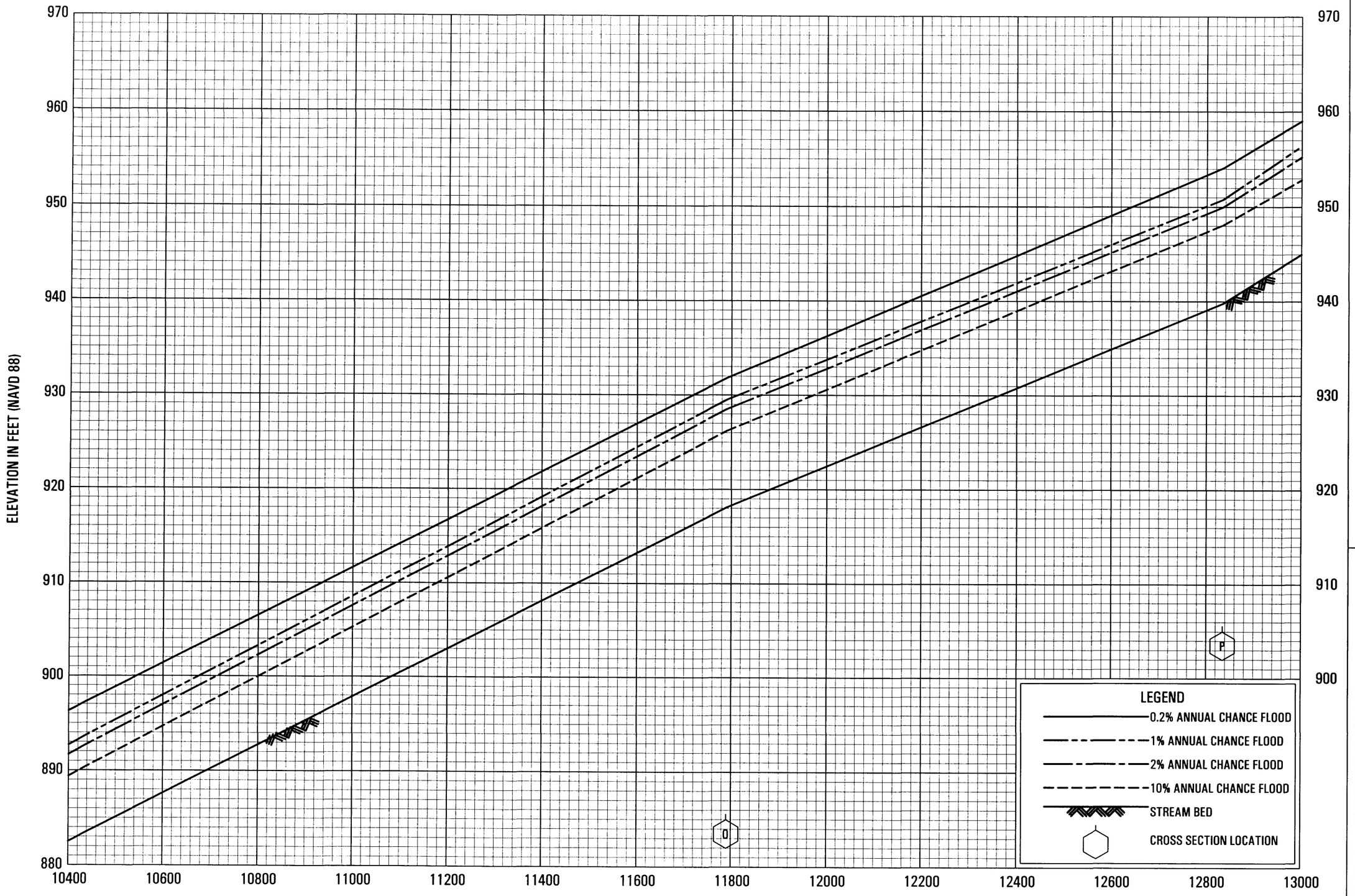

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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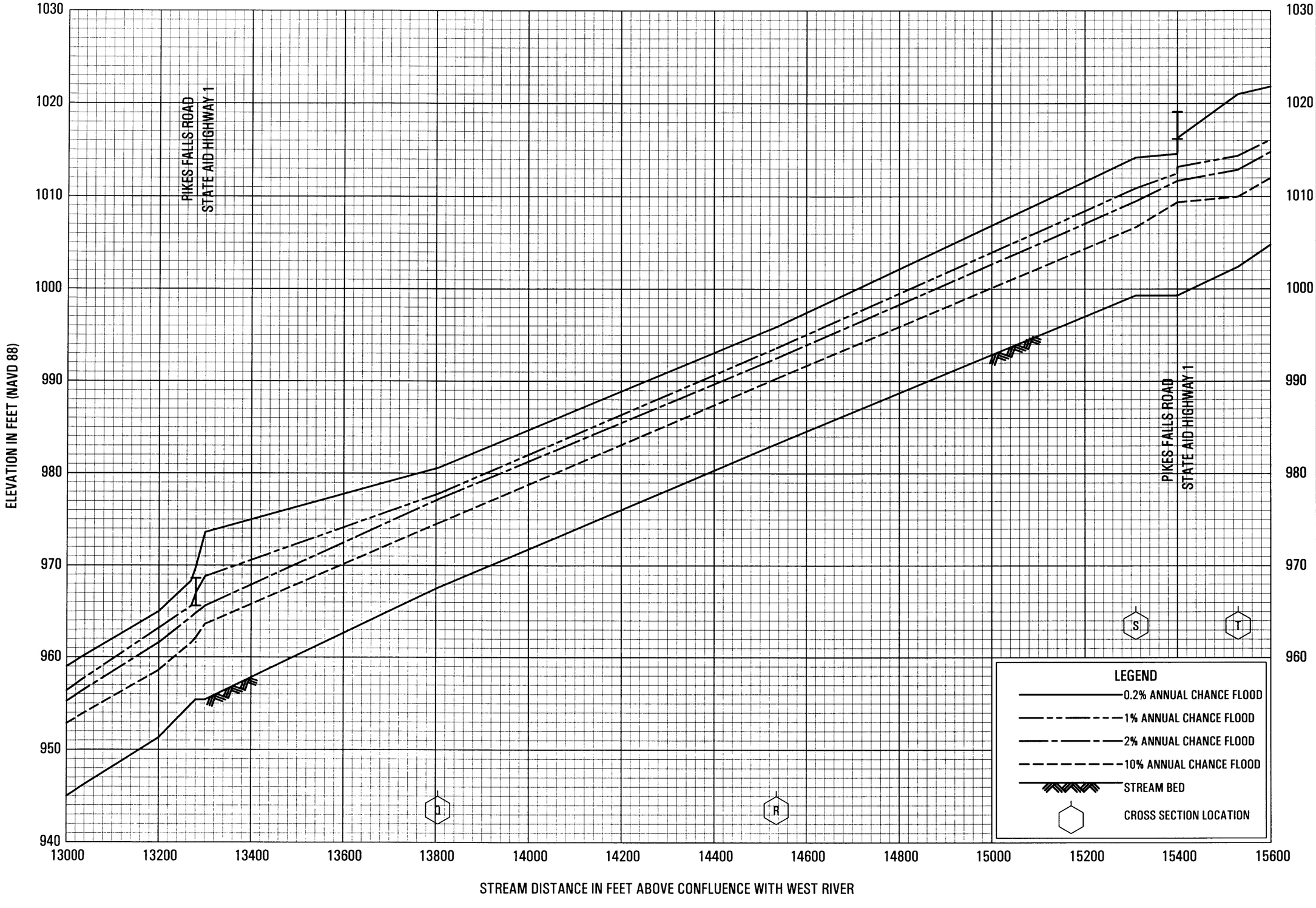


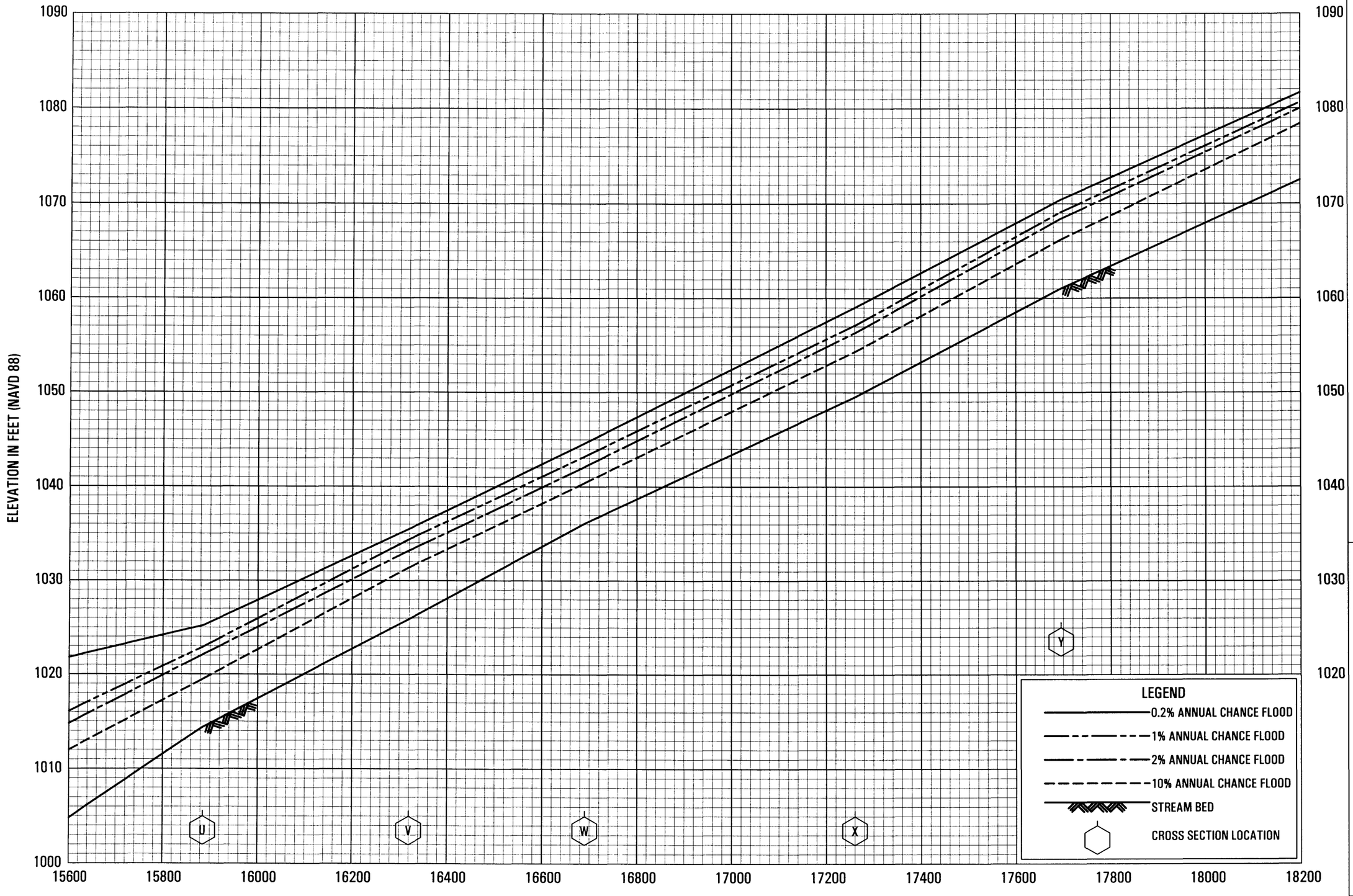
FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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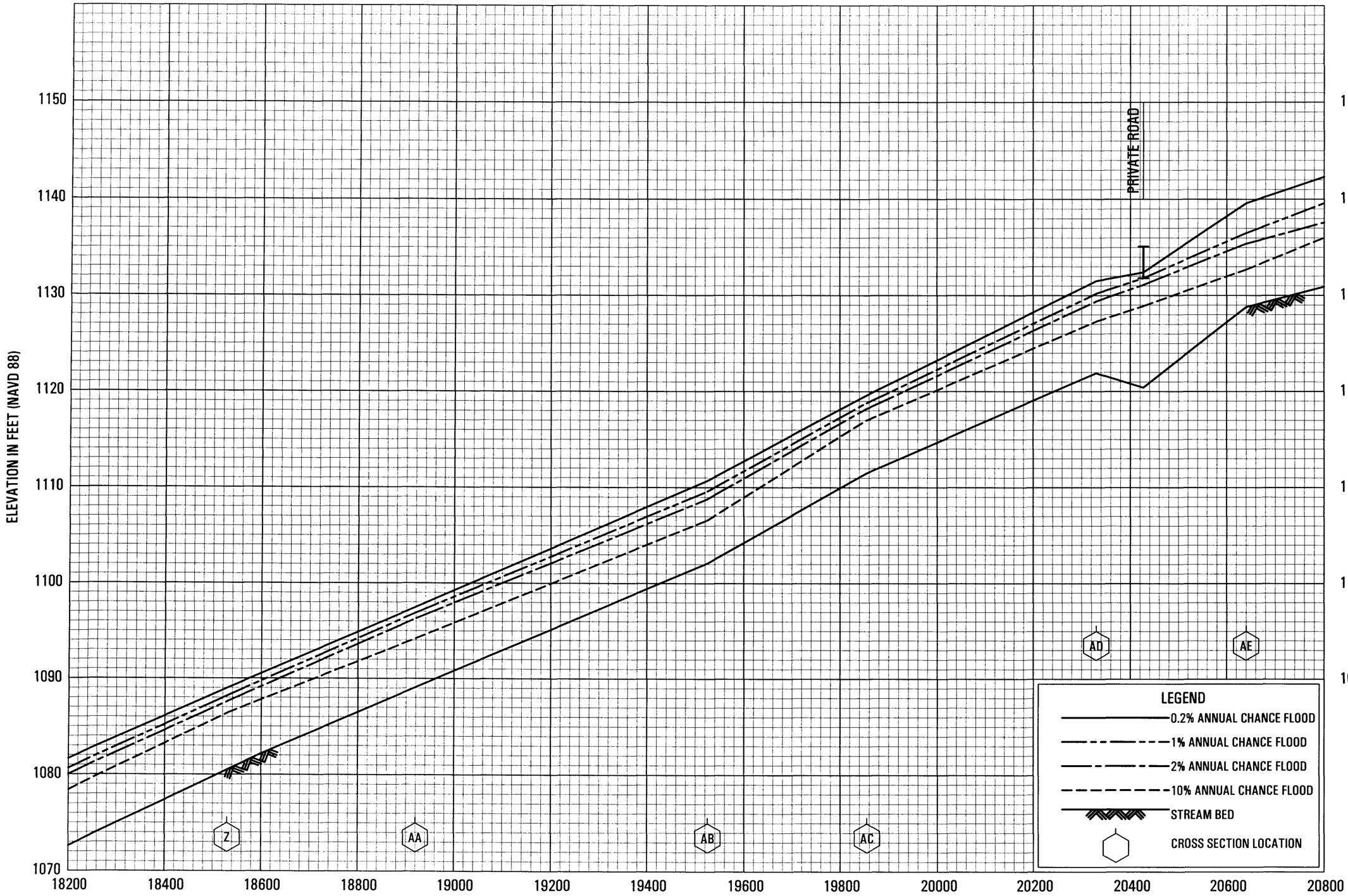


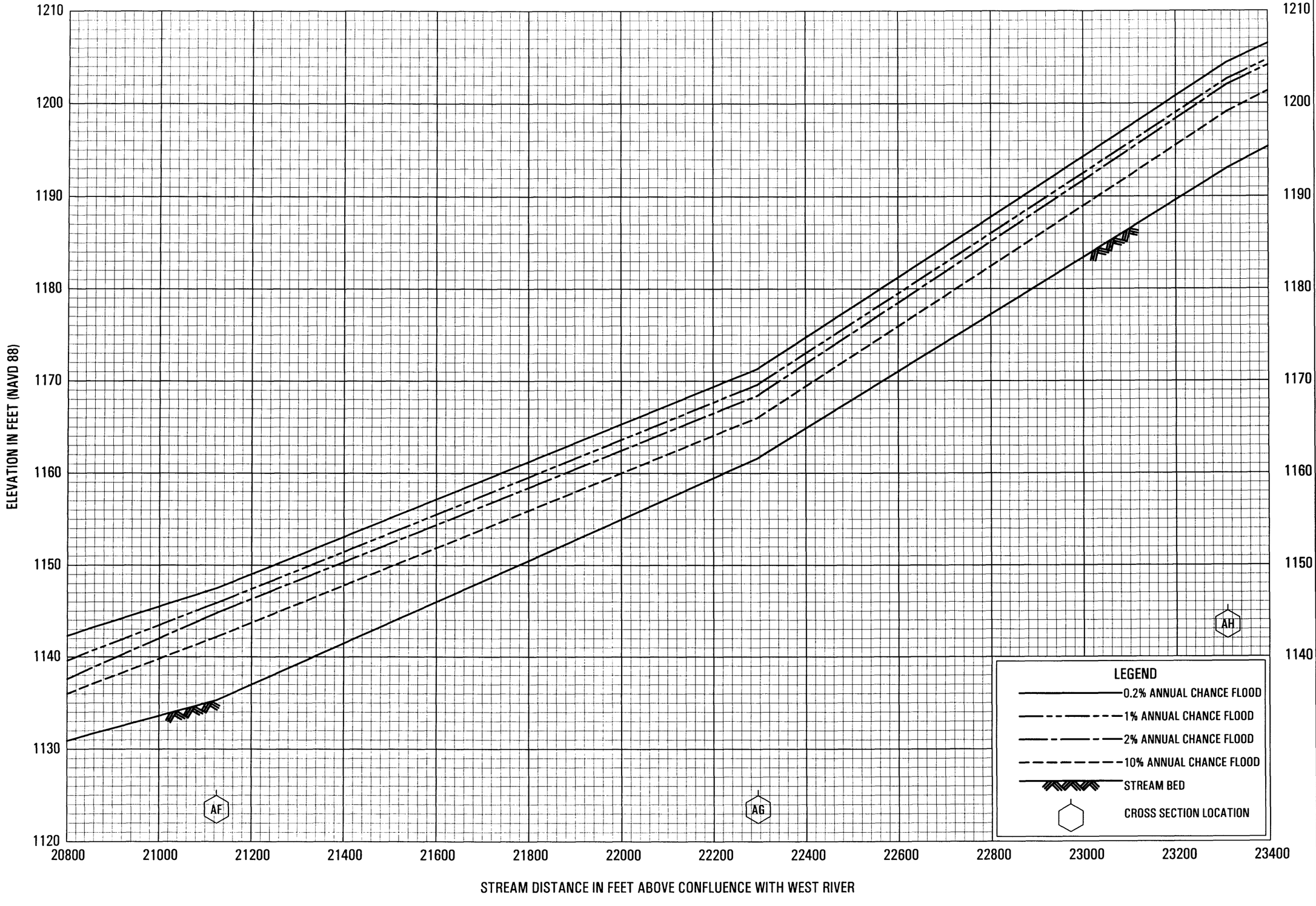
FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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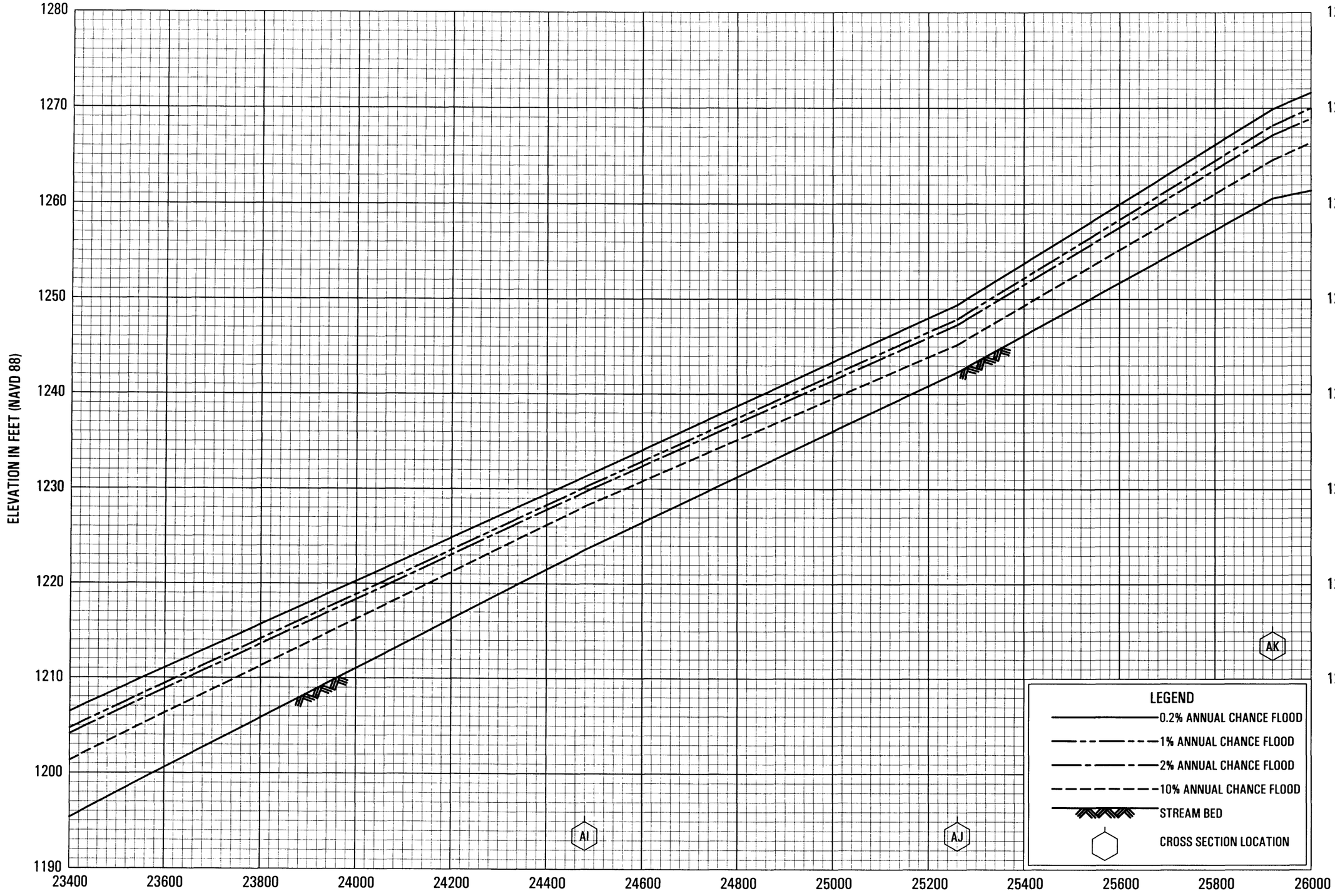

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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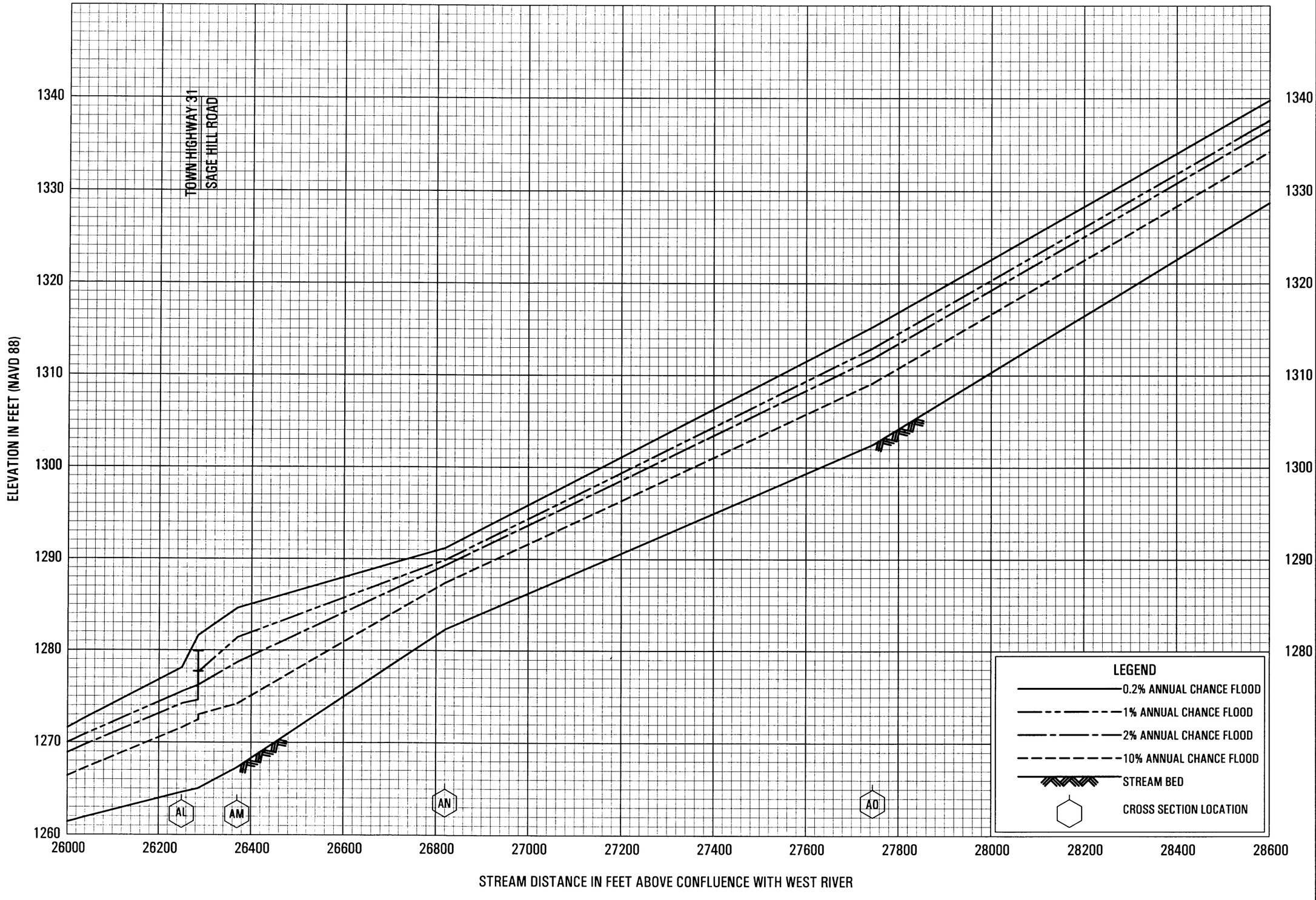

FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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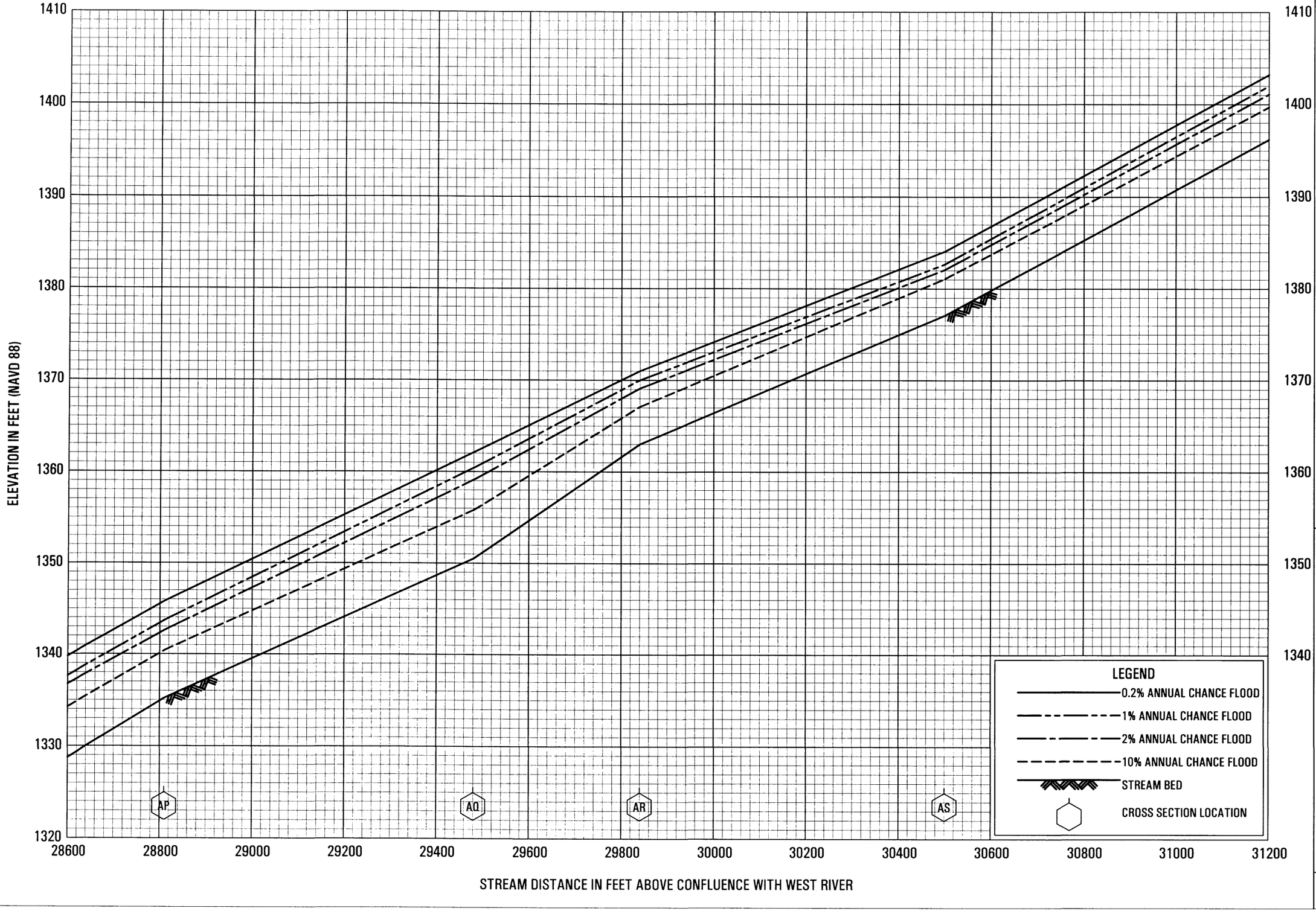

FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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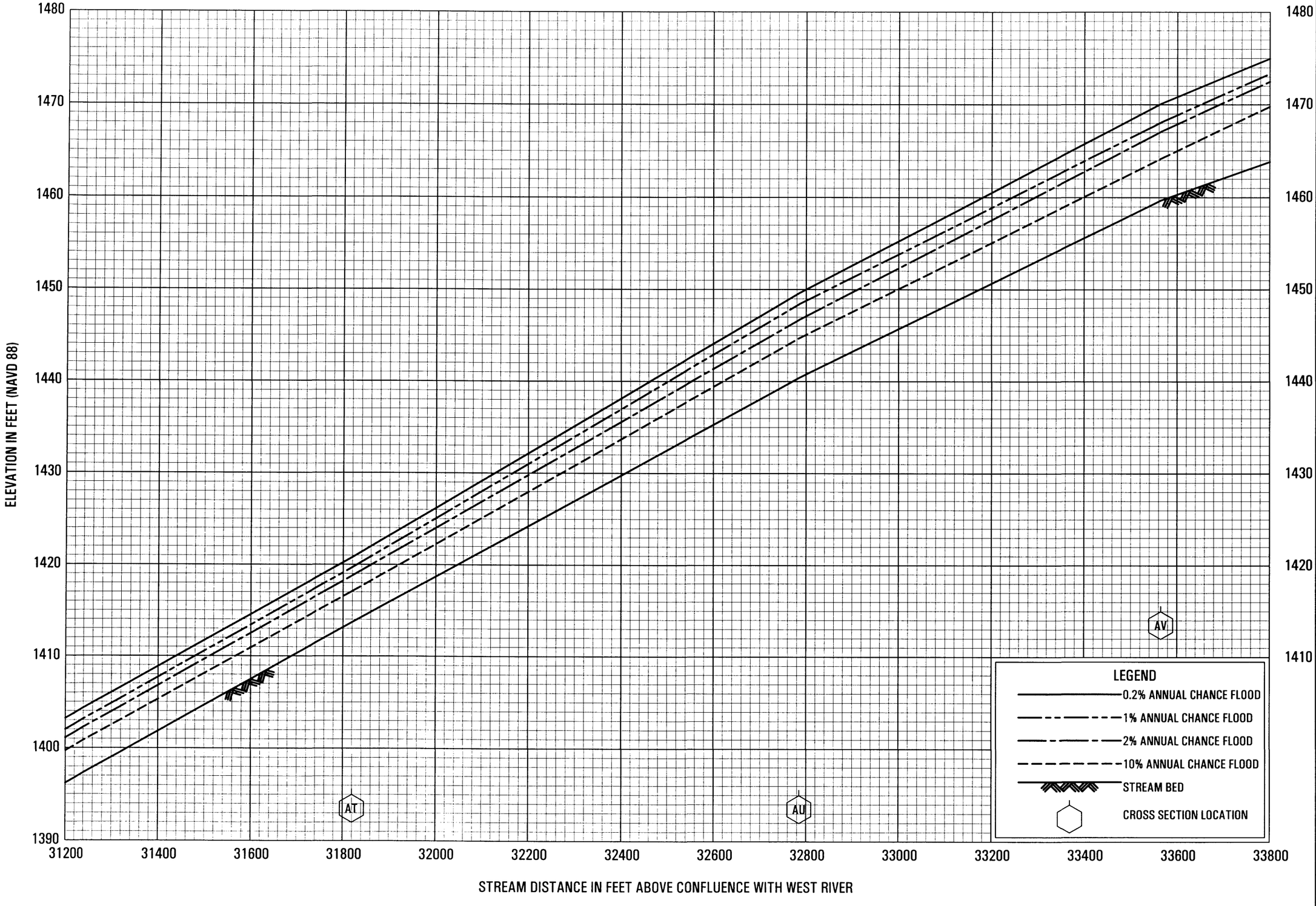


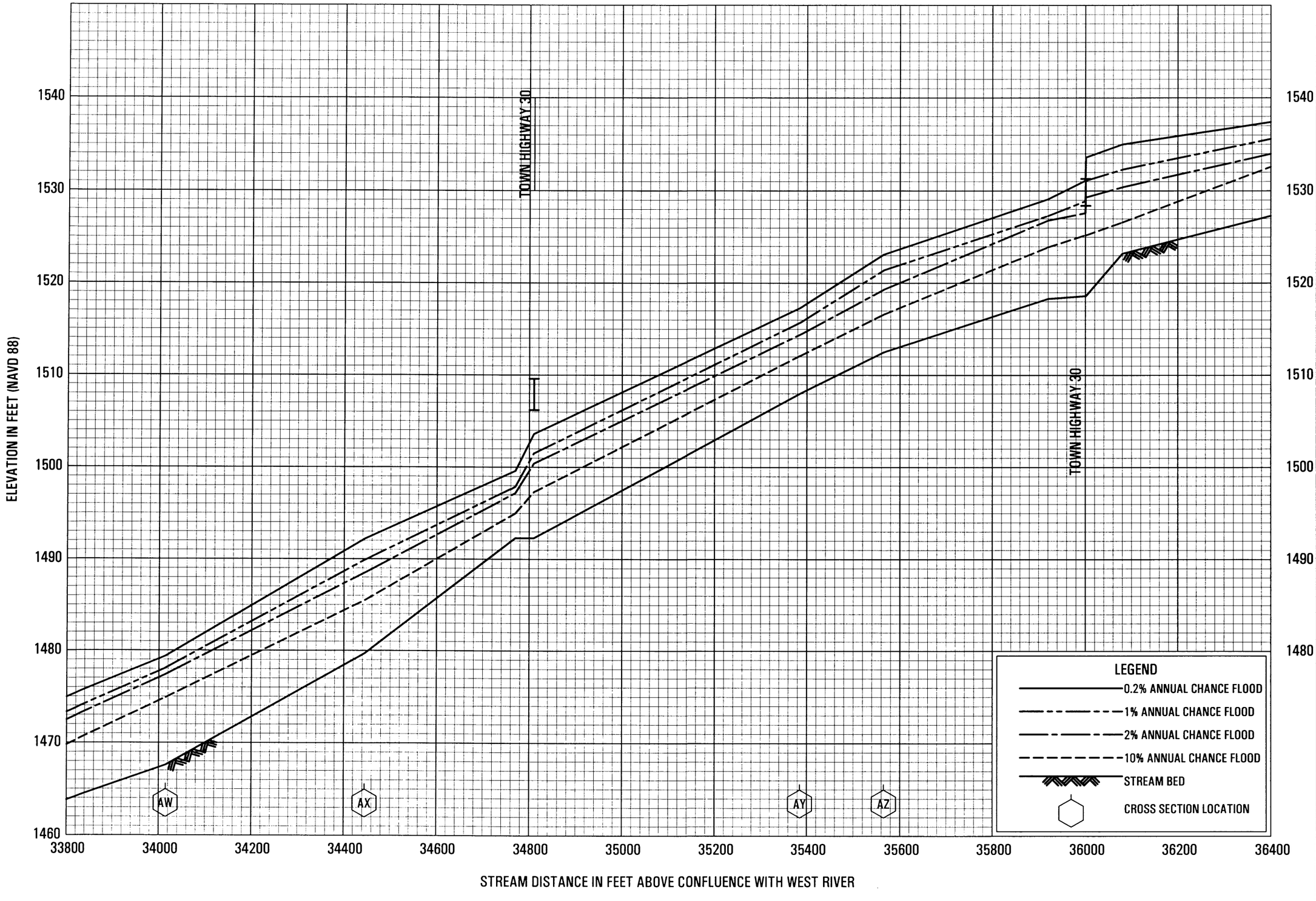
FLOOD PROFILES

BALL MOUNTAIN BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



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WINDHAM COUNTY, VT

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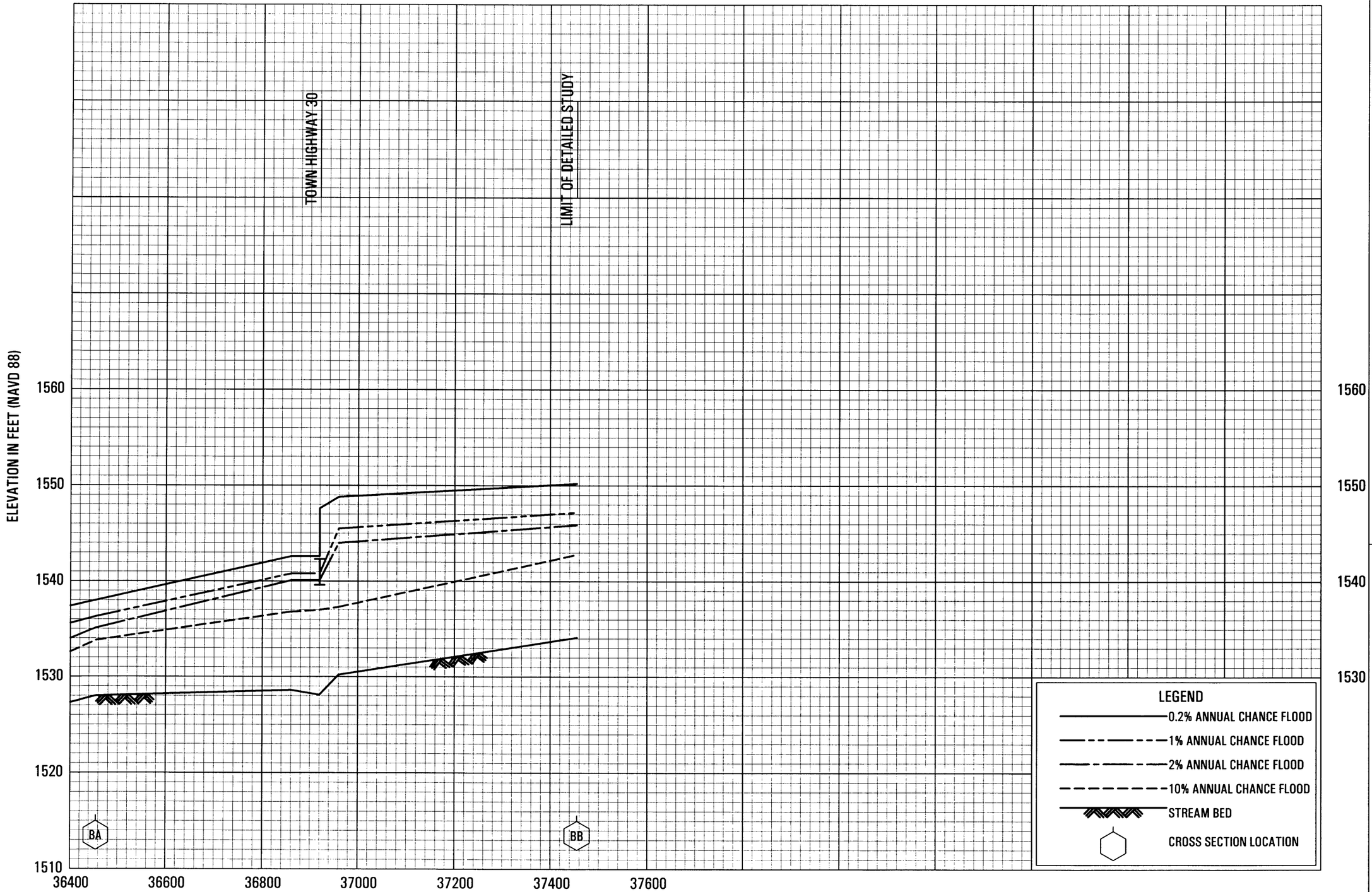

FLOOD PROFILES

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WINDHAM COUNTY, VT

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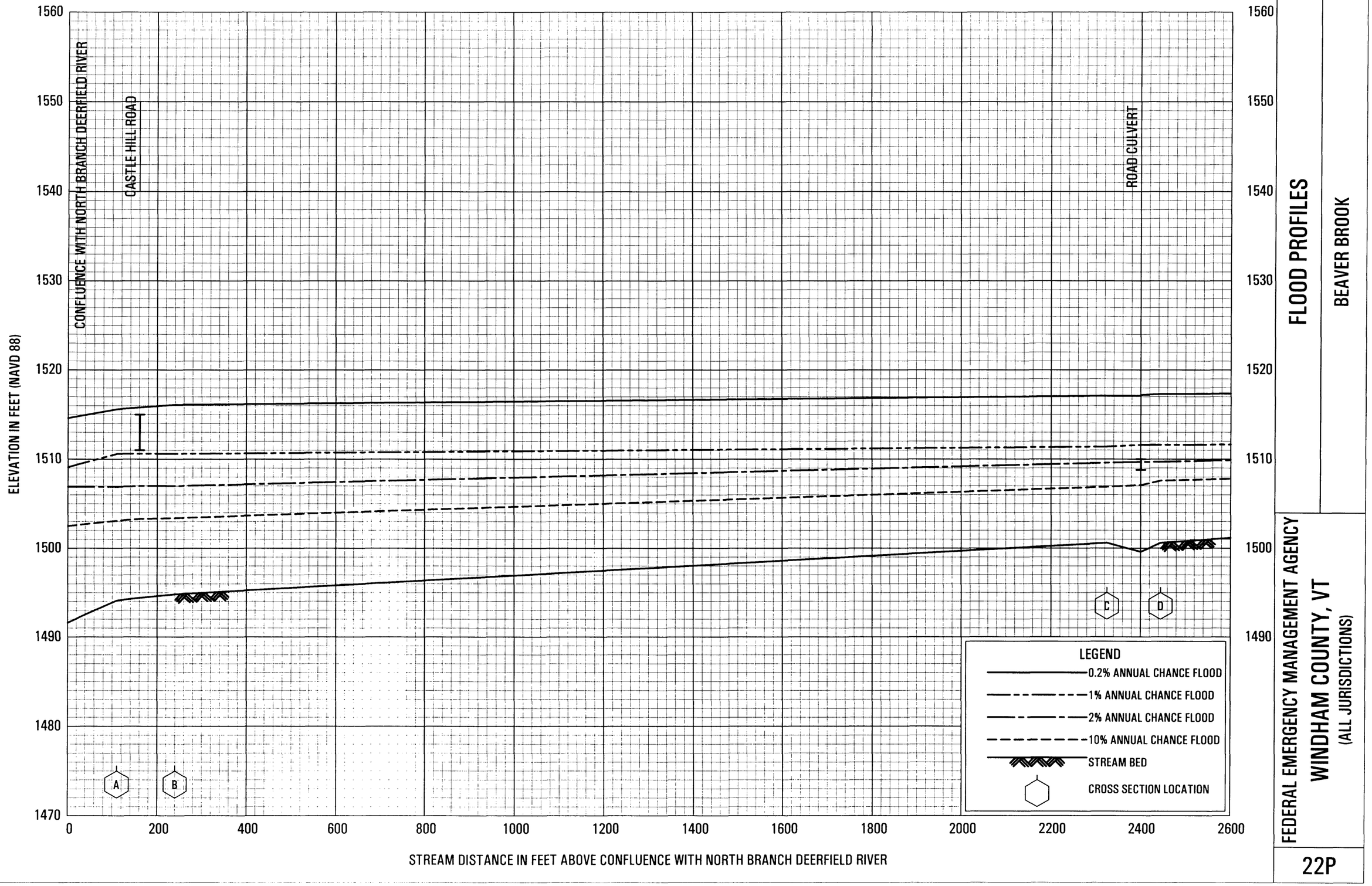

FLOOD PROFILES

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WINDHAM COUNTY, VT

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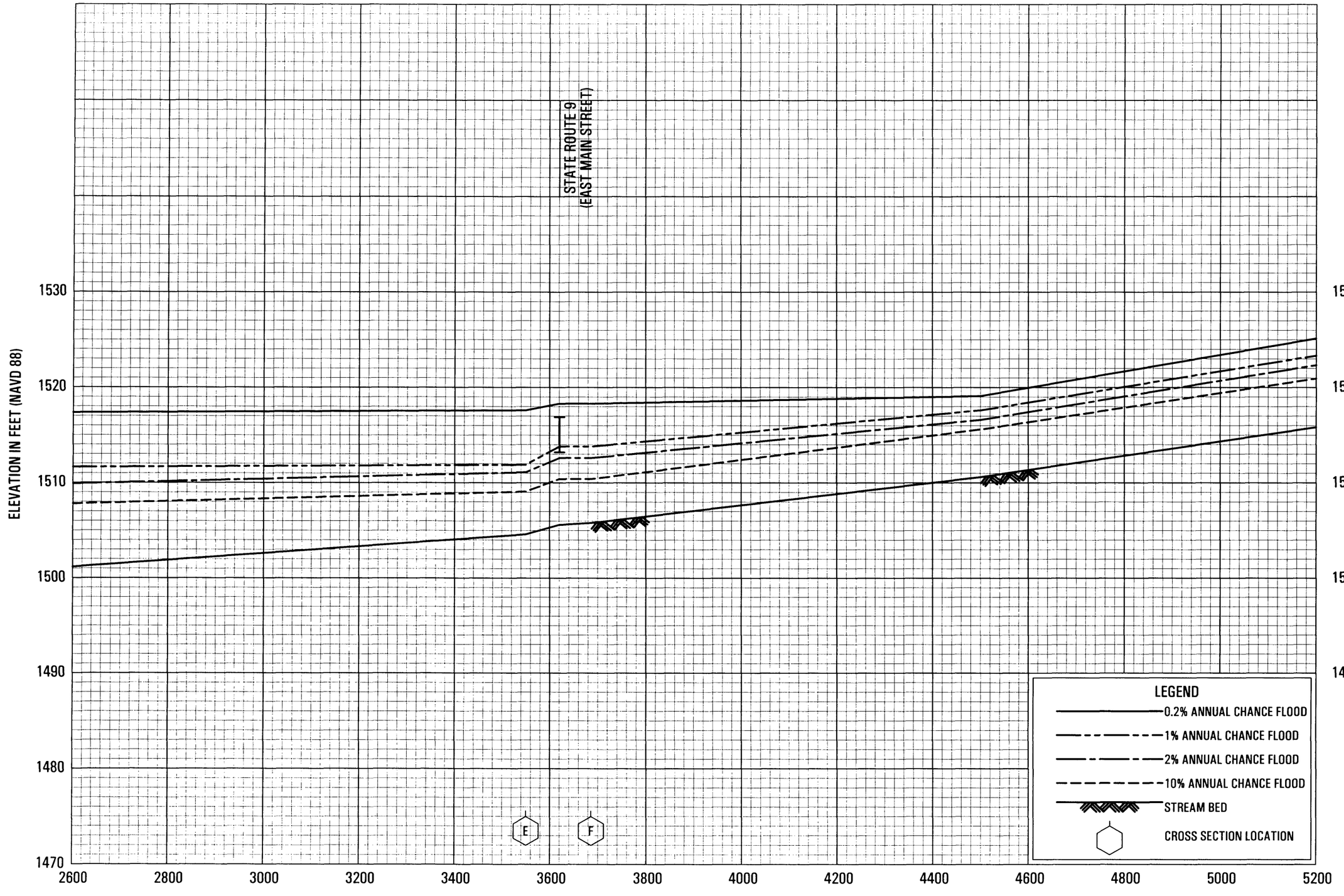

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WINDHAM COUNTY, VT

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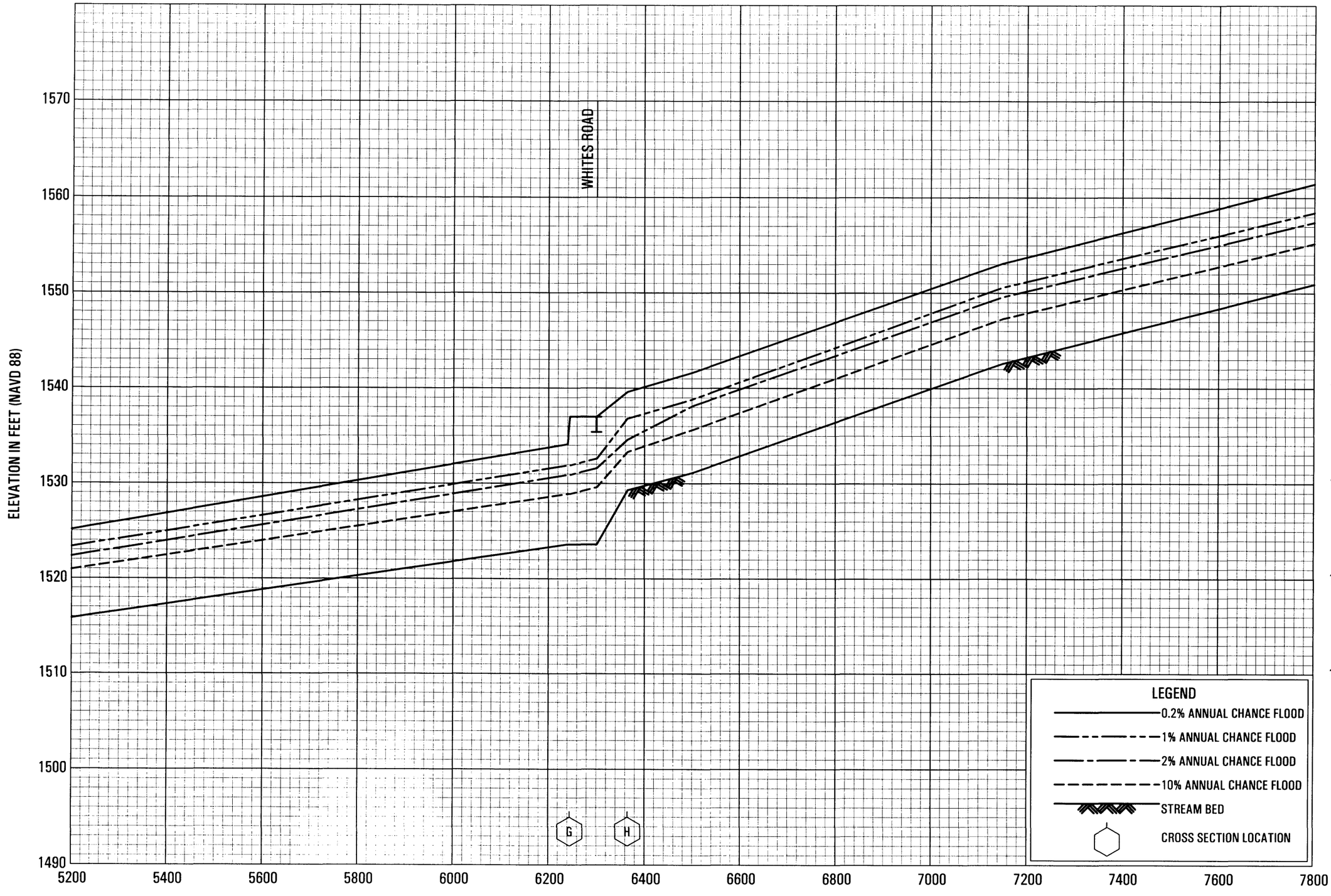

FLOOD PROFILES

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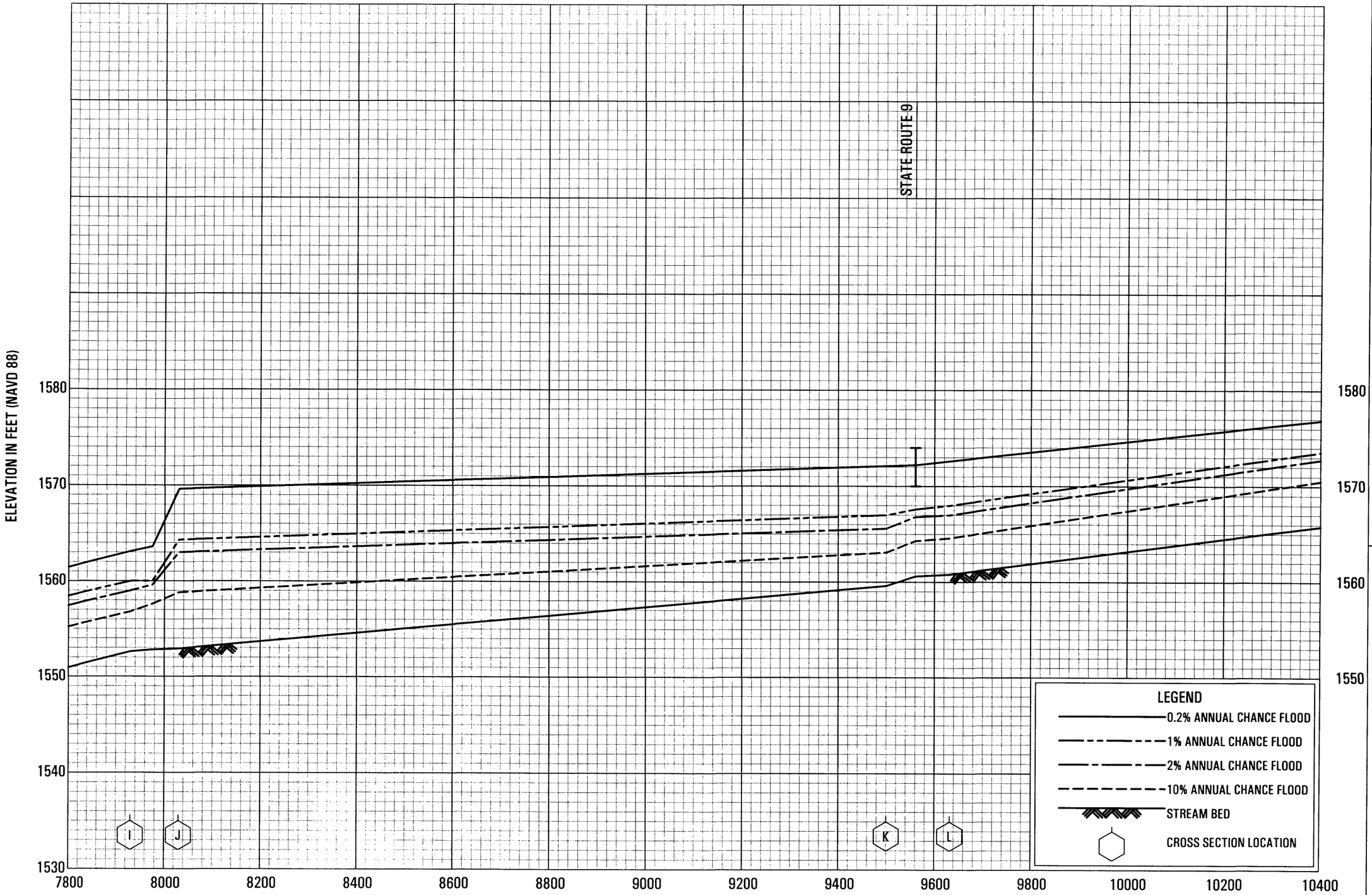
WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

BEAVER BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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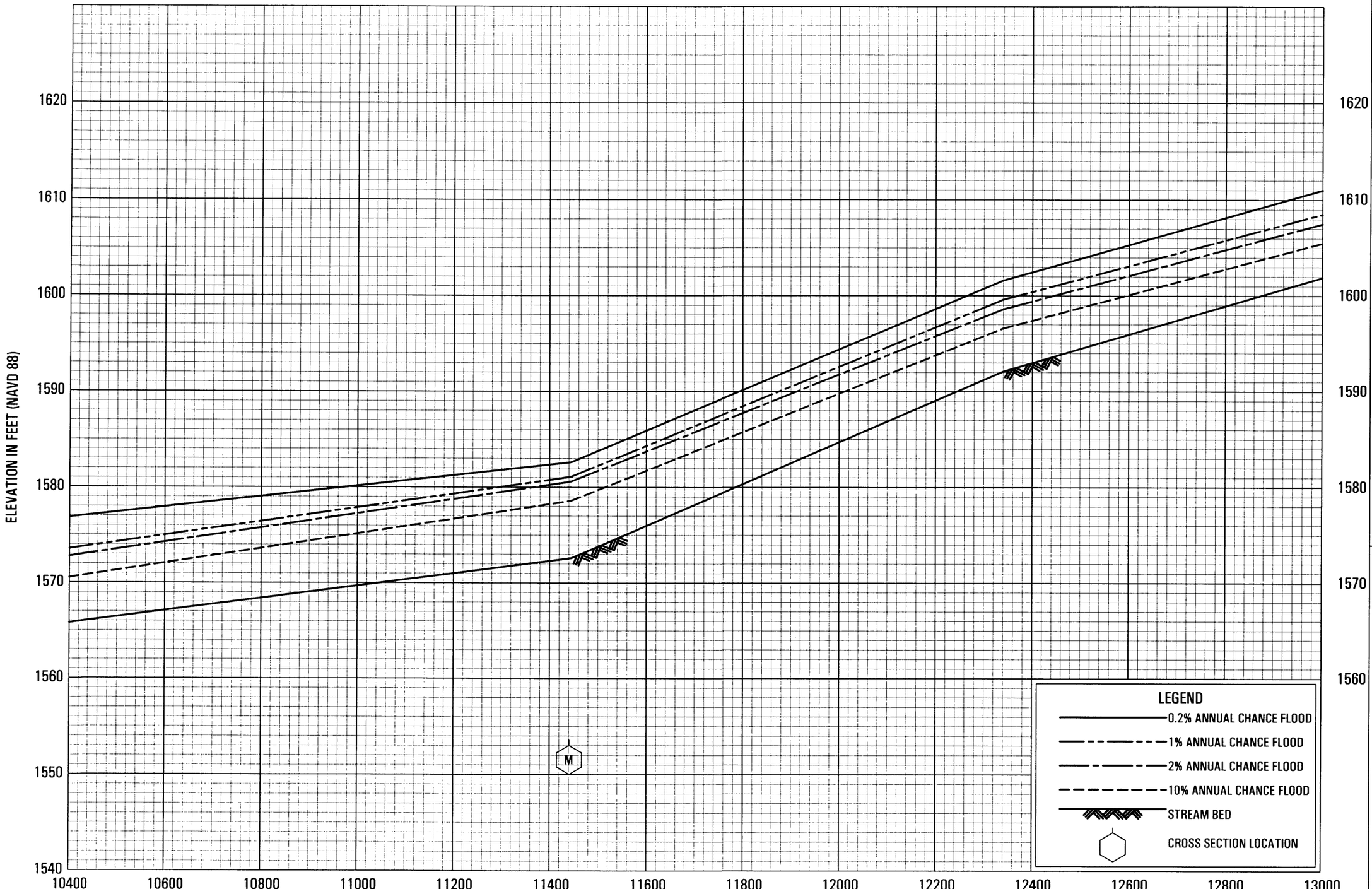

FLOOD PROFILES

BEAVER BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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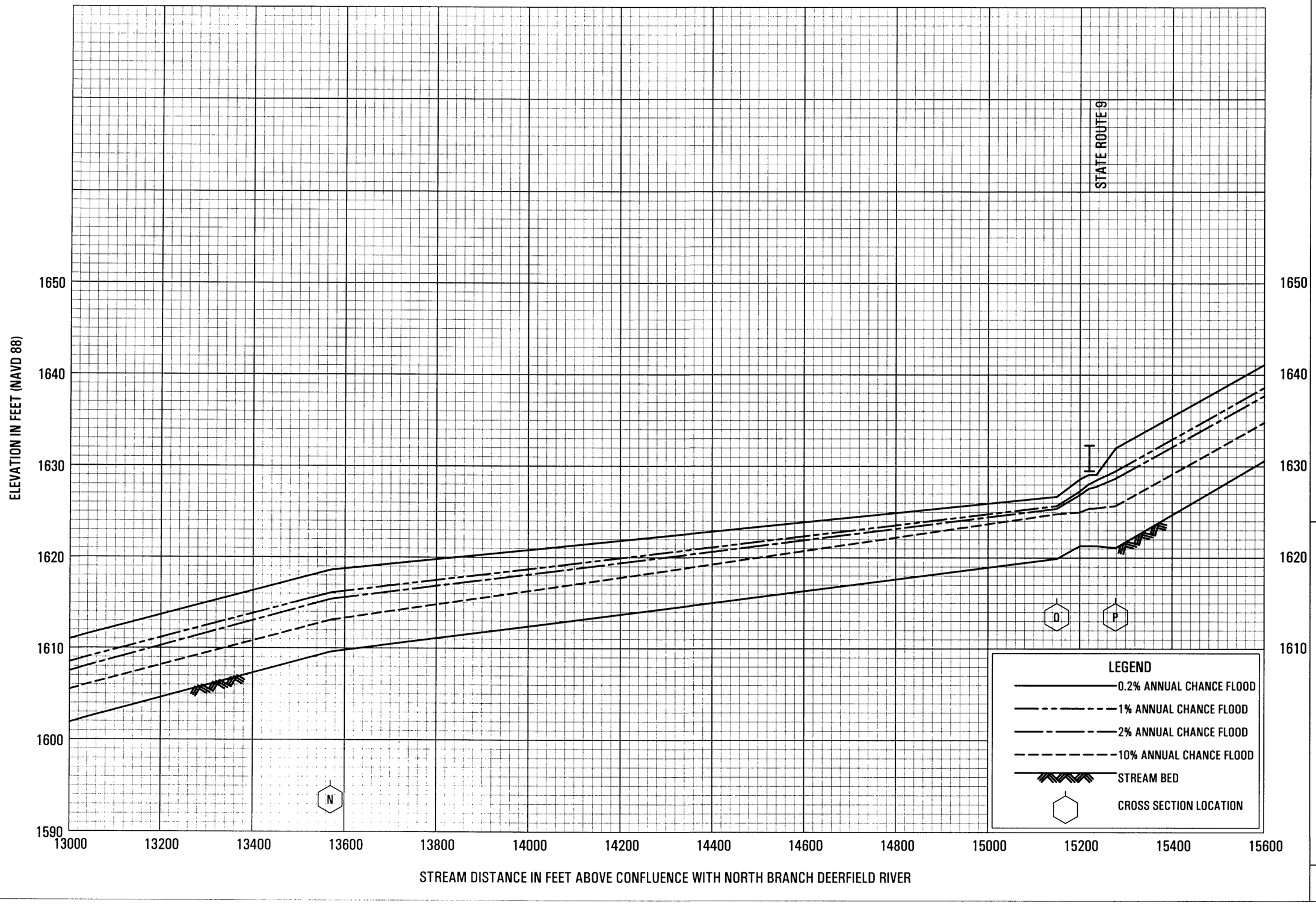

FLOOD PROFILES

BEAVER BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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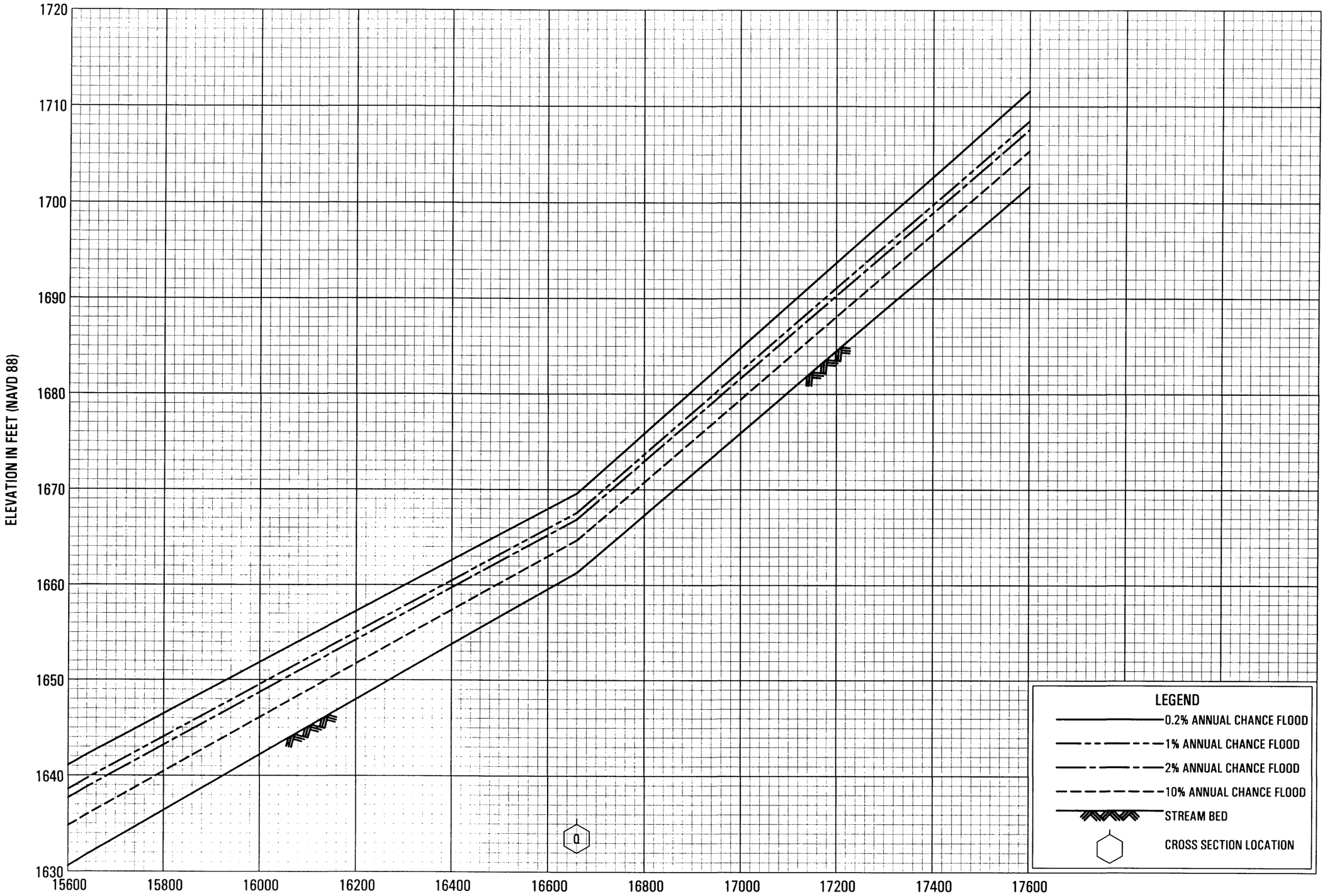

FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

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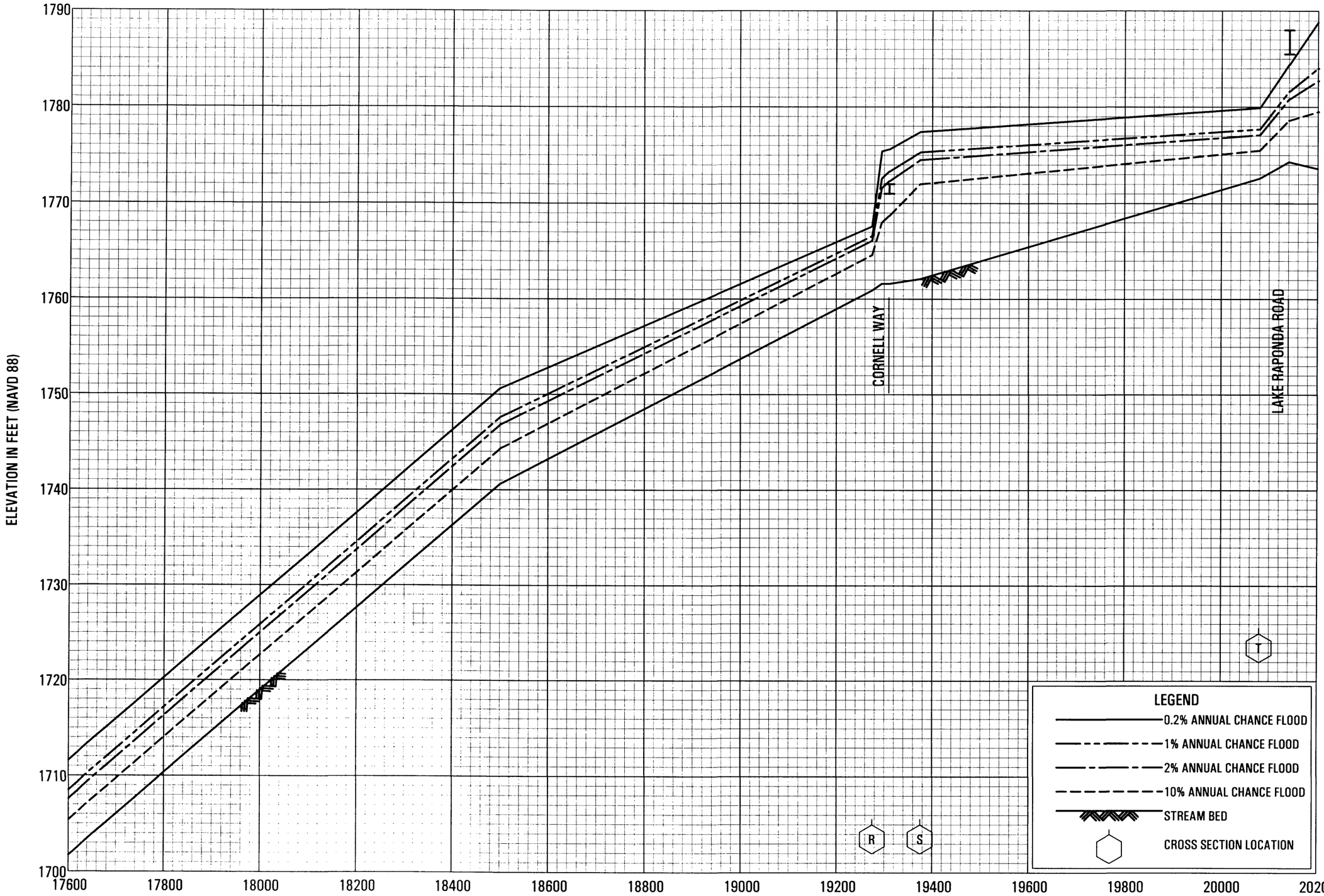

FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

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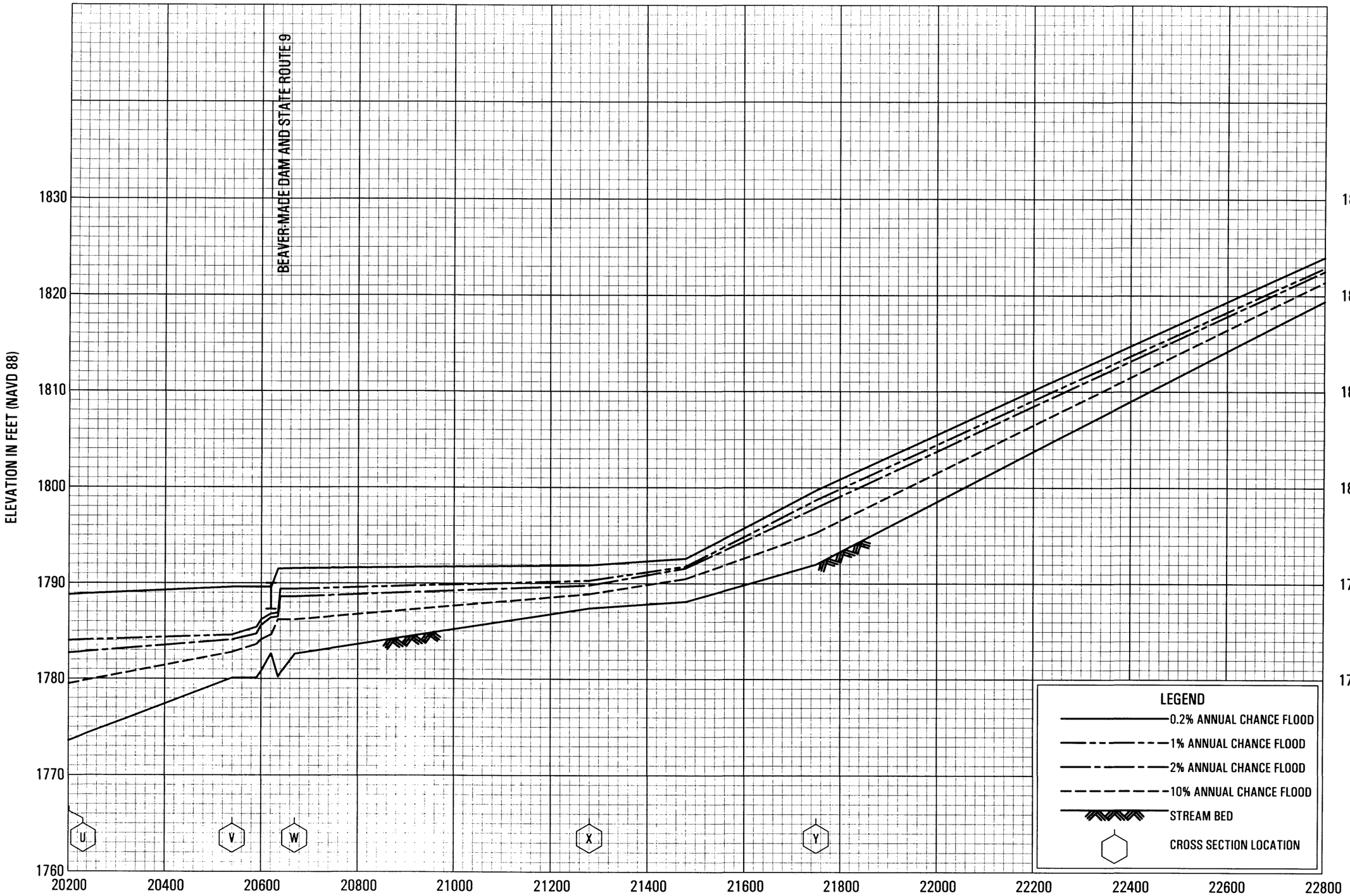

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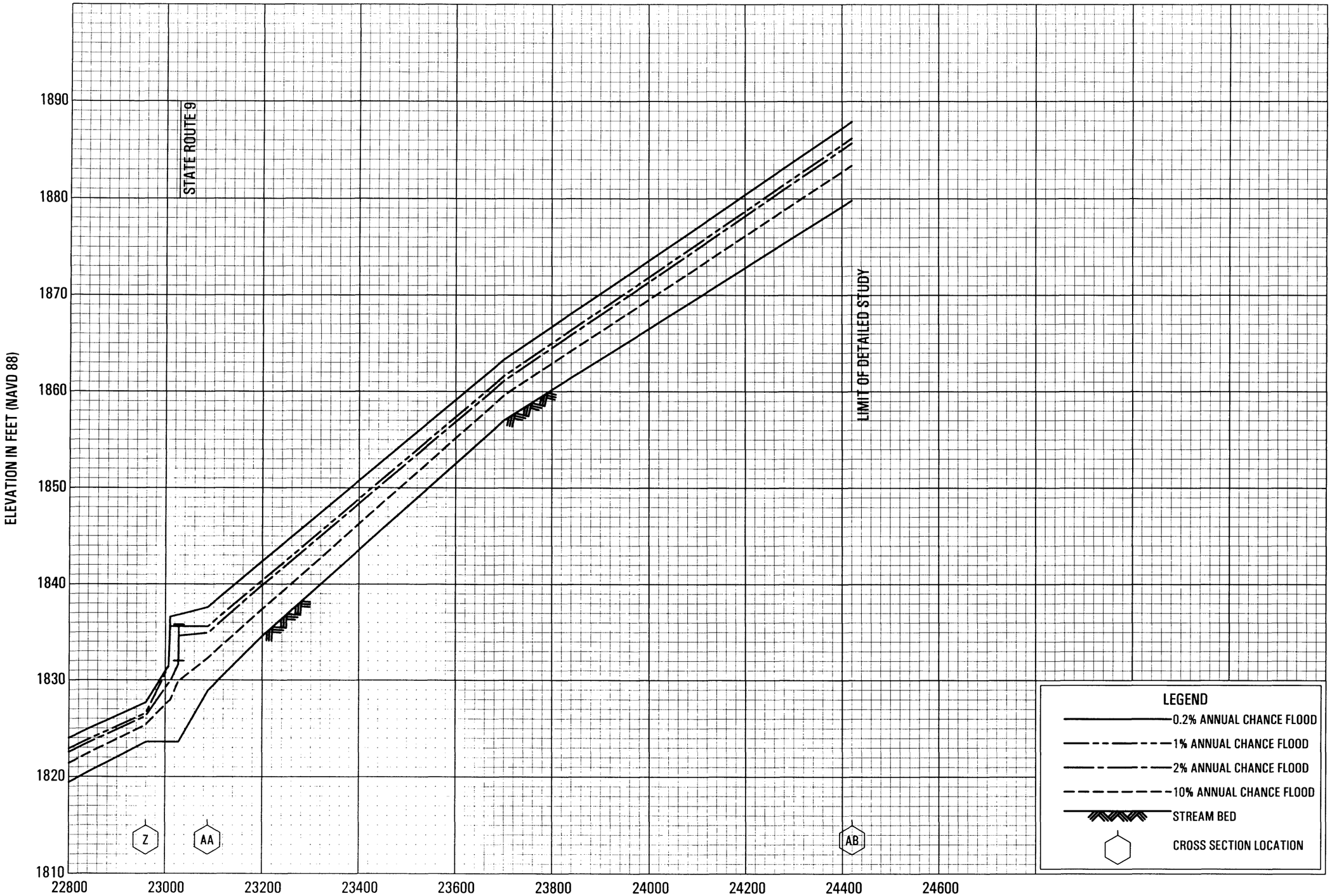
BEAVER BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



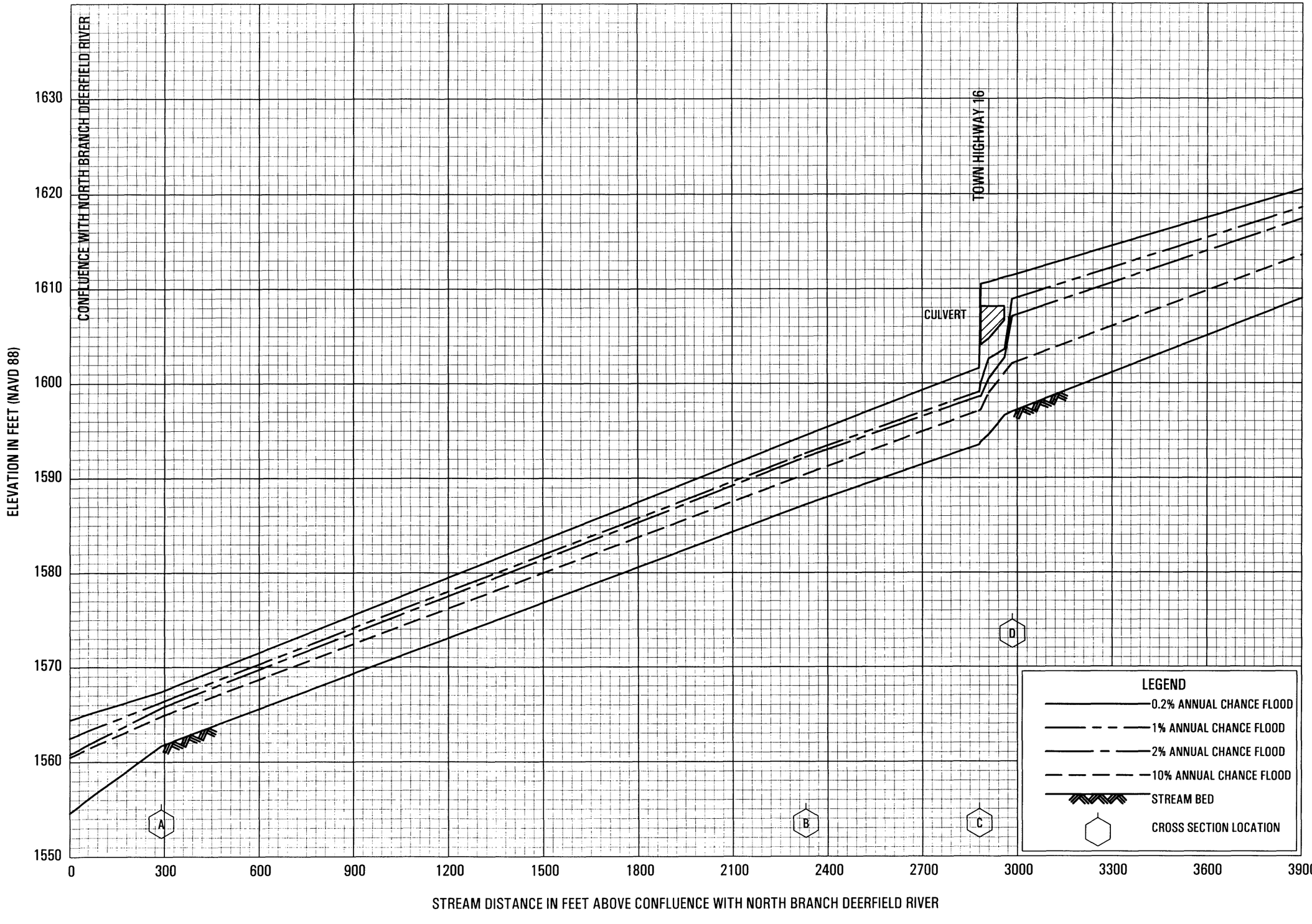
FLOOD PROFILES

BEAVER BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

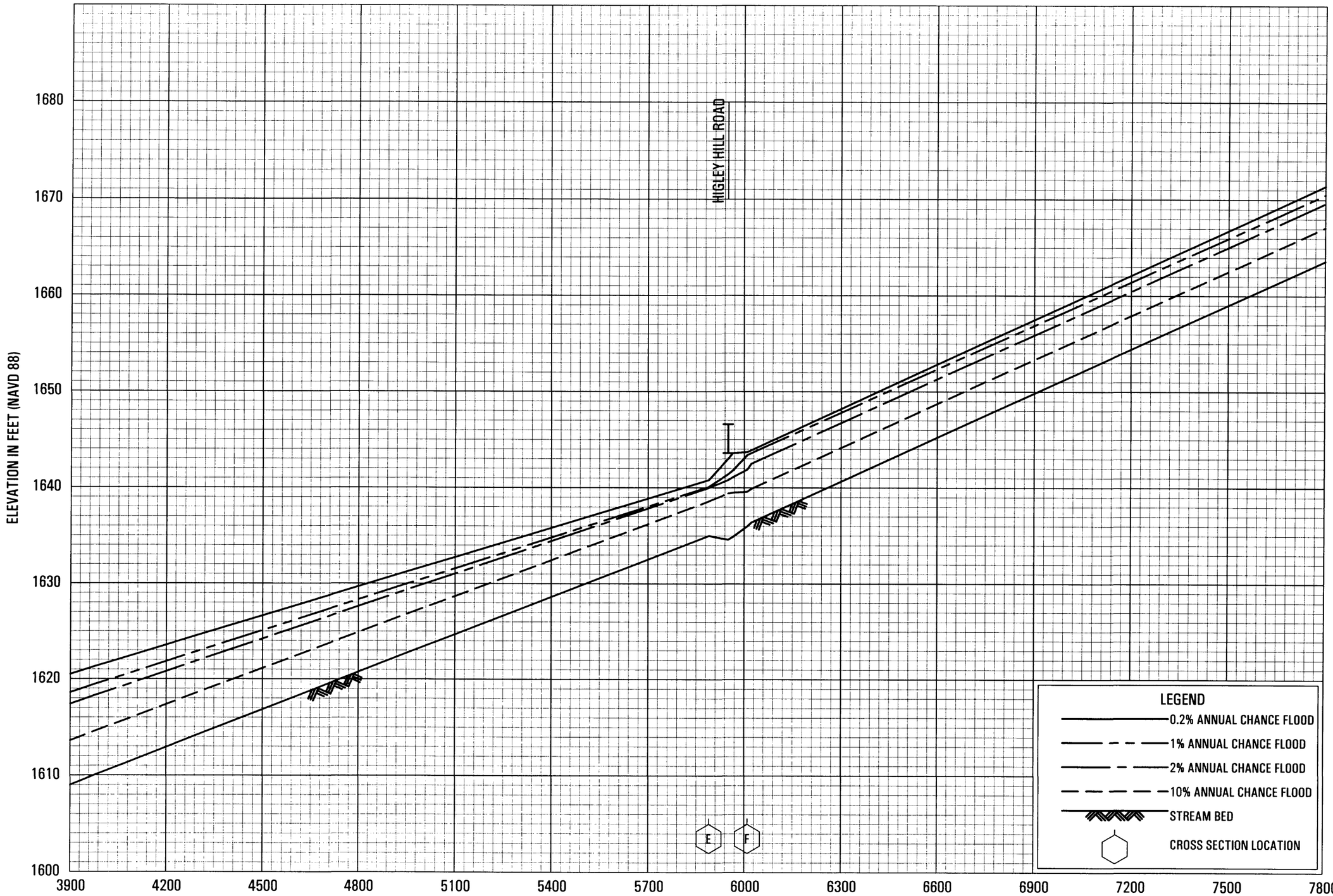
BILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

32P



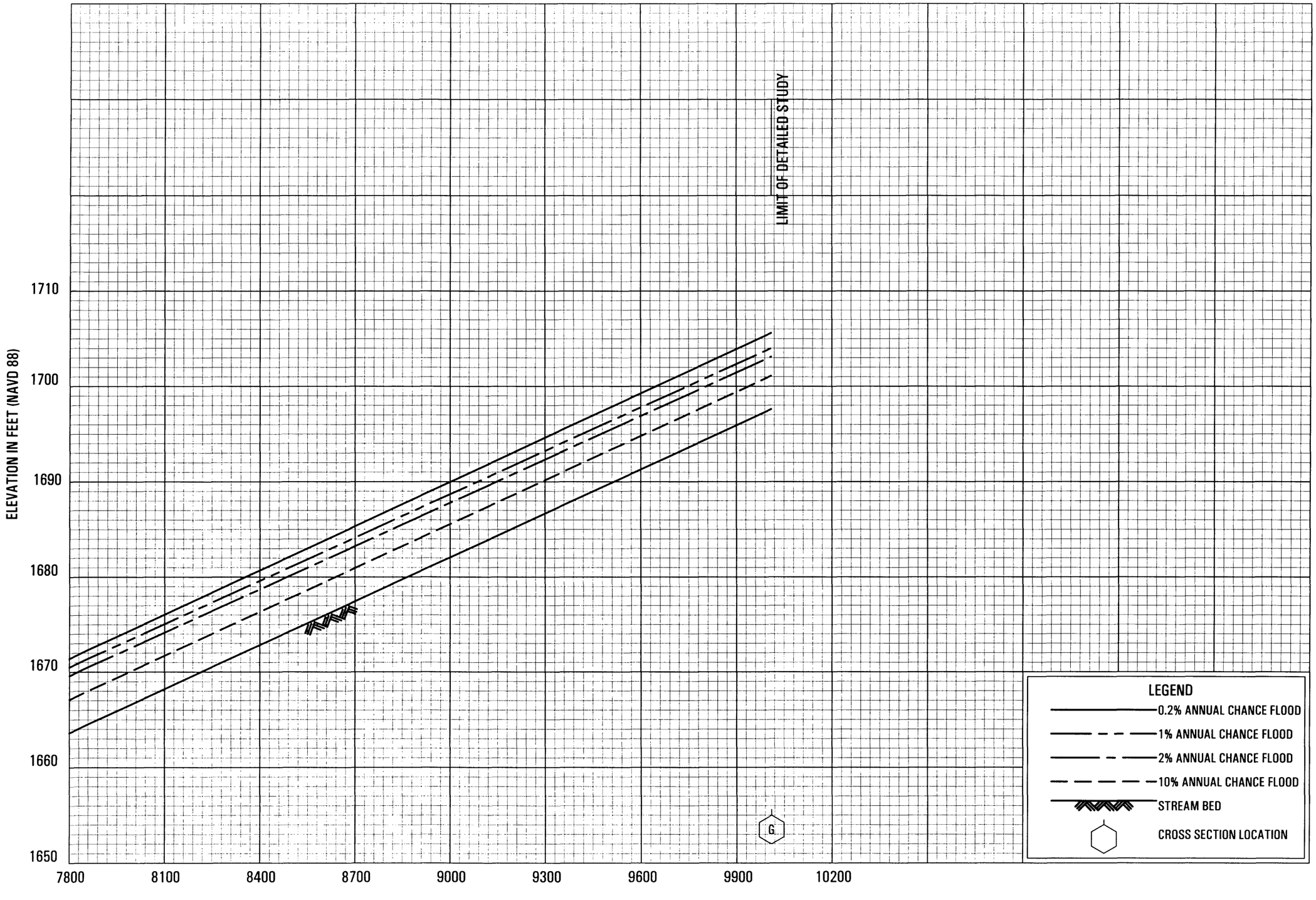
FLOOD PROFILES

BILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



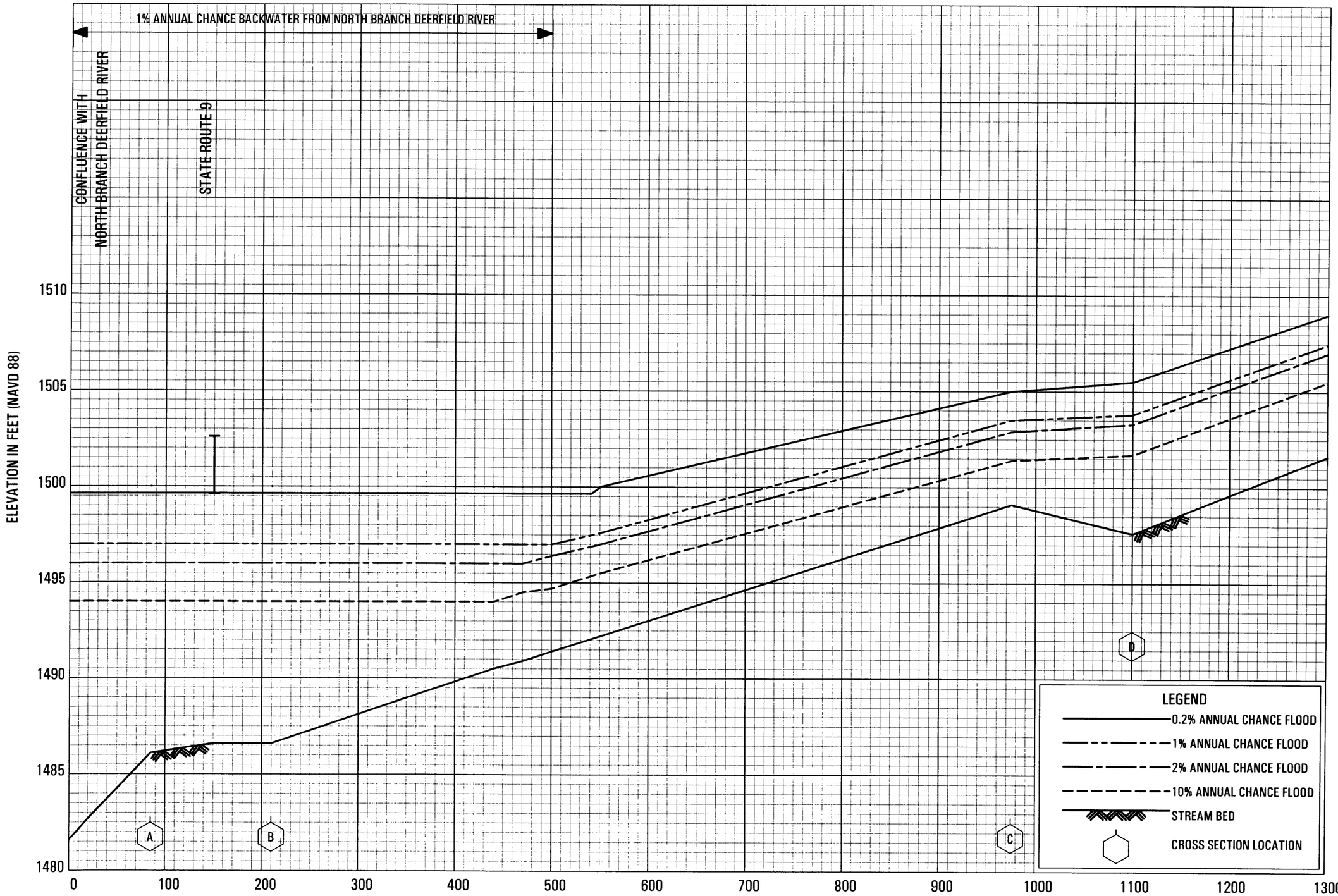
FLOOD PROFILES

BILL BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

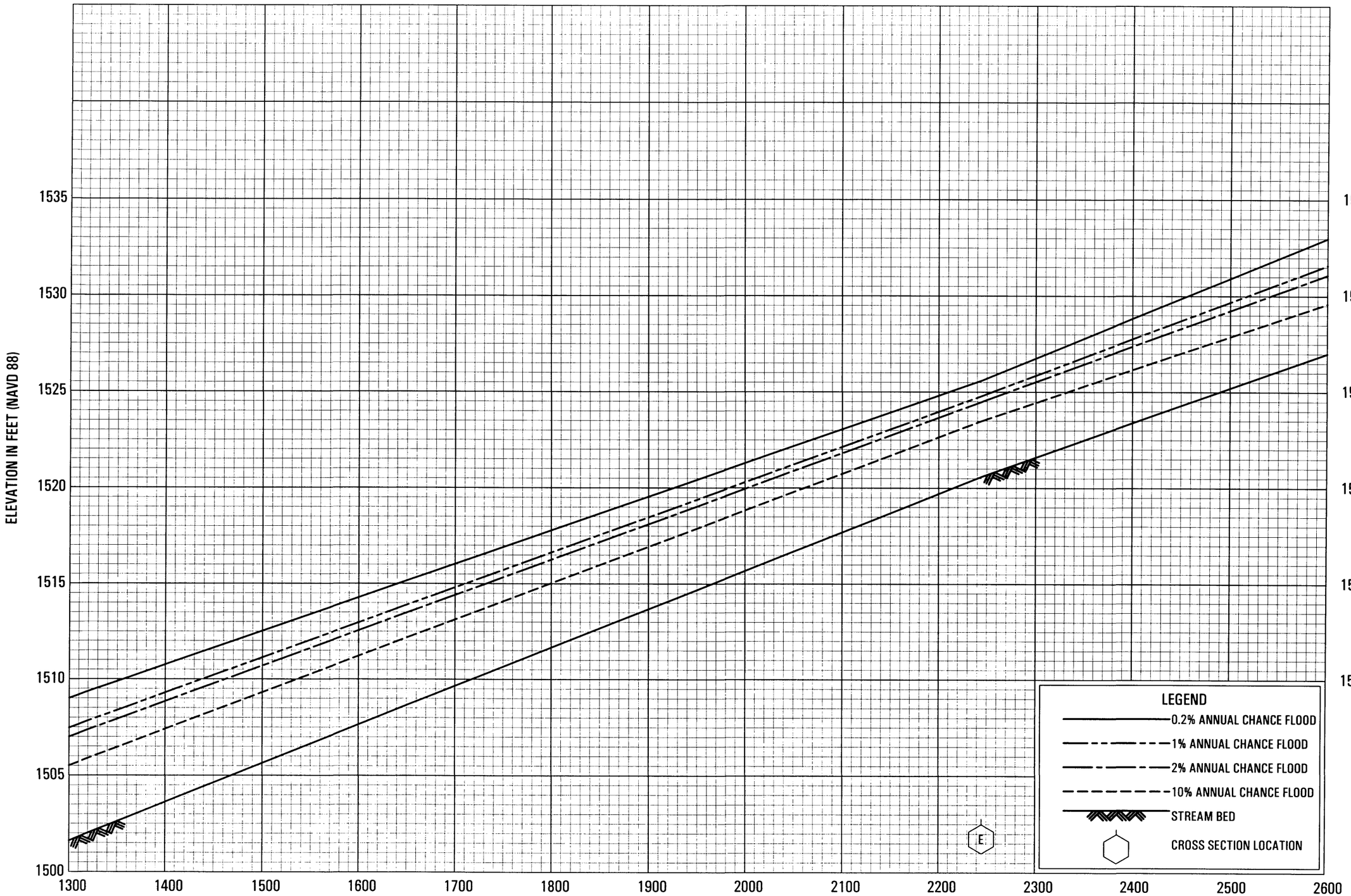
BINNEY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

35P



FLOOD PROFILES

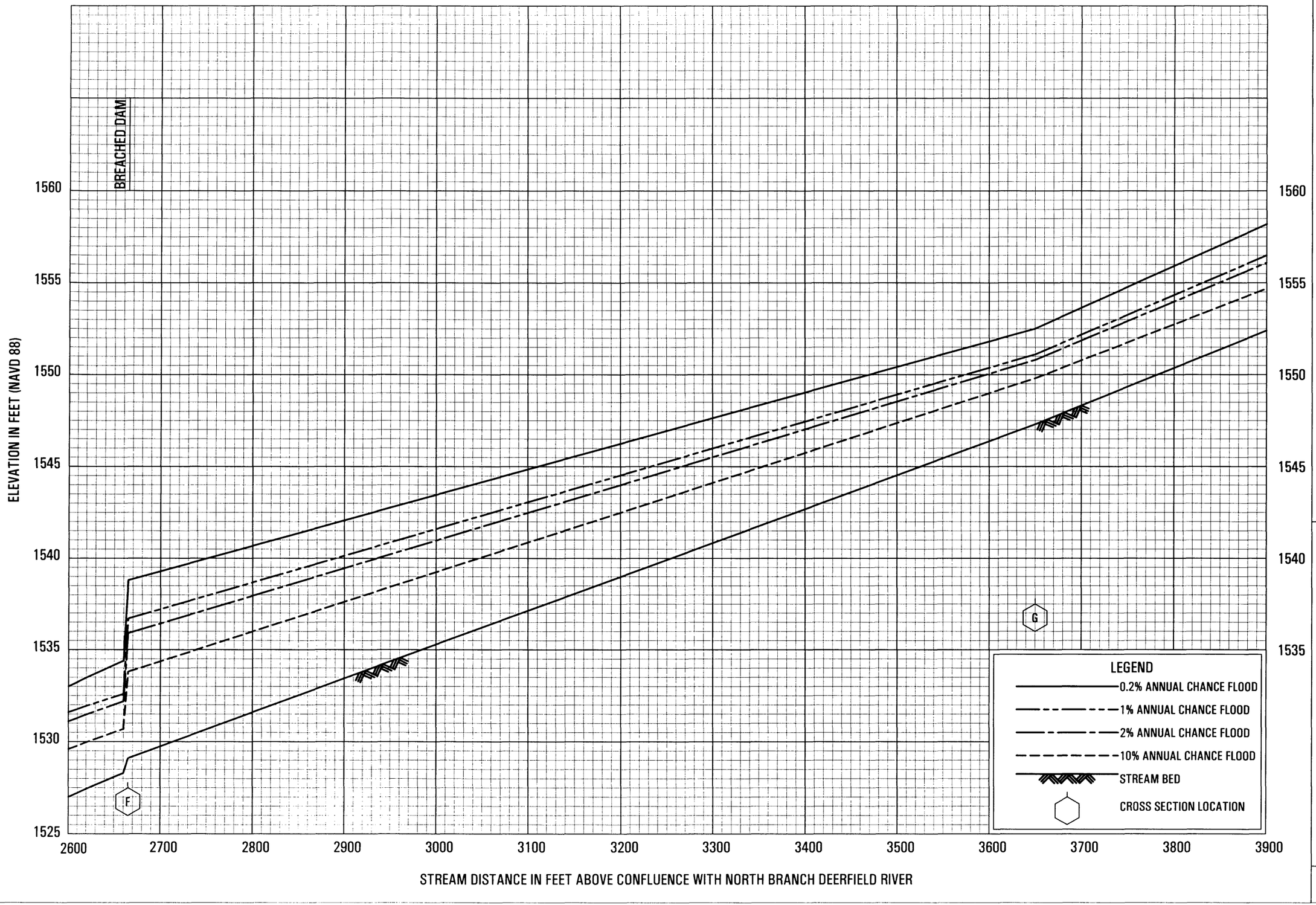
BINNEY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

36P



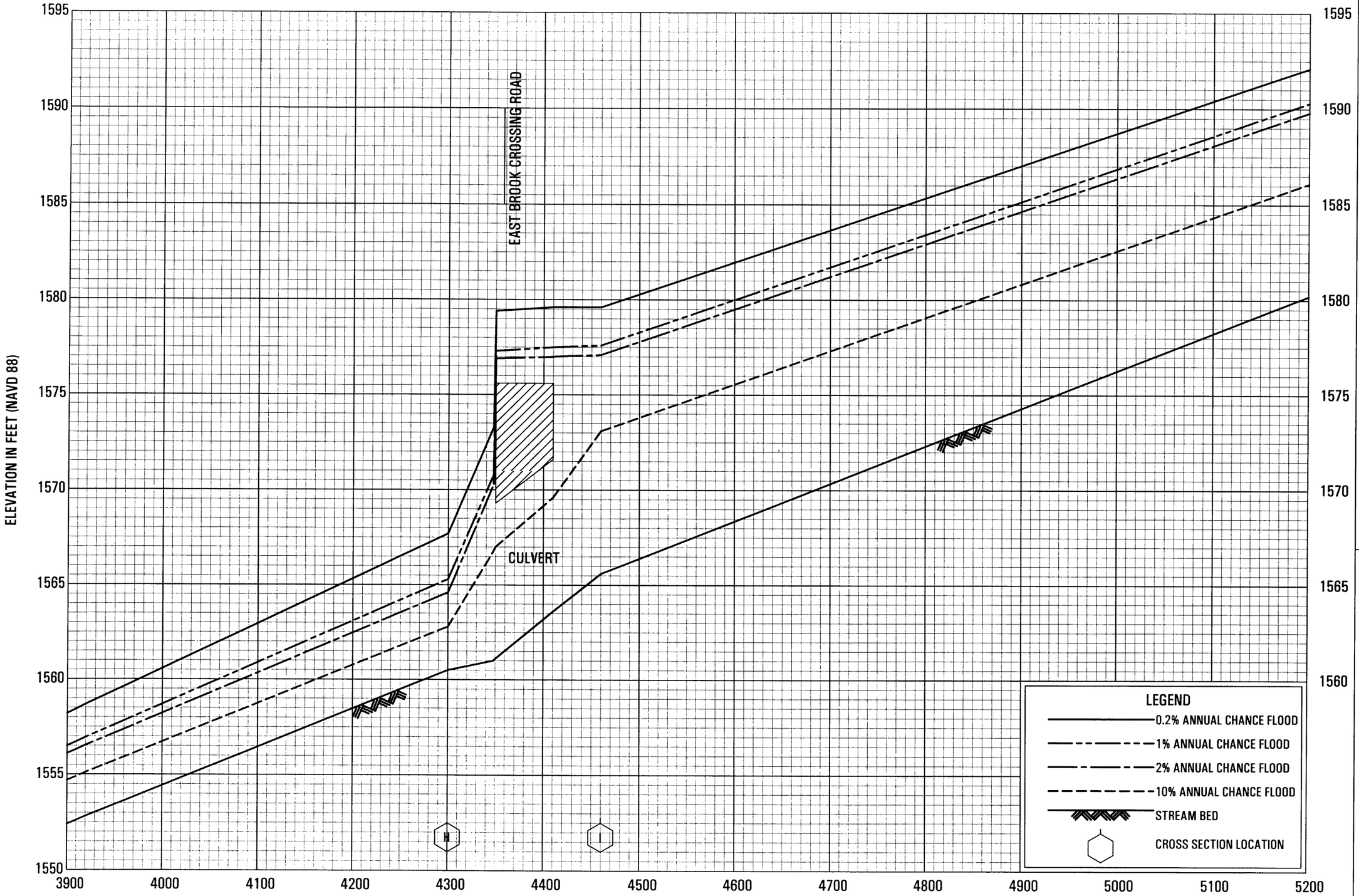
FLOOD PROFILES

BINNEY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

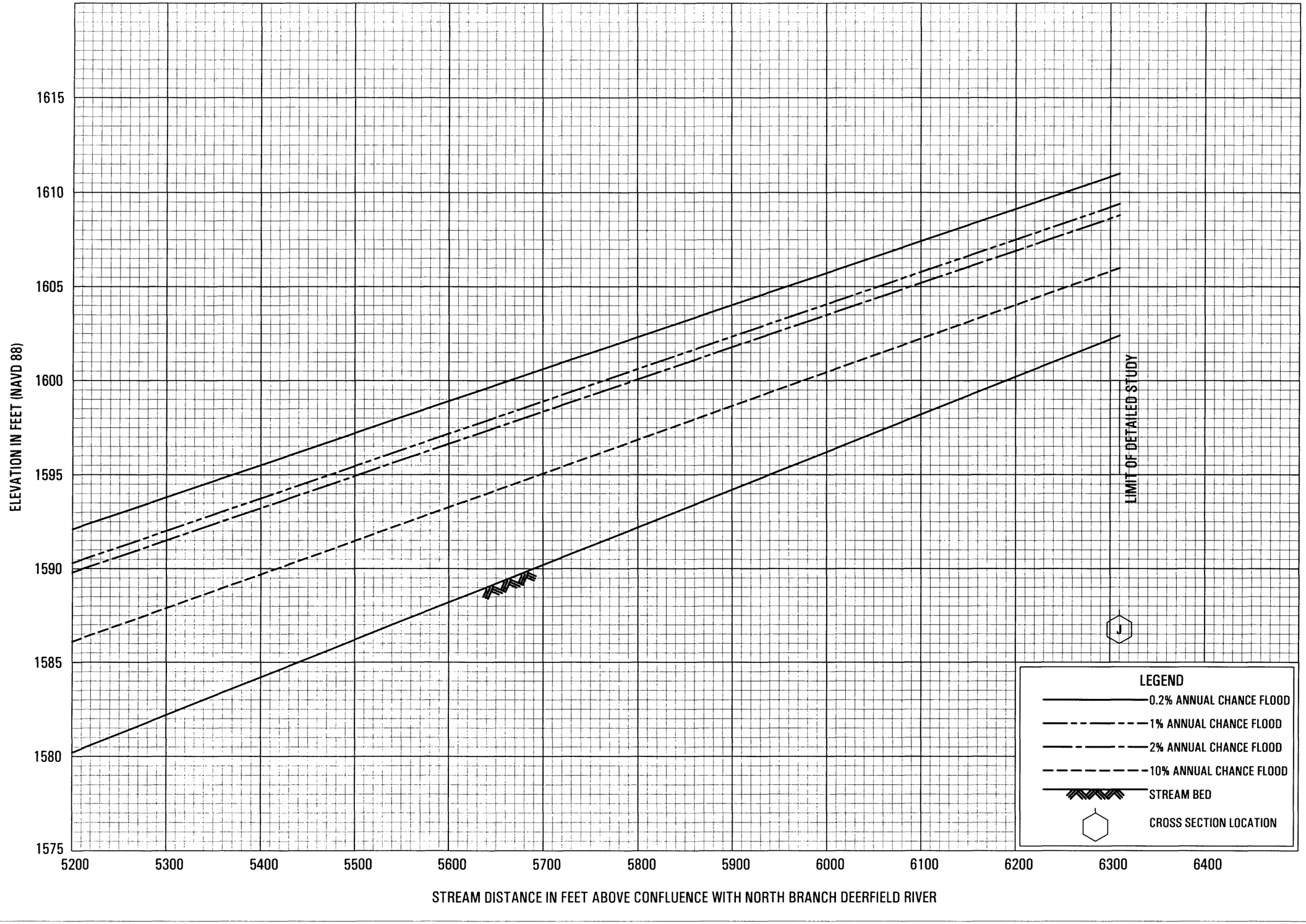
BINNEY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

38P



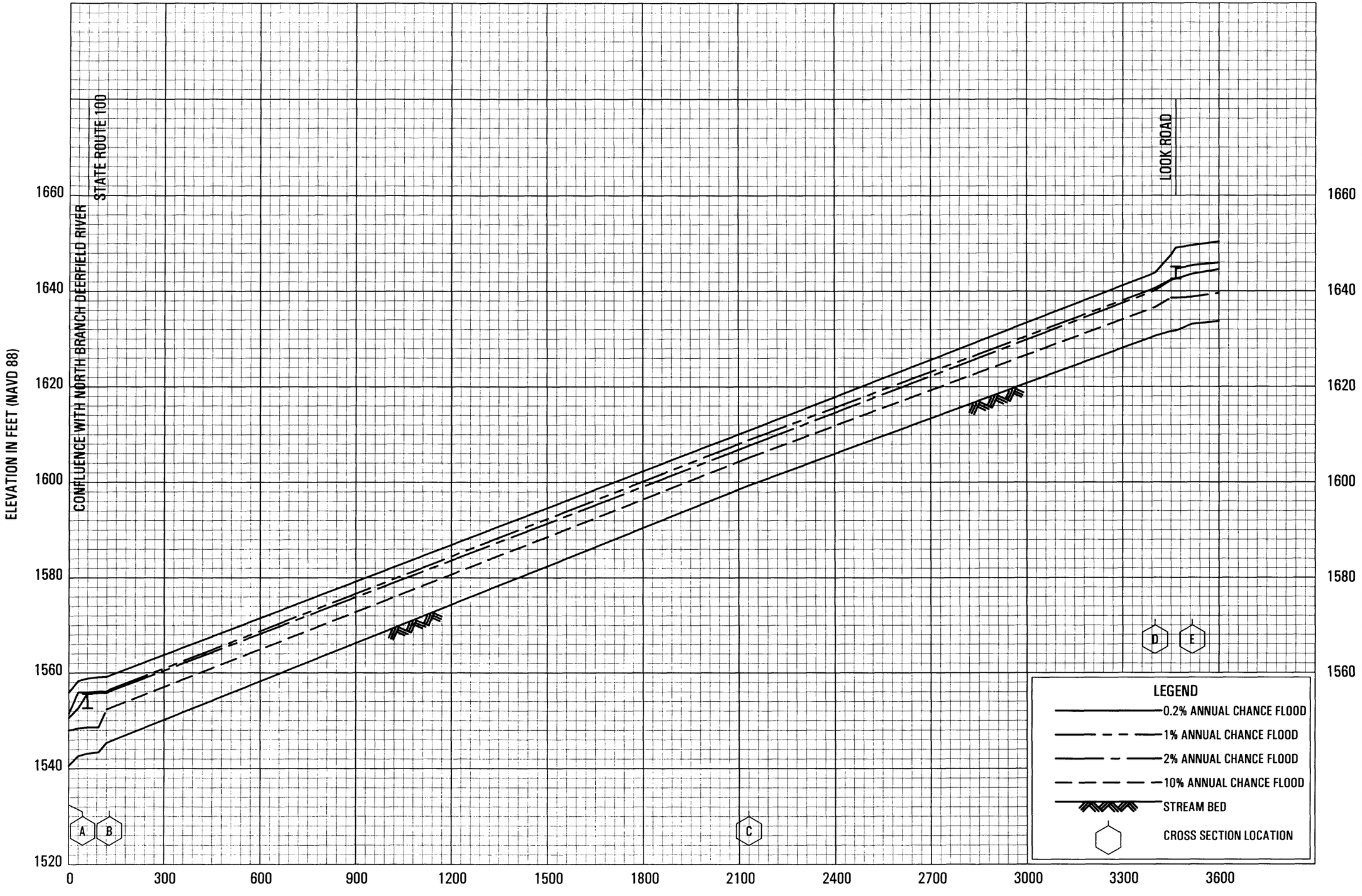
FLOOD PROFILES

BINNEY BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



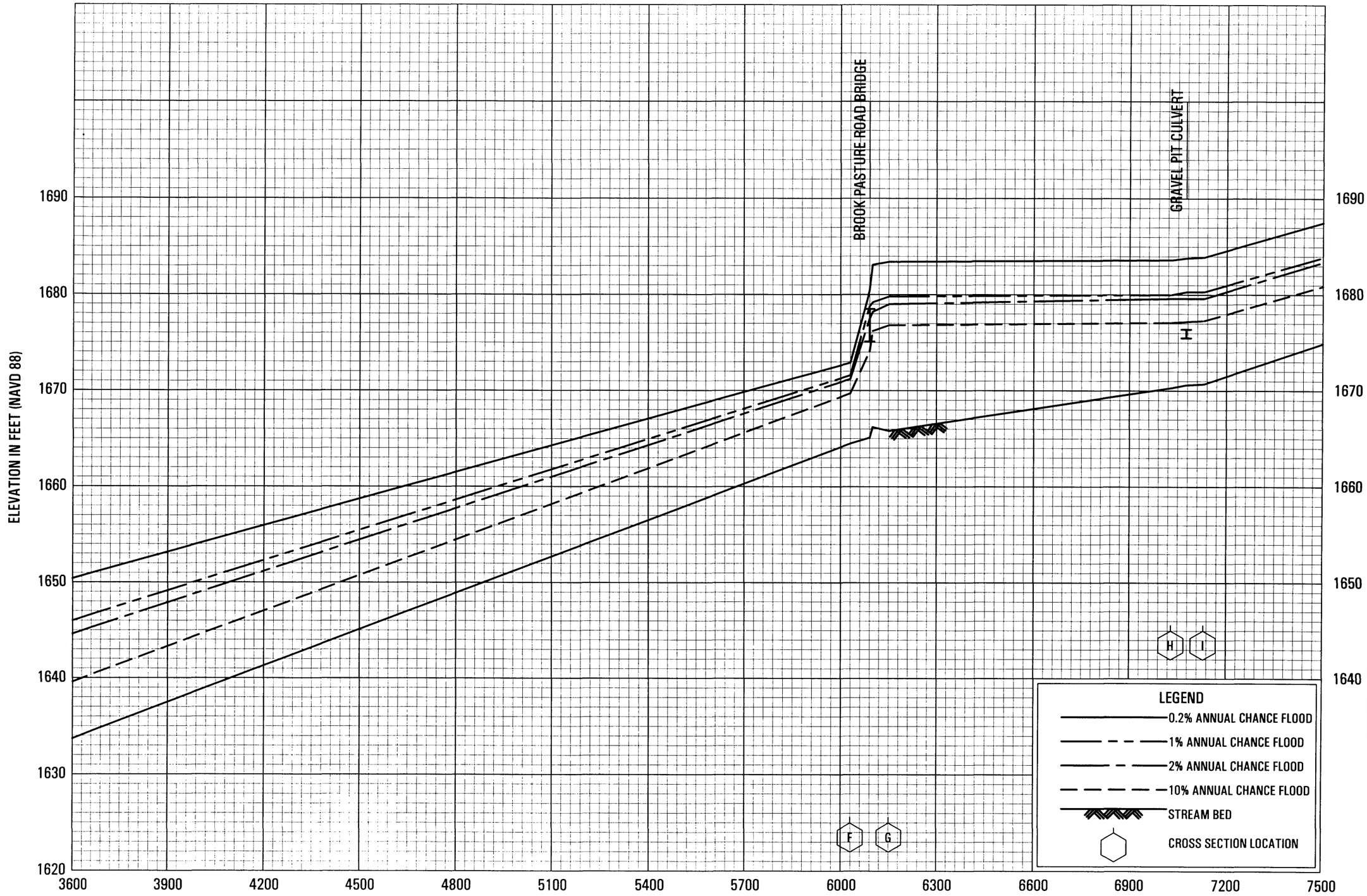
FLOOD PROFILES

COLD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

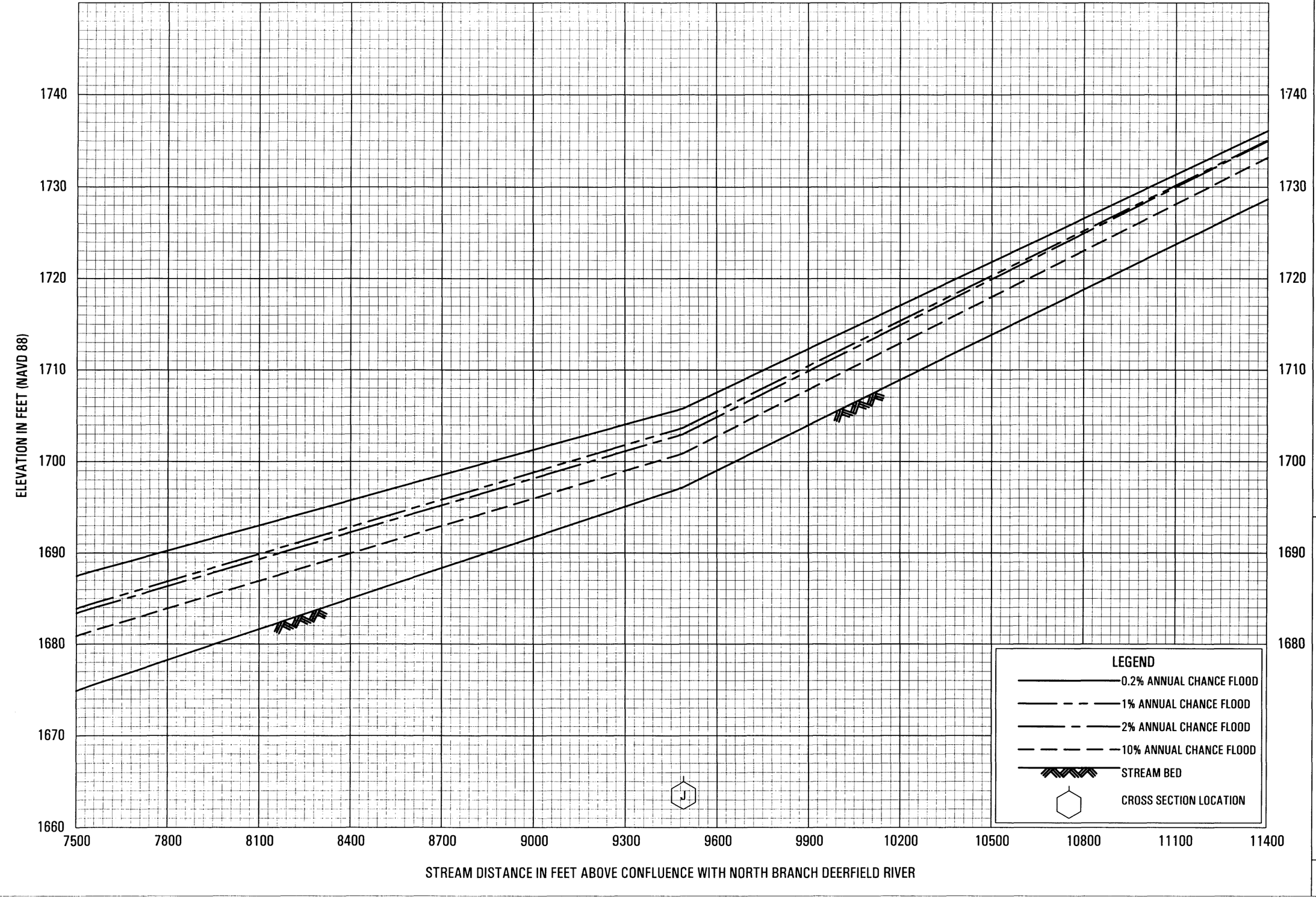
COLD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

41P



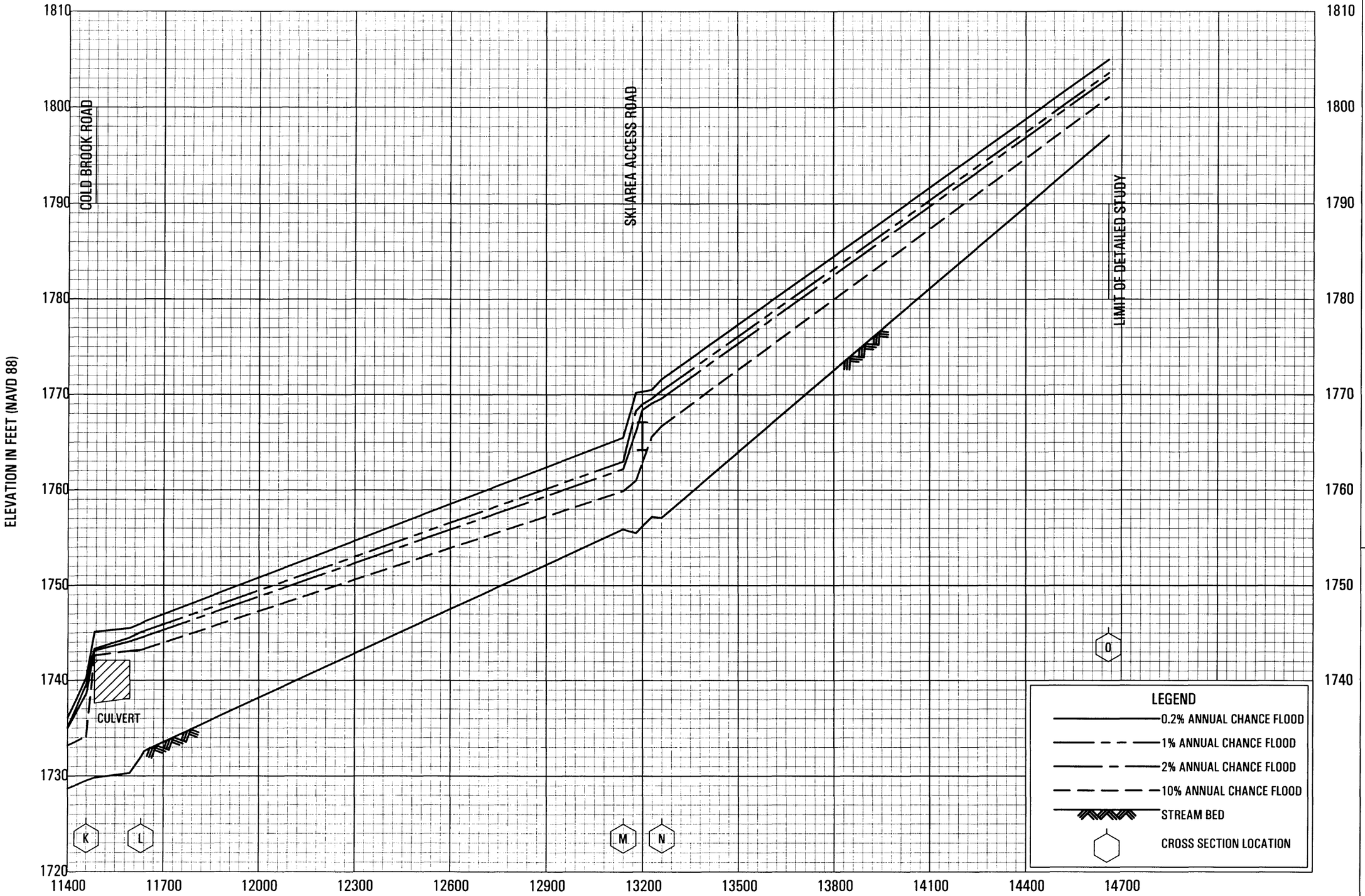
FLOOD PROFILES

COLD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



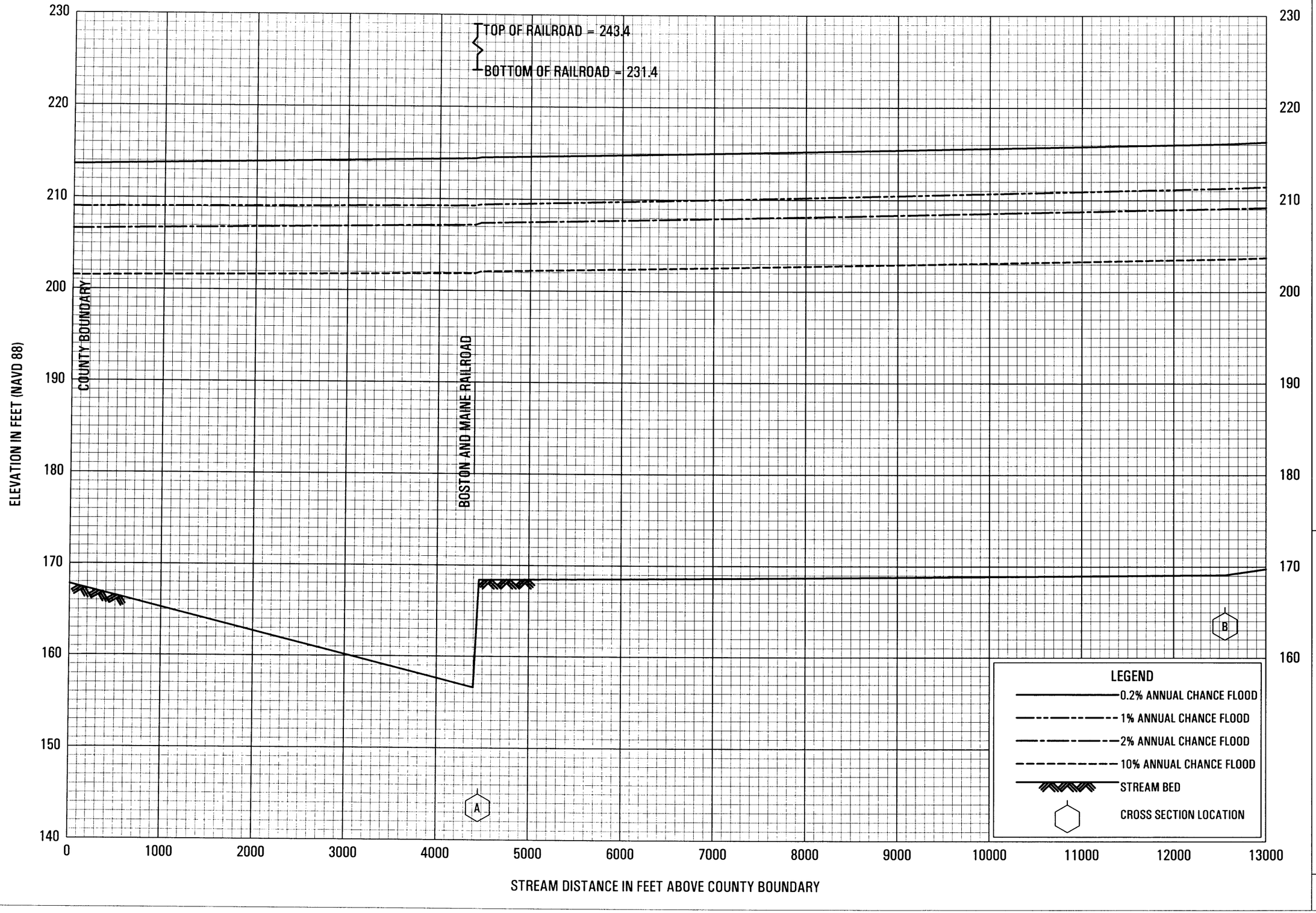
FLOOD PROFILES

COLD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



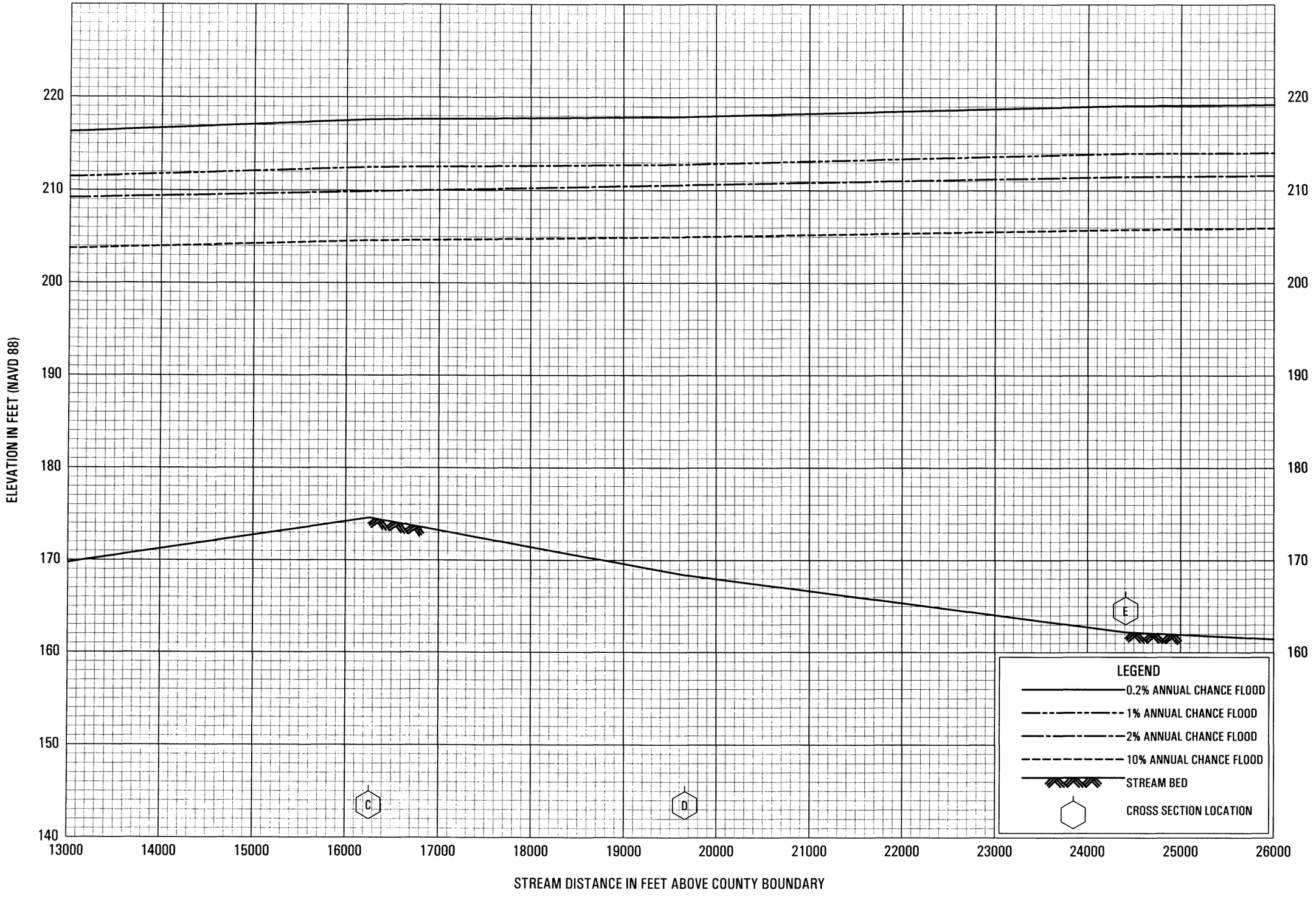
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



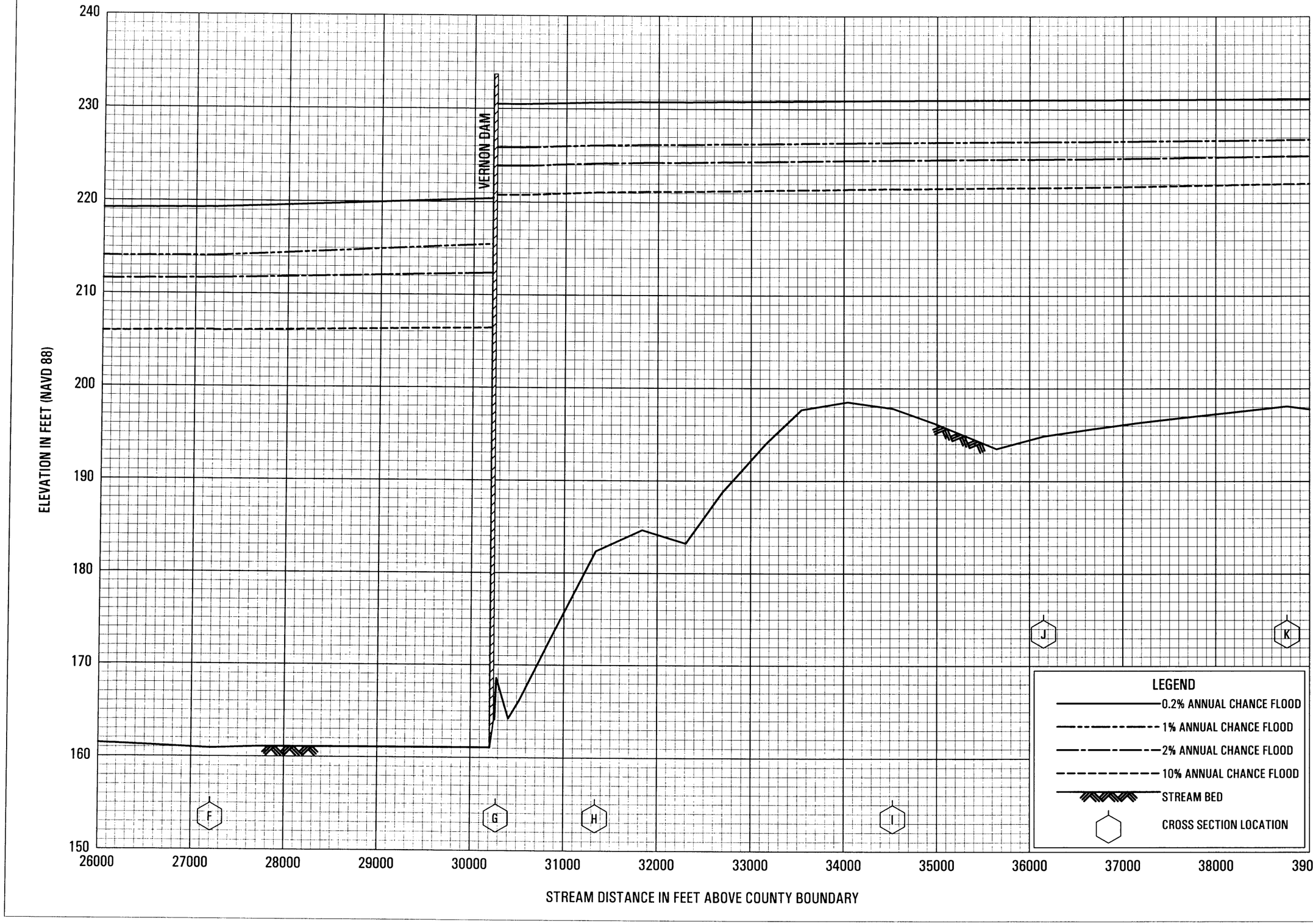
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



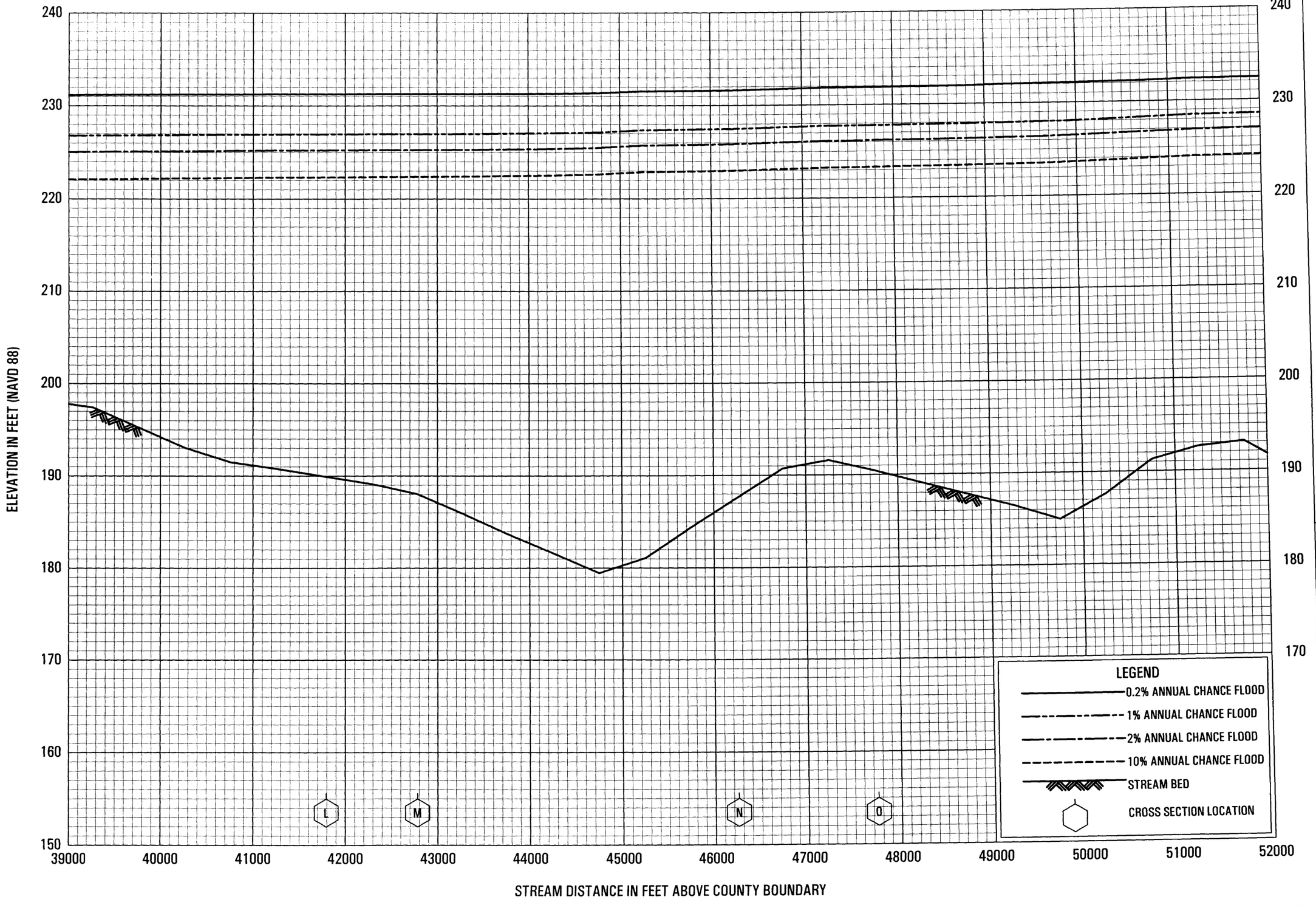
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

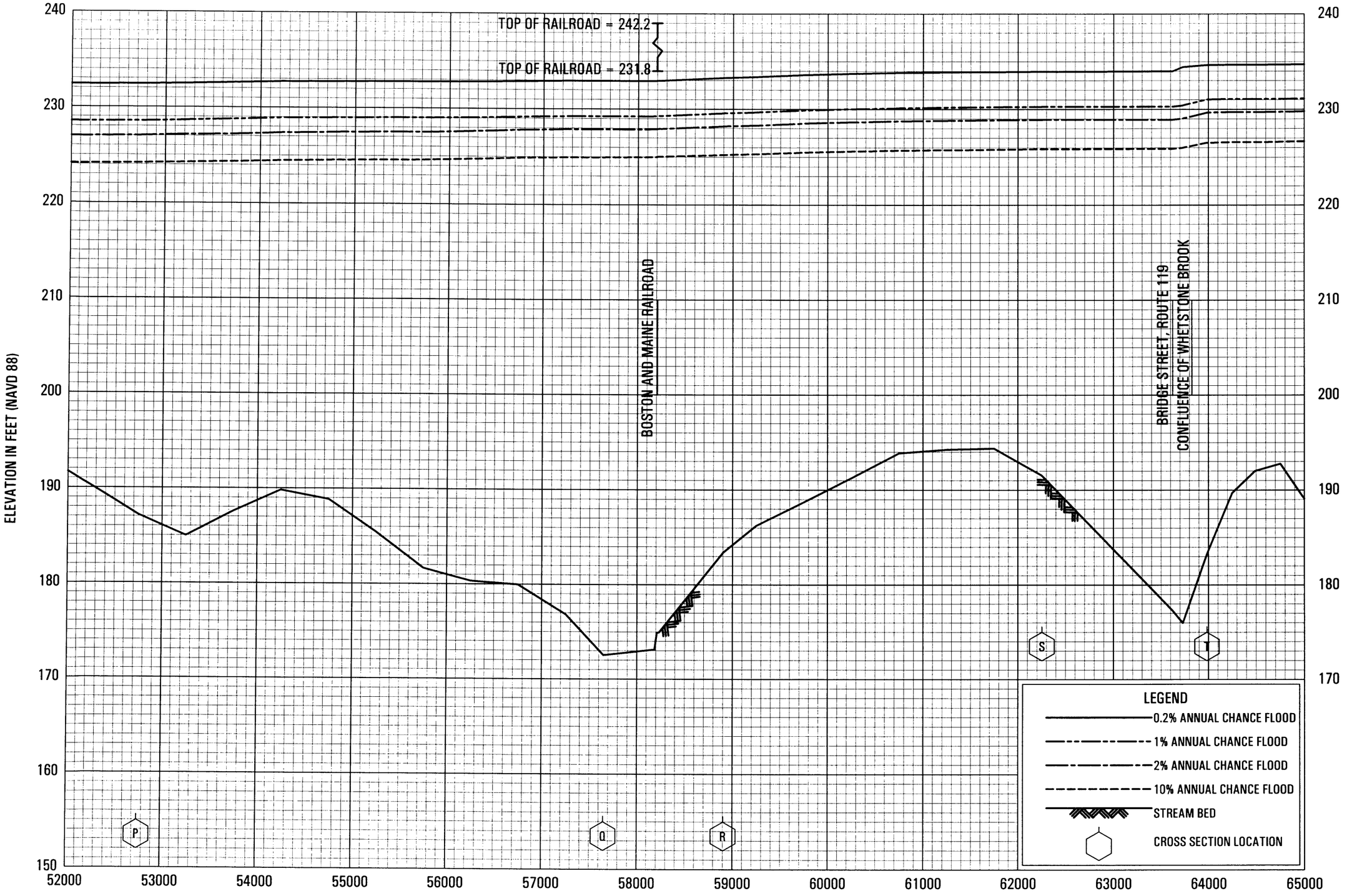
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

47P



FLOOD PROFILES

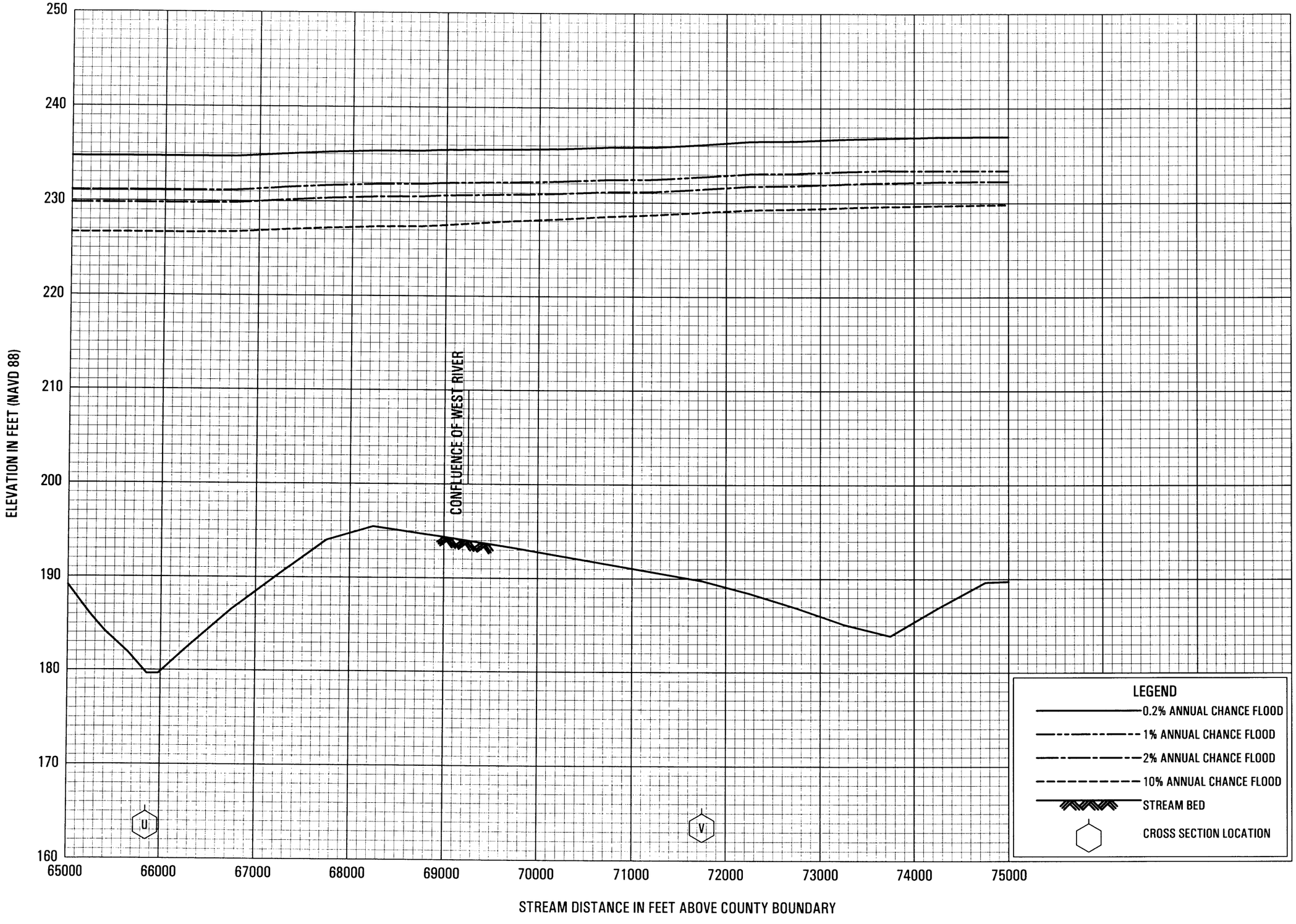
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

48P



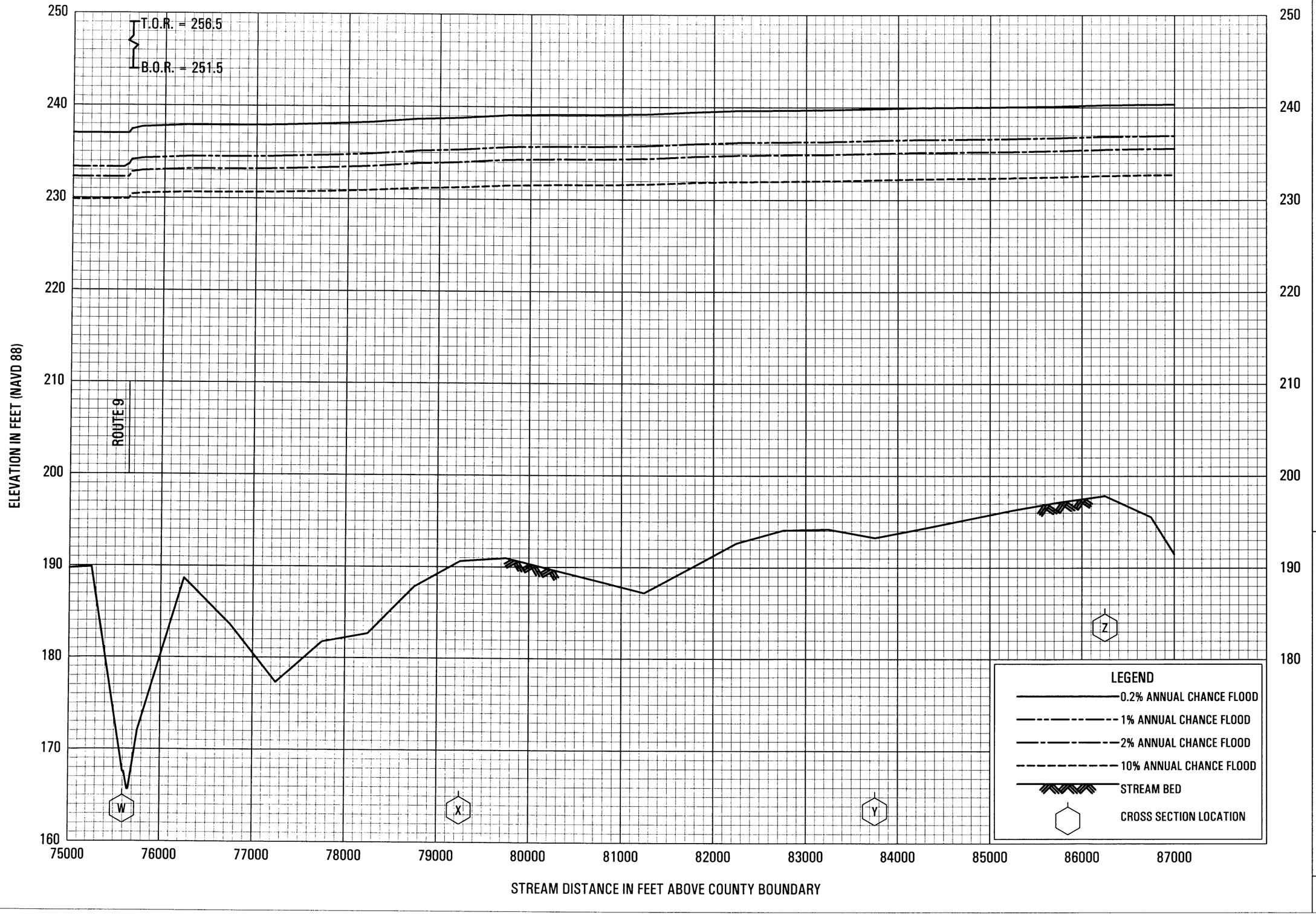
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

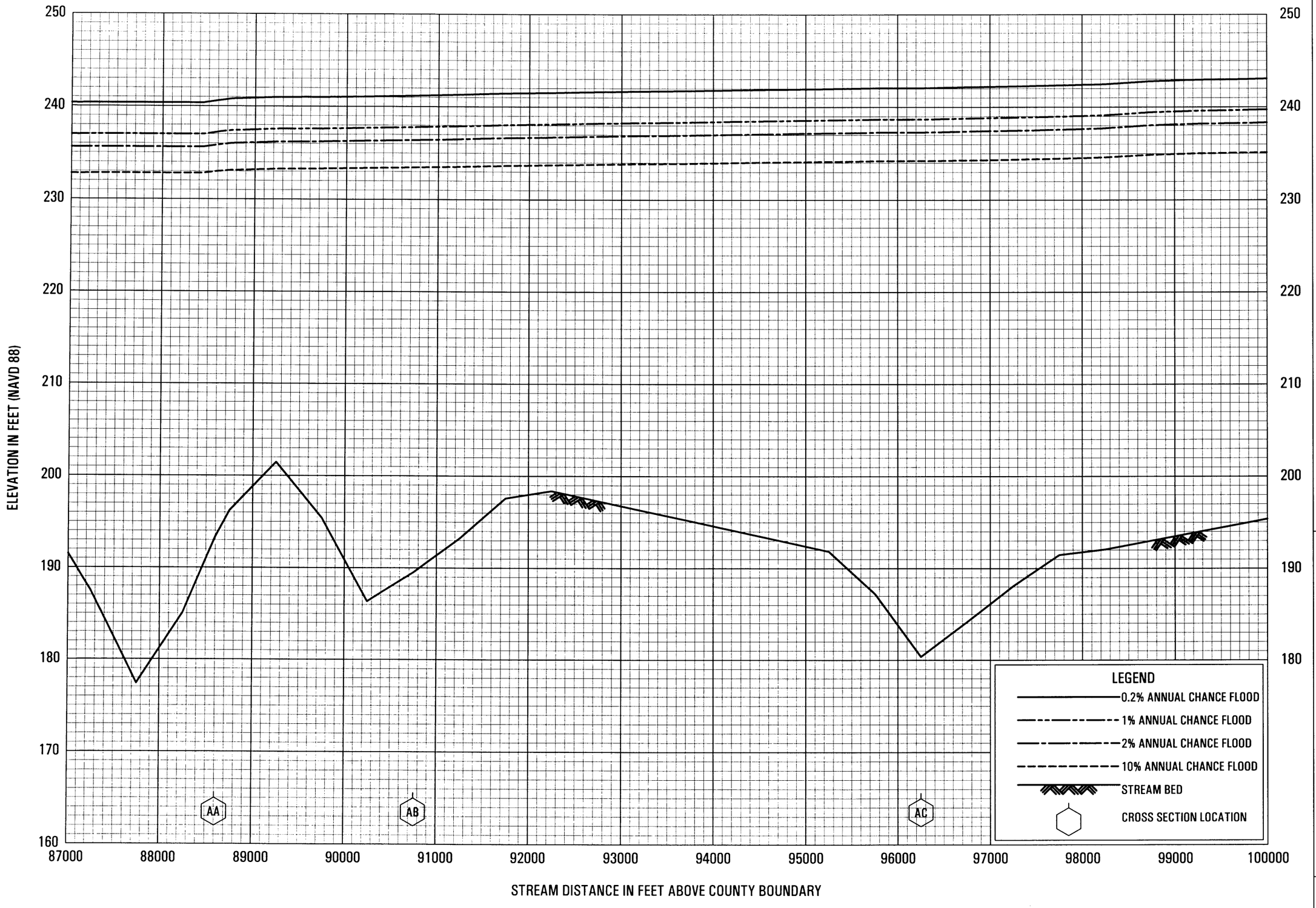
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

50P



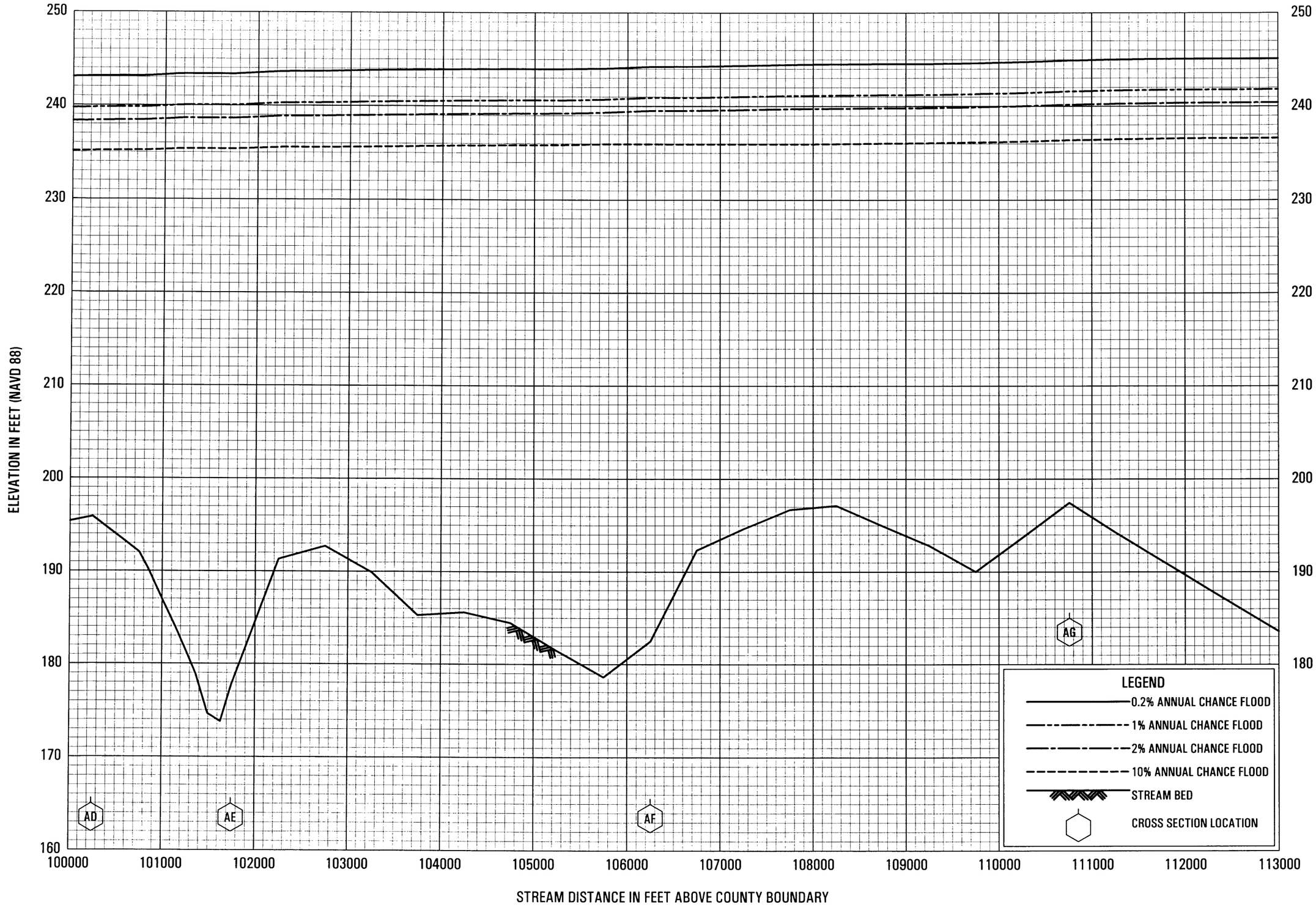
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

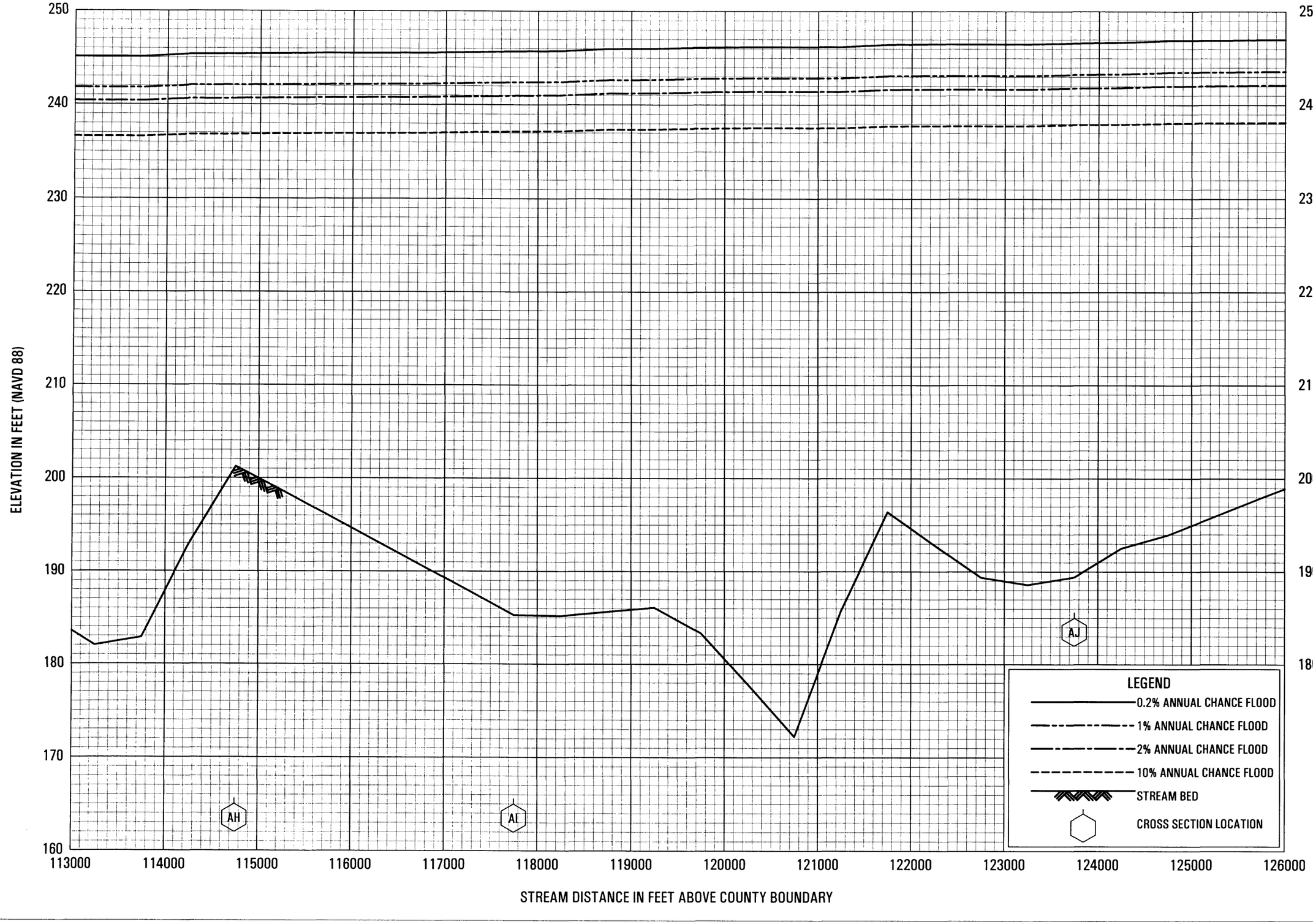
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

52P



FLOOD PROFILES

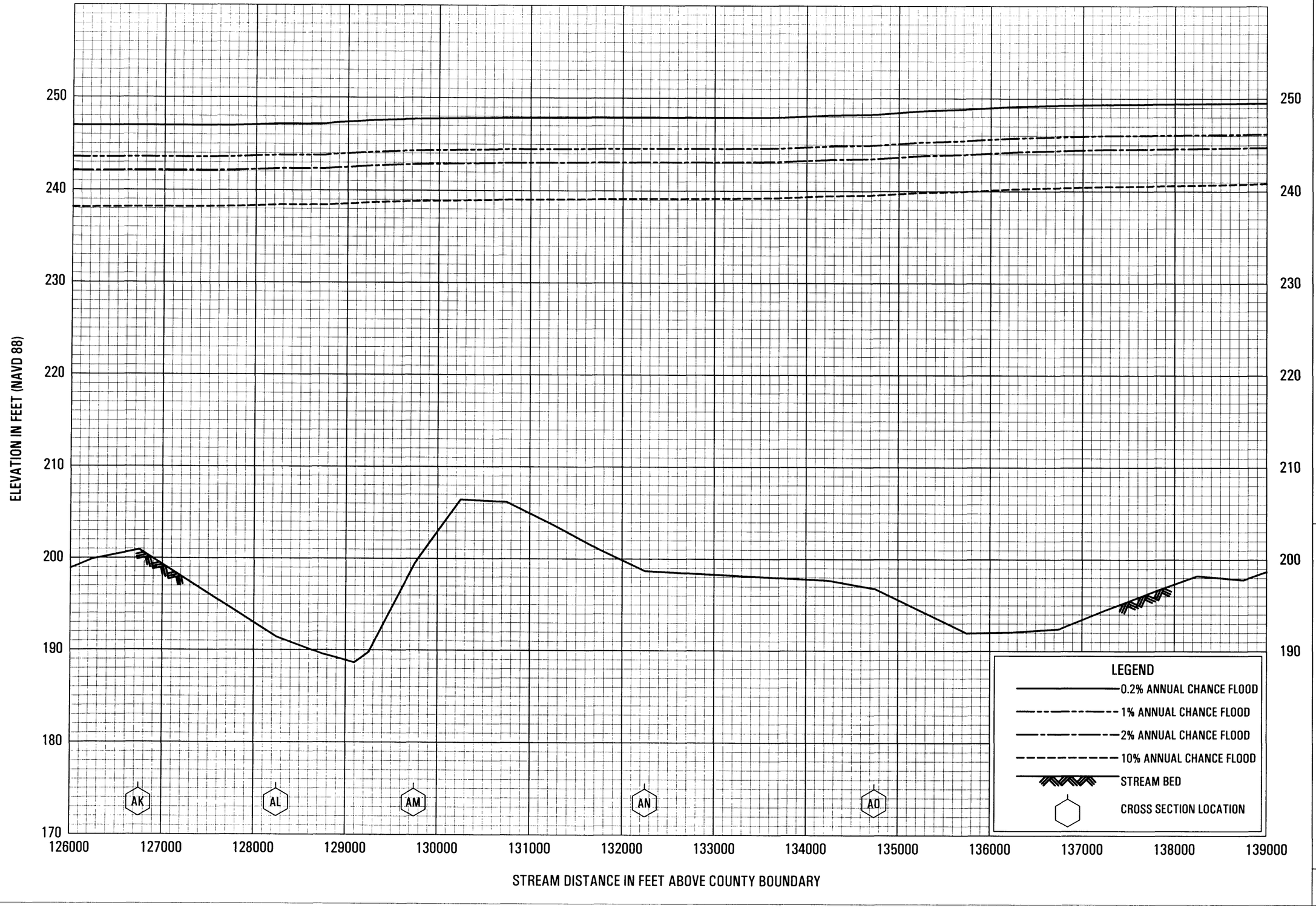
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

53P



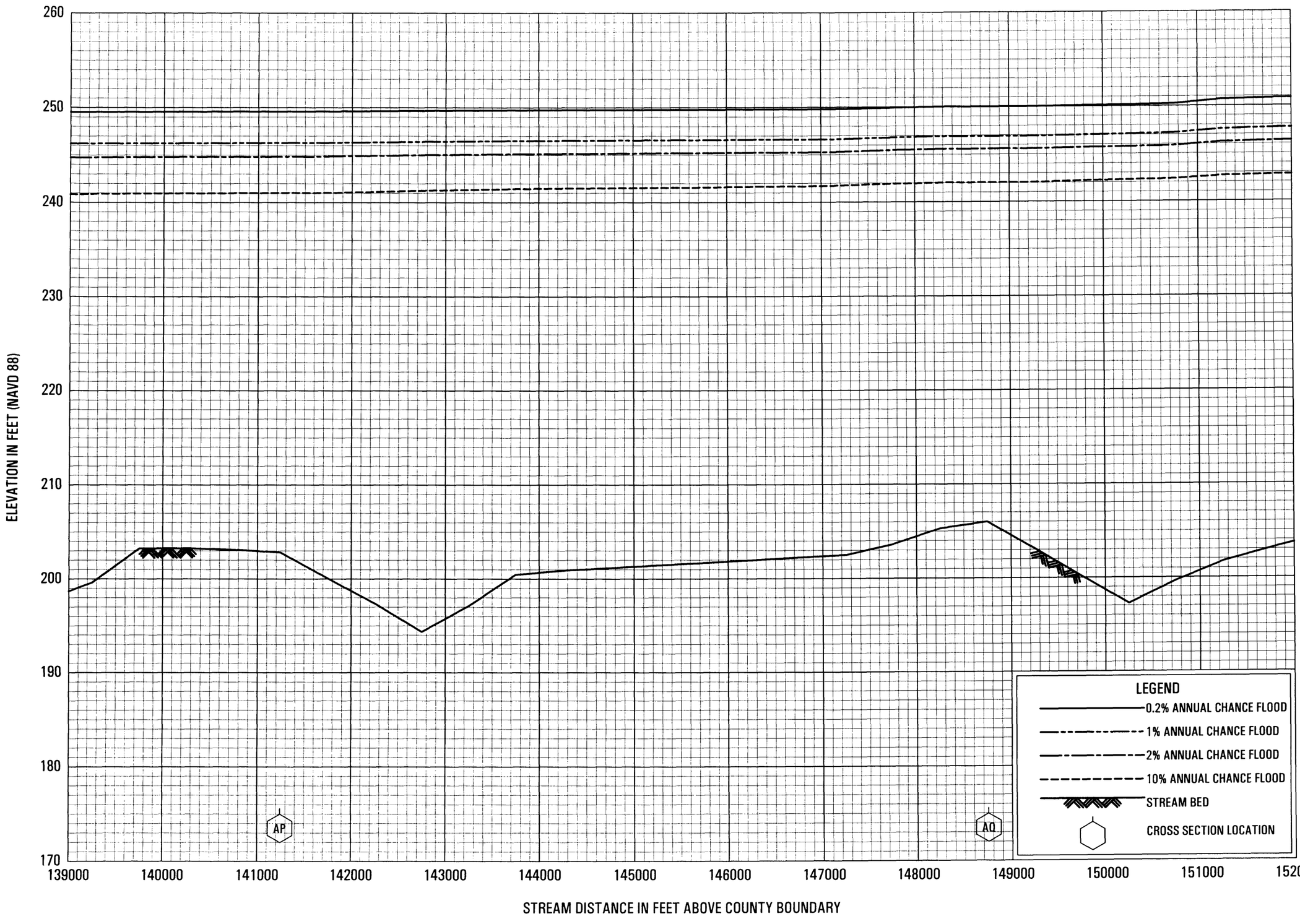
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

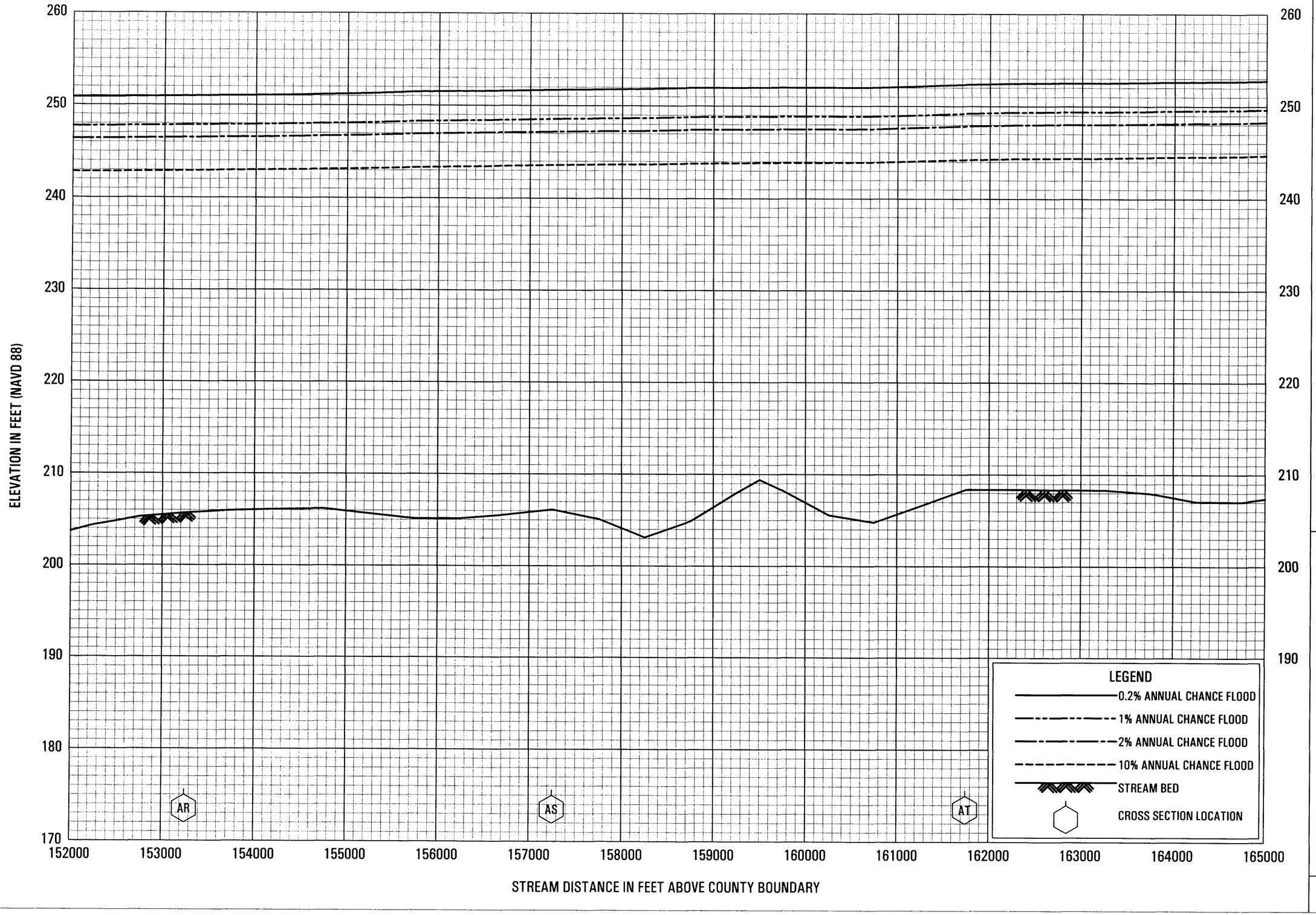
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

55P



FLOOD PROFILES

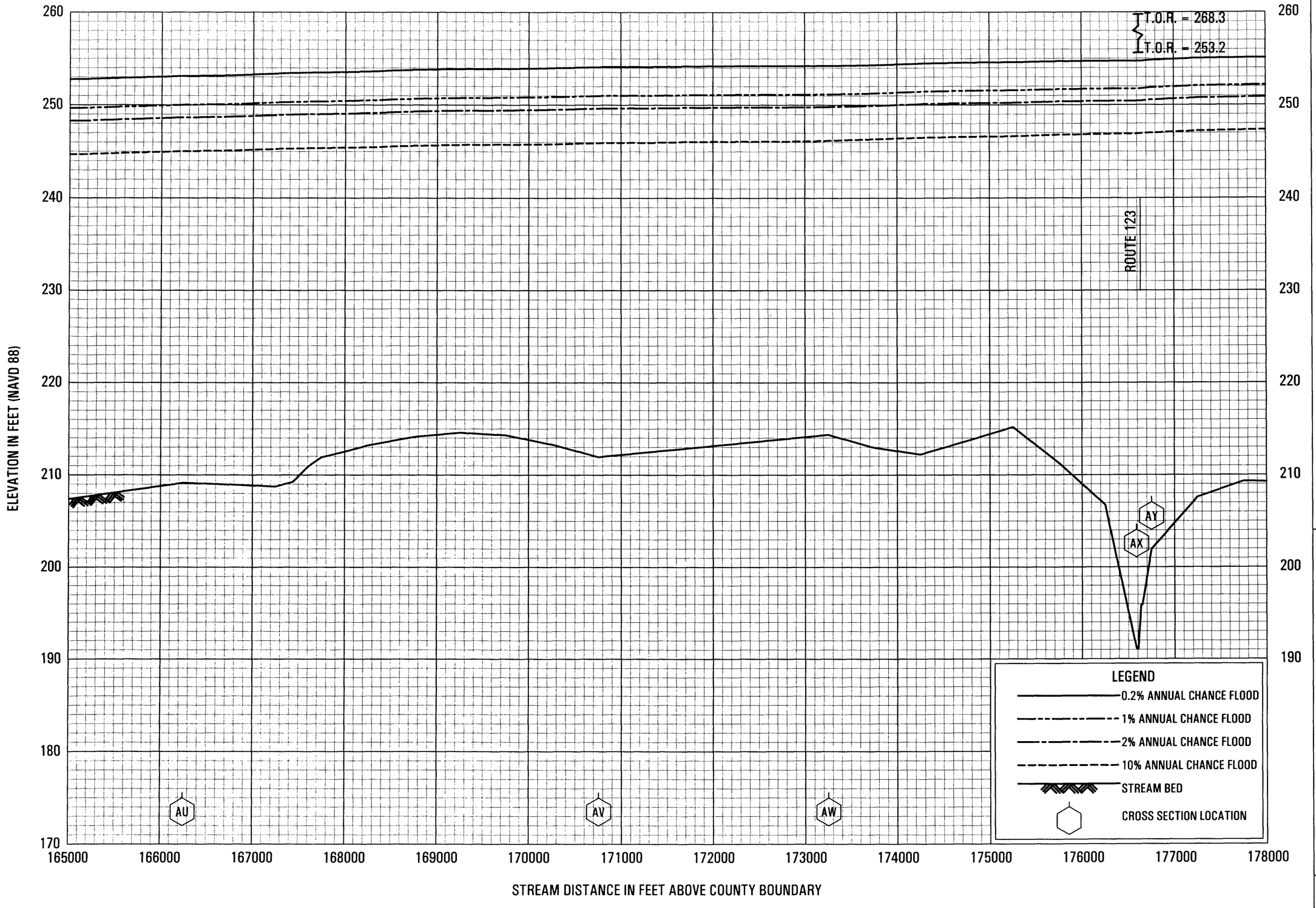
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

56P



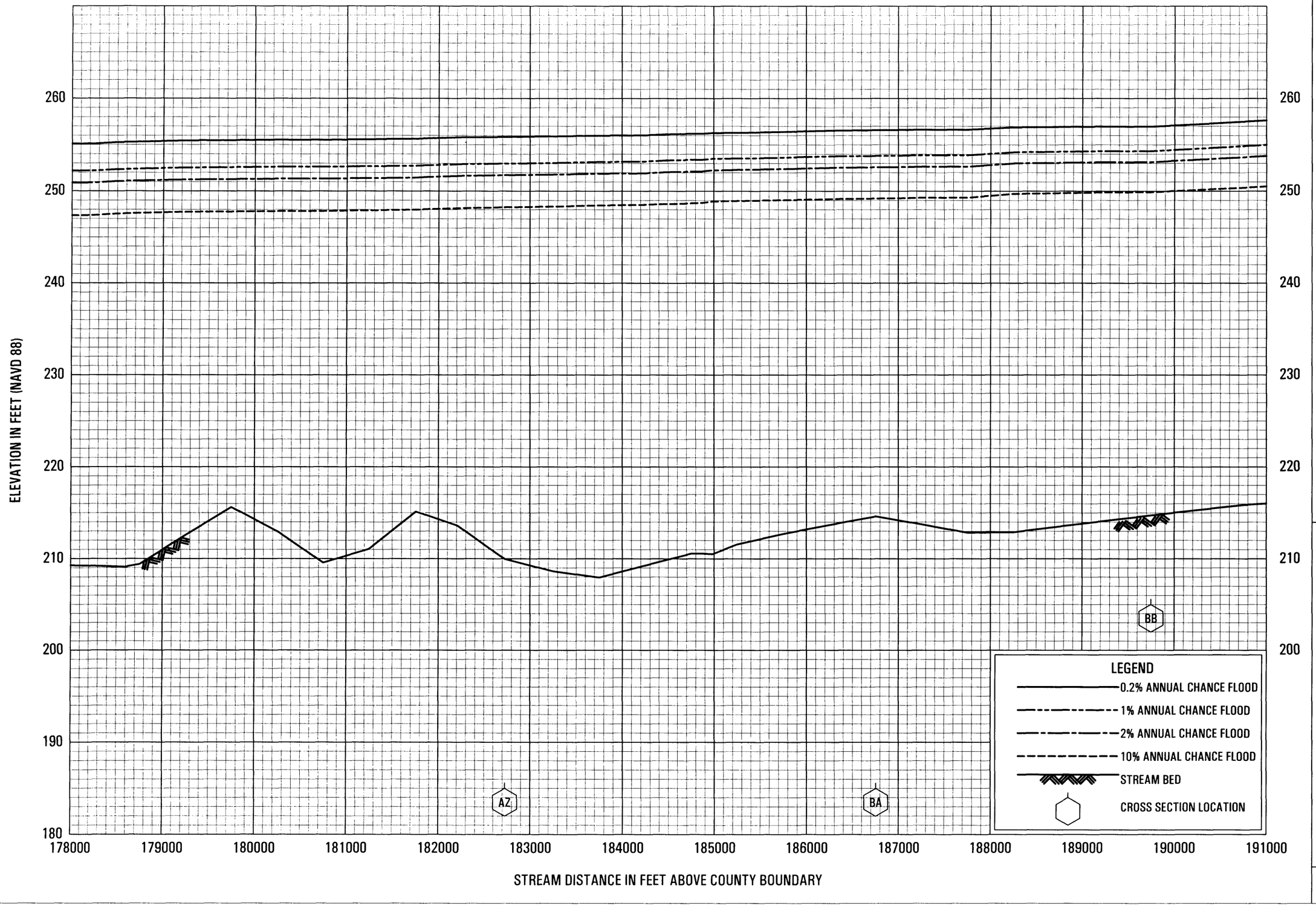
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



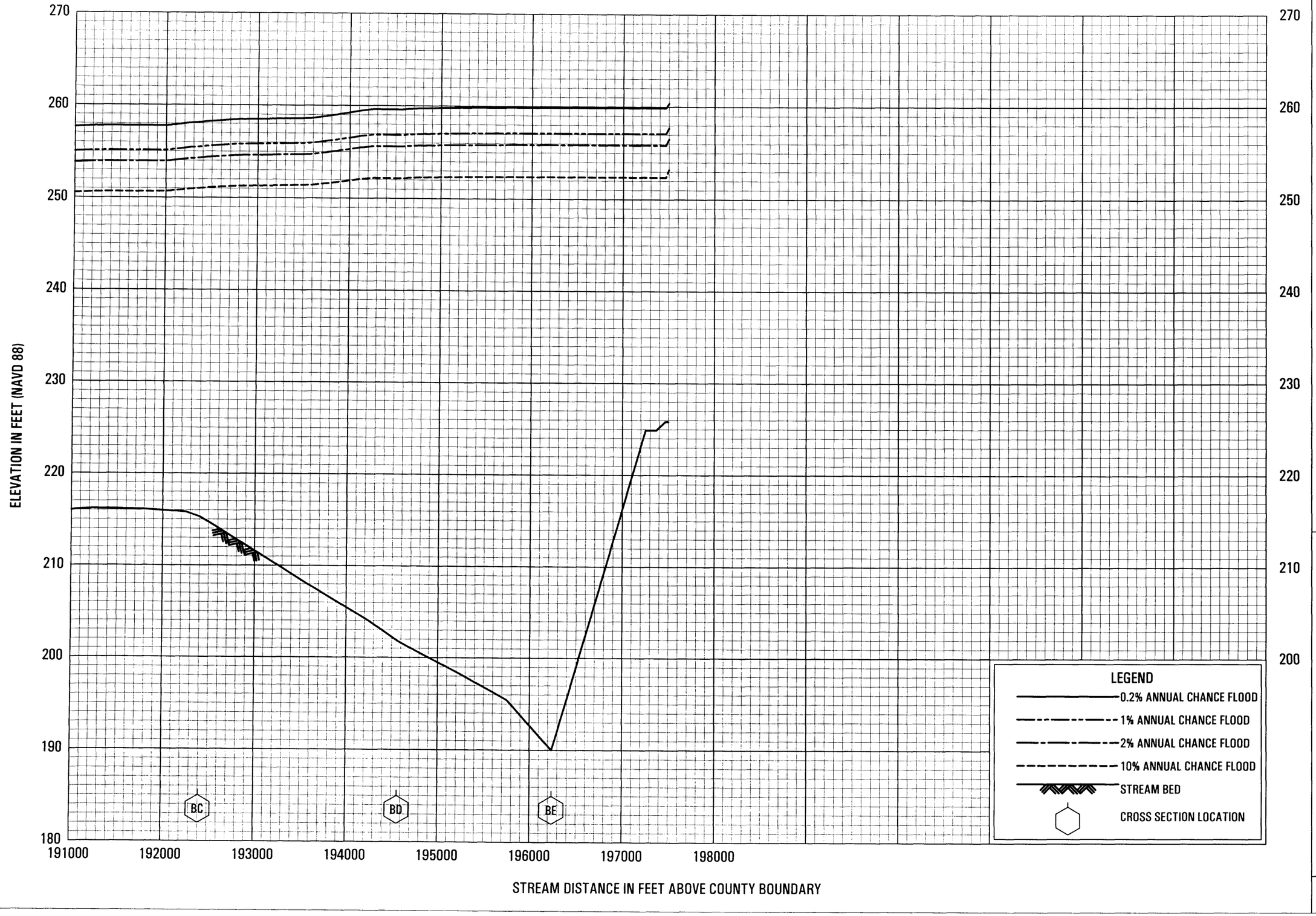
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)



FLOOD PROFILES

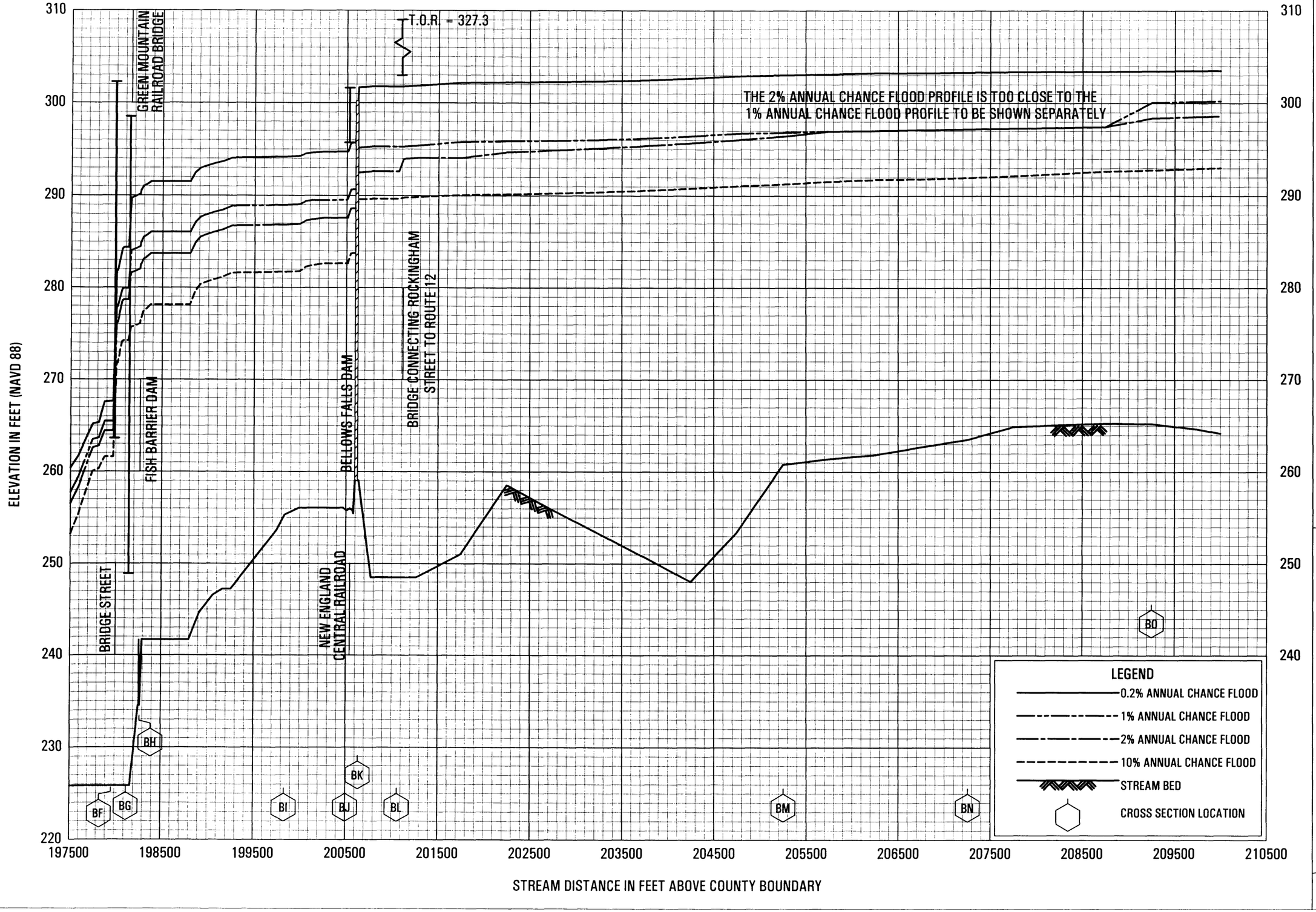
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

59P



FLOOD PROFILES

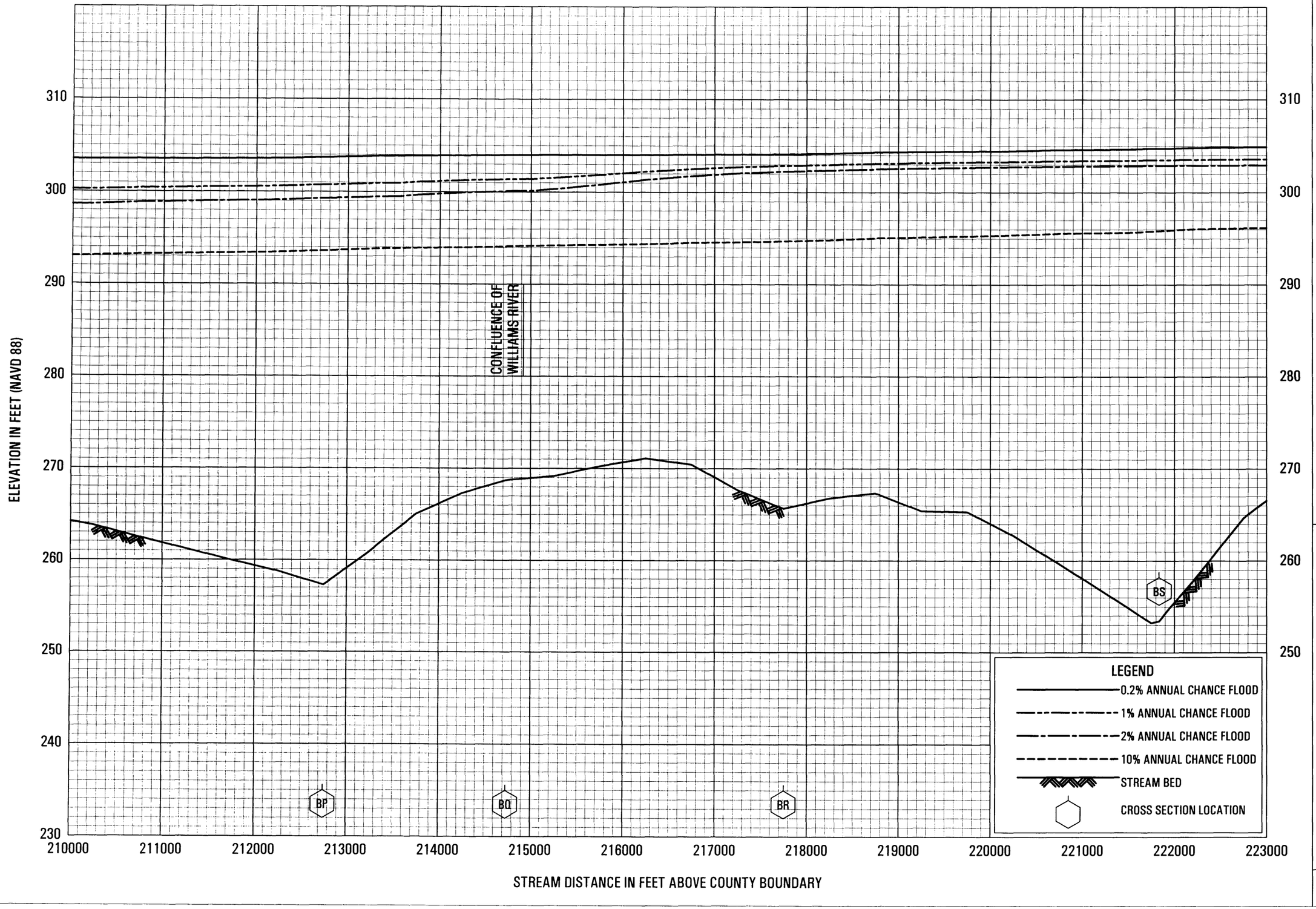
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

60P



FLOOD PROFILES

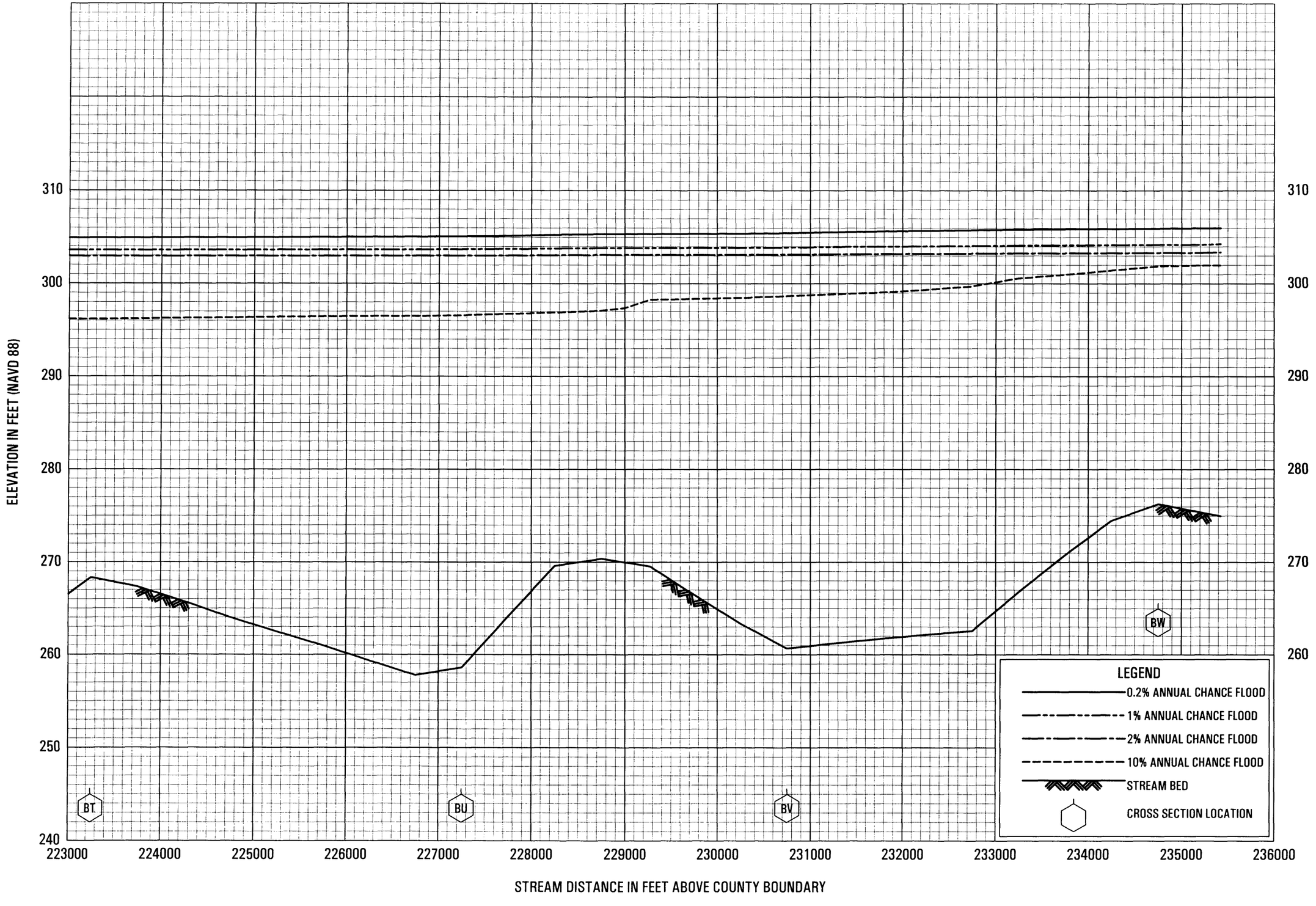
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

61P



FLOOD PROFILES

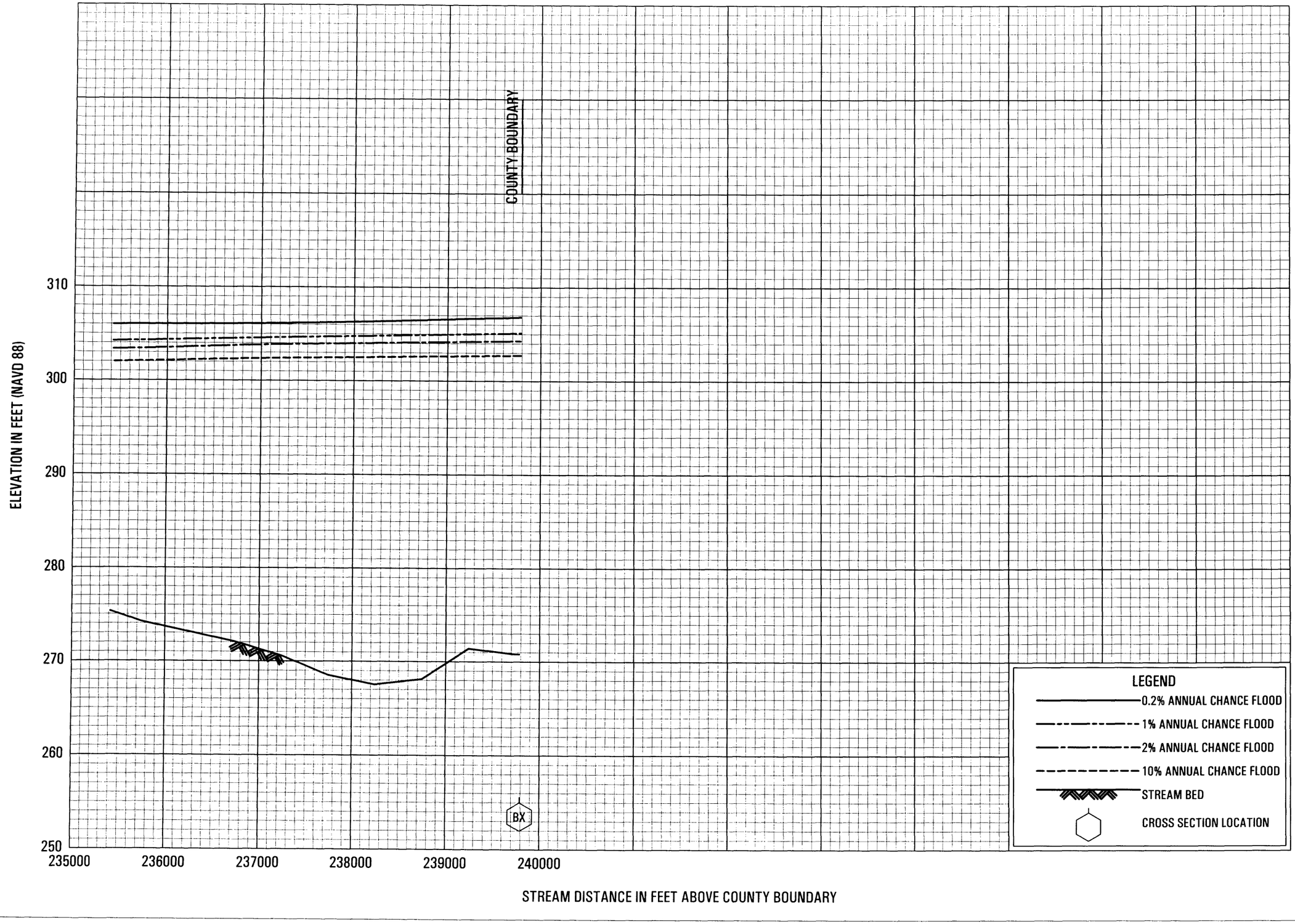
CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

62P



FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WINDHAM COUNTY, VT

(ALL JURISDICTIONS)

63P