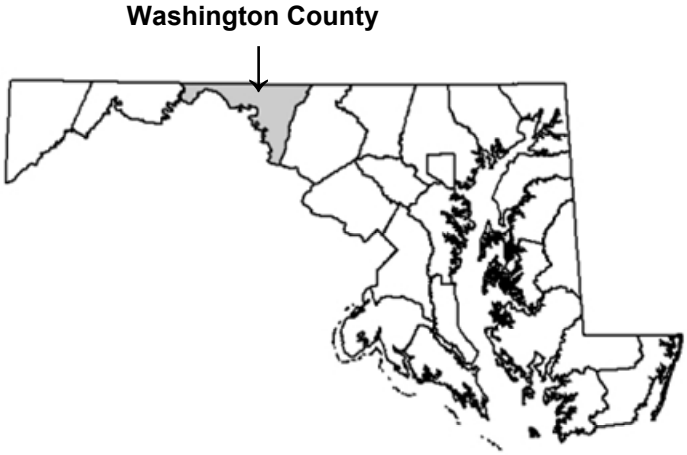
FLOOD INSURANCE STUDY

WASHINGTON COUNTY, MARYLAND

AND INCORPORATED AREAS

Volume 2 of 2

Community Name	Community Number
BOONSBORO, TOWN OF	240071
CLEAR SPRING, TOWN OF	240072
FUNKSTOWN, TOWN OF	240073
HAGERSTOWN, CITY OF	240074
HANCOCK, TOWN OF	240109
KEEDYSVILLE, TOWN OF	240075
SHARPSBURG, TOWN OF	240076
SMITHSBURG, TOWN OF	240124
WASHINGTON COUNTY (UNINCORPORATED AREAS)	240070
WILLIAMSPORT, TOWN OF	240077



EFFECTIVE DATE: XX/XX/XXXX

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER:

24043CV002A

REVISED PRELIMINARY

October 18, 2016

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

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

Flood Insurance Rate Map panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways and cross sections). In addition, Flood Insurance Rate Map panels for this community contain new flood zone designations. The flood hazard zones have been changed as follows:

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

Initial Countywide FIS Effective Date: TBD

TABLE OF CONTENTS- Volume 1

Page

1.0 **INTRODUCTION** 1

1.1 Purpose of Study 1

1.2 Authority and Acknowledgements 1

1.3 Coordination 3

2.0 **AREA STUDIED** 6

2.1 Scope of Study 6

2.2 Community Description 9

2.3 Principal Flood Problems 9

2.4 Flood Protection Measures 10

3.0 **ENGINEERING METHODS** 10

3.1 Hydrologic Analyses 10

3.2 Hydraulic Analyses 18

3.3 Vertical Datum 22

4.0 **FLOODPLAIN MANAGEMENT APPLICATIONS** 23

4.1 Floodplain Boundaries 23

4.2 Floodways 23

5.0 **INSURANCE APPLICATIONS** 64

6.0 **FLOOD INSURANCE RATE MAP** 64

7.0 **OTHER STUDIES** 65

8.0 **LOCATION OF DATA** 67

9.0 **BIBLIOGRAPHY AND REFERENCES** 67

TABLE OF CONTENTS- Volume 1 - continued

Page

FIGURES

Figure 1 – Floodway Schematic 25

TABLES

Table 1 – Flooding Sources Studied by Detailed Methods 7
Table 2 – Flooding Sources Studied by Approximate Methods 8
Table 3 – Rural Piedmont and Blue Ridge Fixed Region Regression Equations 11
Table 4 – Appalachian Plateau Fixed Region Regression Equations 12
Table 5 – Summary of Discharges 13-17
Table 6 – Manning's "n" Values 19-20
Table 7 – Floodway Data 26-63
Table 8 – Community Map History 66

EXHIBITS

Exhibit 1 – Flood Profiles

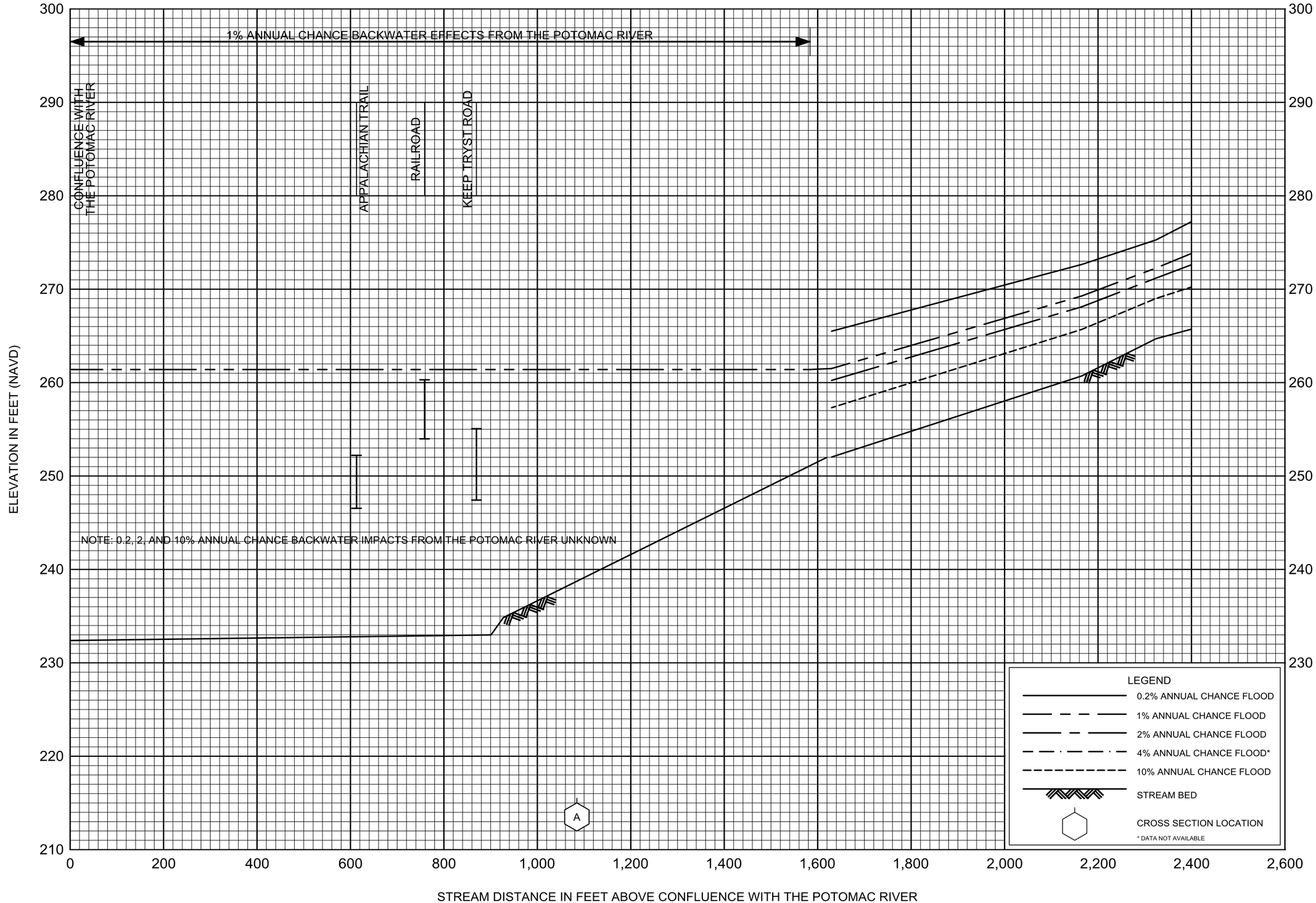
Antietam Creek Panels 01P-07P
Beaver Creek Panel 07(a)P
Branch B Panel 08P
Conococheague Creek Panels 09P-11P
Hamilton Run Panels 12P-15P

TABLE OF CONTENTS- Volume 2

Exhibit 1- Flood Profiles (continued)

Israel Creek	Panels 16P-23P
Little Antietam Creek	Panels 24P-27P
Little Tonoloway Creek	Panels 28P-29P
Marsh Run I	Panels 30P-35P
Potomac River	Panels 36P-42P
Semple Run	Panel 43P
Toms Run I	Panels 44P-46P
Tonoloway Creek	Panel 47P
Tributary No 3	Panels 48P-49P
Tributary No 29	Panels 50P-52P
Tributary No 29A	Panel 53P
Tributary No 29B	Panel 54P
Tributary No 30	Panels 55P-56P
Tributary No 31	Panels 57P-59P
Tributary No 33	Panels 60P-63P
Tributary No 35	Panel 64P
Tributary No 36	Panels 65P-66P
Tributary No 67	Panels 67P-68P
Tributary No 73	Panels 69P-70P
Tributary No 75	Panels 71P-72P
Tributary No 76	Panels 73P-74P
Tributary No 78	Panels 75P-76P
Tributary No 79	Panel 77P
Tributary No 97	Panels 78P-79P
Tributary No 98	Panel 80P-81P
Tributary No 102	Panels 82P-83P
Tributary No 105	Panel 84P
Tributary No 112	Panels 85P-87P
West Branch	Panels 88P-89P

Exhibit 2 – Flood Insurance Rate Map Index
Flood Insurance Rate Map



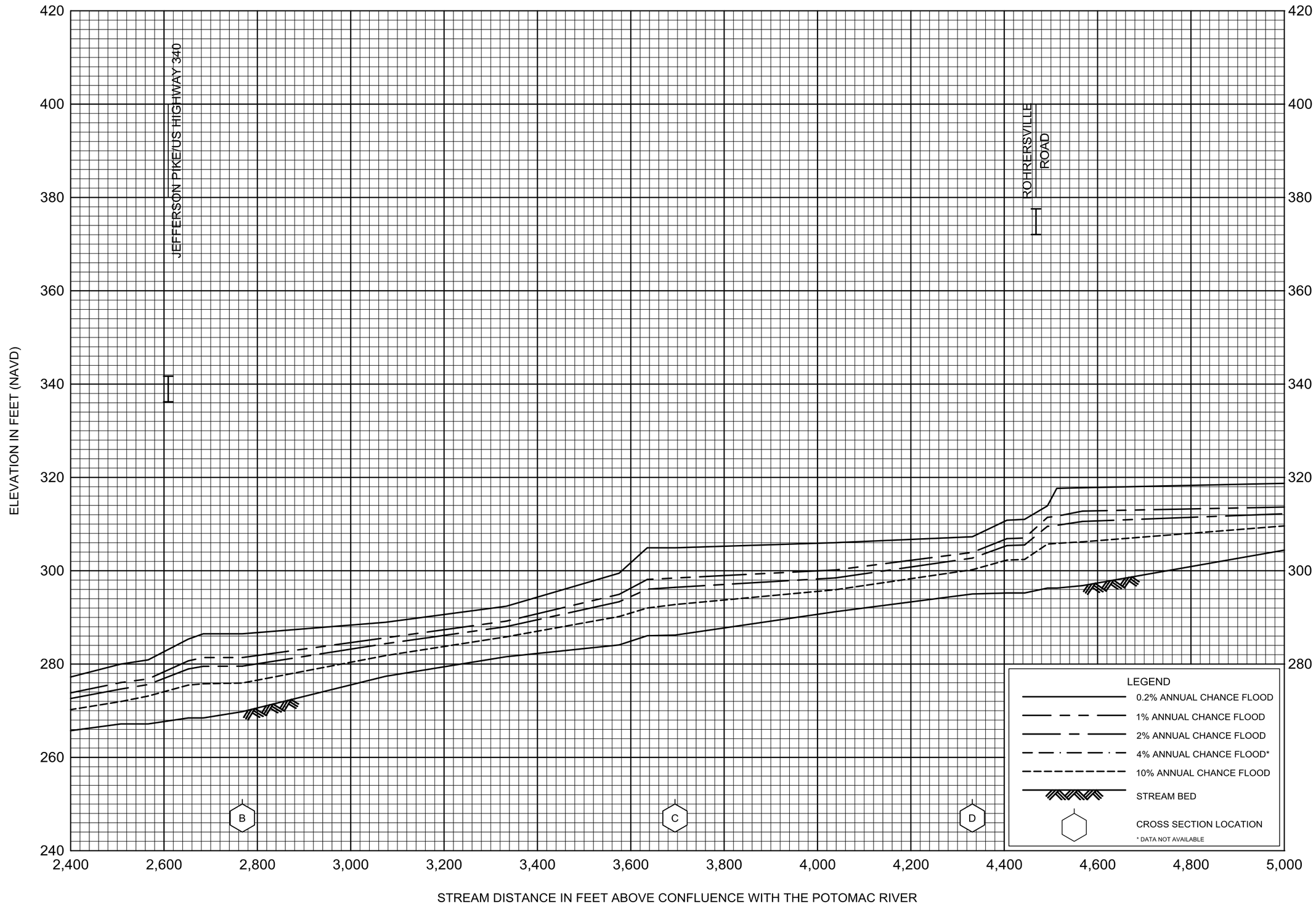
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



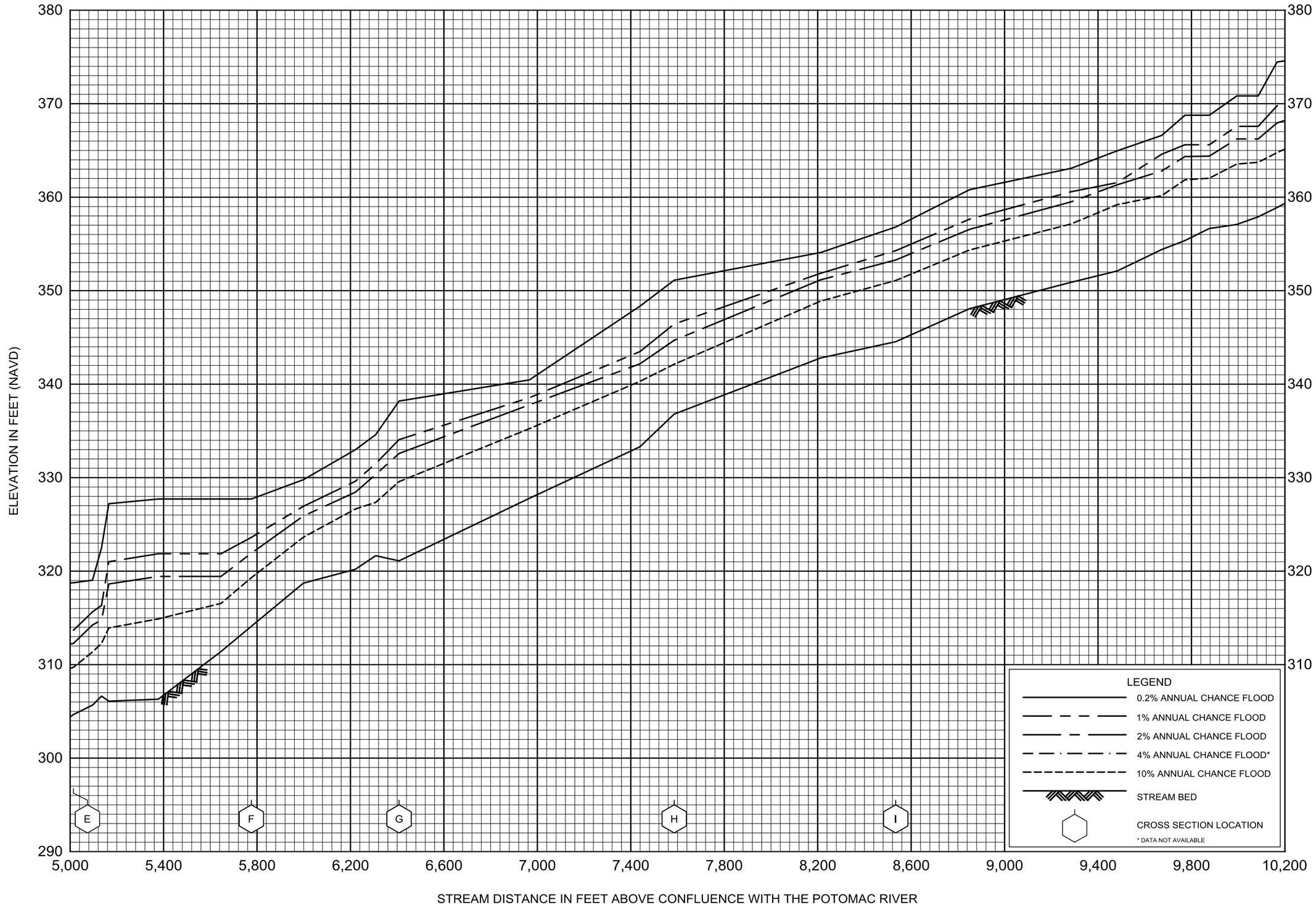
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



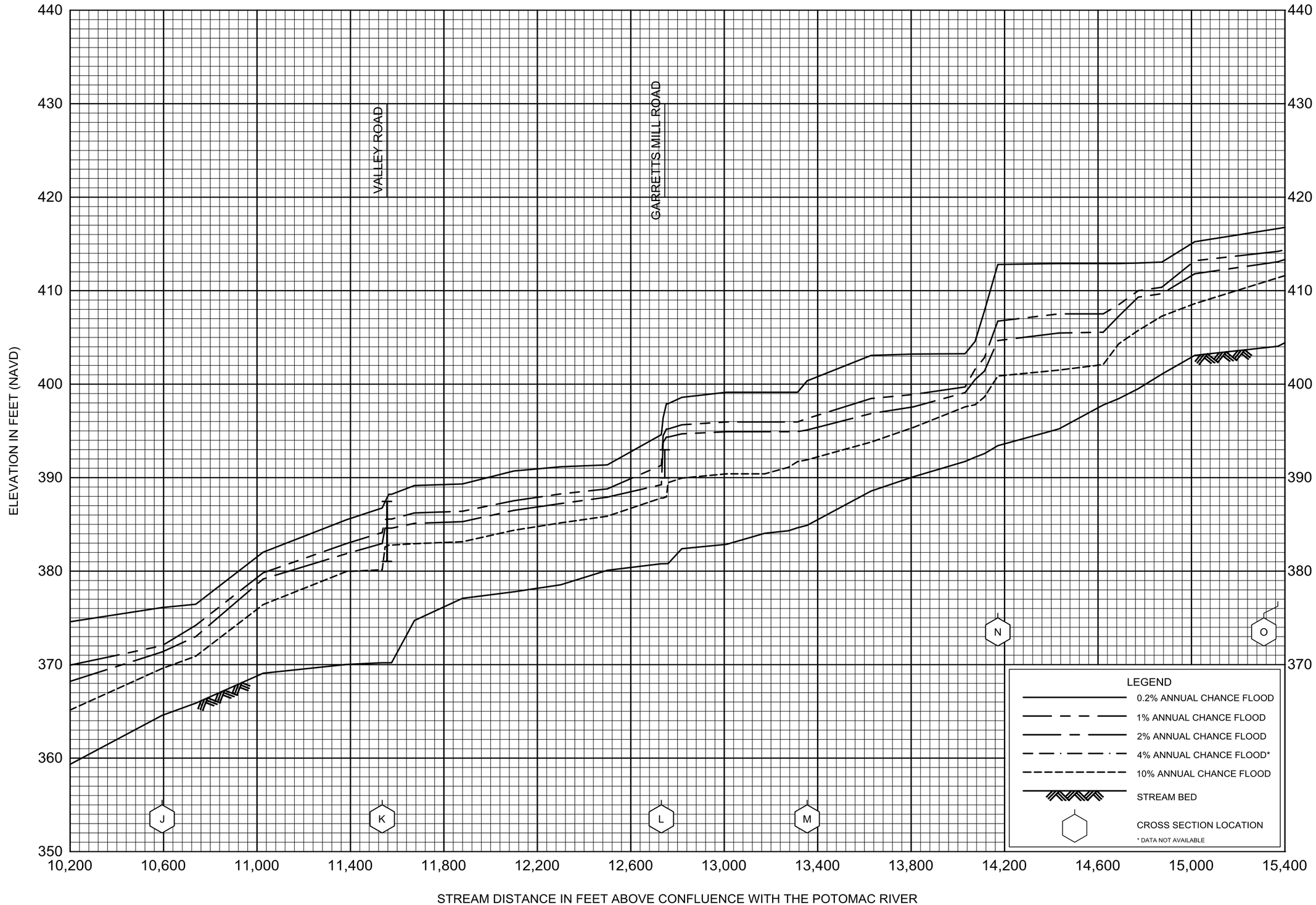
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



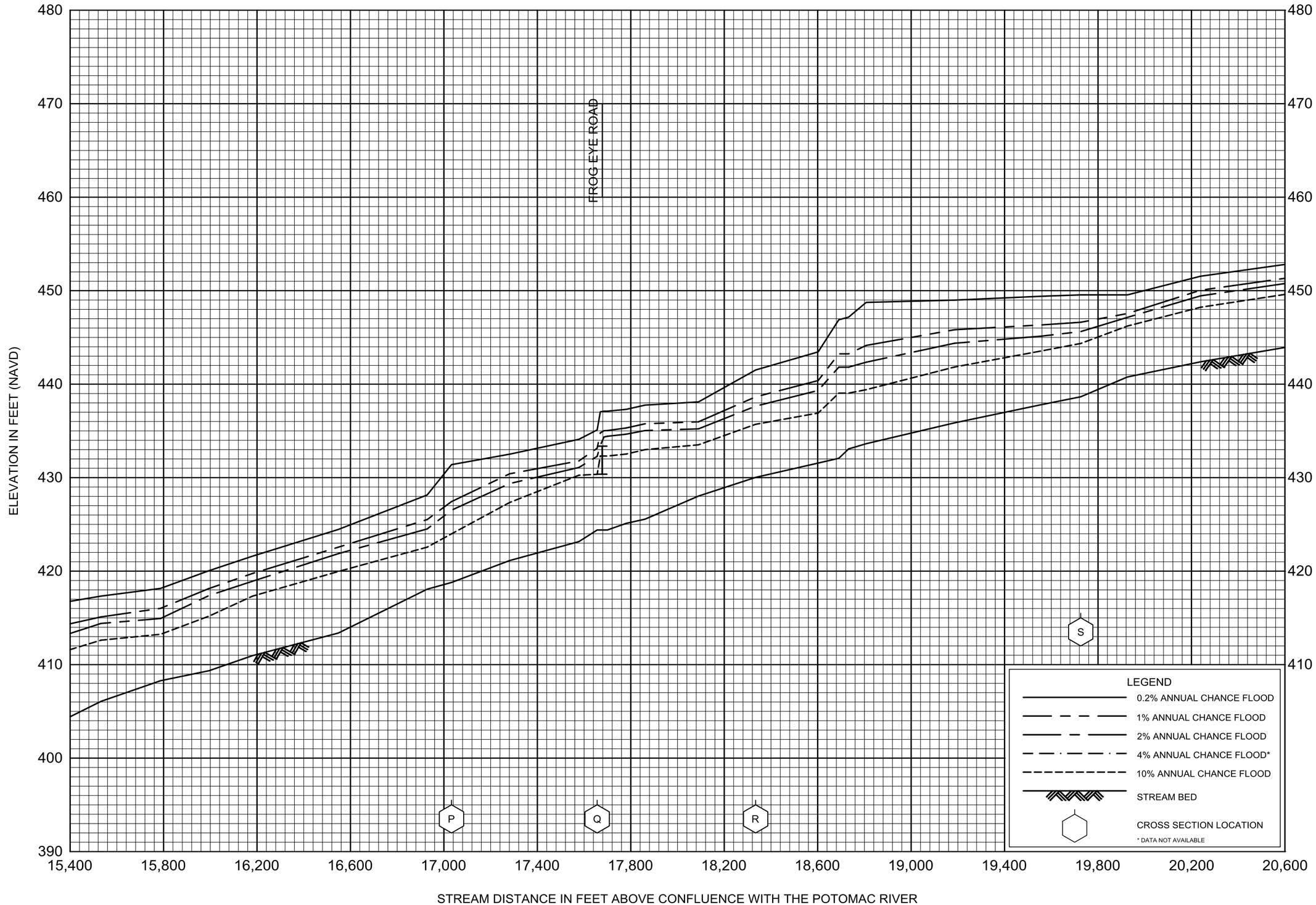
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



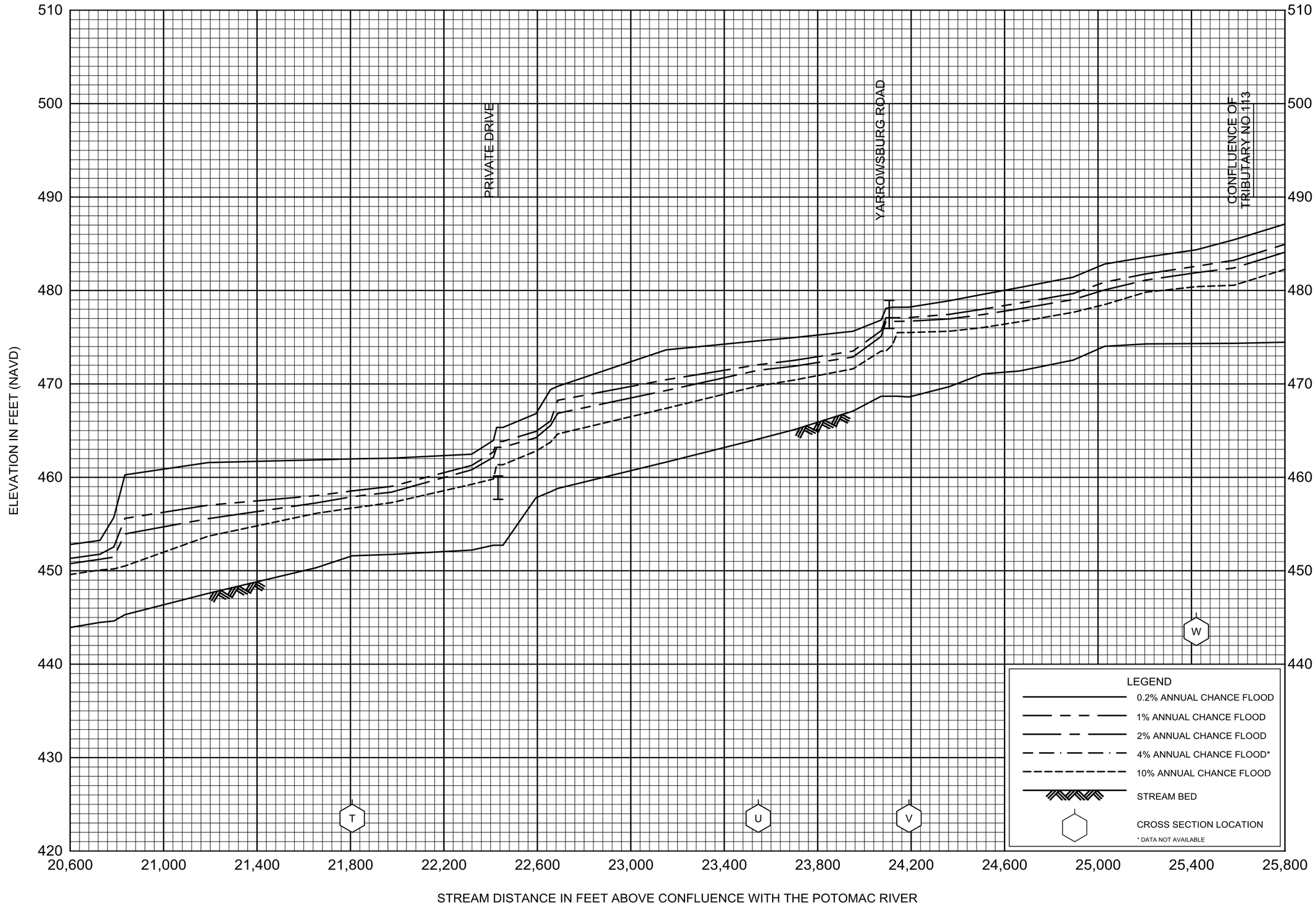
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



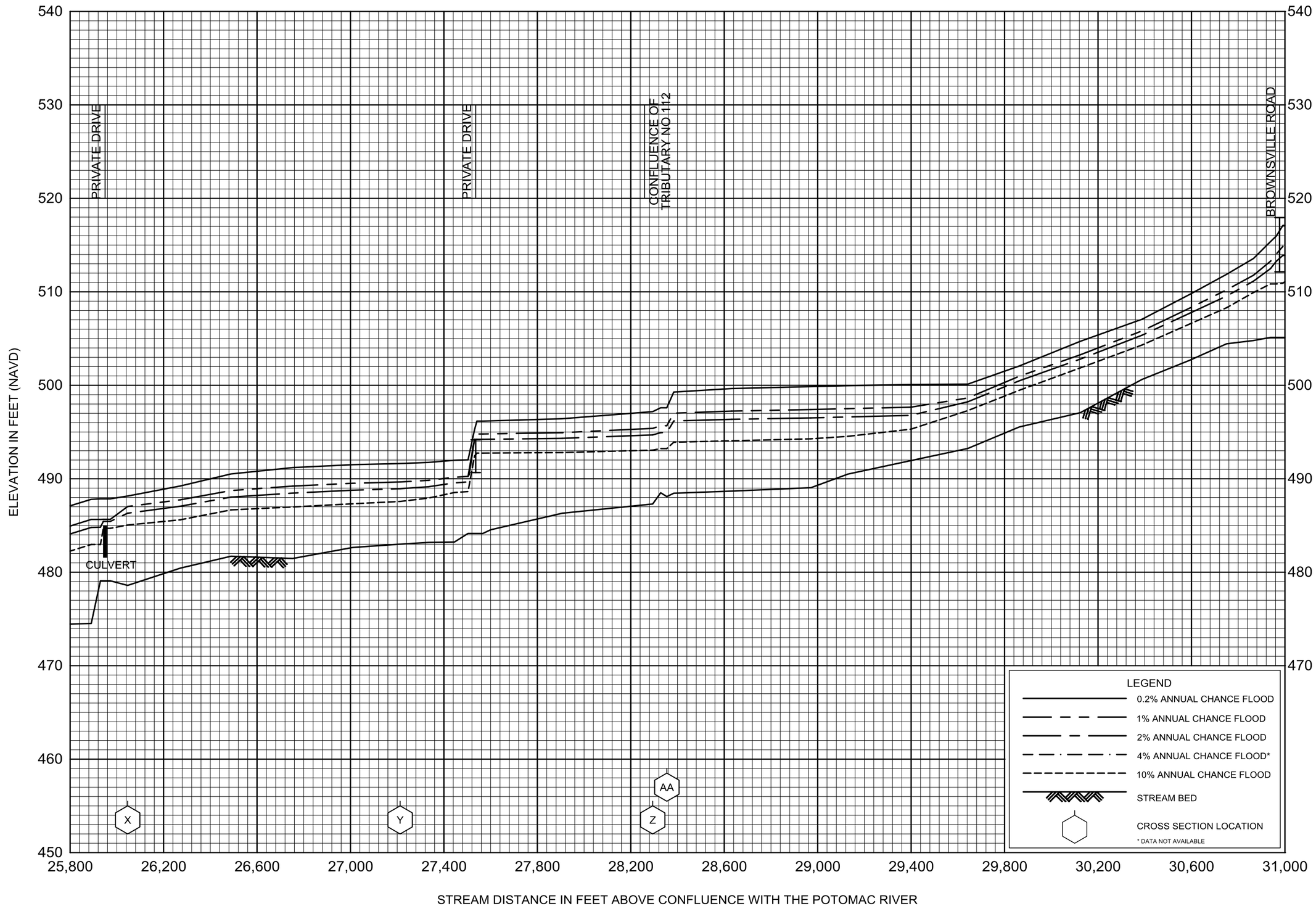
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



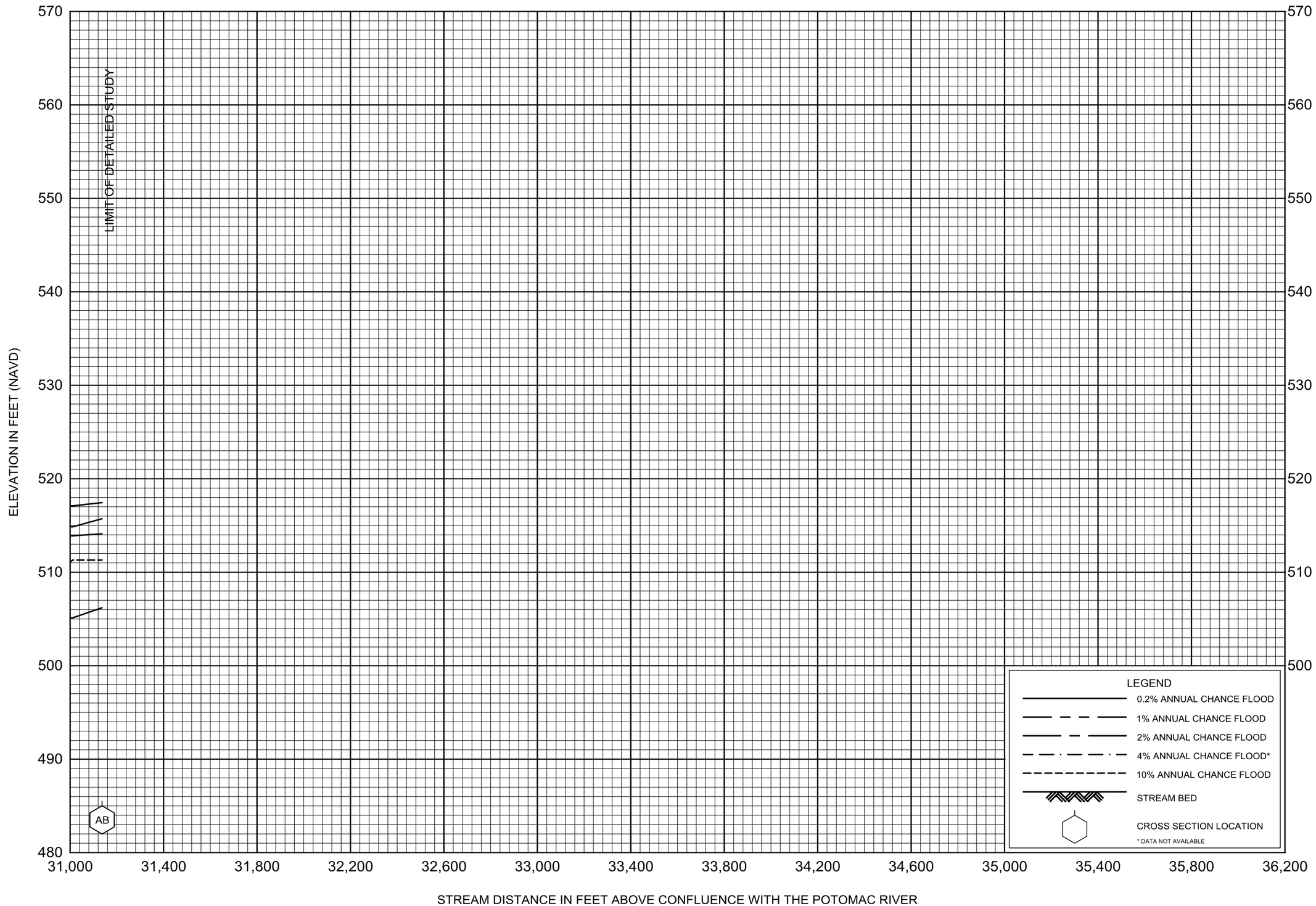
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



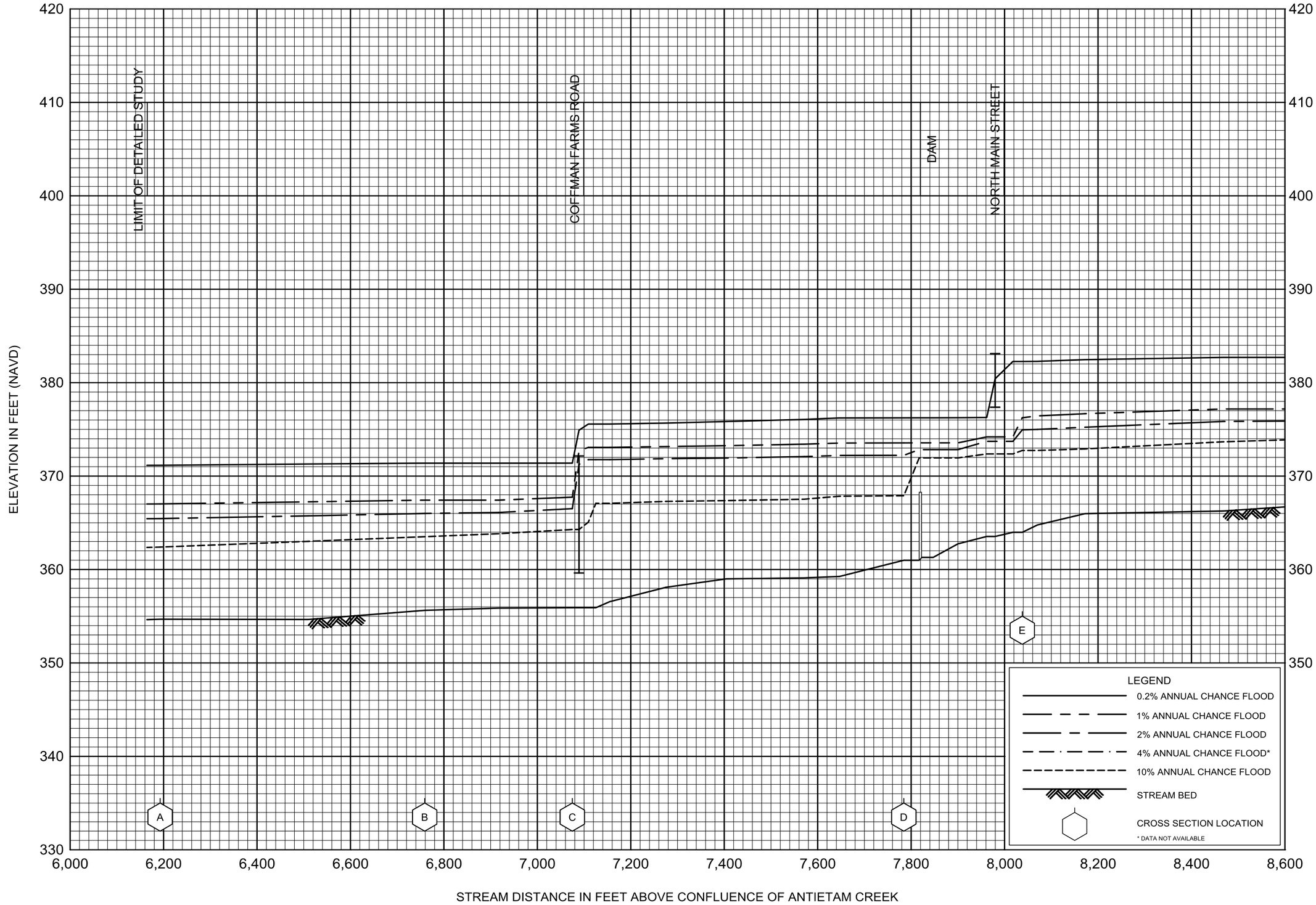
FLOOD PROFILES

ISRAEL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



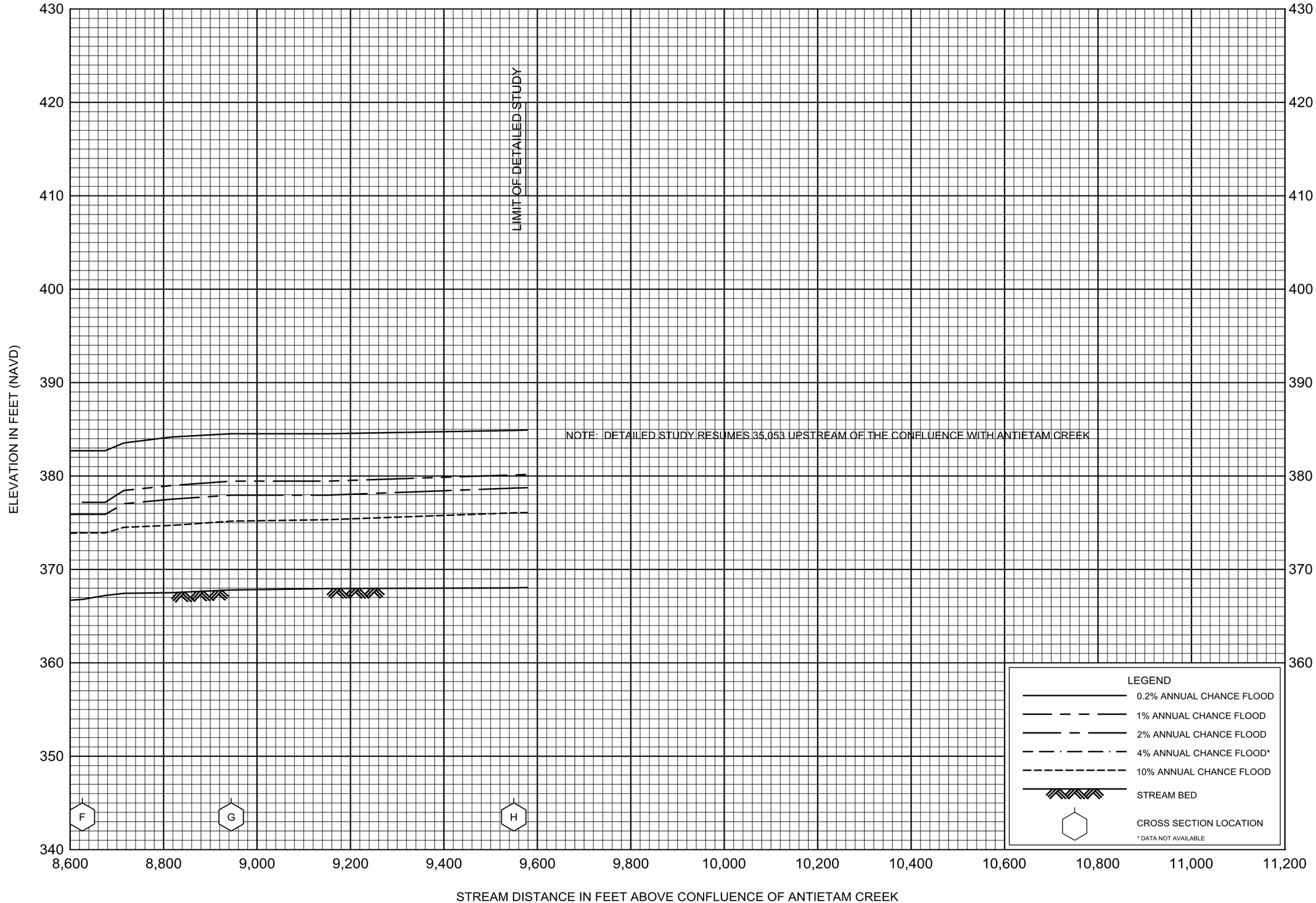
FLOOD PROFILES

LITTLE ANTIETAM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



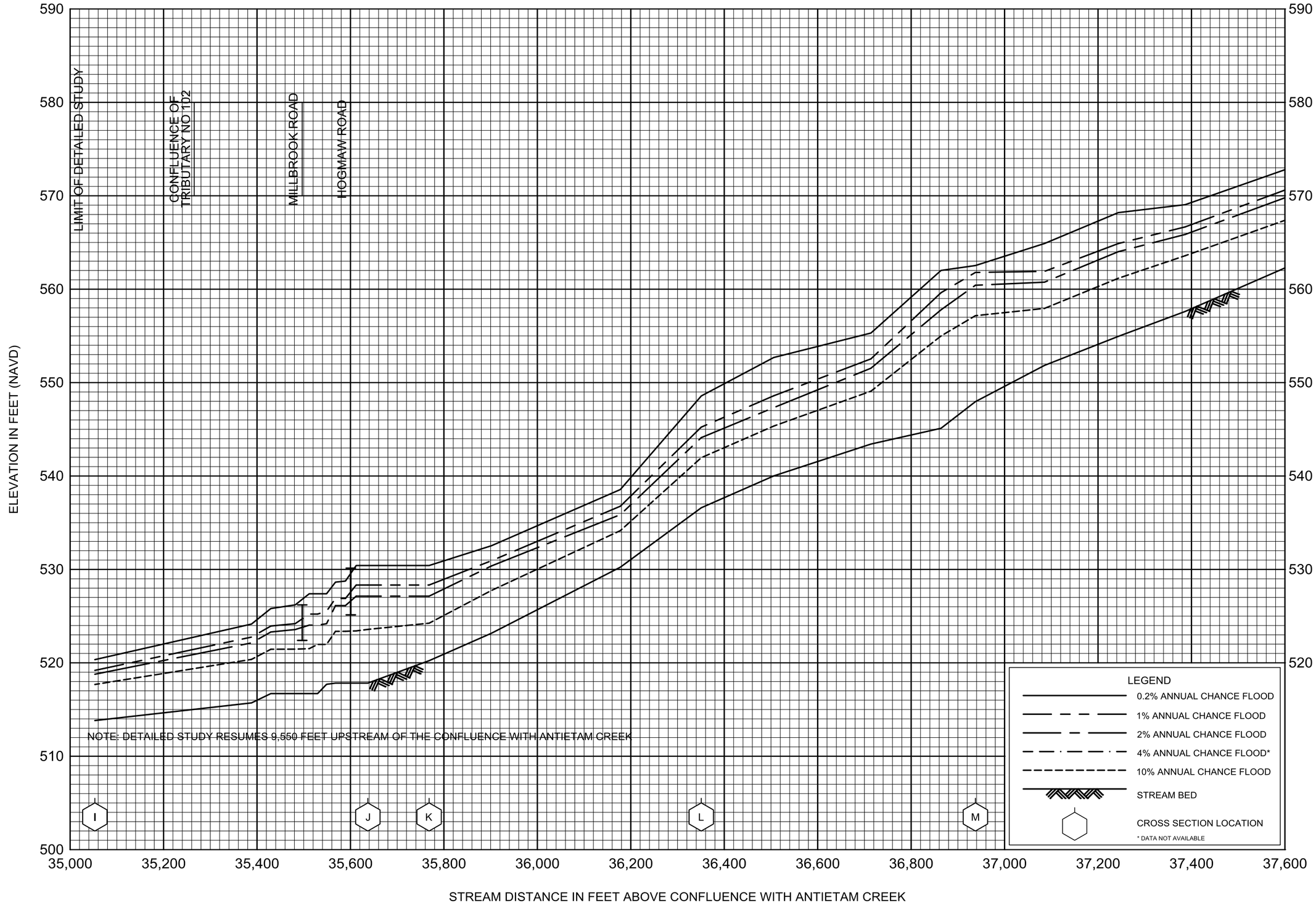
FLOOD PROFILES

LITTLE ANTIETAM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



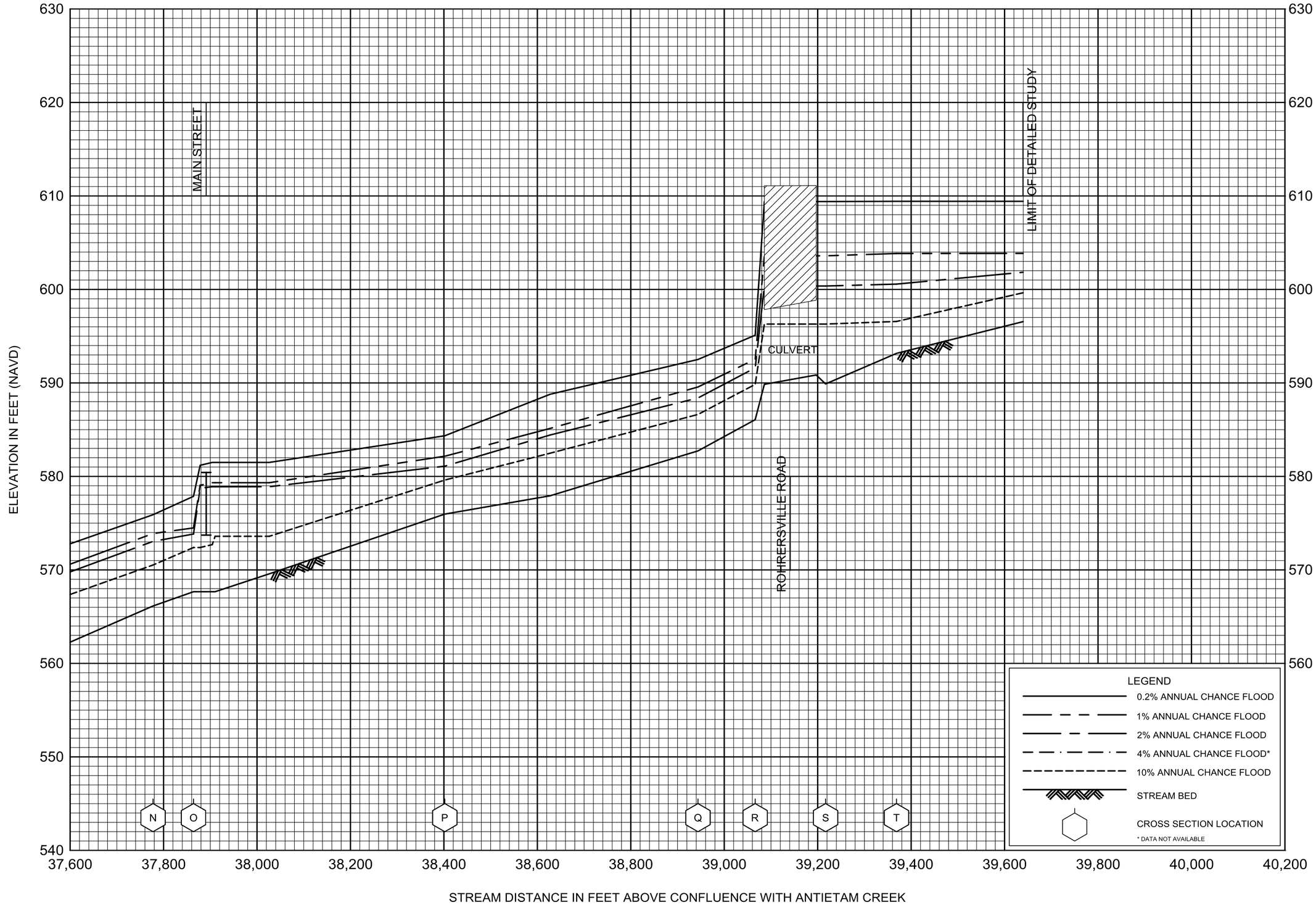
FLOOD PROFILES

LITTLE ANTIETAM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



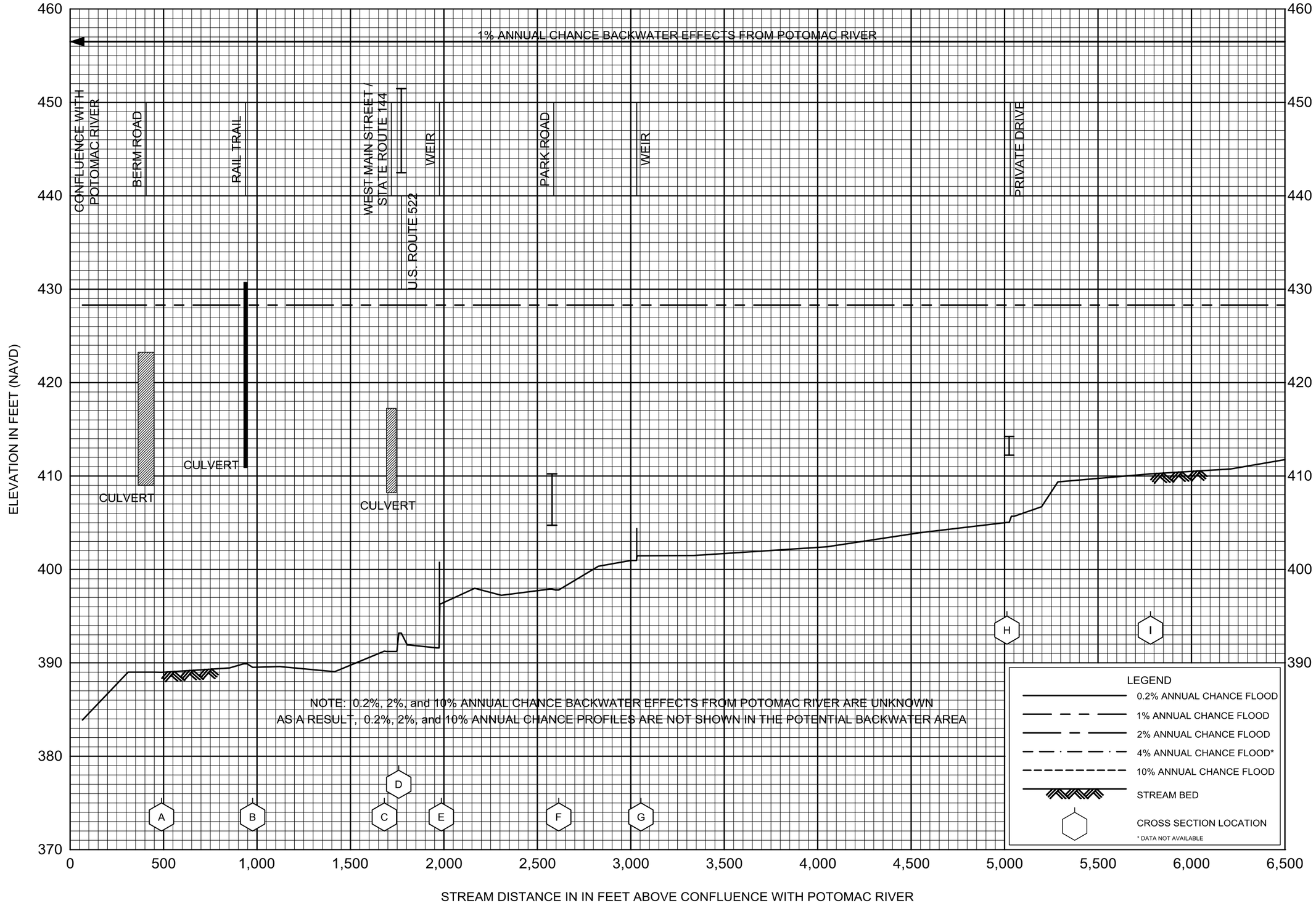
FLOOD PROFILES

LITTLE ANTIETAM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



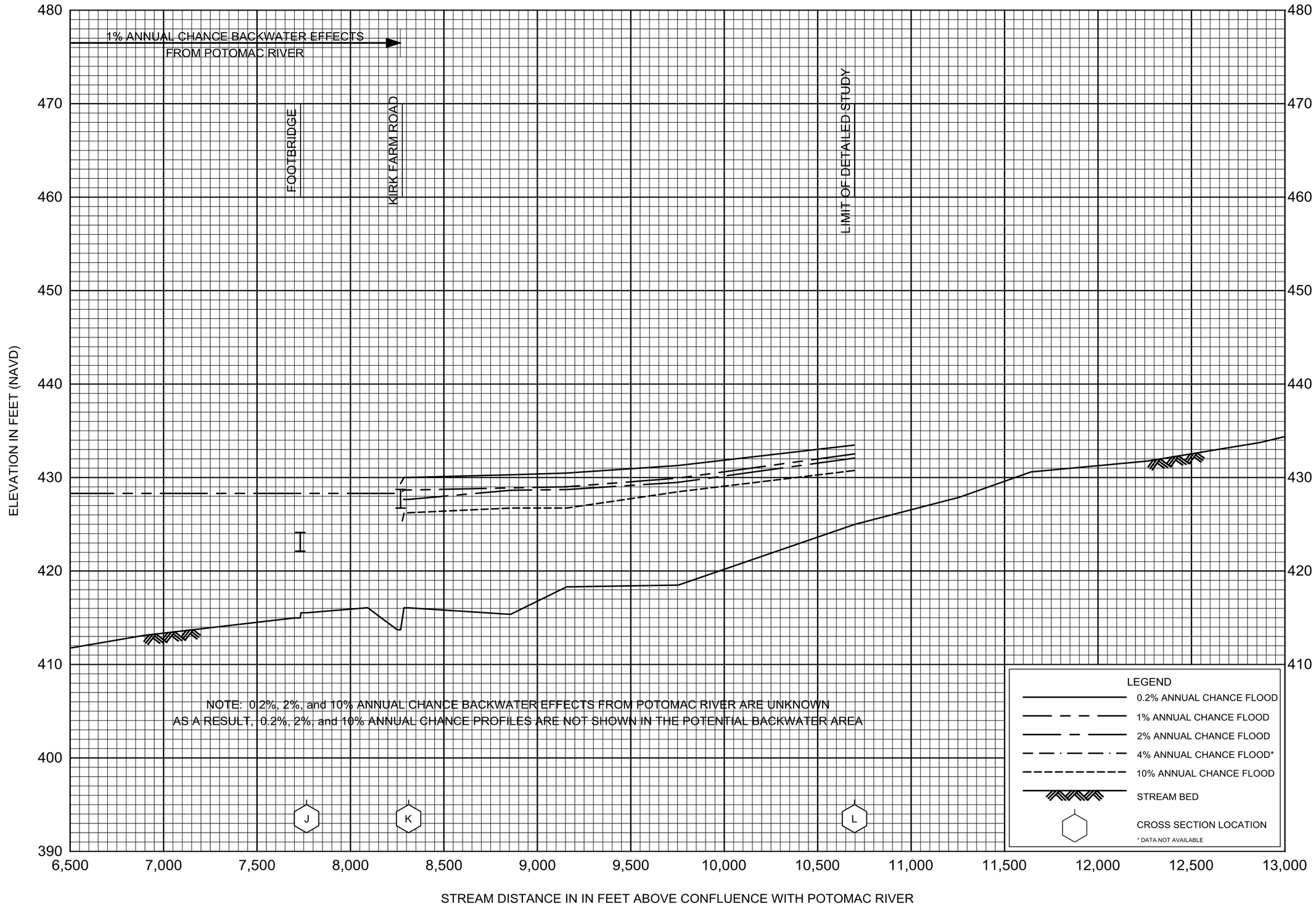
FLOOD PROFILES

LITTLE TONOLOWAY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



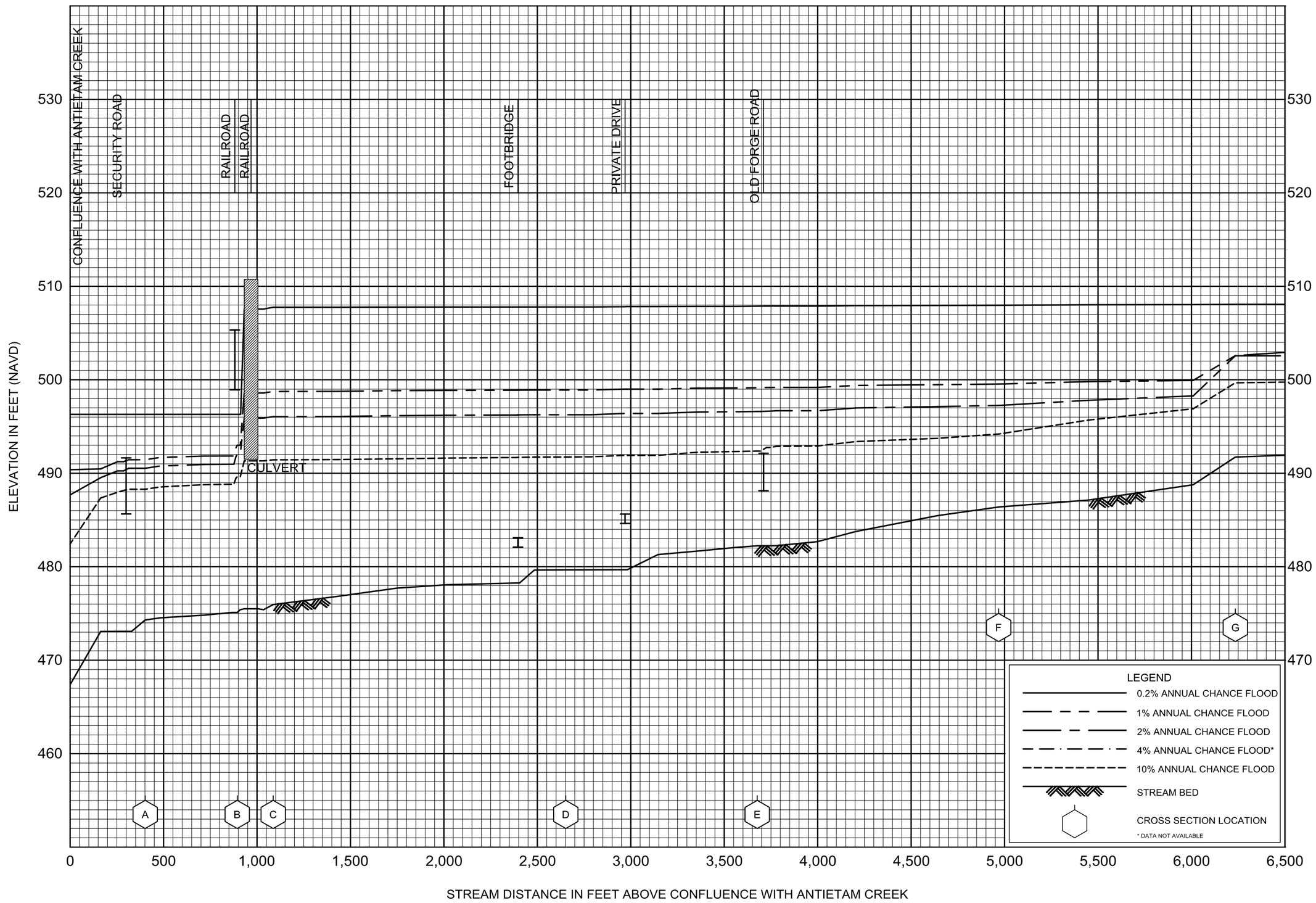
FLOOD PROFILES

LITTLE TONOLOWAY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



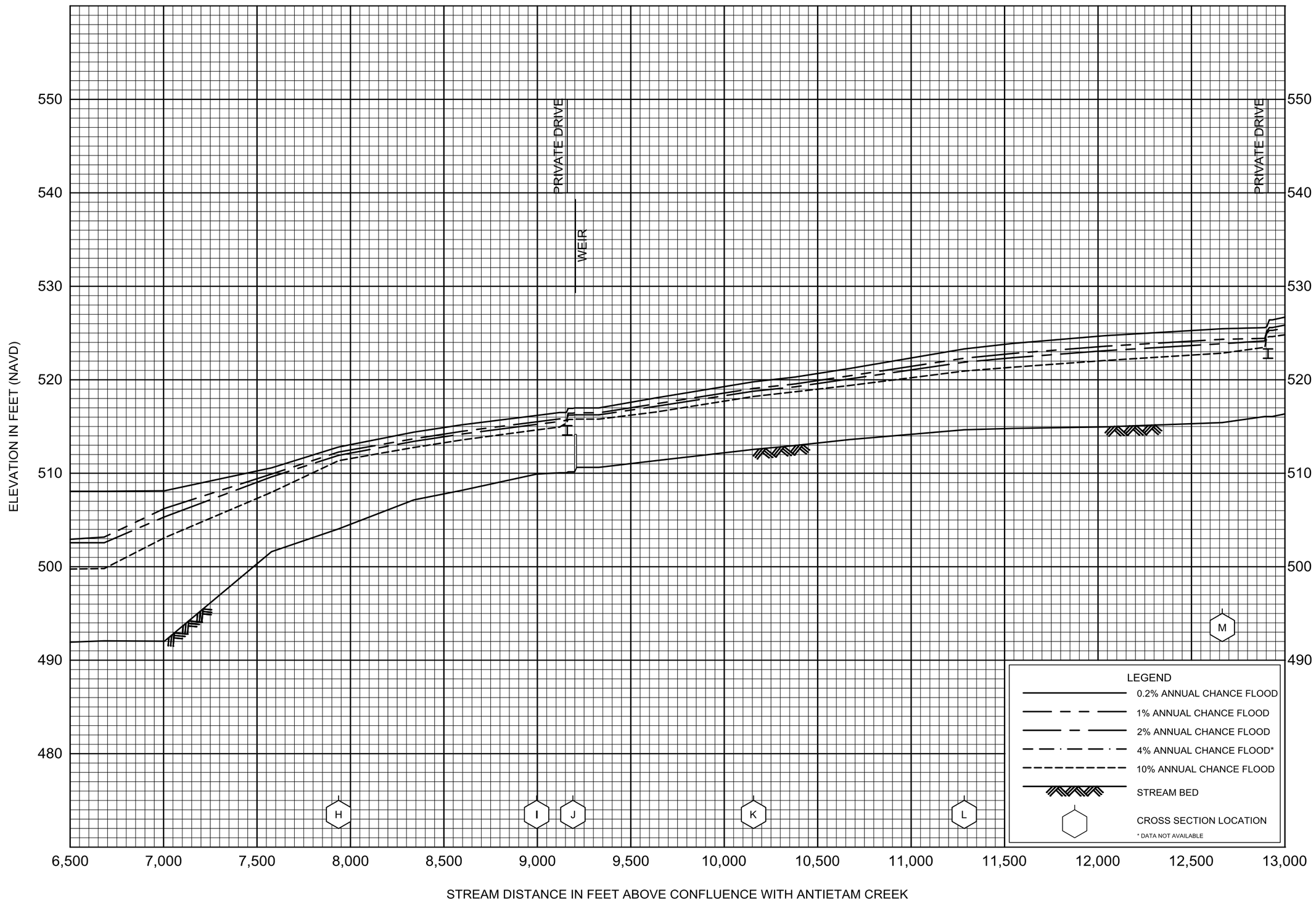
FLOOD PROFILES

MARSH RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



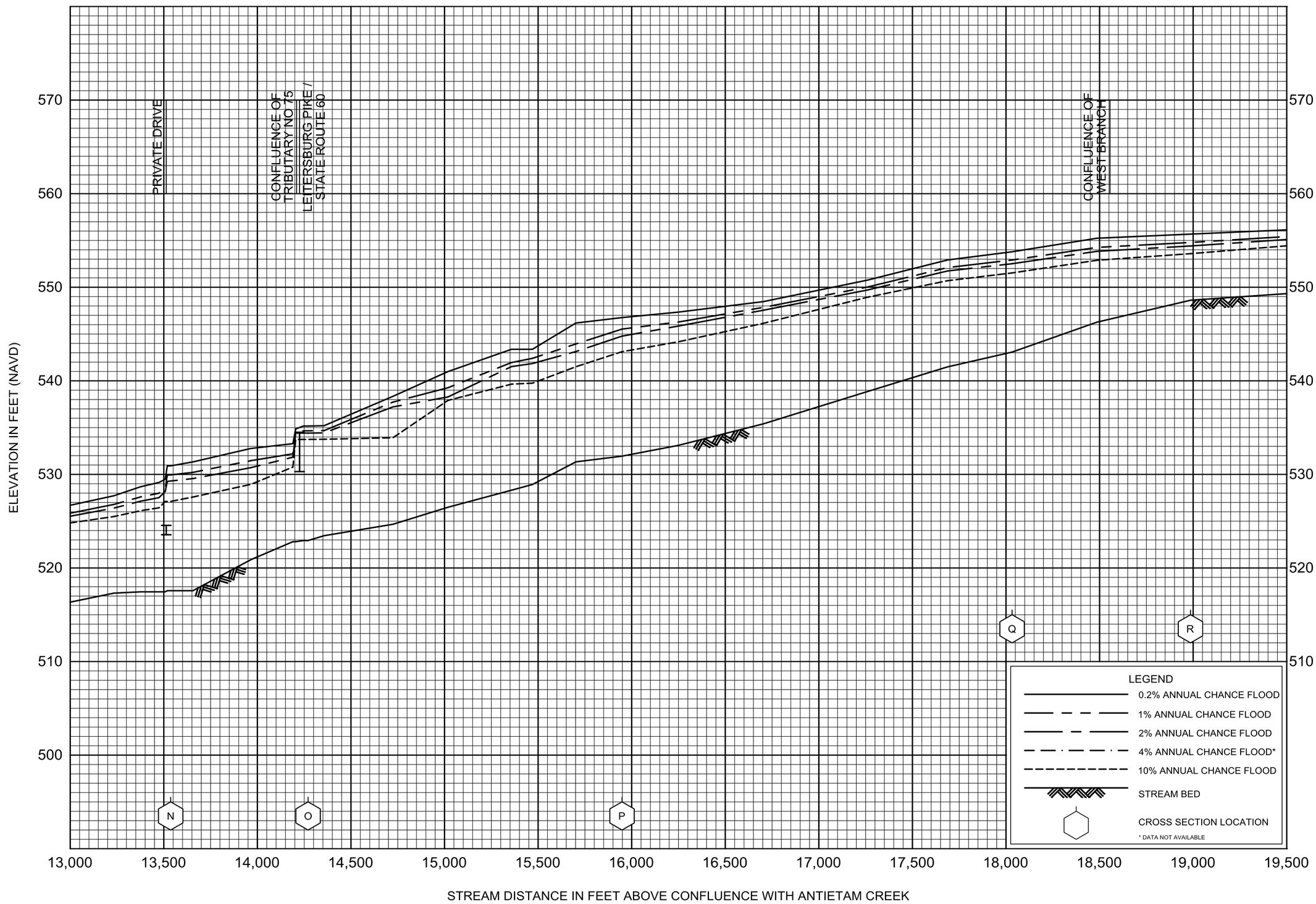
FLOOD PROFILES

MARSH RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



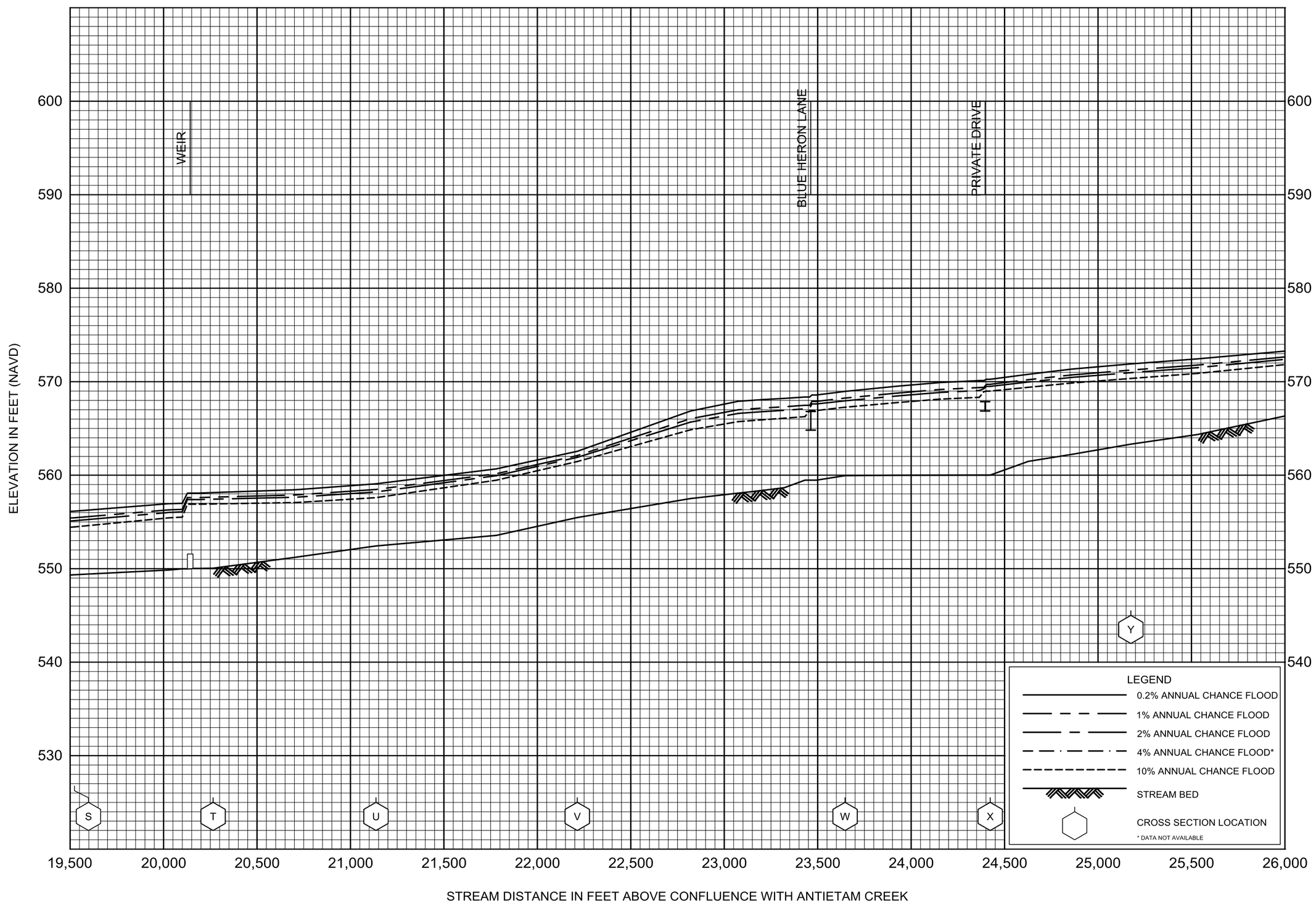
FLOOD PROFILES

MARSH RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



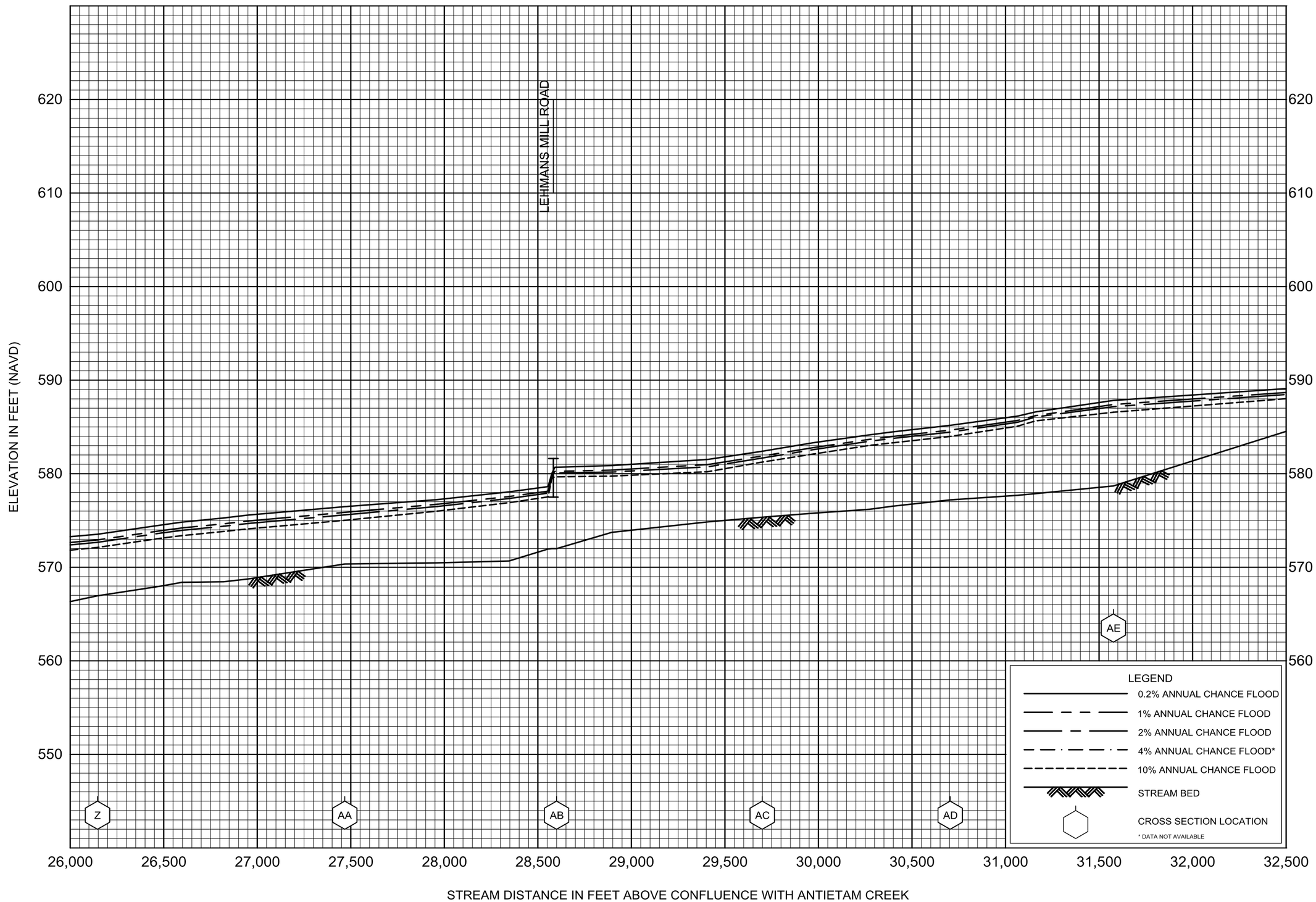
FLOOD PROFILES

MARSH RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



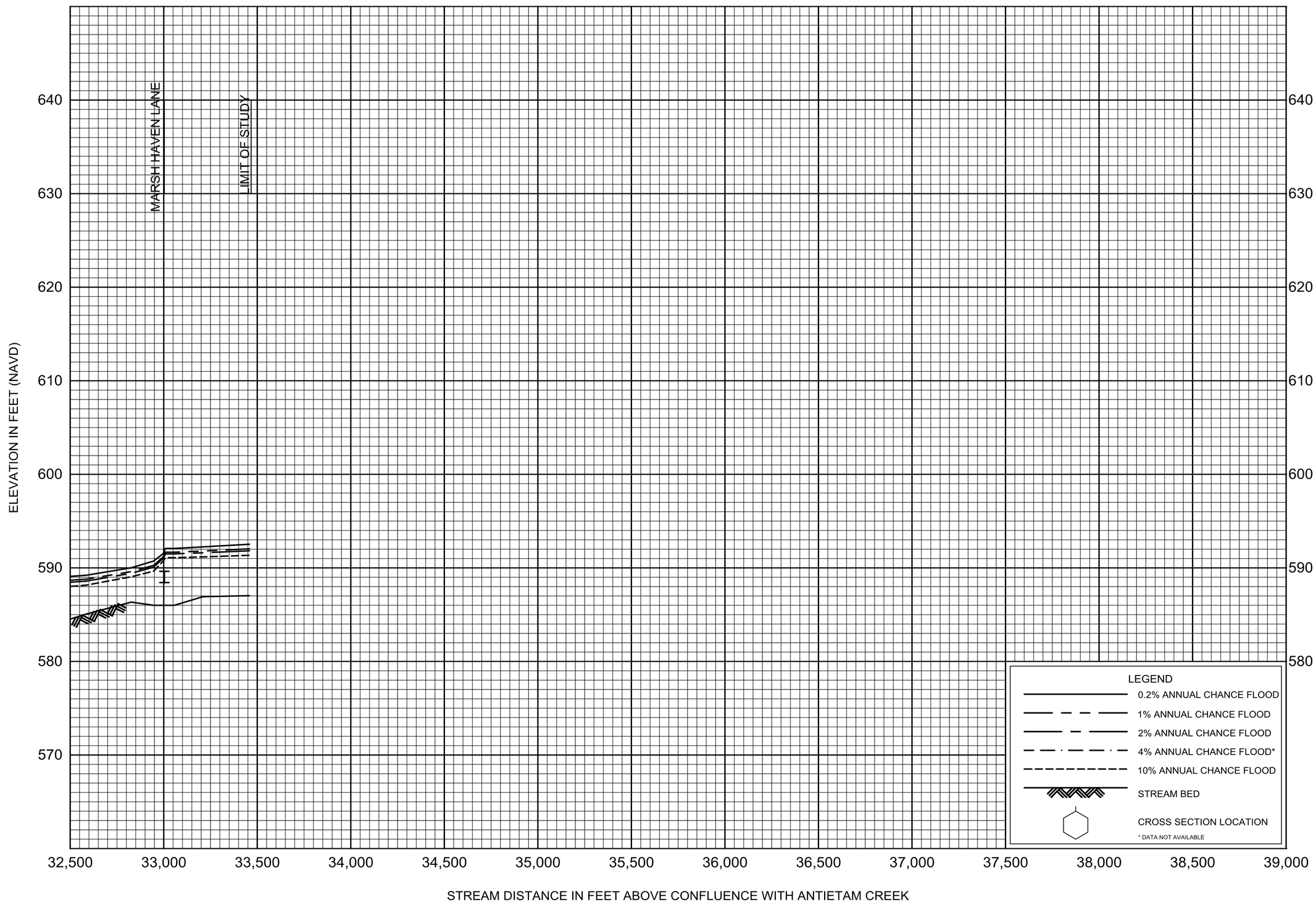
FLOOD PROFILES

MARSH RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



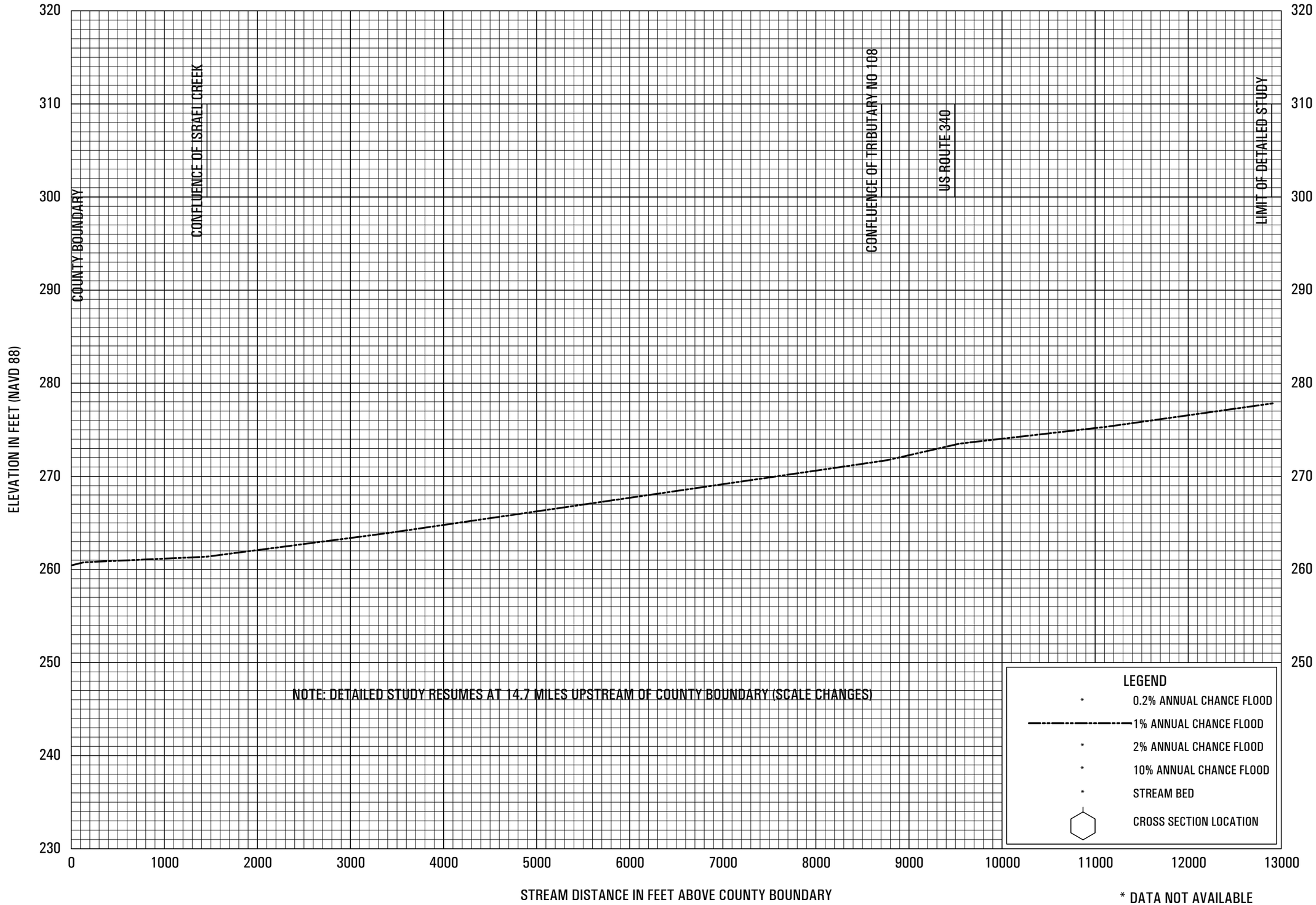
FLOOD PROFILES

MARSH RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



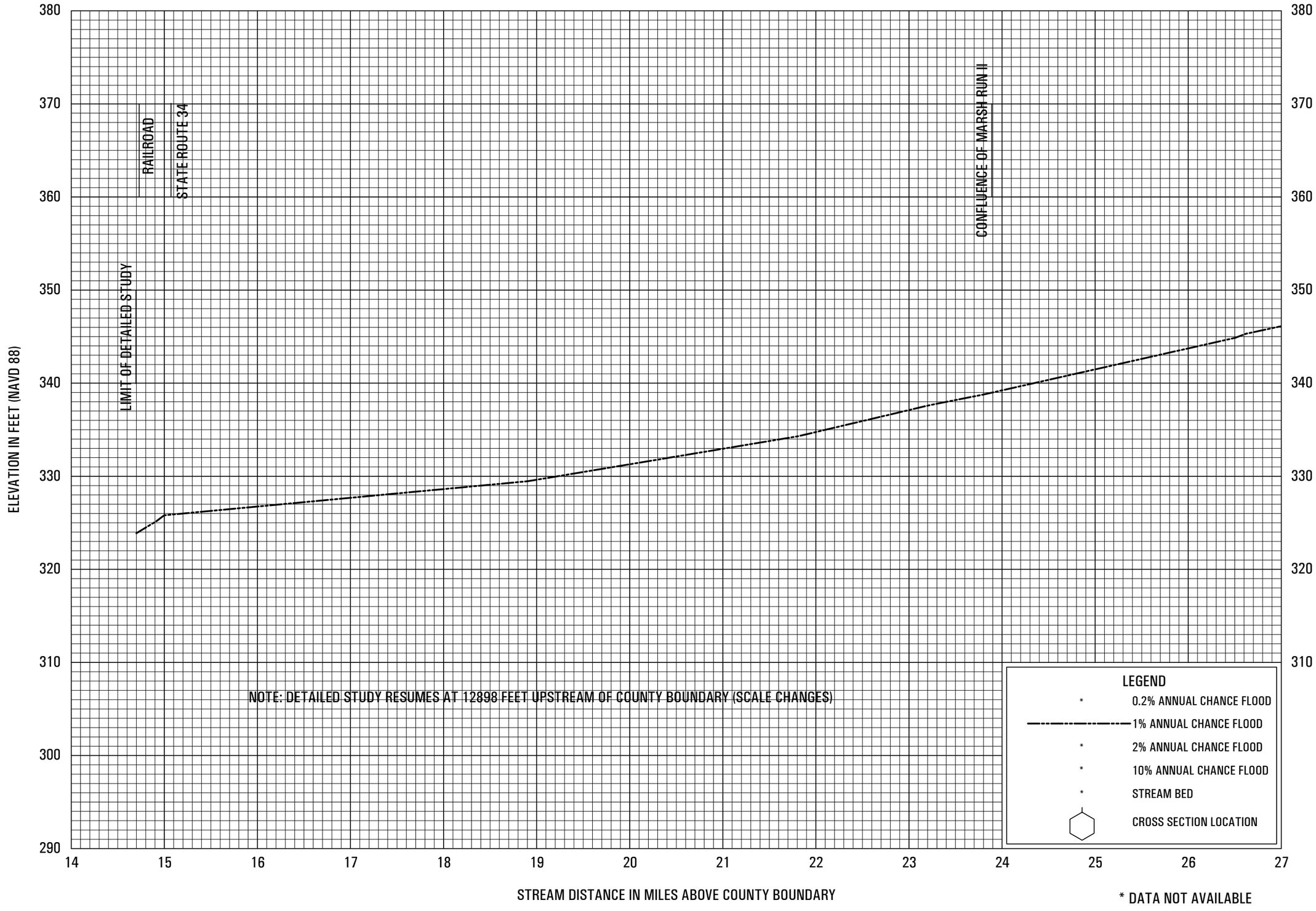
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



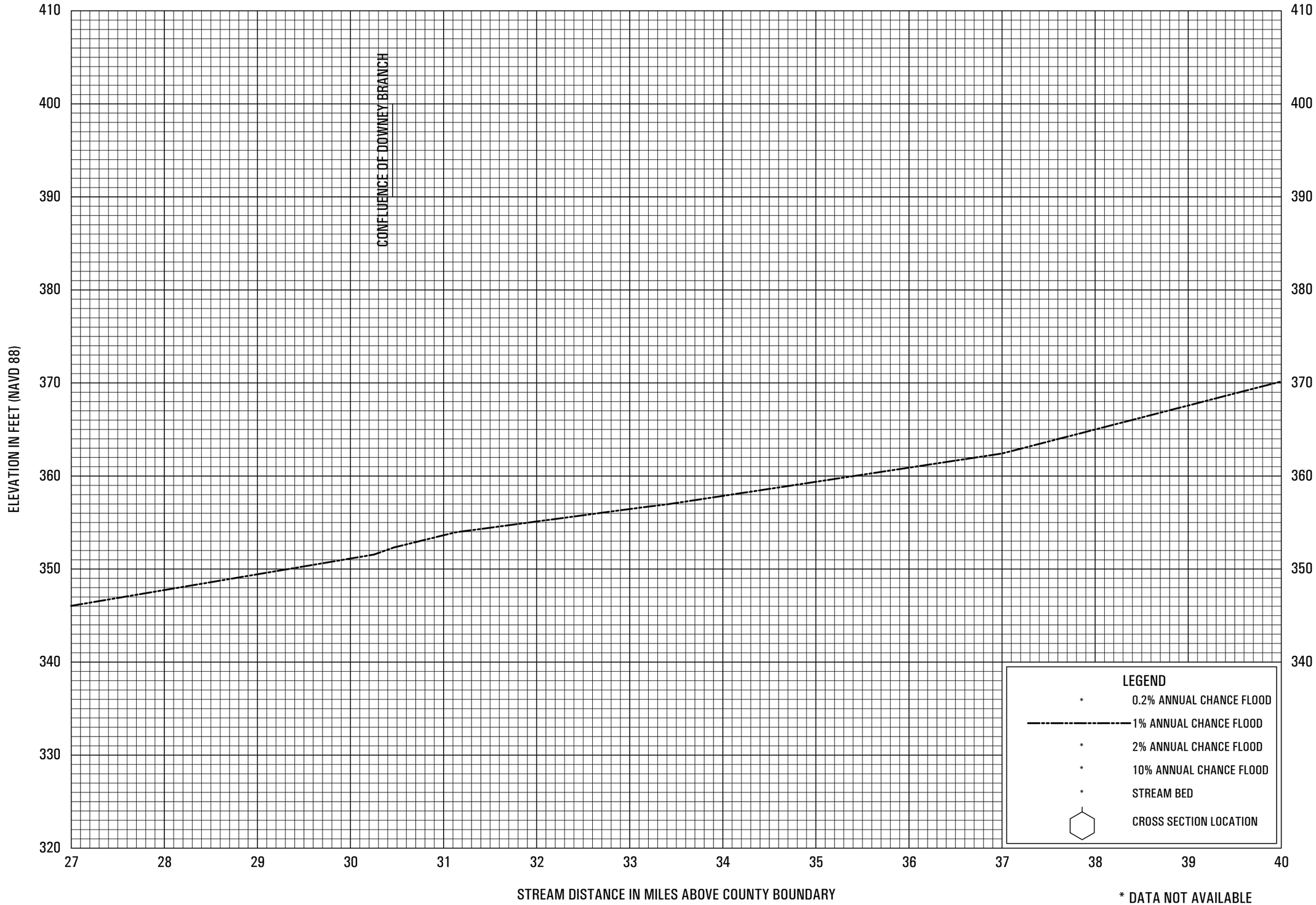
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



* DATA NOT AVAILABLE

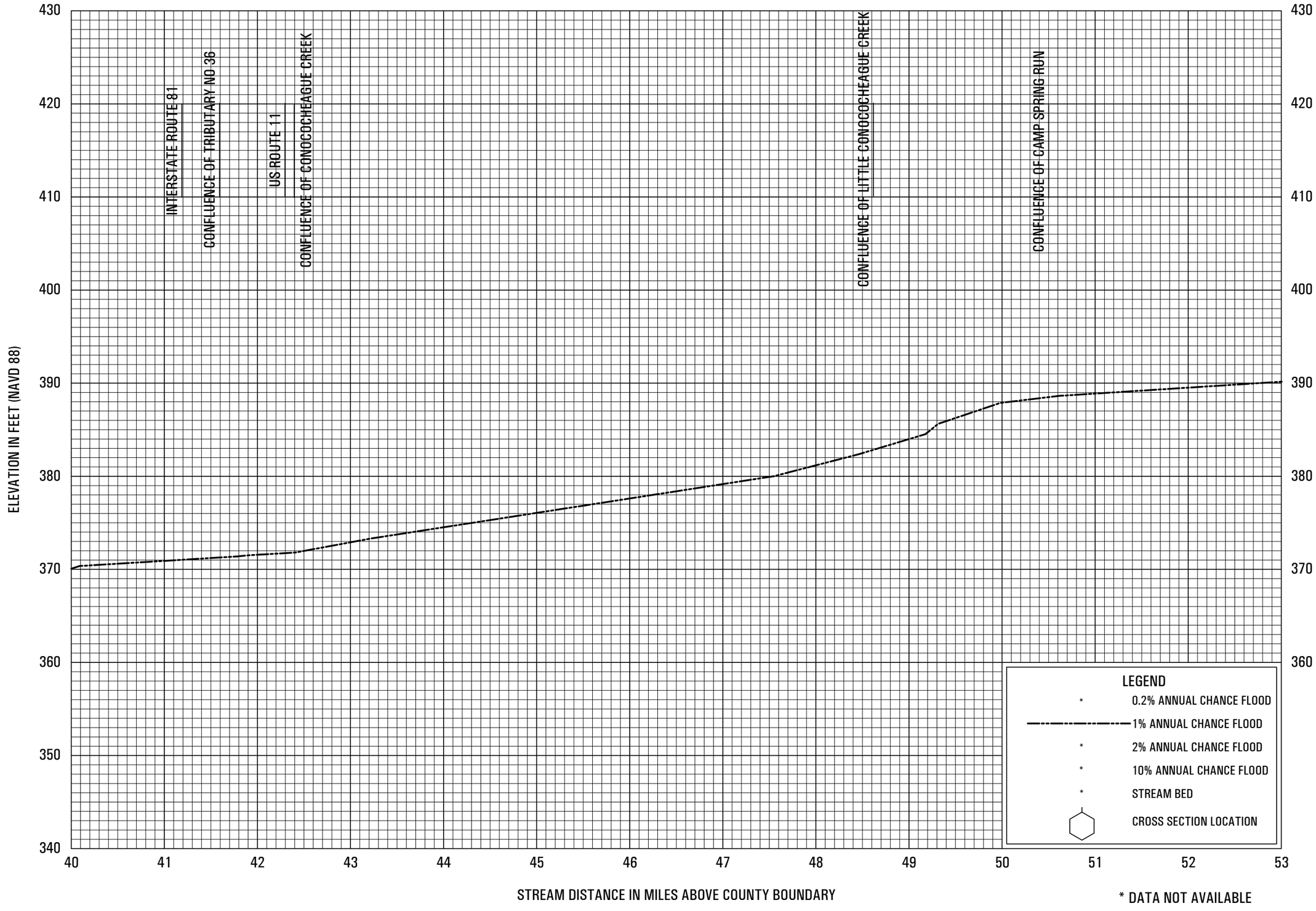
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



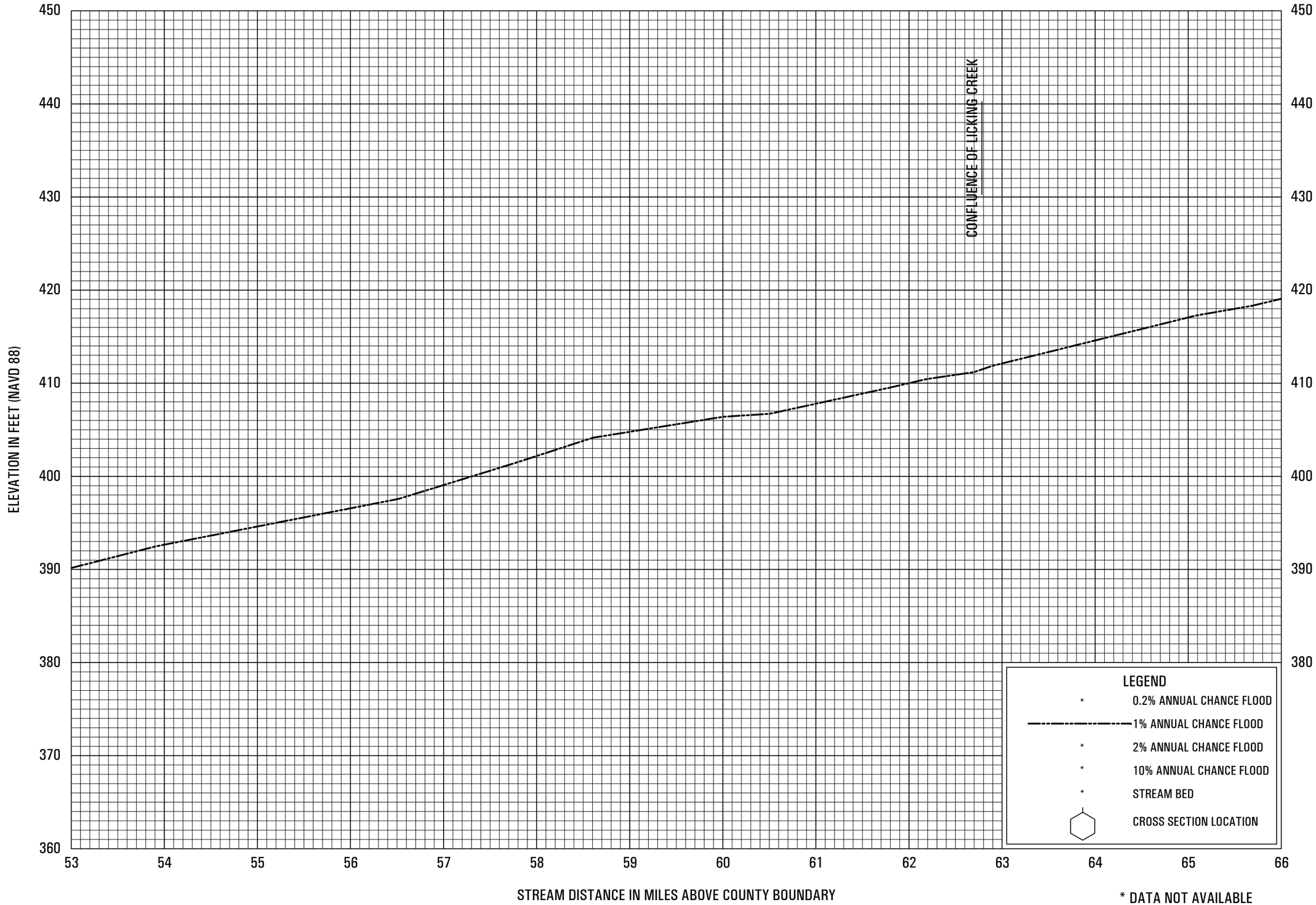
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



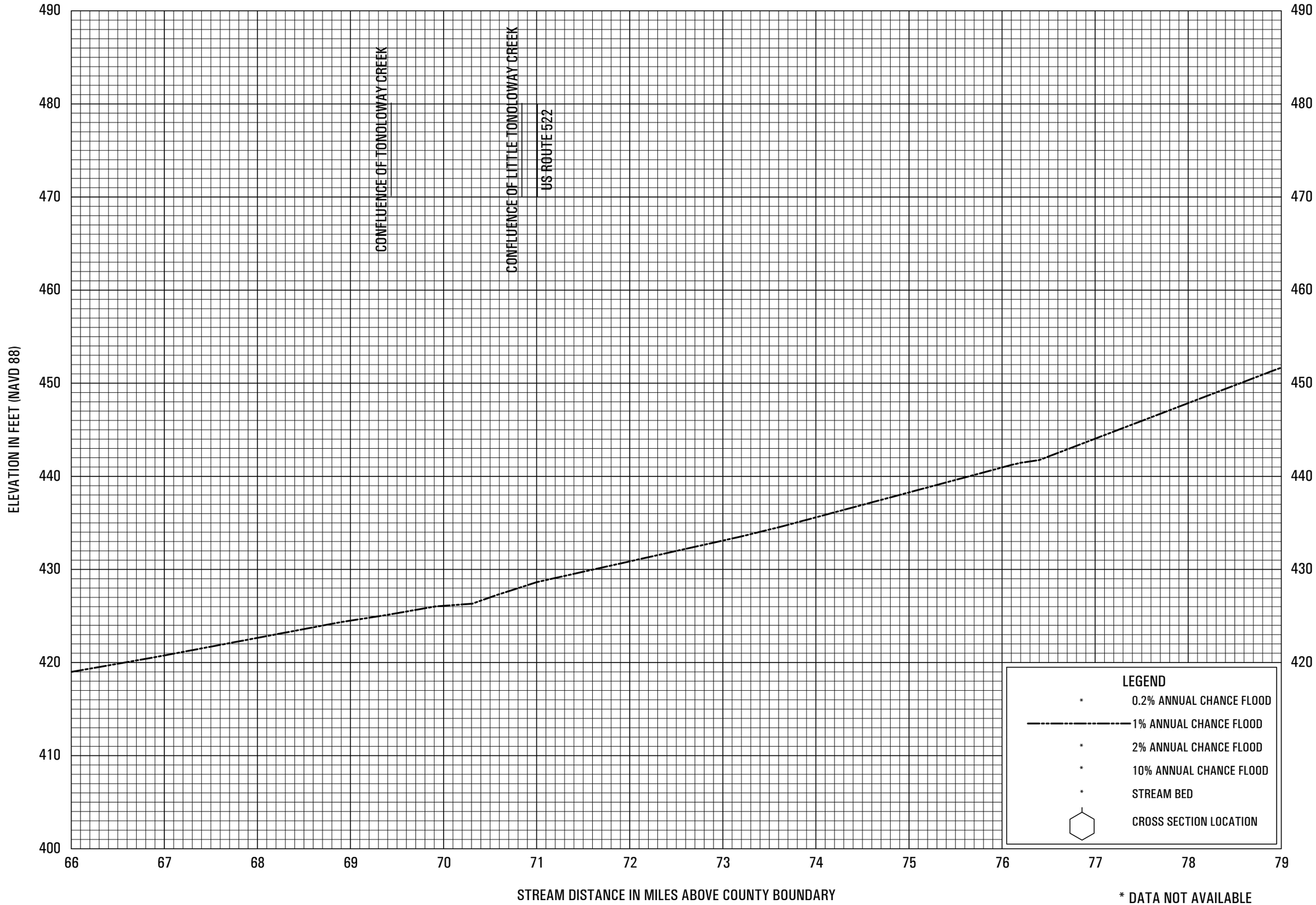
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



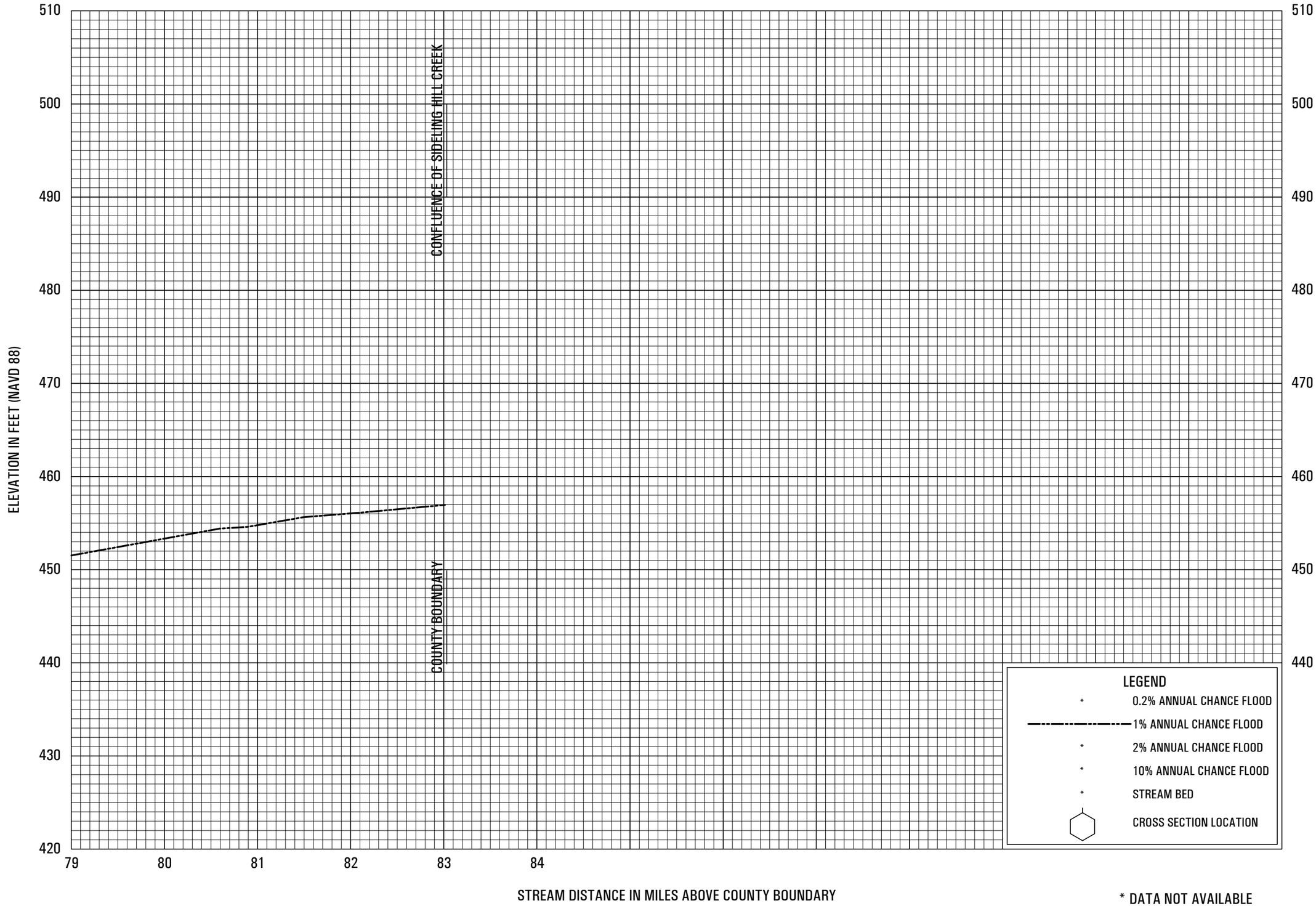
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



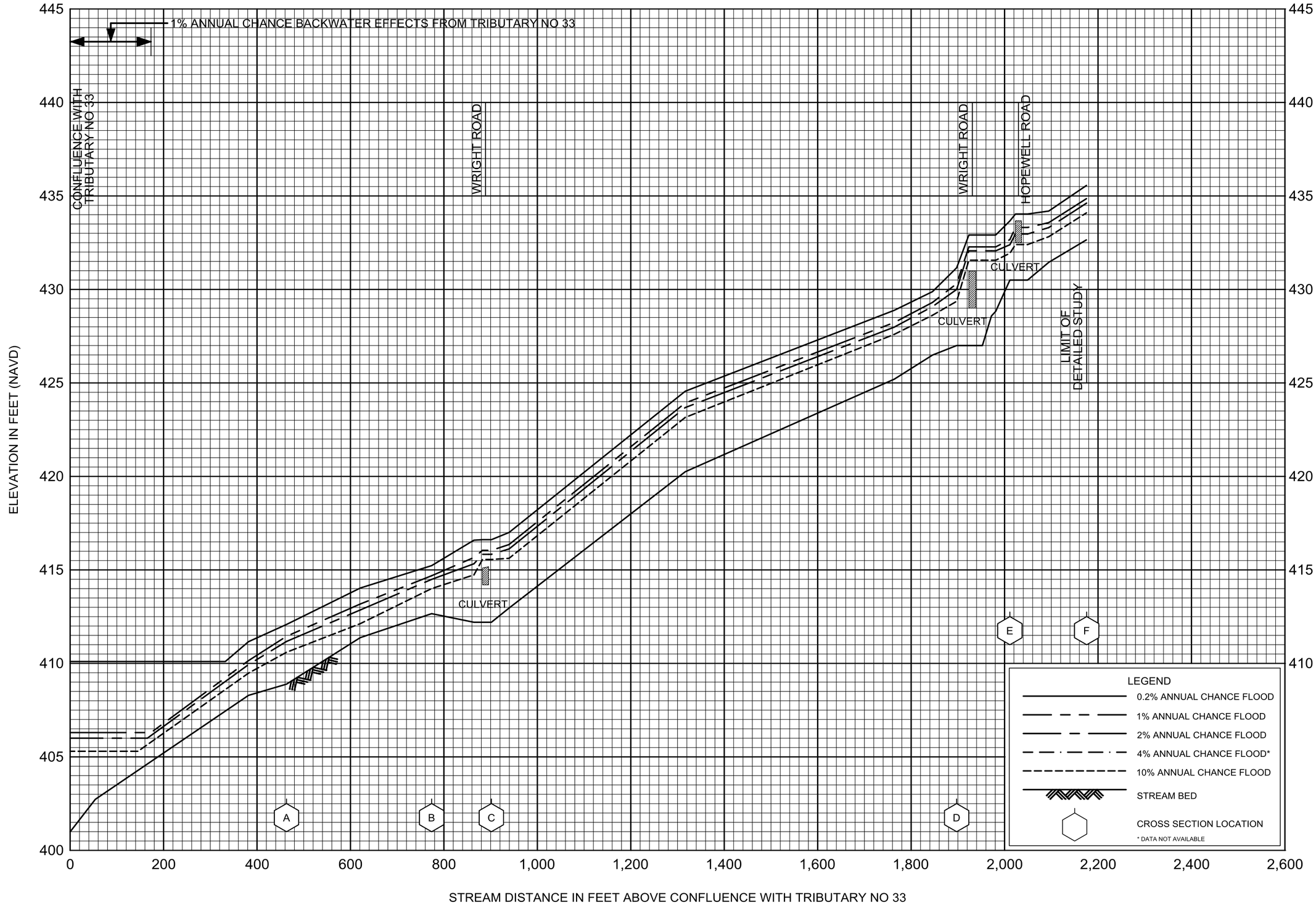
FLOOD PROFILES

POTOMAC RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



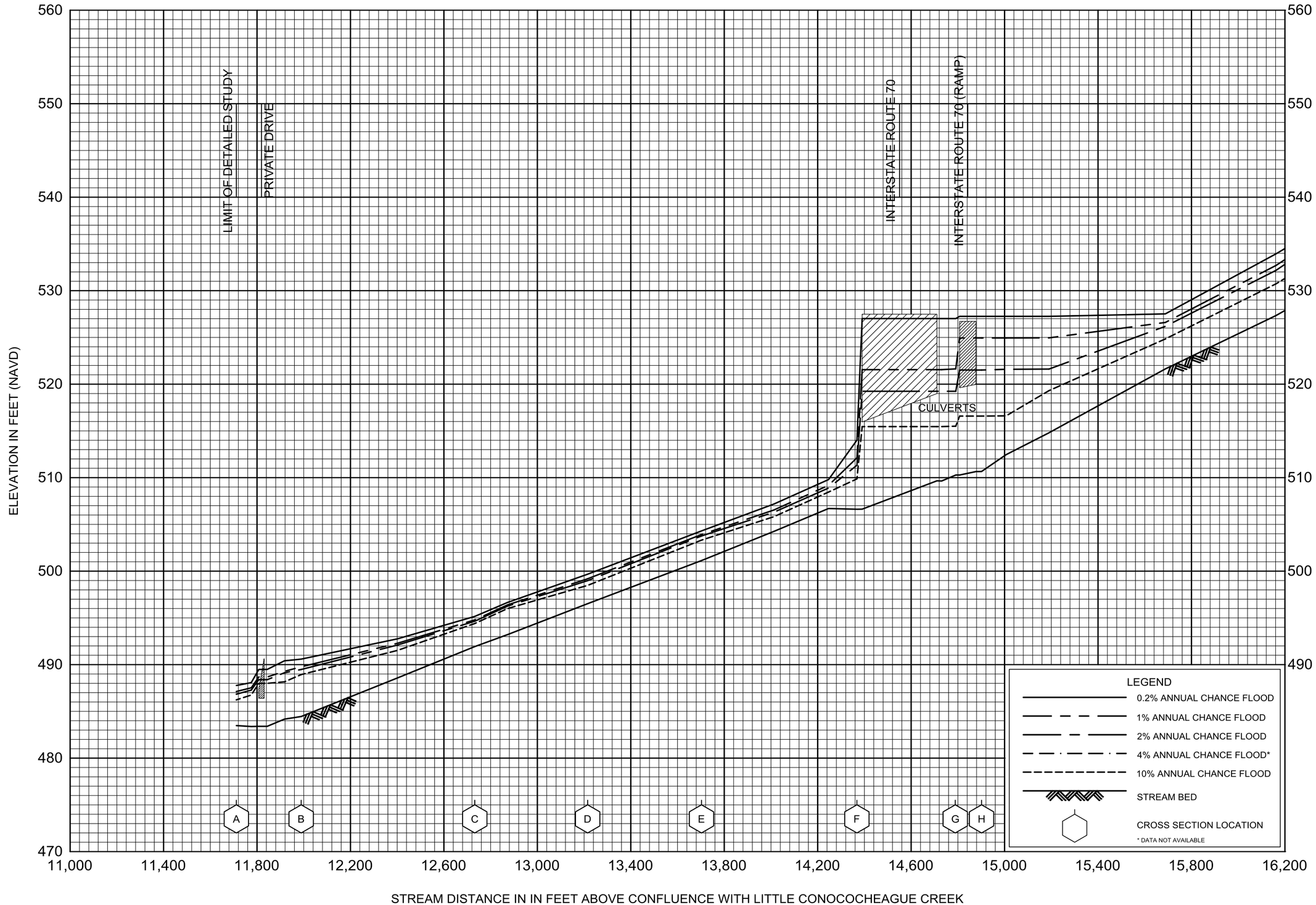
FLOOD PROFILES

SEMPLE RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



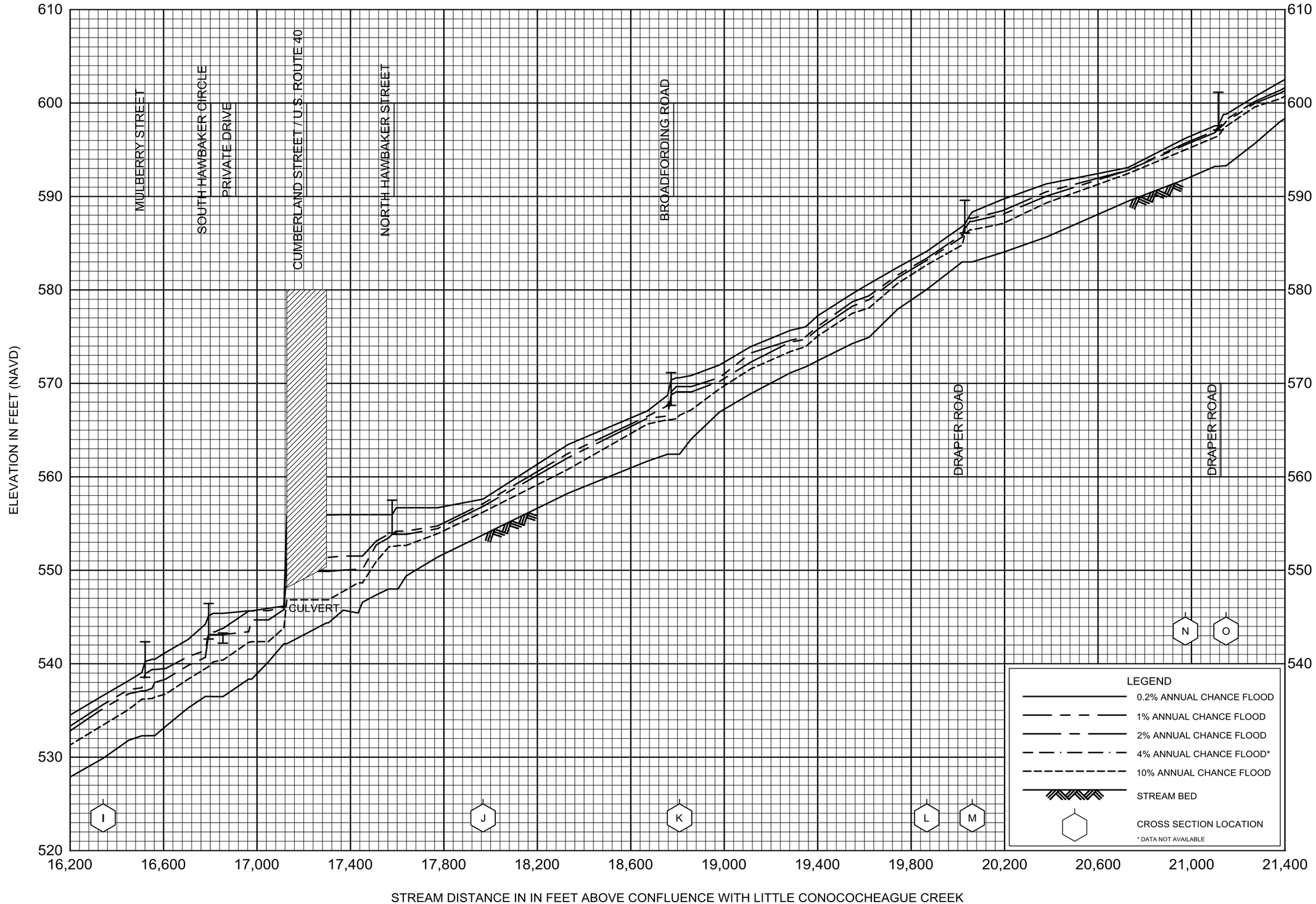
FLOOD PROFILES

TOMS RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



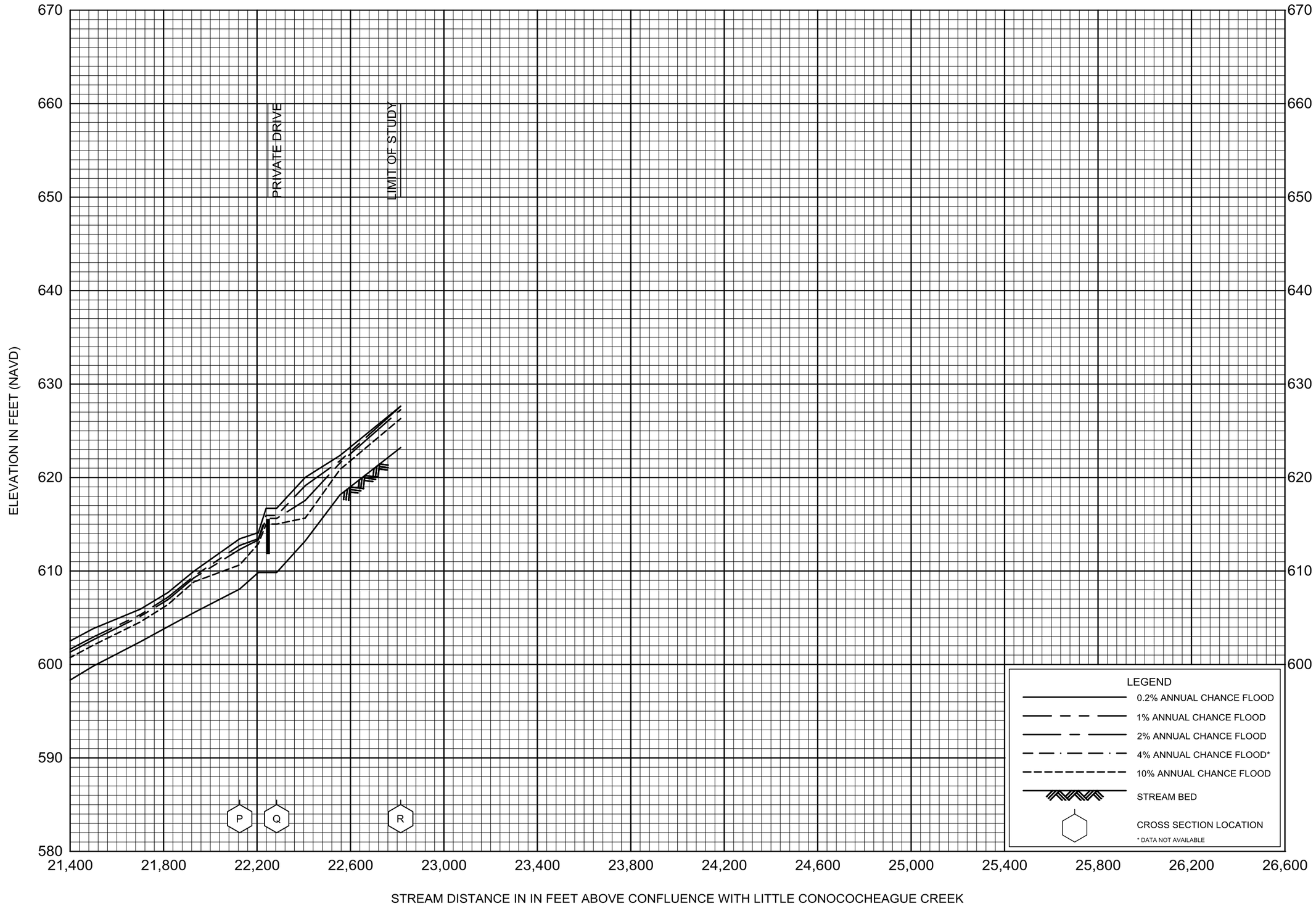
FLOOD PROFILES

TOMS RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



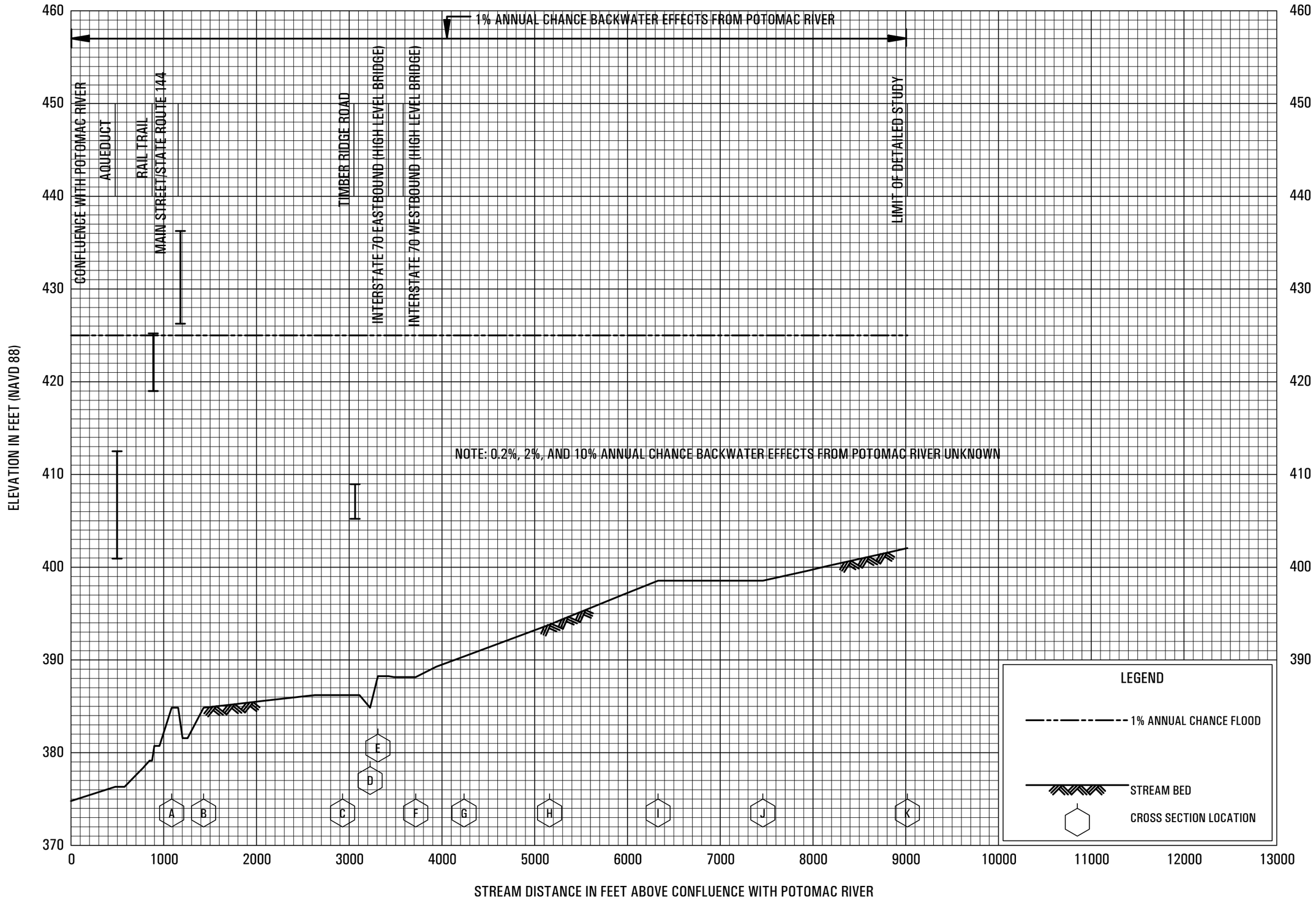
FLOOD PROFILES

TOMS RUN I

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



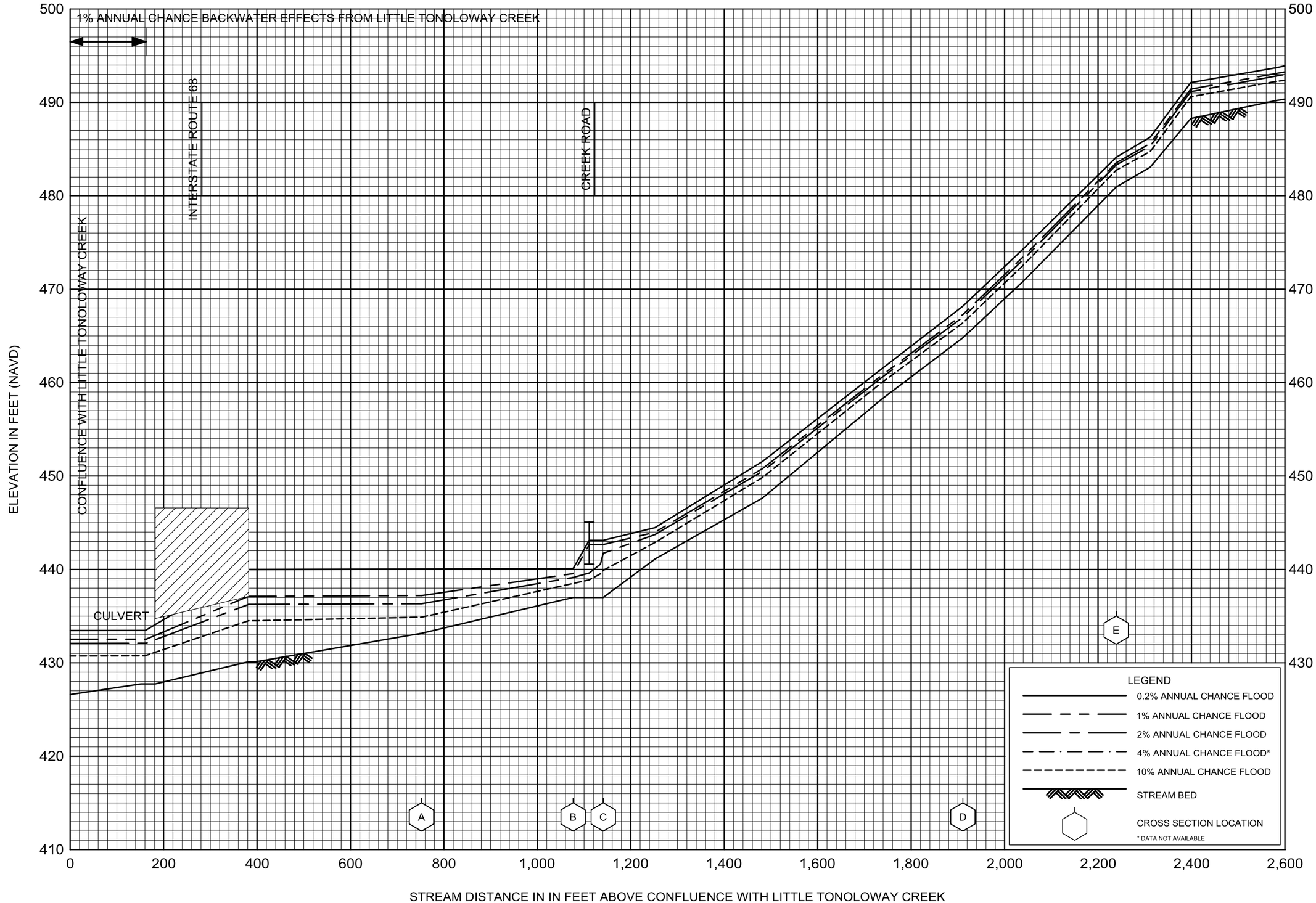
FLOOD PROFILES

TONOLOWAY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



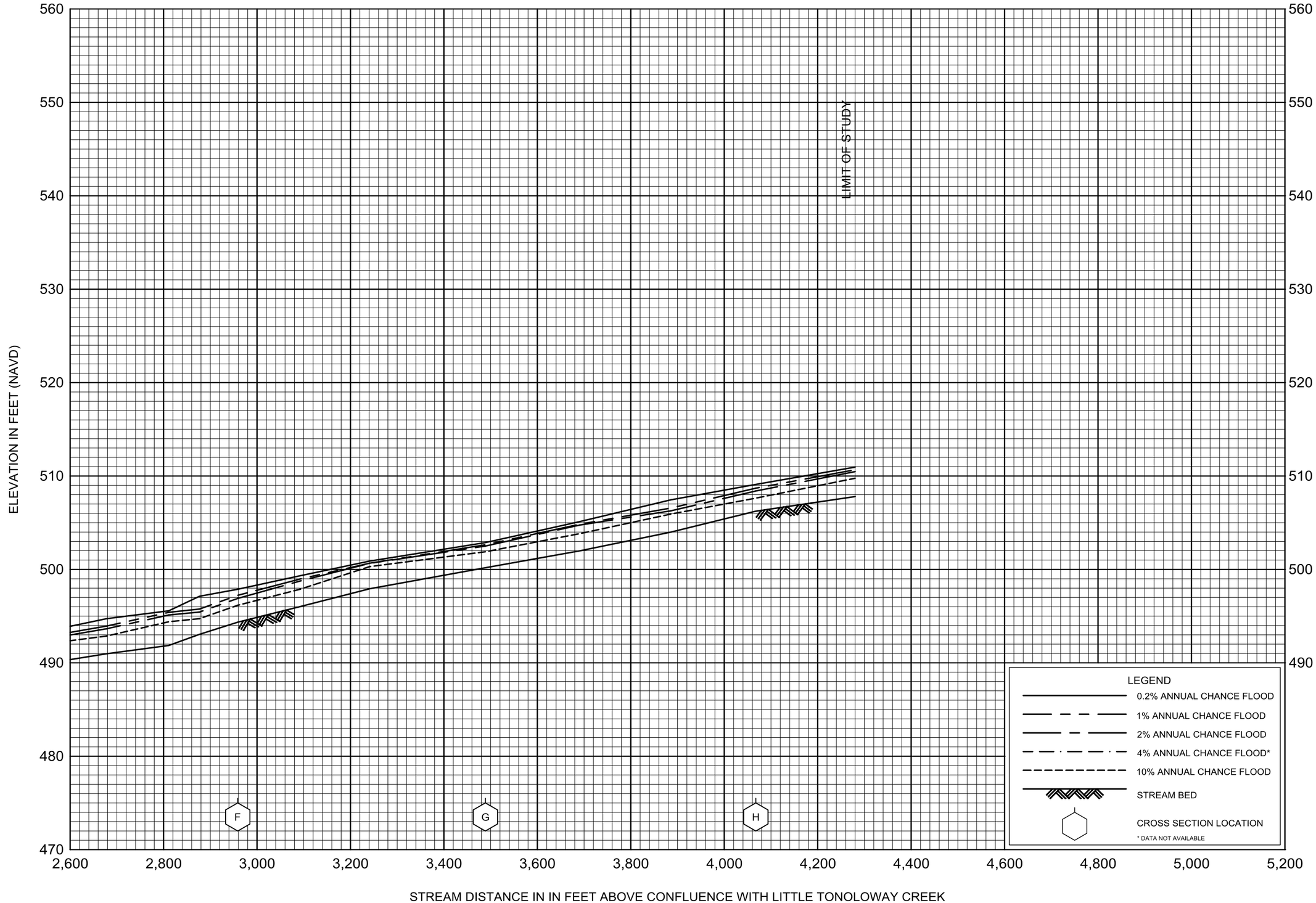
FLOOD PROFILES

TRIBUTARY NO 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



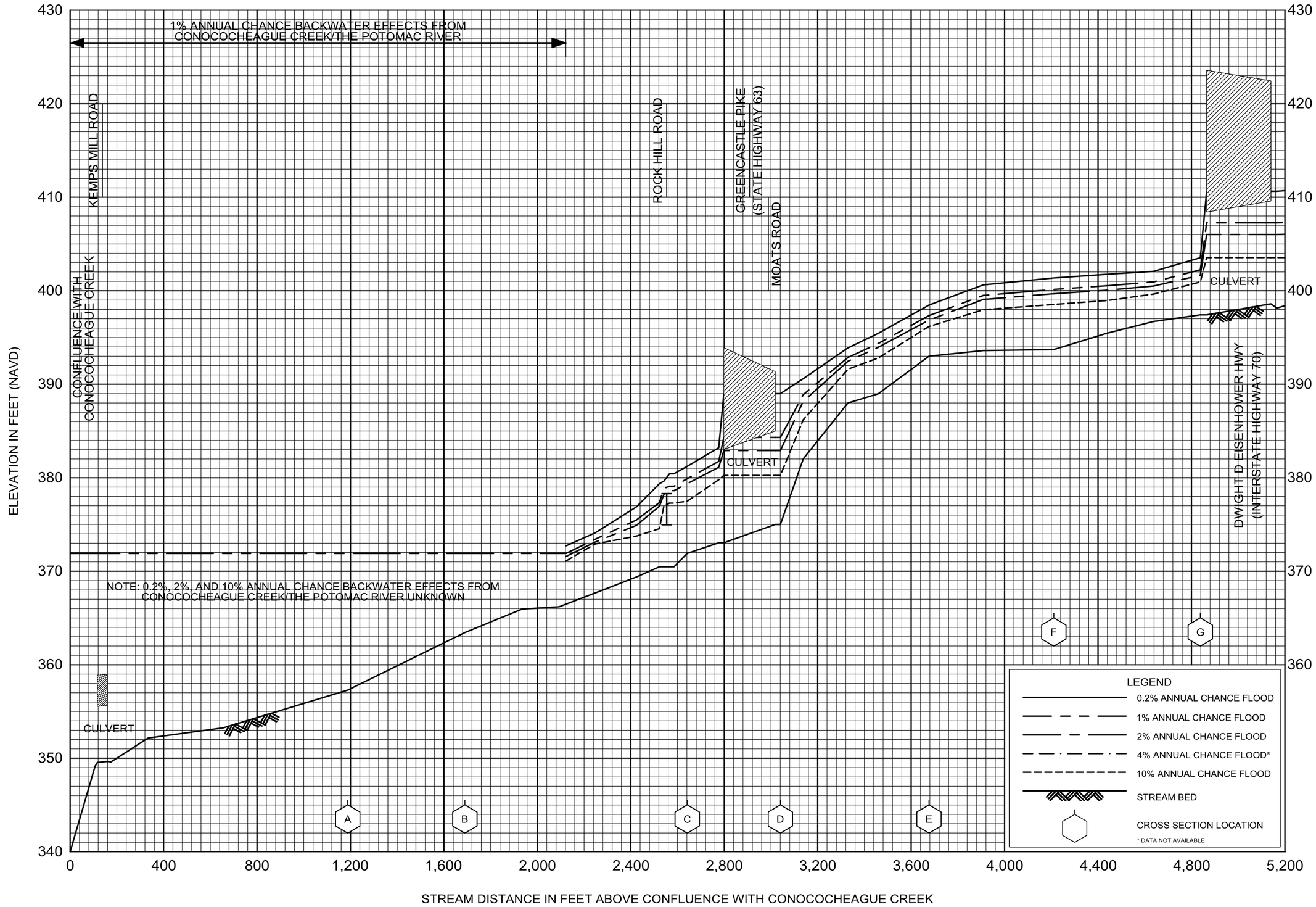
FLOOD PROFILES

TRIBUTARY NO 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



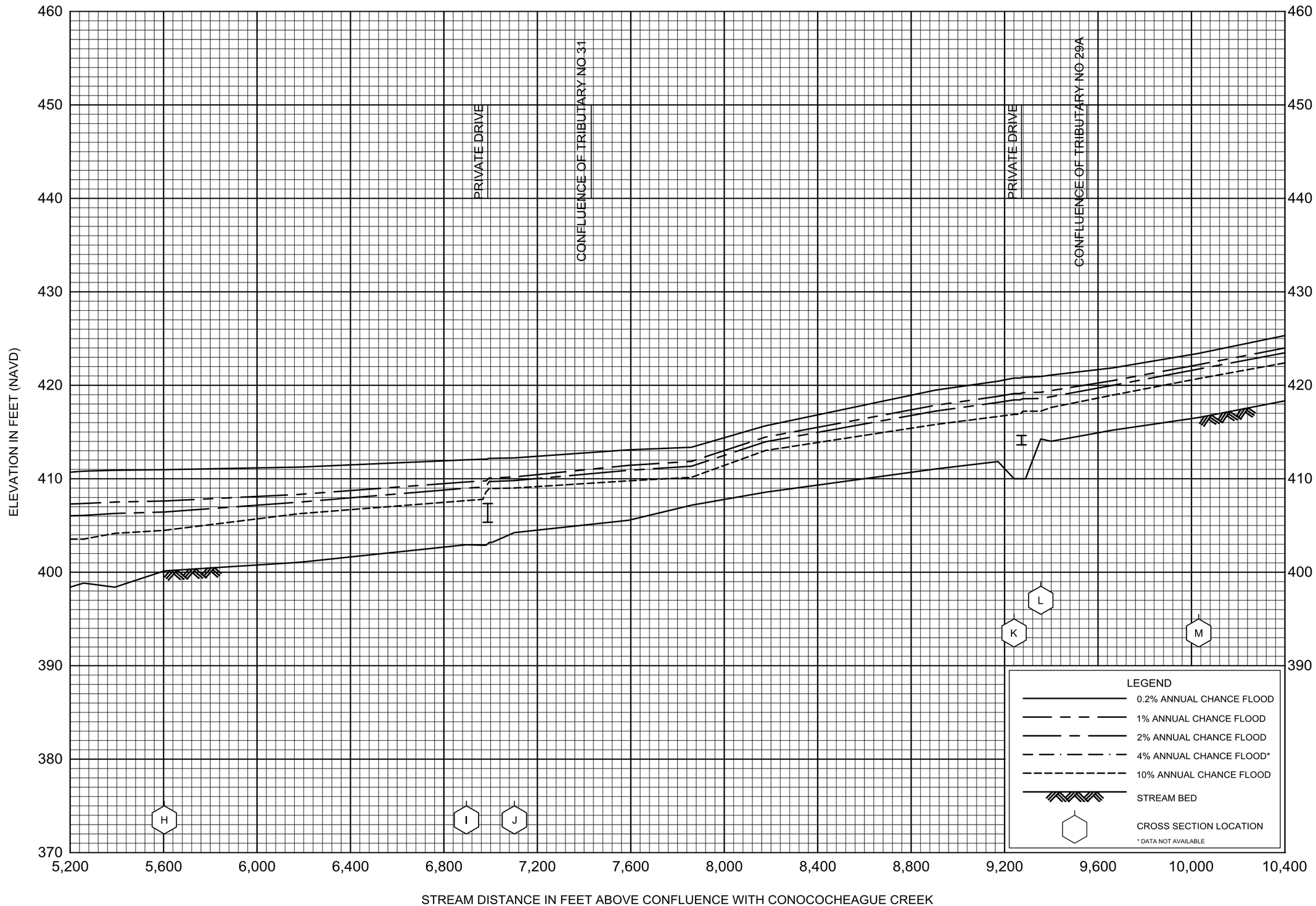
FLOOD PROFILES

TRIBUTARY NO 29

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



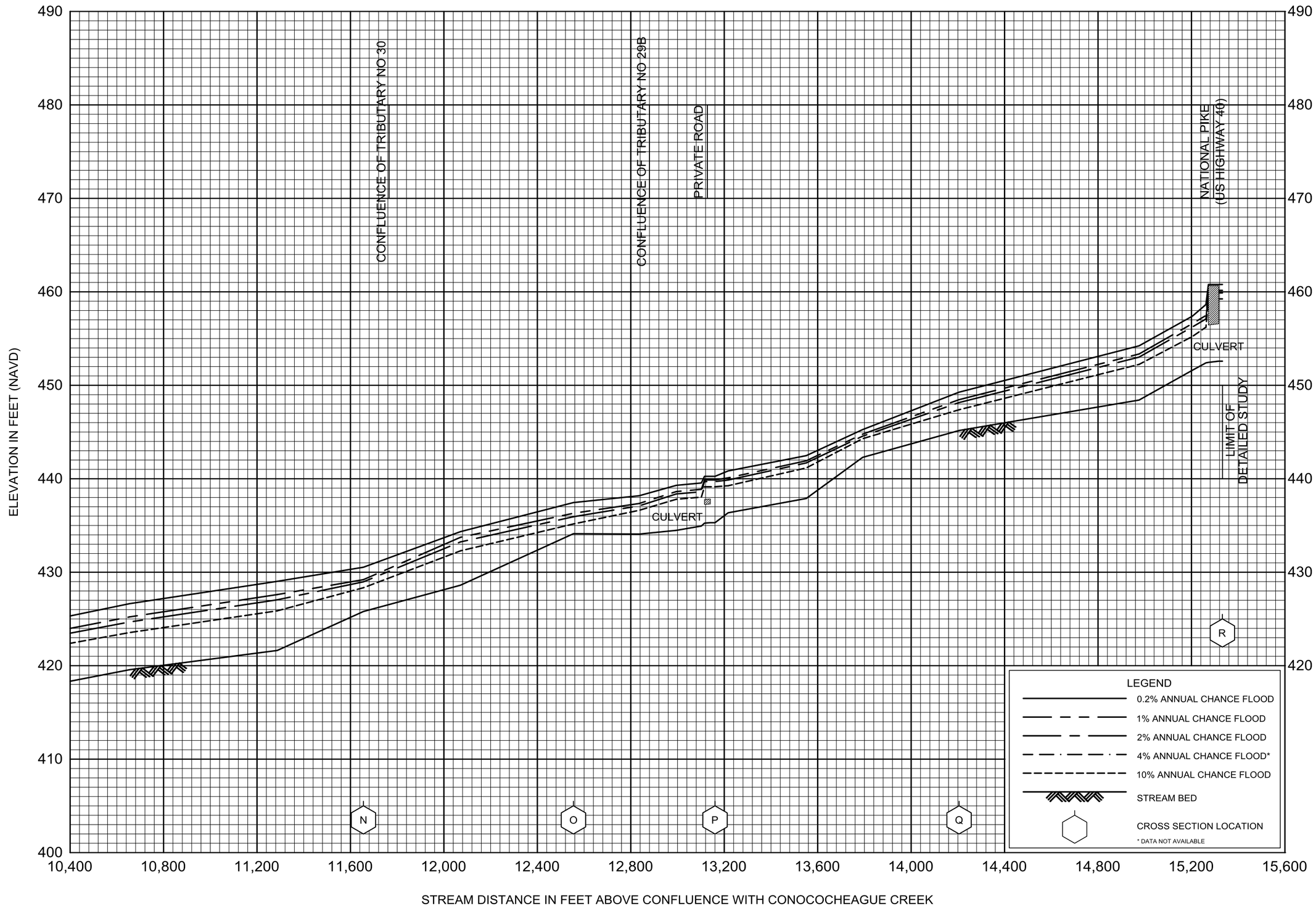
FLOOD PROFILES

TRIBUTARY NO 29

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



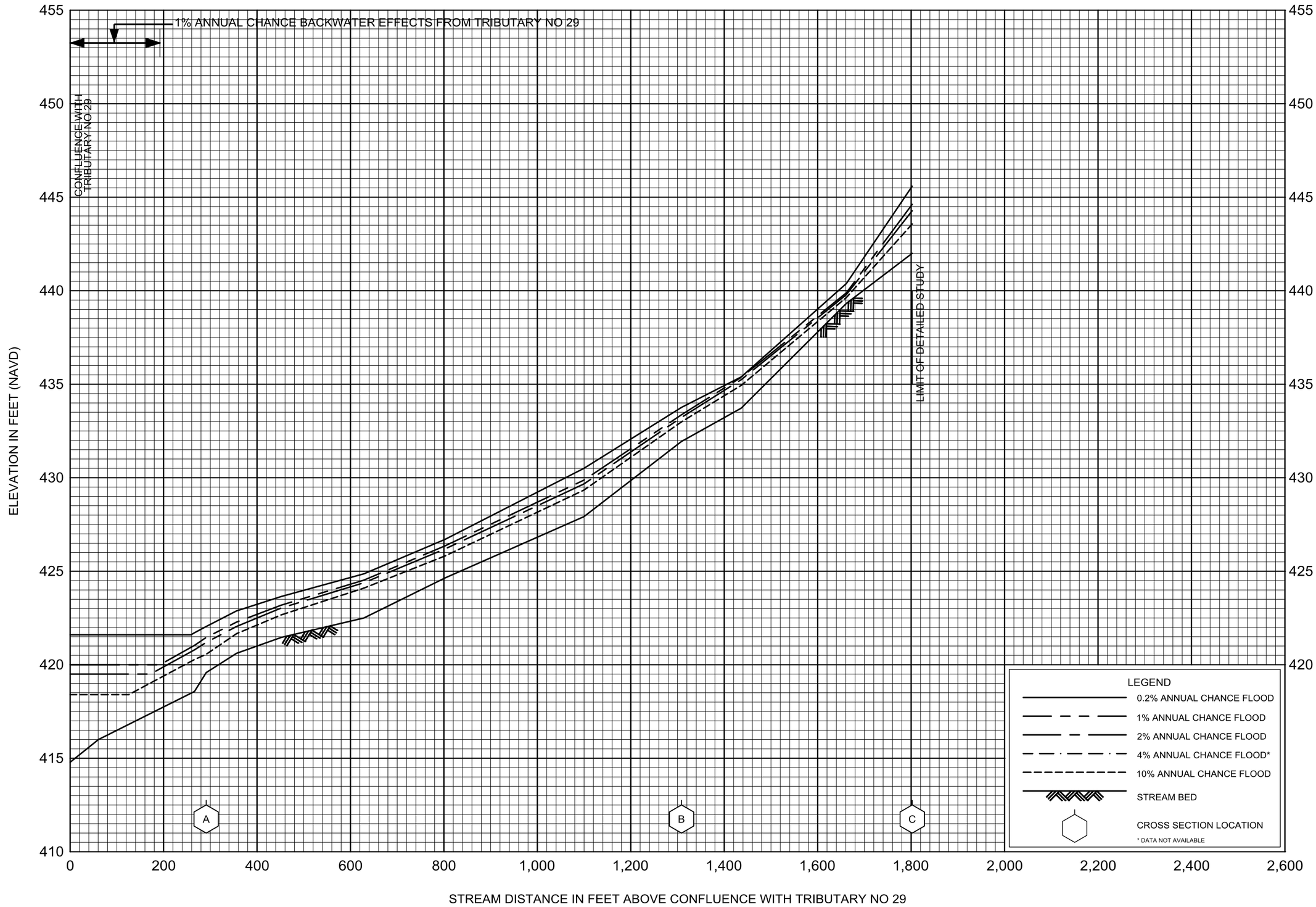
FLOOD PROFILES

TRIBUTARY NO 29

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



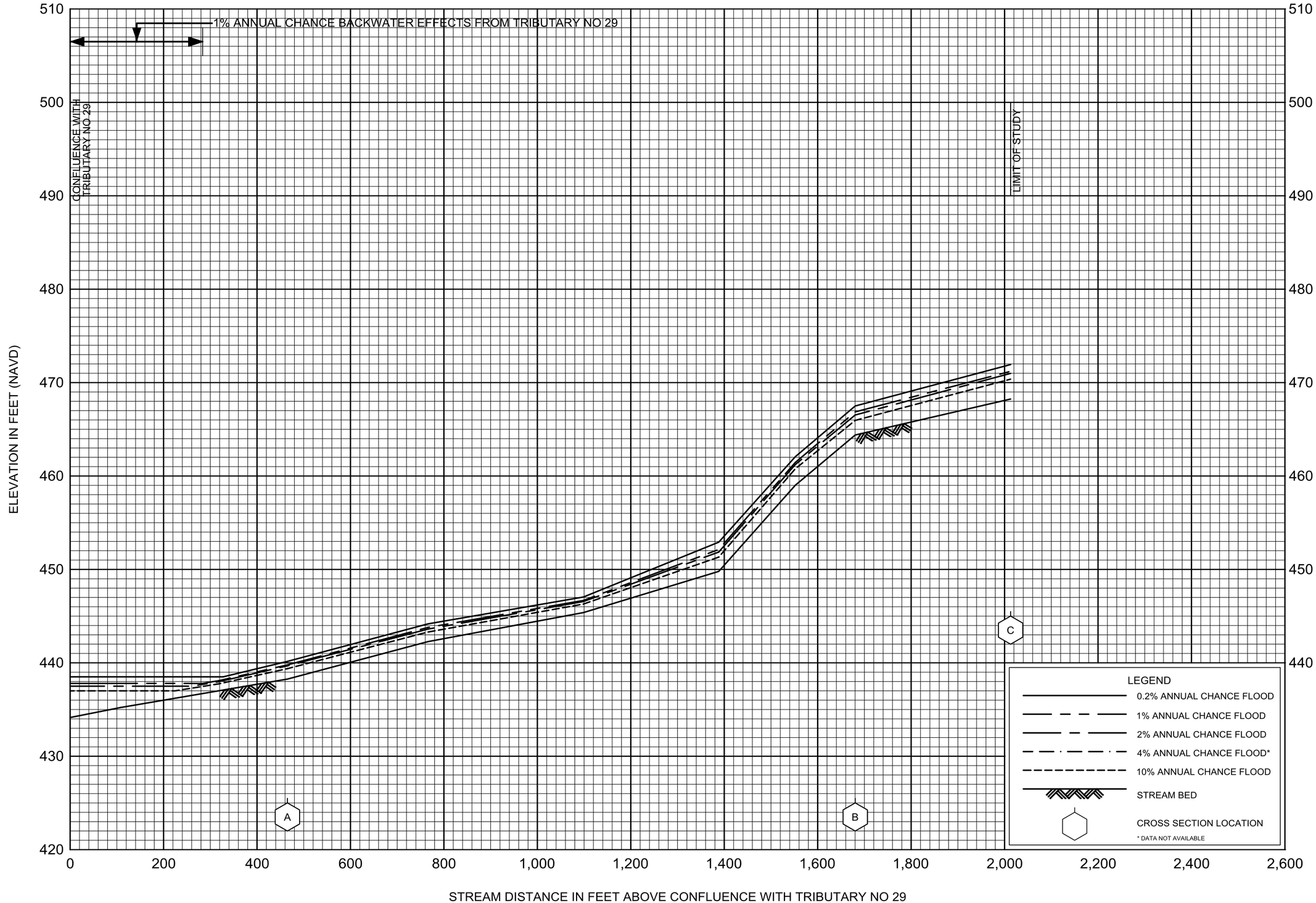
FLOOD PROFILES

TRIBUTARY NO 29A

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



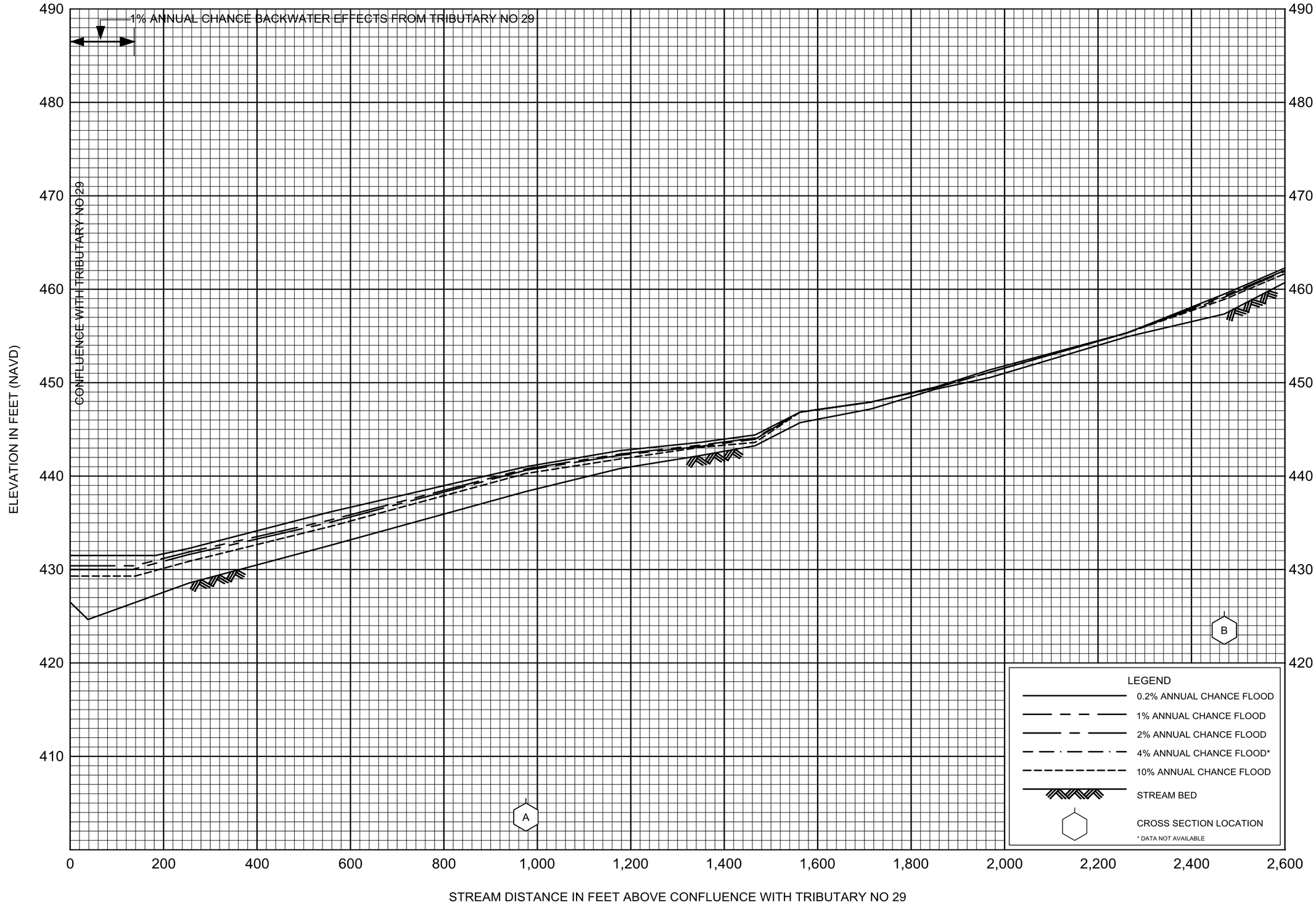
FLOOD PROFILES

TRIBUTARY NO 29B

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



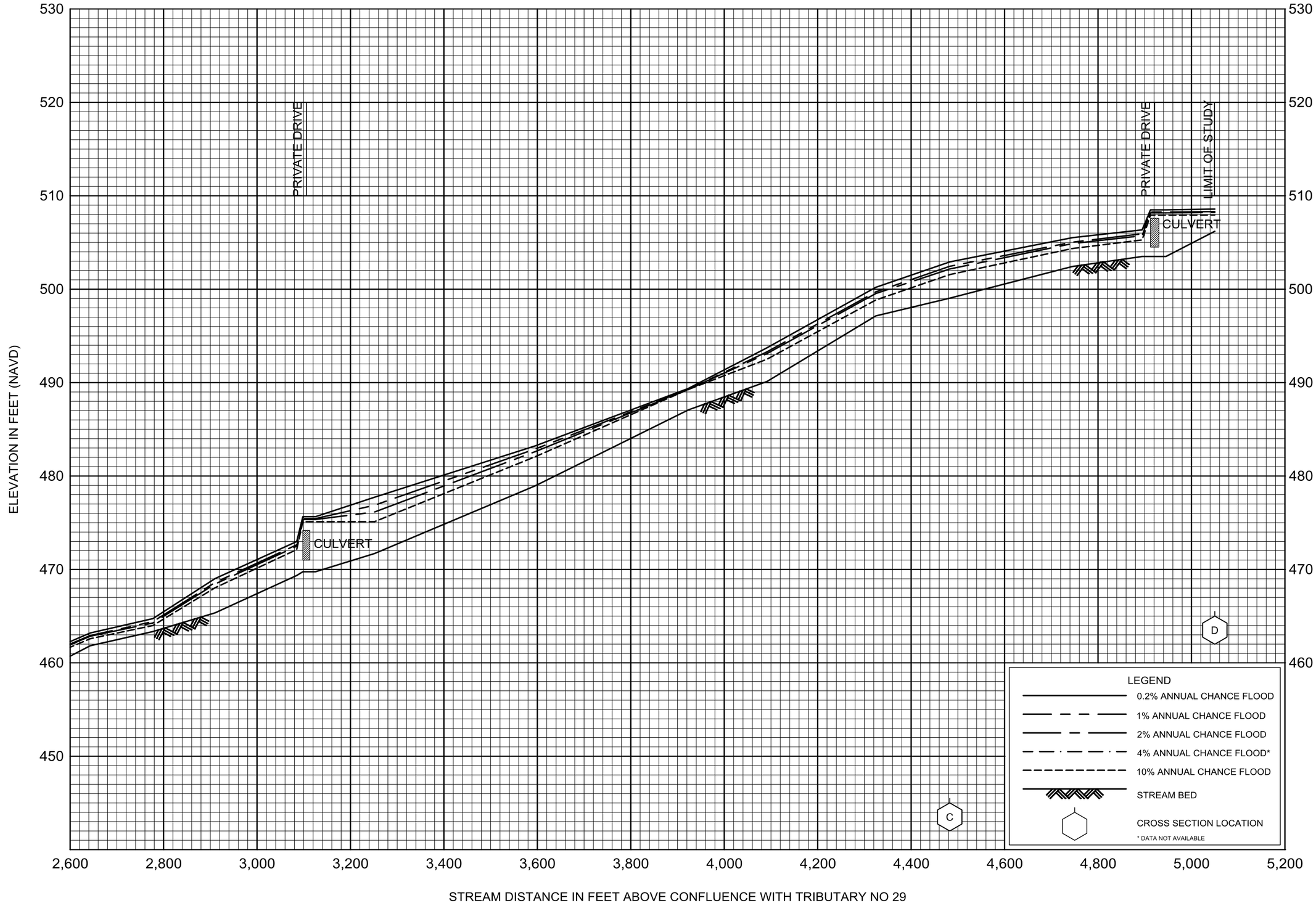
FLOOD PROFILES

TRIBUTARY NO 30

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



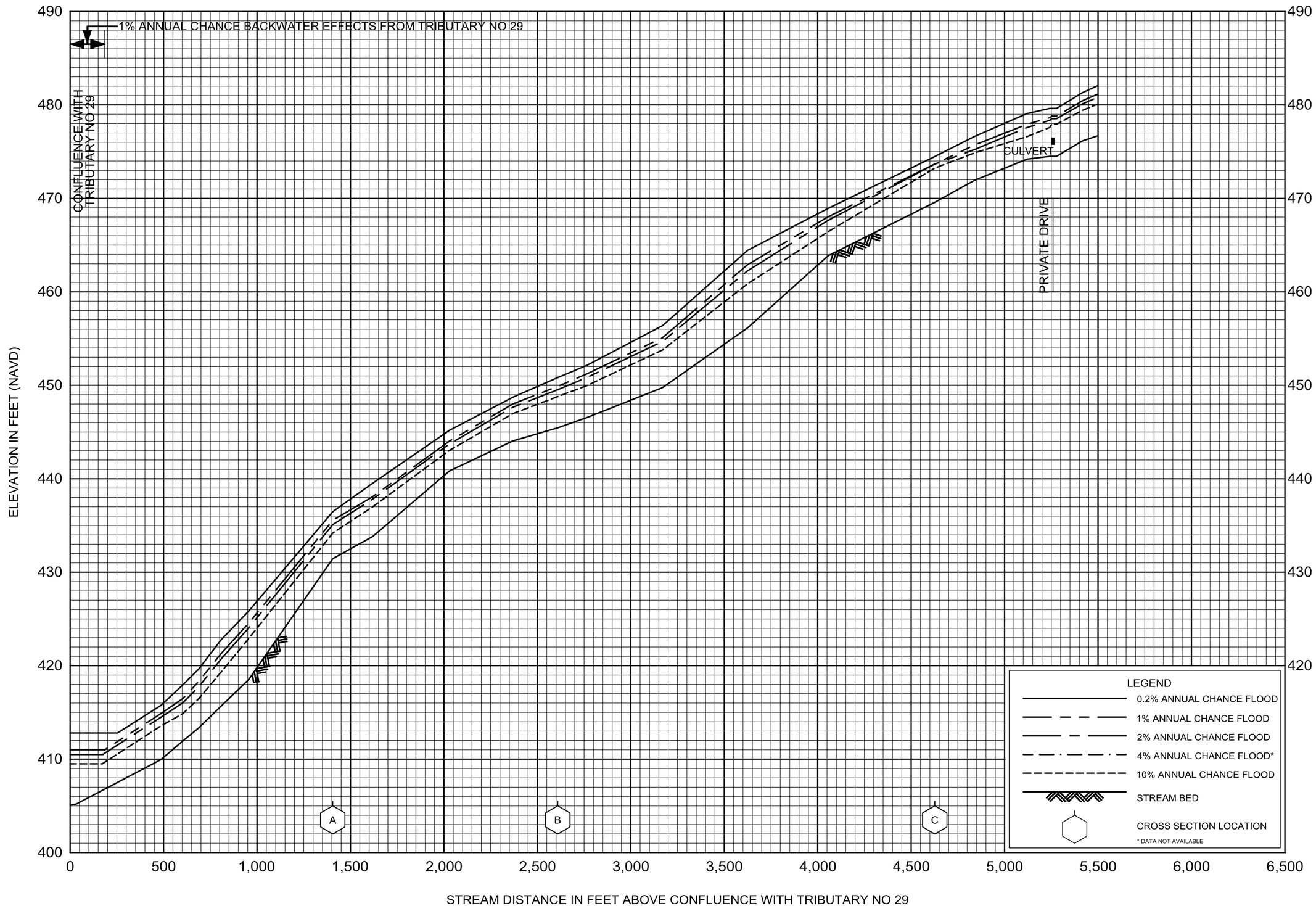
FLOOD PROFILES

TRIBUTARY NO 30

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



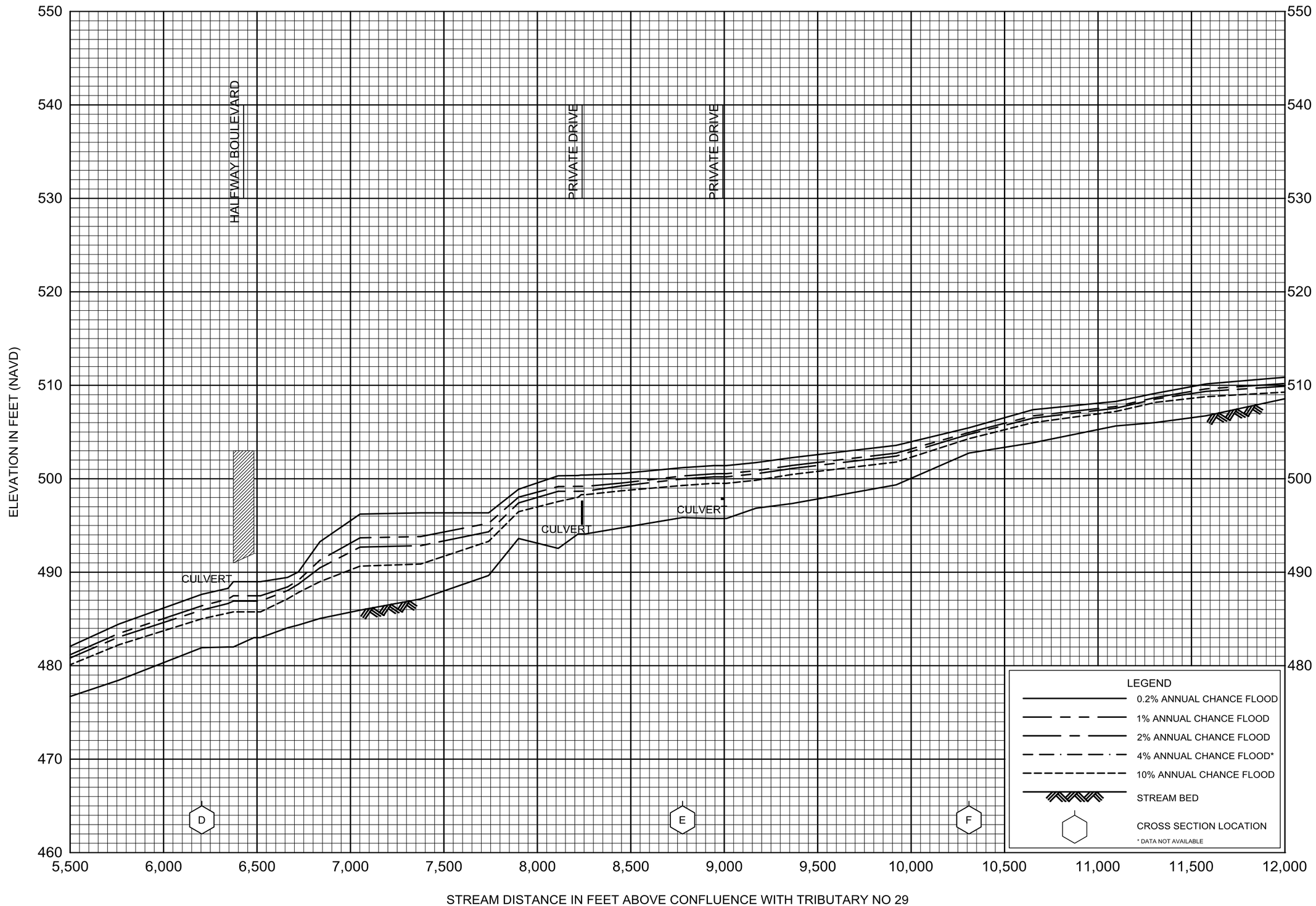
FLOOD PROFILES

TRIBUTARY NO 31

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



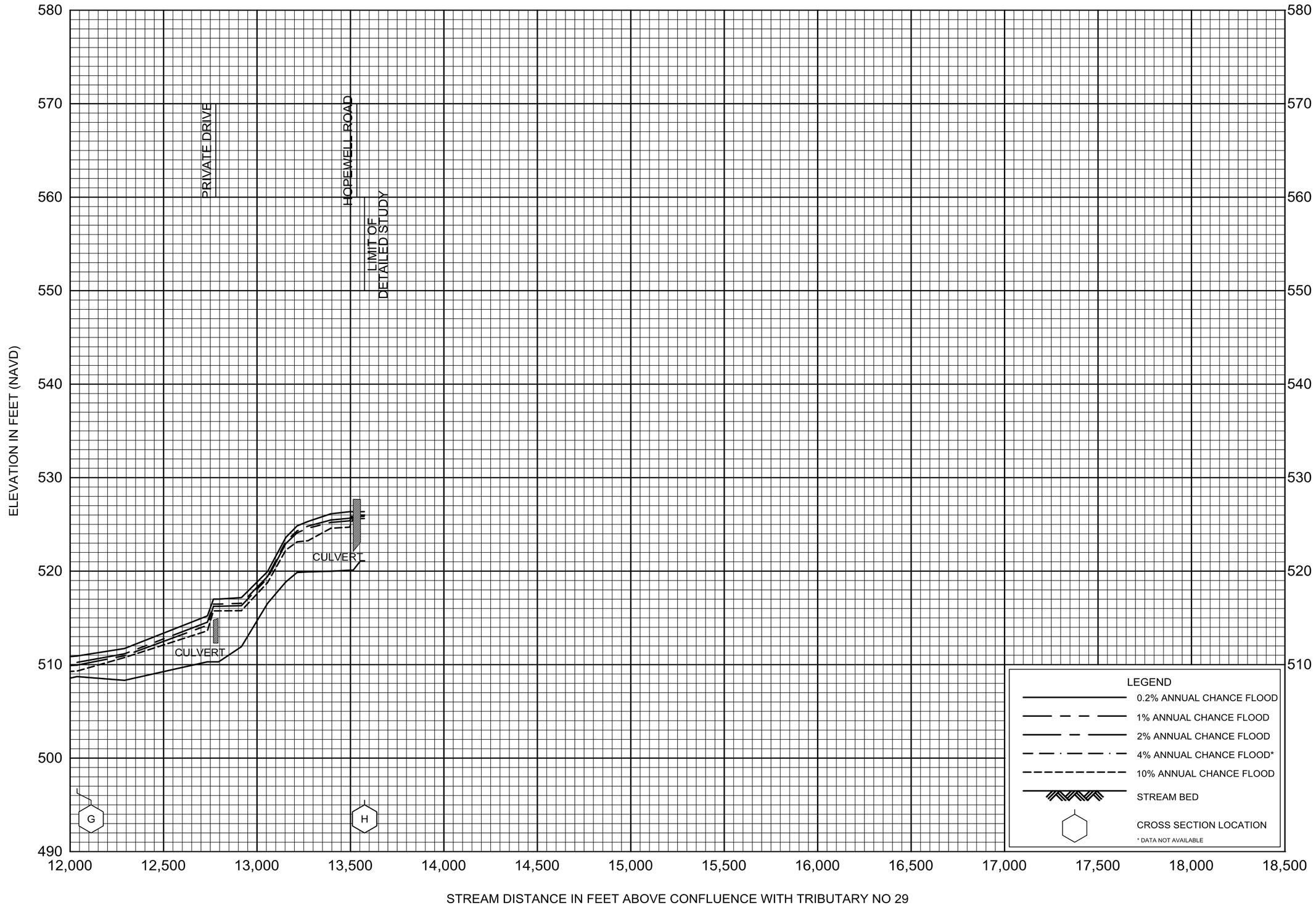
FLOOD PROFILES

TRIBUTARY NO 31

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



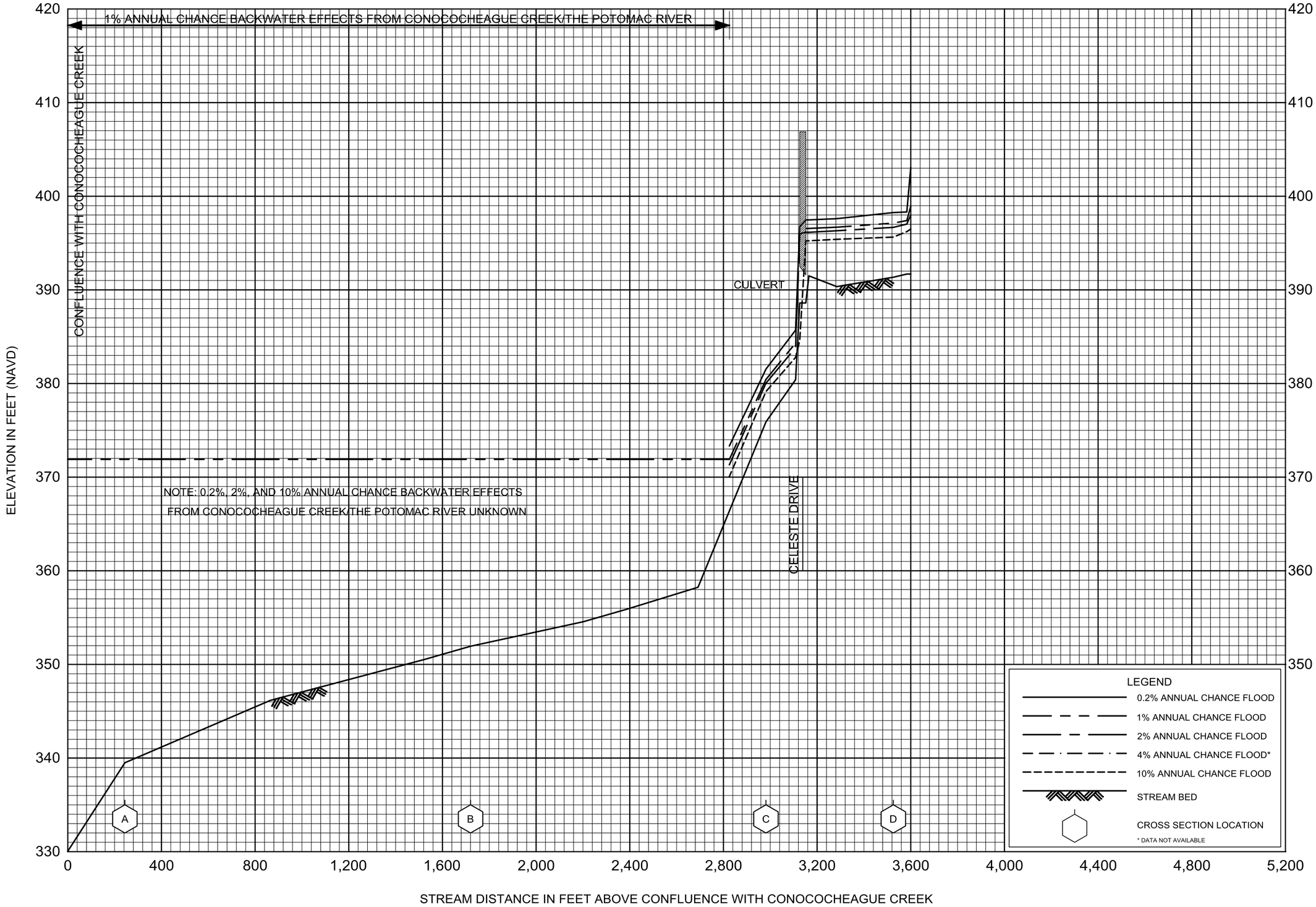
FLOOD PROFILES

TRIBUTARY NO 31

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



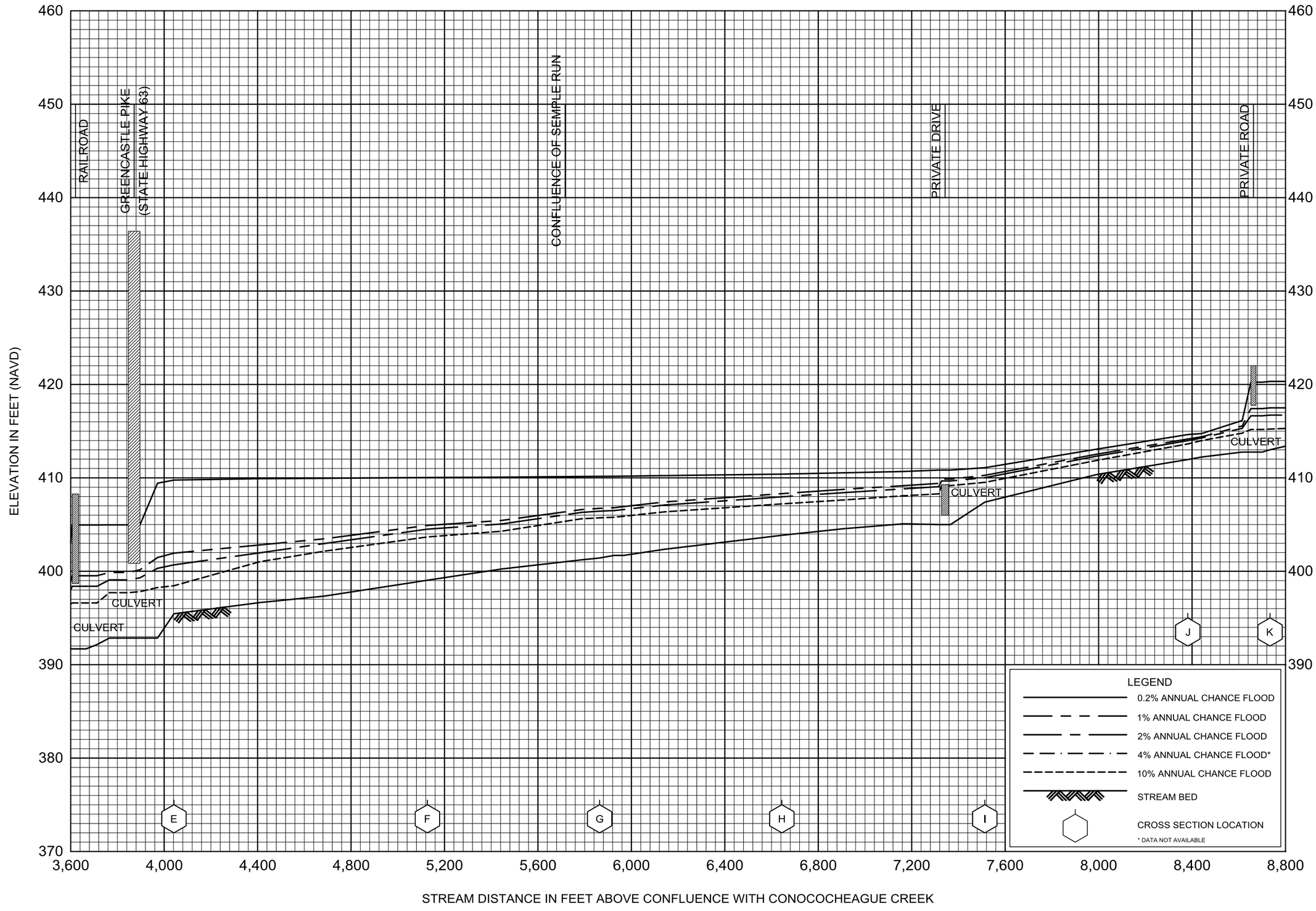
FLOOD PROFILES

TRIBUTARY NO 33

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



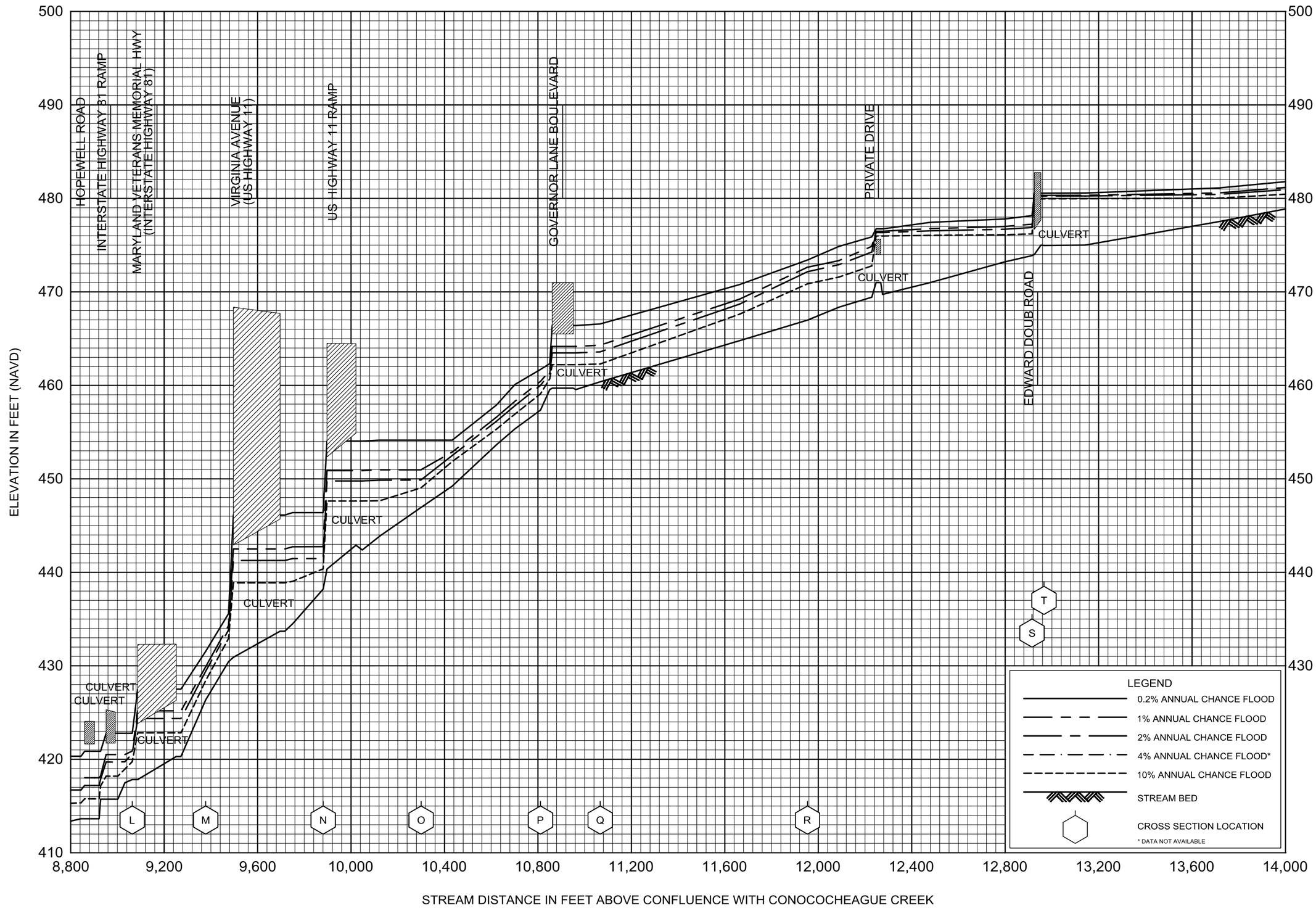
FLOOD PROFILES

TRIBUTARY NO 33

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



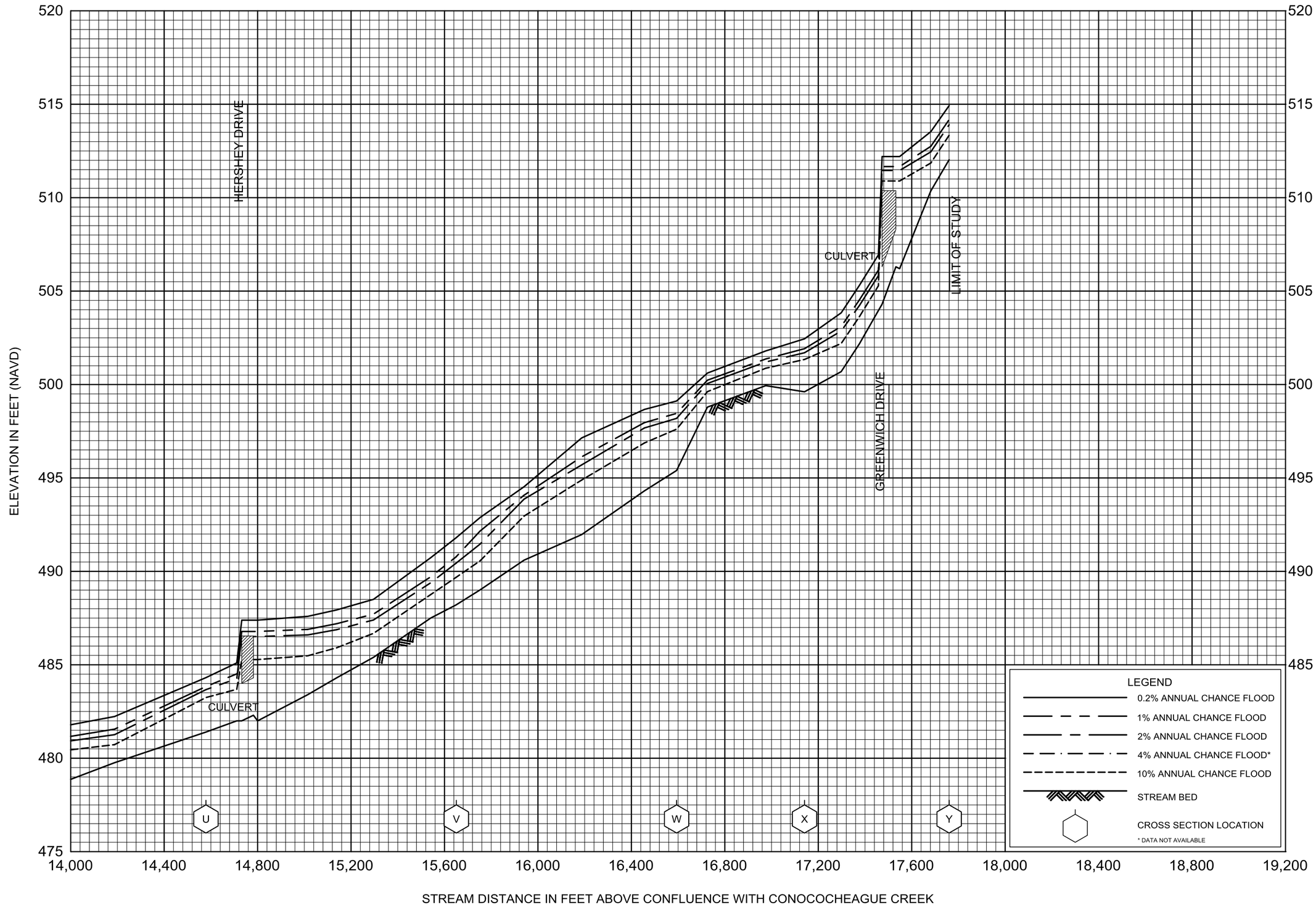
FLOOD PROFILES

TRIBUTARY NO 33

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



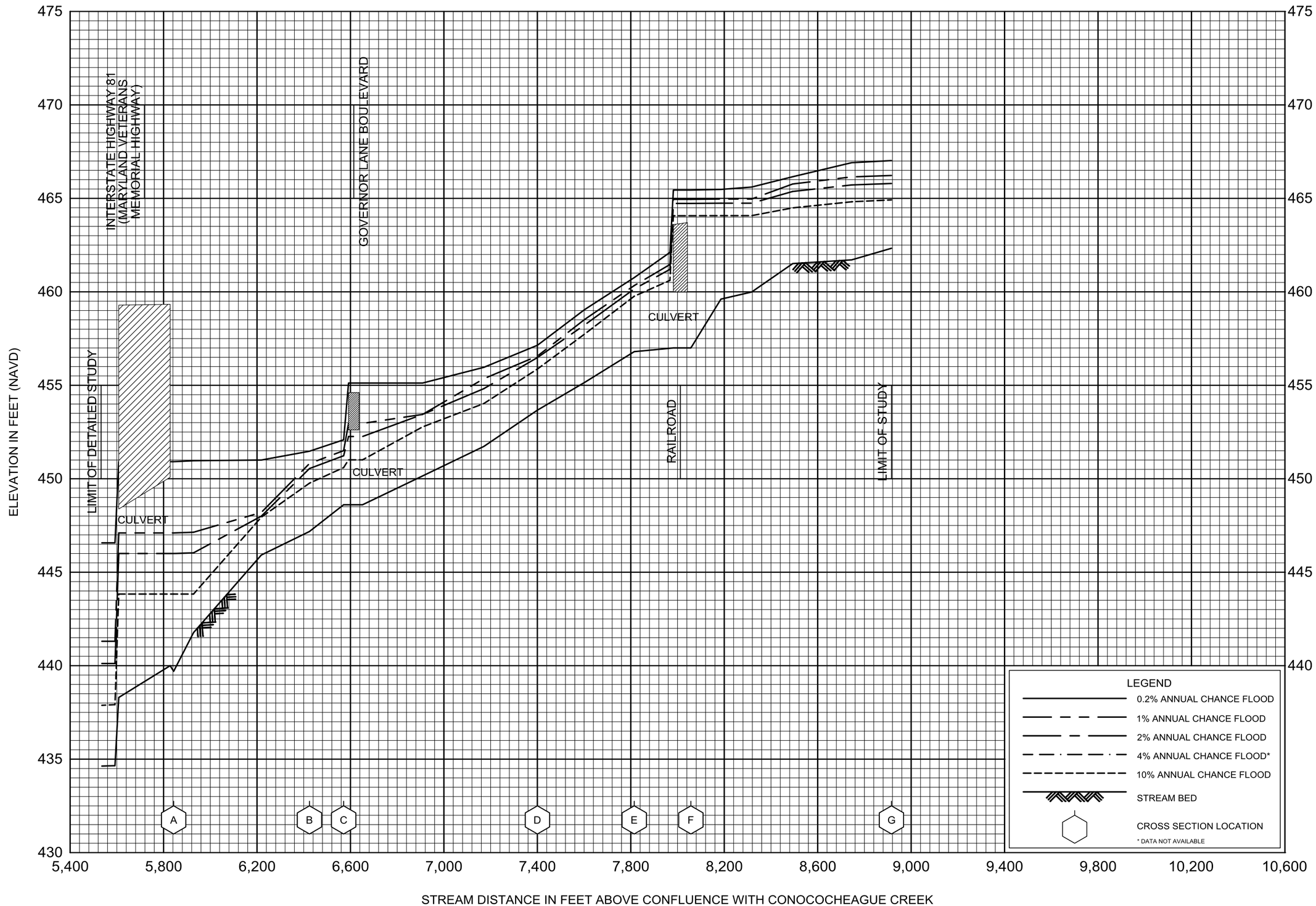
FLOOD PROFILES

TRIBUTARY NO 33

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



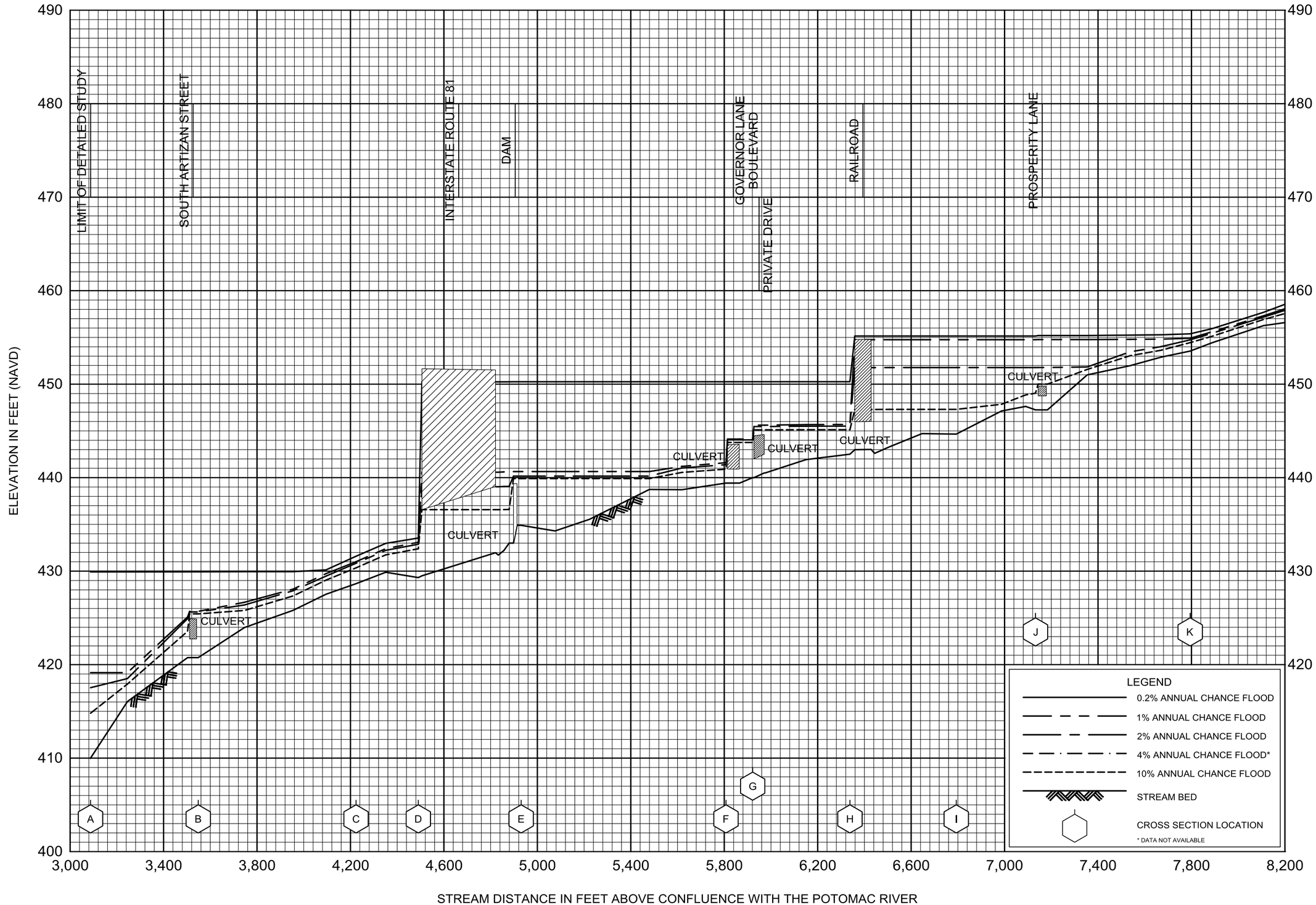
FLOOD PROFILES

TRIBUTARY NO 35

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



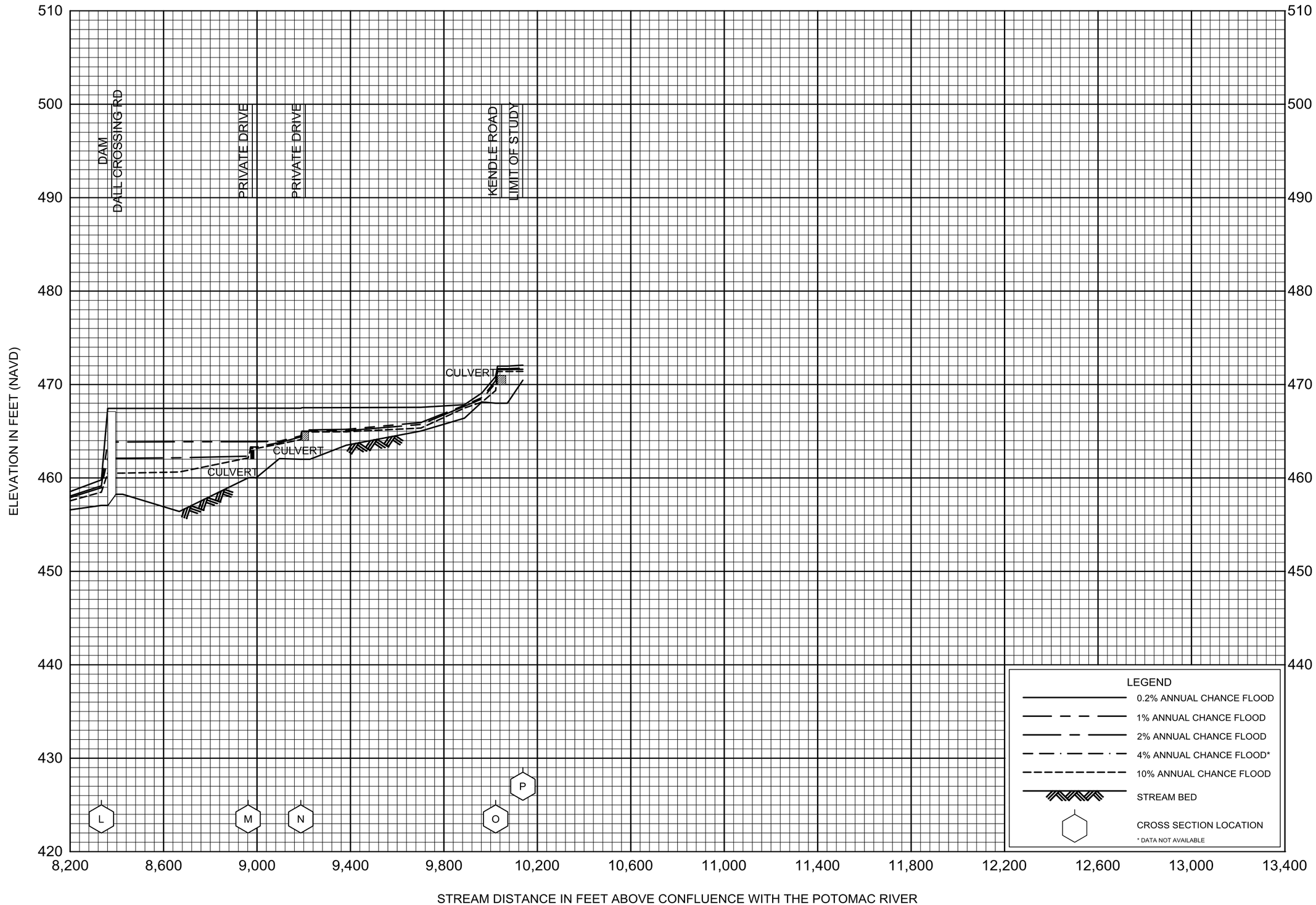
FLOOD PROFILES

TRIBUTARY NO 36

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



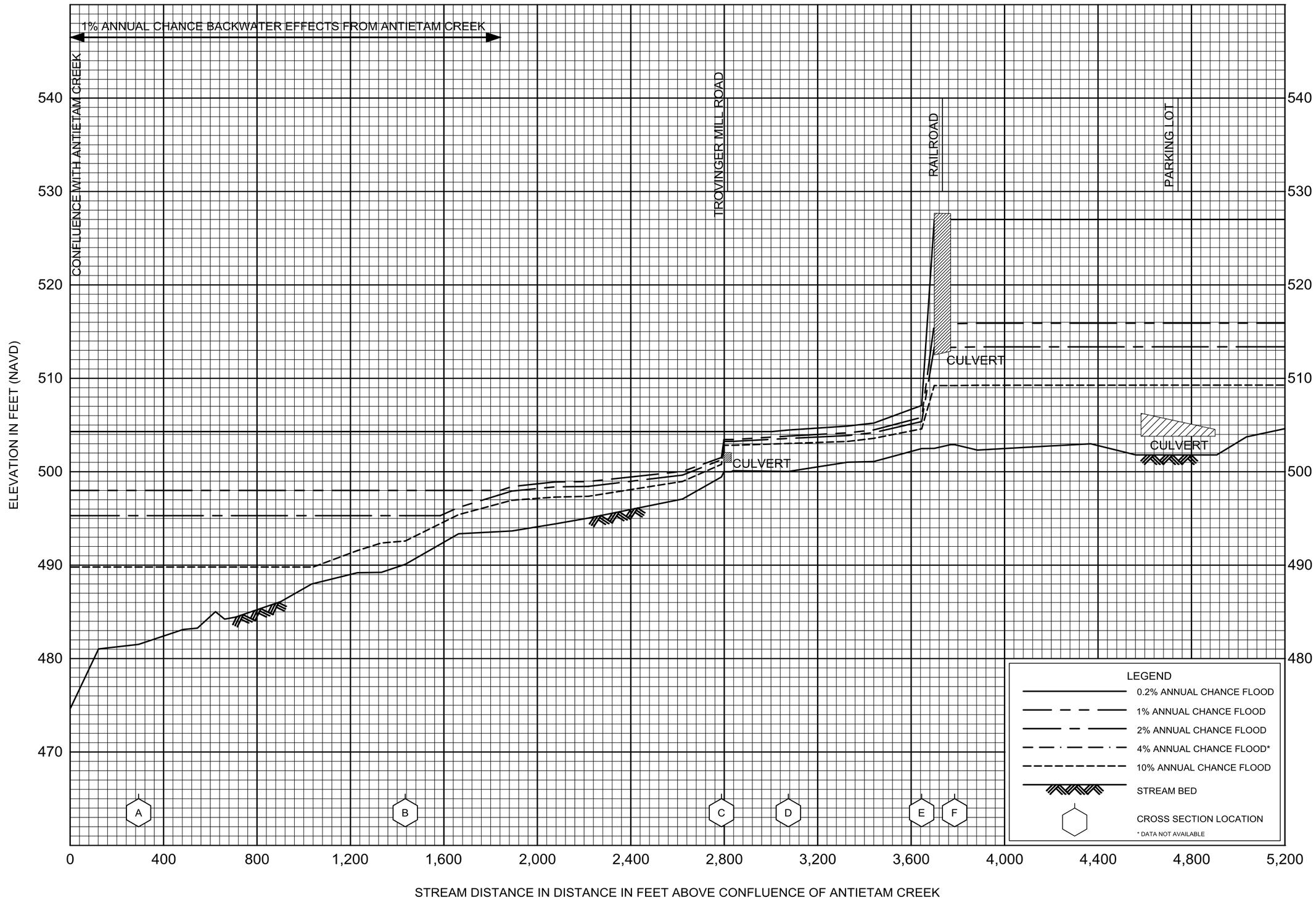
FLOOD PROFILES

TRIBUTARY NO 36

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



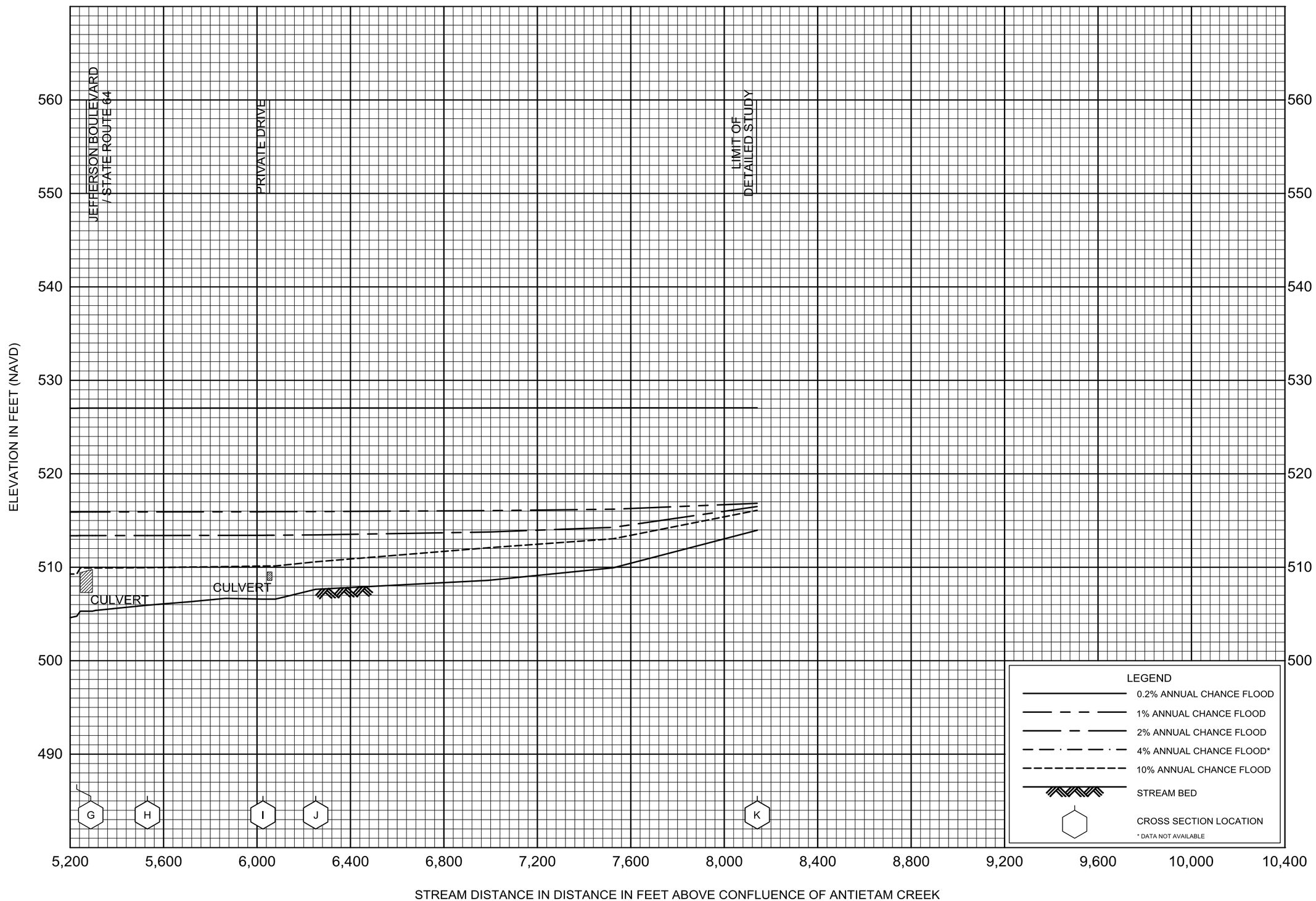
FLOOD PROFILES

TRIBUTARY NO 67

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



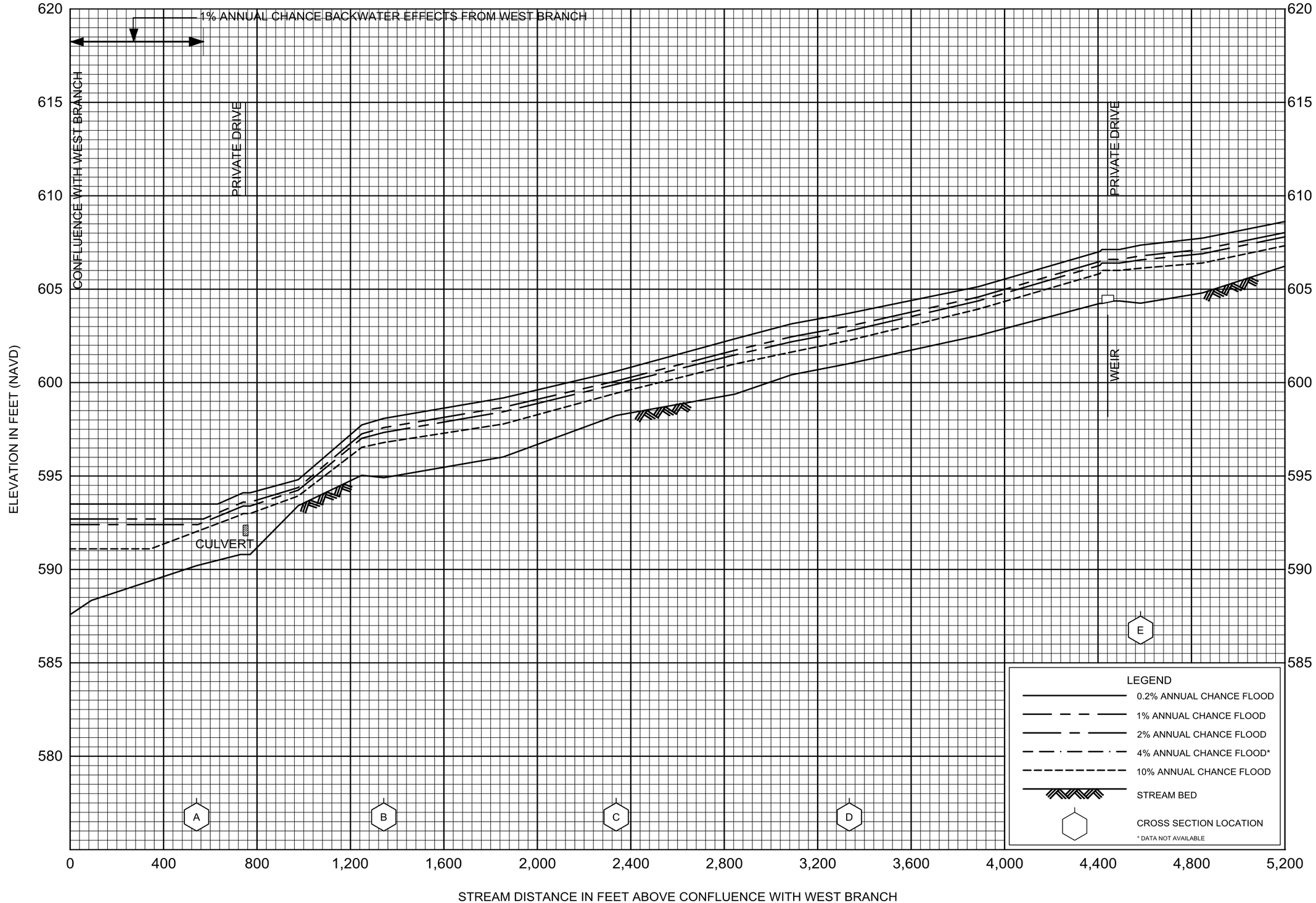
FLOOD PROFILES

TRIBUTARY NO 67

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



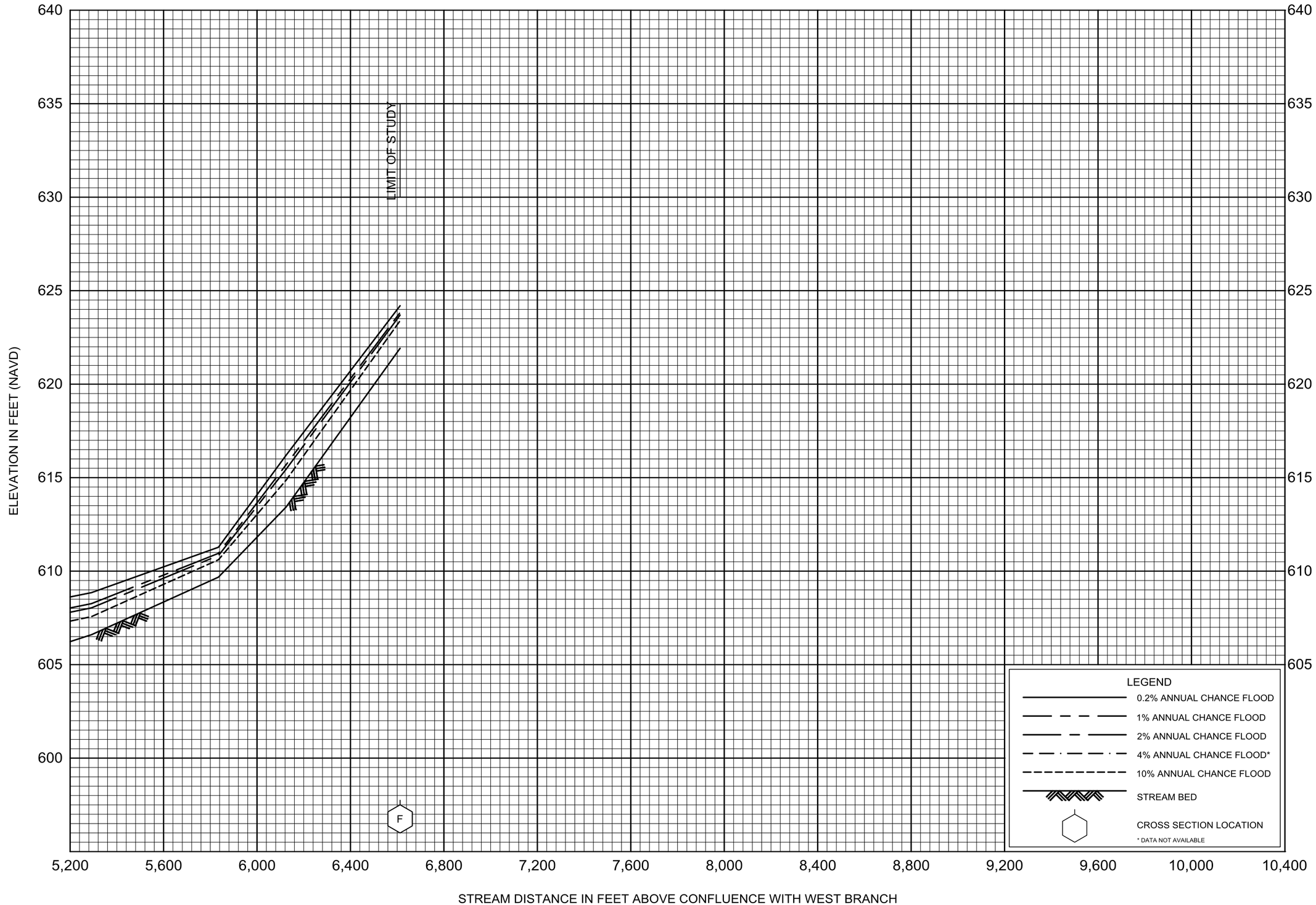
FLOOD PROFILES

TRIBUTARY NO 73

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



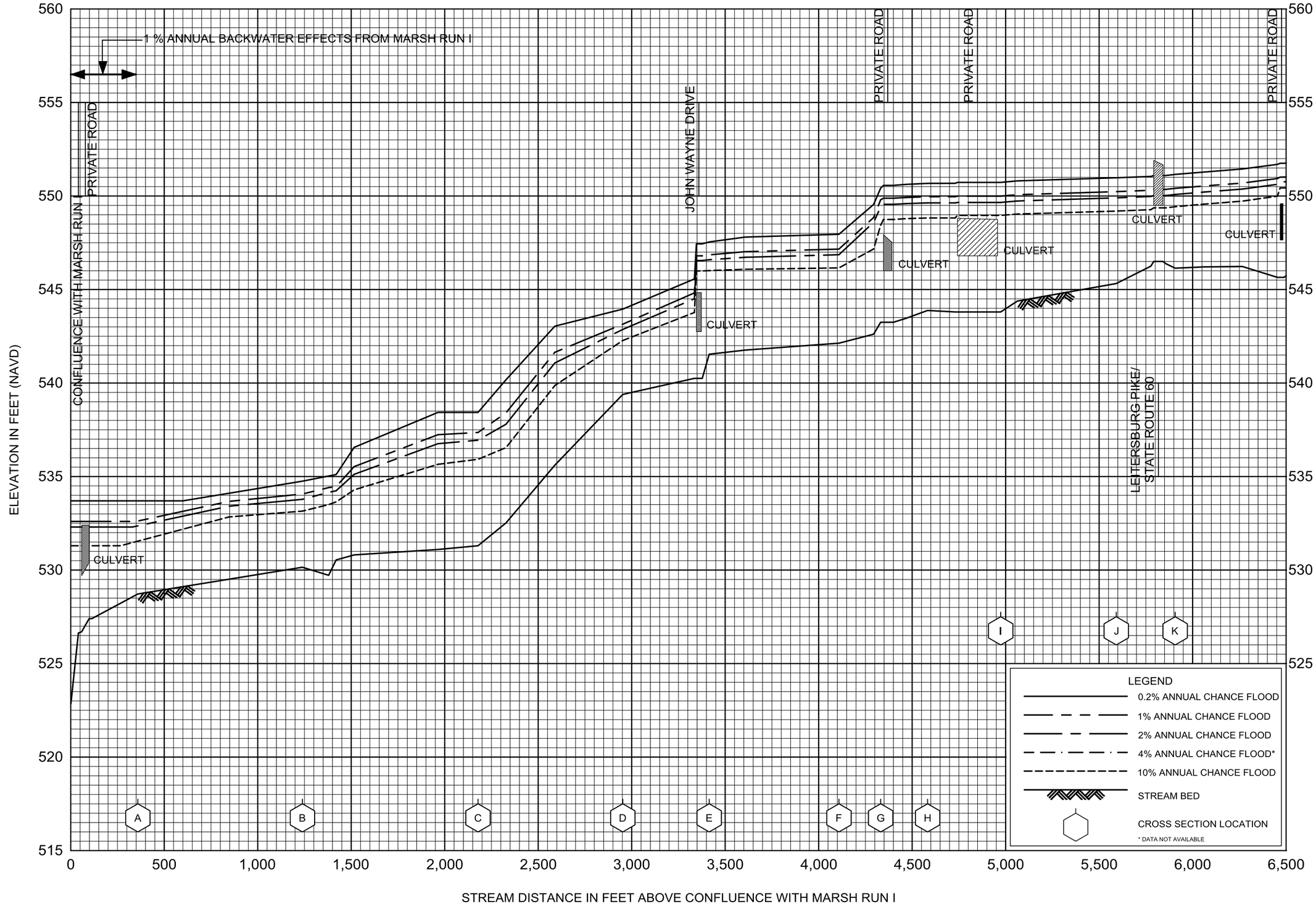
FLOOD PROFILES

TRIBUTARY NO 73

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



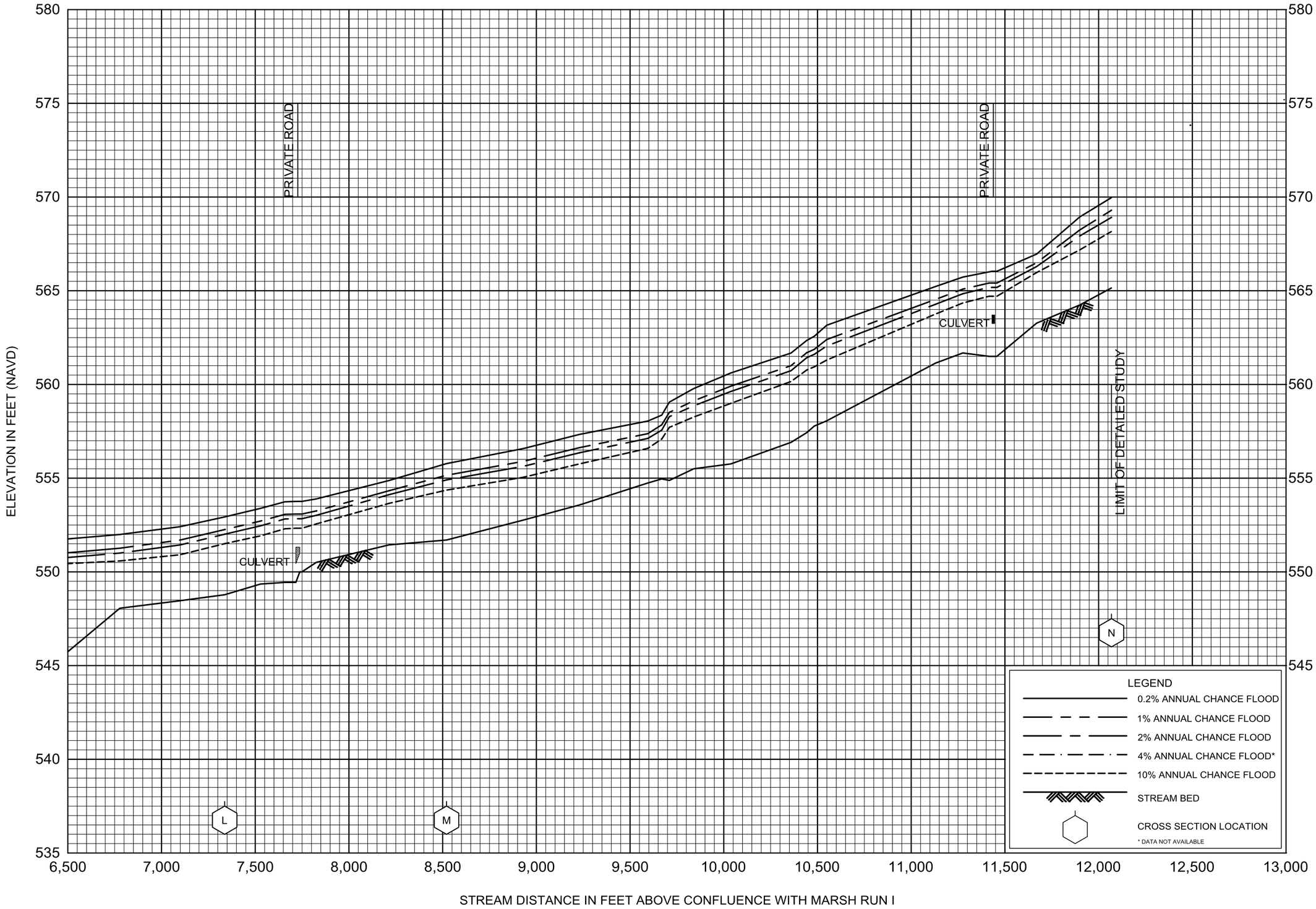
FLOOD PROFILES

TRIBUTARY NO 75

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



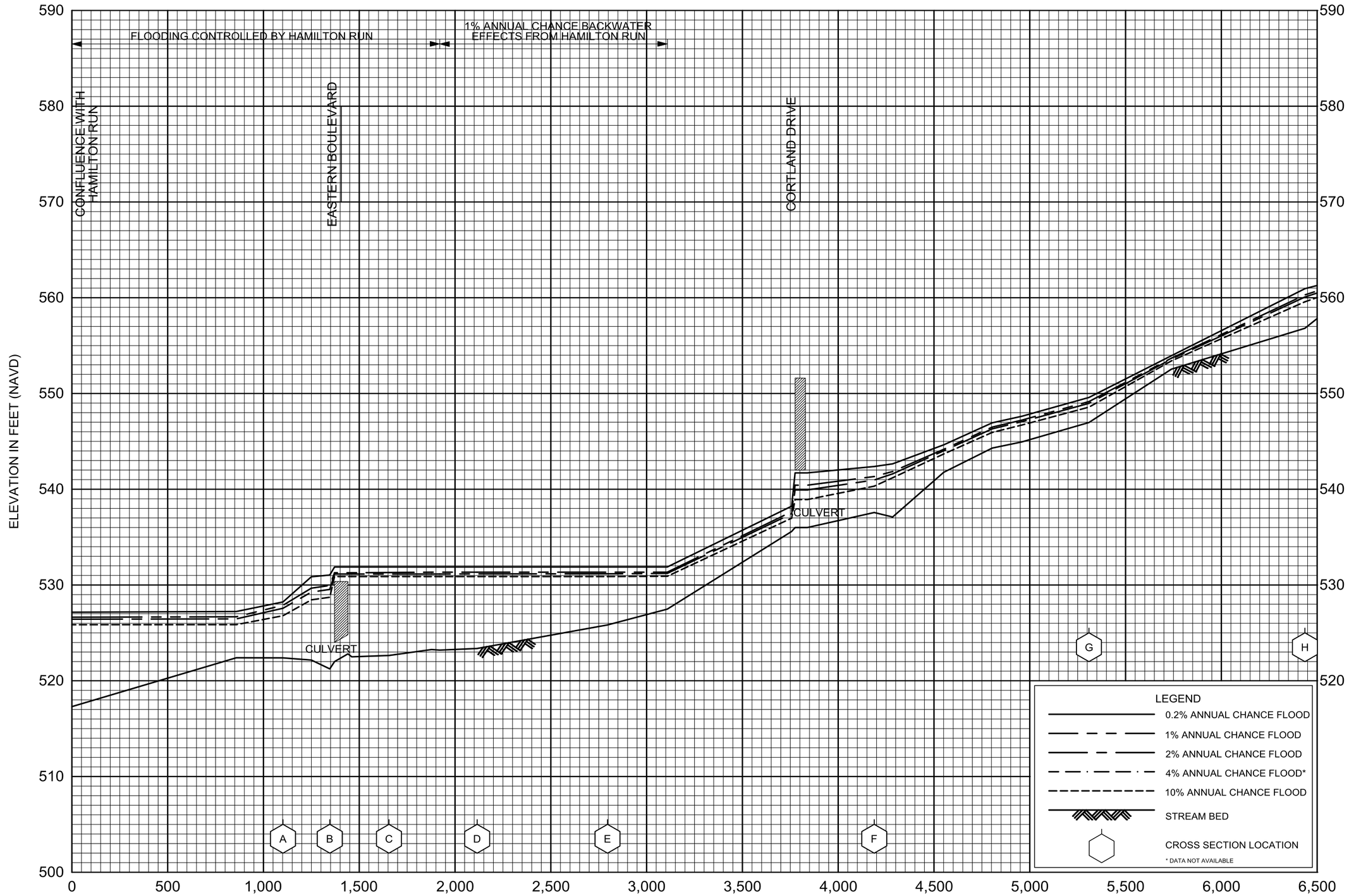
FLOOD PROFILES

TRIBUTARY NO 75

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



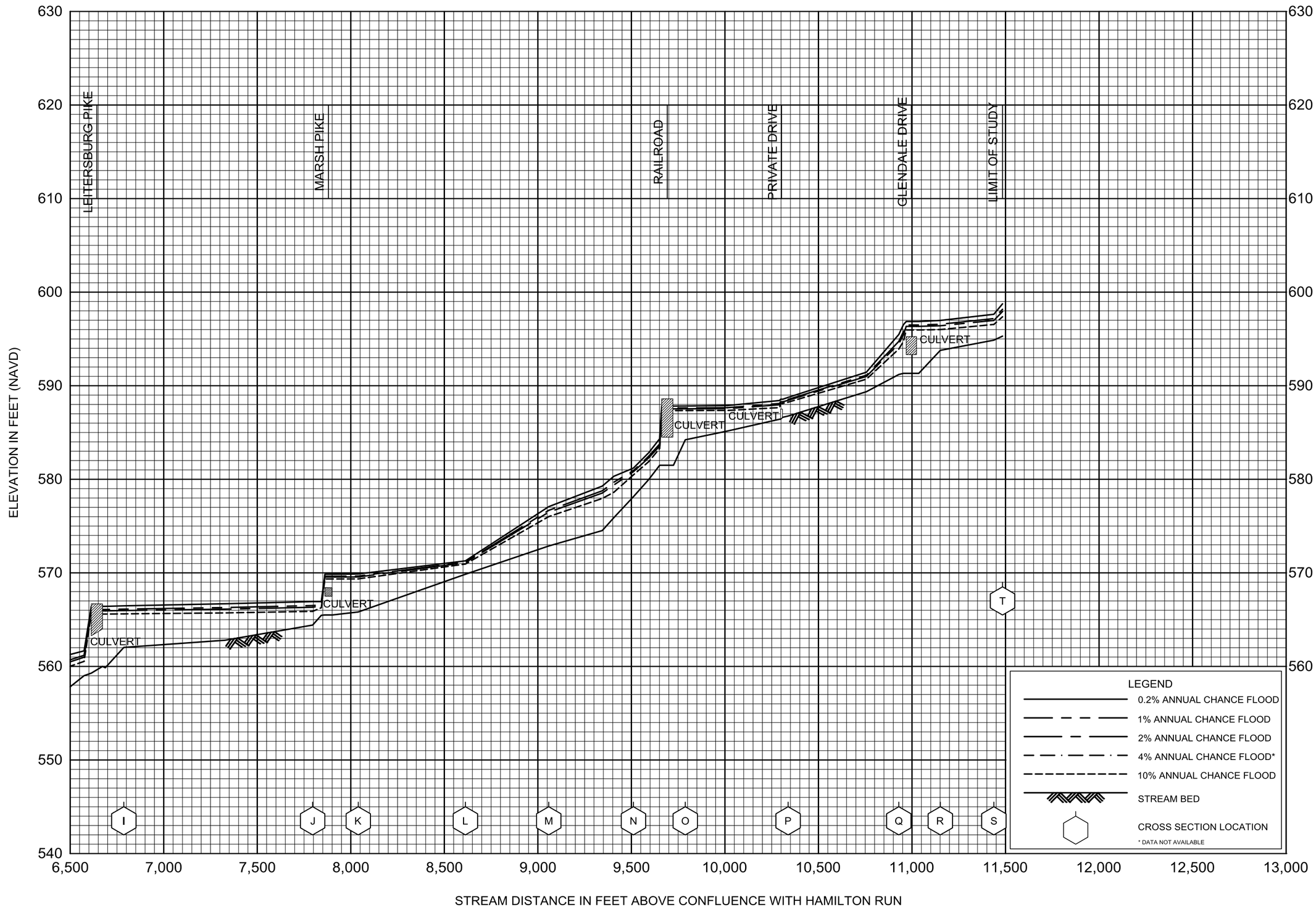
FLOOD PROFILES

TRIBUTARY NO 76

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



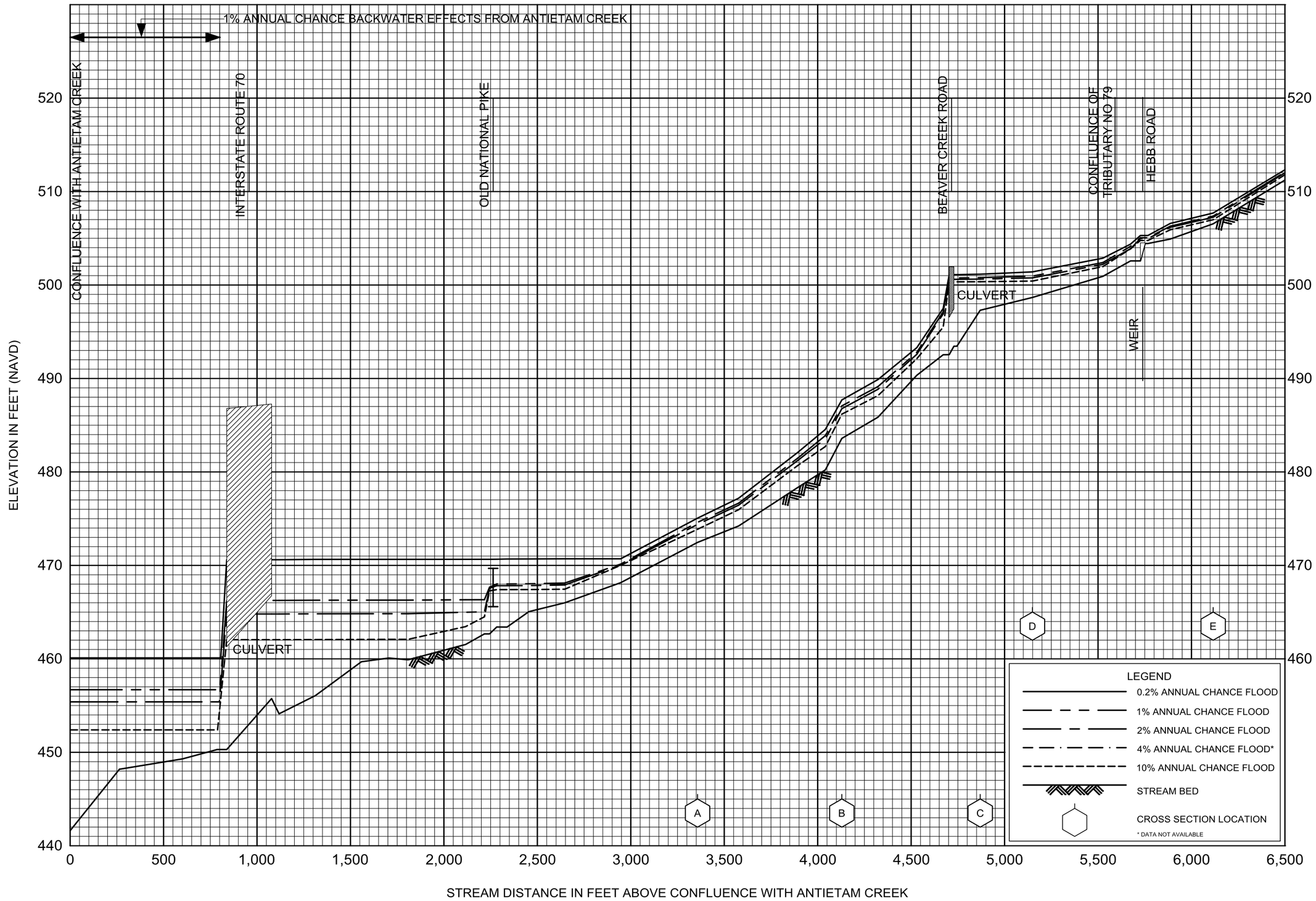
FLOOD PROFILES

TRIBUTARY NO 76

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



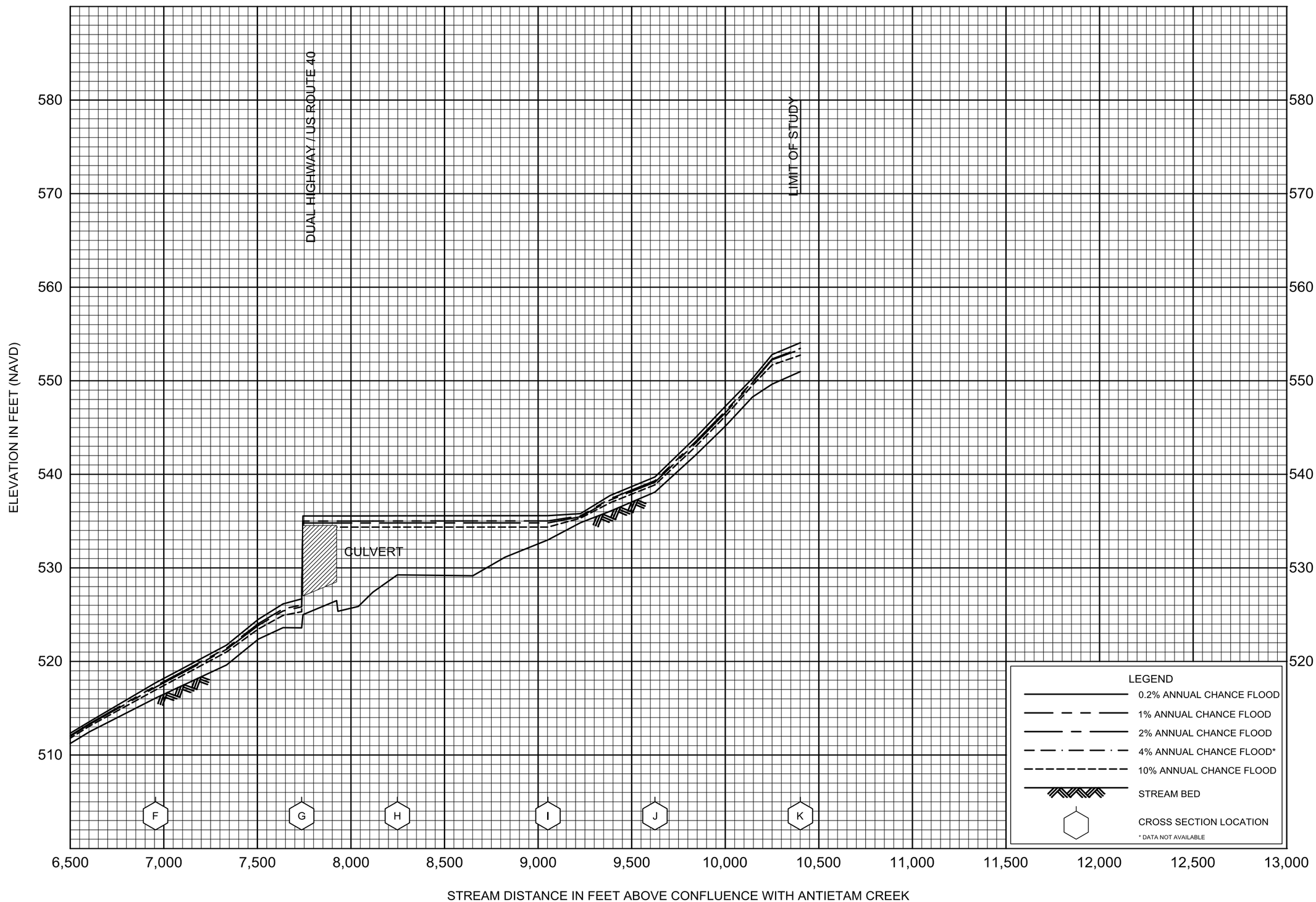
FLOOD PROFILES

TRIBUTARY NO 78

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



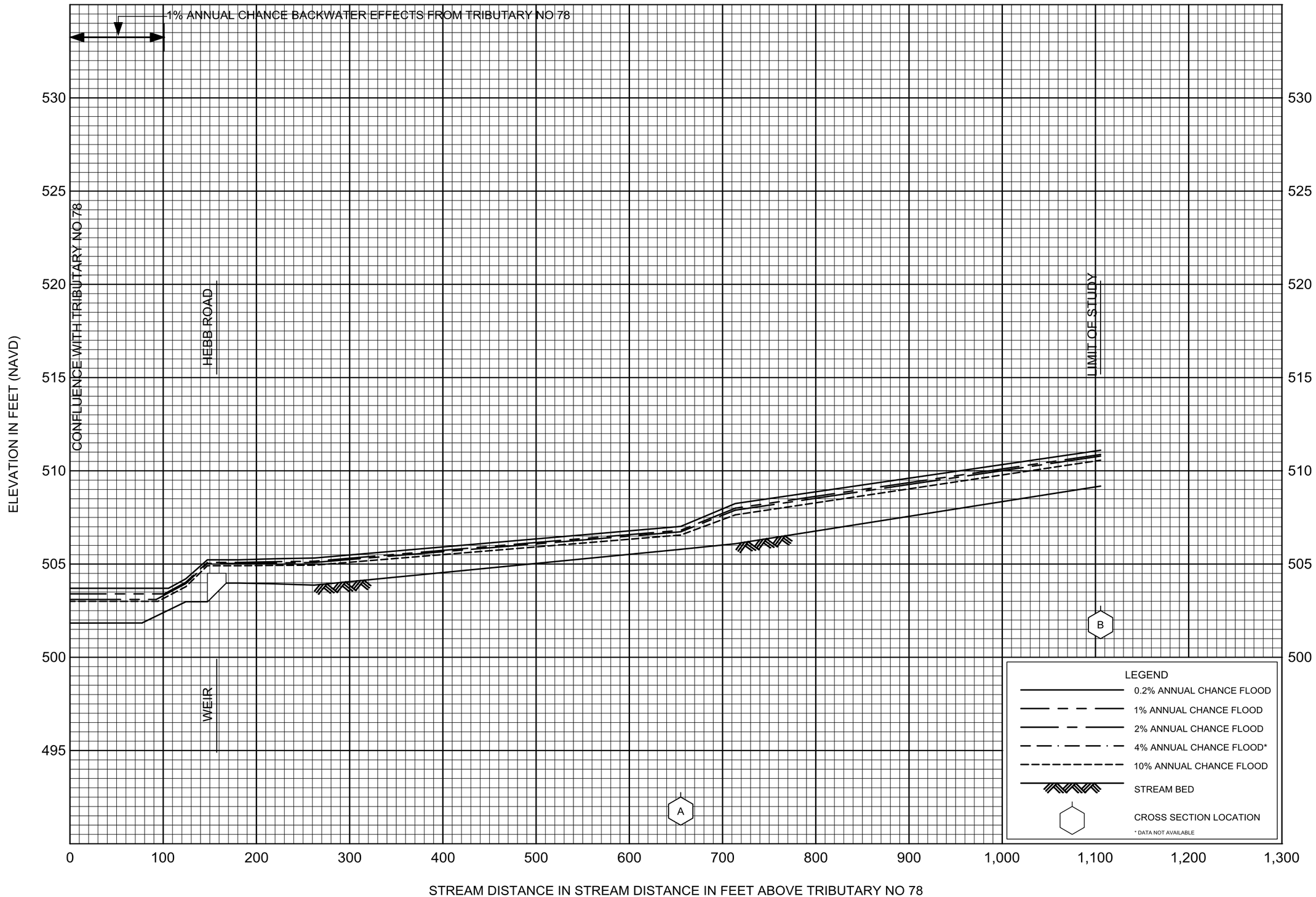
FLOOD PROFILES

TRIBUTARY NO 78

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



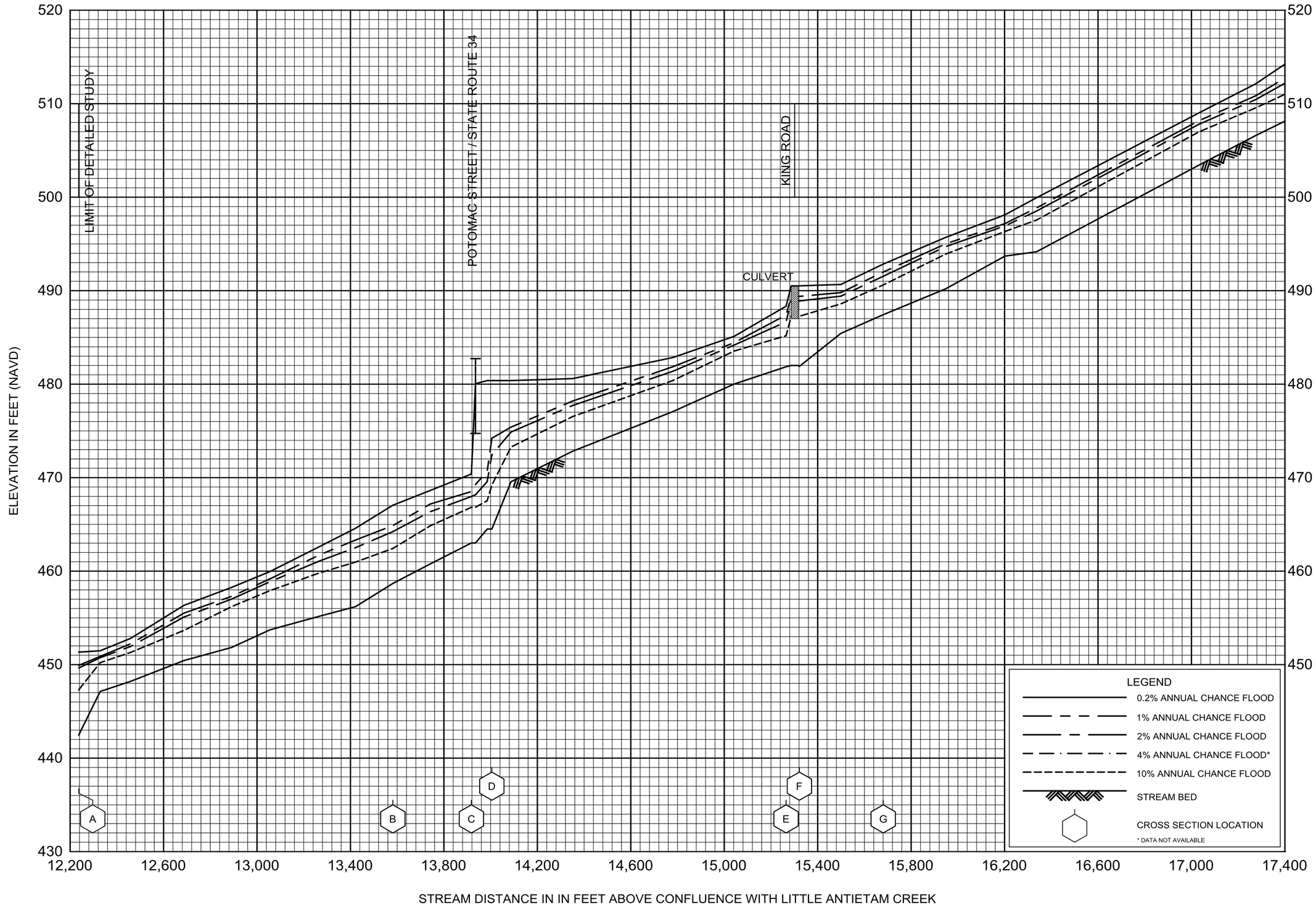
FLOOD PROFILES

TRIBUTARY NO 79

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



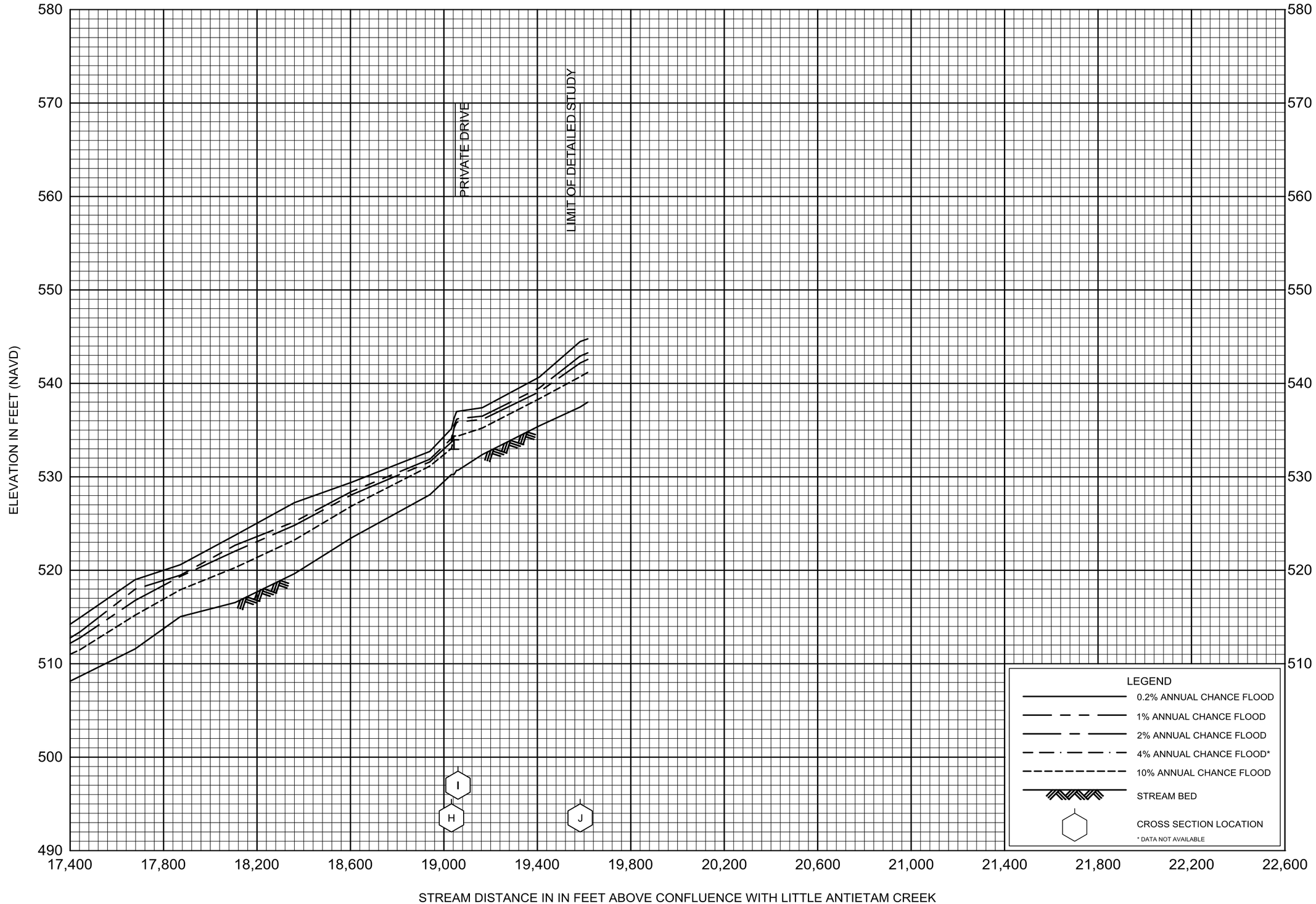
FLOOD PROFILES

TRIBUTARY NO 97

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



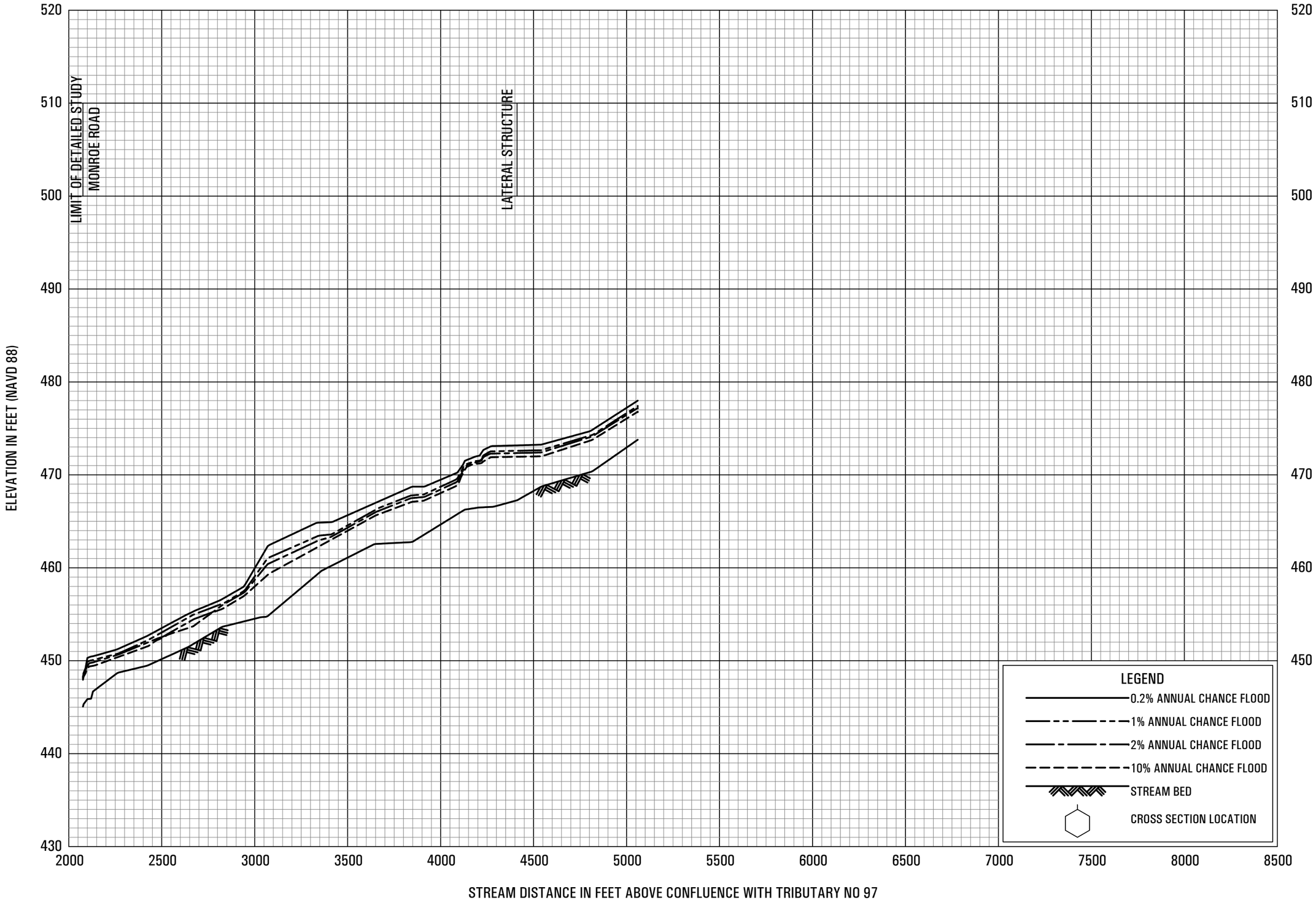
FLOOD PROFILES

TRIBUTARY NO 97

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



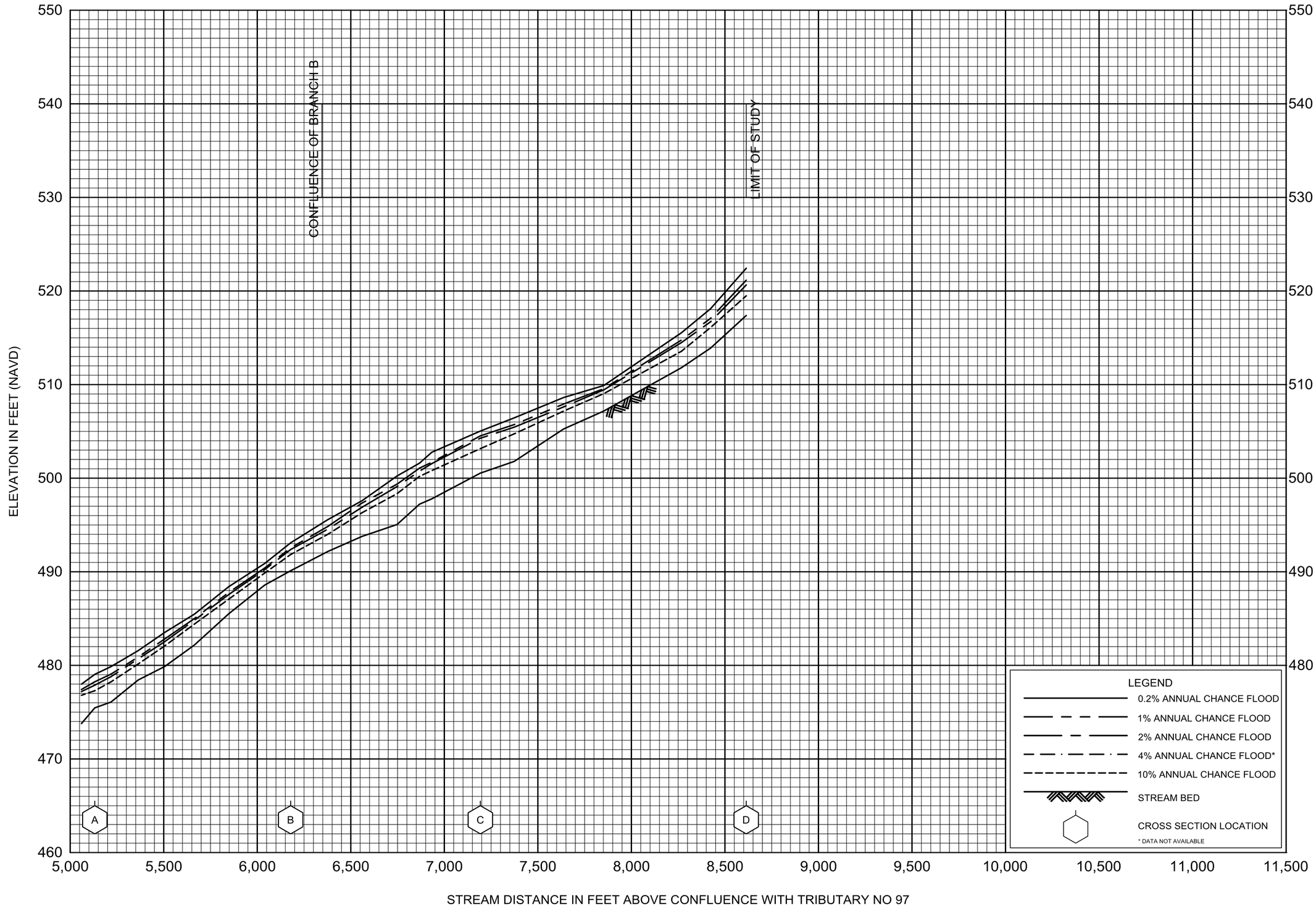
FLOOD PROFILES

TRIBUTARY NO 98

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



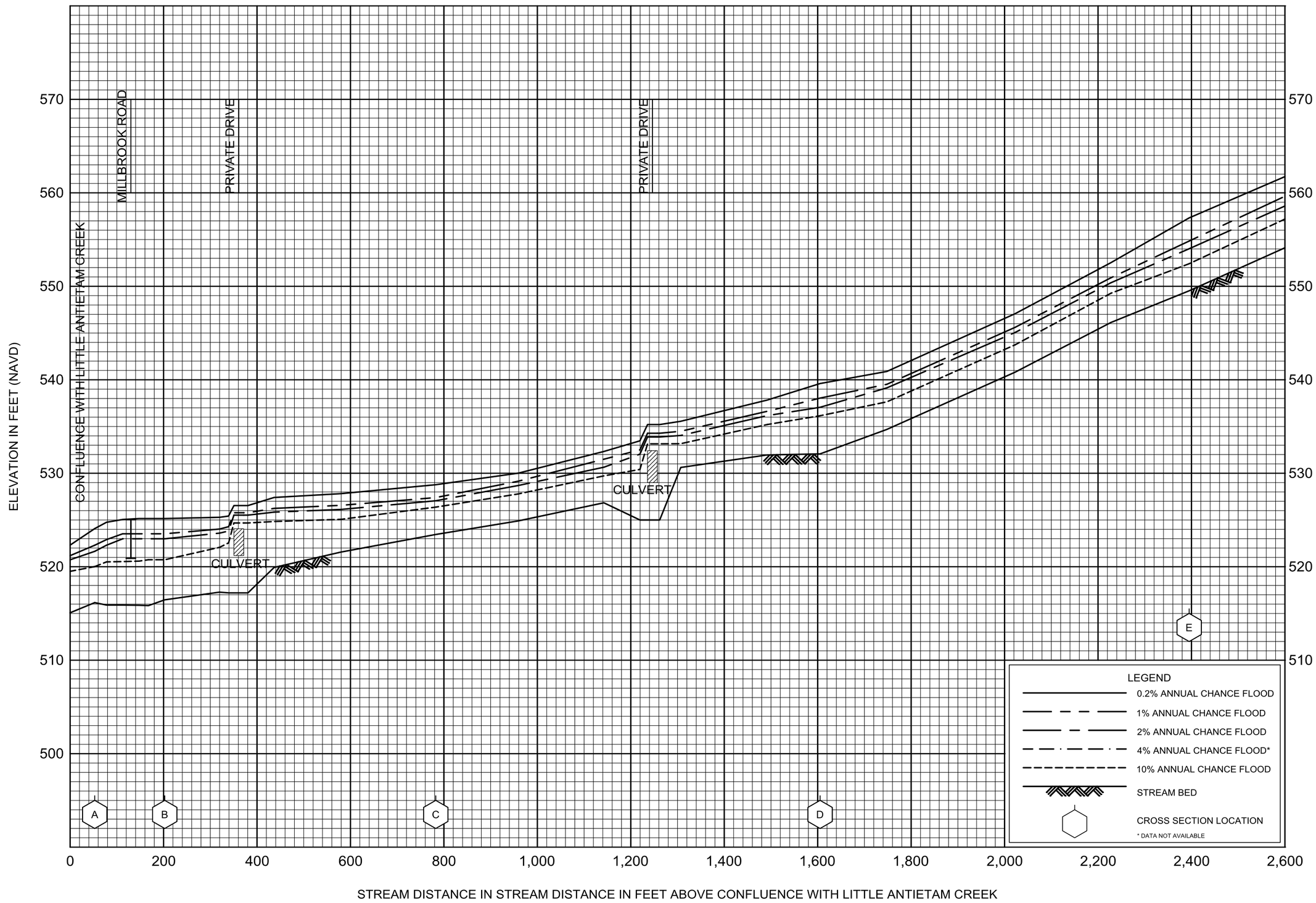
FLOOD PROFILES

TRIBUTARY NO 98

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



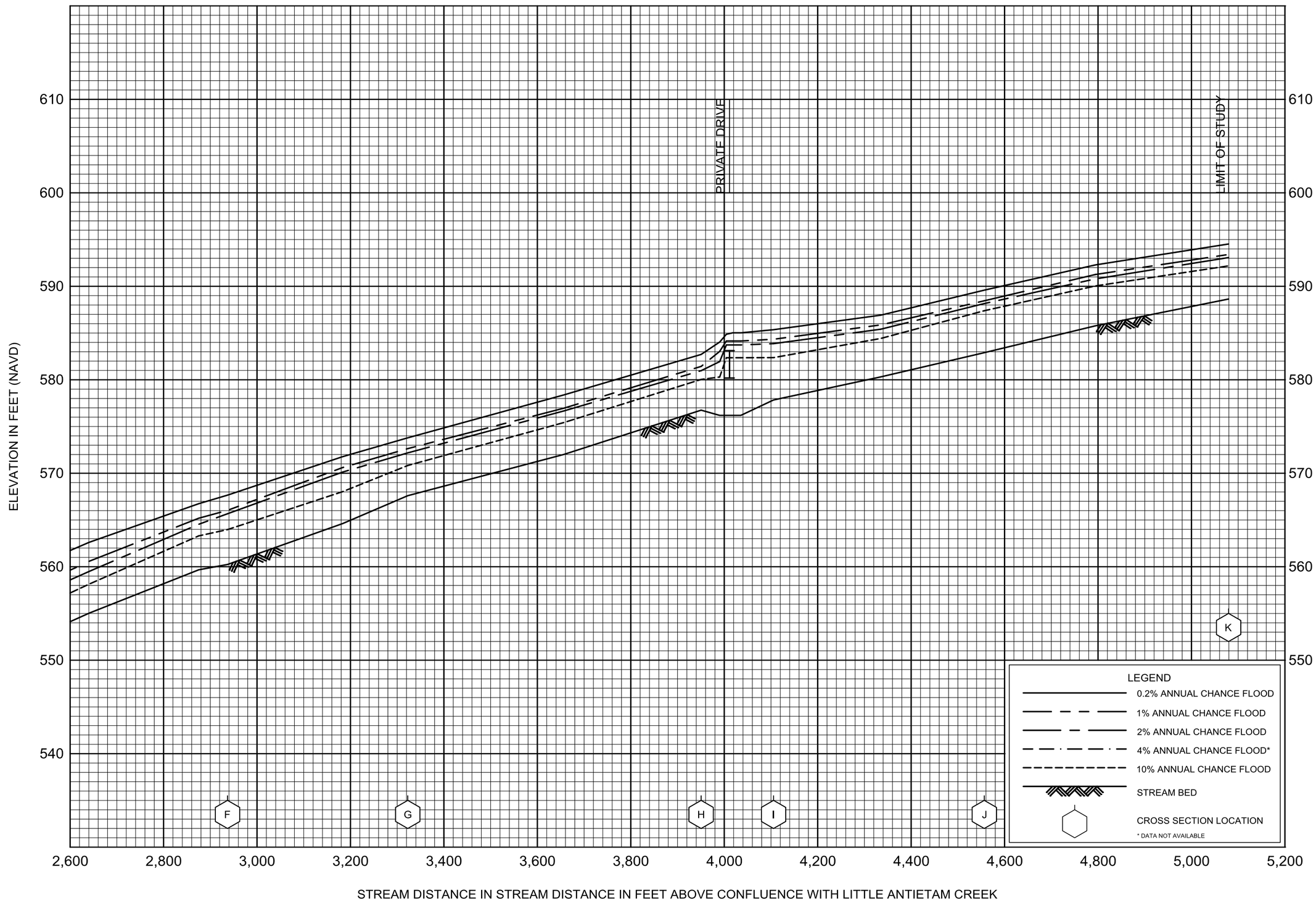
FLOOD PROFILES

TRIBUTARY NO 102

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



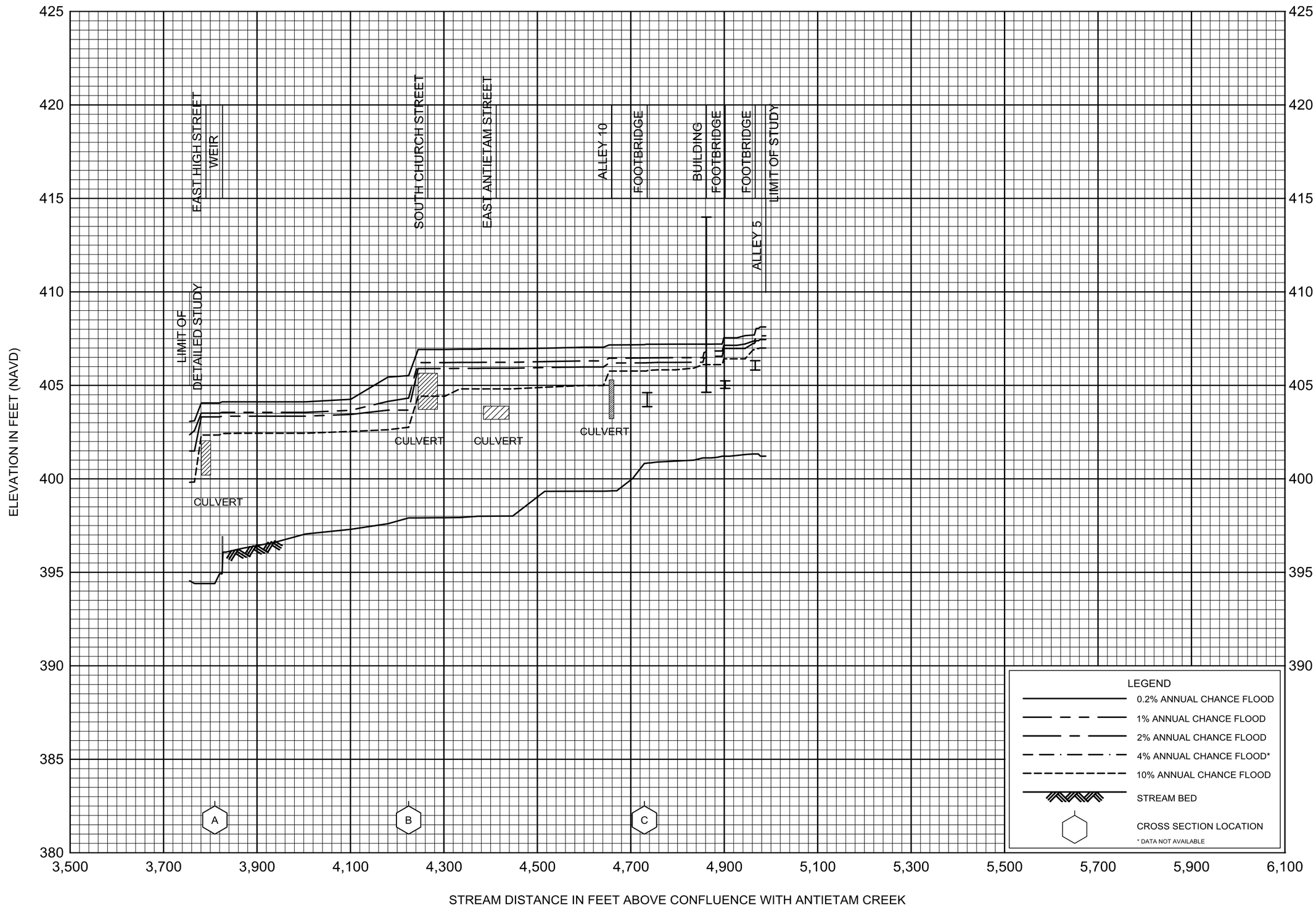
FLOOD PROFILES

TRIBUTARY NO 102

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



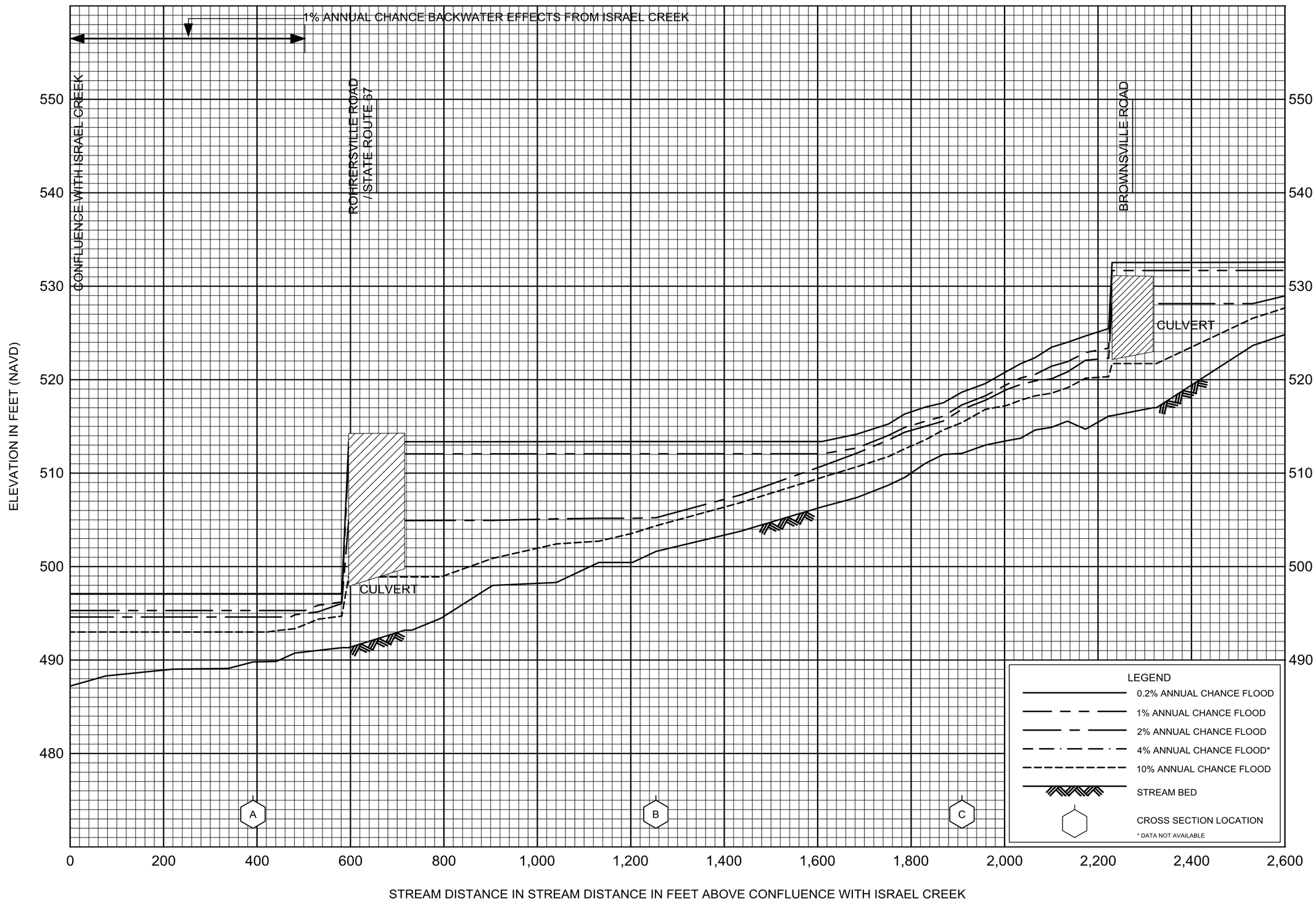
FLOOD PROFILES

TRIBUTARY NO 105

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



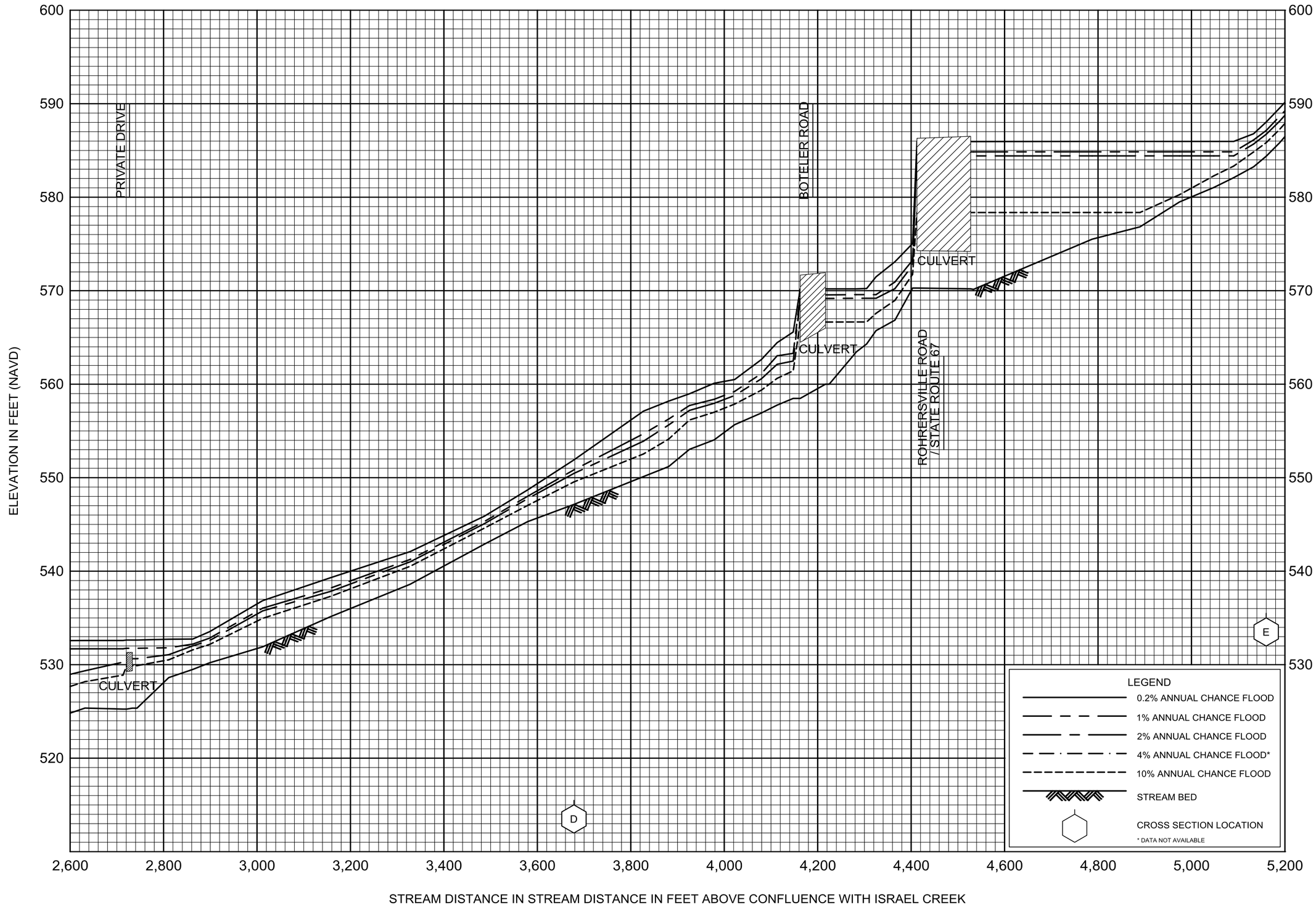
FLOOD PROFILES

TRIBUTARY NO 112

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



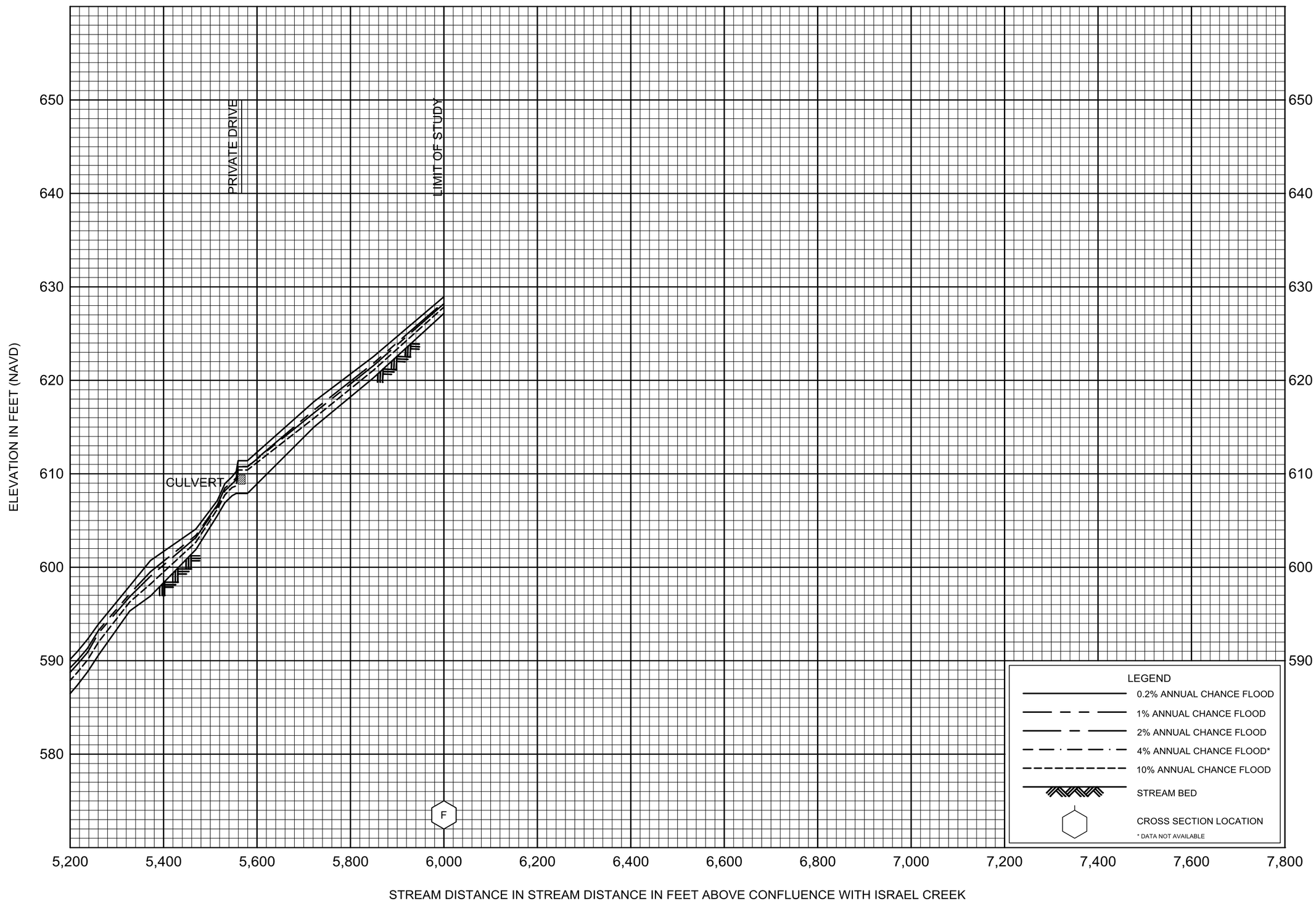
FLOOD PROFILES

TRIBUTARY NO 112

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



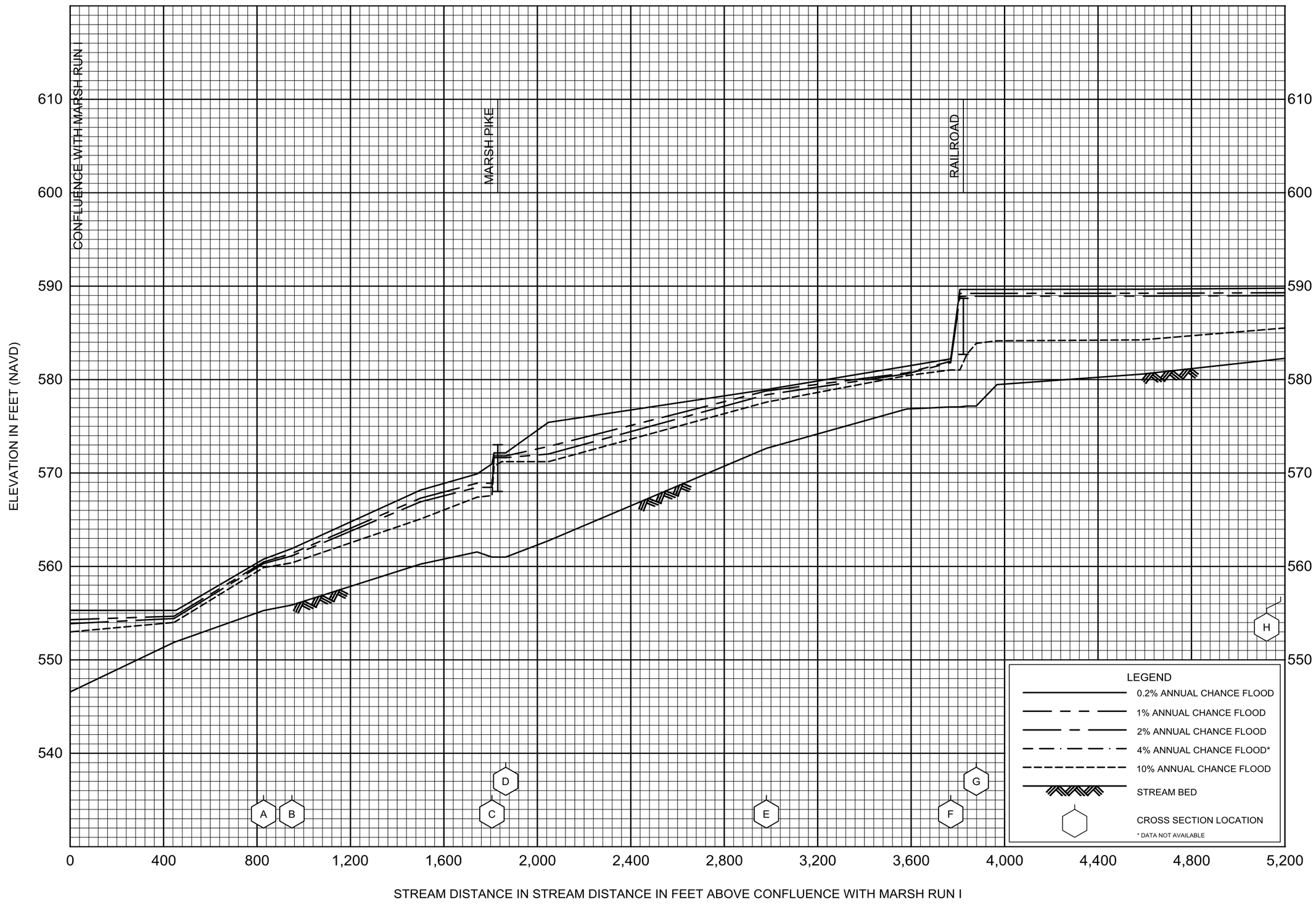
FLOOD PROFILES

TRIBUTARY NO 112

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



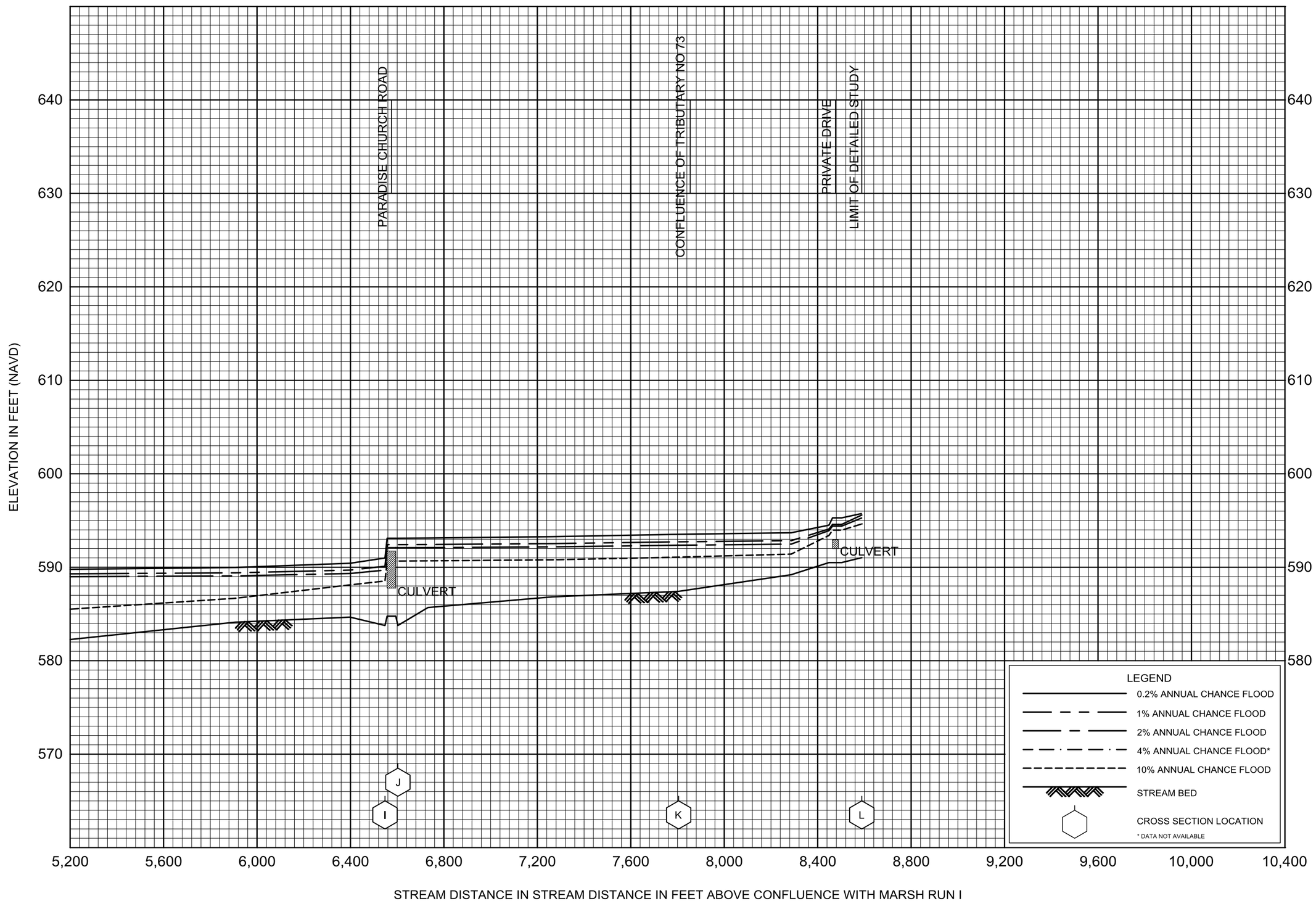
FLOOD PROFILES

WEST BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS



FLOOD PROFILES

WEST BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, MD

AND INCORPORATED AREAS