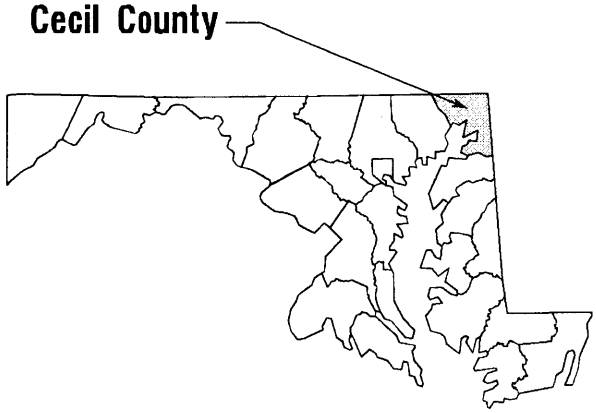
FLOOD INSURANCE STUDY



CECIL COUNTY, MARYLAND
(UNINCORPORATED AREAS)

REVISED:
JANUARY 3, 1997

Federal Emergency Management Agency

COMMUNITY NUMBER - 240019

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.

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

Old Zones	New Zone
A1 through A30	AE
V1 through V30	VE
B	X
C	X

FIS Effective Date: April 4, 1983

Revised FIS Dates: September 5, 1984
December 4, 1986
January 3, 1997

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FLOOD INSURANCE STUDY
UNINCORPORATED AREAS OF CECIL COUNTY, MARYLAND

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates a previous FIS/Flood Insurance Rate Map (FIRM) for the unincorporated areas of Cecil County. This information will be used by Cecil County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

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.

In the original, April 4, 1983, FIS, the hydrologic and hydraulic analyses were prepared by the State of Maryland, Water Resources Administration, Flood Management Division, for the Federal Emergency Management Agency (FEMA), under Contract No. H-4621. This work was completed in June 1980.

In the September 5, 1984, FIS, approximate flooding was added to the FIRM by Dewberry & Davis for FEMA. This work was completed in November 1983.

In the December 4, 1986, FIS, flooding was revised based on information taken from the FIS for Kent County, Maryland (Reference 1).

In this revision, the hydrologic and hydraulic analyses for the Christina River were prepared by the U.S. Army Corps of Engineers (USACE), Philadelphia District, for FEMA, under Inter-Agency Agreement No. EMW-92-E-3839, Task Letter #92-15. This work was completed in September 1994. The hydrologic and hydraulic analyses for the West Branch Christina River were prepared by the USACE, Philadelphia District, for FEMA, under Inter-Agency Agreement No. EMW-93-E-4119, Task Letter #93-6. This work was completed in April 1995.

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.

For the April 4, 1983, FIS, an initial CCO meeting was held on March 6, 1978, attended by representatives of the Town of Charleston, Maryland; the Town of North East, Maryland; the Town of Chesapeake City, Maryland; Cecil County; the State of Maryland, Water Resources Administration; and FEMA. Flood discharge information was coordinated with the U.S. Geological Survey (USGS); the Virginia Institute of Marine Science (VIMS); the National Oceanic and Atmospheric Administration; the U.S. Department of Agriculture, Soil Conservation Service (SCS); and USACE. A final CCO meeting was held on May 10, 1982, attended by representatives of Cecil County; State of Maryland, Water Resources Administration; and FEMA.

For this revised study, the community was notified by FEMA in an October 27, 1994, letter that its FIS would be revised.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the unincorporated areas of Cecil County. The area of study is shown on the Vicinity Map (Figure 1).

In the April 4, 1983, FIS, the following streams were studied by detailed methods: the Susquehanna River, Big Elk Creek, Northeast Creek, Little Northeast Creek, Little Elk Creek, Stone Run Tributary 1, Mill Creek, West Branch, and Stone Run Tributary 2.

Additionally in the April 4, 1983, FIS, tidal analyses were performed on the Chesapeake Bay, the Northeast, Elk, and Bohemia Rivers, and Back Creek.

In the December 4, 1986, FIS, stillwater elevations and corresponding flood boundaries were added to the Sassafras River.

In this revision, detailed analyses were performed on the Christina River for its entire reach within Cecil County, and the West Branch Christina River was restudied from the Cecil County boundary to a point approximately 250 feet upstream of Jackson Hall School Road. In this FIS, the stream referred to as West Branch in previously printed FISs has been renamed West Branch Christina River.

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

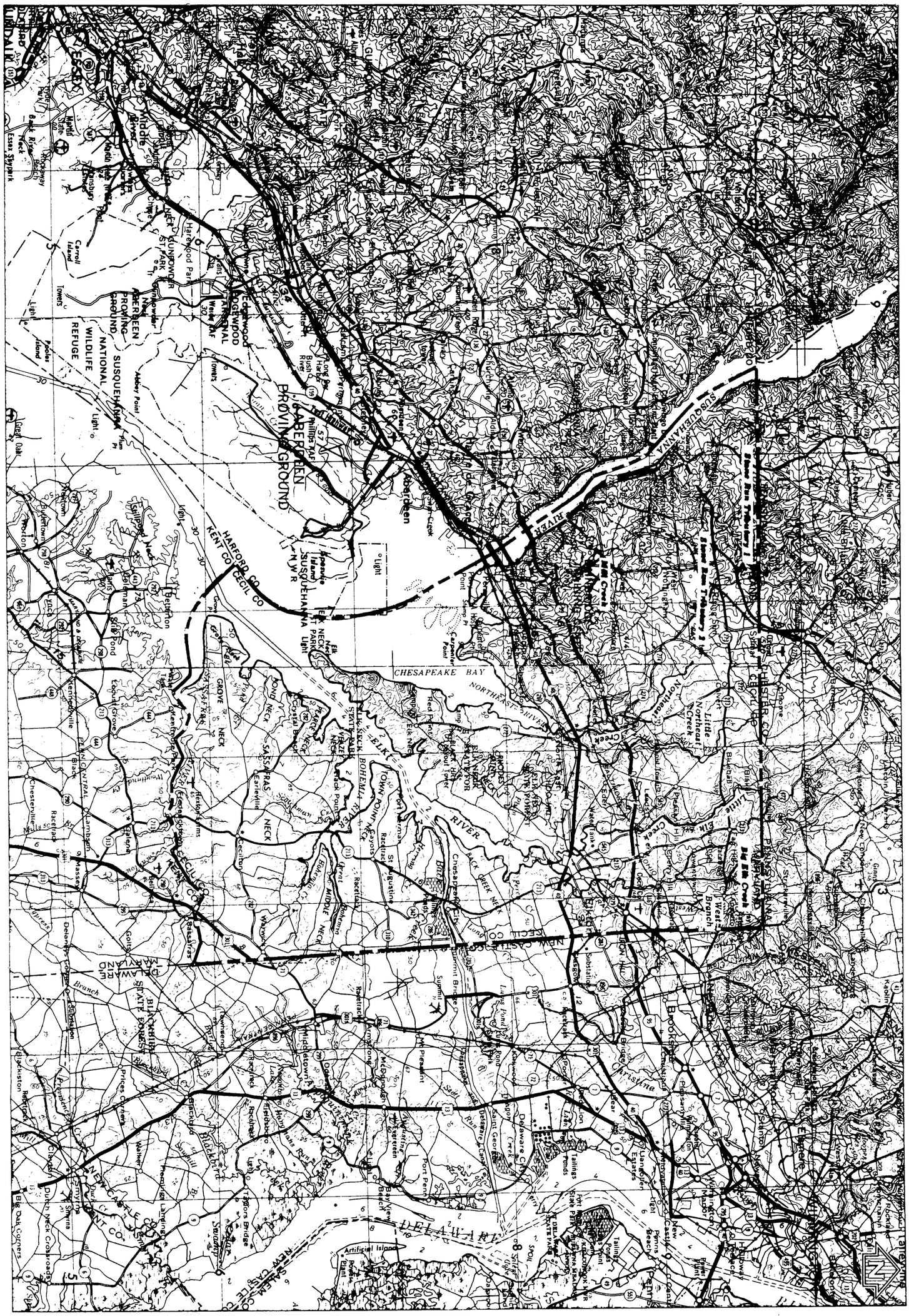


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

All or portions of the following streams were studied by approximate methods: Conowingo Creek, Scotchman Creek, Hall Creek, Duffy Creek, East Branch Laurel Run, West Branch Laurel Run, Granies Run, East Branch, Laurel Run, Gravelly Run, Dogwood Run, Plum Creek, Principio Creek, Susquehanna Tributary, Octoraro Creek, Stone Run, Stony Run, Basin Run, Perch Creek, Long Creek, the Chesapeake and Delaware Canal, Great Bohemia Creek, Little Bohemia Creek, and the remaining portions of the Susquehanna River, the Bohemia River, Big Elk Creek, Stone Run Tributary 1, the West Branch Christina River, Northeast Creek, Little Northeast Creek, Little Elk Creek, Mill Creek, and Back Creek. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Cecil County.

2.2 Community Description

Cecil County is located in the northeastern corner of Maryland. It is bordered by the Susquehanna River and the Chesapeake Bay to the west, the Sassafras River to the south, the State of Pennsylvania to the north, and the State of Delaware to the east. Much of Cecil County is affected by tidal waters of the Chesapeake Bay. The county is drained by the Susquehanna, the Northeast, the Elk, and the Sassafras Rivers.

Land use is predominantly rural with some urbanized pockets on the floodplains of major rivers. Development of waterfront properties is extensive and is susceptible to storm damage from high winds and rising tides.

The topography of the county is characterized by the rolling hills of the piedmont and the low, flat coastal plain. Piedmont elevations average approximately 300 feet and sometimes exceed 400 feet. Conversely, the coastal plain rarely exceeds 200 feet, averaging approximately 50 feet elevation (Reference 2).

The climate of Cecil County is characterized by well defined seasons with a large annual temperature range. Record temperatures range from a high of 100 degrees Fahrenheit (°F) to a low of -10°F. The average January temperature is 29.8°F, and the average July temperature is 75.8°f. The average annual precipitation is 48 inches, and the snowfall range is between 22 to 67 inches (Reference 2).

2.3 Principal Flood Problems

Floods in Cecil County are usually caused by severe thunderstorms, rapidly rising tides from runoff, and from occasional hurricanes.

In late June 1884, a series of thunderstorms ended a period of long drought and caused an estimated $70,000 in bridge damage throughout the county. A water-surface elevation of 14.3 feet was recorded on Elk Creek (Reference 3).

A hurricane brought 7.1 inches of rain on the Town of Elkton in a 48-hour period in August 1933. Little Elk Creek washed away a wall at the Elk Paper Manufacturing Company in Childs. The equipment at the company was under 3 feet of water. Two major highways were covered by 6 feet of water, and basements along Main Street had several inches of water. Piers weakened under the highway bridge over the Northwest River from heavy and rapid flow, causing the State Road Commissioner to close the road (Reference 4).

A severe thunderstorm on July 8, 1935, completely isolated the Town of Elkton. A bridge at Mechanics Valley and Childs was washed out. The State road from Elkton to Glasgow was under 3 to 6 feet of water at the Big Elk Creek crossing (Reference 5). Estimated damage was in the "many thousands of dollars" (Reference 6).

In August 1937, heavy thunderstorms caused automobile traffic to come to a halt as a record 4.24 inches of rain fell in a 24-hour period at Elkton. Approximately 10,000 cars were held up in Elkton because small bridges had washed out, and all roads in a 25-mile radius southwest of Wilmington, Delaware, were inundated (Reference 6).

On September 20, 1945, a storm brought the highest water level to Elkton since the flood of August 1933. The rising Elk River washed out the bridge at the Elk Paper Manufacturing Company and came within a foot of the high-water mark of 1933 (Reference 7).

On August 18, 1955, Hurricane Connie caused an estimated $100,000 damage to roads in Cecil County, $50,000 of which was done to bridges. Most road damage was to State Routes 272 and 280, north of U.S. Route 40. Newark Road, State Route 7, East Main Street at Farr Creek, and Walnut Lane in the Town of Elkton were flooded and closed for 7 hours. Approximately 1,000 customers of the Conowingo Power Company were without service for approximately 24 hours, and telephones were out in Elkton, North East, and Port Deposit. The Chesapeake and Delaware Canal rose 5 feet above normal high tide at Shaeffers Wharf and covered the floor of a restaurant with 8 inches of water. A warehouse along the canal, usually 4 feet above the water surface, was flooded with 6 inches of water. Waterfront properties were extensively damaged, especially Hanford Owen's wharf at Perryville. Rising floodwaters from the Susquehanna River swept away piers, docks, gasoline tanks, and small vessels. Nearby, 3 feet of water rose inside many Charlestown Beach houses (Reference 8).

In August 1969, severe thunderstorms caused washouts on the Susquehanna River and flooding in Havre de Grace, Port Deposit, and Perryville. Unofficial records show storm totals of 6 inches in Port Deposit and 4 inches in a 2-hour period at Havre de Grace. A reported $100,000 in damage occurred in Port Deposit, as well as $50,000 in Havre de Grace (Reference 9).

In June 1972, Maryland experienced one of the most devastating floods in its history. Hurricane Agnes reportedly caused the deaths of 19 people, injured 57 others, and caused $80 million damage statewide. In Elkton, business property losses were nearly $300,000. North East reported $14,000 in damage. Conowingo Dam had a record flood stage height of 111.5 feet, 3 feet above its designated capacity. Big Elk Creek, one of the hardest hit areas, overflowed its banks and closed Delaware Avenue, Howard Street, Appleton Road, and Rickets Mill Road. Little Elk Creek flooded Newark Avenue. A huge washout on Northeast Creek severely damaged the Maudlin Avenue bridge. Basements along Main Street in Elkton were also flooded (Reference 9).

In July 1975, Hurricane Eloise caused a reported $24 million damage to the State of Maryland. Cecil County was among the 10 counties in the State listed as disaster areas which were eligible for Federal relief. Tidal creeks, such as the Elk River, overflowed their banks and caused business and residential districts to be evacuated in Elkton and Rising Sun (Reference 9).

2.4 Flood Protection Measures

Several levees exist along Back Creek; however, they offer no significant flood protection. At the present time, no major flood control structures exist in Cecil County. However, minor flood protection is afforded by stormwater management ponds and channelization projects (Reference 10).

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude 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 community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

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

April 4, 1983, FIS

Discharges for the Susquehanna River were obtained from the Flood Insurance Study for the City of Havre de Grace (Reference 11). In that study, the discharges were provided by the Susquehanna River Basin Commission. The discharges were determined from discharge-frequency curves for the stream gages at Harrisburg and Sunbury, Pennsylvania, as published by USACE. Harrisburg and Sunbury are located approximately 70 and 123 miles, respectively, upstream from Havre de Grace. Discharge values for the 10-, 50-, 100-, and 500-year return periods at the two gaging stations were plotted against drainage area on log-log paper and the curve extrapolated to the drainage area at the mouth of the Susquehanna River.

Hydrologic information for Little Elk Creek was taken from the FIS for the Town of Elkton, Maryland (Reference 12).

Peak discharge-frequency relationships for the riverine flooding sources were determined using 2 streamflow gages, Northeast Creek at Leslie, and Big Elk Creek at Elk Mills. The lengths of record for the gages were 45 and 30 years, respectively. This information was applied to a multiple regression formula using log-Pearson Type III flood-flow frequency analyses (Reference 13). Results were checked with high-water marks and graphed with respect to drainage area and discharge, and utilized in the detailed flooding computer models.

The SCS TR-20 computer program was employed to generate additional peak discharge-frequency relationships for smaller watersheds (Reference 14). Runoff curve numbers, drainage areas, and times of concentration for each watershed portion was developed for input in this model. Results were recorded in conjunction with the aforementioned graph to provide further accuracy on the lower end of the curve for small drainage areas.

Storm surge elevations for the 10-, 50-, 100-, and 500-year floods were determined for several tidal areas in Cecil County. Starting water-surface elevations used in this study for the tidal areas were developed by VIMS under separate contract to FEMA (Reference 15). The analyses reported herein reflect the stillwater elevations due to tidal and wind setup effects, but do not include contributions from wave action effect such as wave crest height and wave runup.

December 4, 1986, FIS

The backwater flooding affecting the Sassafras River was obtained from the FIS for the unincorporated areas of Kent County, Maryland (Reference 1).

This revision

The discharge-frequency relationship for the Christina River was developed to be consistent with the flows previously developed for the FIS for the City of Newark, Delaware, using WRI 78-93 (Reference 16).

The discharge-frequency relationship for the West Branch Christina River was developed using USGS TR-55 computer program (Reference 17).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
SUSQUEHANNA RIVER At the confluence with the Chesapeake Bay	27,500	460,000	680,000	780,000	1,200,000
BIG ELK CREEK At the Town of Elkton corporate limits	57.8	6,600	11,500	14,000	23,000
NORTHEAST CREEK At State Route 7	44.0	4,800	8,600	10,600	17,000
LITTLE NORTHEAST CREEK At the confluence with Northeast Creek	17.2	2,800	4,800	6,100	9,600
LITTLE ELK CREEK At the confluence with the Elk River	39.6	5,400	9,800	12,200	20,000
STONE RUN TRIBUTARY 1 At the confluence with Stone Run	4.7	2,200	3,220	3,960	6,330
MILL CREEK At the Town of Perryville corporate limits	3.8	1,975	2,675	3,340	4,950
STONE RUN TRIBUTARY 2 At the confluence with Stone Run	1.7	1,010	1,500	1,850	2,980

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
WEST BRANCH CHRISTINA RIVER					
3,900 feet upstream of Brewster Bridge Road	1.22	690	1,022	1,194	1,700
Upstream of confluence of unnamed tributary	2.11	1,005	1,500	1,757	2,700
Upstream of confluence of Persimmon Run	4.21	1,446	2,171	2,547	4,000
Upstream of confluence with the Christina River	6.48	1,907	2,870	3,376	5,000
CHRISTINA RIVER					
At Pennsylvania/ Maryland boundary	1.60	740	1,200	1,500	2,200
Upstream of confluence of the East Branch Christina River	3.84	1,100	1,900	2,500	3,800
Upstream of Nottingham Road	6.70	1,500	2,500	3,300	5,200

The stillwater elevations have been determined for the 10-, 50-, 100-, and 500-year floods for the Chesapeake Bay, the Northeast, Elk, and Bohemia Rivers, and Back Creek. These are summarized in Table 2, "Summary of Stillwater Elevations."

TABLE 2 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NGVD*) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CHESAPEAKE BAY				
At the mouth of the Sassafras River	5.1	8.7	10.5	13.4
At the Town of Perryville	5.3	9.6	11.5	14.6
NORTHEAST RIVER				
At the Town of Charleston	5.9	10.2	12.2	15.2
ELK RIVER				
At Turkey Point	5.5	9.5	11.4	14.4
At the Town of Elkton	6.0	10.0	11.9	14.9

*National Geodetic Vertical Datum of 1929

TABLE 2 - SUMMARY OF STILLWATER ELEVATIONS - continued

FLOODING SOURCE AND LOCATION	ELEVATION (feet NGVD*) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
BOHEMIA RIVER				
At the confluence with the Elk River	5.7	9.7	11.6	14.6
BACK CREEK				
At the Chesapeake and Delaware Canal Mooring Basin	6.0	10.0	11.9	14.9

*National Geodetic Vertical Datum of 1929

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.

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. 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 Flood Boundary and Floodway Map or the revised FIRM (Exhibit 2).

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

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study, and their descriptions, are shown on the maps.

April 4, 1983, FIS

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 18). Input data for the backwater analyses were developed from field surveys.

Cross sections for the flooding sources studied by detailed methods were obtained from field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Starting water-surface elevations for the Susquehanna River were determined using tidal elevations from the Chesapeake Bay. Starting water-surface elevations for Big Elk Creek and the West Branch Christina River were determined using critical depth. Starting water-surface elevations for Little Elk Creek were determined using the slope-area method. Starting water-surface elevations for Northeast Creek were obtained from the FIS for the Town of North East (Reference 19). Starting water-surface elevations for Little Northeast Creek were determined assuming coincident peak flow with Northeast Creek. Starting water-surface elevations for Mill Creek and Stone Run Tributary 1 were taken from elevations computed in the TR-20 program (Reference 14). Starting water-surface elevations for Stone Run Tributary 2 were determined assuming coincident peak flow with Stone Run Tributary 1.

This revision

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 18).

Cross sections for the flooding sources studied by detailed methods were obtained from the Digital Terrain Model developed for this study (References 20, 21, and 22).

Starting water-surface elevations for the Christina River and the West Branch Christina River were determined using the slope/area method.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by field inspection. The following tabulation shows the channel and overbank "n" values for the streams studied by detailed methods:

Stream	Channel "n"	Overbank "n"
Susquehanna River	0.030	0.060-0.075
Big Elk Creek	0.025-0.070	0.030-0.092
Northeast Creek	0.045-0.050	0.035-0.100
Little Northeast Creek	0.035-0.045	0.039-0.100
Little Elk Creek	0.035-0.040	0.060-0.100
Stone Run Tributary 1	0.045-0.060	0.040-0.150
Mill Creek	0.012-0.075	0.060-0.120
West Branch Christina River	0.013-0.035	0.035-1.000
Stone Run Tributary 2	0.045-0.065	0.012-0.070
Christina River	0.020-0.045	0.050-0.100

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS generally provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the flooding sources studied in detail, the 100- and 500-year floodplain boundaries have been delineated using topographic maps at a scale of 1:24,000 with contour intervals of 20 feet and 5 feet (References 23 and 24).

For the flooding sources studied by approximate methods, the boundaries of the 100-year flood were delineated using topographic maps and USGS flood-prone quadrangles (References 23 and 25).

The 100- and 500-year floodplain boundaries are shown on the Flood Boundary and Floodway Map and FIRM (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, and numbered A Zones), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year 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 100-year floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

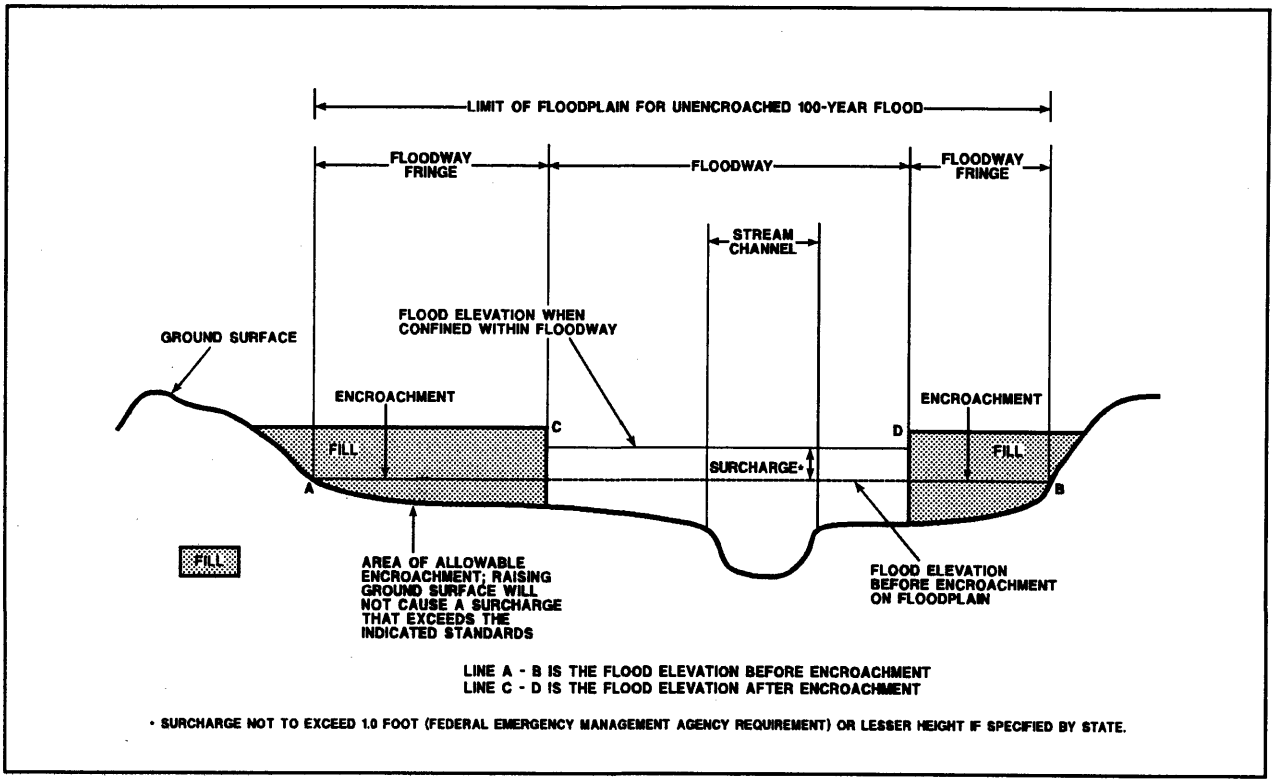
Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development 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 100-year 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 100-year 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 study 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 3). The computed floodways are shown on the Flood Boundary and Floodway Map or the revised FIRM (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway widths for the Susquehanna River, Big Elk Creek, Little Elk Creek, and Stone Run Tributaries 1 and 2 extend beyond the corporate limits.

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 3, "Floodway Data." In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

The area between the floodway and 100-year 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 100-year 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 2.



FLOODWAY SCHEMATIC Figure 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH[3] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Susquehanna River								
A	10,286[1]	5,010	114,491	6.8	11.5	8.4[4]	9.0	0.6
B	14,236[1]	4,200	109,192	7.1	11.5	9.6[4]	10.1	0.5
C	17,498[1]	4,555	126,224	6.2	11.5	10.6[4]	11.0	0.4
D	21,411[1]	4,563	116,960	6.7	11.5	11.3[4]	11.7	0.4
E	25,463[1]	3,979	76,360	10.2	12.4	12.4	12.7	0.3
F	27,483[1]	4,225	84,157	9.2	14.2	14.2	14.4	0.2
G	28,315[1]	4,335	106,594	7.3	15.1	15.1	15.3	0.2
H	30,550[1]	4,011	82,982	9.4	15.7	15.7	15.9	0.2
I	32,950[1]	3,291	65,008	12.0	17.2	17.2	17.3	0.1
J	34,210[1]	3,132	51,834	15.0	18.1	18.1	18.2	0.1
K	36,180[1]	3,146	67,286	11.6	22.2	22.2	22.5	0.3
L	37,900[1]	3,011	69,511	11.2	23.9	23.9	24.1	0.2
M	40,910[1]	3,066	75,430	10.3	26.3	26.3	26.5	0.2
N	43,170[1]	2,613	65,522	11.9	27.5	27.5	27.7	0.2
O	47,480[1]	2,528	65,980	11.8	30.2	30.2	30.3	0.1
P	49,125[1]	2,597	61,994	12.6	34.8	34.8	34.9	0.1
Q	49,845[1]	3,226	88,884	8.8	37.6	37.6	37.9	0.3
Big Elk Creek								
A	1,175[2]	340	2,077	6.7	29.5	29.5	30.1	0.6
B	1,925[2]	175	1,367	10.2	31.0	31.0	31.9	0.9
C	2,325[2]	102	1,319	10.6	33.7	33.7	33.8	0.1

[1]Feet above confluence with Chesapeake Bay

[2]Feet above Conrail

[3]This width extends beyond corporate limits

[4]Elevation computed without consideration of backwater effects from Chesapeake Bay

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

SUSQUEHANNA RIVER AND BIG ELK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Big Elk Creek								
D	2,490[1]	306[3]	3,005	4.7	35.9	35.9	35.9	0.0
E	4,550[1]	419	3,382	4.1	37.3	37.3	37.3	0.0
F	6,230[1]	353	2,284	6.1	40.4	40.4	40.6	0.2
G	6,309[1]	307	2,060	6.8	40.5	40.5	41.2	0.7
H	9,799[1]	675	1,783	7.9	47.4	47.4	47.5	0.1
I	11,199[1]	926	3,593	3.9	52.9	52.9	52.9	0.0
J	12,999[1]	191	1,122	12.5	57.9	57.9	58.0	0.1
K	14,659[1]	576	4,040	3.5	63.7	63.7	64.2	0.5
L	15,065[1]	500	2,282	6.1	64.8	64.8	65.2	0.4
Northeast Creek								
A	3,343[2]	110	1,226	8.6	17.5	17.5	17.5	0.0
B	3,550[2]	86	877	12.1	18.5	18.5	19.0	0.5
C	4,060[2]	214	2,220	4.8	22.2	22.2	22.5	0.3
D	4,360[2]	117	737	14.4	29.3	29.3	29.3	0.0
E	4,450[2]	162	2,006	5.3	36.1	36.1	36.1	0.0
F	5,800[2]	458	3,540	3.0	37.3	37.3	37.7	0.4
G	6,500[2]	850[4]	2,539	2.9	37.6	37.6	38.5	0.9
H	6,899[2]	480	2,171	3.4	39.0	39.0	39.2	0.2
I	8,199[2]	138	658	11.1	47.4	47.4	47.4	0.0

[1]Feet above Conrail

[2]Feet above State Route 7

[3]This width extends beyond corporate limits

[4]Combined Northeast Creek/Little Northeast Creek floodway

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

BIG ELK CREEK AND NORTHEAST CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Northeast Creek (continued)								
J	9,349[1]	89	557	13.1	63.0	63.0	63.0	0.0
K	9,749[1]	48	429	17.0	71.6	71.6	71.6	0.0
Little Northeast Creek								
A	400[2]	850[3]	3,748	1.6	37.5	37.5	38.3	0.8
B	799[2]	424	2,534	2.4	38.5	38.5	39.0	0.5
C	1,979[2]	153	1,033	5.9	39.8	39.8	40.6	0.8
D	3,549[2]	139	691	8.8	48.7	48.7	49.0	0.3
E	3,879[2]	350	2,131	2.9	53.2	53.2	54.1	0.9
F	5,459[2]	655	1,279	4.8	58.3	58.3	58.3	0.0
G	6,809[2]	265	948	6.4	66.3	66.3	67.0	0.7
H	8,449[2]	117	787	7.8	76.5	76.5	77.4	0.9
I	9,149[2]	67	561	10.9	80.3	80.3	80.8	0.5

[1]Feet above State Route 7

[2]Feet above confluence with Northeast Creek

[3]Combined Northeast Creek/Little Northeast Creek floodway

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTHEAST CREEK AND LITTLE NORTHEAST CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Little Elk Creek								
A	1,200[1]	1,480[3]	9,148	1.3	11.9	5.6[4]	6.6	1.0
B	2,090[1]	930[3]	1,719	7.0	11.9	6.8[4]	7.6	0.8
C	2,630[1]	770[3]	5,094	2.4	11.9	7.7[4]	8.2	0.5
D	5,380[1]	1,470[3]	8,933	1.4	11.9	8.6[4]	9.2	0.6
E	6,840[1]	1,800[3]	11,942	1.0	11.9	8.9[4]	9.6	0.7
F	7,520[1]	1,580[3]	8,413	1.5	11.9	9.0[4]	9.7	0.7
G	8,680[1]	170[3]	1,362	9.0	11.9	11.3[4]	12.2	0.9
H	9,270[1]	190[3]	1,747	7.0	13.7	13.7	14.4	0.7
I	10,640[1]	150[3]	1,329	9.2	16.0	16.0	16.4	0.4
J	11,960[1]	520[3]	1,905	6.4	19.8	19.8	20.3	0.5
K	12,890[1]	630[3]	4,258	2.9	21.8	21.8	22.2	0.4
Stone Run Tributary 1								
A	600[2]	85	352	11.2	277.4	277.4	277.7	0.3
B	2,100[2]	135	753	5.3	284.8	284.8	285.8	1.0
C	3,300[2]	29	241	16.4	297.0	297.0	297.0	0.0
D	3,341[2]	29	409	9.7	302.6	302.6	302.7	0.1
E	3,771[2]	350	2,428	1.6	304.6	304.6	304.7	0.1
F	3,987[2]	201	1,344	2.9	304.7	304.7	304.9	0.2
G	4,287[2]	350	1,360	2.9	305.0	305.0	305.4	0.4

[1]Feet above confluence with the Elk River

[2]Feet above confluence with Stone Run

[3]This width extends beyond corporate limits

[4]Elevation computed without consideration of backwater effects from the Elk River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE ELK CREEK AND STONE RUN TRIBUTARY 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Stone Run Tributary 1 (continued)								
H	4,307[1]	380	3,946	1.0	311.8	311.8	312.8	1.0
I	5,359[1]	193[3]	625	3.0	314.6	314.6	314.9	0.3
J	8,535[1]	220[3]	1,144	1.6	342.9	342.9	343.1	0.2
K	9,635[1]	61	187	10.0	354.8	354.8	355.3	0.5
Mill Creek								
A	228[2]	203	578	5.8	79.4	79.4	79.4	0.0
B	928[2]	276	659	5.1	84.3	84.3	85.0	0.7
C	2,428[2]	27	209	16.0	100.0	100.0	100.0	0.0
D	2,561[2]	27	342	9.8	104.6	104.6	105.0	0.4
E	2,936[2]	150	1,134	2.9	106.7	106.7	107.1	0.4
F	4,392[2]	104	430	6.3	115.4	115.4	115.9	0.5
G	5,492[2]	124	501	5.4	132.1	132.1	132.6	0.5
H	6,442[2]	116	387	7.0	143.7	143.7	144.3	0.6
I	7,392[2]	87	357	7.5	156.7	156.7	157.1	0.4
J	7,529[2]	202	1,128	1.9	165.5	165.5	166.2	0.7
K	7,729[2]	207	1,169	1.8	165.8	165.8	166.4	0.6
L	8,035[2]	33	260	8.1	176.5	176.5	177.2	0.7
M	8,235[2]	95	257	8.2	178.6	178.6	179.5	0.9
N	9,340[2]	56	216	9.7	195.0	195.0	195.2	0.2

[1]Feet above confluence with Stone Run

[2]Feet from corporate limits

[3]This width extends beyond corporate limits

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

STONE RUN TRIBUTARY 1 AND MILL CREEK

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
Mill Creek (continued)								
O	10,852	120	368	5.7	217.9	217.9	218.4	0.5
P	11,108	57	226	9.3	223.8	223.8	224.2	0.4
Q	11,464	55	219	9.6	234.4	234.4	234.9	0.5
R	11,630	40	274	7.7	244.9	244.9	244.9	0.0
S	11,730	25	58	10.9	245.3	245.3	245.3	0.0
T	11,930	25	262	8.0	268.1	268.1	269.1	1.0
U	12,025	45	194	10.8	270.7	270.7	270.8	0.1
V	12,357	42	148	9.5	278.0	278.0	278.1	0.1
W	12,785	169	466	3.0	284.2	284.2	284.7	0.5

[1]Feet from corporate limits

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

MILL CREEK

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
West Branch Christina River								
A	8,702	120	469	3.7	107.2	107.2	107.6	0.4
B	10,100	125	321	5.2	112.1	112.1	112.1	0.0
C	11,957	100	324	5.2	119.1	119.1	119.3	0.2
D	12,949	170	980	1.7	124.6	124.6	125.6	1.0
E	14,424	274	408	4.1	128.6	128.6	128.8	0.2
F	14,570	275	1,748	1.0	133.5	133.5	134.0	0.5
G	15,261	223	987	1.7	133.6	133.6	134.1	0.5
H	16,317	162	372	3.8	135.6	135.6	135.8	0.2
I	17,523	173	327	4.4	140.2	140.2	140.3	0.1
J	18,823	195	441	3.2	145.5	145.5	145.7	0.2
K	19,223	220	1,077	1.3	150.1	150.1	150.1	0.0
L	19,573	157	500	2.8	150.3	150.3	150.5	0.2
M	19,880	130	668	2.1	152.7	152.7	152.7	0.0
N	21,159	101	316	4.5	155.4	155.4	155.7	0.3
O	21,991	168	605	2.0	158.9	158.9	159.4	0.5
P	22,584	102	374	3.2	159.7	159.7	160.1	0.4
Q	22,987	79	208	5.7	161.3	161.3	161.3	0.0
R	23,784	127	300	4.0	163.9	163.9	164.2	0.3
S	25,226	167	318	3.8	168.8	168.8	168.9	0.1
T	25,707	37	153	7.8	169.8	169.8	169.9	0.1
U	26,298	148	285	4.2	174.0	174.0	174.0	0.0
V	27,405	138	332	3.6	181.6	181.6	181.9	0.3
W	28,869	138	308	3.9	191.5	191.5	192.0	0.5
X	29,145	119	539	2.2	196.2	196.2	196.7	0.5

[1]Feet above confluence with Christina River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

WEST BRANCH CHRISTINA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Stone Run Tributary 2								
A	600	113	245	7.6	279.2	279.2	279.2	0.0
B	814	115	511	3.6	283.8	283.8	283.8	0.0
C	1,689	47	190	9.8	294.8	294.8	294.8	0.0
D	2,564	174[2]	524	3.5	307.9	307.9	308.3	0.4

[1]Feet above confluence with Stone Run

[2]This width extends beyond corporate limits

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

STONE RUN TRIBUTARY 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Christina River								
A	596	61	314	8.0	161.2	161.2	162.1	0.9
B	3,303	64	337	6.7	179.0	179.0	179.4	0.4
C	4,730	120	359	5.9	192.0	192.0	192.4	0.4
D	7,231	87	342	5.9	209.5	209.5	210.2	0.7
E	9,770	91	276	6.4	225.9	225.9	226.2	0.3
F	12,116	116	372	4.3	238.8	238.8	239.1	0.3
G	13,992	55	269	5.6	248.2	248.2	248.6	0.4
H	15,485	101	256	5.5	259.0	259.0	259.2	0.2

[1]Feet above Wedgewood Road

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHRISTINA RIVER

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 3 for certain downstream cross sections of the Susquehanna River and Little Elk Creek are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

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 100-year 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 (includes Zones A1 through A30)

Zone AE is the flood insurance rate zone that corresponds to the 100-year 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 100-year 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 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year 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 100-year 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 (includes Zones V1 through V30)

Zone VE is the flood insurance rate zone that corresponds to the 100-year 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 (includes Zone B and C)

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year 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 100-year 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 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable. Floodways are shown on the Flood Boundary and Floodway Map where not shown on the FIRM.

7.0 OTHER STUDIES

FISs have been prepared for the Towns of North East, Chesapeake City, Port Deposit, Perryville, Charleston, and Elkton, and for Kent County (References 19, 26, 27, 28, 29, 30, and 31).

Because it is based on more up-to-date analyses, this FIS supersedes the previously printed FIS for Cecil County (Reference 32).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Mitigation Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

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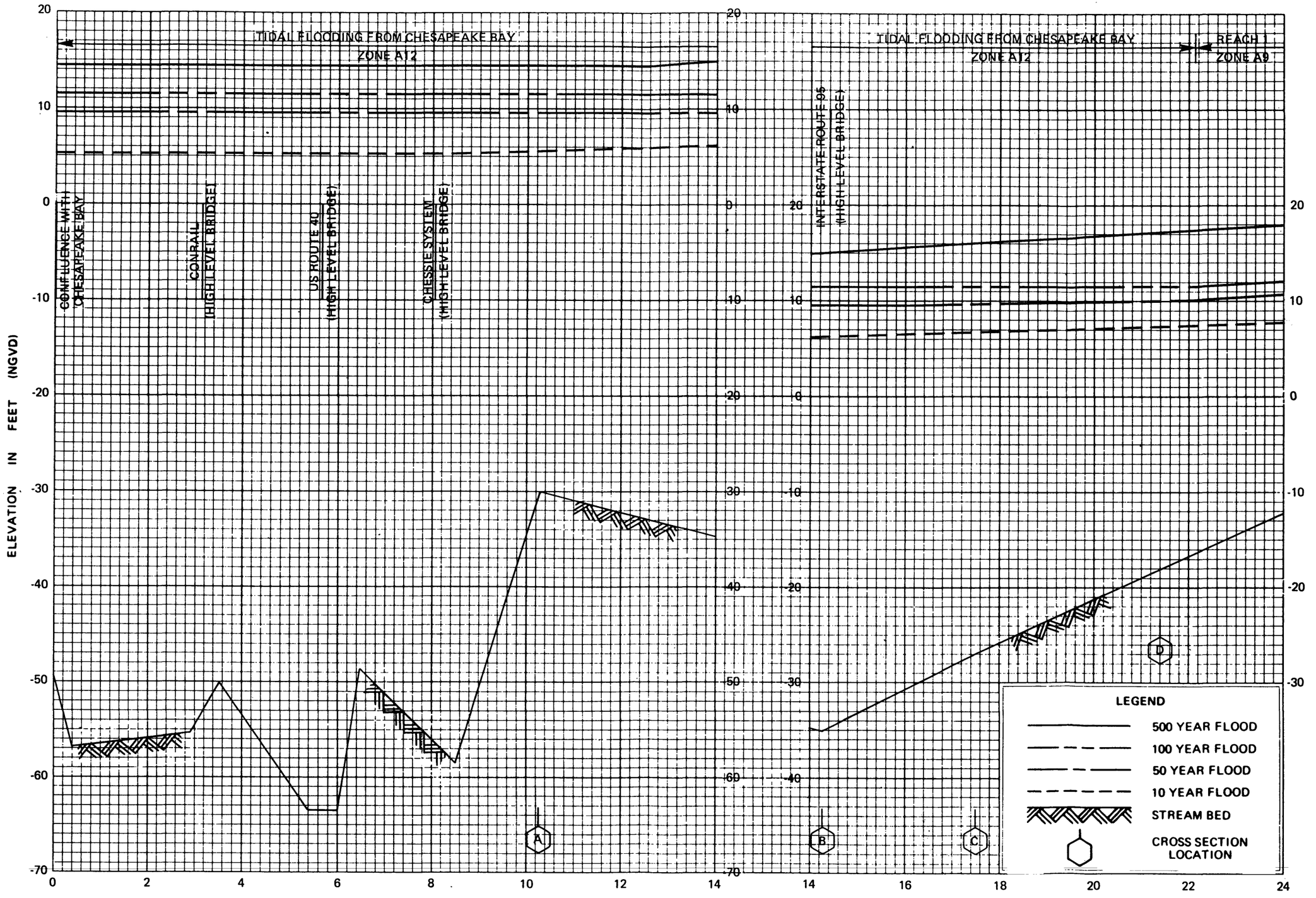


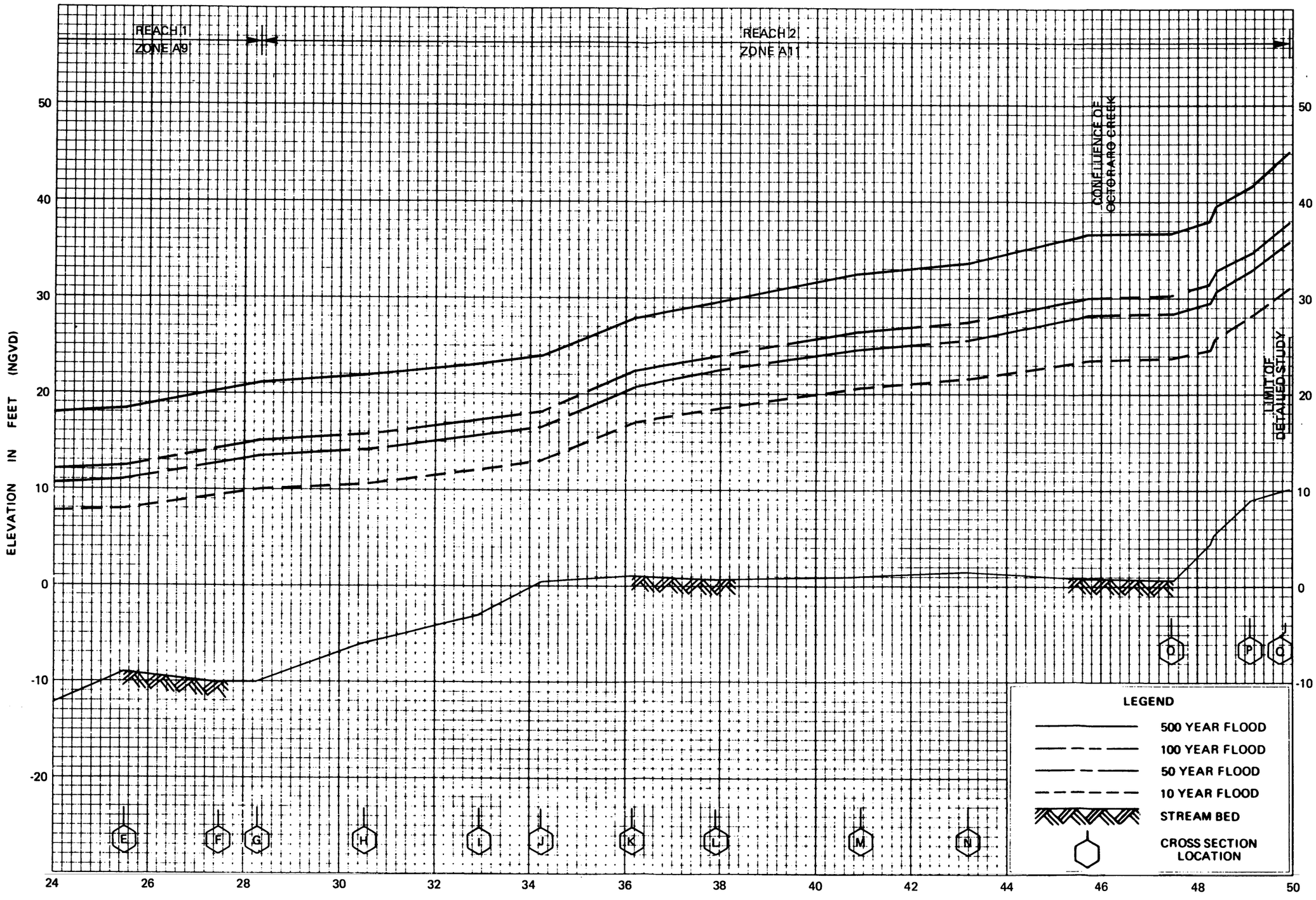
FLOOD PROFILES

SUSQUEHANNA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

01P



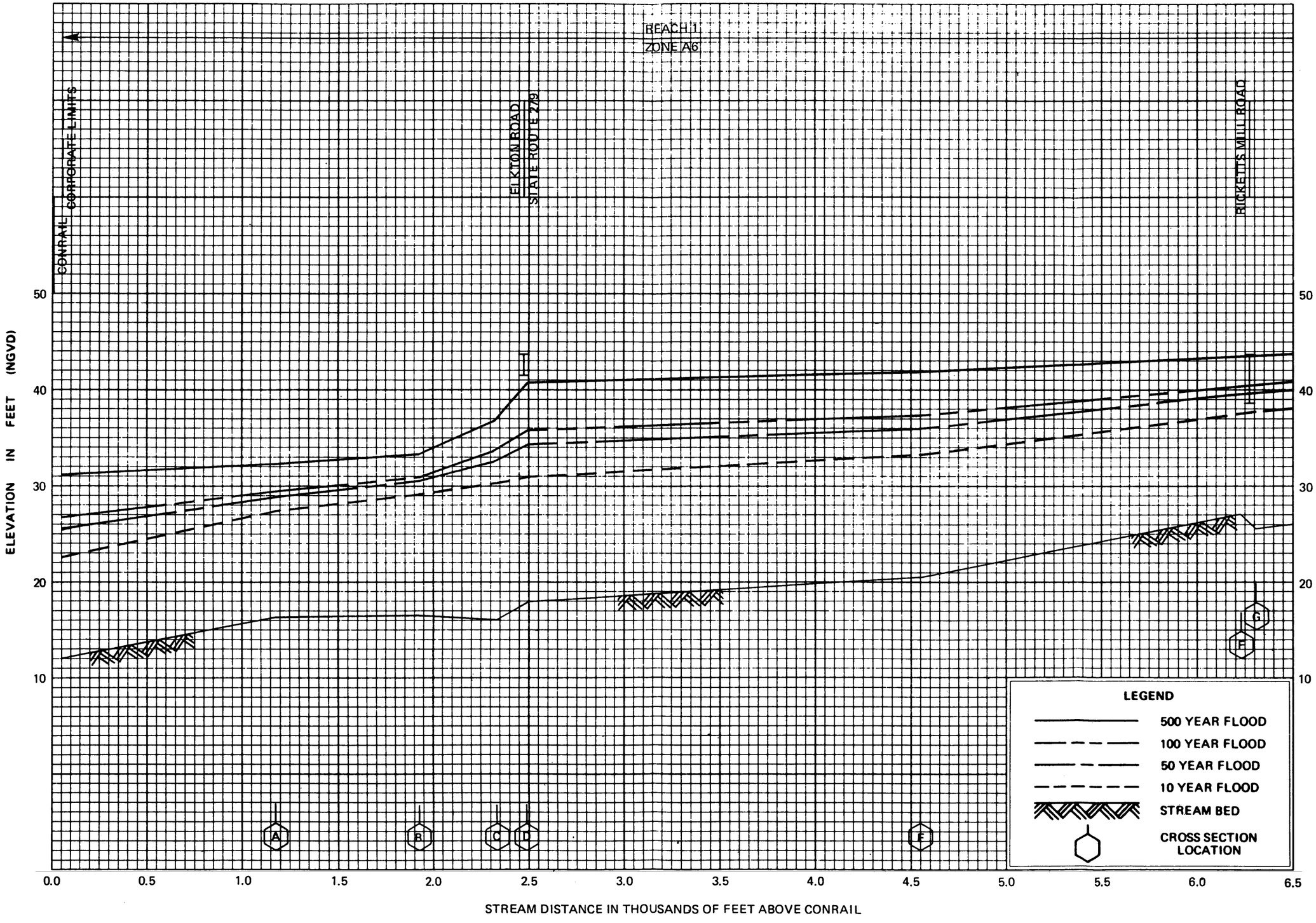
FLOOD PROFILES

SUSQUEHANNA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

02P



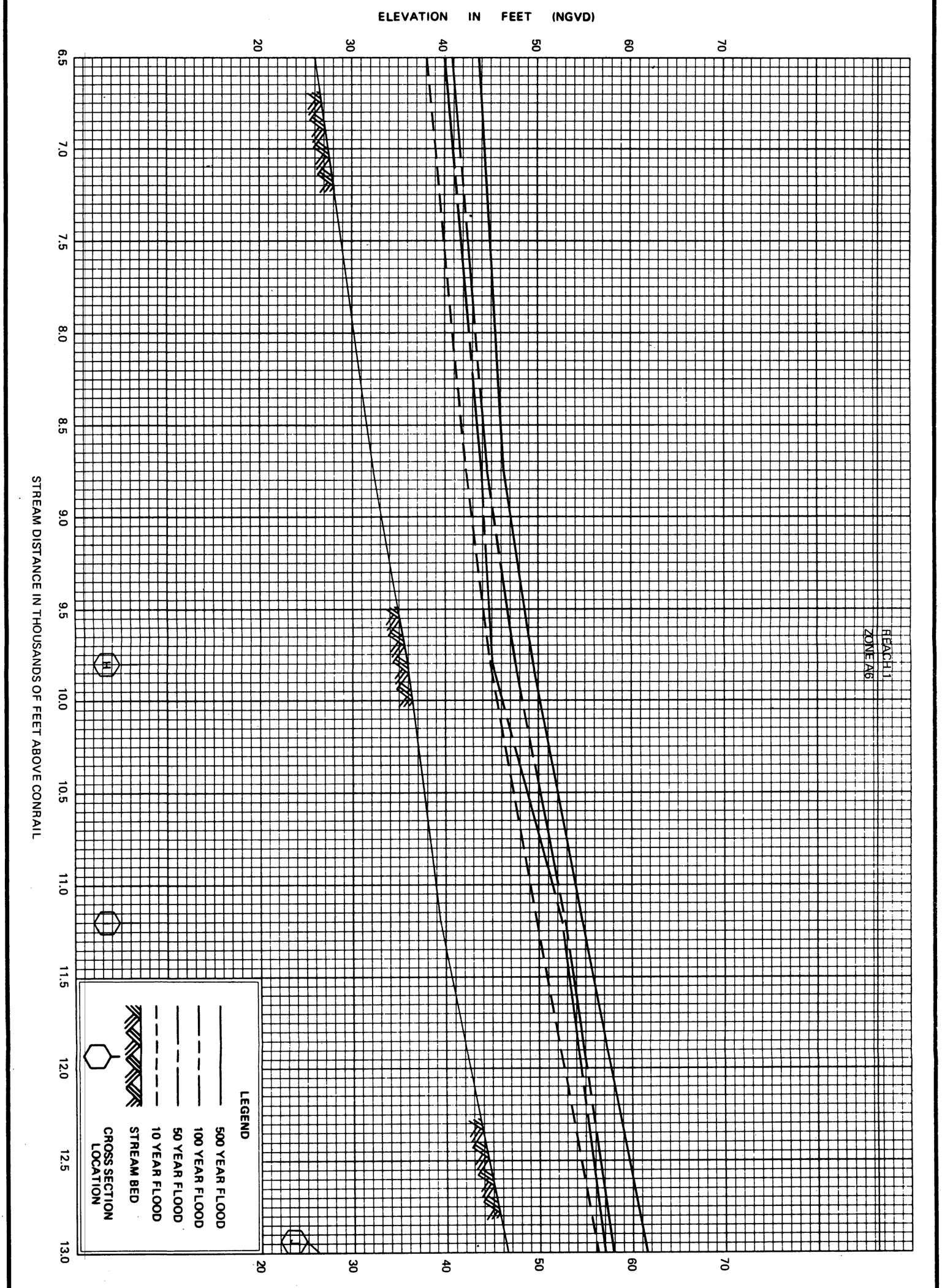
FLOOD PROFILES

BIG ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

03P



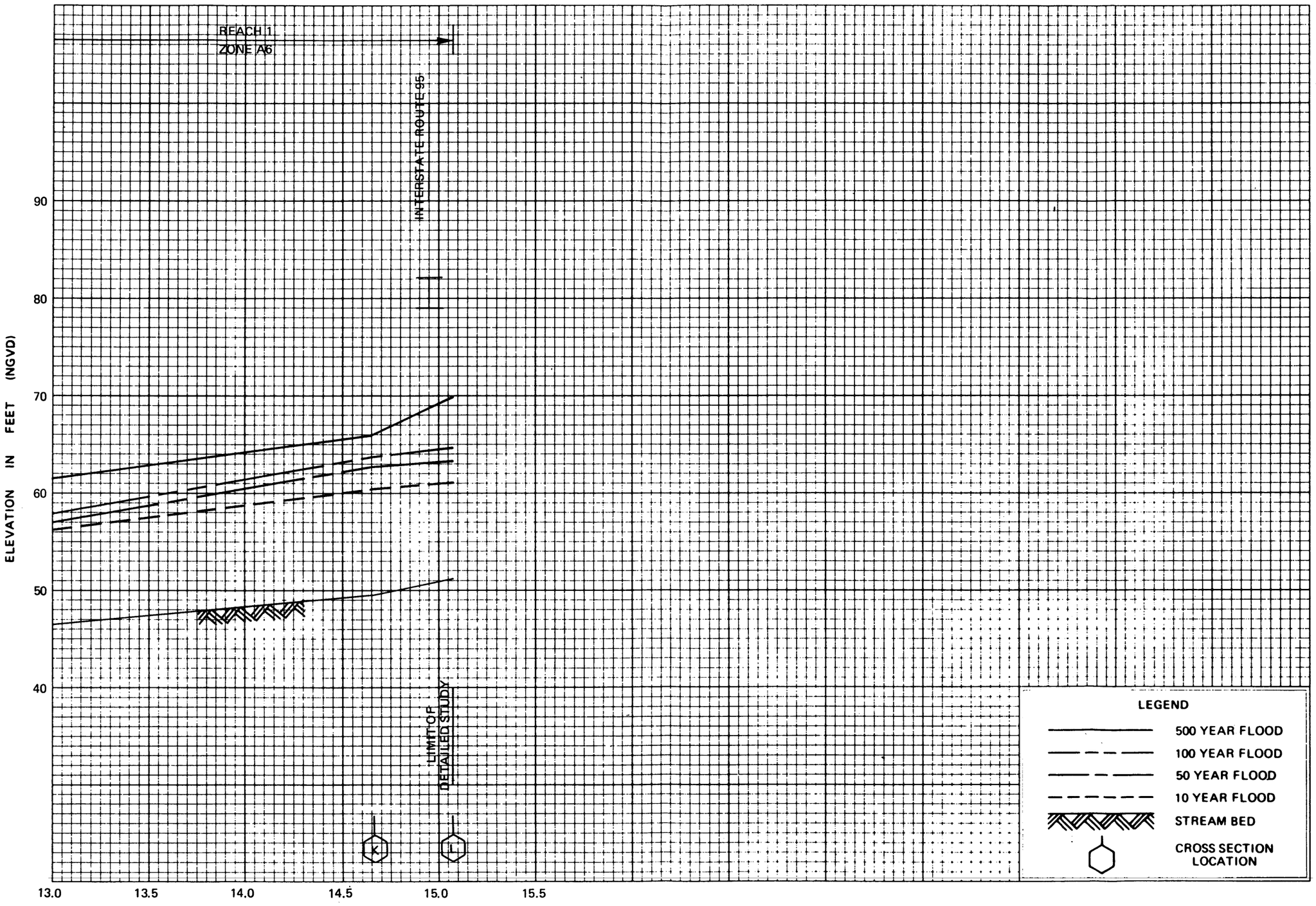
04P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

FLOOD PROFILES

BIG ELK CREEK



FLOOD PROFILES

BIG ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

05P

REACH 1
ZONE A7

CORPORATE LIMITS
DEANS BANK ROAD
CONRAIL
DAM
CONFLUENCE OF LITTLE NORTHEAST CREEK
U.S. ROUTE 40

ELEVATION IN FEET (NGVD)

50
40
30
20
10
0

2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE STATE ROUTE 7

A B C D E F G H

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

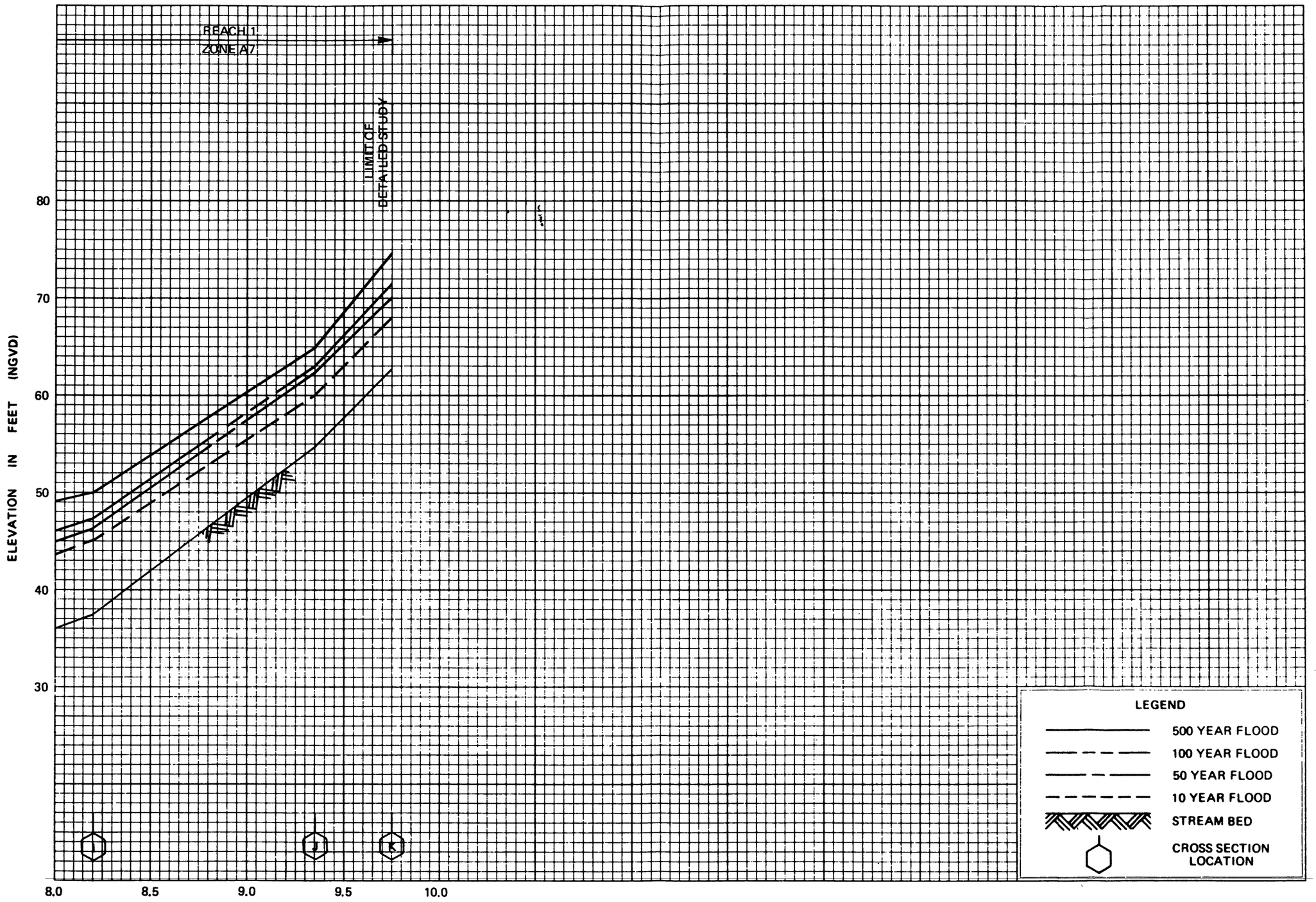
FLOOD PROFILES

NORTHEAST CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

06P



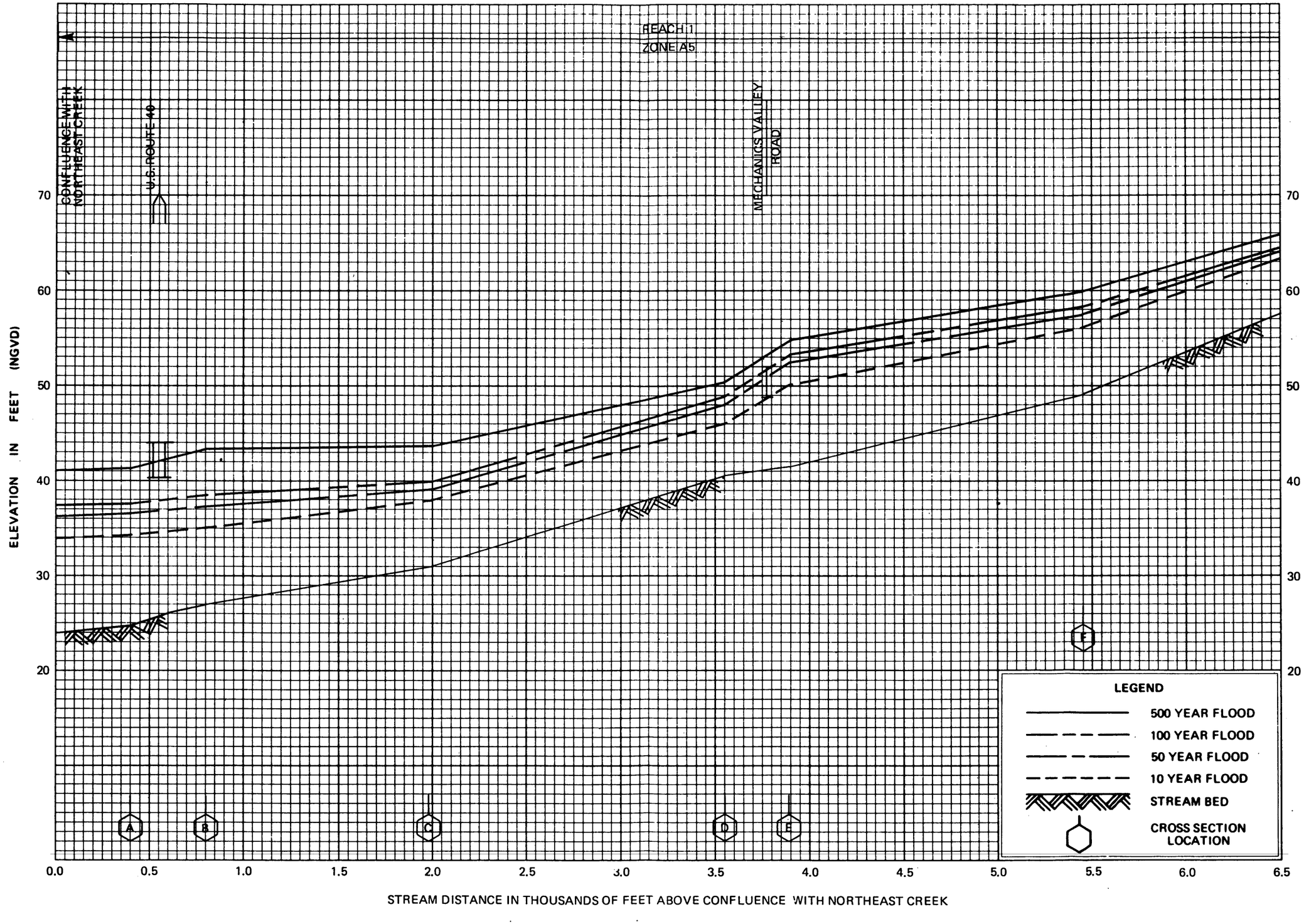
FLOOD PROFILES

NORTHEAST CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

07P



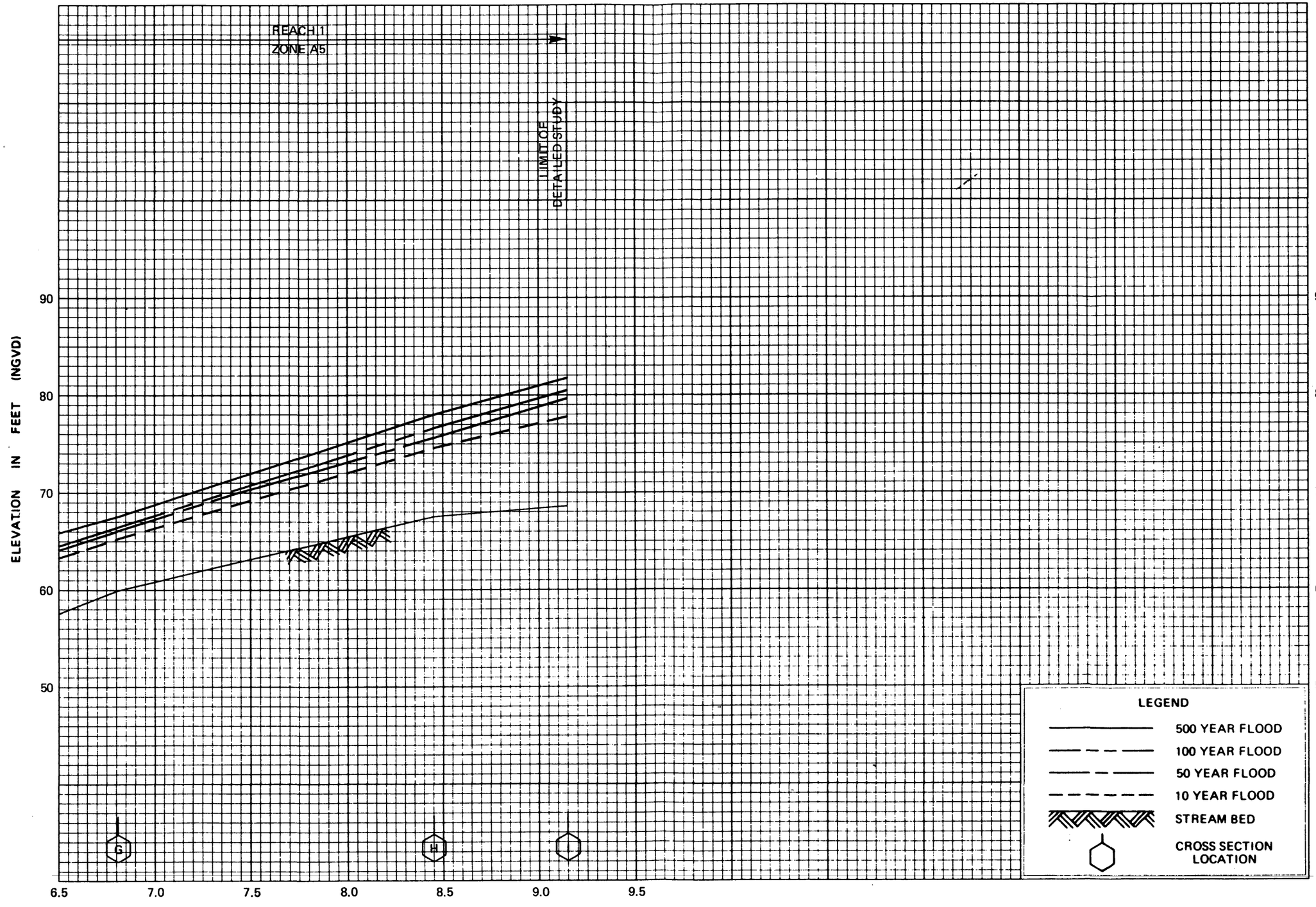
FLOOD PROFILES

LITTLE NORTHEAST CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

08P



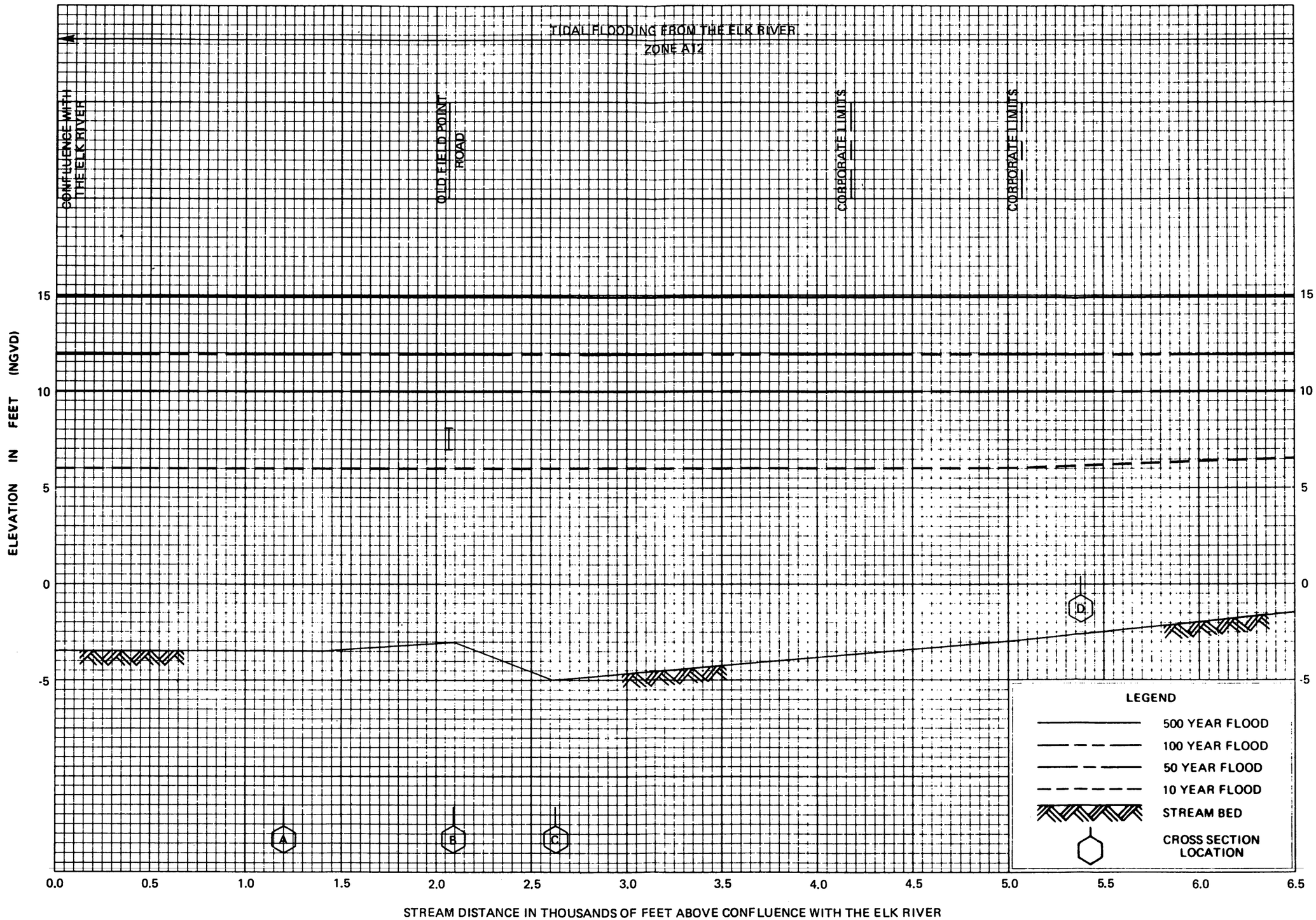
FLOOD PROFILES

LITTLE NORTHEAST CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

09P



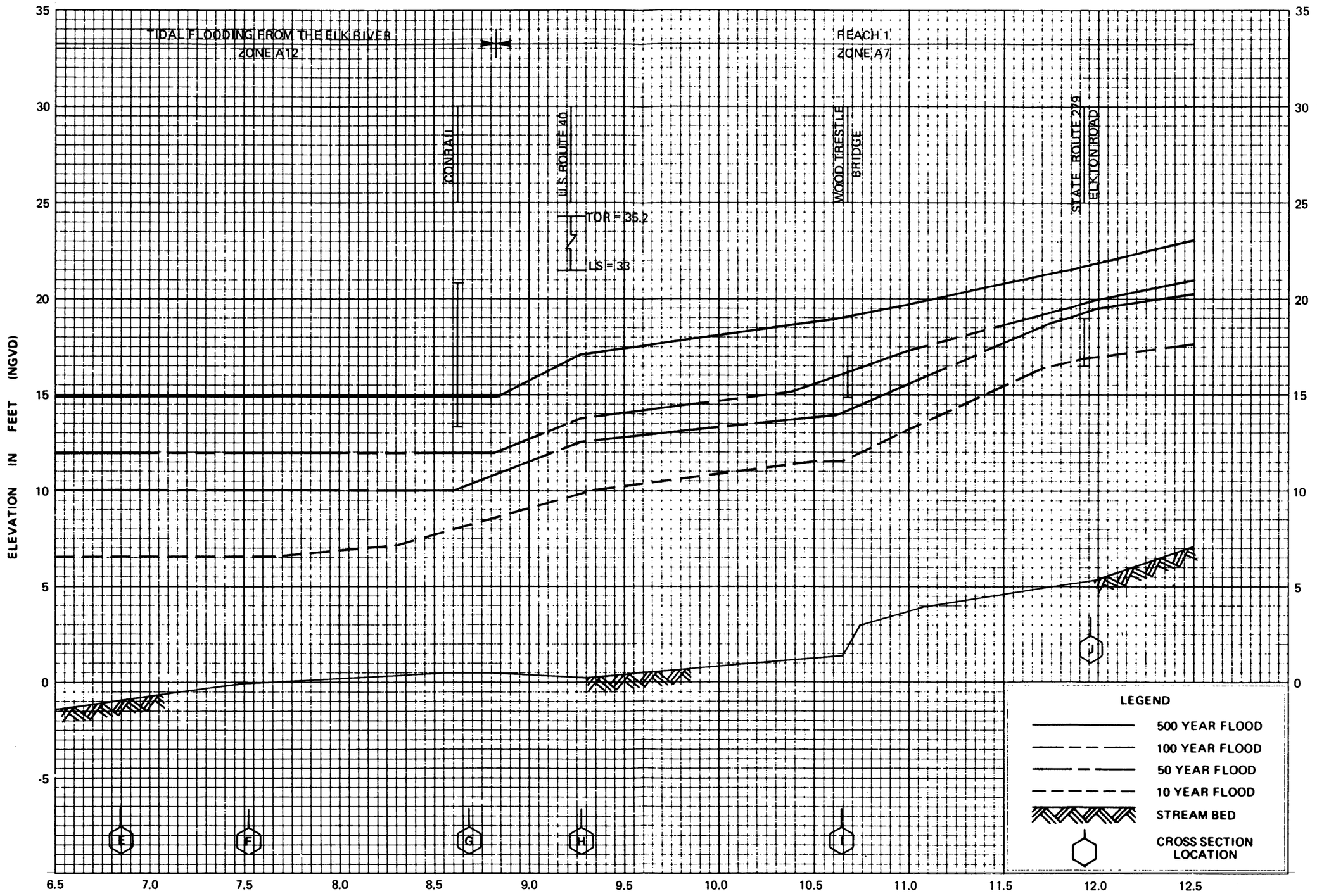
FLOOD PROFILES

LITTLE ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

10P



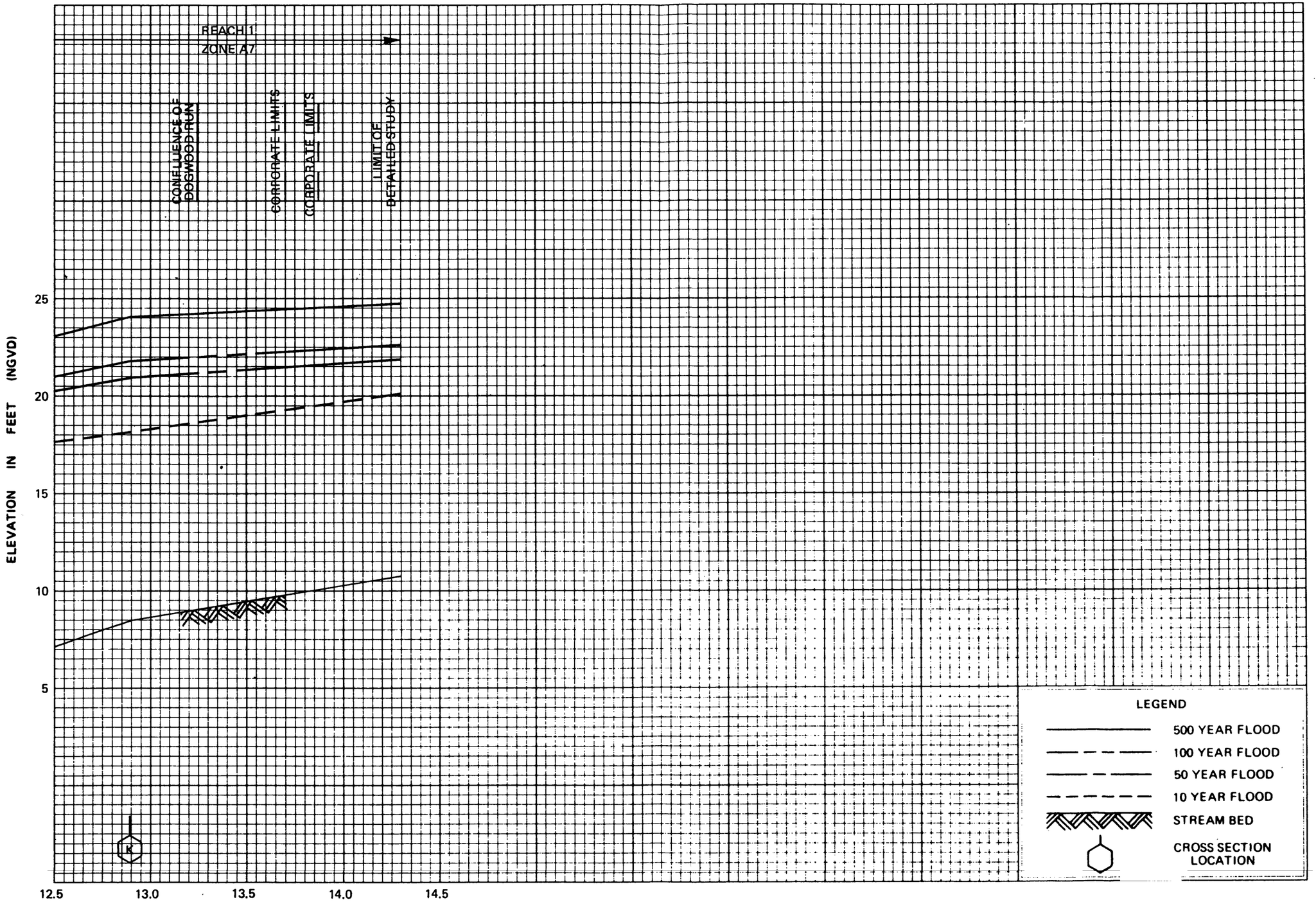
FLOOD PROFILES

LITTLE ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

11P



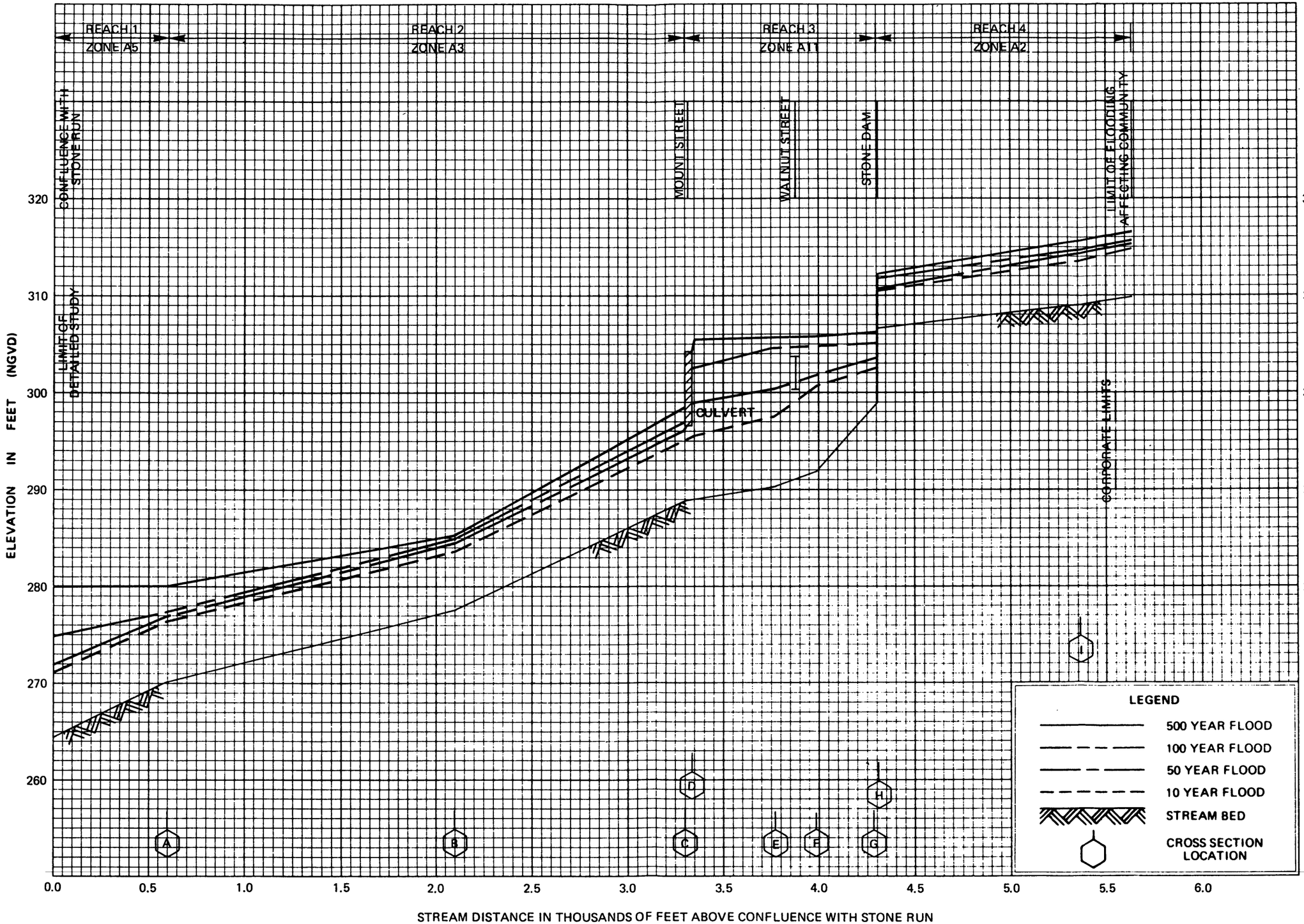
FLOOD PROFILES

LITTLE ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

12P



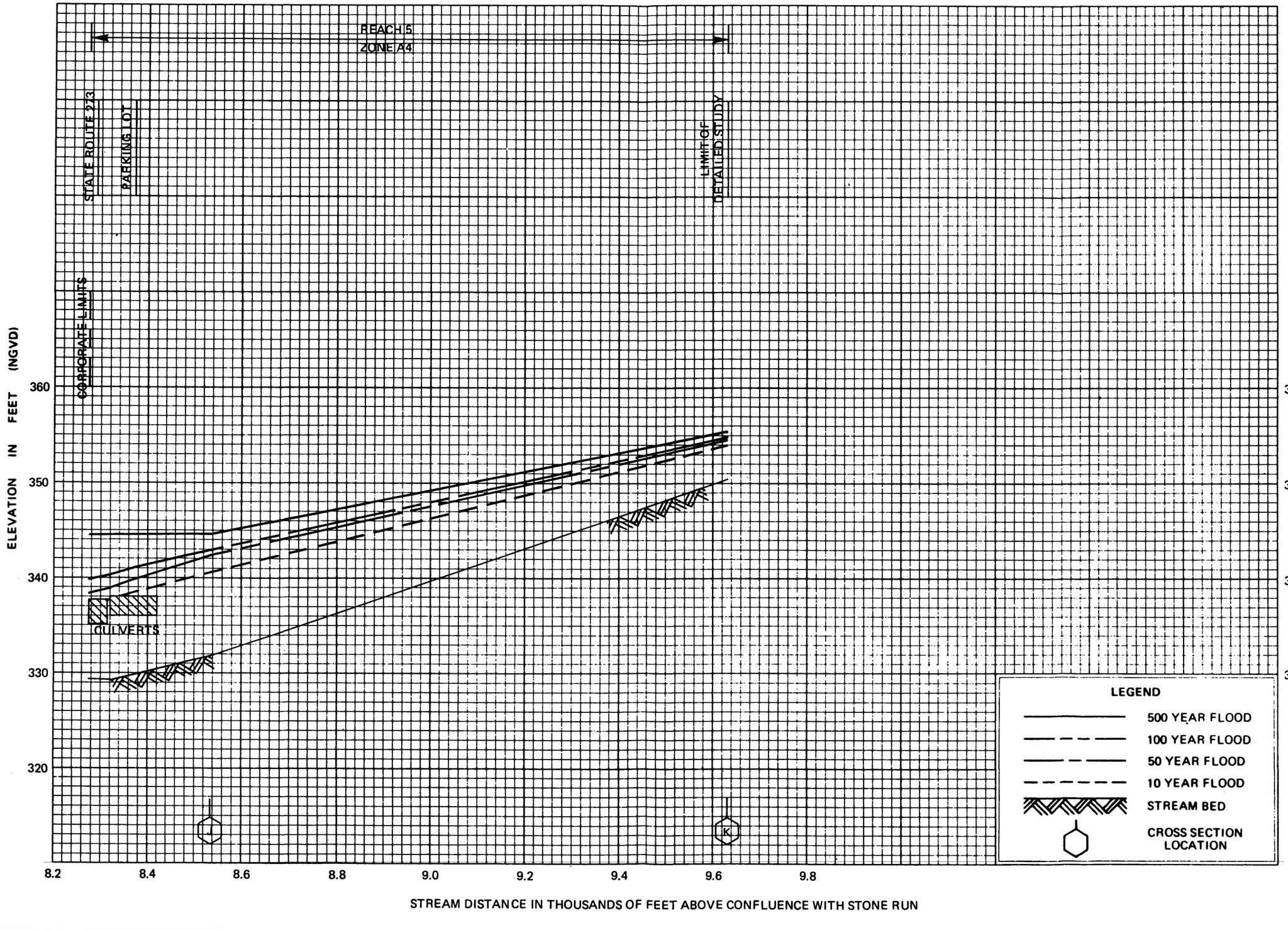
FLOOD PROFILES

STONE RUN TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

13P



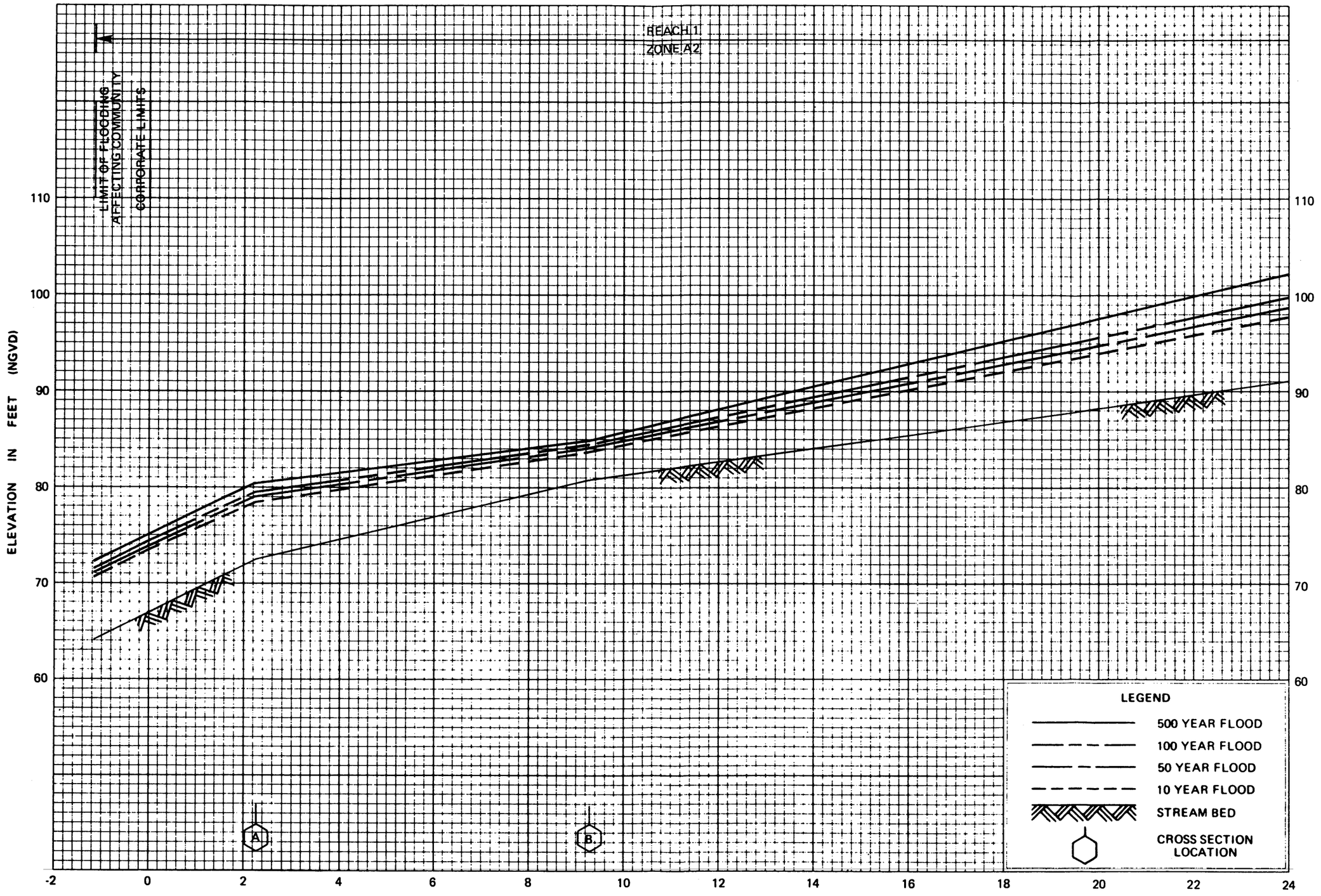
FLOOD PROFILES

STONE RUN TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

14P



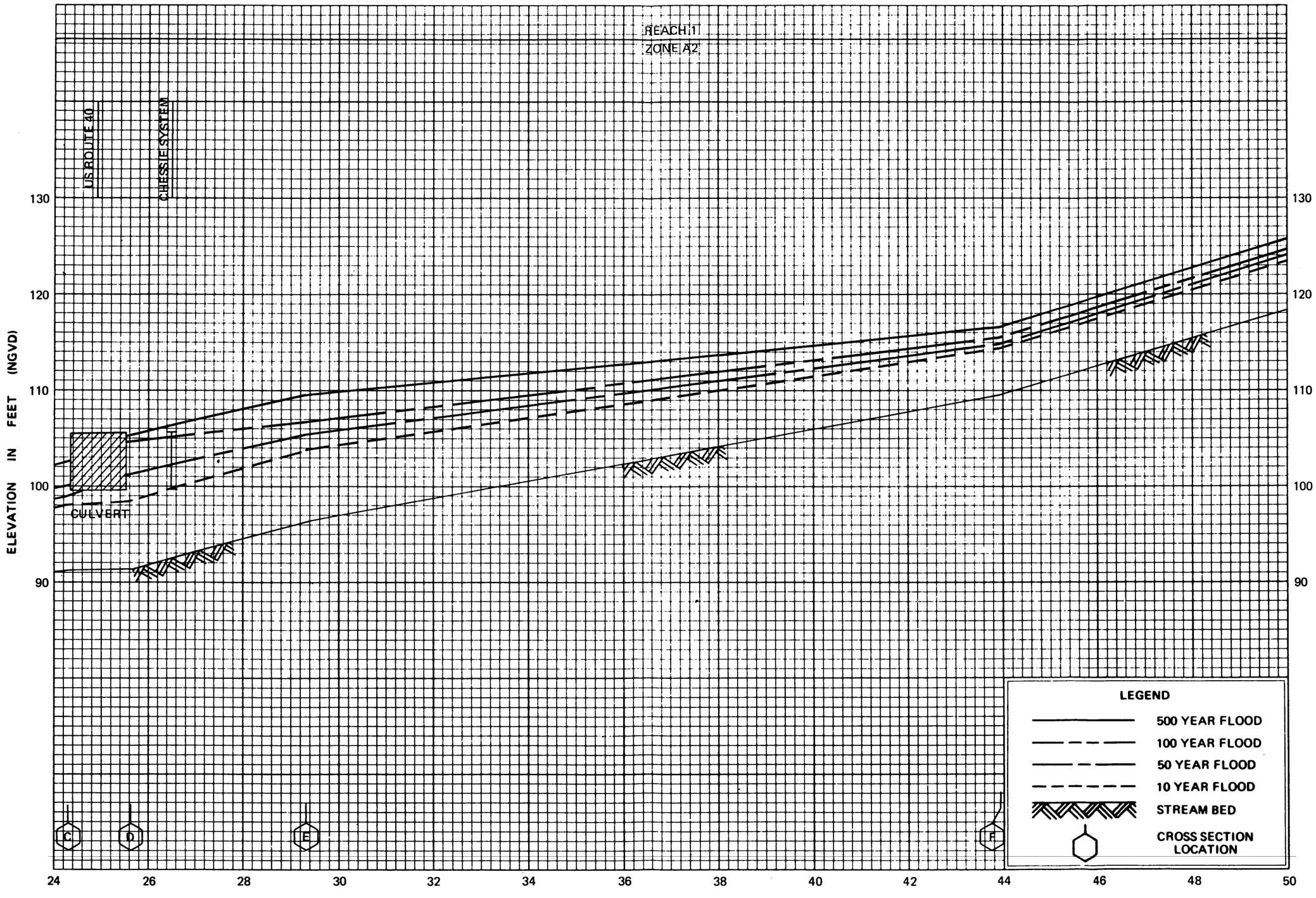
FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

15P



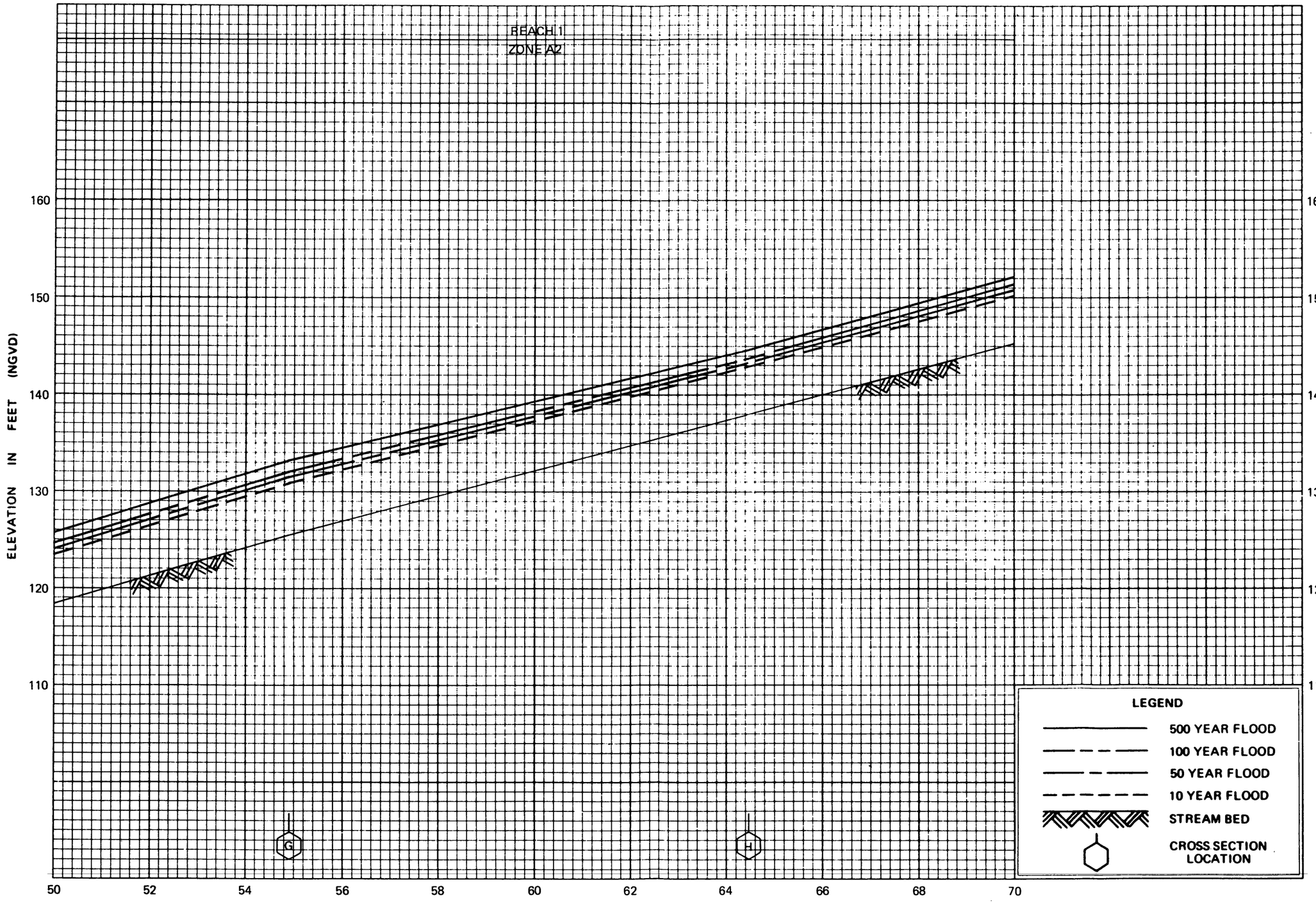
FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

16P



FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

17P

REACH 1
ZONE A2

RESERVOIR ROAD

CULVERT

ELEVATION IN FEET (NGVD)

170
160
150
140

I
J
K

70 72 74 76 78

STREAM DISTANCE IN HUNDREDS OF FEET FROM CORPORATE LIMITS

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

18P

REACH 1
ZONE A2

ELEVATION IN FEET (NGVD)

200
190
180
170
160

78 79 80 81 82 83 84 85 86 87 88 89 90 91

STREAM DISTANCE IN HUNDREDS OF FEET FROM CORPORATE LIMITS

L
M

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

19P

REACH 1
ZONE A2

THE 50-YEAR FLOOD PROFILE IS TOO CLOSE TO THE 100-YEAR ELEVATION TO BE SHOWN SEPARATELY.

ELEVATION IN FEET (NGVD)

220
210
200
190
180

91 92 93 94 95 96 97 98 99 100 101 102 103 104

STREAM DISTANCE IN HUNDREDS OF FEET FROM CORPORATE LIMITS

N

LEGEND
- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

20P

REACH 1
ZONE A2

JACKSON STATION ROAD

PRIVATE DRIVE

THE 50-YEAR FLOOD PROFILE IS TOO CLOSE TO THE 100-YEAR ELEVATION TO BE SHOWN SEPARATELY.

CULVERT

ELEVATION IN FEET (NGVD)

250
240
230
220
210
200

104 105 106 107 108 109 110 111 112 113 114 115 116 117

STREAM DISTANCE IN HUNDREDS OF FEET FROM CORPORATE LIMITS

O P Q R

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

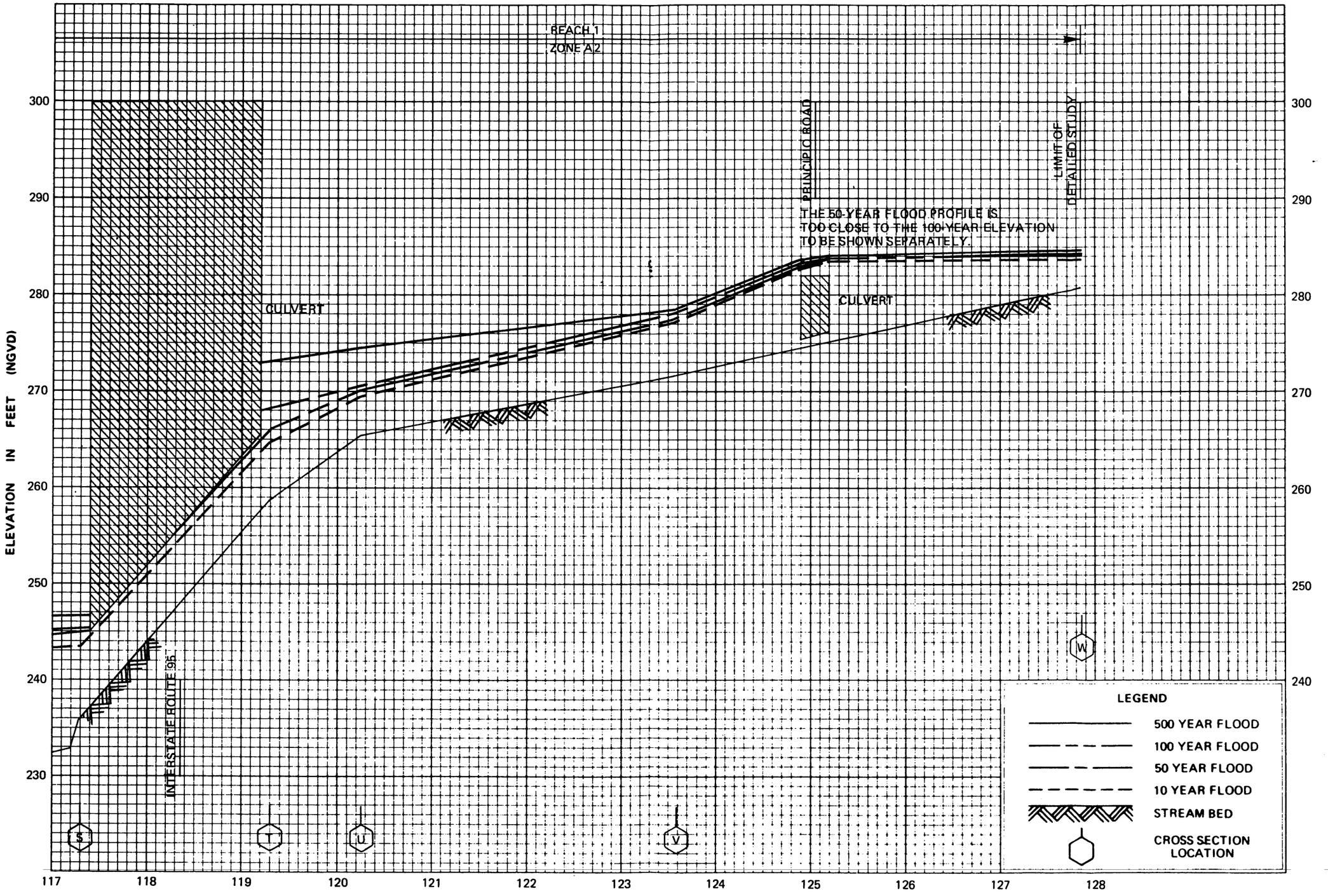
FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

21P



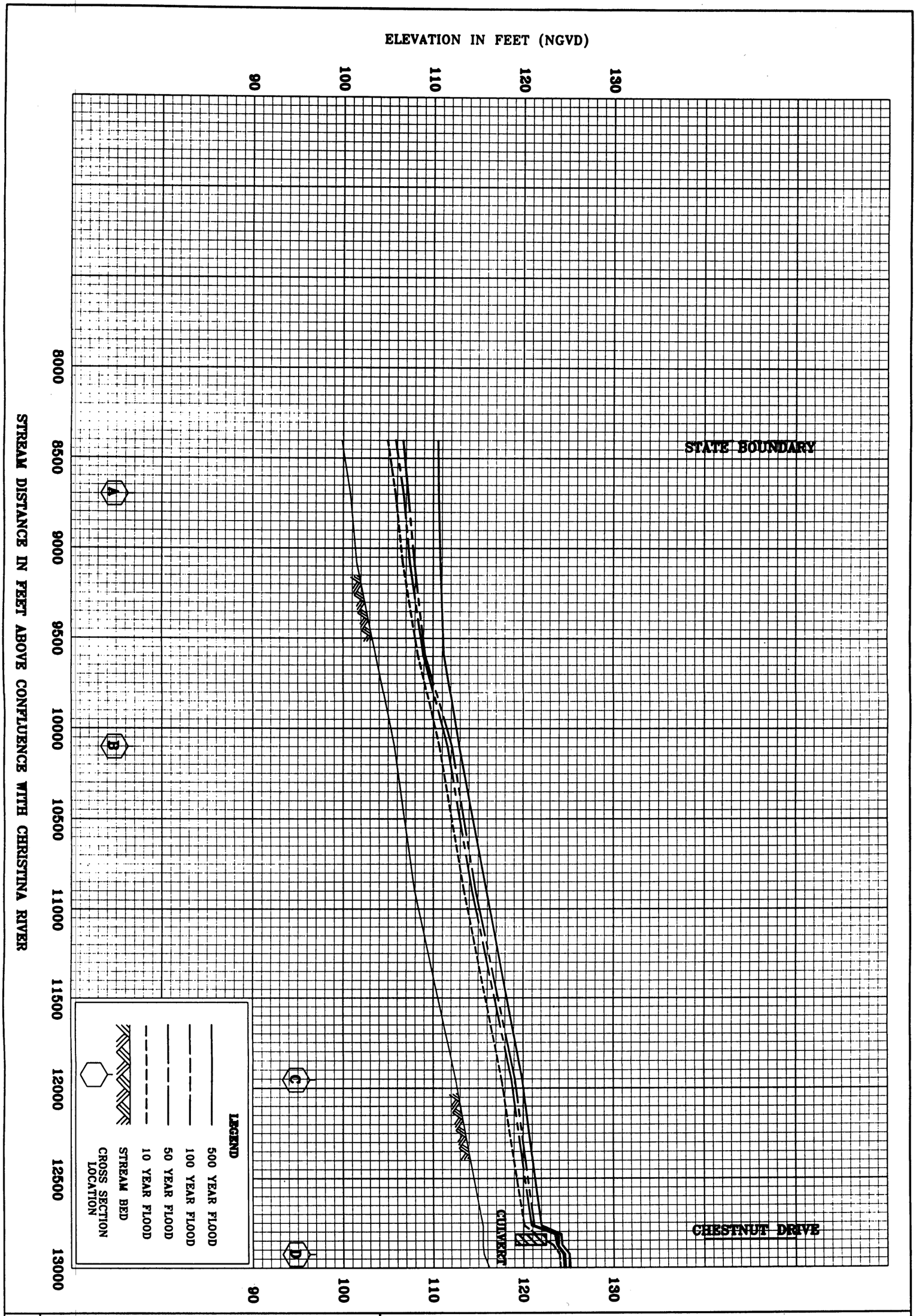
FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

22P



23P

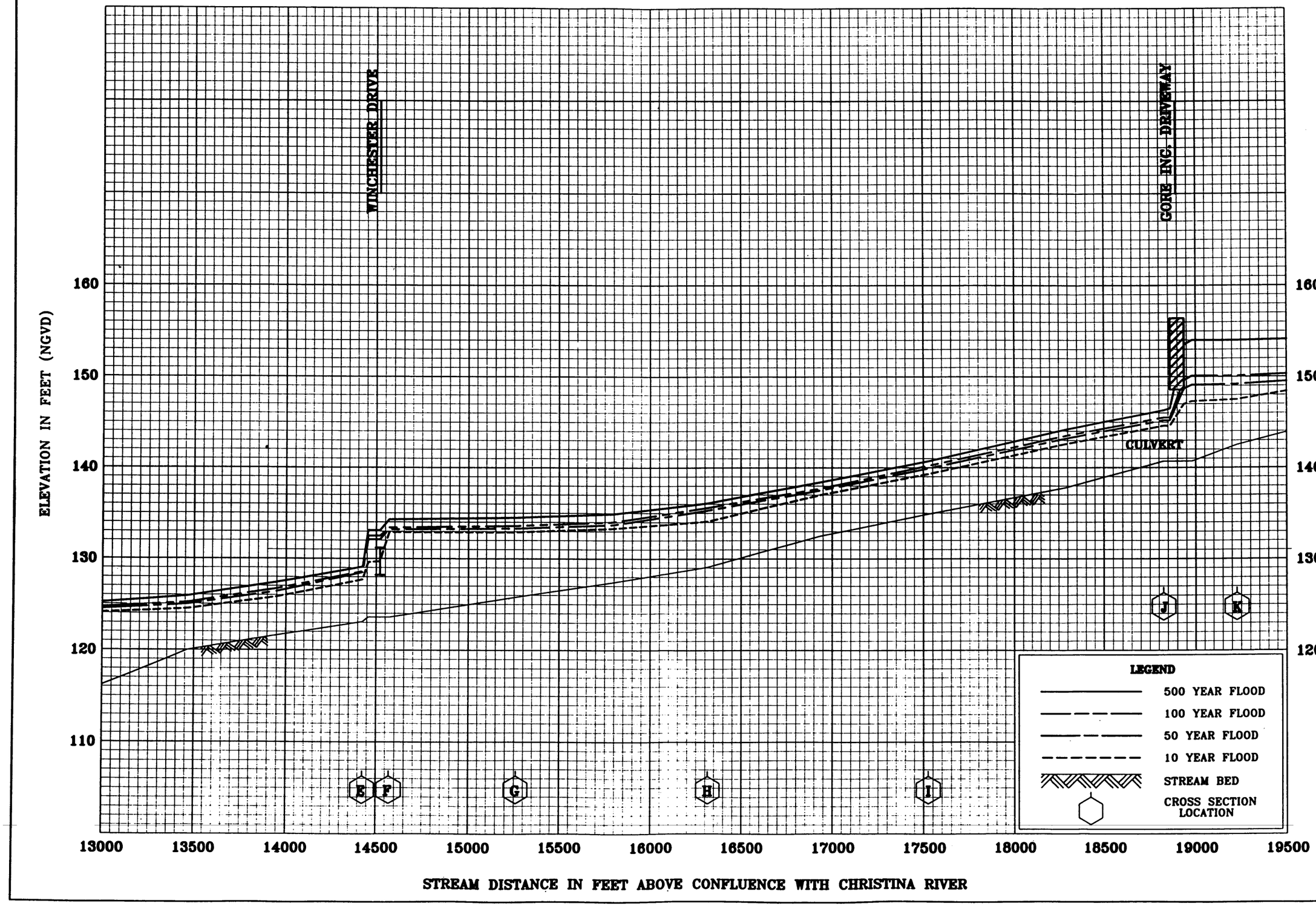
FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)

FLOOD PROFILES

WEST BRANCH CHRISTINA RIVER



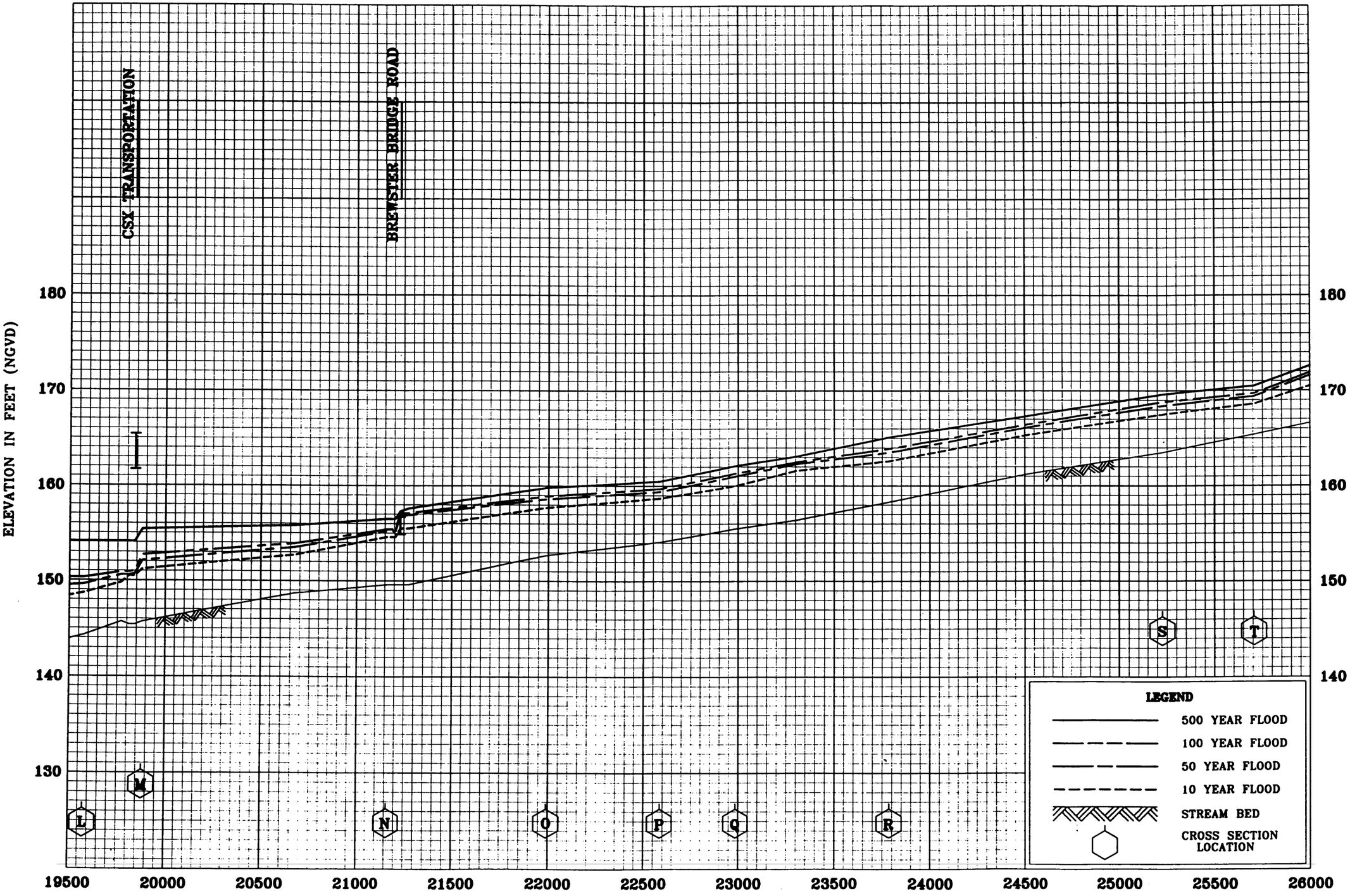
FLOOD PROFILES

WEST BRANCH CHRISTINA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)



FLOOD PROFILES

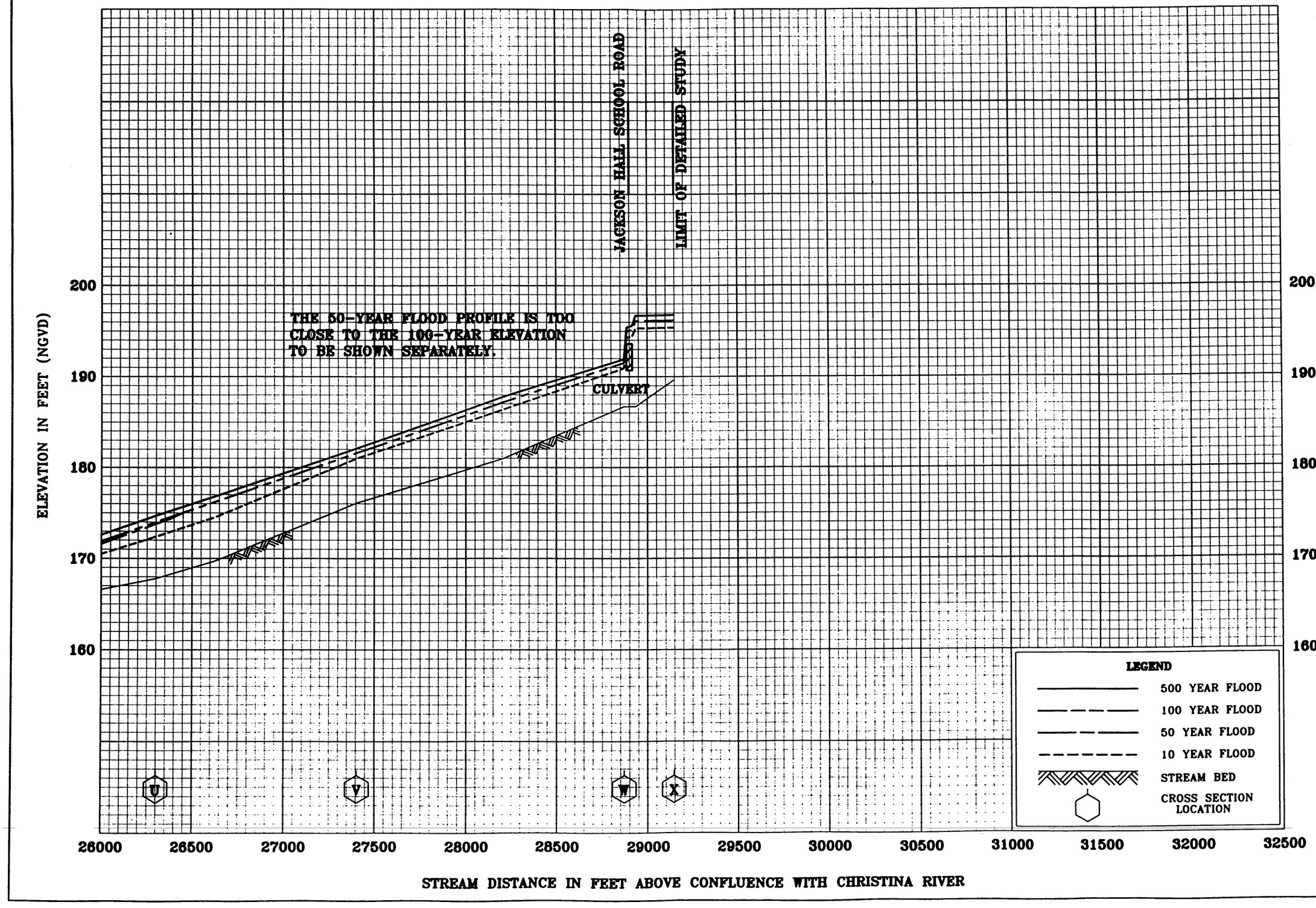
WEST BRANCH CHRISTINA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)

24P(a)



FLOOD PROFILES

WEST BRANCH CHRISTINA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)

24P(b)

REACH 1
ZONE A5

REACH 2
ZONE A2

CONFLUENCE WITH STONE RUN

INCINERATOR LANE

ELEVATION IN FEET (NGVD)

310
300
290
280
270
260

A
B
C

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH STONE RUN

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

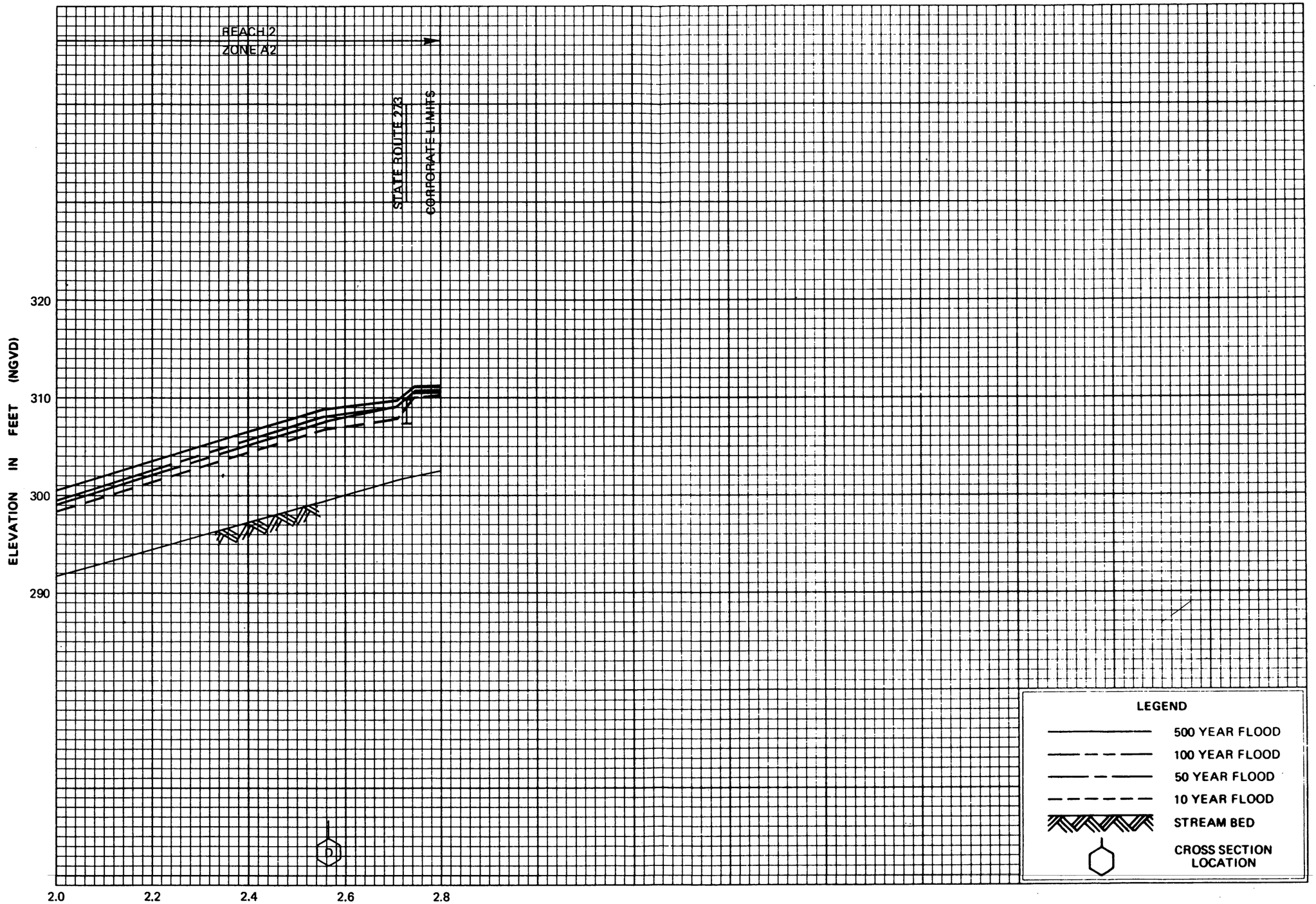
FLOOD PROFILES

STONE RUN TRIBUTARY 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

25P



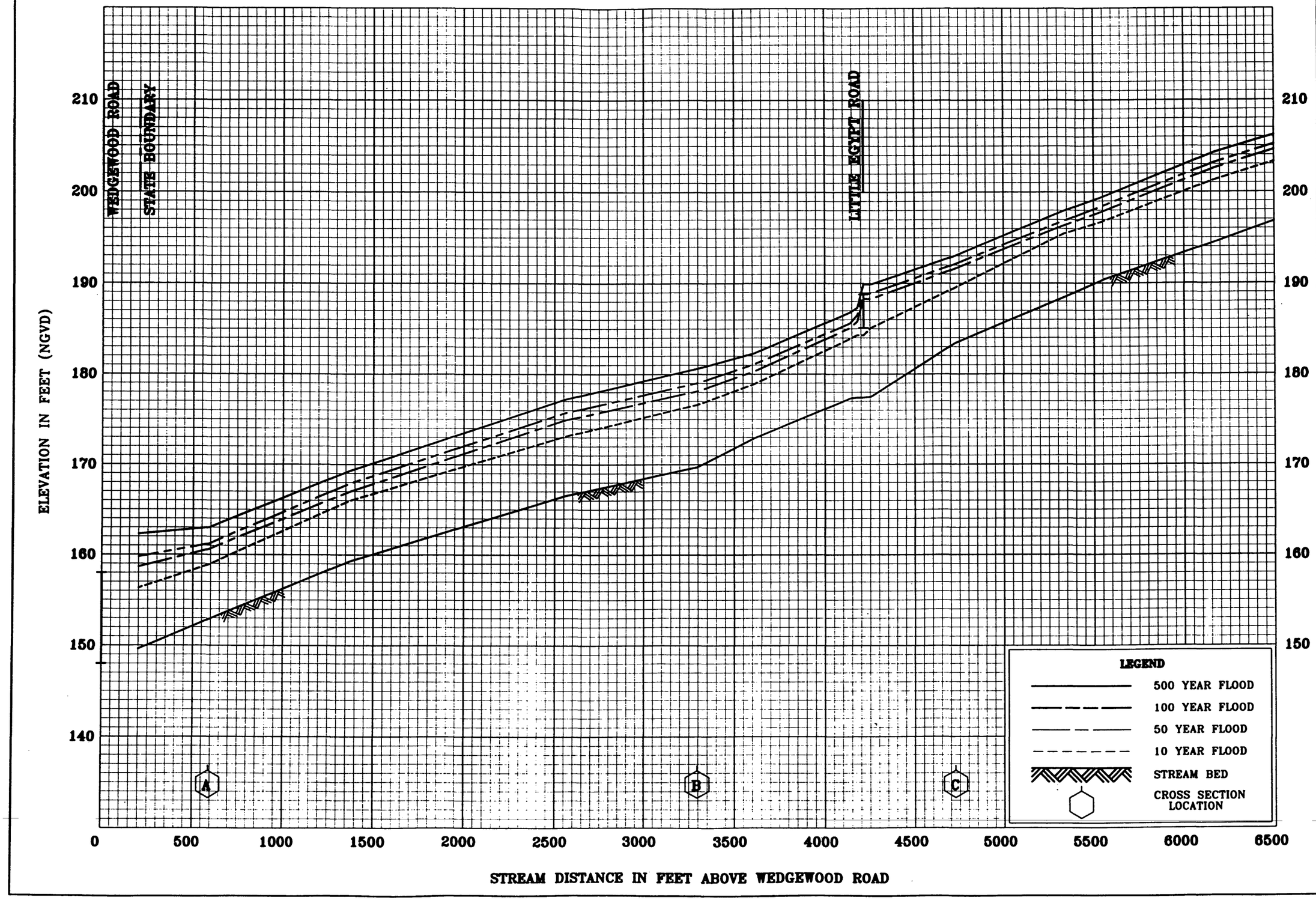
FLOOD PROFILES

STONE RUN TRIBUTARY 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD
(UNINCORPORATED AREAS)

26P



FLOOD PROFILES

CHRISTINA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)

27P

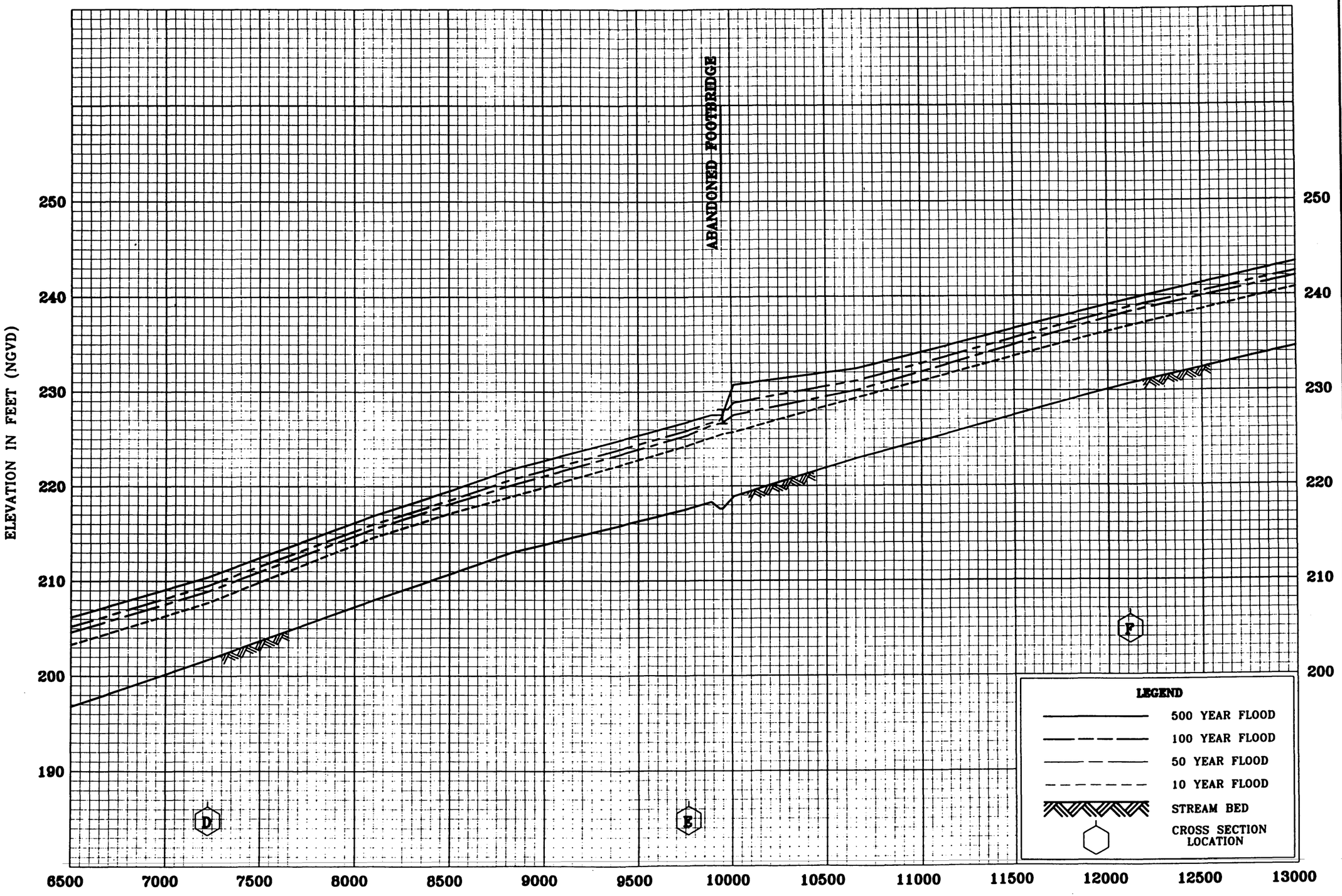
CHRISTINA RIVER

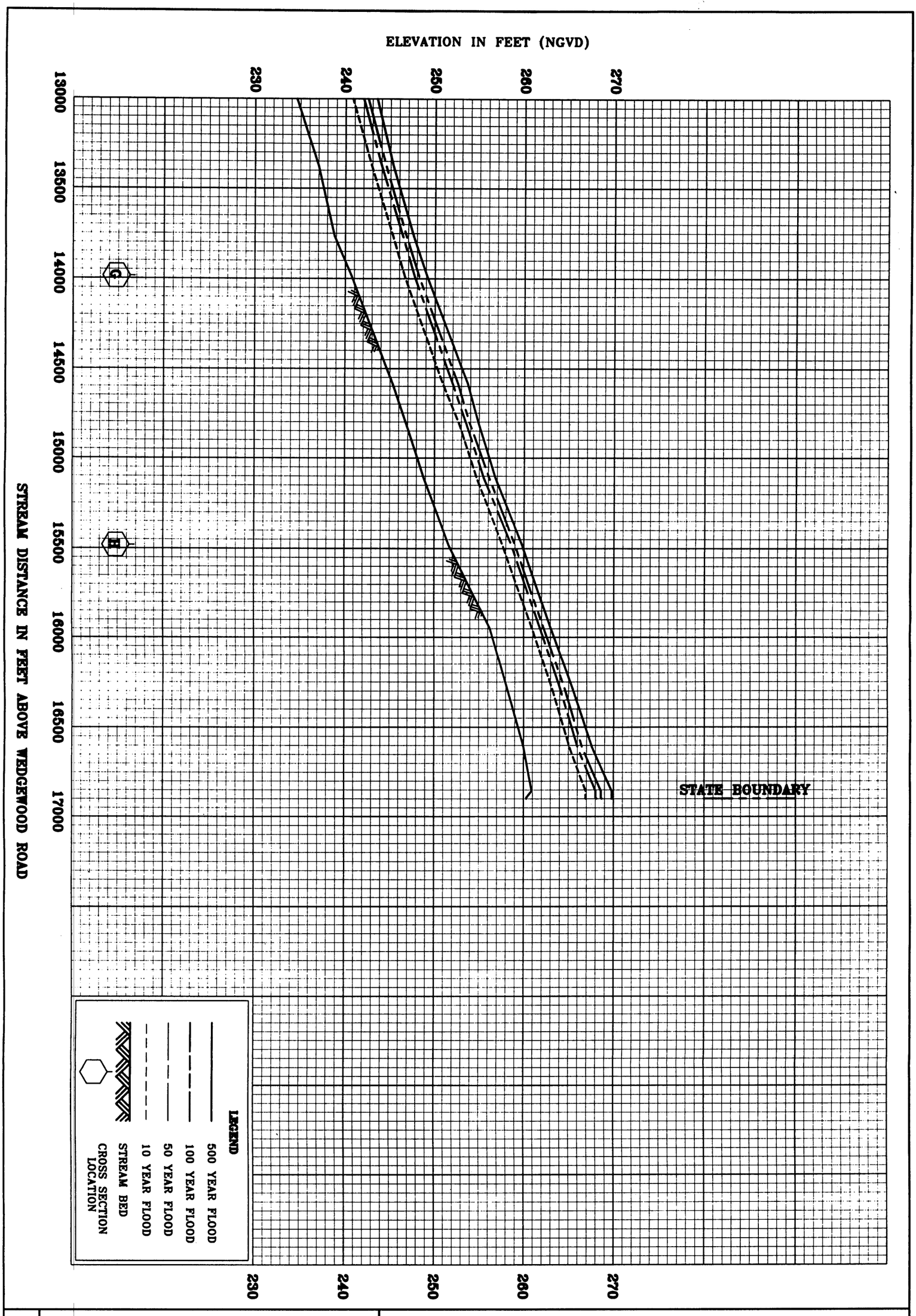
FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)





29P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CECIL COUNTY, MD

(UNINCORPORATED AREAS)

FLOOD PROFILES

CHRISTINA RIVER