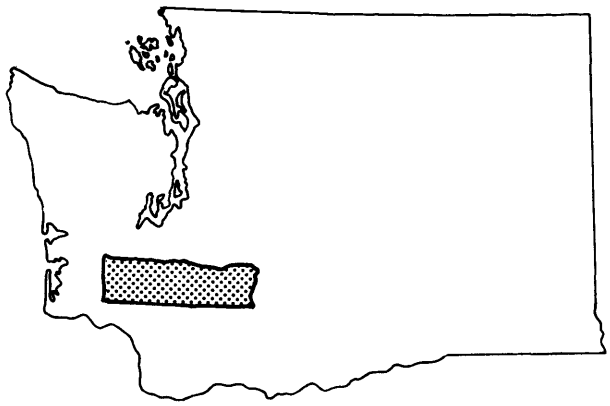
FLOOD INSURANCE STUDY

LEWIS COUNTY, WASHINGTON
UNINCORPORATED AREAS



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Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the unincorporated areas of Lewis County, Washington, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Lewis County to the regular program of flood insurance by the Federal Emergency Management Agency. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

The identification of streams selected for detailed analysis was accomplished in a meeting attended by representatives of the community, a study contractor originally selected to perform the study but subsequently not brought under contract, and the Federal Emergency Management Agency on April 14, 1976. A later meeting was attended by representatives of the county, the finally selected study contractor, and the Federal Emergency Management Agency on July 6, 1976.

During the course of the work, numerous informal contacts were made by the study contractor with the community for the purpose of obtaining data and acquiring base map material. On July 25, 1979, the results of the work were reviewed at an Interim Technical Meeting attended by representatives of the study contractor, the Federal Emergency Management Agency, and Lewis County.

A final coordination meeting was held on December 18, 1980, and was attended by representatives of the Federal Emergency Management Agency, the study contractor, and the county. No problems were raised at the meeting.

1.3 Authority and Acknowledgments

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Tudor Engineering Company, for the Federal Emergency Management Agency, under Contract No. H-4025. This work, which was completed in September 1979, covered all significant flooding sources affecting Lewis County.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Lewis County, Washington. The area of study is shown on the Vicinity Map (Figure 1).

Flood hazard areas defined include those for the rural communities of Packwood and Randle on Cowlitz River; Doty, Dryad, Meskill, Curtis, Adna, and Galvin on Chehalis River; Ethel on Lacamas Creek; and St. Urbans on Olequa Creek. The unincorporated areas surrounding the Cities of Morton, Toledo, Vader, Winlock, Chehalis, Centralia, and Pe Ell were also included.

The following streams were studied by detailed methods:

Stream	Detailed Study Reach From River Mile	to River Mile
Skookumchuck River	0.0	5.80
Chehalis River	60.48	98.0
	99.67	101.63
	105.10	106.97
South Fork Chehalis River	0.0	6.95
Newaukum River	0.0	11.42
South Fork Newaukum River	11.42	23.86
North Fork Newaukum River	0.0	5.25
Middle Fork Newaukum River	0.0	1.25
Tilton River	9.0	21.90
South Fork Tilton River	0.0	1.05
Cispus River	12.20	16.67
Cowlitz River	29.07	36.84
	91.12	131.64
China Creek	0.0	4.55
Coffee Creek	0.0	2.60
Lincoln Creek	0.0	1.12
Dillenbaugh Creek	0.0	5.25
Berwick Creek	0.0	2.98
Hanaford Creek	0.0	3.04
Salzer Creek	0.0	4.62
Salzer Creek-Middle Fork	0.0	0.45
Salzer Creek-South Fork	0.0	4.14
Salzer Creek-North Fork	0.0	0.75
Lake Creek (Tributary to South Fork Chehalis River)	0.0	2.0
Elk Creek	0.0	2.84
Lake Creek (Tributary to Tilton River)	0.0	1.94
Big Creek	0.0	6.20
Olequa Creek	2.0	5.12
	10.05	16.67
Mineral Creek	1.45	4.13

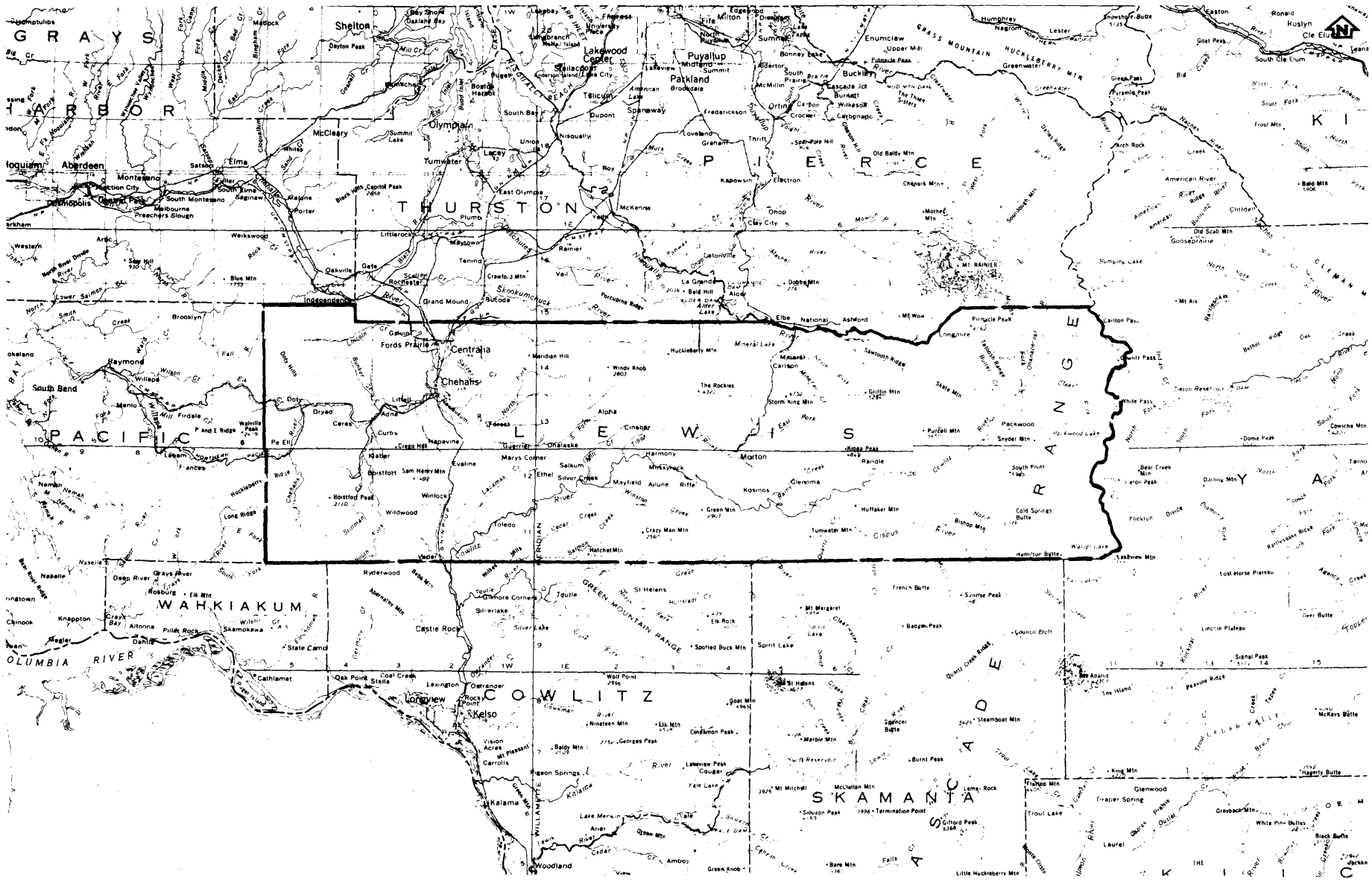

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

16 0 16 32 48 MILES

VICINITY MAP

Stream	Detailed Study Reach From River Mile	to River Mile
Roundtop Creek	0.0	1.0
Lacamas Creek	3.75	18.50
Siler Creek	0.0	3.40
No Name Creek (Tributary to Siler Creek)	0.0	0.39
Surrey Creek	0.0	1.87
Silver Creek	0.15	1.25
Hall Creek	0.0	3.22
Coal Creek	0.0	2.60

A number of streams were selected for study by approximate methods. The list, agreed upon in the course of coordination meetings between representatives of Lewis County, Federal Emergency Management Agency officials, and the study contractor, reflects areas of limited development. The list follows:

Stream	Approximate Study Reach From River Mile	to River Mile
Rock Creek	0.0	3.1
Jones Creek	0.0	3.5
Katula Creek	0.0	0.7
Chehalis River	101.6	105.0
	98.0	99.7
Eagle Creek	0.0	2.5
Scammon Creek	0.0	2.2
King Creek	0.0	5.9
Stillman Creek	0.0	2.5
Halfway Creek	0.0	1.0
Lost Creek	0.0	3.2
South Hanaford Creek	0.0	5.1
Dillenbaugh Creek	5.3	7.1
Berwick Creek	3.0	4.4
Lucas Creek	0.0	2.6
North Fork Newaukum River	5.3	9.3
Stearns Creek	0.0	8.5
Lacamas Creek	0.0	3.8
Foster Creek	0.0	5.2
Stillwater Creek	0.0	6.5
Olequa Creek	5.2	10.0
Curtis Creek	0.0	0.6
Skook Creek	0.0	2.3
Tributary to Skook Creek	0.0	2.1
Cowlitz River	37.0	54.6
Newaukum River	23.9	33.5
Mill Creek	0.0	10.5
Silver Creek	1.3	3.9
Kearney Creek	0.0	4.4
Cispus River	0.9	7.6
Roundtop Creek	1.0	2.0
Butter Creek	0.0	0.6
Miller Creek	0.0	0.5
Peters Creek	0.0	1.0
Hall Creek	3.3	3.9

In addition to those streams aforementioned, Mineral Lake, located in the north-central portion of the state, was studied by approximate methods.

Those areas studied by detailed methods were chosen with consideration given to all proposed construction and forecasted development through 1984.

2.2 Community Description

Lewis County is located in southwestern Washington and covers an area of approximately 2427 square miles. It is bordered to the south by Cowlitz, Skamania, and Wahkiakum Counties, to the west by Pacific County, to the east by Yakima County, and to the north by Thurston, Pierce, and Grays Harbor Counties. Chehalis, the county seat, is situated in the northwestern portion of the county, approximately 85 miles south of the City of Seattle on Interstate Highway 5. The county is served by a network of major highways which includes Interstate Highway 5 from north to south through western Lewis County; State Highway 6, State Highway 508, and U.S. Highway 12 from east to west through the central portions of the county.

Lewis County was founded in 1845 and named after the explorer Meriwether Lewis. County boundaries were redefined in 1851 at the first legislature session in Washington Territory, and, in 1861, further changes were made which provided for county lines as they exist today. One of the first settlers in the county was John Jackson who began farming in 1845 in the area known as Jackson Prairie, approximately 10 miles southeast of the present City of Chehalis. Cowlitz Landing, the first community and common meeting place for all of Lewis County, was established in 1843 on Cowlitz River, just south of the present City of Toledo. By the mid 1850s, many small settlements had developed throughout the Cowlitz and Chehalis River basins, the most remote being Packwood which was founded in 1854 during an effort to establish a route east of the Cascade Range. In 1872, a railroad came through the territory from Columbus River to Puget Sound, opening new areas for development and providing an alternate method of transportation which, up to this time, was primarily by river boat and canoe within the network of major rivers and smaller tributary streams. Today, rail service is provided by the Burlington Northern; Union Pacific; Chicago, Milwaukee, St. Paul & Pacific; and Curtis, Millburn, & Eastern Railroads.

The population of Lewis County grew rapidly from approximately 12,500 in 1890 to over 32,000 in 1910, an increase of approximately 156 percent over two decades. Over the next 50 years, however, the rate of population growth was very slow, and, by 1960, the population had increased by 31 percent to approximately 41,900. This figure grew to approximately 48,500 by 1969 and then dropped slightly to approximately 47,100 by 1975 (References 1 and 2). In the early days of settlement, agriculture, lumbering, and coal

mining were the chief economic activities within the county. Currently, forest products provide the mainstay of the county economy, with 24.6 percent of wage and salary earners employed in lumber and wood products manufacturing. Approximately 80 percent of the total land area in Lewis County is forested. Private and corporate ownership accounts for approximately 60 percent of all commercial forest lands. In 1974, approximately 700 million board feet of timber were harvested, a volume which ranked Lewis County as the second largest timber-producing county in the State of Washington (Reference 3). Farming and allied industries (such as food processing) account for approximately 5 percent of wage and salary earners. Approximately 162,000 acres of land were utilized by over 1,200 farms for agriculture, dairy, and poultry products in 1969 (Reference 3).

The climate of Lewis County is influenced by the Coast Range which extends to over 1300 feet in western Lewis County, and the Cascade Range in the extreme eastern portion of the county. Average annual precipitation varies from 90 inches in the higher elevations to less than 50 inches in the lowlands of the Chehalis River basin (Chehalis Prairie). The greater portion of this precipitation generally occurs during the period of October through March. Annual snowfall is in the range of 10 to 50 inches, with as much as 300 inches occurring in the higher elevations of the Cascade Range (Reference 4). Temperature variations throughout the county are also dependent on elevation. Average afternoon temperatures in the coldest months range from 35°F to 45°F, and minimum temperatures range from 25°F to 35°F. In the lower elevations, minimum temperatures drop below freezing on 50 to 80 nights each winter and on 125 to 160 nights in the mountains. The coldest weather is usually the result of cold air from Canada or the arrival of a high-pressure area that developed over the Pacific Northwest or east of the Cascade Range. Under these conditions, the sky is frequently clear, and minimum temperatures range from 5°F to 15°F, occasionally reaching 0°F with maximum temperatures remaining below freezing. During the warmest summer months, afternoon temperatures in the lower elevations range from 70°F to 80°F, reaching 90°F or higher on 5 to 15 days, and 100°F or higher in one out of four summers. Minimum temperatures range from 45°F to 55°F. Temperatures in the mountains decrease 2°F to 3°F with each 1000-foot increase in elevation. Relative humidity ranges from 45 percent in the afternoon to near 90 percent at sunrise (Reference 4).

With the exception of Mineral Creek, Big Creek, Roundtop Creek, and watersheds which drain approximately 112 square miles of the Nisqually River basin in northeastern Lewis County, the entire study is concerned with rivers and streams within the Chehalis and Cowlitz River basins. The principal river systems are described as follows:

Chehalis River Basin

Chehalis River, together with its major tributaries Skookumchuck and Newaukum Rivers, represents the principal drainage routes through this basin in Lewis County. Soil characteristics throughout the basin may be decribed within four main soil types. In the rugged, mountainous areas of the Coast and Cascade Ranges, the Olympic and Cispus soil materials are most prevalent. These soils are brown to reddish and have developed from parent material weathered from basalt rock. They are well drained and may extend from a few inches to over 20 feet above underlying bedrock. Runoff and drainage are rapid on the steeper slopes. Throughout the rolling foothills, the Melbourne-Meskill silty clay loams are predominant. These soils are granular, friable, and poorly drained to moderately well drained. They have gray to brown heavy surface soil over dense, slightly to well compacted subsoil. In the lower Newaukum River valley south and east of Chehalis, the Salkum and Scamman silty clay loams are typical. These are light brown to dark brown granular soils which grade into a clay and gravel matrix extending over 100 feet deep in some areas. These soils range from well to poorly drained. Finally, occupying the alluvial flood plains of all the major rivers in the basin, is a well-drained, brown to dark, deep alluvial soil classified as Chehalis loam. This loam was derived from washings from unglaciated uplands and laid down as the result of annual overflows. It is one of the most important agricultural soils of the county (Reference 5).

Chehalis River

Chehalis River, with a total drainage area of approximately 2114 square miles, originates in the steep, rugged, and densely forested area north of Skamokawa Pass in the southwestern corner of Lewis County. The river flows northerly through the Town of Pe Ell to Doty, then easterly to Chehalis from whence it flows generally north by east to its mouth in Grays Harbor County at Aberdeen. Over 38 percent of the river basin lies within Lewis County. Elevations within the basin range from over 2500 feet at the headwaters to approximately 150 feet at Galvin at the northern county limits. Streambed slopes vary from approximately 13 feet per mile at Pe Ell to approximately 3 feet per mile at Chehalis. The average slope through Lewis County is approximately 5 feet per mile.

Skookumchuck River

Although Skookumchuck River originates in northeastern Lewis County, it flows generally north by west for most of its course through Thurston County before turning southwest into Lewis County once again and discharging into Chehalis River at Centralia. The river drains an area of approximately 181 square miles, with Hanaford Creek being its largest tributary. The headwaters of Skookumchuck River are located in the rugged, densely forested Snoqualmie National Forest at elevations of over 3000 feet. In its lower 3.5 miles, the river flows through the City of Centralia with an average streambed slope of approximately 9 feet per mile.

Newaukum River

Newaukum River, with a drainage area of 155 square miles at its mouth, flows into Chehalis River at River Mile 75.2. Between River Mile 11.5 and River Mile 13.5, the river is divided into three forks; North Fork, Middle Fork, and South Fork Newaukum River. South Fork Newaukum River is sometimes identified as Newaukum River proper. The basin is roughly 24 miles long by 9 miles at its widest point, and is entirely within Lewis County. Headwaters of South Fork Newaukum River originate in Newaukum Lake at an elevation of 3100 feet in Snoqualmie National Forest. All three forks flow generally west by south from their source to Newaukum Prairie where they join and then flow northwesterly to the confluence with Chehalis River south of the City of Chehalis. Topography of the watershed is mountainous in the headwaters, with well-defined ridges and broad, relatively flat valleys. The streambed gradient averages approximately 15 feet per mile through the study area.

South Fork Chehalis River is another significant tributary to Chehalis River within Lewis County, draining approximately 123 square miles in the southwestern portion of the county. The topography of the basin is generally rugged and steep, with elevations up to 2500 feet at the headwaters. In the lower 10 miles, the river flows through a broad, relatively flat valley before discharging into Chehalis River at River Mile 88.6. The average streambed slope through the study reach is approximately 6 feet per mile.

China Creek, Salzer Creek, and Dillenbaugh Creek are minor tributaries to Chehalis River and are included in the study because of their history of flooding within the Cities of Centralia and Chehalis.

Cowlitz River Basin

Cowlitz River, together with its major tributaries Tilton River and Cispus River, drains approximately 1622 square miles upstream of the Lewis County/Cowlitz County line. Soil types throughout the basin generally concur with those as defined for the Chehalis River basin. One marked difference is the predominance of Cispus and Siler silt loam in the Cowlitz River valley upstream of Mossyrock Dam. Siler loam is an alluvial deposit which occurs from 10 to 20 feet above the normal stage of the river. It consists of a grayish-brown surface soil, from 6 to 18 inches thick, resting on a thin layer of loose, porous, yellowish-white pumice. This subsoil is underlain by layers of stratified fine sand and silt that continue for several feet without appreciable change. Soils of the Cispus series occupy terrace positions above the valley floor. They are composed of pumice fragments varying in size from 0.25 to 2 inches in diameter. The soils are very loose, coarse, and porous, and range from 2 to 5 feet deep. The pumice was erupted from Mount St. Helens, previous to the 1980 eruptions, and blown into the area between Kosmos and Randle by southwest winds (Reference 5).

Cowlitz River

Cowlitz River, with a total drainage area of 2480 square miles, has its headwaters in the high Cascade Range. The topography of the watershed is generally rugged and timber covered. The highest point in the basin is Mount Rainier with an elevation of over 14,400 feet. The main axis of the basin within Lewis County lies east and west; the area is trapezoidal in shape, 65 miles long by approximately 30 miles wide at the upper end. Of the total drainage area, approximately 75 percent is mountainous terrain. The remainder is bottom land and rolling, terraced foothills. The headwaters fall steeply from approximately 5000 feet at River Mile 145 to 1000 feet at River Mile 124, near Packwood, an average slope of 190 feet per mile. In the next 72 miles, the river falls 760 feet to a point downstream of the Mayfield Dam at an average slope of almost 11 feet per mile. Below that point, through the Toledo area, the average slope is approximately 6 feet per mile.

Tilton River

Tilton River, together with its major tributaries, East Fork, West Fork, and North Fork Tilton River, drains approximately 166 square miles before discharging into Cowlitz River at the upstream end of Mayfield Lake. Topography of the watershed is generally extremely rugged, with steep, timber-covered mountainous terrain. The highest point in the basin is at the headwaters of East Fork Tilton River, in the Gifford Pinchot National Forest, with an elevation of approximately 4500 feet. East Fork Tilton River joins South Fork Tilton River and flows into Tilton River immediately north of Coal Canyon, at the upstream end of the study. From there, the river flows southwesterly to the City of Morton, and then generally west by north to its confluence with Bear Canyon Creek, at approximately River Mile 6, before flowing southwesterly to its confluence with Cowlitz River. Average streambed gradient through the study reach is approximately 29 feet per mile.

Cispus River

Cispus River drains an area of approximately 445 square miles, approximately 44 percent of which is located in southeastern Lewis County. Topography of the basin is generally rugged, with steep, timber-covered ridges. The highest point in the watershed is in the headwaters at Mount Adams, which rises to over 12,300 feet. The river flows generally west by north from its origin and discharges into Cowlitz River approximately 6 miles upstream from Riffe Lake behind Mossyrock Dam. Average streambed slope through the reach studied is approximately 23 feet per mile.

Within Lewis County, two other streams of significant size flow into Cowlitz River from the west. Olequa Creek, joining Cowlitz River at River Mile 24.8 in Cowlitz County, drains an area of 106 square miles. Approximately 75 percent of the basin is in Lewis County, north and west of Vader, and in the vicinity of Winlock. West of the stream, the topography is rugged and timber covered, rising to elevations of over 1200 feet. To the north and east, the topography is generally rolling farmland in the areas of Napavine Prairie and Grand Prairie, with elevations ranging from 400 to 500 feet. Average streambed slope through the study area varies from 18 feet per mile through Vader to over 40 feet per mile upstream of Winlock.

Lacamas Creek empties into Cowlitz River approximately 1 mile east of Vader, at approximately River Mile 28.5. The watershed is elongated in shape, approximately 18 miles long by 3.5 miles at its widest point; encompassing a total area of approximately 46 square miles. In the upper reaches, the stream drains Lacamas Prairie to the east, and Drews Prairie farther downstream to the west. Elevations range from less than 100 feet at the mouth to over 600 feet at the headwaters south of Onalaska. Average streambed slope varies from 10 feet per mile to as much as 36 feet per mile in certain reaches.

2.3 Principal Flood Problems

Major flooding within the Chehalis River basin occurs during the winter season, generally from November through February, and is the result of heavy rainfall, occasionally augmented by snowmelt. Flooding and resultant damage are a significant problem in the basin, especially in those areas surrounding the urban centers of Centralia and Chehalis. The worst flooding occurs when Chehalis River and its tributaries reach flood stage at approximately the same time. Because of the low-lying, relatively flat topography of the valley lands extending from Fords Prairie, north of Centralia to Adna, west of Chehalis, and the lower Newaukum River valley, southeast of Chehalis, flooding is intensified over a large area by backwater from Chehalis River. During periods of flooding on that river, water flows upstream into the numerous small tributaries, and generally creates extensive areas of shallow ponding. Normal flows, or floodflows, on the tributary streams add to ponding problems since they cannot escape through regular drainage routes. It is estimated that the 100-year flood would inundate approximately 16 square miles in the immediate Chehalis-Centralia area, of which approximately 6 square miles have been developed for commercial, industrial, or residential use (Reference 6). Flows recorded for Chehalis River have been maintained since 1928 at the U.S. Geological Survey gaging station near Grand Mound, 6 miles downstream of Centralia. Flood stage is considered to be 14.5 feet at the gage, corresponding to a flow of approximately 23,000 cubic feet per second. Over a 48-year period of record, flood stage has been exceeded on 38 occasions. Of these, four of the eight largest floods on Chehalis River have occurred since 1970.

Table 1 lists the highest discharges at the Grand Mound stream gage in 48 years of records.

Table 1. Historic Peak Discharges, Chehalis River

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
January 21, 1972	49,200	18.21	33
December 29, 1937	48,400	18.39	30
December 21, 1933	45,700	18.00	21
December 5, 1975	44,800	17.73	21
January 26, 1971	40,800	17.29	11
January 23, 1935	38,000	17.10	8
February 10, 1951	38,000	16.96	8
January 17, 1974	37,400	16.88	7

High flows at Grand Mound usually coincide with peak flows on Newaukum and Skookumchuck Rivers. A gaging station at River Mile 4.4 on Newaukum River has been in service since March 1929, with the exception of the period from September 1931 to July 1942. The highest flows occurring in 36 years of records are listed in Table 2.

Table 2. Historic Peak Discharges, Newaukum River

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
January 21, 1972	9770	12.12	29
January 15, 1974	8440	11.17	13
January 26, 1971	8390	11.99	13
December 14, 1975	8020	10.85	9
January 25, 1964	7970	12.97	9
December 9, 1953	7880	13.62	8
January 15, 1976	7560	10.47	7
January 14, 1975	7400	10.33	6
December 12, 1955	7200	13.00	5

A gaging station on Skookumchuck River, at River Mile 6.4 near Bucoda, has been in service since December 1967. The highest flows occurring in 9 years of record are listed in Table 3.

Table 3. Historic Peak Discharges, Skookumchuck River

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
January 21, 1972	8190	16.82	18
January 26, 1971	6630	15.82	7
December 4, 1975	6110	15.42	5
January 16, 1974	5950	15.30	5
January 15, 1976	5060	14.53	Less Than 4
February 4, 1968	4850	14.21	Less Than 4
January 14, 1975	4610	14.03	Less Than 4

Crest stage on Chehalis, Newaukum, and Skookumchuck Rivers is usually reached within 1 day of the heaviest rainfall. The peak flow usually subsides within a few hours. In the immediate vicinity of the confluence of Chehalis River with Skookumchuck and Newaukum Rivers, backwater effects may prolong high river stages for several hours on either river. The January 1972 flood was the largest recorded flood in the upper Chehalis River basin. The flood was extremely severe near the two confluences because of the record high discharges on all three rivers, peaking almost simultaneously at those locations. The flood resulted from heavy rains and rapid warming which accompanied an intense maritime Pacific Ocean storm system. Flood damage in the areas affected by these three rivers was estimated at over $5 million, the major portion occurring in the Centralia-Chehalis urban areas (Reference 6). Other damaging floods occurred in the upper Chehalis River basin during December 1933, January 1935, December 1937, January 1973, and December 1975.

Flooding from rivers and creeks within the Cowlitz River basin also generally occurs during the winter months. Major floods usually result from a combination of intensive rainfall and snowmelt after the watershed has been saturated from prior rainfall. The largest flood on Cowlitz River, in recorded history, occurred in December 1933. In earlier times, floods are reported as having occurred on this river in 1855, 1867, and 1894, but no indication of their magnitude has been recorded. In 1867, the former community of Cowlitz Landing was almost entirely washed away. This event prompted the relocation of the community to higher ground in the area of Toledo. Flooding in the Cowlitz River basin results mainly in damage to farm buildings, livestock, highways, and associated utilities such as electric and telephone services. Small areas in the vicinity of Packwood and Randle have suffered damage to residential and commercial buildings. Figures 2 through 12 show the results of flooding in selected flood hazard areas throughout Lewis County during the 1974 and 1975 flood events.

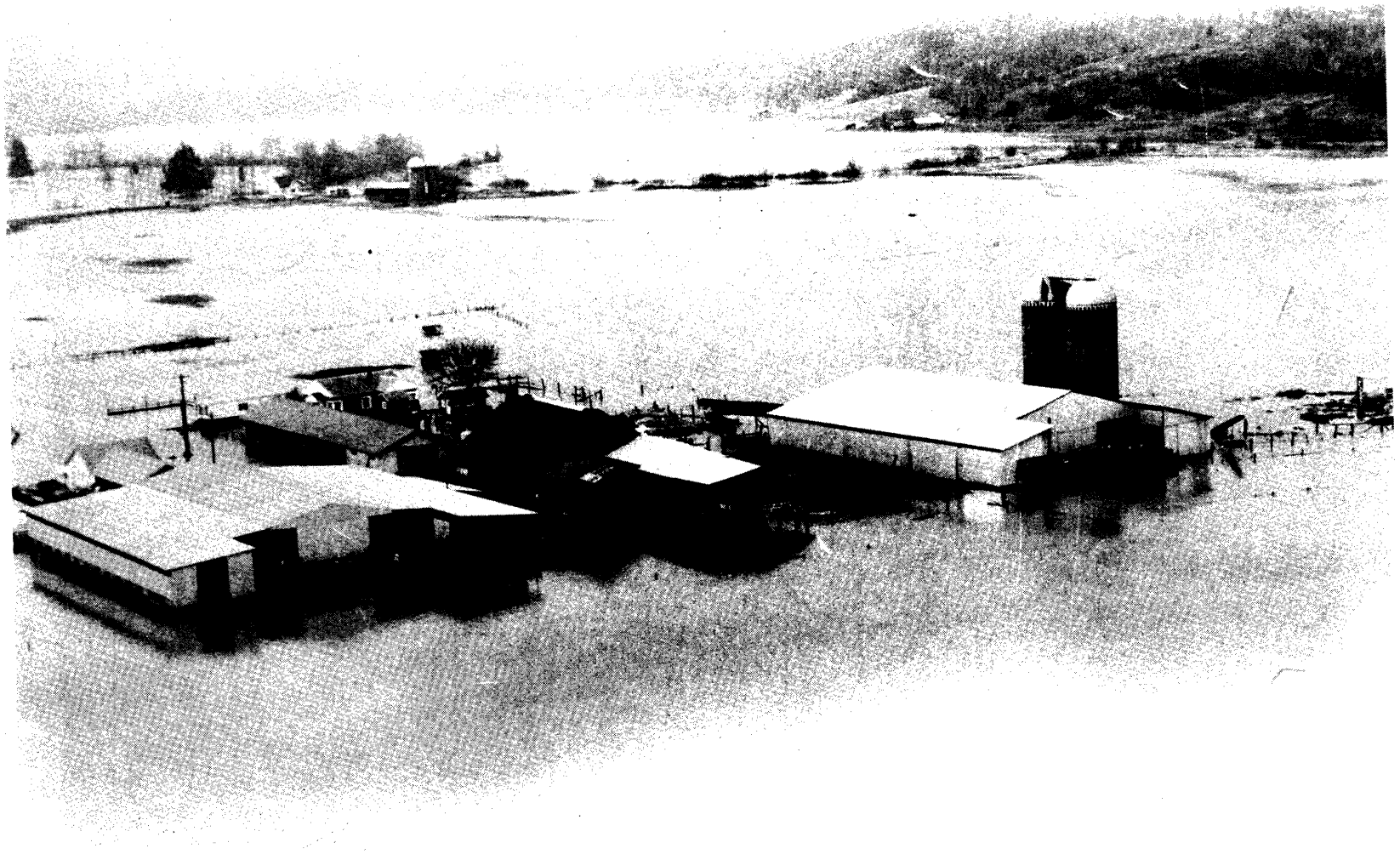

Figure 2. Chehalis Valley Farms Inundated by Floodwaters of Chehalis River, December 4, 1975

Figure 3. Floodwaters of Skookumchuck River Inundating Schaefer County Park, December 4, 1975

Figure 4. Flooding Over Krasky Avenue, Between Centralia and Chehalis, From Salzer Creek, December 4, 1975

Figure 5. Flooding in Curtis Due to Backwater in Lake Creek From South Fork Chehalis River, December 4, 1975

Figure 6. Floodwaters From Skookumchuck River Over the Centralia-Bucoda Highway, December 4, 1975

Figure 7. Floodwater From Newaukum River Inundating Stan Hedwall Park in South Chehalis, December 4, 1975

Figure 8. Chehalis River, Looking North Toward Fords Prairie Area, Interstate Highway 5 at Right, January 17, 1974

Figure 9. Flooding From Chehalis River at Prindle Street In West Chehalis, January 1974

Figure 10. Floodwaters From Lacamas Creek Over Frost Road, North of Toledo, January 1974 (This Scene Is Typical of Many Rural Roads Which Can Sustain Considerable Damage and Become Impassable During Flood Events.)

Figure 11. U.S. Forest Service Bridge Over Iron Creek, A Tributary to Cispus River, Destroyed by Floodwaters, January 1974

Figure 12. Chicago, Milwaukee, St. Paul & Pacific Railroad Bridge and Tracks Destroyed by Floodwaters of Chehalis River, January 1974

Tables 4 and 5 list the six highest peak discharges recorded on Cowlitz River in 46 and 29 years of record at the Packwood and Randle gages, respectively. The gage near Randle was moved 1.4 miles upstream of its former location in 1968.

Table 4. Historic Peak Discharges, Cowlitz River at Packwood

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
December 2, 1977	36,200	13.7	33
December 21, 1933	36,000	13.0[1]	33
November 23, 1959	34,300	--[1]	25
November 20, 1962	32,100	--[1]	20
December 4, 1975	30,600	12.8[1]	16
December 18, 1917	28,800	--[1]	13

[1]Data Not Available

Table 5. Historic Peak Discharges, Cowlitz River Near Randle

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
December 3, 1977	89,300	26.5	115
December 4, 1975	73,300	24.5	42
January 16, 1974	65,800	23.5[1]	25
November 24, 1959	47,500	--[1]	7
January 3, 1965	45,000	--[1]	5
November 20, 1962	41,000	--[1]	4

[1]Data Not Available

In 1977, the flow at the gage below Randle was in excess of the 100-year discharge, while at Packwood it was considerably less than the expected 100-year discharge for that gage. During the floods of 1959 and 1962, conditions were such that relatively high return discharges were experienced at Packwood, while flows at Randle represented low expected return events. These observations give some indication of the temporal and spatial diversity of rainstorm events in the upper Cowlitz River valley, and the effect, together with snowmelt runoff in the headwaters, on localized flooding throughout that area.

Tables 6 and 7 list the six highest discharges recorded on Cispus and Tilton Rivers, respectively. Both these rivers discharge into Cowlitz River upstream of the gage near Randle, but below the Packwood gage. The gage on Cispus River is located near Randle and covers 47 years of record. Two gages have operated on Tilton River, one near Cinebar from 1941 to 1958 and the other above Bear Creek from 1956 to the present.

Table 6. Historic Peak Discharges, Cispus River

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
January 15, 1974	21,700	12.5	33
December 2, 1977	21,200	12.2	30
December 22, 1933	20,000	--[1]	25
December 4, 1975	17,300	11.3	13
November 20, 1962	14,100	10.3	7
December 21, 1972	14,000	10.3	7

[1]Data Not Available

Table 7. Historic Peak Discharges, Tilton River

Date	Peak Discharges (Cubic Feet per Second)	Gage Height (Feet)	Approximate Recurrence Interval (Years)
December 11, 1955	23,200[1]	--[2]	39[3]
December 9, 1953	22,500[1]	--[2]	33[3]
December 2, 1977	22,500	17.5	50
December 1, 1975	17,600	14.8	13
January 20, 1972	17,600	14.8	13
November 20, 1962	16,300	--[2]	9

[1]Recorded at Gage Site Near Cinebar, Drainage Area Increase of 17 Square Miles
[2]Data Not Available
[3]Based on Estimated Frequency Curve at the Gage Near Cinebar

2.4 Flood Protection Measures

Under Chapter 86.16 of the Revised Code of Washington, Chehalis, Skookumchuck, and Newaukum Rivers are in Flood Control Zone 13. Cowlitz and Cispus Rivers are in Flood Control Zone 14. Pursuant to the statute, flood plain management in these zones is administered by the Department of Ecology and Lewis County authorities. Specific provisions for flood plain management require all new buildings in flood hazard areas to be flood-proofed against 100-year flood conditions. To meet these requirements, developers must construct the lowest floor of any building at, or above, the 100-year flood water-surface elevation, and no structure can be built within the designated floodway in such a manner as to obstruct the passage of floodwaters.

Several projects lessen the impact of flooding on Cowlitz River below River Mile 52. Riffe Lake at River Mile 65.5 (storage began 1968) and, to a lesser extent, Mayfield Reservoir at River Mile 52.0 (storage began 1962) provide significant flood storage capacity. Both projects, owned and operated by the City of Tacoma under a Federal Power Commission license, regulate flood peaks at Castle Rock in coordination with the U.S. Army Corps of Engineers, Portland District. Several levee projects have been constructed at various locations along Cowlitz River, which have minimal effect on the 100- and 500-year floods.

In the Chehalis River basin, particularly in the Centralia-Chehalis area, existing flood-control structures providing low to medium levels of protection have been built by local agencies in coordination with State and Federal agencies. Other minor channel work and bank protection have been accomplished by the U.S. Soil Conservation Service and other agencies. Lewis County recently carried out some channel realinement on Salzer Creek from River Mile 0.9 to River Mile 1.15.

The U.S. Army Corps of Engineers, Seattle District, is currently engaged in an ongoing study of flood damage reduction measures in the Centralia-Chehalis area which include a system of levees along Chehalis, Skookumchuck, and Newaukum Rivers (Reference 6). Implementation of any measure arising from this study is not expected to take place before 1984.

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 study. Flood events of a magnitude which are expected to be equalled 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 flood plain management and for flood insurance premium 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 equalled 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 occurrence) 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 here reflect flooding potentials based on conditions existing in the county 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 floods of the selected recurrence intervals for each flooding source studied in detail affecting the county.

Chehalis River Basin

Hydrologic characteristics of the Chehalis River basin were analyzed using three different methods:

(1) The Standard log-Pearson Type III frequency analysis, as outlined by the U.S. Water Resources Council (Reference 7), was performed on all available streamflow gage records. A list of all gages, maintained and operated by the U.S. Geological Survey, from which a sufficient record length was available, is provided in the following tabulation. In some instances, where feasible, short records were correlated with longer records to provide additional data for the analyses. A frequency-probability curve was computed for each station, and the 10-, 50-, 100-, and 500-year peak flood discharges were obtained.

Stream Name and Gage Number	Location	Period of Record
Chehalis River (No. 120275)	Near Grand Mound	1928 - Current
Chehalis River (No. 120200)	Near Doty	1939 - Current
South Fork Chehalis River (No. 120209)	Near Boistfort	1965 - Current
Newaukum River (No. 120250)	Near Chehalis	1942 - Current
South Fork Newaukum River (No. 120240)	Near Onalaska	1945 - Current (Record Not Continuous)
North Fork Newaukum River (No. 120245)	Near Forest	1957 to 1966
Skookumchuck River (No. 120260	Near Centralia Below Bloody Run Creek	1939 - Current

Stream Name and Gage Number	Location	Period of Record
Skookumchuck River (No. 120264)	Near Bucoda	1967 - Current
Skookumchuck River (No. 120257)	Near Vail	1967 - Current
Elk Creek (No. 120205)	Near Doty	1944 - Current (Record Not Continuous)
Water Mill Creek (No. 120196)	Near Pe Ell	1950 to 1970

(2) A regional frequency analysis was carried out based on the results of the log-Pearson Type III analyses described above. In this analysis, a regression equation was derived for each return flood by correlating the drainage area, stream length, average slope, precipitation, and surface storage with the computed peak discharge at each station. A regional residual coefficient map of the basin was plotted, and peak discharges obtained from the equations were modified by the appropriate coefficients at stream reaches studied in detail.

(3) Results from the above two analyses were used to calibrate an in-house runoff-routing computer model incorporating design recurrence for 24-hour storm precipitation and the U.S. Soil Conservation Service unit hydrograph criteria (Reference 8). Storm precipitation volumes for the 10-, 50-, and 100-year return storm frequencies were obtained from the National Oceanic and Atmospheric Administration Atlas 2 (Reference 9). Precipitation volume for the 500-year storm was obtained by extending the Atlas 2 frequency curve on normal distribution probability paper. The intensity distributions of the precipitation volumes were based on worst case 24-hour distribution recorded at the Centralia rainfall gage. Loss factors were estimated from soil type and land use, as recommended by U.S. Soil Conservation Service methodology (Reference 8).

The U.S. Army Corps of Engineers, Seattle District, and the U.S. Soil Conservation Service, had previously conducted hydrologic studies for selected reaches on Chehalis and Skookumchuck Rivers (Reference 10), Newaukum River (Reference 11), Salzer and Coal Creeks, (Reference 12), China Creek (Reference 13), and Coffee Creek (Reference 14) watersheds. Frequency probability curves and other runoff data were provided by these agencies and verified by the study contractor.

Hydrologic characteristics for the Cowlitz River basin were analyzed as described above, using the following streamflow gages:

Stream Name and Gage Number	Location	Period of Record
Cowlitz River (No. 142265)	At Packwood	1929 - Current
Cowlitz River (No. 142334)	Near Randle	1947 - Current
Cowlitz River (No. 142380)	Near Mayfield Dam	1934 - Current (Regulated Since 1962)
Cowlitz River (No. 142430)	At Castle Rock	1926 - Current (Regulated Since 1962)
Cispus River (No. 142325)	Near Randle	1929 - Current
Tilton River (No. 142365	Near Cinebar	1941 to 1958
Tilton River (No. 142362)	Above Bear Creek	1956 - Current
West Fork Tilton River (No. 142355)	Upstream of Morton	1950 - Current
Lake Creek (No. 142260)	Near Packwood	1962 - Current
Mineral Creek (No. 120830)	Near Mineral (Nisqually River Basin)	1942 - Current

Discharge frequencies for Cowlitz River below Mayfield Dam were based on Mayfield Dam operational criteria and a cumulative frequency curve developed by the U.S. Army Corps of Engineers, Portland District, dated February 1972. Adjustments to compensate for contributing areas downstream from the dam were made using the runoff-routing computer model previously described in this section. The rainfall intensity distribution pattern was based on precipitation records at Cinebar and Castle Rock.

Peak discharge-drainage area relationships for all streams studied in detail are shown in Table 8.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of streams in the county were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each stream studied in the county.

All backwater analyses carried out by the study contractor to obtain water-surface elevations were performed using the U.S. Army Corps of Engineers HEC-2 step-backwater computer program (Reference 15).

Streambed cross sections were taken in the field by depth soundings across the area of flow. Overbank cross sections were obtained photogrammetrically.

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 is computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Channel and overbank roughness coefficients (Manning's "n") were based on field inspection, or derived from calibrating known discharges to associated high-water elevations during past floods. Channel roughness coefficients ranged from 0.025 for large rivers to over 0.050 for smaller creeks. The overbank coefficients varied from 0.080 to 0.150.

Starting water-surface elevations generally were derived using the slope-area method. For Chehalis River upstream of Adna, starting water-surface elevations were based on results obtained from the U.S. Army Corps of Engineers downstream backwater model used in the Flood Plain Information report for Chehalis River (Reference 10).

Hydraulic studies to determine the flooding characteristics of Chehalis River, from River Mile 59.6 to River Mile 81.2; Newaukum River, from River Mile 0.0 to River Mile 7.7; and Skookumchuck River, from River Mile 0.0 to River Mile 6.0, were carried out in 1968, and updated in 1974 and 1976, by the U.S. Army Corps of Engineers, Seattle District (References 10 and 11). Flood profiles and floodways for these portions of Chehalis and Newaukum Rivers were computed using the U.S. Army Corps of Engineers backwater models. The models were modified to reflect changes in design flood discharges. A HEC-2 backwater model for Skookumchuck River was assembled using streambed cross sections from the previous study and overbank sections from available topographic mapping (Section 4.1).

Table 8. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Skookumchuck River					
At Confluence With Chehalis River	181	8,750	11,000	13,000	17,900
Chehalis River					
At Pe Ell (River Mile 106.4)	95	15,200	20,000	23,000	28,000
Downstream Confluence With South Fork Chehalis River (River Mile 88.6)	332	24,600	32,000	35,220	43,800
Downstream Confluence With Newaukum River (River Mile 75.3)	593	32,100	38,500	42,500	58,700
At Grand Mound Gaging Station	895	38,700	51,600	56,000	70,000
South Fork Chehalis River					
At Confluence With Chehalis River	123	9,300	12,860	14,800	18,600
Newaukum River (Including South Fork Newaukum River)					
At Confluence With Chehalis River	155	7,860	10,750	11,500	13,640
North Fork Newaukum River					
At Confluence With Newaukum River	69	4,400	6,350	7,400	9,400
Middle Fork Newaukum River					
At Confluence With North Fork Newaukum River	19	660	1,000	1,250	1,700
Tilton River					
At Morton (Downstream of Confluence With Lake Creek)	86	11,100	14,700	17,100	21,000
Downstream Study Limit at River Mile 9.0	138.7	16,100	21,700	24,500	30,650
South Fork Tilton River					
At Confluence With Tilton River	28	4,150	5,350	6,250	8,000
Cispus River					
Downstream Study Reach (River Mile 12.2)	321	15,300	22,000	25,100	32,900

Table 8. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Cowlitz River					
At Packwood	287	27,300	39,800	45,600	60,800
Downstream of Confluence With Cispus River	1,030	53,000	75,000	85,100	111,000
At Toledo (Downstream of Salmon Creek Confluence)	1,542	51,000[1]	63,000[1]	73,600[1]	98,900[1]
China Creek					
At Confluence With Chehalis River	5.9	120	220	290	--[2]
Coffee Creek					
At Confluence With Skookumchuck River	7.3	150	275	345	510
Lincoln Creek					
At Confluence With Chehalis River	45	2,600	3,700	4,250	5,400
Dillenbaugh Creek					
At Confluence With Chehalis River	12.1	440	560	630	800
Berwick Creek					
At Confluence With Dillenbaugh Creek	5	130	180	220	280
Hanaford Creek					
At Confluence With Skookumchuck River	57.7	2,100	3,150	3,700	4,800
Salzer Creek					
At Confluence With Chehalis River	24.5	600	1,070	1,360	--[2]
Salzer Creek - Middle Fork					
At Confluence With Salzer Creek	2	190	340	440	--[2]
Salzer Creek - South Fork					
At Confluence With Salzer Creek	8	250	450	580	--[2]

[1] Discharges Reduced Due to Retarding Effects of Flood Peaks by Riffe Lake and Mayfield Reservoir
[2] Data Not Available

Table 8. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Salzer Creek - North Fork					
At Confluence With Salzer Creek-Middle Fork	3	180	320	410	--[1]
Lake Creek (Tributary to South Fork Chehalis River)					
At Confluence With South Fork Chehalis River	28	900	1,350	1,600	2,100
Elk Creek					
At Confluence With Chehalis River	61	4,200	5,100	5,600	7,300
Big Creek					
At Confluence With Nisqually River	38.8	5,400	7,300	8,000	10,300
Olequa Creek					
At Winlock (Downstream of King Creek Confluence)	38.5	1,370	2,450	2,900	4,350
At Vader (Downstream of Stillwater Creek Confluence)	102.2	5,130	8,550	10,000	14,180
Mineral Creek					
At Downstream Study Limit	62.1	8,200	11,100	12,400	16,100
Roundtop Creek					
At Confluence With Mineral Creek	11.2	1,250	1,700	1,900	2,390
Lacamas Creek					
Upstream Study Limit	3.9	200	350	410	550
Downstream Study Limit	34.4	1,150	1,900	2,400	3,250
Siler Creek					
At Confluence With Cowlitz River	12.4	930	1,550	1,800	2,500

[1] Data Not Available

Table 8. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
No Name Creek (Tributary to Siler Creek)					
At Confluence With Siler Creek	2.1	180	290	350	480
Surrey Creek					
At Confluence With Cowlitz River	4.4	590	890	1,120	1,460
Silver Creek					
At Confluence With Cowlitz River	51.7	7,100	10,550	12,750	16,300
Hall Creek					
At Confluence With Cowlitz River	12.7	1,660	2,200	2,400	3,000
Coal Creek					
At Confluence With Salzer Creek	9.2	230	420	530	790

Similar studies were performed by the U.S. Soil Conservation Service for Salzer Creek and its tributaries, Coal Creek, China Creek, and Coffee Creek (References 12, 13, and 14). Elevations and floodway widths for these streams were taken directly from the published reports. No 500-year elevations were provided by the U.S. Soil Conservation Service for Salzer Creek and its tributaries or China Creek; therefore, no 500-year profiles are shown.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1). Backwater effects of large rivers on smaller tributaries are shown by extending the higher water-surface elevations, at the confluences, until they intersect the natural profiles of the smaller streams.

Shallow flooding analysis in Packwood was completed by comparing elevations of a ridge between Cowlitz River and Packwood with elevations of 100-year flooding from Cowlitz River. From this, a discharge was determined over the ridge and a normal-depth analysis was used to calculate the depth of flooding in the Packwood area.

Streams selected for approximate analysis were investigated using discharges for detailed analysis, but for the 100-year recurrence interval only. Flood depths were estimated in the field by use of the hand-held programmable calculator using the normal-depth method. Flooded areas corresponding to the estimated depth of flooding were then mapped, in the field, using a hand level and approximate distances. All mapping used for approximate studies was obtained from U.S. Geological Survey topographic maps (References 16 and 17).

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

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage State and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Emergency Management Agency as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800, with a contour interval of 4 feet (Reference 18); at a scale of 1:2,400, with a contour interval of 5 feet (References 19 and 20); at a scale of 1:2,400, with a contour interval of 2 feet (Reference 21); at a scale of 1:1,200, with a contour interval of 2 feet (Reference 22); and some boundaries were developed photogrammetrically, using aerial photographs at a scale of 1:12,000 (Reference 12).

Approximate flood boundaries in some portions of the study area were taken from the Flood Hazard Boundary Map (Reference 23).

Flood boundaries for the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year flood boundary has been shown. Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity and increases flood heights, thus increasing flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. As minimum standards, the Federal Emergency Management Agency limits such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced.

The floodways developed in this study were computed on the basis of equal-conveyance reduction from each side of the flood plain.

The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 9). No section area or velocity data were supplied by the U.S. Soil Conservation Service for China Creek, Coffee Creek, Salzer Creek and its tributaries, and Coal Creek; therefore, no data are shown in Table 9.

At China Creek, the majority of the conveyance from the three computed floods (10-, 50-, and 100-year) will break out of the channel at Lundberg Road, flow across a field, and rejoin the channel at Little Hanaford Road. The floodway, therefore, is shown outside of the channel in this area.

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year flood boundaries are close together, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 13.

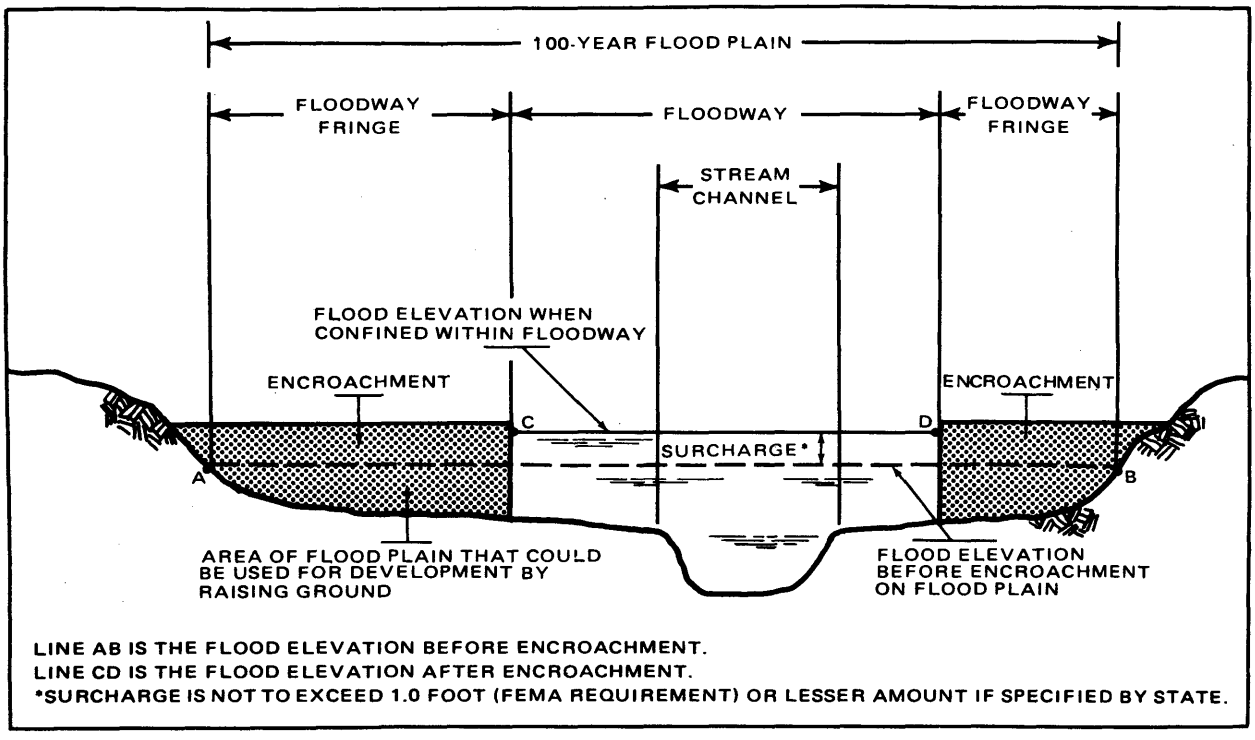

Figure 13. Floodway Schematic

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)			
Skookumchuck River								
E	1.492	207/112[2]	1,953	6.7	178.8	178.8	179.8	1.0
F	1.545	152/ 52[2]	1,644	7.9	180.1	180.1	180.8	0.7
G	1.951	290/150[2]	2,613	4.9	183.5	183.5	184.2	0.7
H	2.404	142/127[2]	1,565	8.2	185.7	185.7	186.7	1.0
J	3.286	250	1,900	6.7	192.6	192.6	193.5	0.9
K	3.819	792	4,694	2.7	196.9	196.9	197.9	1.0
L	3.974	1110	4,489	2.3	197.6	197.6	198.6	1.0
M	4.214	500	3,350	3.1	198.6	198.6	199.6	1.0
N	4.785	322	2,276	4.5	200.9	200.9	201.8	0.9
O	5.402	300	1,882	5.5	204.5	204.5	205.2	0.7
P	5.768	793	3,365	3.1	207.4	207.4	208.4	1.0

[1]Miles Above Mouth [2]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SKOOKUMCHUCK 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)			
Chehalis River								
A	60.96	2,172[2]	18,012	3.1	149.3	149.3	150.0	0.7
B	61.76	3,541	29,284	1.9	152.2	152.2	153.1	0.9
C	62.93	1,836	11,417	4.9	157.5	157.5	158.4	0.9
D	64.01	1,880	13,609	4.1	162.3	162.3	163.0	0.7
E	64.61	758	12,578	4.4	165.0	165.0	165.6	0.6
F	65.12	1,323	19,812	2.8	166.7	166.7	167.3	0.6
G	66.12	1,408	12,070	4.6	169.2	169.2	169.8	0.6
H	67.26	599	8,029	5.8	173.2	173.2	173.8	0.6
I	68.02	3,449	44,958	1.0	175.1	175.1	175.5	0.4
J	70.60	3,600	33,251	1.4	175.6	175.6	176.2	0.6
K	71.60	2,077	19,984	2.3	176.2	176.2	176.9	0.7
L	72.66	2,233/1,553[3]	21,919	2.1	177.4	177.4	178.3	0.9
M	74.02	3,291/1,381[3]	25,949	1.5	178.8	178.8	179.7	0.9
N	74.72	698/283[3]	8,953	5.2	179.8	179.8	180.6	0.8
O	75.17	1,901/1,336[3]	10,572	4.4	181.4	181.4	182.1	0.7
P	75.77	1,922	23,485	1.4	183.1	183.1	183.9	0.8
Q	76.08	2,470	23,314	1.5	183.2	183.2	184.0	0.8
R	76.18	2,422	18,471	1.8	183.2	183.2	184.0	0.8
S	76.70	2,170	13,514	2.5	183.6	183.6	184.4	0.8
T	76.99	2,553	19,361	1.8	183.9	183.9	184.7	0.8
U	77.26	2,100	15,324	2.2	184.1	184.1	184.9	0.8
V	77.44	1,729	9,908	3.4	184.2	184.2	185.0	0.8
W	77.74	260	5,867	5.8	184.6	184.6	185.4	0.8
X	78.03	420	6,186	5.5	185.6	185.6	186.3	0.7

[1]Miles Above Mouth [2]Without Consideration of Lincoln Creek Floodway [3]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHEHALIS 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)			
Chehalis River (Cont'd)								
Y	78.39	1,613	12,492	2.7	187.1	187.1	187.7	0.6
Z	78.82	1,044	10,604	3.2	187.4	187.4	188.0	0.6
AA	79.16	1,073	8,613	3.9	188.0	188.0	188.6	0.6
AB	79.64	1,186	9,869	3.2	189.1	189.1	189.7	0.6
AC	79.87	851	8,363	4.1	189.5	189.5	190.1	0.6
AD	80.44	1,032	10,554	3.2	190.9	190.9	191.4	0.5
AE	80.87	466	6,119	5.6	191.7	191.7	192.2	0.5
AF	81.29	400	5,765	5.9	192.9	192.9	193.3	0.4

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHEHALIS 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)			
Chehalis River								
A	81.340	333	5,122	6.6	193.0	193.0	193.4	0.4
B	81.790	346	8,217	4.1	194.4	194.4	195.0	0.6
C	82.340	1,296	15,393	2.2	195.1	195.1	195.7	0.6
D	82.960	1,000	16,029	2.1	195.5	195.5	196.3	0.8
E	83.120	599	10,042	3.4	195.8	195.8	196.6	0.8
F	83.490	212	4,350	7.8	196.3	196.3	197.2	0.9
G	83.780	390	5,985	5.7	198.1	198.1	198.8	0.7
H	84.220	559	10,714	3.2	199.2	199.2	200.0	0.8
I	84.560	545	7,016	4.8	199.6	199.6	200.4	0.8
J	84.930	1,027	12,491	2.7	200.7	200.7	201.4	0.7
K	85.310	1,033	11,586	2.9	201.1	201.1	202.0	0.9
L	85.970	677	8,572	4.0	202.4	202.4	203.4	1.0
M	86.290	364	4,376	7.8	203.5	203.5	204.5	1.0
N	86.620	210	3,622	9.4	206.2	206.2	207.1	0.9
O	86.800	232	3,957	9.0	208.1	208.1	208.7	0.6
P	87.070	202	4,045	8.8	210.2	210.2	210.6	0.4
Q	87.400	191	3,727	9.5	212.3	212.3	212.7	0.4
R	87.860	215	4,077	8.7	215.8	215.8	216.2	0.4
S	88.230	245	4,493	7.9	218.3	218.3	218.5	0.2
T	88.560	210	3,782	9.4	220.3	220.3	220.9	0.6
U	89.140	1,140	13,049	2.0	223.4	223.4	224.3	0.9
V	89.580	1,501	7,237	3.6	224.0	224.0	224.9	0.9
W	90.200	273	3,447	7.6	227.3	227.3	228.3	1.0
X	90.660	520	5,289	5.0	230.4	230.4	231.4	1.0
Y	90.780	334	4,678	5.6	230.9	230.9	231.9	1.0
Z	91.150	1,250	15,098	1.7	232.2	232.2	233.1	0.9
AA	92.440	400	4,461	5.9	232.5	232.5	233.4	0.9

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHEHALIS 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)			
Chehalis River (Cont'd)								
AB	91.960	173	3,021	8.7	235.6	235.6	236.5	0.9
AC	92.300	163	3,088	8.5	238.3	238.3	238.9	0.6
AD	92.490	210	3,660	7.2	239.7	239.7	240.3	0.6
AE	92.980	207	3,886	6.8	242.1	242.1	242.5	0.4
AF	93.320	183	3,787	6.9	243.7	243.7	244.1	0.4
AG	93.580	169	3,708	7.1	245.2	245.2	245.6	0.4
AH	93.820	201	4,112	6.4	246.5	246.5	247.1	0.6
AI	94.110	157	2,808	9.4	248.3	248.3	248.9	0.6
AJ	94.390	357	5,134	5.1	251.9	251.9	252.3	0.4
AK	94.600	246	3,674	7.1	253.1	253.1	253.4	0.3
AL	94.910	182	3,677	7.1	255.3	255.3	255.6	0.3
AM	94.980	174	3,153	8.3	256.2	256.2	257.0	0.8
AN	95.230	179	3,285	8.0	258.0	258.0	258.6	0.6
AO	95.510	186	3,695	7.1	259.7	259.7	260.1	0.4
AP	95.860	169	3,359	7.8	261.2	261.2	261.6	0.4
AQ	96.420	290	4,156	6.3	264.4	264.4	264.6	0.2
AR	96.880	256	3,324	7.9	266.7	266.7	266.9	0.2
AS	97.270	246	3,905	6.7	269.2	269.2	270.0	0.8
AT	97.710	164	2,151	12.1	272.5	272.5	272.8	0.3
AU	97.990	246	3,469	7.5	277.4	277.4	277.5	0.1
Chehalis River (Near Dryad)								
A	99.670	170	2,902	9.0	290.5	290.5	291.5	1.0
B	100.110	187	3,307	7.9	294.7	294.7	295.4	0.7
C	100.580	182	3,094	8.4	297.3	297.3	298.0	0.7

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHEHALIS RIVER-CHEHALIS RIVER (NEAR DRYAD)

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)			
Chehalis River (Near Dryad) (Cont'd)								
D	100.890	181	2,611	10.0	300.1	300.1	300.5	0.4
E	101.100	219	2,783	7.7	303.1	303.1	303.3	0.2
F	101.220	174	2,451	8.7	304.1	304.1	304.2	0.1
G	101.410	135	2,179	9.8	305.8	305.8	306.0	0.2
H	101.630	152	2,416	8.8	308.0	308.0	308.3	0.3
Chehalis River (Near Pe Ell)								
A	105.110	300	2,779	8.3	350.5	350.5	351.5	1.0
B	105.810	280/180[2]	2,494	9.2	358.2	358.2	359.0	0.8
C	106.200	145/105[2]	2,111	10.9	363.8	363.8	364.1	0.3
D	106.350	215/185[2]	2,732	8.0	366.7	366.7	366.8	0.1
E	106.750	157	2,406	6.2	369.5	369.5	369.8	0.3
F	106.970	140	1,462	10.2	370.8	370.8	371.1	0.3

[1]Miles Above Mouth [2]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHEHALIS RIVER (NEAR DRYAD)-CHEHALIS RIVER (NEAR PE ELL)

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)			
South Fork Chehalis River								
A	0.027	500[2]	3,041	4.9	220.8	213.3[3]	214.3[3]	1.0
B	0.165	109	1,451	10.2	220.8	214.4[3]	215.4[3]	1.0
C	0.274	238	1,869	7.9	220.8	217.5[3]	217.8[3]	0.3
D	0.634	417	4,329	3.4	220.8	219.7[3]	220.7[3]	1.0
E	1.034	165	2,003	7.4	221.2	221.2	222.2	1.0
F	1.779	272	3,102	4.4	225.6	225.6	226.3	0.7
G	2.113	171	2,332	5.9	226.8	226.8	227.6	0.8
H	2.183	120	1,565	8.8	227.1	227.1	227.7	0.6
I	2.613	300	3,002	4.6	230.0	230.0	231.0	1.0
J	2.772	147	2,100	6.6	230.6	230.6	231.6	1.0
K	2.883	144	2,410	5.7	232.1	232.1	232.7	0.6
L	3.330	155	2,186	6.3	233.8	233.8	234.5	0.7
M	3.634	109	1,745	7.9	235.3	235.3	236.0	0.7
N	3.709	631	4,863	2.8	237.3	237.3	238.0	0.7
O	4.238	290	2,537	5.4	238.3	238.3	239.1	0.8
P	4.793	540	4,202	3.3	241.0	241.0	242.0	1.0
Q	5.544	120	1,415	9.8	244.6	244.6	245.4	0.8
R	5.819	134	1,790	7.7	248.5	248.5	249.1	0.6
S	6.287	1,037	6,474	1.0	250.7	250.7	251.4	0.7
T	6.642	115	781	8.3	250.8	250.8	251.8	1.0
U	6.900	354	1,926	3.4	255.4	255.4	255.9	0.5

[1]Miles Above Mouth [2]Width Shown Without Consideration of Chehalis River Floodway

[3]Elevations Computed Without Consideration of Backwater From Chehalis River

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH FORK CHEHALIS 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)		
Newaukum River								
A	0.10	325	4,820	2.3	181.7	180.6[2]	180.6[2]	0.0
B	0.54	650	7,240	1.9	181.7	181.4[2]	182.3[2]	0.9
C	1.03	980	7,856	1.4	183.2	183.2	184.2	1.0
D	1.67	210	2,063	3.7	184.1	184.1	185.1	1.0
E	1.84	1,464	9,427	1.2	184.9	184.9	185.6	0.7
F	2.47	310	2,020	5.5	187.6	187.6	188.3	0.7
G	2.80	727	4,339	2.5	190.0	190.0	190.4	0.4
H	3.02	229	1,980	5.6	190.6	190.6	191.1	0.5
I	3.36	729	2,968	3.7	192.6	192.6	192.9	0.3
J	4.14	477	1,900	5.8	198.0	198.0	198.6	0.6
K	4.38	179	1,574	7.0	200.9	200.9	201.4	0.5
L	4.63	160	1,503	7.3	202.5	202.5	202.8	0.3
M	4.92	410	3,082	3.6	205.1	205.1	205.4	0.3
N	5.20	550	2,252	4.9	206.9	206.9	207.3	0.4
O	5.47	187	1,434	7.6	209.3	209.3	209.6	0.3
P	5.80	260	1,894	5.8	213.3	213.3	213.7	0.4
Q	6.24	446	2,012	5.5	216.3	216.3	217.0	0.7
R	6.62	262	1,690	6.5	219.2	219.2	219.6	0.4
S	6.92	420	2,548	4.3	222.2	222.2	222.3	0.1
T	7.37	200	1,083	10.1	227.7	227.7	227.7	0.0
U	7.69	190	1,658	6.6	234.4	234.4	234.4	0.0
V	7.70	181	2,199	4.9	234.5	234.5	235.5	1.0
W	7.72	181	1,939	5.6	234.6	234.6	235.6	1.0
X	8.22	549	2,703	4.0	238.4	238.4	239.1	0.7
Y	8.25	185	1,403	7.8	238.6	238.6	239.3	0.7
Z	8.27	679	2,982	3.6	240.0	240.0	240.3	0.3
AA	8.81	702	2,787	3.9	243.2	243.2	244.2	1.0

[1]Miles Above Mouth [2]Elevation Computed Without Consideration of Backwater From Chehalis River

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NEWAUKUM 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)			
Newaukum River (Cont'd)								
AB	9.12	770	4,087	2.7	245.9	245.9	246.9	1.0
AC	9.59	157	1,146	9.5	250.6	250.6	251.2	0.6
AD	10.13	792	2,328	4.7	260.3	260.3	260.9	0.6
AE	10.18	137	1,813	6.0	260.7	260.7	261.7	1.0
AF	10.20	1,043	7,424	1.5	261.5	261.5	262.3	0.8
AG	10.89	1,729	9,600	1.1	262.1	262.1	263.0	0.9
AH	11.38	159	1,192	8.9	265.5	265.5	266.4	0.9

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NEWAUKUM 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)			
South Fork Newaukum River								
AI	11.44	277	1,449	3.8	268.0	268.0	268.5	0.5
AJ	11.51	105	678	8.0	268.4	268.4	269.0	0.6
AK	11.57	194	1,354	4.0	270.0	270.0	270.8	0.8
AL	11.60	132	752	7.2	270.3	270.3	271.0	0.7
AM	11.80	109	779	7.0	274.9	274.9	275.2	0.3
AN	12.67	208	1,060	5.1	289.8	289.8	290.6	0.8
AO	13.17	370	1,328	4.1	297.5	297.5	298.5	1.0
AP	13.37	380	1,452	3.7	300.5	300.5	301.3	0.8
AQ	13.42	158	569	9.6	301.4	301.4	301.6	0.2
AR	13.44	648	1,921	2.8	303.5	303.5	303.5	0.0
AS	13.84	247	1,022	5.3	305.9	305.9	306.9	1.0
AT	14.32	241	1,014	5.4	314.5	314.5	314.6	0.1
AU	14.68	141	752	7.2	320.2	320.2	321.0	0.8
AV	14.70	120	722	7.5	321.2	321.2	321.7	0.5
AW	14.75	166	862	6.3	323.4	323.4	323.5	0.1
AX	15.57	305	1,428	3.8	335.2	335.2	336.1	0.9
AY	15.62	147	833	6.5	336.0	336.0	336.7	0.7
AZ	15.64	148	1,024	5.3	337.1	337.1	337.4	0.3
BA	16.19	372	1,713	3.2	342.3	342.3	342.5	0.2
BB	16.46	104	559	9.2	345.4	345.4	345.5	0.1
BC	16.82	210	1,109	4.6	353.6	353.6	354.5	0.9
BD	17.56	256	1,146	4.5	368.1	368.1	368.5	0.4
BE	17.86	94	689	7.5	373.1	373.1	374.0	0.9
BF	17.89	140	752	6.8	374.6	374.6	375.0	0.4
BG	17.91	248	1,226	4.2	375.9	375.9	375.9	0.0
BH	18.08	200	1,115	4.6	377.3	377.3	377.8	0.5

[1]Miles Above Newaukum River Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH FORK NEWAUKUM 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)			
South Fork Newaukum River (Cont'd)								
BI	18.53	135	647	7.9	385.4	385.4	385.8	0.4
BJ	18.98	126	710	7.2	394.1	394.1	394.7	0.6
BK	19.26	152	767	6.7	398.1	398.1	398.1	0.0
BL	19.65	234	829	6.2	403.1	403.1	403.5	0.4
BM	20.10	145	796	6.1	411.8	411.8	411.9	0.1
BN	20.92	456[2]	1,236	3.9	426.0	426.0	427.0	1.0
BO	21.23	164	915	5.3	431.2	431.2	431.7	0.5
BP	21.62	168	627	7.7	442.4	442.4	443.0	0.6
BQ	22.16	154	926	5.2	457.7	457.7	458.5	0.8
BR	22.77	186	956	5.1	468.4	468.4	468.5	0.1
BS	23.03	129	719	6.7	474.2	474.2	474.8	0.6
BT	23.09	125	1,045	4.6	475.1	475.1	476.1	1.0
BU	23.13	219	1,032	4.7	475.7	475.7	476.6	0.9
BV	23.49	109	610	7.9	483.9	483.9	483.9	0.0
BW	23.91	63	493	9.8	496.6	496.6	497.5	0.9

[1]Miles Above Mouth [2]Width Does Not Include Small Areas of High Ground

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH FORK NEWAUKUM 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)			
North Fork Newaukum River								
A	0.010	307	1,733	4.3	267.3	267.3	268.3	1.0
B	0.251	515	2,956	2.5	269.0	269.0	270.0	1.0
C	0.300	171	928	8.0	269.1	269.1	270.1	1.0
D	0.327	152	1,148	6.4	271.1	271.1	271.2	0.1
E	0.633	115	914	8.1	274.2	274.2	275.0	0.8
F	1.292	803	2,574	2.9	281.9	281.9	282.8	0.9
G	1.480	1,068	3,294	1.9	283.6	283.6	284.4	0.8
H	1.825	399	1,942	3.2	285.7	285.7	286.7	1.0
I	2.280	124	1,067	5.9	289.5	289.5	290.5	1.0
J	2.777	143	1,036	6.1	294.5	294.5	295.3	0.8
K	2.839	75	600	10.5	295.1	295.1	295.9	0.8
L	2.873	110	845	7.4	297.5	297.5	297.7	0.2
M	3.219	151	1,027	6.1	302.1	302.1	302.5	0.4
N	3.715	122	908	6.9	307.5	307.5	308.5	1.0
O	4.113	134	802	7.3	314.2	314.2	314.6	0.4
P	4.455	170	1,136	5.5	319.2	319.2	319.7	0.5
Q	4.784	114	945	6.6	322.5	322.5	323.4	0.9
R	5.032	148	941	6.7	326.1	326.1	326.7	0.6
Middle Fork Newaukum River								
A	0.022	139	1,190	1.0	283.3	283.3	284.3	1.0
B	0.515	99	255	4.8	284.3	284.3	285.2	0.9
C	1.030	365	674	1.8	292.8	292.8	293.6	0.8
D	1.247	57	214	5.7	299.7	299.7	300.2	0.5

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH FORK NEWAUKUM RIVER-MIDDLE FORK NEWAUKUM 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)			
Tilton River								
A	9.00	200	2,336	10.5	696.0	696.0	696.9	0.9
B	9.41	650	5,266	4.6	705.8	705.8	706.7	0.9
C	9.69	750	6,391	3.8	710.9	710.9	711.7	0.8
D	10.16	500	4,009	6.0	721.5	721.5	722.4	0.9
E	10.44	1,118	7,536	3.2	730.8	730.8	731.8	1.0
F	11.16	500	3,596	6.7	747.2	747.2	747.6	0.4
G	11.69	164	1,786	13.3	762.6	762.6	762.6	0.0
H	11.90	128	1,729	13.8	769.3	769.3	770.0	0.7
I	12.41	270	2,202	10.0	787.0	787.0	787.9	0.9
J	13.02	800	5,076	3.2	801.9	801.9	802.7	0.8
K	13.08	111	1,436	12.6	803.5	803.5	804.3	0.8
L	13.14	307	3,404	5.3	807.0	807.0	807.2	0.2
M	13.59	835	5,775	3.1	811.9	811.9	812.8	0.9
N	13.90	175	1,707	10.5	819.6	819.6	820.0	0.4
O	14.28	500	3,860	4.7	830.3	830.3	830.5	0.2
P	14.61	400	3,041	5.9	837.0	837.0	837.7	0.7
Q	15.05	640	5,312	3.4	844.4	844.4	845.1	0.7
R	15.25	120	1,445	12.4	847.0	847.0	847.7	0.7
S	15.37	94	1,472	12.1	853.2	853.2	853.9	0.7
T	15.39	335	3,949	4.5	855.9	855.9	855.9	0.0
U	15.81	130	1,630	10.9	858.2	858.2	859.2	1.0
V	16.06	110	1,477	12.0	864.7	864.7	865.0	0.3
W	16.39	90	1,163	15.3	874.1	874.1	874.3	0.2
X	16.66	210	2,894	5.9	883.4	883.4	883.6	0.2
Y	17.08	186	2,055	8.3	887.7	887.7	888.4	0.7
Z	17.34	158	1,291	12.3	893.3	893.3	894.0	0.7
AC	17.86	655/470[2]	5,114	3.1	918.0	918.0	918.4	0.4

[1]Feet Above Mouth [2]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

TILTON 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 (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Tilton River (Cont'd)								
AD	18.16	121	1,017	15.3	922.8	922.8	923.3	0.5
AE	18.41	460/130[2]	3,615	4.3	938.5	938.5	938.8	0.3
AF	18.64	450	3,664	4.2	942.8	942.8	943.7	0.9
AG	18.82	230	1,988	7.2	946.8	946.8	947.5	0.7
AH	19.13	330	2,625	5.5	959.0	959.0	959.9	0.9
AI	19.53	350	2,461	5.8	972.9	972.9	973.2	0.3
AJ	19.97	1,070	4,761	3.0	985.0	985.0	986.0	1.0
AK	20.28	244	1,350	10.1	996.7	996.7	997.4	0.7
AL	20.57	450	3,126	4.4	1,011.0	1,011.0	1,011.8	0.8
AM	20.86	250	1,562	8.8	1,021.9	1,021.9	1,022.1	0.2
AN	20.92	80	1,051	13.0	1,026.9	1,026.9	1,027.1	0.2
AO	20.96	370	3,381	4.0	1,030.4	1,030.4	1,030.5	0.1
AP	21.09	200	1,807	7.6	1,032.2	1,032.2	1,032.2	0.0
AQ	21.20	200	2,134	3.5	1,035.2	1,035.2	1,035.7	0.5
AR	21.90	340	897	8.3	1,062.7	1,062.7	1,062.7	0.0
South Fork Tilton River								
A	0.12	125	529	11.8	1,039.5	1,039.5	1,039.5	0.0
B	0.15	180	1,497	4.2	1,042.6	1,042.6	1,042.6	0.0
C	0.18	174	1,123	5.6	1,042.9	1,042.9	1,042.9	0.0
D	0.63	293	1,858	3.4	1,082.3	1,082.3	1,083.3	1.0
E	1.05	107	641	9.7	1,108.5	1,108.5	1,108.9	0.4

[1]Feet Above Mouth [2]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

TILTON RIVER-SOUTH FORK TILTON 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)			
Cispus River								
A	12.20	139	2,093	12.0	1,177.6	1,177.6	1,178.6	1.0
B	12.59	228	3,131	8.0	1,185.5	1,185.5	1,186.2	0.7
C	13.04	197	2,294	10.9	1,192.2	1,192.2	1,192.6	0.4
D	13.27	207	2,644	9.5	1,197.2	1,197.2	1,197.6	0.4
E	13.59	221	2,499	10.0	1,202.7	1,202.7	1,203.2	0.5
F	13.81	239	2,179	11.5	1,208.4	1,208.4	1,208.8	0.4
G	14.10	907	4,439	5.6	1,217.3	1,217.3	1,217.8	0.5
H	14.43	1,391	6,556	3.8	1,224.3	1,224.3	1,225.0	0.7
I	14.85	1,140	4,524	5.5	1,231.3	1,231.3	1,232.3	1.0
J	14.95	330	2,011	12.5	1,233.2	1,233.2	1,234.1	0.9
K	15.00	218	3,033	8.3	1,237.9	1,237.9	1,237.9	0.0
L	15.22	200	2,690	9.3	1,239.5	1,239.5	1,240.0	0.5
M	15.60	305	2,505	10.0	1,247.0	1,247.0	1,247.7	0.7
N	16.23	950	7,702	3.3	1,264.3	1,264.3	1,264.9	0.6
O	16.46	430	4,109	6.1	1,268.1	1,268.1	1,269.1	1.0
P	16.64	670	3,620	6.9	1,271.8	1,271.8	1,272.2	0.4

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CISPUS 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)			
Cowlitz River (Near Toledo)								
A	29.073	1,740	15,040	4.9	79.3	79.3	80.3	1.0
B	29.735	721	9,110	8.1	82.4	82.4	83.4	1.0
C	30.403	596	10,090	7.3	85.9	85.9	86.6	0.7
D	30.846	483	9,160	8.0	87.7	87.7	88.2	0.5
E	31.159	1,090	18,680	3.9	89.3	89.3	89.8	0.5
F	31.537	659	9,940	7.4	89.8	89.8	90.3	0.5
G	31.760	1,007	14,810	5.0	91.0	91.0	91.7	0.7
H	31.973	1,018	12,370	6.0	91.2	91.2	91.9	0.7
I	32.425	2,246	18,980	3.9	92.7	92.7	93.6	0.9
J	32.996	759	8,110	8.6	94.8	94.8	95.7	0.9
K	33.509	1,510	16,280	4.3	98.3	98.3	98.9	0.6
L	34.228	727/662[2]	7,270	9.6	101.0	101.0	102.0	1.0
M	34.367	728	9,020	7.7	102.6	102.6	103.3	0.7
N	34.774	1,281/ 1,263[2]	13,390	5.2	106.7	106.7	107.1	0.4
O	35.314	647	8,730	8.0	109.0	109.0	109.9	0.9
P	35.971	763	7,120	9.8	113.4	113.4	114.2	0.8
Q	36.298	1,279	15,310	4.5	118.0	118.0	118.8	0.8
R	36.856	1,168	12,150	5.7	121.3	121.3	122.1	0.8

[1]Miles Above Mouth [2]Width/Width Within County Limits

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

COWLITZ RIVER (NEAR TOLEDO)

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)			
Cowlitz River								
A	91.120	239	5,090	12.2	860.6	860.6	861.6	1.0
B	91.492	315	5,820	10.7	864.0	864.0	864.8	0.8
C	92.175	898	11,680	5.3	868.0	868.0	868.4	0.4
D	92.610	648	9,790	6.3	869.0	869.0	869.5	0.5
E	93.056	393	7,160	8.7	870.3	870.3	870.9	0.6
F	93.746	340	7,010	8.9	874.7	874.7	875.1	0.4
G	93.913	279	6,340	9.8	875.2	875.2	875.6	0.4
H	94.410	1,895	22,080	2.8	878.0	878.0	878.5	0.5
I	94.927	2,064	20,060	3.1	878.5	878.5	879.1	0.6
J	95.302	577	10,620	5.9	879.1	879.1	879.7	0.6
K	95.597	410	7,540	8.2	879.6	879.6	880.2	0.6
L	96.034	236	6,770	9.2	881.1	881.1	881.7	0.6
M	96.593	962	15,900	3.9	883.2	883.2	883.9	0.7
N	97.034	1,667	24,910	2.5	884.2	884.2	885.0	0.8
O	97.608	2,942	41,190	1.5	884.8	884.8	885.6	0.8
P	97.995	3,188	4,190	1.5	885.0	885.0	885.8	0.8
Q	98.642	4,140	51,250	1.2	885.5	885.5	886.3	0.8
R	98.937	3,900	49,820	1.2	885.6	885.6	886.5	0.9
S	99.444	2,310	18,490	3.3	885.8	885.8	886.7	0.9
T	100.063	3,690	41,510	1.5	886.6	886.6	887.6	1.0
U	100.557	3,380	39,320	1.5	887.0	887.0	888.0	1.0
V	101.424	5,214	42,840	1.4	887.5	887.5	888.5	1.0
W	102.278	5,830	50,760	1.2	888.1	888.1	889.0	0.9
X	102.849	3,349	24,250	2.5	888.5	888.5	889.5	1.0
Y	102.940	3,175	20,520	2.9	888.7	888.7	889.7	1.0
Z	102.972	3,610	22,560	2.7	889.3	889.3	889.7	0.4
AA	103.410	4,890	46,670	1.3	890.5	890.5	891.1	0.6

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

COWLITZ 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)		
Cowlitz River (Cont'd)								
AB	103.798	5,050	49,000	1.2	890.8	890.8	891.5	0.7
AC	104.578	1,900	13,510	4.4	892.1	892.1	892.7	0.6
AD	104.998	1,060	12,940	4.6	894.7	894.7	895.4	0.7
AE	105.323	1,110	11,980	5.0	896.2	896.2	896.9	0.7
AF	106.044	2,660	19,510	2.9	899.9	899.9	900.5	0.6
AG	106.636	3,200	25,740	2.2	901.5	901.5	902.1	0.6
AH	107.665	3,540	36,130	1.6	902.9	902.9	903.5	0.6
AI	108.132	3,660	28,620	2.0	903.5	903.5	904.2	0.7
AJ	109.075	4,035	16,588	3.4	905.7	905.7	906.3	0.6
AK	110.273	3,880	14,690	3.8	911.5	911.5	911.9	0.4
AL	111.088	3,920	19,630	2.9	915.8	915.8	916.3	0.5
AM	112.232	3,420	12,640	4.5	921.1	921.1	921.7	0.6
AN	112.691	2,890	19,420	2.9	925.0	925.0	925.9	0.9
AO	113.744	2,630	17,480	3.2	930.8	930.8	931.5	0.7
AP	114.432	2,980	15,100	3.6	935.9	935.9	936.4	0.5
AQ	114.961	2,110	13,550	4.0	939.7	939.7	940.3	0.6
AR	115.756	820	9,010	6.1	946.3	946.3	947.1	0.8
AS	115.839	487	6,390	8.6	947.4	947.4	948.0	0.6
AT	115.872	460	6,940	7.9	948.4	948.4	948.6	0.2
AU	116.819	1,463	14,840	3.7	954.1	954.1	955.1	1.0
AV	117.804	2,380	14,550	3.8	961.5	961.5	962.3	0.8
AW	118.548	2,197	15,520	3.5	971.9	971.9	972.9	1.0
AX	119.014	1,753	15,270	3.6	977.1	977.1	978.1	1.0
AY	119.562	1,570	10,650	5.1	982.0	982.0	982.7	0.7
AZ	119.890	2,280	15,710	3.5	987.3	987.3	987.7	0.4
BA	120.058	2,470	12,430	4.4	988.5	988.5	988.9	0.4

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

COWLITZ 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)			
Cowlitz River (Cont'd)								
BB	120.278	2,115	11,050	5.0	991.0	991.0	991.9	0.9
BC	120.930	300	4,720	11.3	1000.7	1000.7	1001.3	0.6
BD	121.415	338	5,740	8.9	1008.1	1008.1	1008.6	0.5
BE	121.657	939	11,670	4.4	1011.1	1011.1	1011.5	0.4
BF	121.890	2,130	17,550	2.8	1012.4	1012.4	1012.7	0.3
BG	122.131	3,400	19,220	2.4	1014.0	1014.0	1014.2	0.2
BH	122.457	1,890	9,420	4.9	1018.2	1018.2	1018.3	0.1
BI	122.757	639	5,490	8.4	1024.6	1024.6	1024.8	0.2
BJ	123.298	2,361	14,070	3.3	1032.7	1032.7	1033.7	1.0
BK	123.919	1,460	9,210	5.0	1042.1	1042.1	1043.1	1.0
BL	124.587	2,390	18,620	2.4	1049.8	1049.8	1050.5	0.7
BM	124.942	1,620	7,250	6.2	1054.8	1054.8	1055.2	0.4
BN	125.261	614	4,480	10.0	1063.3	1063.3	1063.4	0.1
BO	125.306	730	6,980	6.5	1065.0	1065.0	1065.0	0.0
BP	125.877	905	6,540	7.0	1071.7	1071.7	1072.2	0.5
BQ	126.386	1,090	8,960	5.1	1080.2	1080.2	1081.2	1.0
BR	126.695	742	5,660	8.1	1084.7	1084.7	1085.1	0.4
BS	127.463	1,111	8,330	5.0	1100.0	1100.0	1101.0	1.0
BT	128.617	1,600	9,450	4.0	1124.5	1124.5	1125.3	0.8
BU	129.395	1,470	7,320	5.2	1147.6	1147.6	1148.1	0.5
BV	130.185	563	4,480	7.8	1171.0	1171.0	1171.3	0.3
BW	130.788	640	5,100	6.8	1185.4	1185.4	1186.2	0.8
BX	131.371	523	4,180	6.3	1198.5	1198.5	1198.9	0.4
BY	131.484	125	1,200	13.3	1202.0	1202.0	1203.0	1.0
BZ	131.643	164	2,650	10.0	1207.0	1207.0	1207.5	0.5

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

COWLITZ 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)		
China Creek								
AK	3.00	95	----[2]	----[2]	190.7	190.7	191.7	1.0
AL	3.12	60	----[2]	----[2]	192.6	192.6	193.6	1.0
AM	3.38	30/50[3]	----[2]	----[2]	197.1	197.1	198.1	1.0
AN	3.64	40	----[2]	----[2]	205.2	205.2	206.2	1.0
AO	3.68	40	----[2]	----[2]	207.0	207.0	208.0	1.0
AP	3.77	20	----[2]	----[2]	208.2	208.2	209.2	1.0
AQ	3.84	50	----[2]	----[2]	211.5	211.5	212.5	1.0
AR	3.99	20	----[2]	----[2]	217.2	217.2	218.2	1.0
AS	4.40	30	----[2]	----[2]	238.5	238.5	239.5	1.0
AT	4.56	60	----[2]	----[2]	245.3	245.3	246.3	1.0

[1]Miles Above Mouth [2]Data Not Available [3]Left Channel/Right Channel

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CHINA CREEK

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)			
Coffee Creek								
AA	0.03	46	----[2]	----[2]	182.2	182.2	183.2	1.0
AB	0.18	55	----[2]	----[2]	182.2	182.2	183.2	1.0
AC	0.26	56	----[2]	----[2]	182.7	182.7	183.7	1.0
AD	0.30	155	----[2]	----[2]	183.1	183.1	184.1	1.0
AE	0.34	220	----[2]	----[2]	183.2	183.2	184.2	1.0
AF	0.43	155	----[2]	----[2]	188.0	188.0	189.0	1.0
AG	0.74	80	----[2]	----[2]	188.8	188.8	189.8	1.0
AH	0.76	113	----[2]	----[2]	191.9	191.9	192.9	1.0
AI	1.02	39	----[2]	----[2]	192.1	192.1	193.1	1.0
AJ	1.18	48	----[2]	----[2]	194.8	194.8	195.8	1.0
AK	1.20	31	----[2]	----[2]	201.5	201.5	202.5	1.0
AL	1.55	34	----[2]	----[2]	202.0	202.0	203.0	1.0
AM	1.61	25	----[2]	----[2]	205.1	205.1	206.1	1.0
AN	1.63	25	----[2]	----[2]	205.1	205.1	206.1	1.0
AO	1.79	41	----[2]	----[2]	205.3	205.3	206.3	1.0
AP	1.81	41	----[2]	----[2]	205.4	205.4	206.4	1.0
AQ	1.96	45	----[2]	----[2]	205.5	205.5	206.5	1.0
AR	2.12	29	----[2]	----[2]	205.6	205.6	206.6	1.0
AS	2.13	102	----[2]	----[2]	205.6	205.6	206.6	1.0
AT	2.40	673	----[2]	----[2]	205.6	205.6	206.6	1.0

[1]Miles Above Mouth [2]Data Not Available

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

COFFEE CREEK

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[2] FLOODWAY	WITH[2] FLOODWAY	INCREASE
					(FEET NGVD)			
Lincoln Creek								
A	0.159	85	368	11.6	153.3	143.5	143.5	0.0
B	0.225	100	762	5.6	154.2	147.7	147.7	0.0
C	0.368	385	3,108	1.3	155.4	148.6	149.0	0.4
D	0.710	550	3,978	1.0	156.0	148.8	149.5	0.7
E	1.117	400	2,152	1.9	156.0	149.1	149.9	0.8

[1]Miles Above Mouth [2]Computed Without Consideration of Influence From Chehalis River

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LINCOLN 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 (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Dillenbaugh Creek								
A	0.432	95[2]	279	2.3	179.9	174.4[3]	175.4[3]	1.0
B	0.576	191[2]	808	0.7	179.9	174.9[3]	175.9[4]	1.0
C	0.811	480[2]	2797	0.2	181.0	175.0[4]	176.0[4]	1.0
D	1.076	150[2]	546	1.0	183.0	175.3[4]	176.3[4]	1.0
E	1.439	190[2]	892	0.6	184.2	176.6[4]	177.5[4]	0.9
F	1.742	180[2]	464	1.2	184.5	177.5[4]	178.3[4]	0.8
G	1.858	16[2]	127	4.2	184.8	178.3[4]	179.1[4]	0.8
H	1.892	250/85[5]	856	0.6	184.9	179.2[4]	179.9[4]	0.7
I	2.523	51	166	3.2	186.2	180.5[4]	181.3[4]	0.8
J	2.985	68	246	2.2	186.2	183.4[4]	184.0[4]	0.6
K	3.356	30	150	3.6	186.6	188.6	188.6	0.0
L	3.780	26	96	3.3	192.6	192.6	193.0	0.4
M	3.947	27	76	4.2	195.1	195.1	195.1	0.0
N	4.000	20	51	6.3	196.6	196.6	196.6	0.0
O	4.061	24	73	4.4	198.6	198.6	198.6	0.0
P	4.108	21	58	5.5	199.8	199.8	199.8	0.0
Q	4.146	27	47	6.9	201.8	201.8	201.8	0.0
R	4.455	25	85	3.8	215.6	215.6	215.9	0.3
S	4.871	299	355	0.9	225.1	225.1	226.0	0.9
T	5.250	32	88	3.7	235.6	235.6	235.8	0.2

[1]Miles Above Mouth [2]Floodway Lies Entirely Outside County Limits [3]Elevations Computed Without Consideration of Backwater From Chehalis River [4]Elevations Computed Without Consideration of Influence From Newaukum River [5]Width/Width Within County Limits

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

DILLENBAUGH CREEK

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)			
Berwick Creek								
A	0.303	41	96	2.2	195.3	195.3	195.3	0.0
B	0.492	21	54	4.0	197.7	197.7	198.4	0.7
C	0.619	12	64	3.4	200.5	200.5	201.4	0.9
D	0.777	31	57	3.8	202.6	202.6	202.6	0.0
E	1.098	14	62	3.5	210.2	210.2	210.7	0.5
F	1.250	28	76	2.8	212.7	212.7	213.0	0.3
G	1.268	10	49	4.4	213.1	213.1	213.3	0.2
H	1.360	24	64	3.4	215.3	215.3	215.3	0.0
I	1.549	21	53	4.1	226.3	226.3	226.4	0.1
J	1.608	21	41	5.2	229.3	229.3	229.4	0.1
K	1.629	37	135	1.6	230.7	230.7	230.9	0.2
L	1.922	12	60	3.6	239.8	239.8	239.8	0.0
M	1.934	80	258	0.8	240.0	240.0	240.0	0.0
N	2.106	45	94	2.3	242.2	242.2	243.0	0.8
O	2.375	125	111	1.9	249.5	249.5	250.4	0.9
P	2.761	100	109	1.3	258.9	258.9	259.9	1.0
Q	2.966	8	47	4.6	268.0	268.0	268.9	0.9

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

BERWICK CREEK

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)			
Hanaford Creek								
A	0.072	265	1,140	3.2	197.1	191.3[2]	192.3[2]	1.0
B	0.200	149	676	5.5	197.1	192.5[2]	193.1[2]	0.6
C	0.442	103	760	4.9	197.1	195.3[2]	195.7[2]	0.4
D	0.792	160	996	3.7	197.6	197.6	198.1	0.5
E	1.098	256	918	4.0	199.8	199.8	200.8	1.0
F	1.338	340	2,107	1.8	201.2	201.2	202.2	1.0
G	1.662	120	842	4.4	202.1	202.1	202.9	0.8
H	1.721	240	1,616	2.3	202.7	202.7	203.4	0.7
I	1.953	490	2,407	1.5	203.4	203.4	204.1	0.7
J	2.249	430	2,520	1.4	203.9	203.9	204.5	0.6
K	2.434	820	3,945	0.9	204.1	204.1	204.8	0.7
L	2.661	53	407	7.0	203.8	203.8	204.8	1.0
M	2.942	190	1,396	2.0	205.9	205.9	206.7	0.8

[1]Miles Above Mouth [2]Elevation Computed Without Consideration of Backwater From Skookumchuck River

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

HANAFORD CREEK

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)		
Salzer Creek								
B	0.29	110	---[2]	---[2]	175.5	175.5	176.5	1.0
C	0.39	60	---[2]	---[2]	175.5	175.5	176.5	1.0
D	0.46	70	---[2]	---[2]	175.5	175.5	176.5	1.0
I	2.51	745	---[2]	---[2]	176.1	176.1	177.1	1.0
J	2.61	715	---[2]	---[2]	176.2	176.2	177.2	1.0
K	3.34	90	---[2]	---[2]	177.0	177.0	178.0	1.0
L	4.03	270	---[2]	---[2]	180.0	180.0	181.0	1.0
M	4.53	60	---[2]	---[2]	183.6	183.6	184.6	1.0
Salzer Creek - Middle Fork								
CA	0.20	345	---[2]	---[2]	186.4	186.4	187.4	1.0
CB	0.444	150	---[2]	---[2]	192.8	192.8	193.8	1.0

[1]Miles Above Mouth [2]Data Not Available

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SALZER CREEK—SALZER CREEK-MIDDLE FORK

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)			
Salzer Creek - South Fork								
BA	0.48	295	---[2]	---[2]	189.2	189.2	190.2	1.0
BB	0.634	280	---[2]	---[2]	192.9	192.9	193.9	1.0
BC	1.531	50	---[2]	---[2]	202.4	202.4	203.4	1.0
BD	1.742	60	---[2]	---[2]	205.9	205.9	206.9	1.0
BE	2.059	135	---[2]	---[2]	209.1	209.1	210.1	1.0
BF	2.40	100	---[2]	---[2]	214.6	214.6	215.6	1.0
BG	2.89	20	---[2]	---[2]	222.9	222.9	223.9	1.0
BH	3.22	30	---[2]	---[2]	231.8	231.8	232.8	1.0
BI	4.172	50	---[2]	---[2]	248.0	248.0	249.0	1.0
Salzer Creek - North Fork								
DA	0.15	935	---[2]	---[2]	195.0	195.0	196.0	1.0
DB	0.57	300	---[2]	---[2]	203.4	203.4	204.4	1.0

[1]Miles Above Mouth [2]Data Not Available

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SALZER CREEK-SOUTH FORK–SALZER CREEK-NORTH FORK

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 (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Lake Creek (Tributary to South Fork Chehalis River)								
A	0.528	71	372	4.3	226.0	224.4[2]	225.3[2]	0.9
B	0.587	60	304	5.2	226.0	224.9[2]	225.7[2]	0.8
C	0.766	167	756	2.1	226.8	226.8	227.1	0.3
D	0.977	90	544	2.9	227.4	227.4	227.6	0.2
E	1.428	45	244	6.5	230.4	230.4	230.4	0.0
F	1.940	63	393	4.0	236.1	236.1	237.0	0.9
Elk Creek								
A	0.020	121	1,070	5.2	301.2	301.2	301.2	0.0
B	0.480	69	670	8.3	305.1	305.1	305.1	0.0
C	0.580	107	829	6.7	307.0	307.0	307.0	0.0
D	1.160	85	681	8.2	315.8	315.8	315.9	0.1
E	1.530	85	665	7.0	321.9	321.9	322.0	0.1
F	1.760	53	328	14.3	342.3	342.3	342.3	0.0
G	2.150	74	577	7.3	356.8	356.8	357.0	0.2
H	2.187	69	512	8.2	357.4	357.4	357.6	0.2
I	2.600	146	796	5.3	365.4	365.4	365.5	0.1
J	2.850	86	432	9.7	369.8	369.8	370.0	0.2

[1]Miles Above Mouth [2]Elevations Computed Without Consideration of Influence From South Fork Chehalis River

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LAKE CREEK (TRIBUTARY TO SOUTH FORK CHEHALIS RIVER)–ELK CREEK

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)			
Lake Creek (Tributary to Tilton River)								
A	0.11	42	171	8.9	887.8	887.8	888.5	0.7
B	0.15	37	139	11.0	896.4	896.4	896.4	0.0
C	0.18	51	266	5.7	899.9	899.9	899.9	0.0
D	0.42	71	174	8.8	913.4	913.4	913.4	0.0
E	0.92	40	316	4.8	931.7	931.7	931.8	0.1
F	1.29	56	510	3.0	934.6	934.6	934.8	0.2
G	1.37	40	385	4.0	935.0	935.0	935.3	0.3
H	1.39	37	316	4.8	935.1	935.1	935.5	0.4
I	1.70	600	3,066	0.5	936.0	936.0	937.0	1.0

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LAKE CREEK (TRIBUTARY TO TILTON 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)			
Big Creek								
A	0.05	209	1,248	6.4	1,574.4	1,574.4	1,575.4	1.0
B	0.54	89	735	10.6	1,605.0	1,605.0	1,605.7	0.7
C	0.59	50	602	13.0	1,609.9	1,609.9	1,610.7	0.8
D	0.62	201	1,643	4.8	1,614.1	1,614.1	1,614.3	0.2
E	1.09	86	537	14.3	1,634.8	1,634.8	1,634.8	0.0
F	1.53	350	2,610	2.9	1,659.2	1,659.2	1,660.1	0.9
G	1.60	50	437	7.2	1,661.4	1,661.4	1,661.6	0.2
H	1.63	120	917	3.4	1,662.6	1,662.6	1,662.7	0.1
I	1.98	70	306	10.3	1,676.0	1,676.0	1,676.8	0.8
J	2.46	250	719	4.4	1,712.7	1,712.7	1,713.7	1.0
K	2.84	101	377	8.3	1,737.1	1,737.1	1,737.1	0.0
L	3.11	180	577	5.5	1,754.2	1,754.2	1,754.8	0.6
M	3.15	63	465	6.8	1,759.5	1,759.5	1,759.8	0.3
N	3.18	120	773	4.1	1,760.8	1,760.8	1,760.9	0.1
O	3.40	72	279	11.3	1,772.7	1,772.7	1,772.7	0.0
P	3.43	48	352	8.9	1,777.4	1,777.4	1,777.6	0.2
Q	3.45	133	796	4.0	1,779.2	1,779.2	1,779.2	0.0
R	3.68	137	579	5.4	1,790.0	1,790.0	1,790.0	0.0
S	3.91	70	308	10.2	1,802.2	1,802.2	1,802.5	0.3
T	3.96	55	343	7.3	1,806.2	1,806.2	1,806.5	0.3
U	3.98	125	825	3.0	1,807.5	1,807.5	1,807.7	0.2
V	4.26	66	285	8.8	1,820.5	1,820.5	1,820.8	0.3
W	4.62	37	264	9.5	1,844.1	1,844.1	1,844.4	0.3
X	4.64	34	291	7.1	1,846.3	1,846.3	1,846.3	0.0
Y	5.02	43	253	8.2	1,873.3	1,873.3	1,873.3	0.0
Z	5.21	42	221	9.4	1,886.1	1,886.1	1,886.5	0.4
AA	5.69	36	226	9.2	1,923.9	1,923.9	1,924.7	0.8

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

BIG CREEK

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)			
Big Creek (Cont'd)								
AB	5.95	76	287	7.3	1,943.7	1,943.7	1,943.8	0.1
AC	6.20	47	214	9.7	1,964.2	1,964.2	1,964.2	0.0

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

BIG CREEK

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)			
Olequa Creek (Near Vader)								
B	2.35	230	1,687	6.0	95.4	95.4	96.4	1.0
C	2.53	110	1,507	6.8	97.8	97.8	98.3	0.5
D	2.79	115	1,425	7.0	100.9	100.9	101.2	0.3
E	2.99	137/57[2]	1,463	6.8	102.9	102.9	103.3	0.4
F	3.06	168/103[2]	2,140	4.7	104.0	104.0	104.3	0.3
G	3.09	150/90[2]	1,243	8.1	104.0	104.0	104.3	0.3
H	3.43	140/70[2]	1,579	6.3	109.9	109.9	110.2	0.3
I	3.72	48/18[2]	597	7.9	114.9	114.9	115.3	0.4
J	3.80	92/62[2]	1,115	4.3	116.2	116.2	116.7	0.5
K	3.84	52/22[2]	667	7.1	116.3	116.3	116.8	0.5
L	4.21	80/20[2]	787	5.7	121.0	121.0	122.0	1.0
M	4.41	60	764	5.9	123.8	123.8	124.6	0.8
N	4.91	80	744	6.0	129.8	129.8	130.7	0.9
O	4.99	78	735	6.1	131.4	131.4	132.0	0.6
P	5.03	78	686	6.6	132.0	132.0	132.5	0.5
Q	5.12	94	600	7.5	134.4	134.4	134.8	0.4
Olequa Creek (Near Winlock)								
A	10.04	102	571	5.6	240.3	240.3	240.3	0.0
B	10.41	60	374	8.6	249.5	249.5	249.5	0.0
C	10.67	71	424	7.6	256.3	256.3	256.3	0.0
D	10.70	66	378	8.5	257.8	257.8	257.8	0.0
E	10.74	147/67[2]	609	5.3	261.8	261.8	261.8	0.0
F	10.87	199/179[2]	856	3.8	263.3	263.3	263.3	0.0
G	11.21	129/104[2]	518	6.2	269.5	269.5	269.5	0.0

[1]Miles Above Mouth [2]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

OLEQUA CREEK (NEAR VADER)-OLEQUA CREEK (NEAR WINLOCK)

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)			
Olequa Creek (Cont'd) (Near Winlock)								
H	11.29	111/86[2]	726	4.0	270.9	270.9	270.9	0.0
I	11.33	114/89[2]	759	3.8	271.2	271.2	271.2	0.0
R	12.35	52	261	5.6	293.4	293.4	293.6	0.2
S	12.38	59	310	4.7	294.0	294.0	294.2	0.2
T	12.39	63	306	4.8	294.1	294.1	294.3	0.2
U	12.82	63	215	6.8	304.8	304.8	304.8	0.0
V	12.89	40	160	9.2	308.1	308.1	308.3	0.2
W	13.02	81	330	2.2	313.0	313.0	313.0	0.0
X	13.49	52	206	3.5	334.3	334.3	334.8	0.5
Y	13.94	44	123	5.9	358.9	358.9	359.1	0.2
Z	14.38	51	153	3.5	385.1	385.1	385.3	0.2
AA	14.61	90	96	5.5	392.4	392.4	392.4	0.0
AB	14.65	26	90	5.9	396.9	396.9	396.9	0.0
AC	14.69	62	154	3.4	399.0	399.0	399.0	0.0
AD	14.78	57	152	3.5	401.9	401.9	401.9	0.0
AE	14.81	31	86	6.1	405.3	405.3	405.3	0.0
AF	14.84	43	159	3.3	406.8	406.8	406.9	0.1
AG	15.30	65	146	2.1	418.8	418.8	418.8	0.0
AH	15.82	46	101	3.0	434.4	434.4	434.4	0.0
AI	16.06	16	46	6.5	444.2	444.2	444.2	0.0
AJ	16.09	8	76	3.9	449.1	449.1	449.7	0.6
AK	16.12	102	410	0.7	449.5	449.5	450.1	0.6
AL	16.66	98	134	2.2	459.1	459.1	459.4	0.3

[1]Miles Above Mouth [2]Width/Width Within County

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

OLEQUA CREEK (NEAR WINLOCK)

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)		
Mineral Creek								
A	1.45	293	1,793	6.9	1,330.6	1,330.6	1,331.6	1.0
B	1.50	159	1,770	7.0	1,333.4	1,333.4	1,334.3	0.9
C	1.55	218	2,045	6.1	1,334.8	1,334.8	1,335.3	0.5
D	2.00	365	1,644	7.4	1,346.1	1,346.1	1,346.5	0.4
E	2.40	760	4,788	2.5	1,361.5	1,361.5	1,362.1	0.6
F	2.53	824	3,022	4.0	1,366.8	1,366.8	1,367.8	1.0
G	3.09	320	1,761	5.8	1,404.9	1,404.9	1,405.7	0.8
H	3.35	224	894	11.2	1,421.3	1,421.3	1,422.3	1.0
I	3.40	183	932	10.7	1,426.2	1,426.2	1,462.7	0.5
J	3.43	201	1,968	5.1	1,429.0	1,429.0	1,429.1	0.1
K	3.81	126	480	11.1	1,461.4	1,461.4	1,462.2	0.8
L	4.15	85	501	10.6	1,499.9	1,499.9	1,500.5	0.6
Roundtop Creek								
A	0.34	110	180	10.5	1,373.6	1,373.6	1,373.6	0.0
B	0.83	100	483	3.9	1,392.2	1,392.2	1,393.0	0.8
C	0.86	80	367	5.2	1,392.7	1,392.7	1,393.5	0.8
D	0.87	67	333	5.7	1,393.1	1,393.1	1,393.6	0.5
E	1.00	49	249	7.6	1,398.5	1,398.5	1,398.9	0.4

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

MINERAL CREEK-ROUNDTOP CREEK

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)			
Lacamas Creek								
A	3.80	69	365	6.6	190.0	190.0	191.0	1.0
B	3.84	36	185	13.0	192.2	192.2	192.2	0.0
C	4.26	141	544	4.4	210.5	210.5	210.5	0.0
D	4.59	64	278	8.3	220.4	220.4	220.4	0.0
E	4.62	99	429	5.4	222.5	222.5	222.5	0.0
F	4.65	57	301	7.6	223.2	223.2	223.2	0.0
G	4.94	150	480	4.8	233.7	233.7	234.5	0.8
H	5.14	69	318	7.2	241.3	241.3	242.2	0.9
I	5.49	144	616	3.7	251.1	251.1	251.2	0.1
J	5.81	147	336	5.1	264.9	264.9	264.9	0.0
K	6.19	83	323	5.3	275.6	275.6	275.6	0.0
L	6.41	81	196	8.7	282.9	282.9	282.9	0.0
M	6.45	73	522	3.3	285.0	285.0	285.0	0.0
N	6.47	68	271	6.3	285.1	285.1	285.1	0.0
O	6.72	132	450	3.8	291.7	291.7	291.7	0.0
P	7.03	61	242	7.0	299.5	299.5	299.8	0.3
Q	7.06	26	229	7.4	302.4	302.4	302.4	0.0
R	7.07	85	479	3.6	303.5	303.5	303.5	0.0
S	7.48	88	398	4.3	311.2	311.2	311.3	0.1
T	7.79	232	801	2.1	315.3	315.3	316.0	0.7
U	8.23	136	438	3.9	322.4	322.4	323.2	0.8
V	9.13	382	1,628	1.0	331.8	331.8	332.8	1.0
W	9.96	638	1,398	1.0	337.2	337.2	338.2	1.0
X	10.29	170	526	2.7	341.3	341.3	342.3	1.0
Y	10.78	201	543	2.6	346.8	346.8	347.8	1.0
Z	11.19	286	791	1.8	350.7	350.7	351.2	0.5
AA	11.24	245	1,247	1.1	351.1	351.1	351.5	0.4

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LACAMAS CREEK

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)			
Lacamas Creek (Cont'd)								
AB	11.28	353	620	1.8	351.3	351.3	351.7	0.4
AC	11.85	370	1,038	1.1	359.4	359.4	360.4	1.0
AD	12.17	73	245	4.5	364.4	364.4	365.2	0.8
AE	12.26	28	204	5.4	366.9	366.9	367.5	0.6
AF	12.27	175	456	2.4	367.4	367.4	368.1	0.7
AG	12.75	170	725	1.5	371.7	371.7	372.6	0.9
AH	13.11	52	162	6.8	375.9	375.9	376.7	0.8
AI	13.12	342	274	3.3	378.6	378.6	378.6	0.0
AJ	13.14	361	1,098	0.8	380.1	380.1	380.1	0.0
AK	13.67	152	294	3.1	388.3	388.3	388.7	0.4
AL	14.11	80	227	4.0	402.2	402.2	402.2	0.0
AM	14.36	77	208	4.3	411.3	411.3	411.7	0.4
AN	14.92	80	182	3.3	426.8	426.8	427.4	0.6
AO	14.96	20	124	4.8	429.6	429.6	430.2	0.6
AP	14.97	171	748	0.8	430.2	430.2	430.7	0.5
AQ	15.39	33	71	8.4	445.0	445.0	445.0	0.0
AR	16.18	77	191	3.1	468.4	468.4	468.6	0.2
AS	16.20	31	85	7.1	471.1	471.1	471.1	0.0
AT	16.21	61	275	2.2	472.1	472.1	472.1	0.0
AU	16.24	23	84	7.1	472.3	472.3	472.5	0.2
AV	16.25	61	218	2.8	473.7	473.7	473.7	0.0
AW	16.55	60	246	2.4	478.4	478.4	479.4	1.0
AX	16.87	92	225	2.7	487.9	487.9	488.2	0.3
AY	17.26	60	110	5.5	498.6	498.6	498.8	0.2
AZ	17.64	42	148	3.4	511.1	511.1	511.3	0.2
BA	17.67	28	96	5.3	511.9	511.9	512.2	0.3

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LACAMAS CREEK

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)			
Lacamas Creek (Cont'd)								
BB	17.69	59	121	4.2	513.4	513.4	513.4	0.0
BC	18.48	55	176	2.3	534.4	534.4	534.8	0.4
BD	18.50	21	69	5.9	534.7	534.7	535.1	0.4

[1]Miles Above Mouth

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

LACAMAS CREEK

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 (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Siler Creek								
B	0.817	725	1,616	1.1	886.7	875.0[2]	876.0[2]	1.0
C	0.987	58	397	4.6	886.7	875.9[2]	876.9[2]	1.0
D	1.003	50	300	6.1	886.7	876.0[2]	877.0[2]	1.0
E	1.045	265	1,115	1.6	886.7	877.4[2]	878.1[2]	0.7
F	1.367	826	4,722	0.3	886.9	877.7[2]	878.5[2]	0.8
G	1.647	557	3,293	0.5	886.9	877.9[2]	878.7[2]	0.8
H	2.104	100	306	5.0	887.0	882.3[2]	883.3[2]	1.0
I	2.716	46	237	6.5	896.8	896.8	897.3	0.5
J	2.848	27	163	9.4	901.0	901.0	901.9	0.9
K	2.866	111	552	2.8	903.8	903.8	904.0	0.2
L	3.039	90	379	3.3	907.8	907.8	908.3	0.5
No Name Creek (Tributary to Siler Creek)								
NA	0.015	26	96	3.6	904.8	901.6[3]	902.6[3]	1.0
NB	0.176	97	172	2.0	906.1	906.1	906.6	0.5
NC	0.387	141	136	2.6	913.8	913.8	914.8	1.0
Surrey Creek								
A	0.676	51	288	3.9	901.7	894.2[2]	895.2[2]	1.0
B	0.746	89	572	2.0	901.7	894.8[2]	895.5[2]	0.7
C	0.793	183	626	1.8	901.7	895.0[2]	895.7[2]	0.7
D	1.063	800	3,591	0.3	901.7	895.3[2]	896.2[2]	0.9
E	1.616	260	764	1.5	901.7	897.5[2]	898.1[2]	0.6
F	1.874	82	207	5.4	907.7	907.7	908.7	1.0

[1]Miles Above Mouth [2]Elevation Computed Without Consideration of Influence From Cowlitz River
[3]Elevation Computed Without Consideration of Backwater From Siler Creek

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SILER CREEK-NO NAME CREEK (TRIBUTARY TO SILER CREEK)-SURREY CREEK

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)			
Silver Creek								
SA	0.476	211	1,300	8.1	901.7	901.7	901.7	0.0
SB	0.740	304	1,430	7.4	911.4	911.4	911.4	0.0
SC	0.812	177	1,410	9.0	914.2	914.2	915.2	1.0
SD	0.820	177	1,440	8.8	915.1	915.1	915.7	0.6
SE	1.141	182	1,050	12.1	938.0	938.0	938.0	0.0
SF	1.360	101	930	13.8	955.9	955.9	955.9	0.0
Hall Creek								
A	0.052	212	528	4.6	1,015.0	1,008.9[2]	1,008.9[2]	0.0
B	0.151	33	254	9.5	1,015.0	1,011.0[2]	1,011.3[2]	0.3
C	0.170	107	747	3.2	1,015.0	1,012.4[2]	1,013.4[2]	1.0
D	0.580	188	789	3.1	1,015.0	1,015.0	1,015.7	0.7
E	0.963	117[3]	421	5.7	1,019.2	1,019.2	1,020.2	1.0
F	1.122	184[3]	458	5.3	1,028.5	1,028.5	1,029.4	0.9
G	1.139	224	1,891	1.3	1,033.5	1,033.5	1,034.4	0.9
H	1.725	85	355	6.8	1,035.1	1,035.1	1,036.0	0.9
I	1.778	20	181	13.4	1,038.4	1,038.4	1,038.4	0.0
J	1.917	255	2,727	0.9	1,044.6	1,044.6	1,045.0	0.4
K	2.358	229	1,557	0.4	1,044.7	1,044.7	1,045.2	0.5
L	2.655	272	2,128	0.1	1,044.7	1,044.7	1,045.2	0.5
M	2.935	35	65	4.8	1,045.9	1,045.9	1,046.2	0.3
N	3.219	105	294	1.1	1,053.7	1,053.7	1,054.2	0.5

[1]Miles Above Mouth [2]Elevations Computed Without Consideration of Influence From Cowlitz River
[3]Width Does Not Include Small Areas of High Ground

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

SILVER CREEK-HALL CREEK

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)			
Coal Creek								
AC	1.80	120	---[2]	---[2]	180.2	180.2	181.2	1.0
AD	2.10	30	---[2]	---[2]	185.3	185.3	186.3	1.0
AE	2.72	35	---[2]	---[2]	195.2	195.2	196.2	1.0
AF	3.02	30	---[2]	---[2]	202.9	202.9	203.9	1.0
AG	3.28	22	---[2]	---[2]	212.5	212.5	213.5	1.0
AH	3.72	20	---[2]	---[2]	225.8	225.8	226.5	1.0

[1]Miles Above Mouth [2]Data Not Available

TABLE 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

COAL CREEK

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Emergency Management Agency has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source studied in detail affecting Lewis County.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of Lewis County are shown on the Flood Profiles (Exhibit 1) and summarized in Table 10. Because the flooding on all of Lincoln Creek studied in detail is controlled by Chehalis River, separate reach information is not shown.

5.2 Flood Hazard Factors

The FHF is the Federal Emergency Management Agency device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHF are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Skookumchuck River							
Reach 1	0041,0042						
	0043,0044	-2.02	-0.46	0.94	020	A4	Varies - See Map
Reach 2	0042	-1.67	-0.40	0.84	015	A3	Varies - See Map
Chehalis River							
Reach 1	0040,0041						
	0043,0230						
	0231,0233						
	0240	-2.51	-0.63	1.77	025	A5	Varies - See Map
Reach 2	0205,0210						
	0215,0220						
	0230,0240	-3.3	-1.0	2.2	035	A7	Varies - See Map
Reach 3	0215,0405	-2.7	-0.9	1.4	025	A5	Varies - See Map
South Fork Chehalis River							
Reach 1	0240,0430	-2.7	-0.8	0.8	025	A5	Varies - See Map
Newaukum River							
Reach 1	0233,0241	-3.00	-0.90	2.40	030	A6	Varies - See Map
Reach 2	0241,0242						
	0244	-2.00	-0.47	1.22	020	A4	Varies - See Map
Reach 3	0242,0244						
	0265	-1.08	-0.41	0.69	010	A2	Varies - See Map
South Fork Newaukum River							
Reach 1	0265,0270	-1.08	-0.41	0.69	010	A2	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

SKOOKUMCHUCK RIVER-CHEHALIS RIVER-SOUTH FORK CHEHALIS RIVER-NEWAUKUM RIVER-SOUTH FORK NEWAUKUM RIVER

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
North Fork Newaukum River							
Reach 1	0265	-1.53	-0.45	0.79	015	A3	Varies - See Map
Middle Fork Newaukum River							
Reach 1	0265	-1.09	-0.32	0.60	010	A2	Varies - See Map
Tilton River							
Reach 1	0295,0315						
	0320,0505	-2.28	-0.78	1.34	025	A5	Varies - See Map
South Fork Tilton River							
Reach 1	0315,0320	-1.27	-0.51	0.88	015	A3	Varies - See Map
Cispus River							
Reach 1	0545,0565	-2.63	-0.75	1.75	025	A5	Varies - See Map
Cowlitz River							
Reach 1	0445,0465						
	0635,0655	-2.66	-1.15	2.23	025	A5	Varies - See Map
Reach 2	0530,0535						
	0540	-4.00	-0.73	3.03	040	A8	Varies - See Map
Reach 3	0360,0370						
	0535,0555	-2.22	-0.53	1.53	020	A4	Varies - See Map
Shallow Flooding	0370	N/A	N/A	N/A	N/A	A0	Depth 3

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

NORTH FORK NEWAUKUM RIVER-MIDDLE FORK NEWAUKUM RIVER-TILTON RIVER-SOUTHFORK TILTON RIVER-CISPUS RIVER-COWLITZ RIVER

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
China Creek							
Reach 1	0044	-1.46	-0.83	N/A	015	A3	Varies - See Map
Reach 2	0044	-0.30	-0.20	N/A	005	A1	Varies - See Map
Reach 3	0044	-1.25	-0.30	N/A	015	A3	Varies - See Map
Reach 4	0044	-0.40	-0.20	N/A	005	A1	Varies - See Map
Coffee Creek							
Reach 1	0041,0043	-2.34	-1.16	1.68	025	A5	Varies - See Map
Reach 2	0041	-0.47	-0.12	0.32	005	A1	Varies - See Map
Reach 3	0041,0042	-2.77	-0.57	0.74	030	A6	Varies - See Map
Dillenbaugh Creek							
Reach 1	0234,0242	-1.00	-0.35	0.46	010	A2	Varies - See Map
Reach 2	0242	-0.56	-0.16	0.26	005	A1	Varies - See Map
Berwick Creek							
Reach 1	0242	-0.72	-0.27	0.36	005	A1	Varies - See Map
Hanaford Creek							
Reach 1	0042	-1.55	-0.47	0.84	015	A3	Varies - See Map
Salzer Creek							
Reach 1	0043,0044						
	0231,0232	-3.17	-1.07	N/A	030	A6	Varies - See Map
Reach 2	0232	-0.96	-0.28	N/A	010	A2	Varies - See Map

[1] Flood Insurance Rate Map Panel [2] Weighted Average [3] Rounded to Nearest Foot

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

CHINA CREEK-COFFEE CREEK-DILLENBAUGH CREEK-BERWICK CREEK-HANAFORD CREEK-SALZER CREEK

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Salzer Creek-Middle Fork							
Reach 1	0232	-0.84	-0.17	N/A	010	A2	Varies - See Map
Reach 2	0232	-1.40	-0.40	N/A	015	A3	Varies - See Map
Salzer Creek - South Fork							
Reach 1	0232	-1.00	-0.30	N/A	010	A2	Varies - See Map
Reach 2	0232	-2.63	-0.34	N/A	025	A5	Varies - See Map
Reach 3	0232,0251	-0.01	-0.01	N/A	010	A2	Varies - See Map
Salzer Creek - North Fork							
Reach 1	0232	-1.88	-0.24	N/A	020	A4	Varies - See Map
Reach 2	0232	-0.76	-0.18	N/A	010	A2	Varies - See Map
Lake Creek (Tributary to South Fork Chehalis River)							
Reach 1	0240	-2.46	-0.71	3.09	025	A5	Varies - See Map
Elk Creek							
Reach 1	0205,0215	-1.46	-0.59	1.42	015	A3	Varies - See Map
Lake Creek (Tributary to Tilton River)							
Reach 1	0505	-0.82	-0.35	0.33	010	A2	Varies - See Map
Reach 2	0505	-1.68	-0.68	0.56	015	A3	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

SALZER CREEK-MIDDLE FORK–SALZER CREEK-SOUTH FORK–SALZER CREEK-NORTH FORK–LAKE CREEK (TRIBUTARY TO SOUTH FORK CHEHALIS RIVER)–ELK CREEK–LAKE CREEK (TRIBUTARY TO TILTON RIVER

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Big Creek							
Reach 1	0140	-1.30	-0.33	1.00	015	A3	Varies - See Map
Reach 2	0140,0145	-1.20	-0.30	0.88	010	A2	Varies - See Map
Olequa Creek							
Reach 1	0635	-3.97	-1.02	2.84	040	A8	Varies - See Map
Reach 2	0435,0445	-2.39	-0.55	1.59	025	A5	Varies - See Map
Reach 3	0435,0455	-0.99	-0.17	0.75	010	A2	Varies - See Map
Mineral Creek							
Reach 1	0120	-1.20	-0.35	0.75	010	A2	Varies - See Map
Reach 2	0120	-2.58	-0.79	2.20	025	A5	Varies - See Map
Reach 3	0120	-0.40	-0.10	0.10	005	A1	Varies - See Map
Reach 4	0120,0310	-1.14	-0.33	0.90	010	A2	Varies - See Map
Roundtop Creek							
Reach 1	0120	-1.12	-0.26	0.61	010	A2	Varies - See Map
Lacamas Creek							
Reach 1	0445,0465	-1.72	-0.57	0.93	015	A3	Varies - See Map
Reach 2	0455,0460 0465	-0.88	-0.28	0.44	010	A2	Varies - See Map
Siler Creek							
Reach 1	0535	-4.30	-1.34	2.59	045	A9	Varies - See Map
Reach 2	0535	-1.65	-0.37	1.01	015	A3	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

BIG CREEK-OLEQUA CREEK-MINERAL CREEK-ROUNDTOP CREEK-LACAMAS CREEK-SILER CREEK

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
No Name Creek (Tributary to Siler Creek)							
Reach 1	0535	-0.56	-0.16	0.47	005	A1	Varies - See Map
Surrey Creek							
Reach 1	0535	-1.52	-0.54	0.70	015	A3	Varies - See Map
Silver Creek							
Reach 1	0535	-1.90	-0.01	0.01	020	A4	Varies - See Map
Reach 2	0535	-0.60	-0.60	1.10	005	A1	Varies - See Map
Reach 3	0535	-2.40	-0.90	1.30	025	A5	Varies - See Map
Hall Creek							
Reach 1	0370	-1.00	-0.27	0.73	010	A2	Varies - See Map
Reach 2	0370	-2.63	-0.77	1.33	025	A5	Varies - See Map
Reach 3	0370	-0.30	-0.07	0.27	005	A1	Varies - See Map
Coal Creek							
Reach 1	0231	-3.03	-2.28	3.95	030	A6	Varies - See Map
Reach 2	0231	-4.52	-1.59	3.12	045	A9	Varies - See Map
Reach 3	0231,0233						
	0234	-1.55	-0.52	0.92	015	A3	Varies - See Map
Reach 4	0234	-0.92	-0.34	0.41	010	A2	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

NO NAME CREEK (TRIBUTARY TO SILER CREEK)-SURREY CREEK-SILVER CREEK-HALL CREEK-COAL CREEK

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire unincorporated area of Lewis County was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zone A0:	Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; depths are shown, but no FHFs are determined.
Zones A1 through A9:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHFs.
Zone B:	Areas between the Special Flood Hazard Areas and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

The flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the county are summarized in Table 10.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for Lewis County is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Emergency Management Agency.

6.0 OTHER STUDIES

The U.S. Army Corps of Engineers, Portland District, published a Flood Hazard Information report for Cowlitz River near Toledo (Reference 24). This report, which included Cowlitz River from below Mayfield Dam to the county limits, was approximate in nature, and did not include the development of a hydraulic backwater model. Therefore, it is not in agreement with this study.

The U.S. Army Corps of Engineers, Portland District, published a special Flood Hazard Information report for Tilton River through the Town of Morton (Reference 25). The results presented in this Flood Insurance Study differ slightly due to the use of existing topographic conditions together with updated hydrologic analyses incorporating additional available streamflow data.

The U.S. Army Corps of Engineers, Seattle District, published the results of a special study for Chehalis and Newaukum Rivers in the vicinity of Chehalis, carried out in 1968 and updated in 1974 and 1976 (Reference 11). This Flood Insurance Study incorporates the U.S. Army Corps of Engineers hydraulic model with updated hydrologic data.

The U.S. Army Corps of Engineers, Seattle District, published a Flood Plain Information report for Chehalis and Skookumchuck Rivers in June 1968 (Reference 10). That report was subsequently updated by the U.S. Army Corps of Engineers in 1974 and 1976. The information was updated and the model was used for this study.

The U.S. Soil Conservation Service published a Flood Hazard Analysis for Salzer and Coal Creeks in May 1975 (Reference 12), for China Creek in March 1977 (Reference 13), and for Coffee Creek in February 1978 (Reference 14). The data and results of these reports were reviewed and form the basis of this present study.

Flood Insurance Studies have been published for the incorporated Cities of Chehalis (Reference 26), Winlock (Reference 27), Morton (Reference 28), and Toledo (Reference 29); the Towns of Pe Ell (Reference 30) and Vader (Reference 31); and the unincorporated areas of the adjacent Counties of Cowlitz (Reference 32) and Pacific (Reference 33). Flood Insurance Studies are being prepared for the City of Centralia (Reference 34) and the unincorporated areas of Yakima County (Reference 35).

In the City of Chehalis study, the flood insurance zones for Chehalis River were calculated based on the length of the watercourse within the city only; while for this study, it was based on a longer length. Therefore, the zone designations between the two studies differ slightly, but all other information is in agreement.

The City of Morton study will be revised to match this study, due to the addition of detailed flooding information from Tilton River which affects the northeastern part of the city. All other information is in agreement.

In the Cowlitz County study, the flood insurance zones for Cowlitz River do not match this study. This is because Cowlitz River was studied prior to the 1980 eruption of Mount St. Helens, which altered the characteristics of the Cowlitz River flood plain in Cowlitz County. The 500-year flood plain, therefore, was designated Zone A in Cowlitz County until it can be restudied.

All of the other Flood Insurance Studies are in agreement with the Lewis County study.

A Flood Hazard Boundary Map for Lewis County (Reference 23) has been previously published. This Flood Insurance Study is more detailed, and, thus, supersedes that map.

Flood Hazard Boundary Maps have been published for the adjacent Counties of Wahkiakum (Reference 36), Grays Harbor (Reference 37), Thurston (Reference 38), and Pierce (Reference 39). Because this study used more detailed methods, the Thurston map does not agree.

This study is authoritative for the purposes of the National Flood Insurance Program; data presented herein either supersede or are compatible with all previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the Insurance and Mitigation Division, Federal Emergency Management Agency, Federal Regional Center, 130 228th Street, SW., Bothell, Washington 98011.

8.0 BIBLIOGRAPHY AND REFERENCES

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FLOOD PROFILES

SKOOKUMCHUCK RIVER

REACH I
ZONE A4

Confluence with Chehalis River
Centralia Corporate Limit

I-5

Harrison Ave.

B. N. RR

B. N. RR

Confluence with Coffee Creek

Pearl St.

CITY OF CENTRALIA
CORPORATE LIMITS

CORPORATE LIMITS
CITY OF CENTRALIA

ELEVATION (FEET NGVD)

190
180
170
160
150
140

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6

STREAM DISTANCE IN MILES ABOVE MOUTH

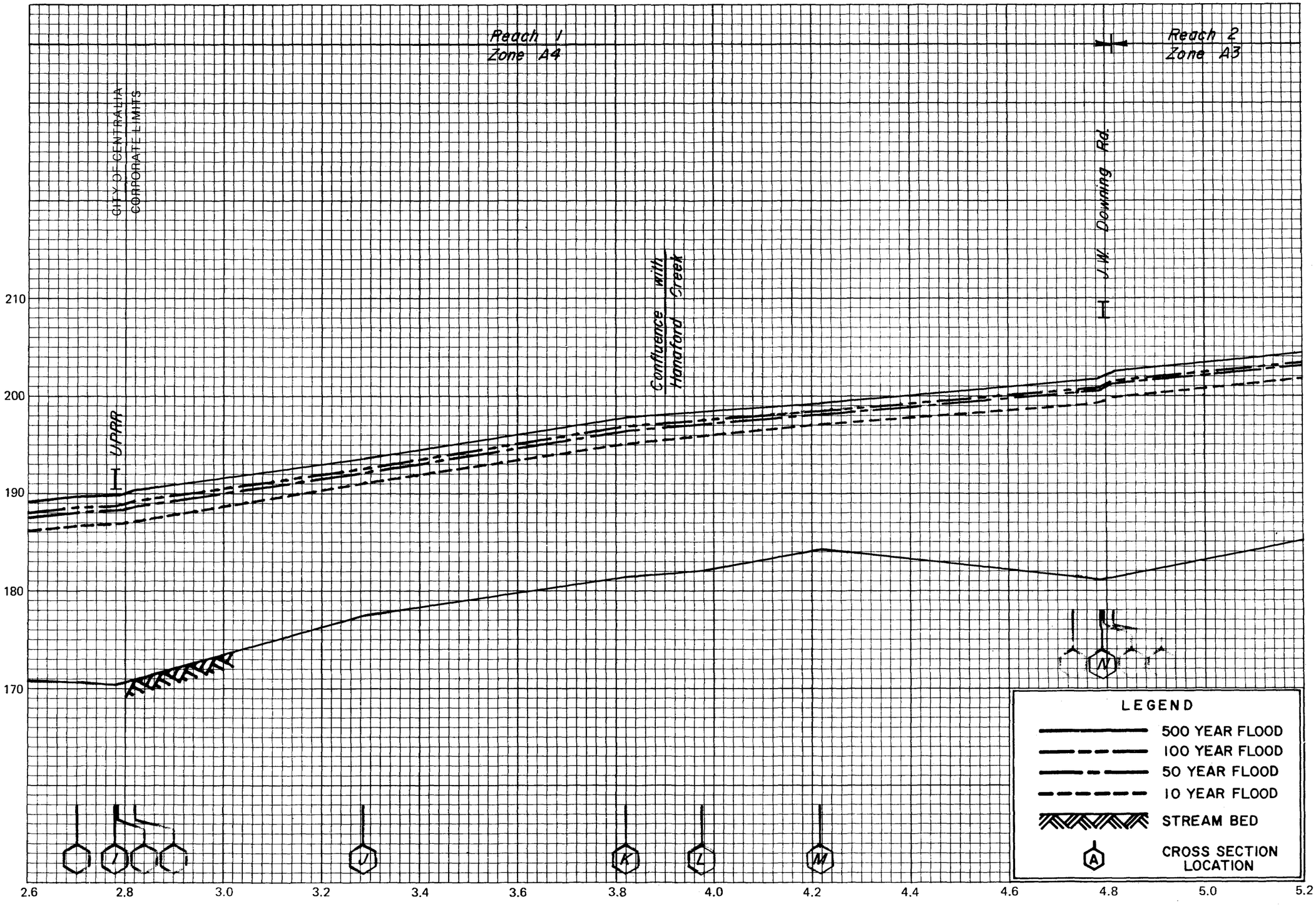
LEGEND

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

01P



FLOOD PROFILES

SKOOKUMCHUCK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

02P

ELEVATION (FEET NGVD)

180 190 200 210

5.2 5.4 5.6 5.8

STREAM DISTANCE IN MILES ABOVE MOUTH

Reach 2
Zone A3

LEWIS COUNTY
THURSTON COUNTY

LEGEND

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

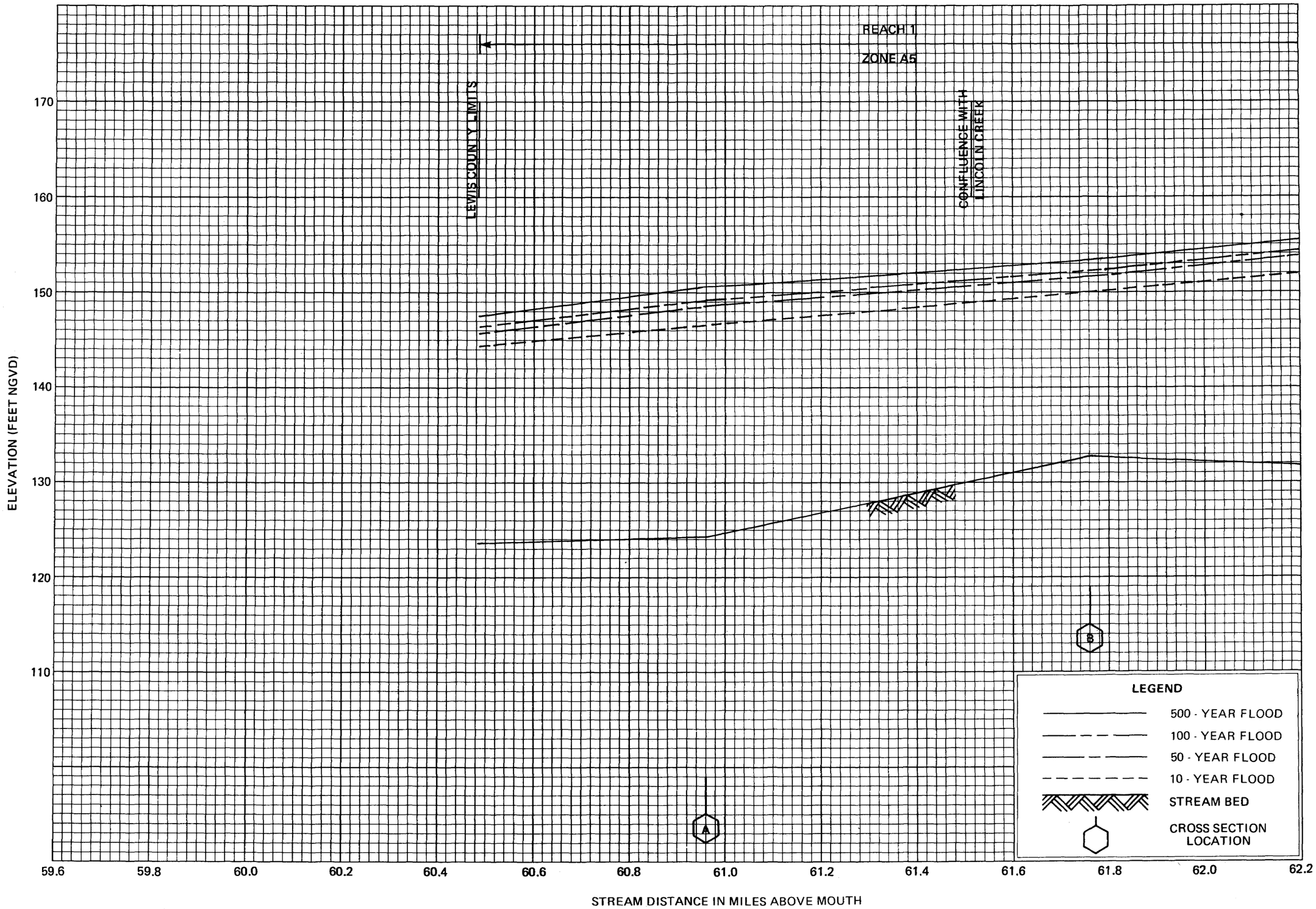
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD PROFILES

SKOOKUMCHUCK RIVER

03P



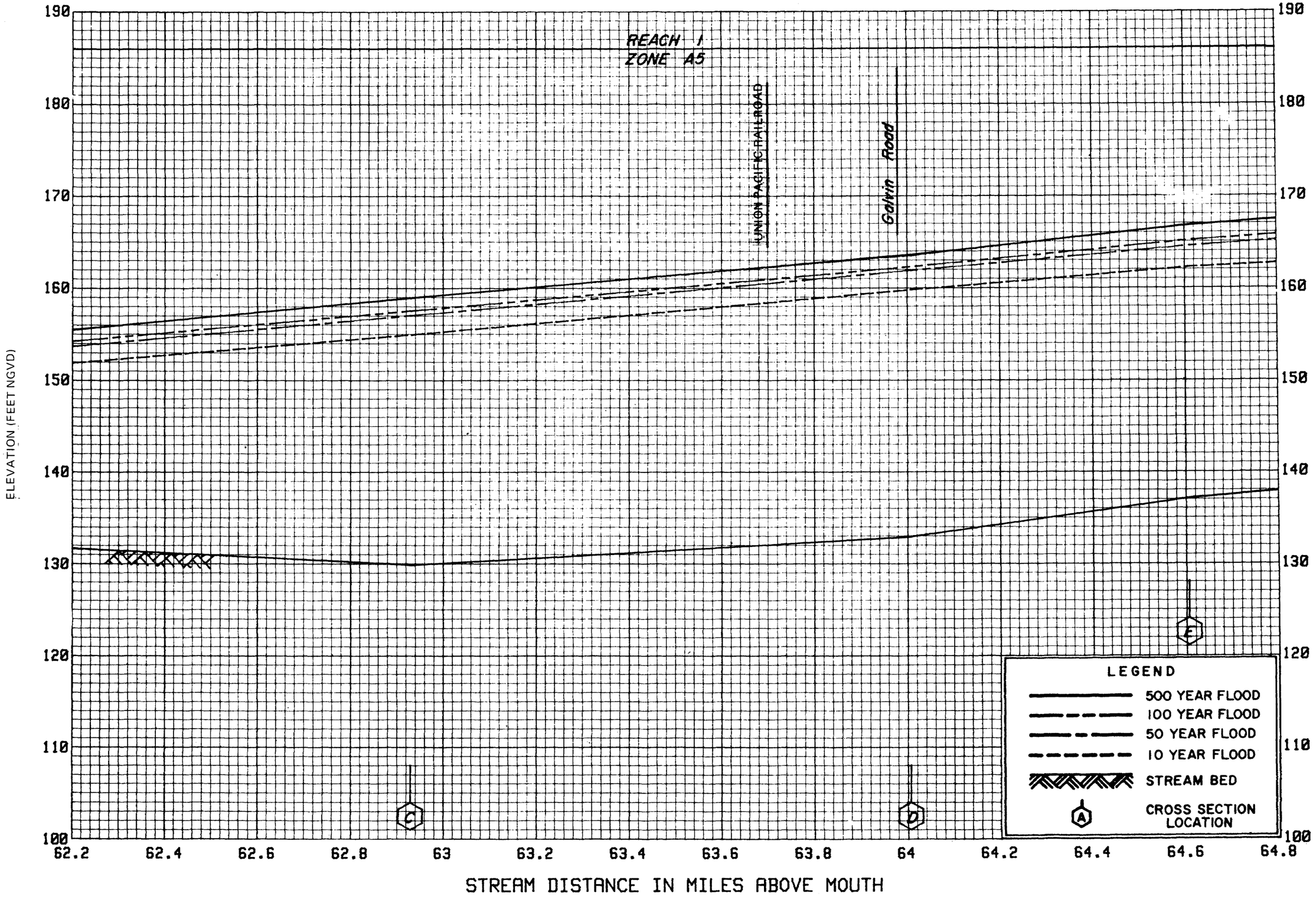
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

04P



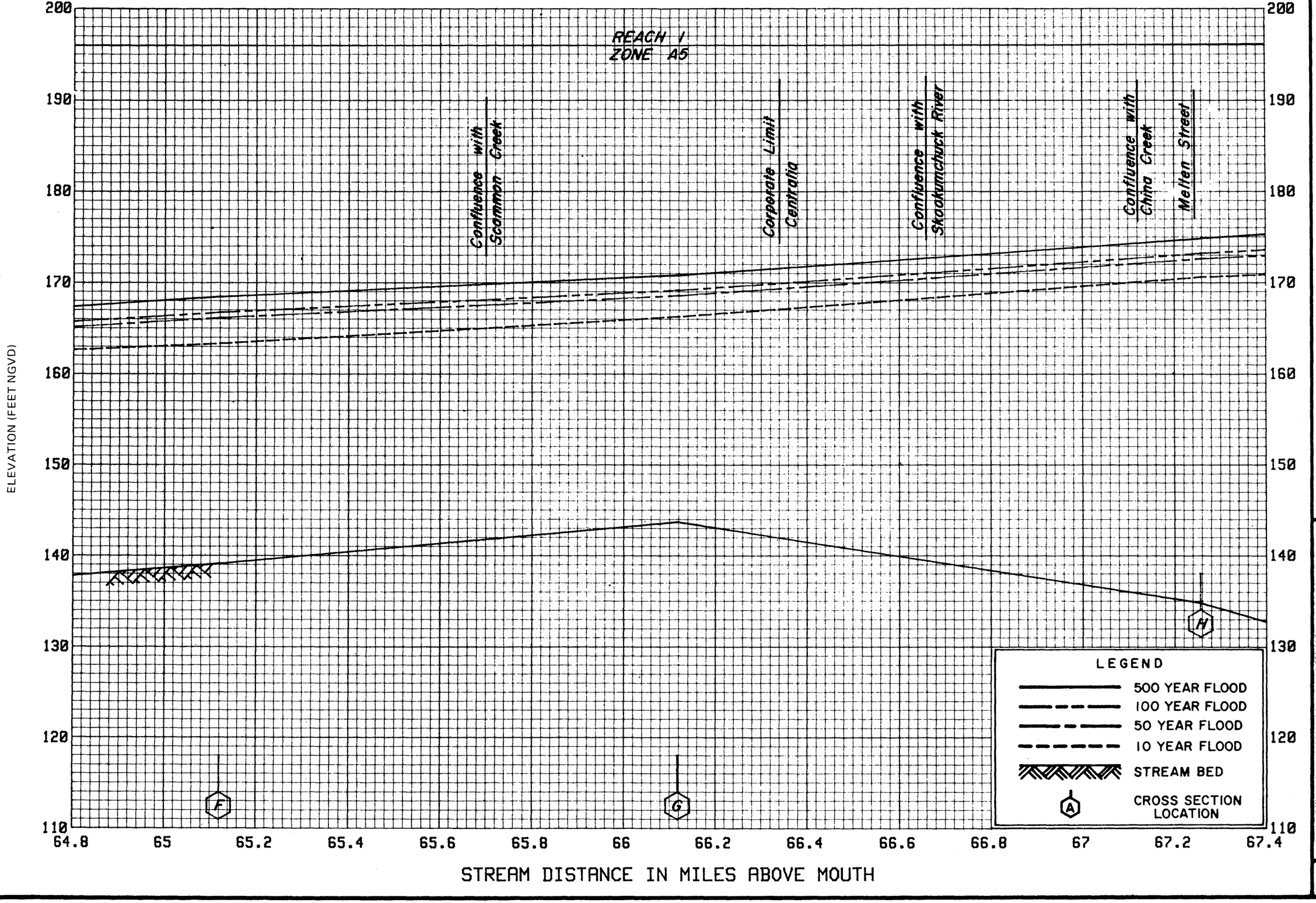
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

05P



FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

06P

ELEVATION (FEET NGVD)

190
180
170
160
150
140
130
120
110
100

REACH 1
ZONE A5

Centralia Corporate Limits
Chehalis Corporate Limits
Confluence with Salzer Creek

1

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

67.4 67.6 67.8 68 68.2 68.4 68.6 68.8 69 69.2 69.4 69.6 69.8 70

STREAM DISTANCE IN MILES ABOVE MOUTH

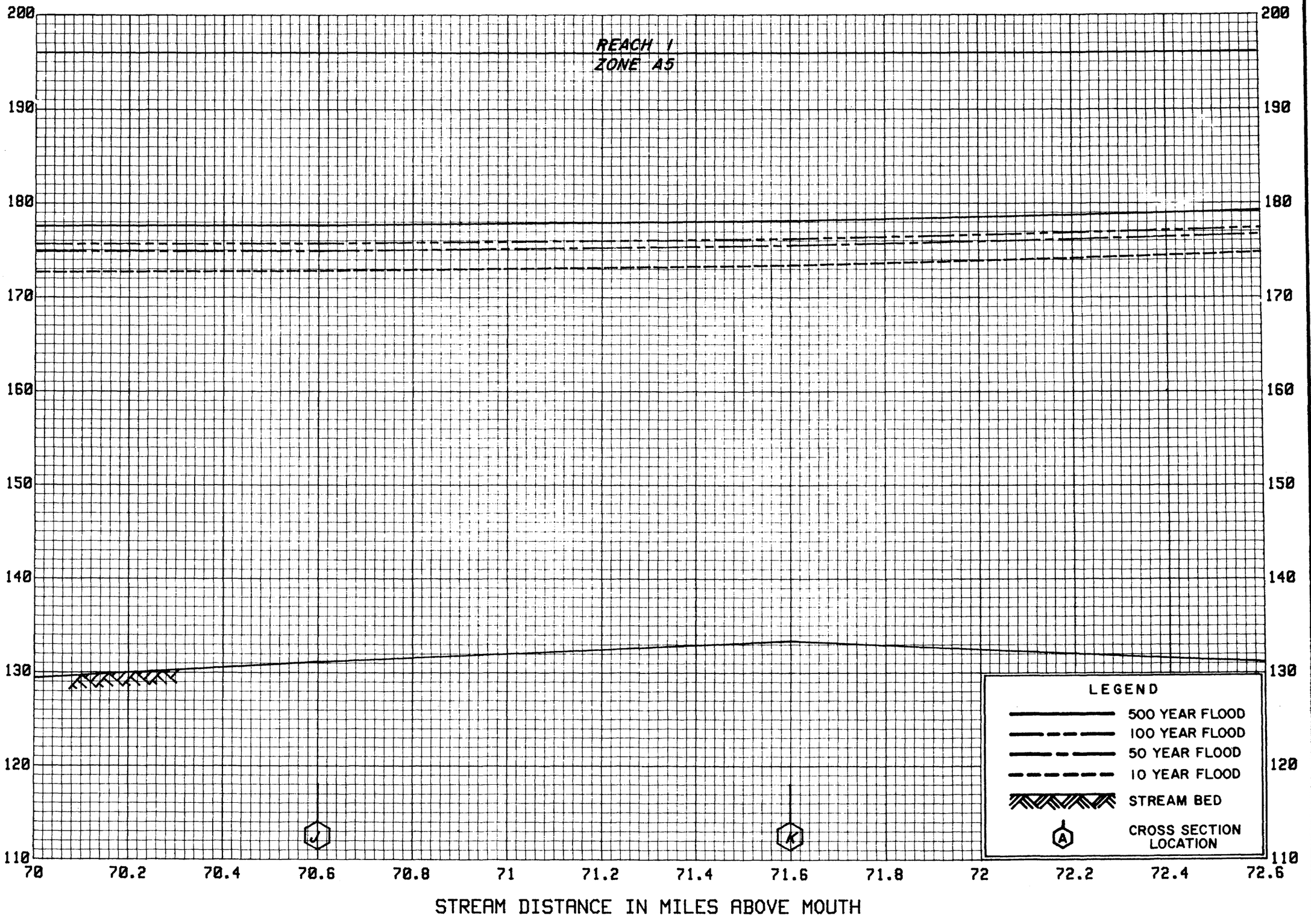
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

07P



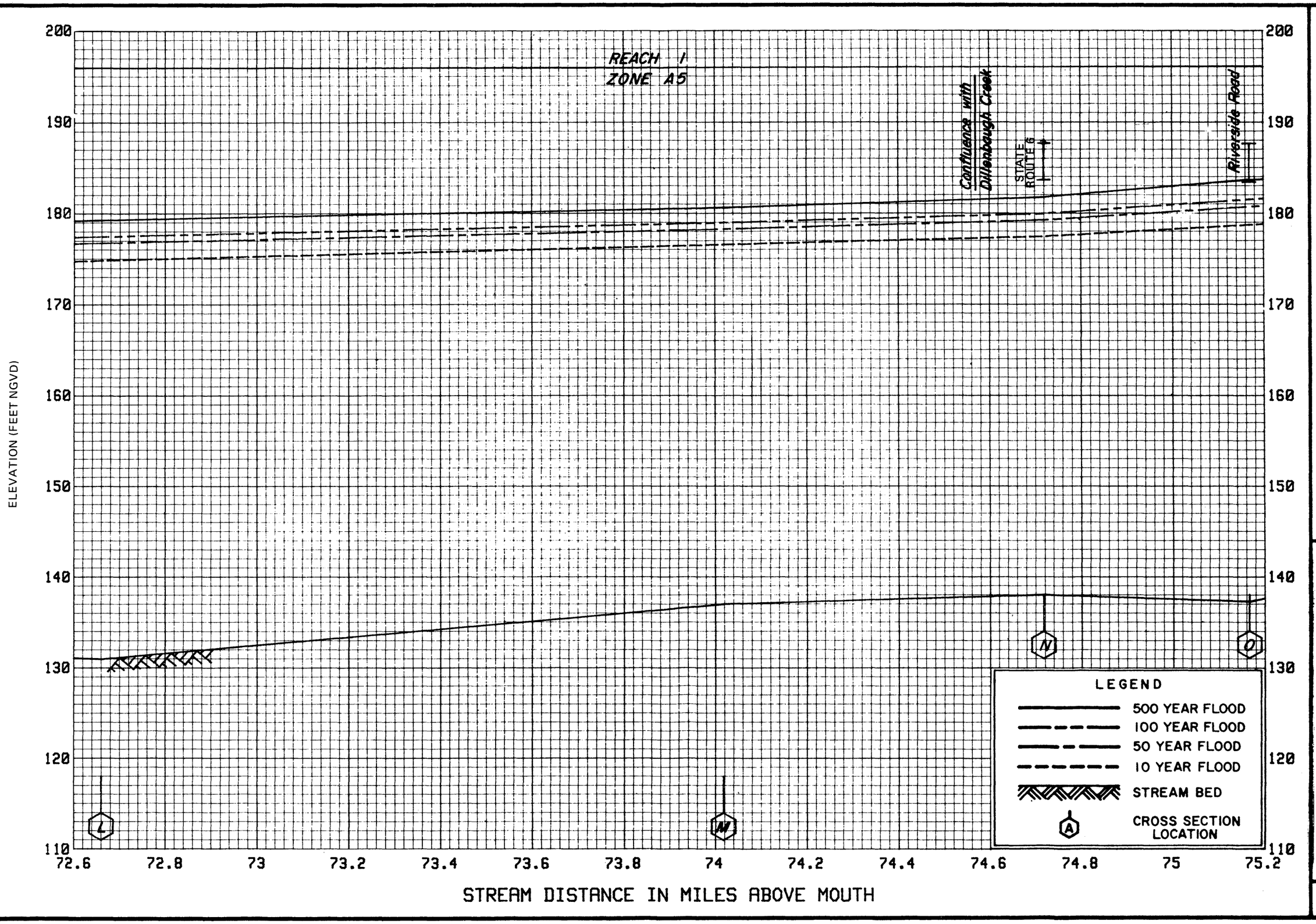
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

08P



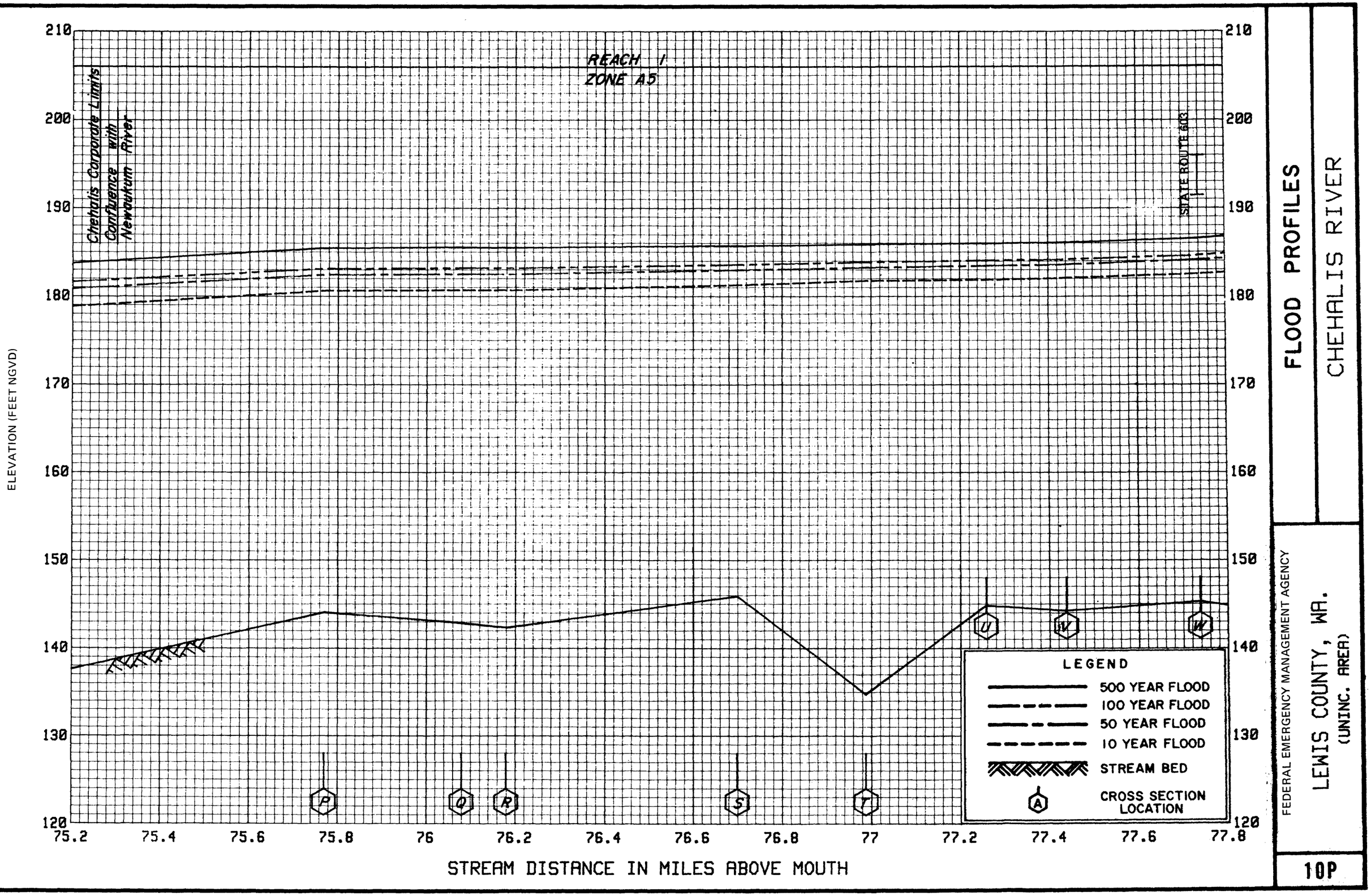
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

09P



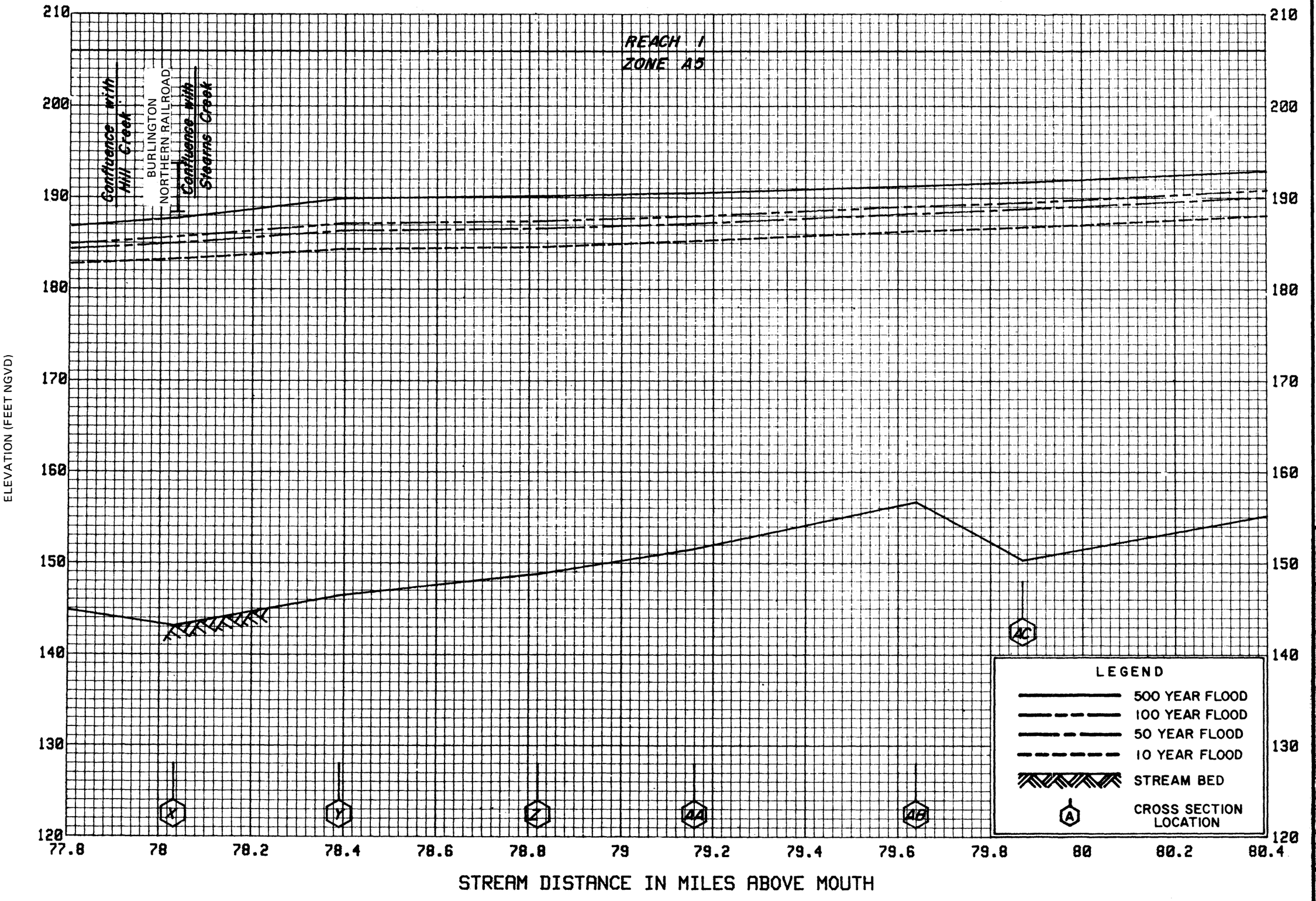
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

10P



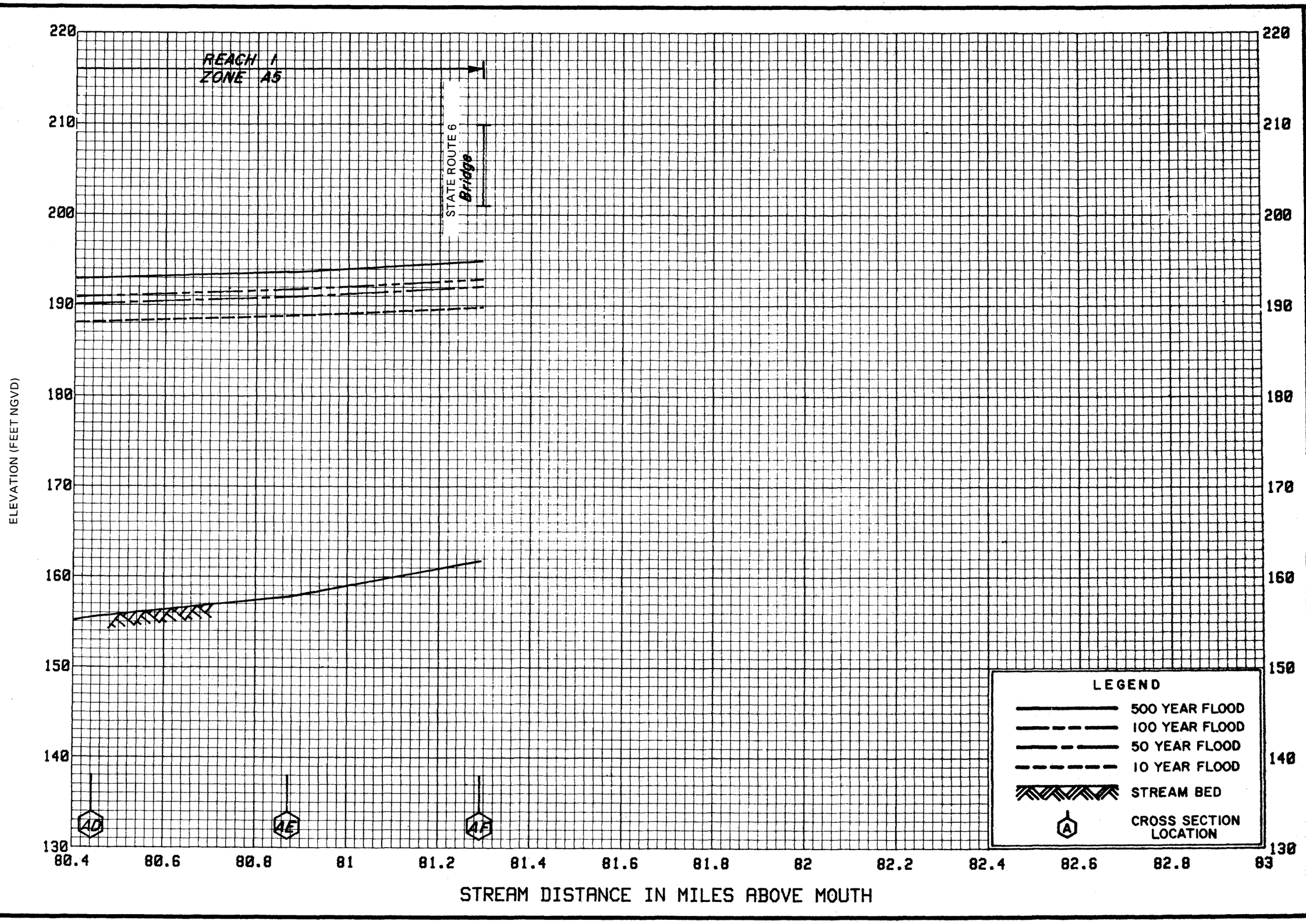
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

11P



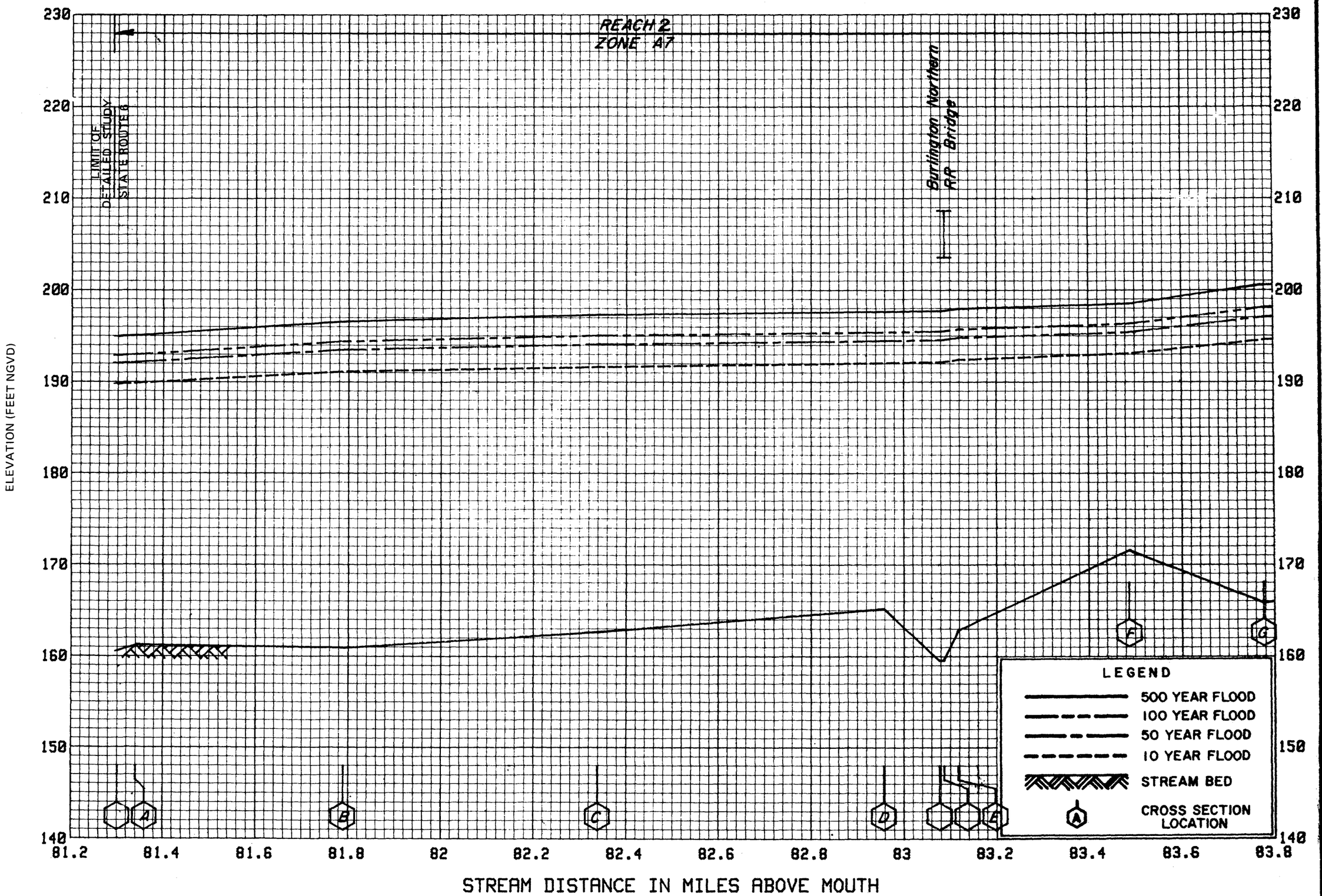
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

12P



FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

13P

REACH 2

ZONE AT

ELEVATION (FEET NGVD)

230
220
210
200
190
180
170
160
150
140

83.8 84 84.2 84.4 84.6 84.8 85 85.2 85.4 85.6 85.8 86 86.2 86.4

STREAM DISTANCE IN MILES ABOVE MOUTH

H I J K L M

LEGEND

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

FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

14P

REACH 2

ZONE A7

Burlington Northern RR Bridge near Bunker

Confluence with South Fork Chehalis

ELEVATION (FEET NGVD)

250
240
230
220
210
200
190
180
170
160

86.4 86.6 86.8 87 87.2 87.4 87.6 87.8 88 88.2 88.4 88.6 88.8 89

STREAM DISTANCE IN MILES ABOVE MOUTH

N O P Q R S T

LEGEND

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

FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

15P

REACH 2

ZONE A7

Ceres Hill Road Bridge

ELEVATION (FEET NGVD)

270
260
250
240
230
220
210
200
190
180

89 89.2 89.4 89.6 89.8 90 90.2 90.4 90.6 90.8 91 91.2 91.4 91.6

STREAM DISTANCE IN MILES ABOVE MOUTH

U V W X Y Z AA

LEGEND

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

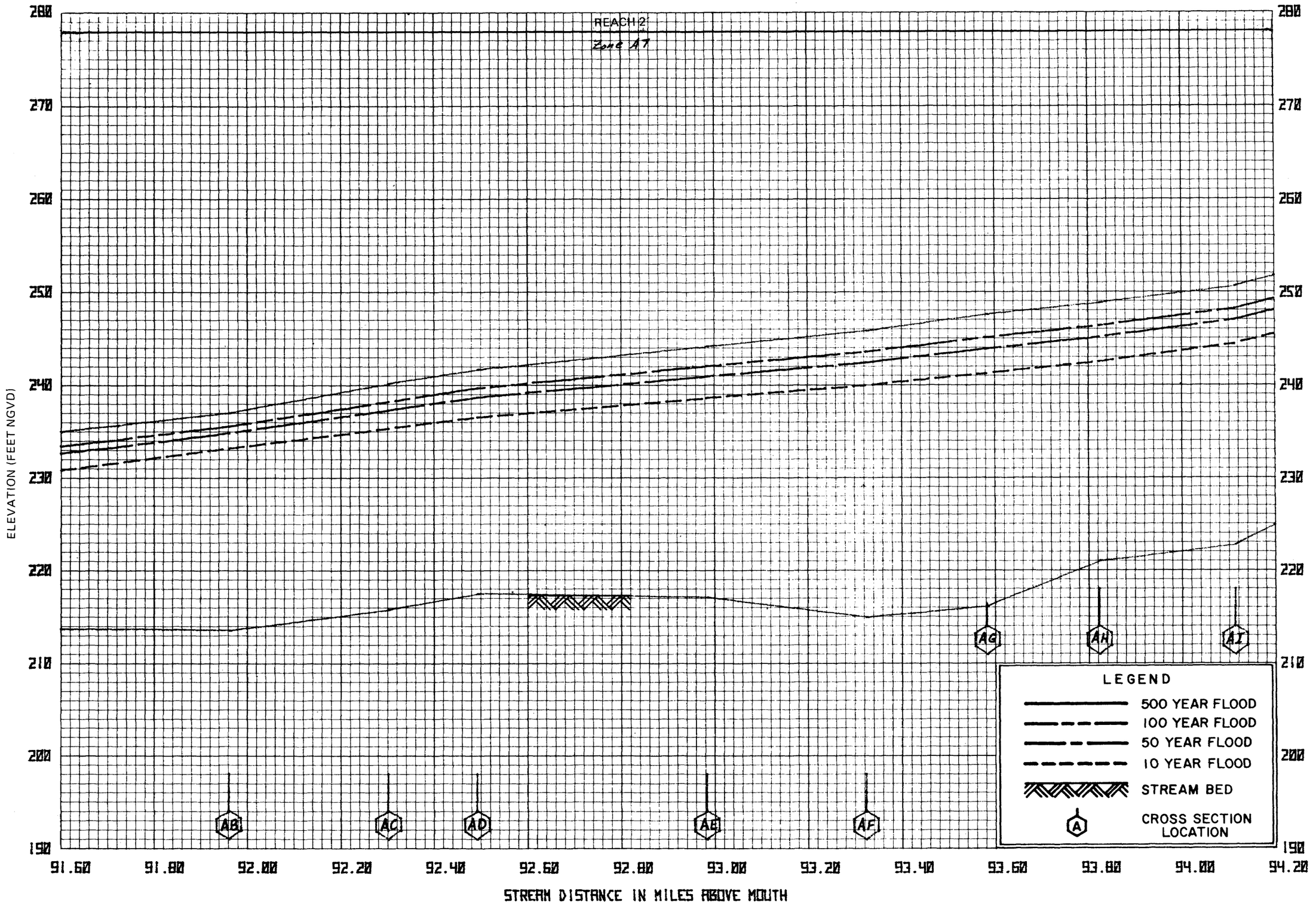
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

16P



FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

17P

REACH 2
Zone A7

River Road

ELEVATION (FEET NGVD)

290
280
270
260
250
240
230
220
210
200

94.20 94.40 94.60 94.80 95.00 95.20 95.40 95.60 95.80 96.00 96.20 96.40 96.60 96.80

STREAM DISTANCE IN MILES ABOVE MOUTH

AJ AK AL AM AN AO AP AQ

LEGEND

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

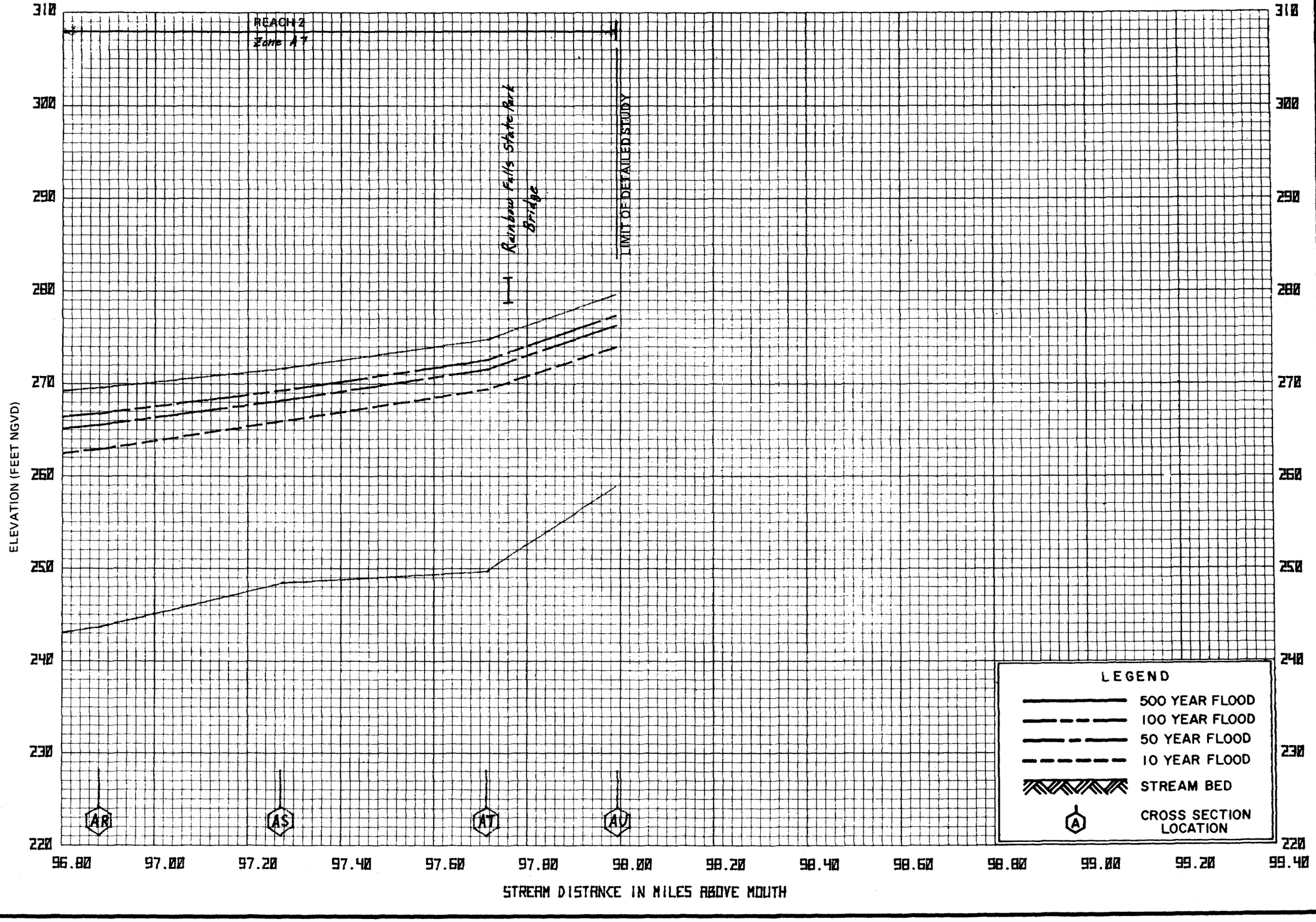
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

18P



FLOOD PROFILES

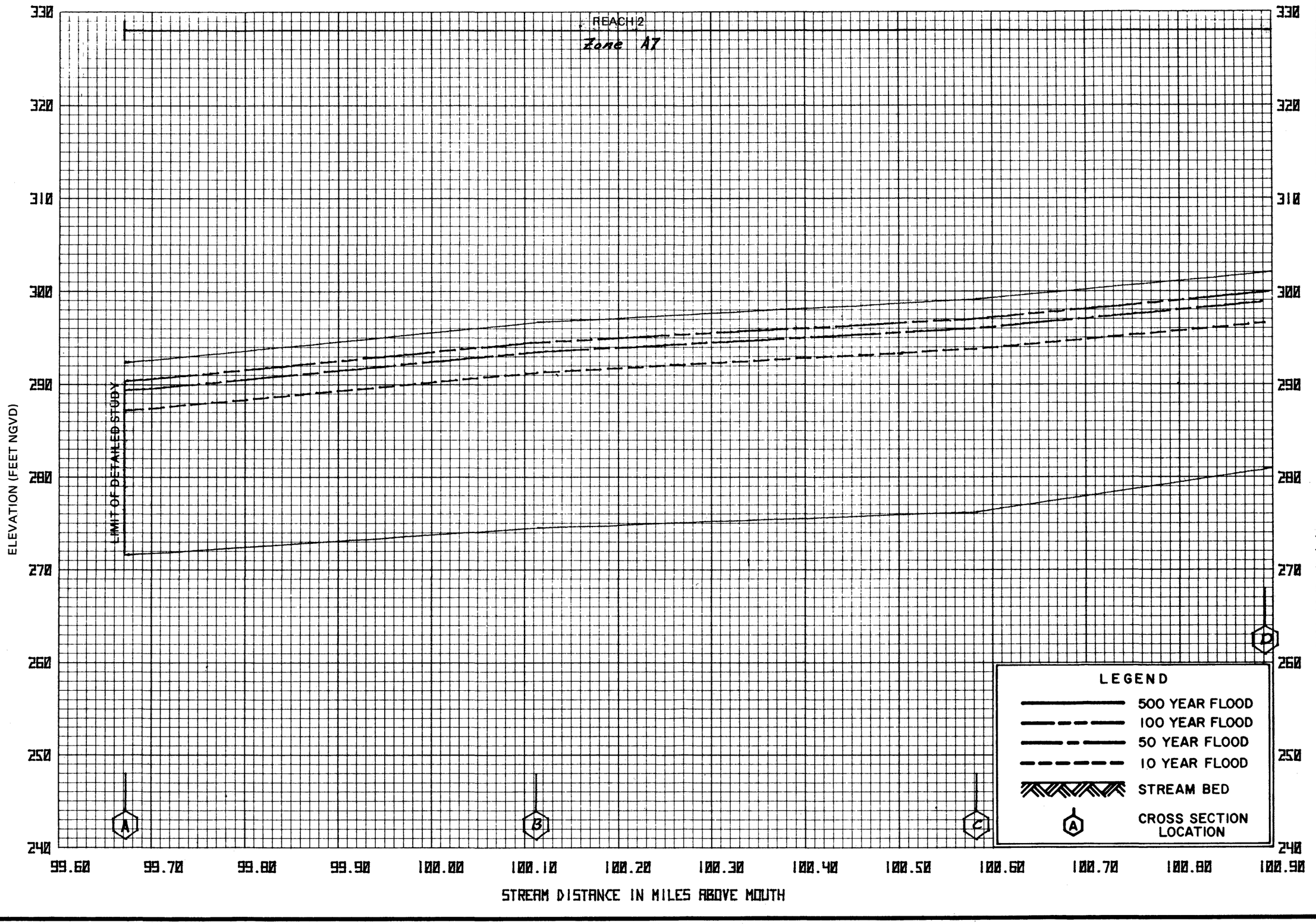
CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

CHEHALIS RIVER



FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

20P

ELEVATION (FEET NGVD)

250 260 270 280 290 300 310 320 330 340

STREAM DISTANCE IN MILES ABOVE MOUTH

102.20 102.10 102.00 101.90 101.80 101.70 101.60 101.50 101.40 101.30 101.20 101.10 101.00 100.90

CONFLUENCE WITH ELK CREEK

Elk Creek Road

ZONE A7

REACH 2

LIMIT OF DETAILED STUDY

E

F

G

H

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

A CROSS SECTION LOCATION

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

CHEHALIS RIVER

21P

ELEVATION (FEET NGVD)

310 320 330 340 350 360 370 380 390 400

STREAM DISTANCE IN MILES ABOVE MOUTH

105.10 105.20 105.30 105.40 105.50 105.60 105.70 105.80 105.90 106.00 106.10 106.20 106.30 106.40

Limits of Detailed Study

PE ELL CITY LIMITS

Reach 3
Zone A3

STATE HIGHWAY 6

CONFLUENCE WITH STOWE CREEK

LEGEND

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

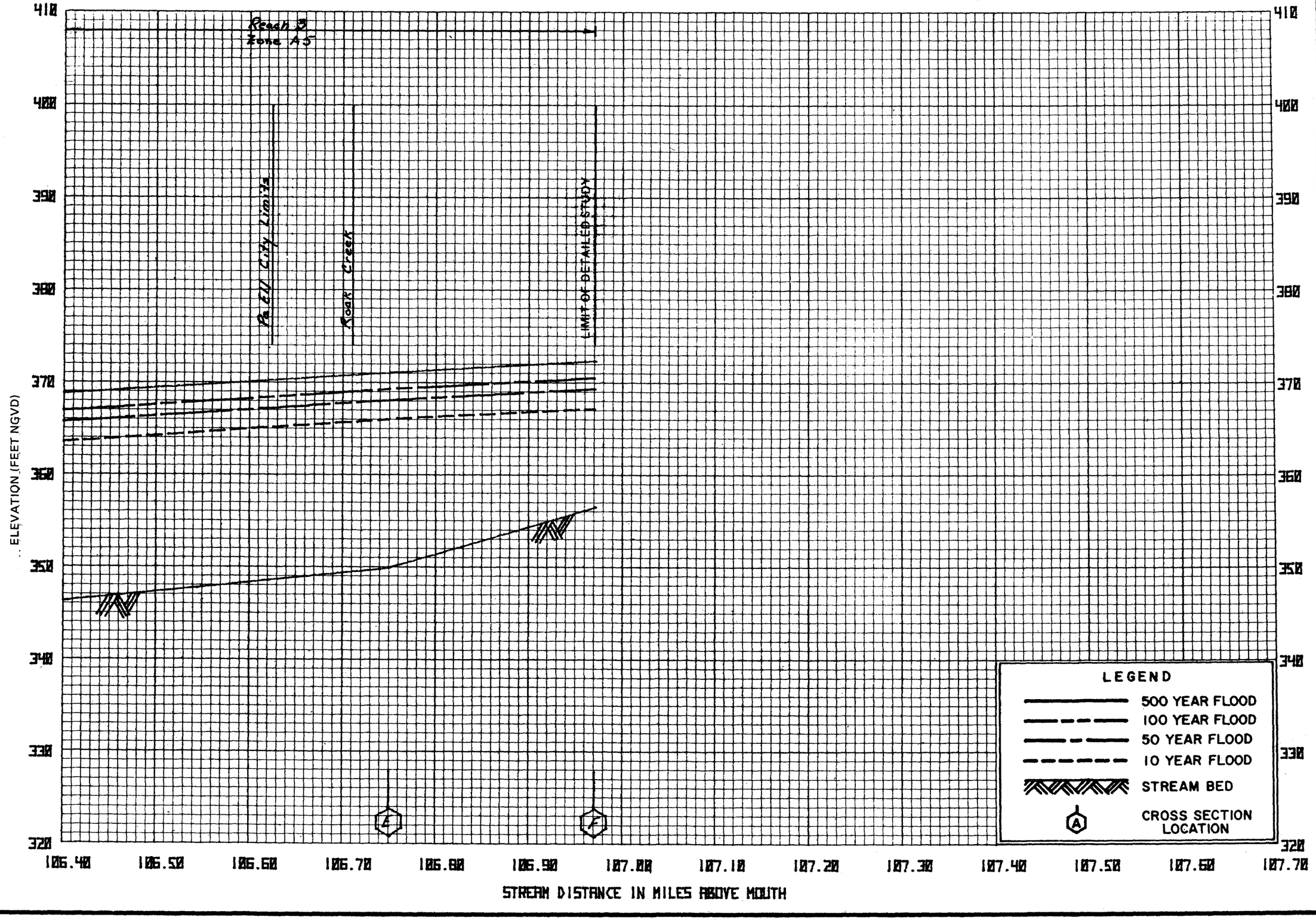
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

CHEHALIS RIVER

22P



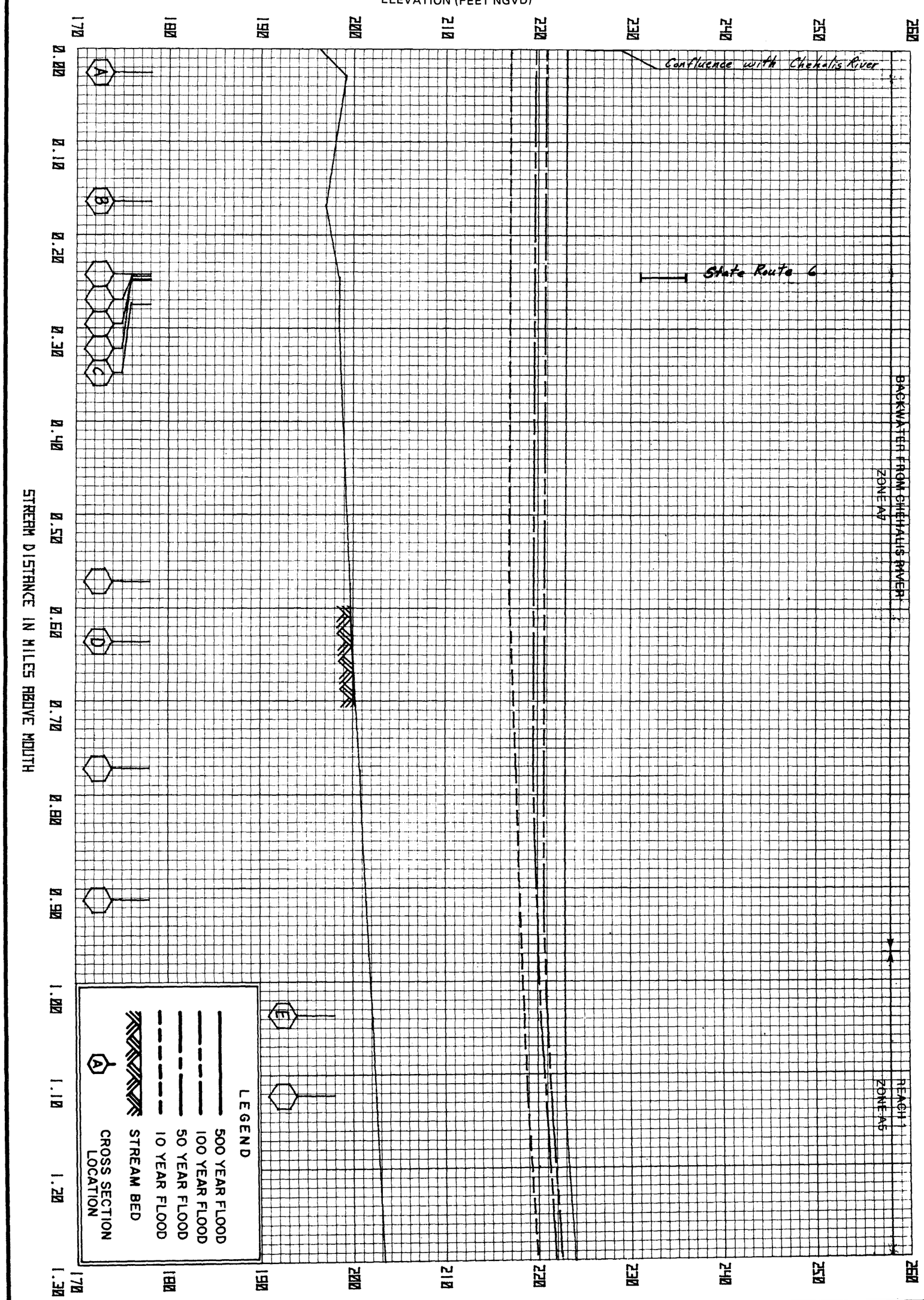
FLOOD PROFILES

CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

23P



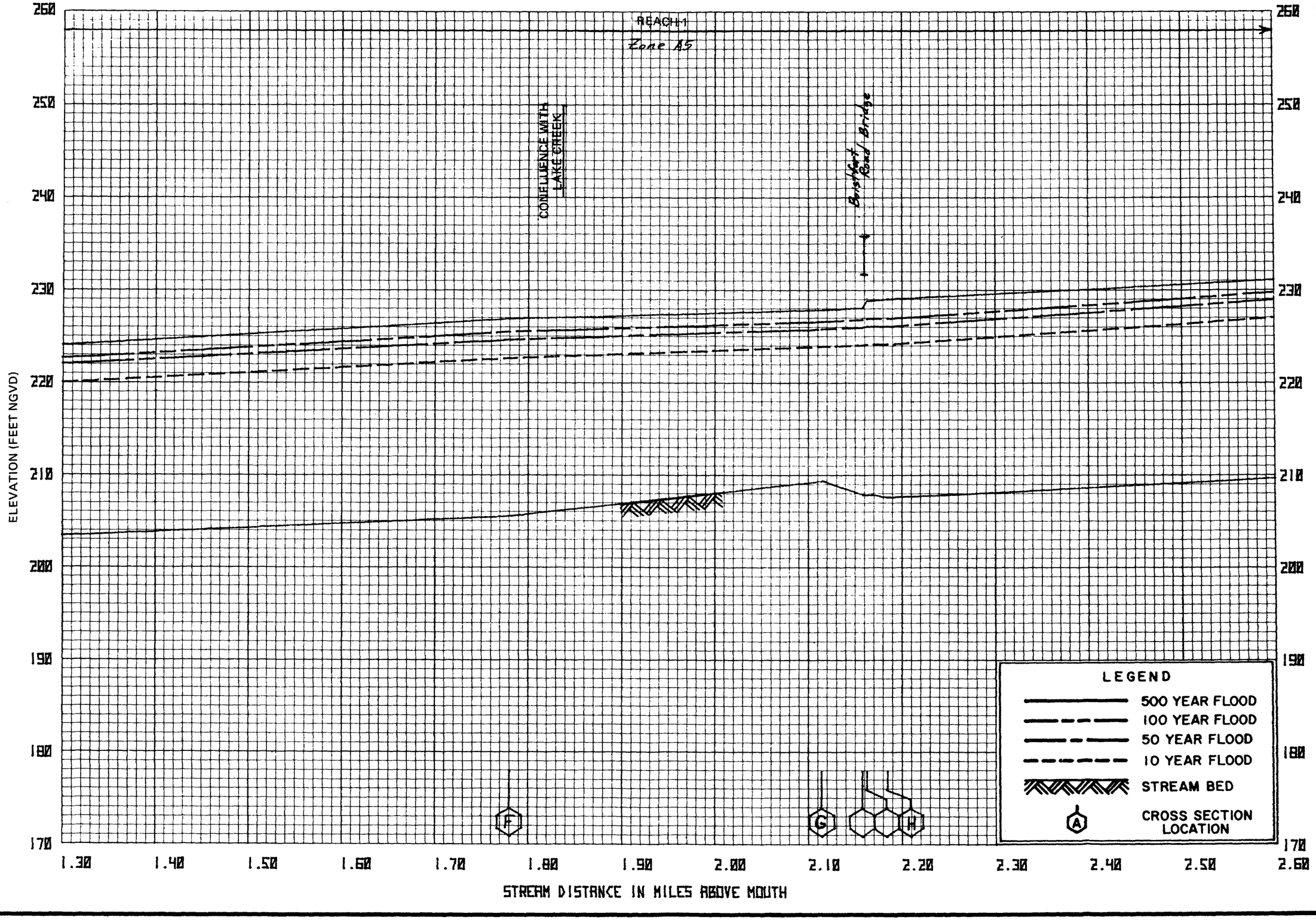
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

SOUTH FORK CHEHALIS **RIVER**

24P



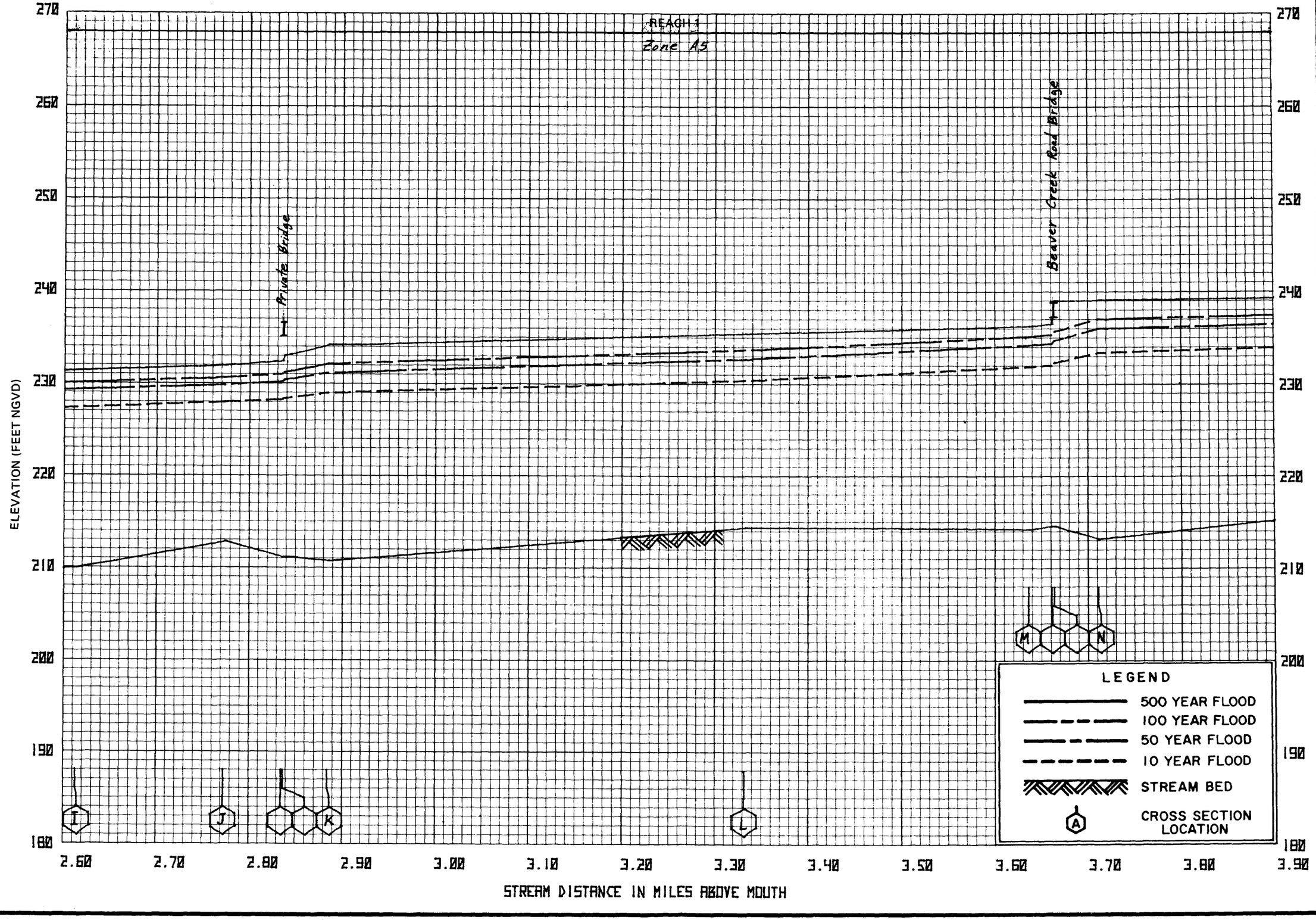
FLOOD PROFILES

SOUTH FORK CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

25P



FLOOD PROFILES

SOUTH FORK CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

26P

REACH 4

Zone A5

ELEVATION (FEET NGVD)

280
270
260
250
240
230
220
210
200
190

3.90 4.00 4.10 4.20 4.30 4.40 4.50 4.60 4.70 4.80 4.90 5.00 5.10 5.20

STREAM DISTANCE IN MILES ABOVE MOUTH

O

P

LEGEND

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

FLOOD PROFILES

SOUTH FORK CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

27P

REACH L
Zone A5

ELEVATION (FEET NGVD)

290
280
270
260
250
240
230
220
210
200

5.20 5.30 5.40 5.50 5.60 5.70 5.80 5.90 6.00 6.10 6.20 6.30 6.40 6.50

STREAM DISTANCE IN MILES ABOVE MOUTH

Q
R
S

LEGEND

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

FLOOD PROFILES

SOUTH FORK CHEHALIS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

28P

ELEVATION (FEET NGVD)

210 220 230 240 250 260 270 280 290 300

STREAM DISTANCE IN MILES ABOVE MOUTH

5.50 5.60 5.70 5.80 5.90 7.00 7.10 7.20 7.30 7.40 7.50 7.60 7.70 7.80

REACH 1
Zone AE

LIMIT OF DETAILED STUDY

LEGEND

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

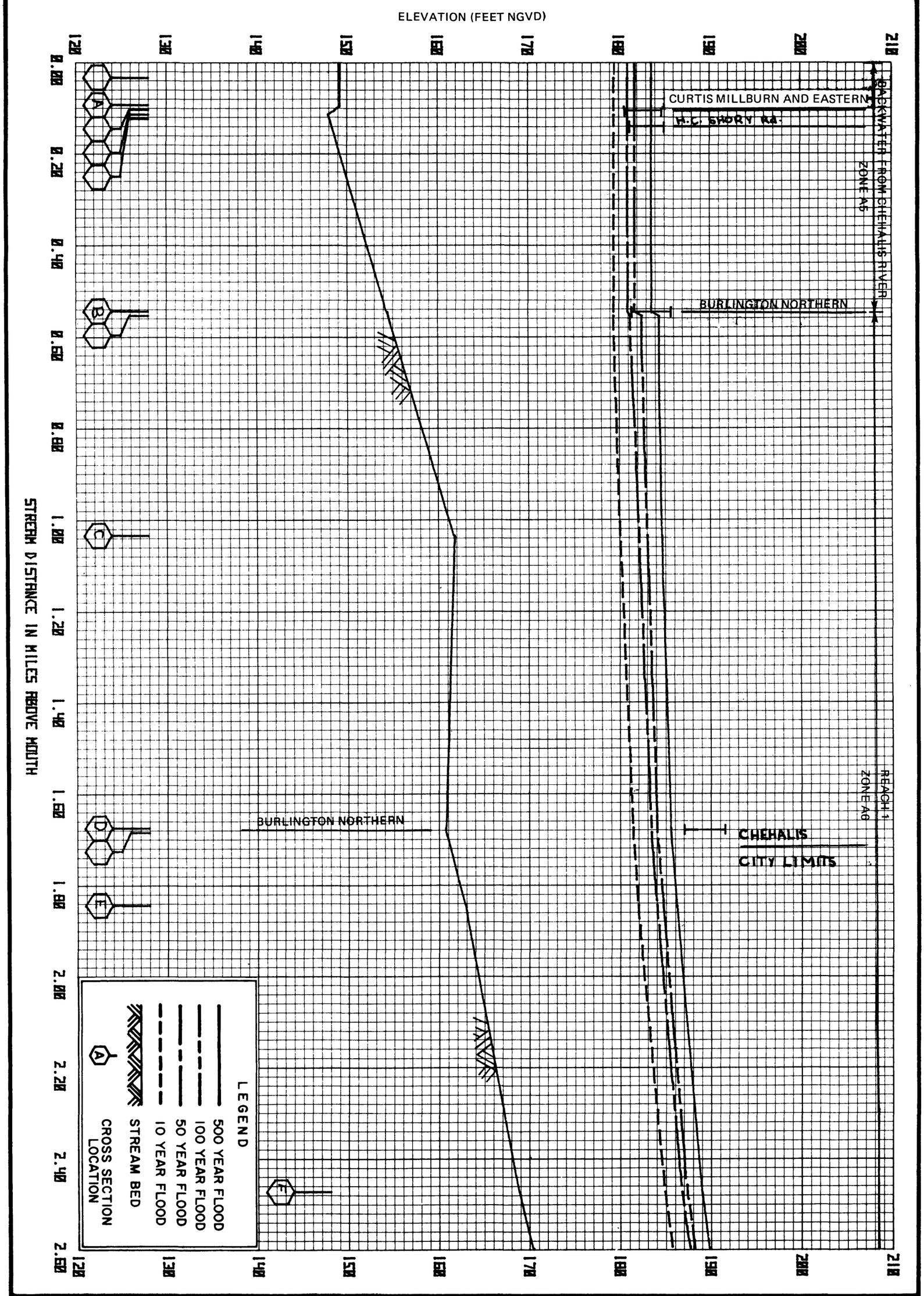
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

SOUTH FORK CHEHALIS **RIVER**

29P



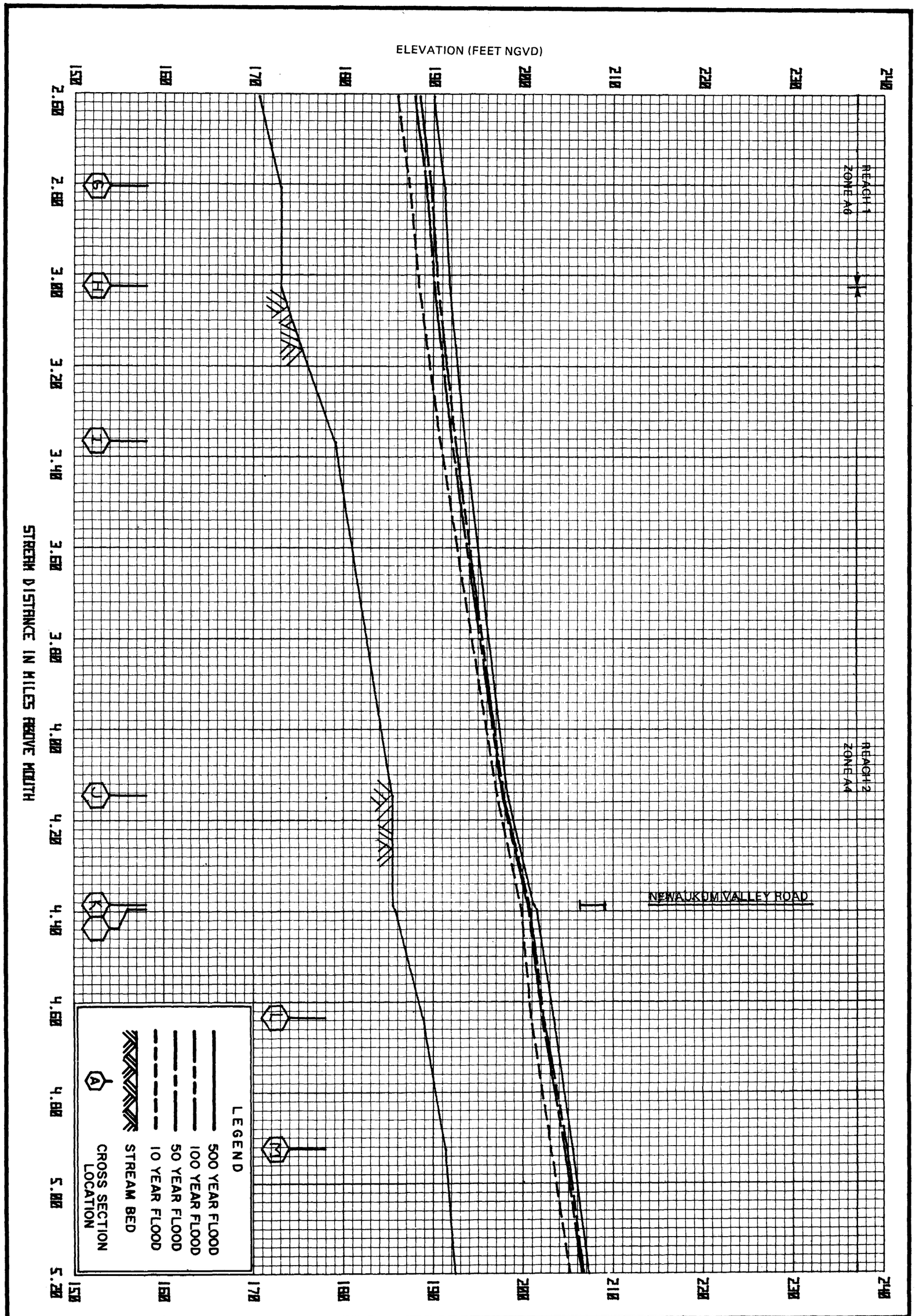
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

NEWAUKUM RIVER

30P



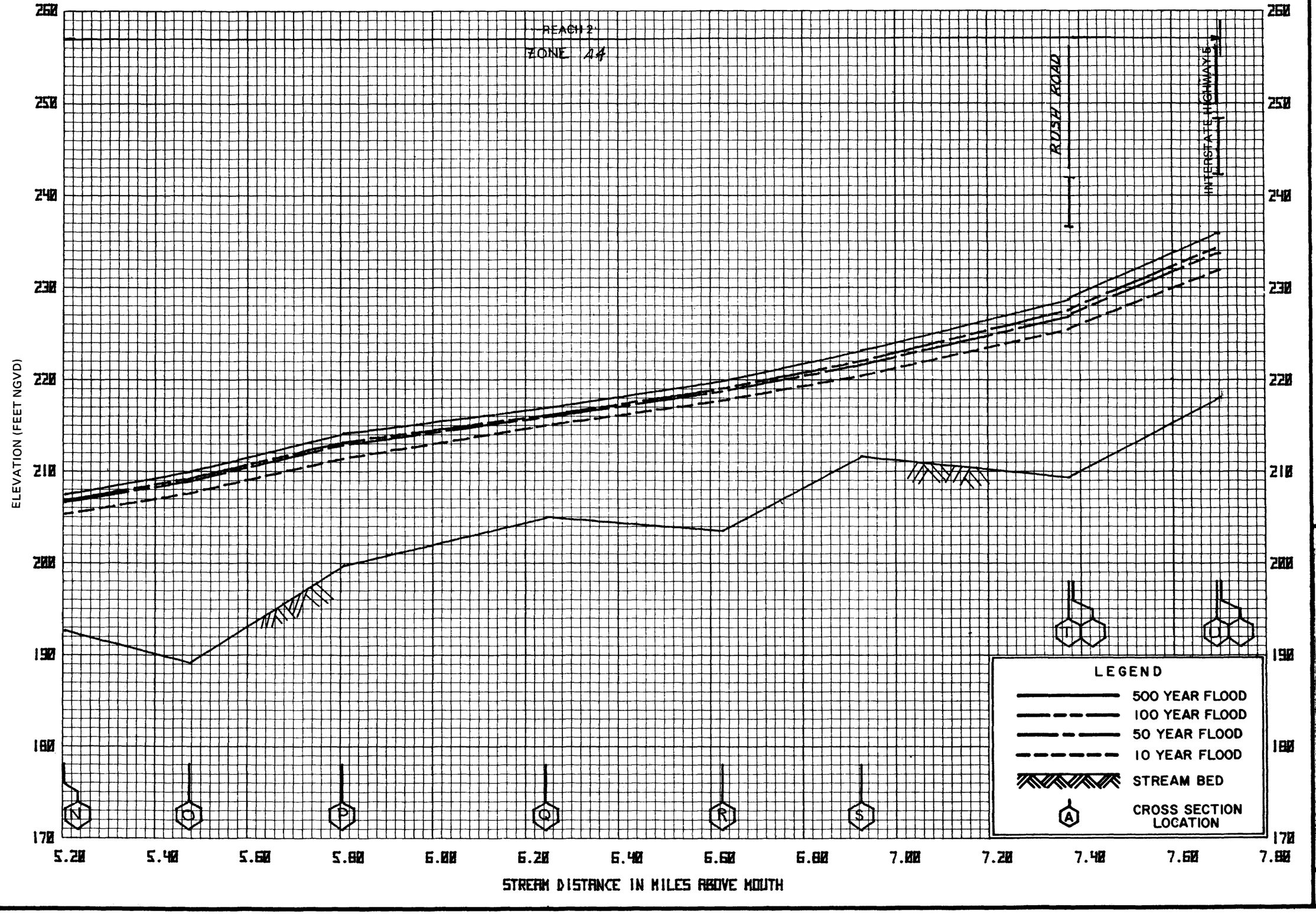
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

NEWAUKUM RIVER

31P



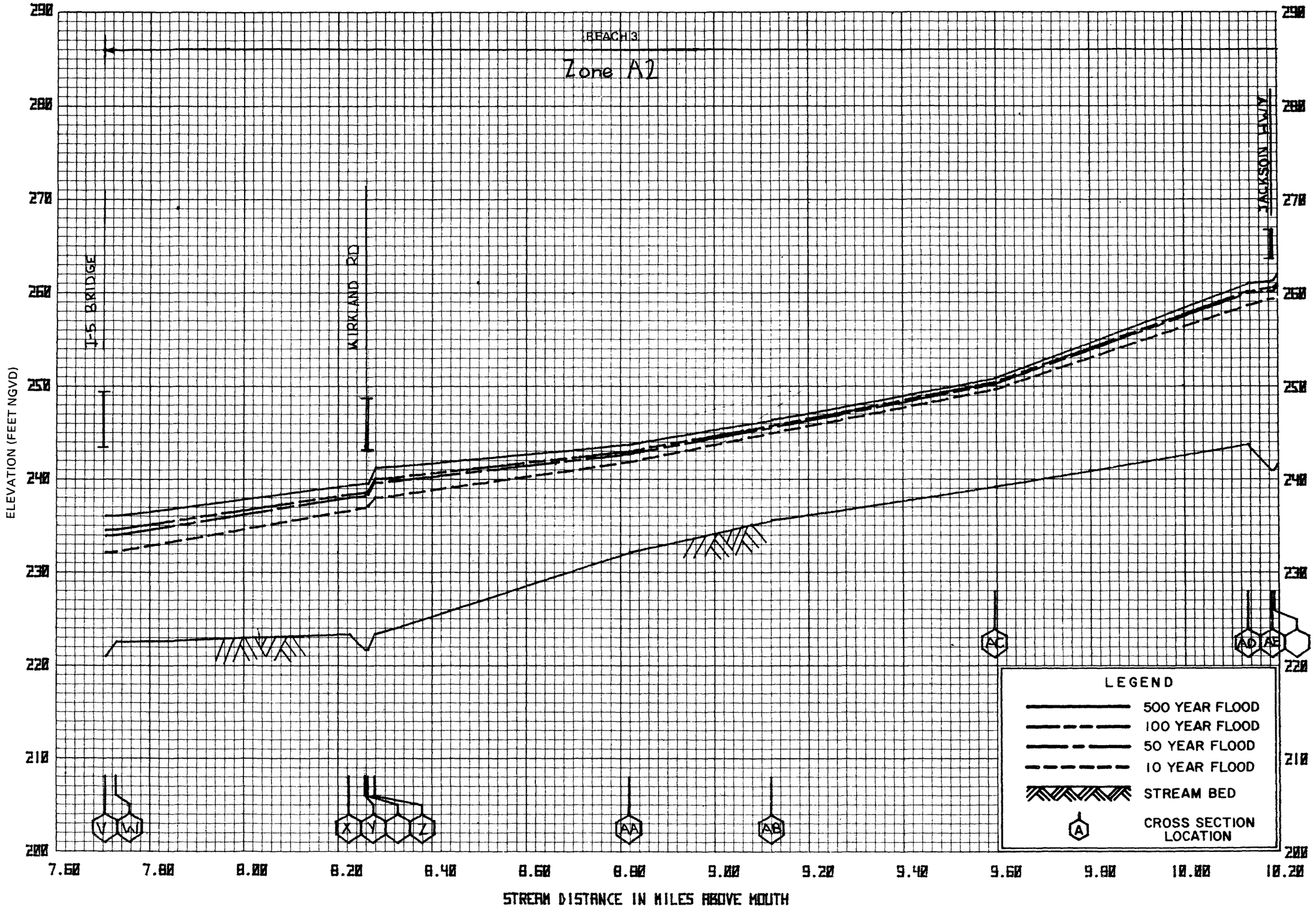
FLOOD PROFILES

NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

32P



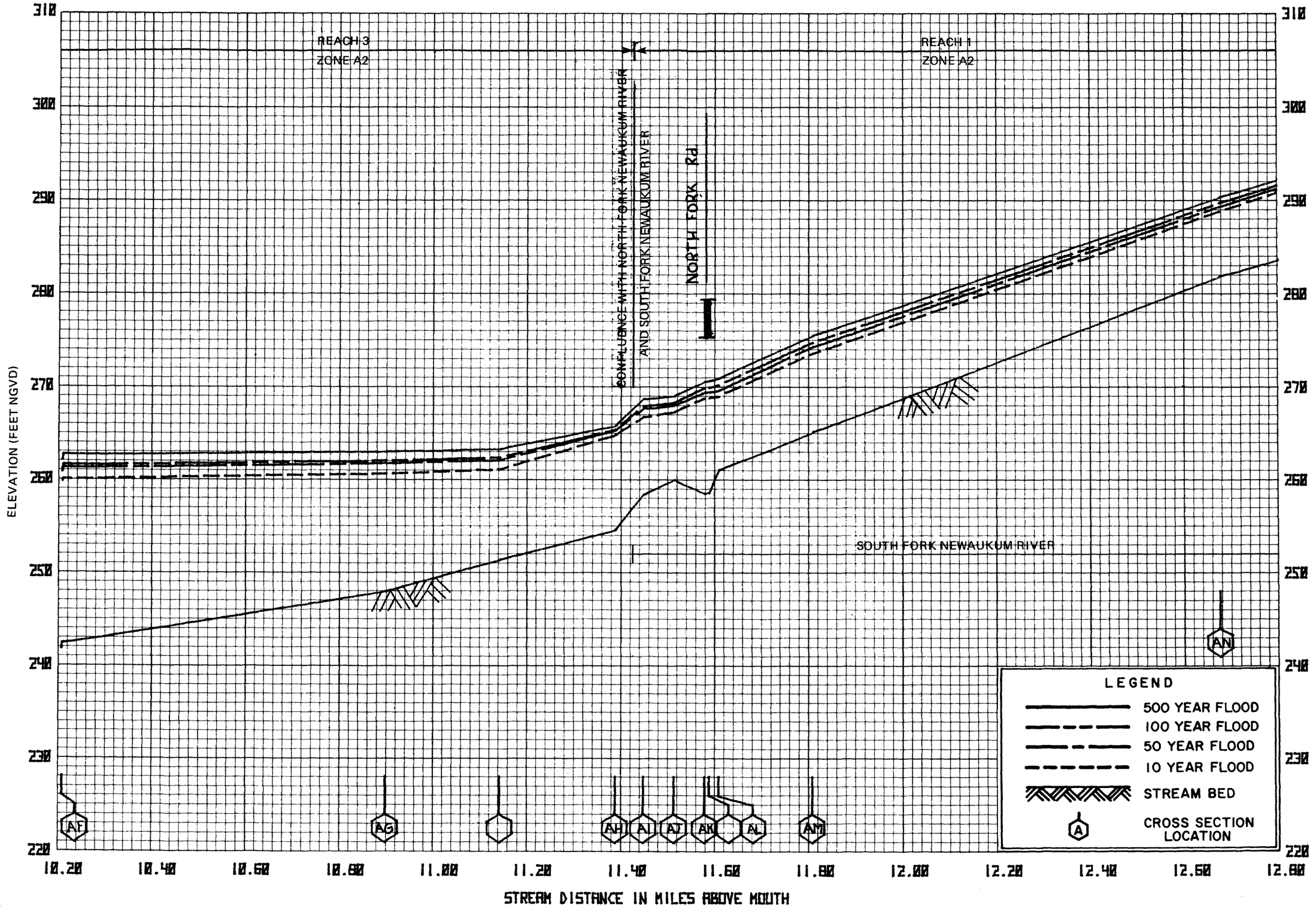
FLOOD PROFILES

NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

33P



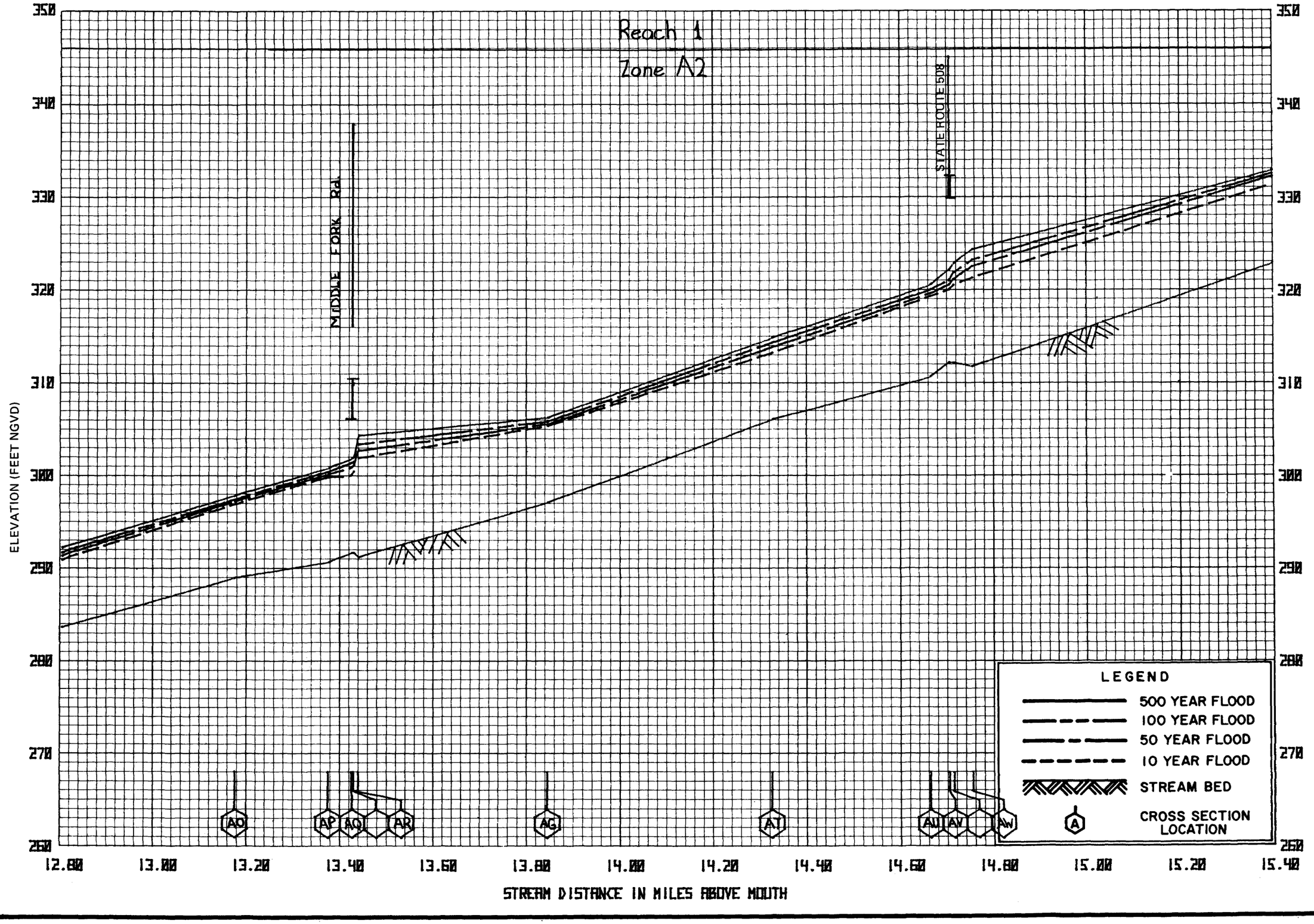
FLOOD PROFILES

NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

34P



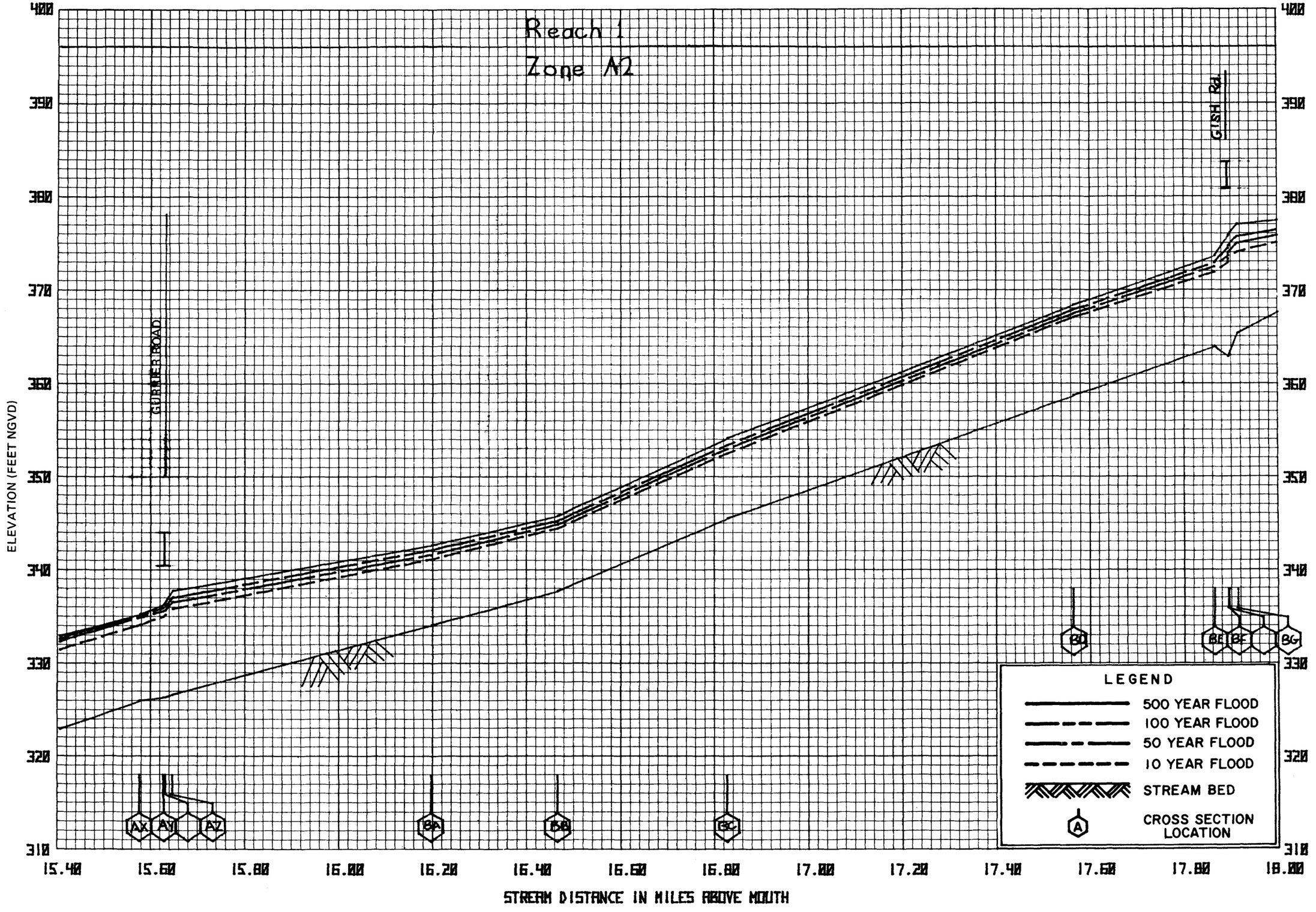
FLOOD PROFILES

SOUTH FORK NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

35P



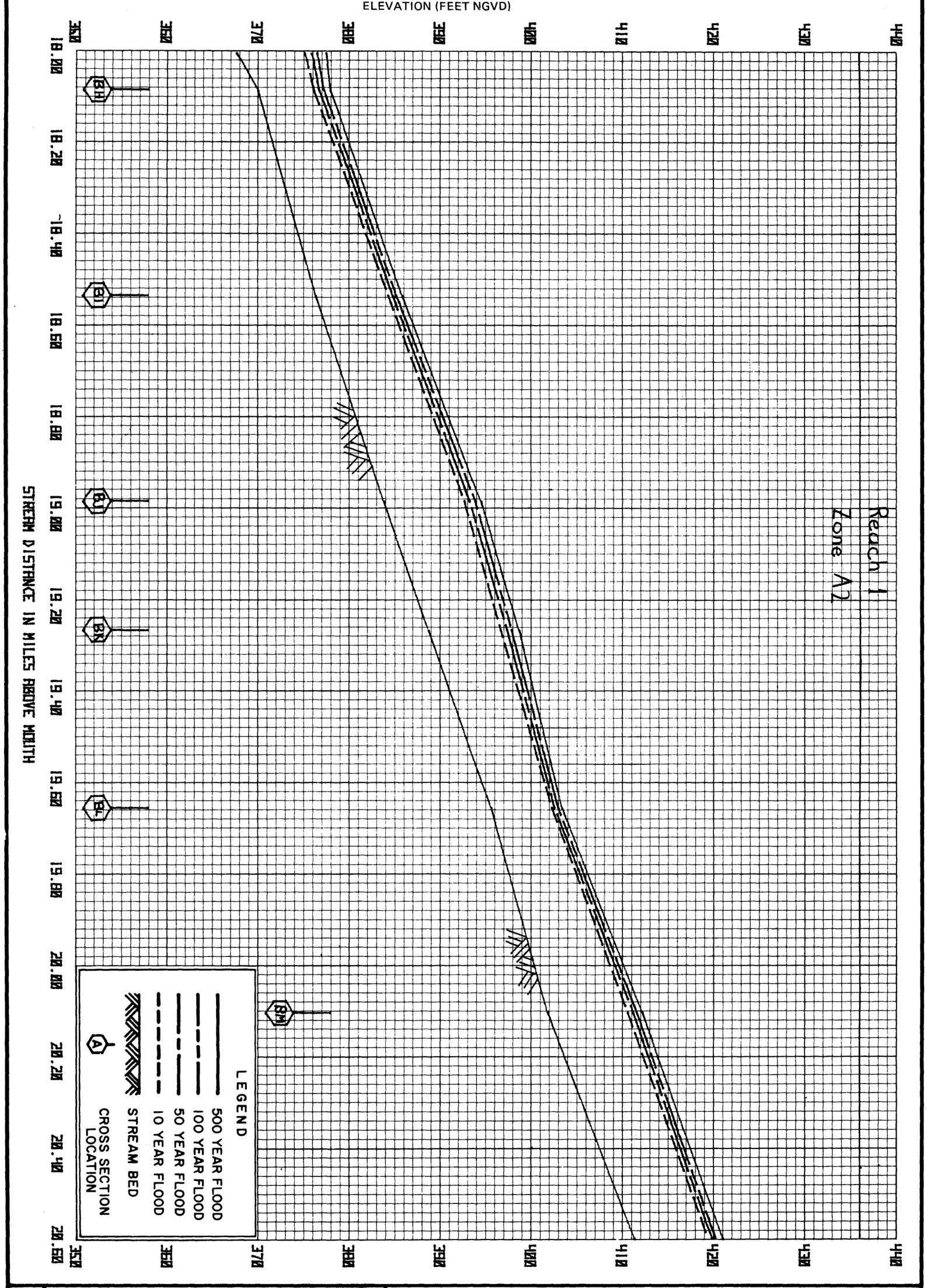
FLOOD PROFILES

SOUTH FORK NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

36P



FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

SOUTH FORK NEWAUKUM RIVER

37P

Reach 1

Zone A2

ELEVATION (FEET NGVD)

490
480
470
460
450
440
430
420
410
400

20.60 20.80 21.00 21.20 21.40 21.60 21.80 22.00 22.20 22.40 22.60 22.80 23.00 23.20

STREAM DISTANCE IN MILES ABOVE MOUTH

LEONARD Rd

BN BO BP BQ BR BS BT BU

LEGEND

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

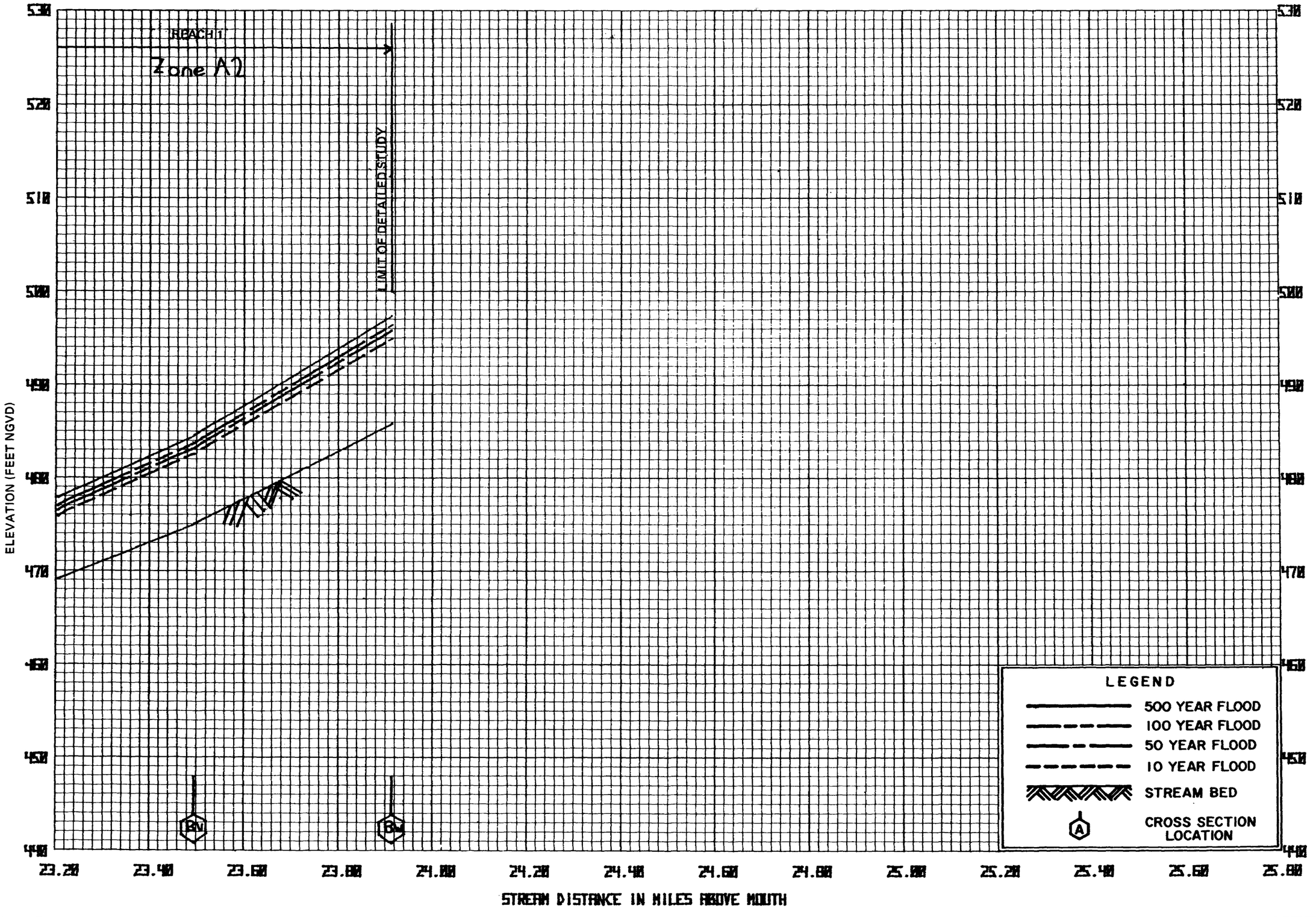
FLOOD PROFILES

SOUTH FORK NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

38P



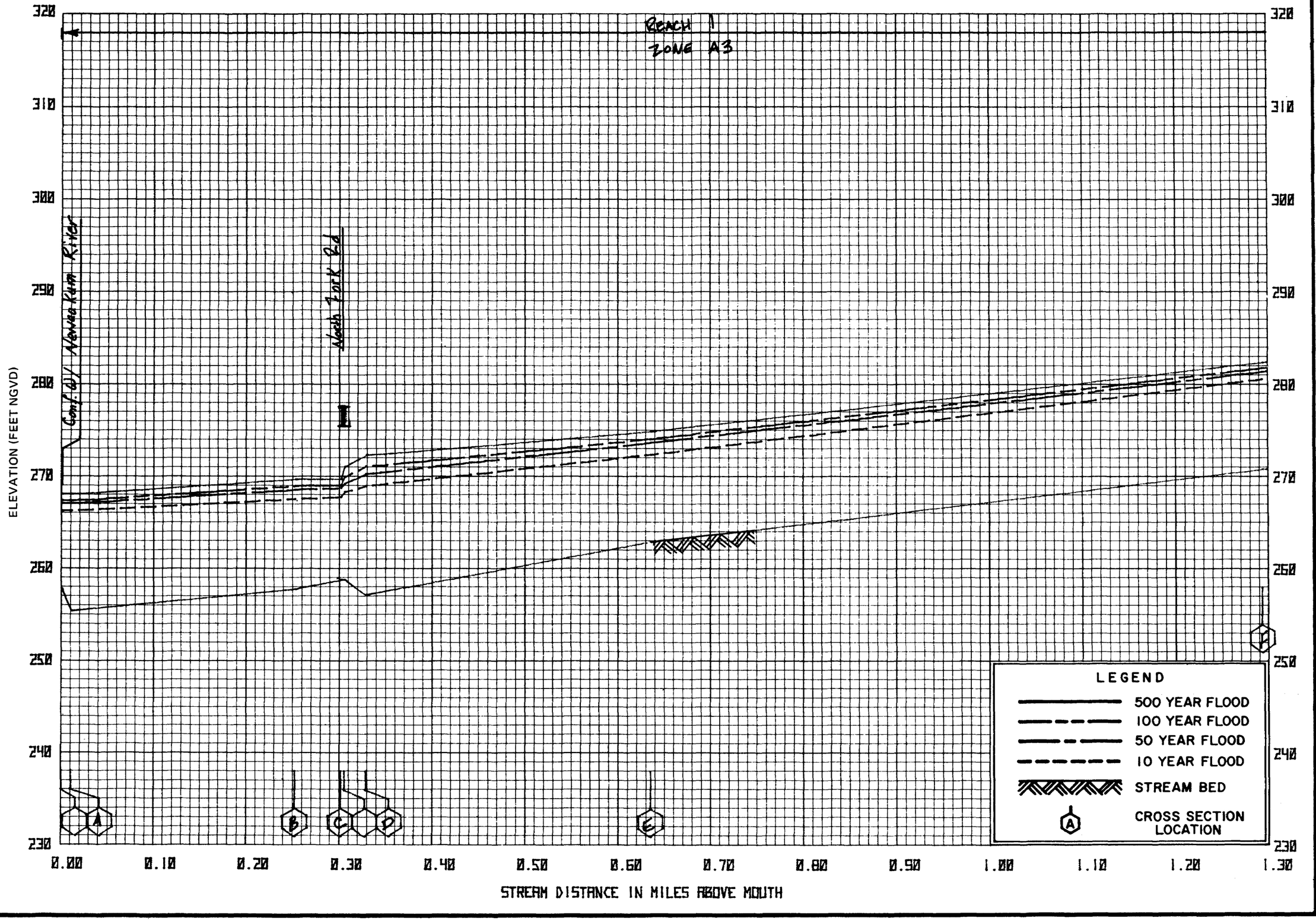
FLOOD PROFILES

SOUTH FORK NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

39P



FLOOD PROFILES

N.F. NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

40P

REACH 1
ZONE A3

Conf w/ Middle Fork Newaukum R.

ELEVATION (FEET NGVD)

330
320
310
300
290
280
270
260
250
240

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60

STREAM DISTANCE IN MILES ABOVE MOUTH

G H I

LEGEND

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

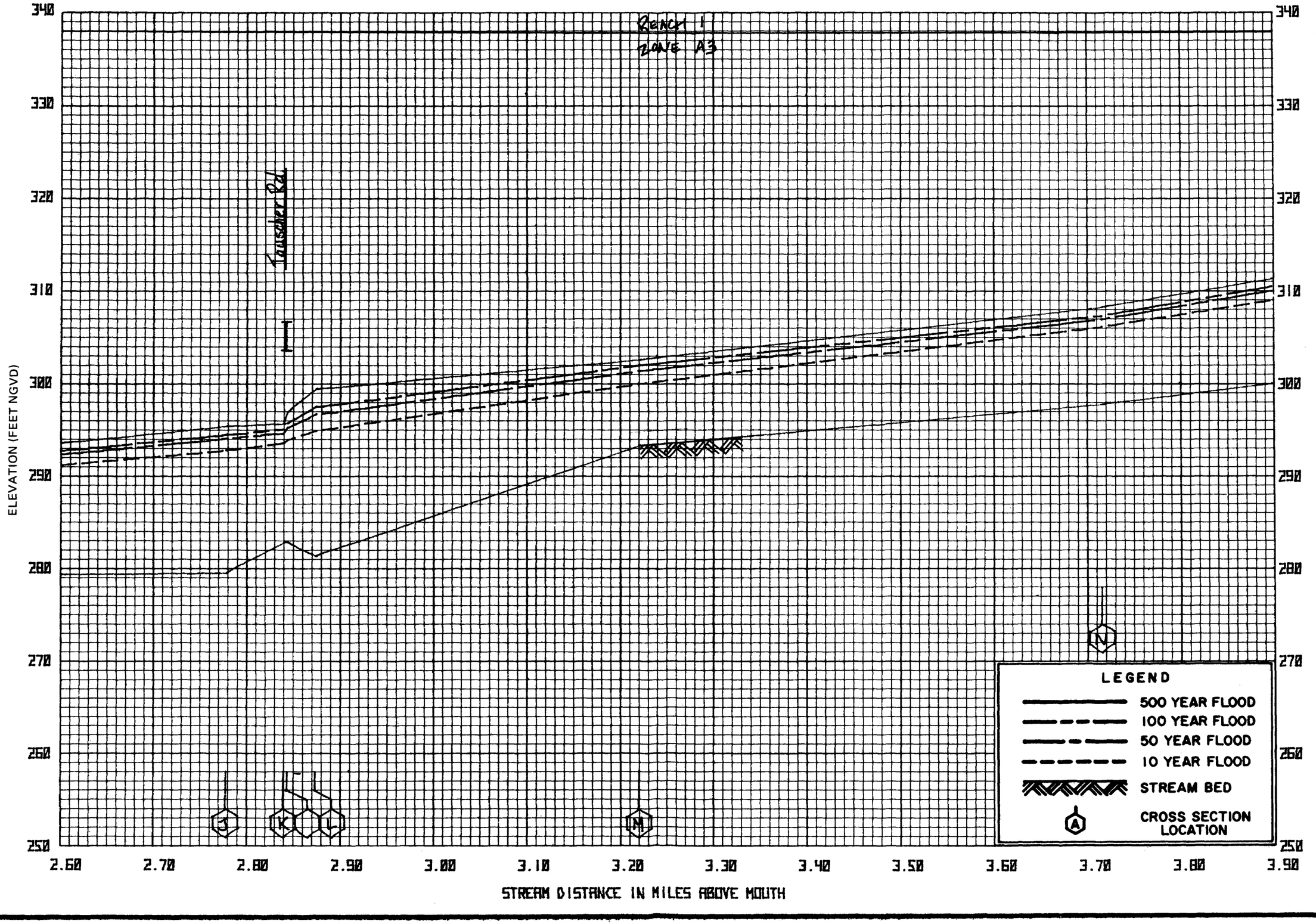
FLOOD PROFILES

N.F. NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

41P



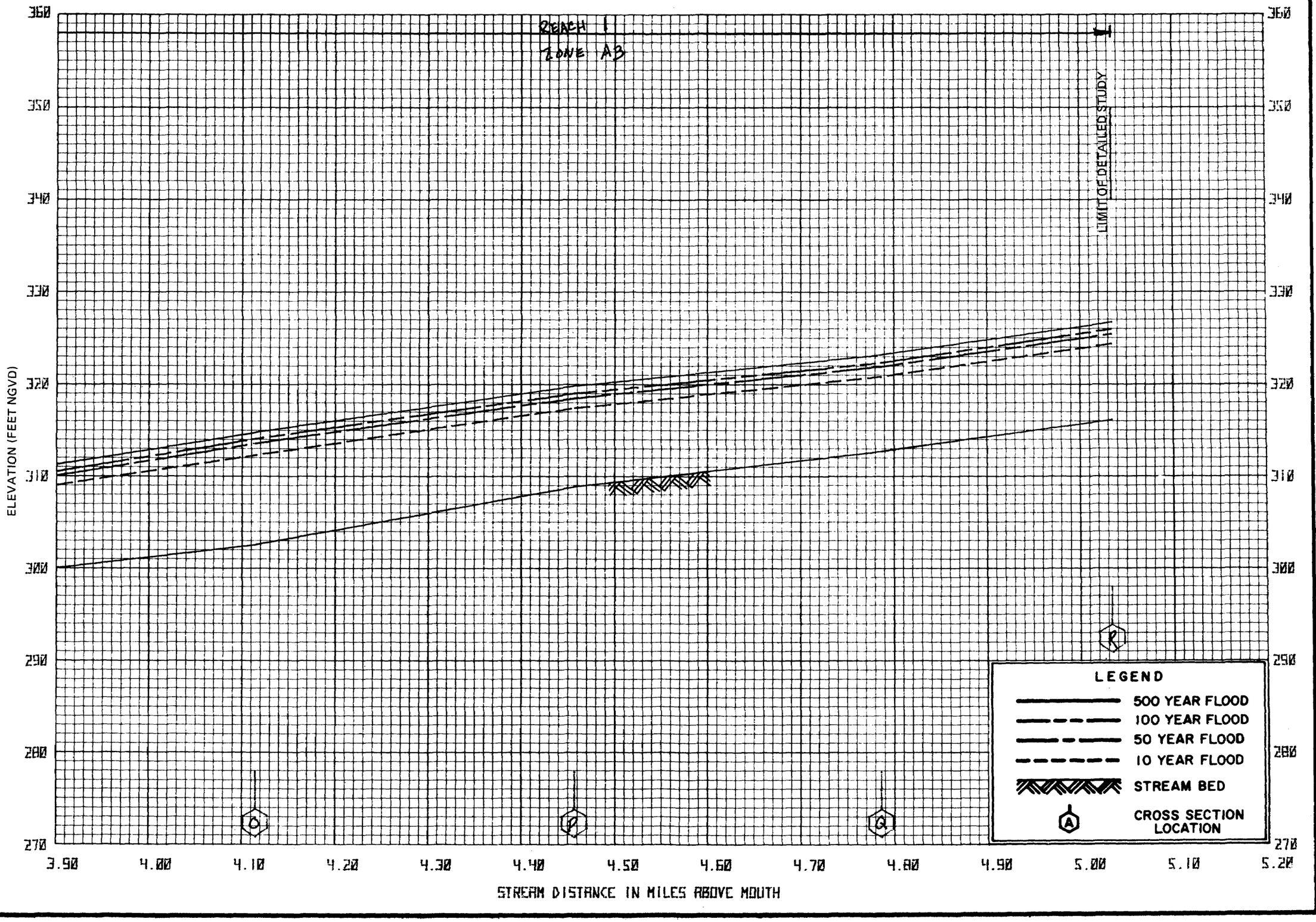
FLOOD PROFILES

N.F. NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

42P



FLOOD PROFILES

N.F. NEWAUKUM RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREAS)

43P

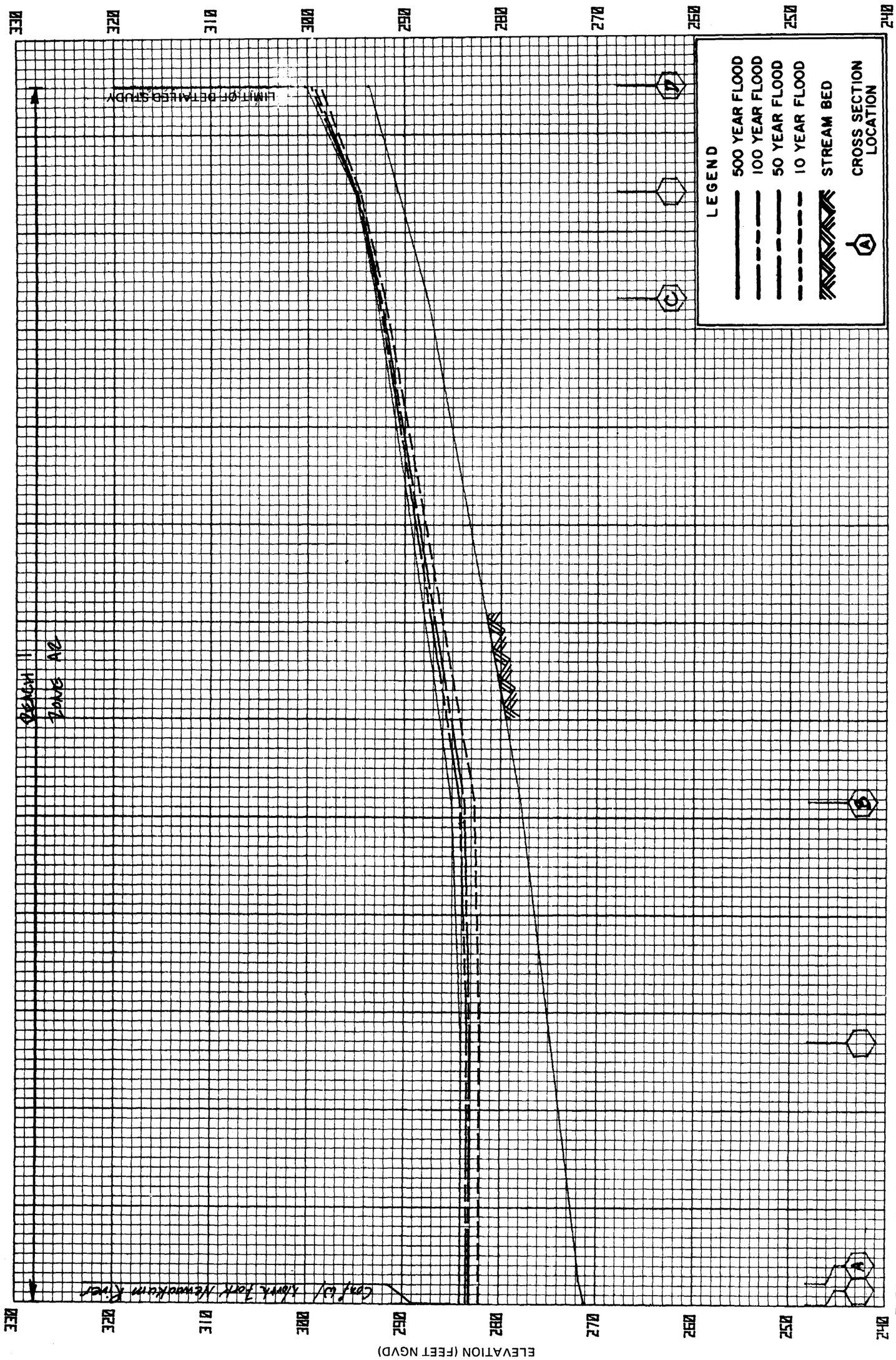
44P

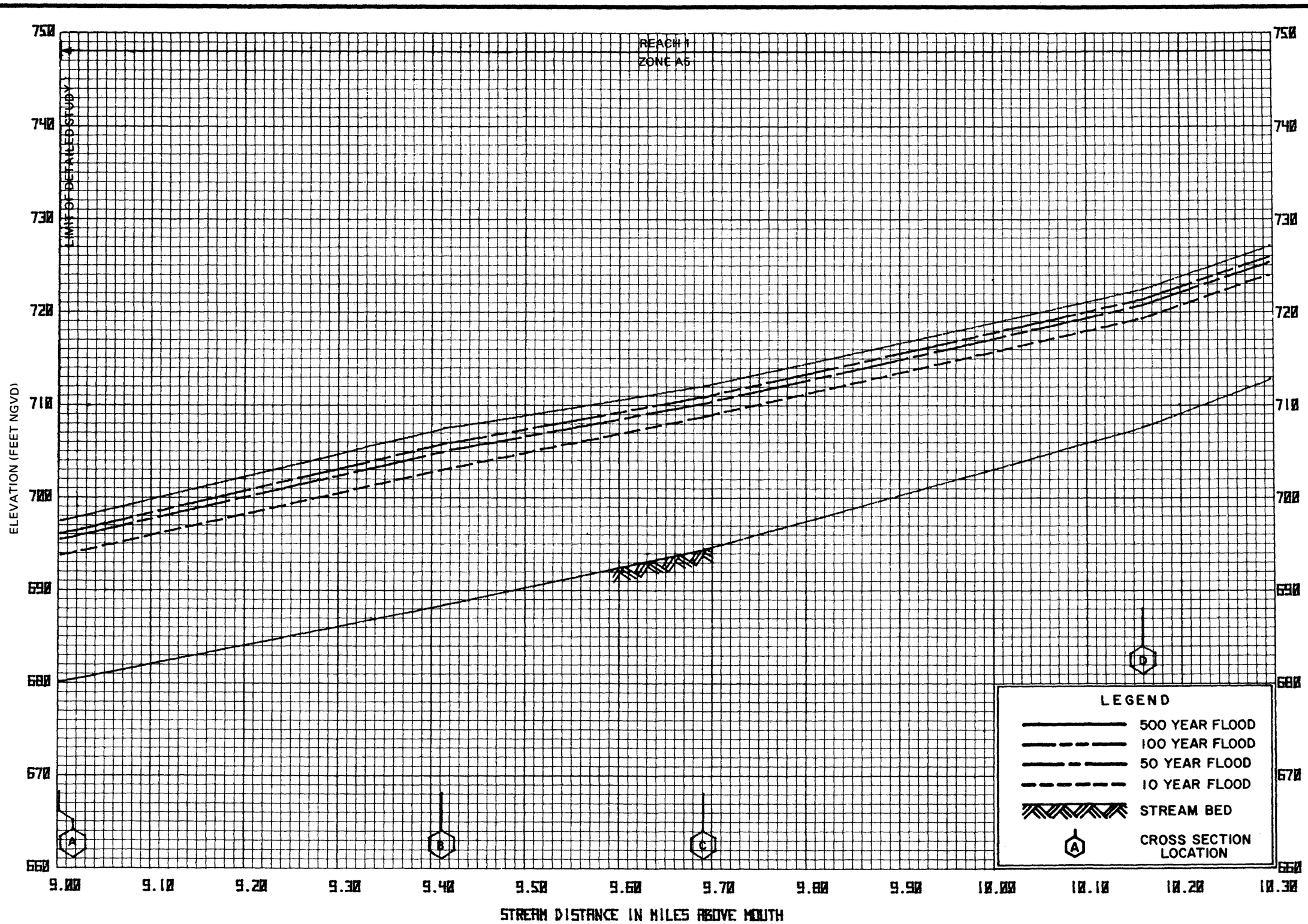
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

M.F. NEWAUKUM RIVER





FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

45P

REACH J
ZONE AG

ELEVATION (FEET NGVD)

780
770
760
750
740
730
720
710
700
690

10.30 10.40 10.50 10.60 10.70 10.80 10.90 11.00 11.10 11.20 11.30 11.40 11.50 11.60

STREAM DISTANCE IN MILES ABOVE MOUTH

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

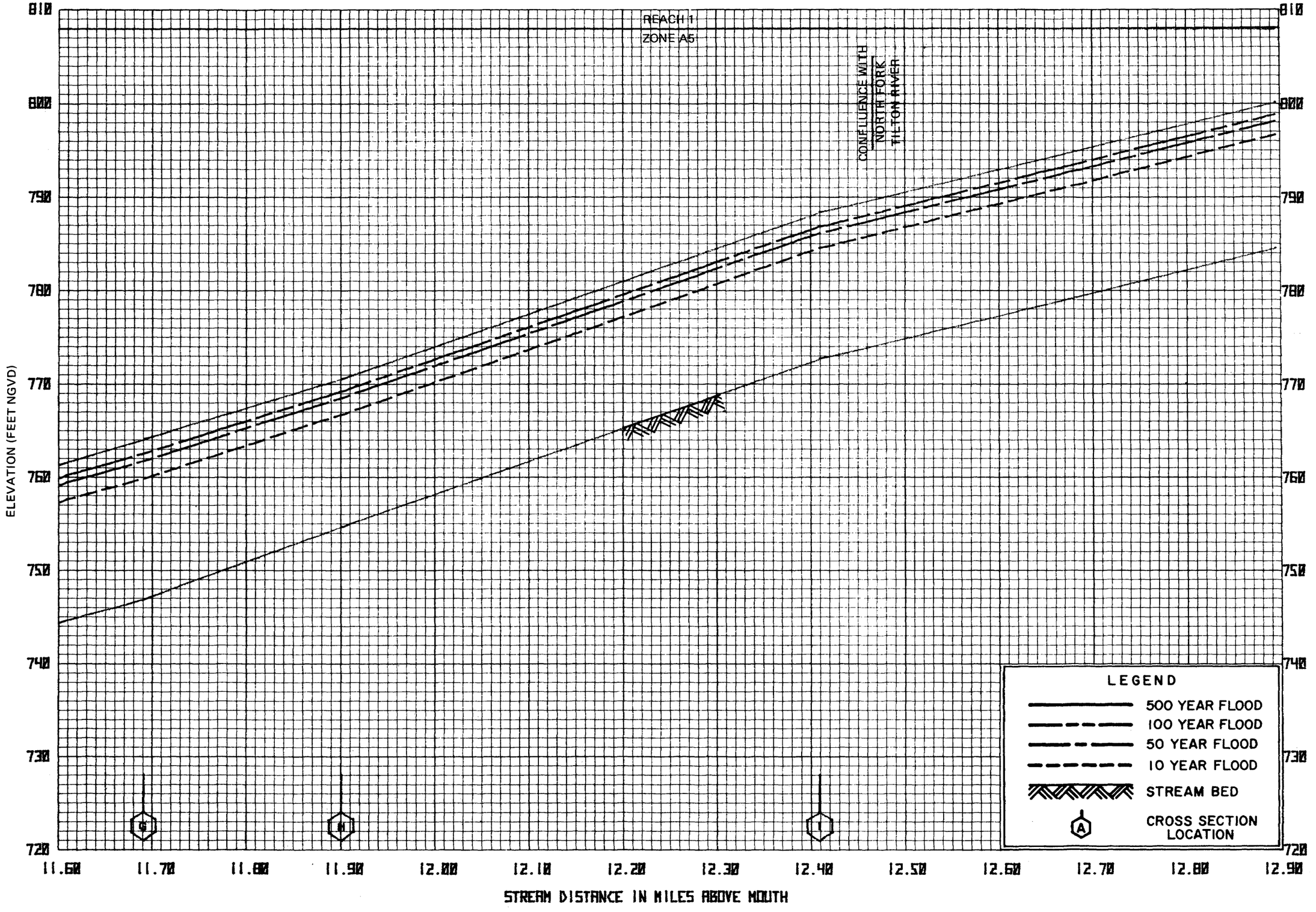
FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

46P



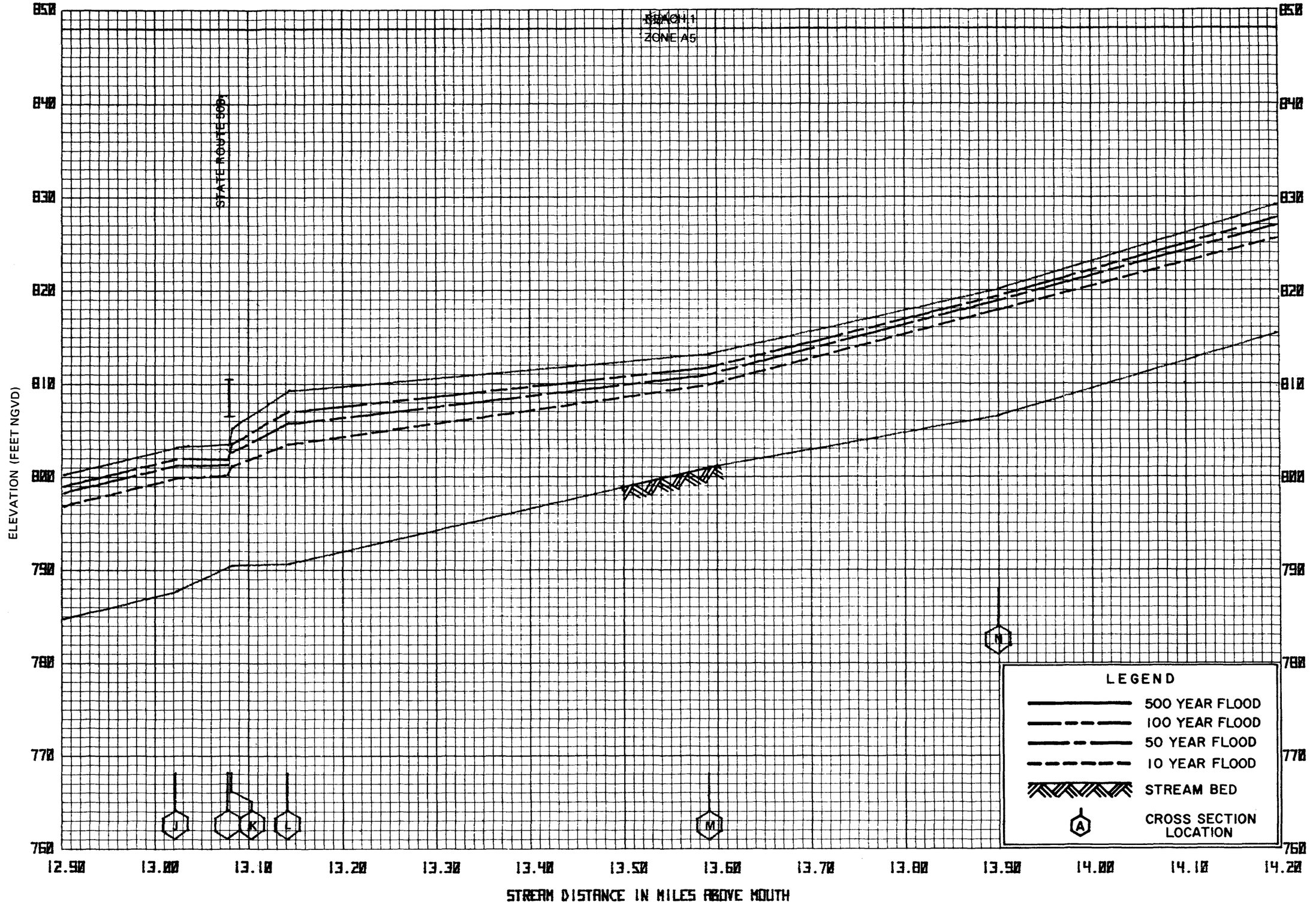
FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

47P

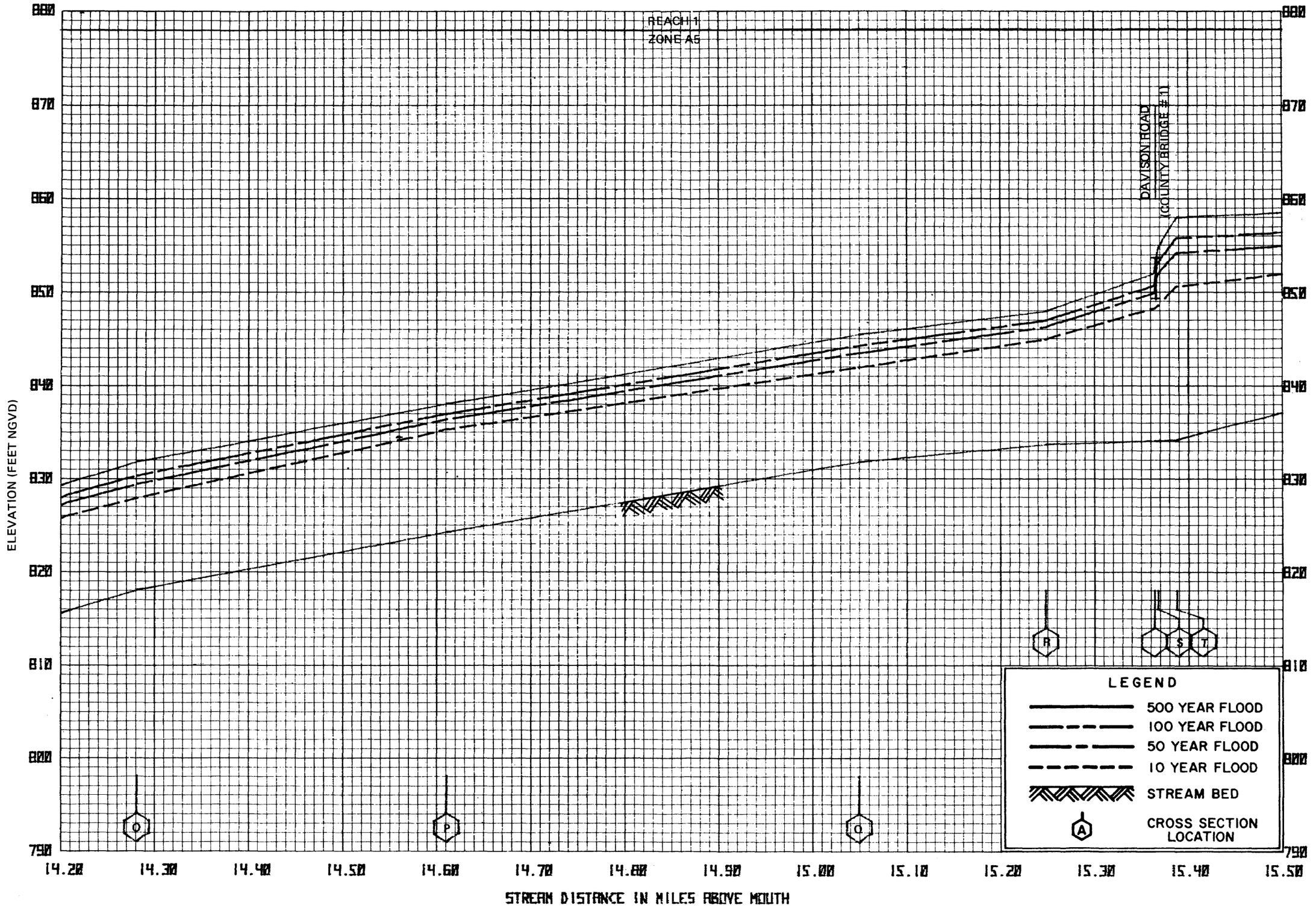


FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)



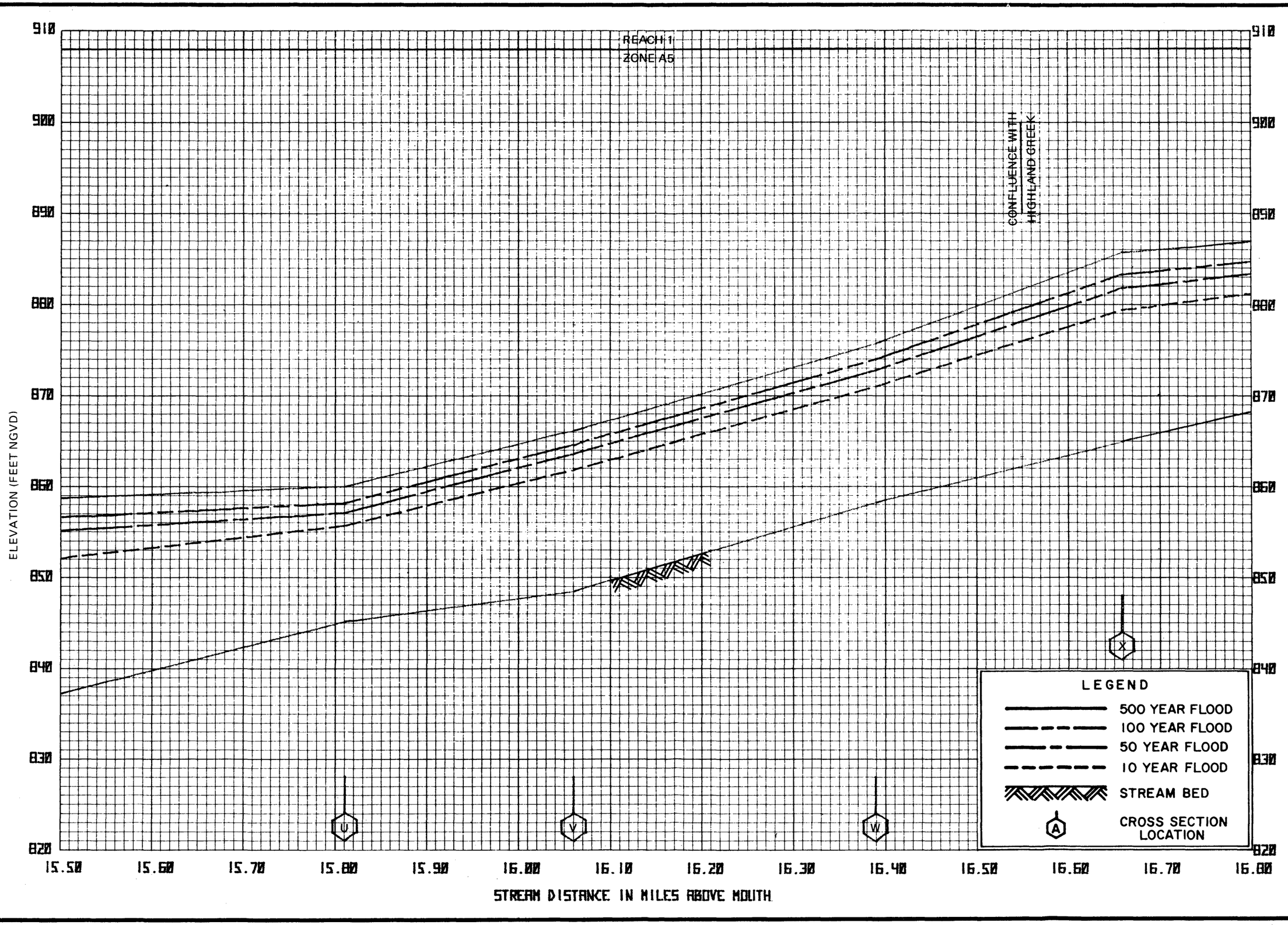
FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

49P



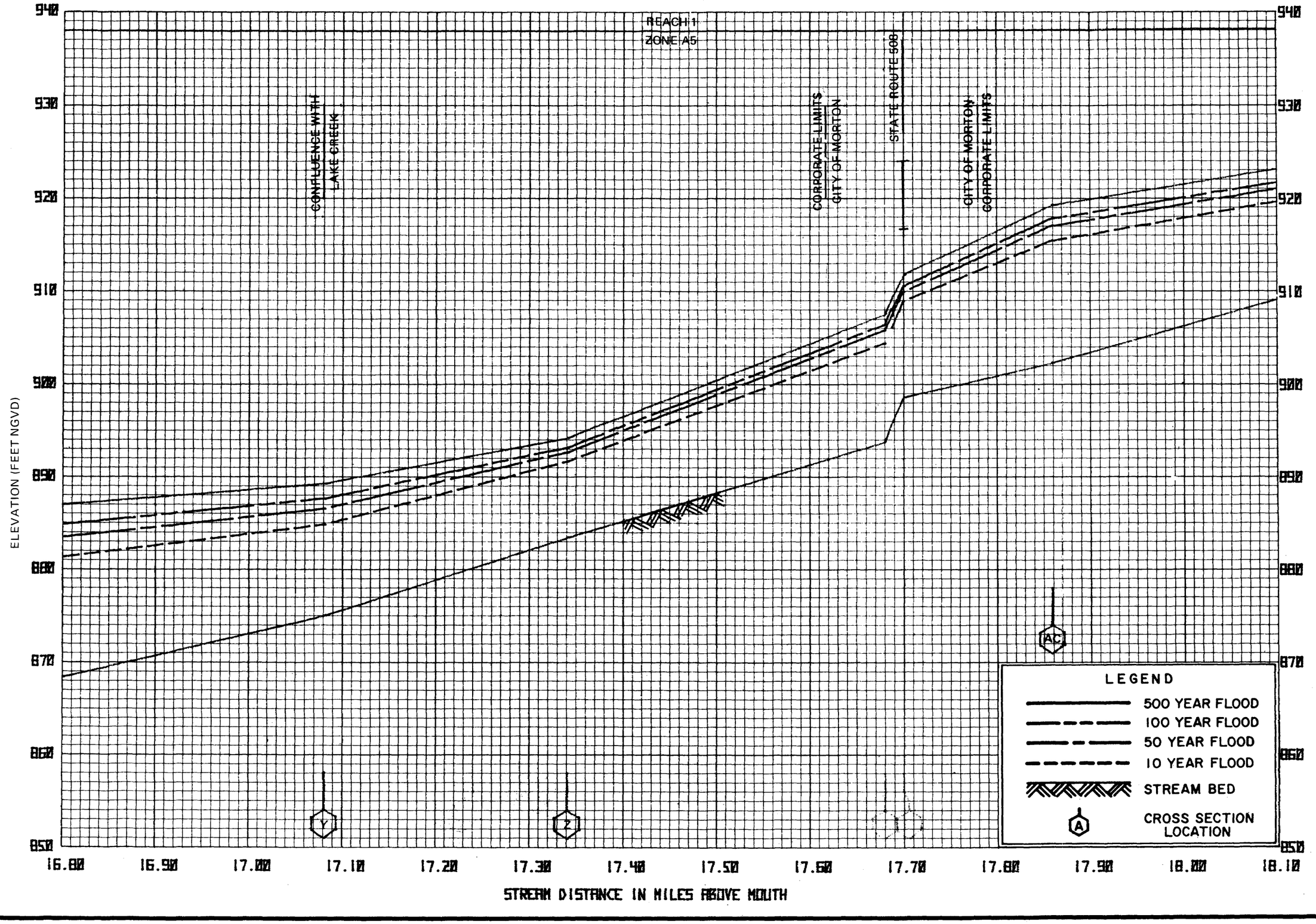
FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

50P



FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

51P

REACH 11
ZONE A5

CORPORATE LIMITS
CITY OF MORTON

CITY OF MORTON
CORPORATE LIMITS

CONFLUENCE WITH
CONNELLY CREEK

ELEVATION (FEET NGVD)

980
970
960
950
940
930
920
910
900
890

18.10 18.20 18.30 18.40 18.50 18.60 18.70 18.80 18.90 19.00 19.10 19.20 19.30 19.40

STREAM DISTANCE IN MILES ABOVE MOUTH

AD AE AF AG AH

LEGEND

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

FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

52P

REACH 1
ZONE A5

ELEVATION (FEET NGVD)

1030
1020
1010
1000
990
980
970
960
950
940

19.40 19.50 19.60 19.70 19.80 19.90 20.00 20.10 20.20 20.30 20.40 20.50 20.60 20.70

STREAM DISTANCE IN MILES ABOVE MOUTH

AI AJ AK AL

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

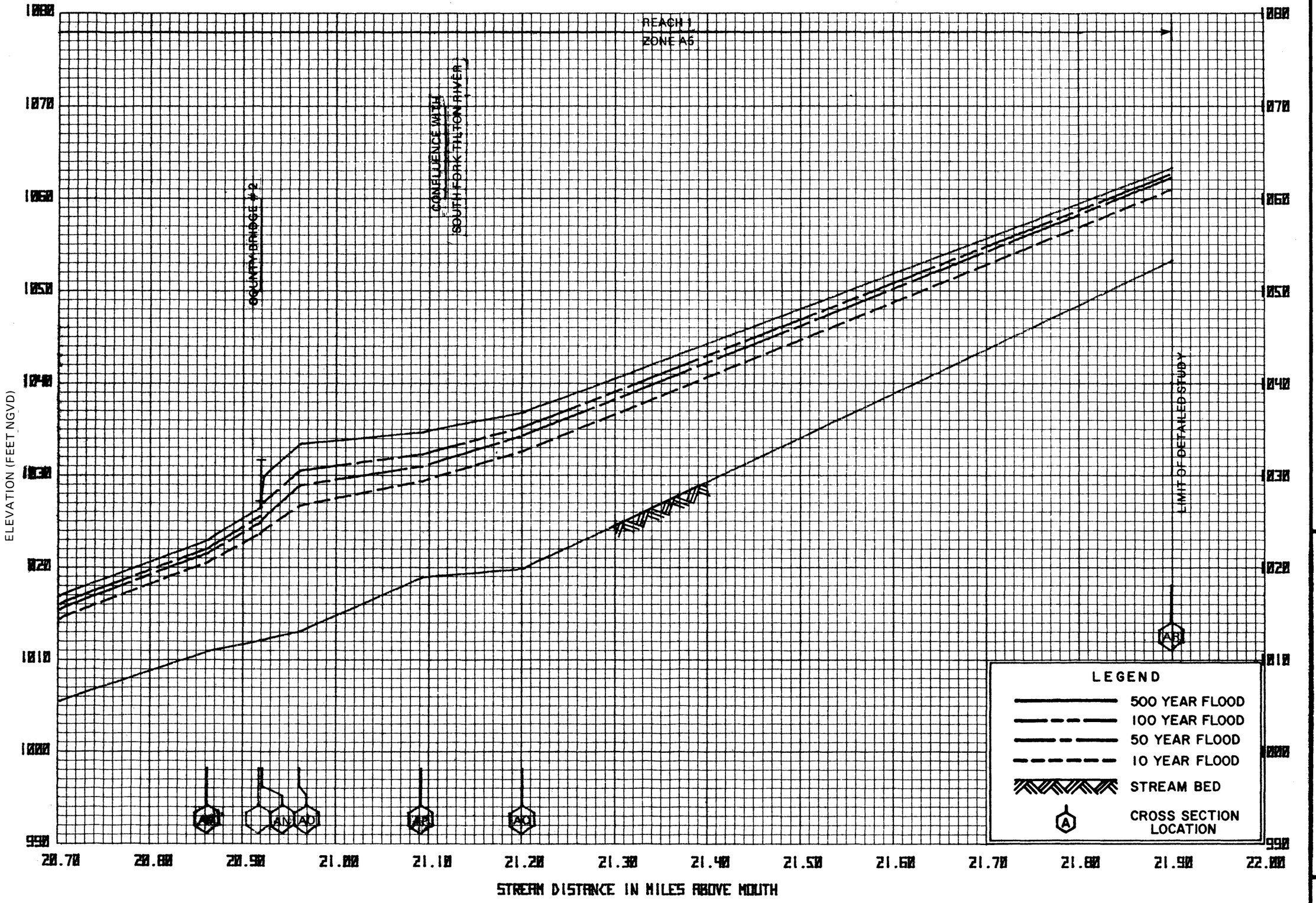
FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

53P



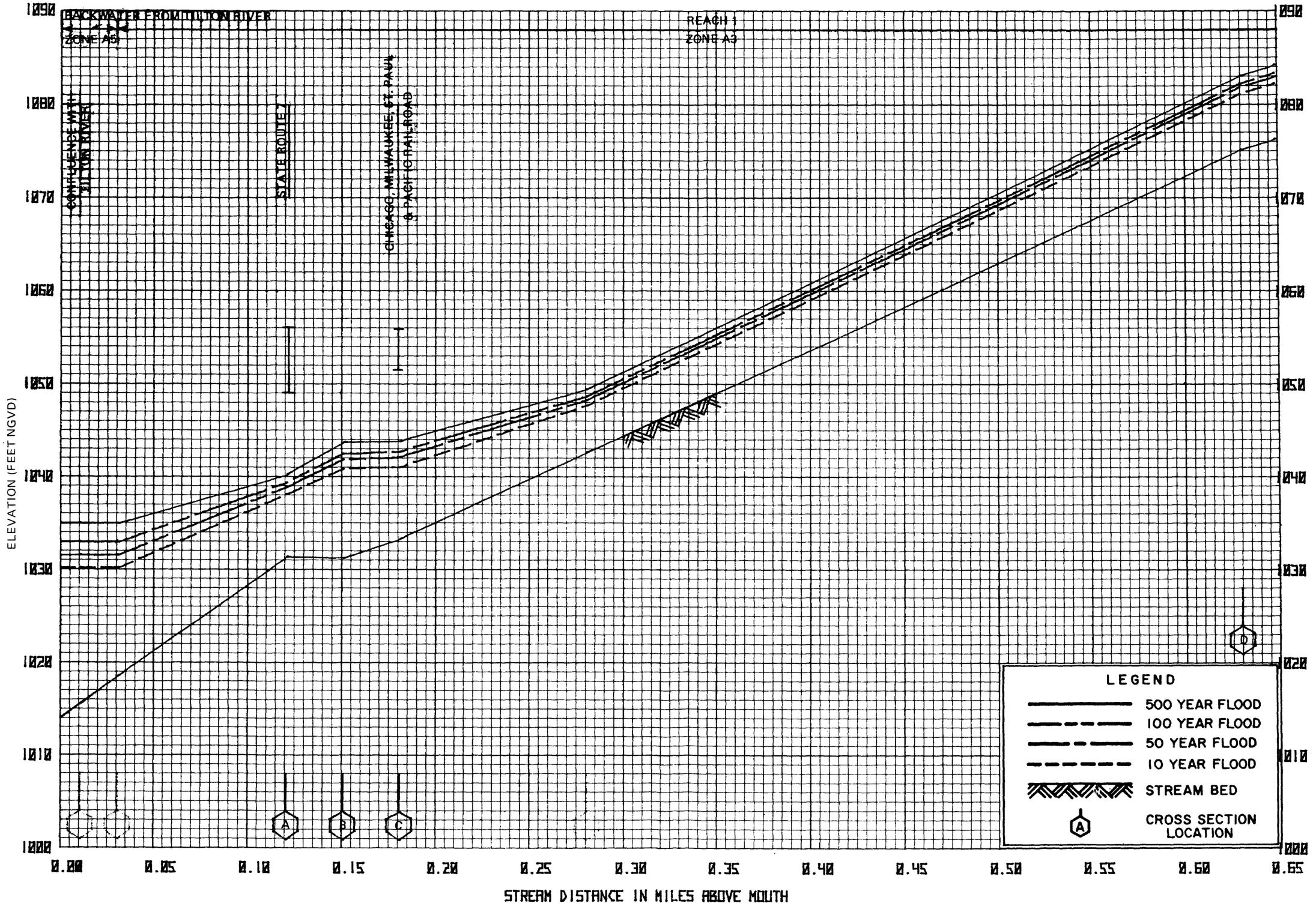
FLOOD PROFILES

TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

54P



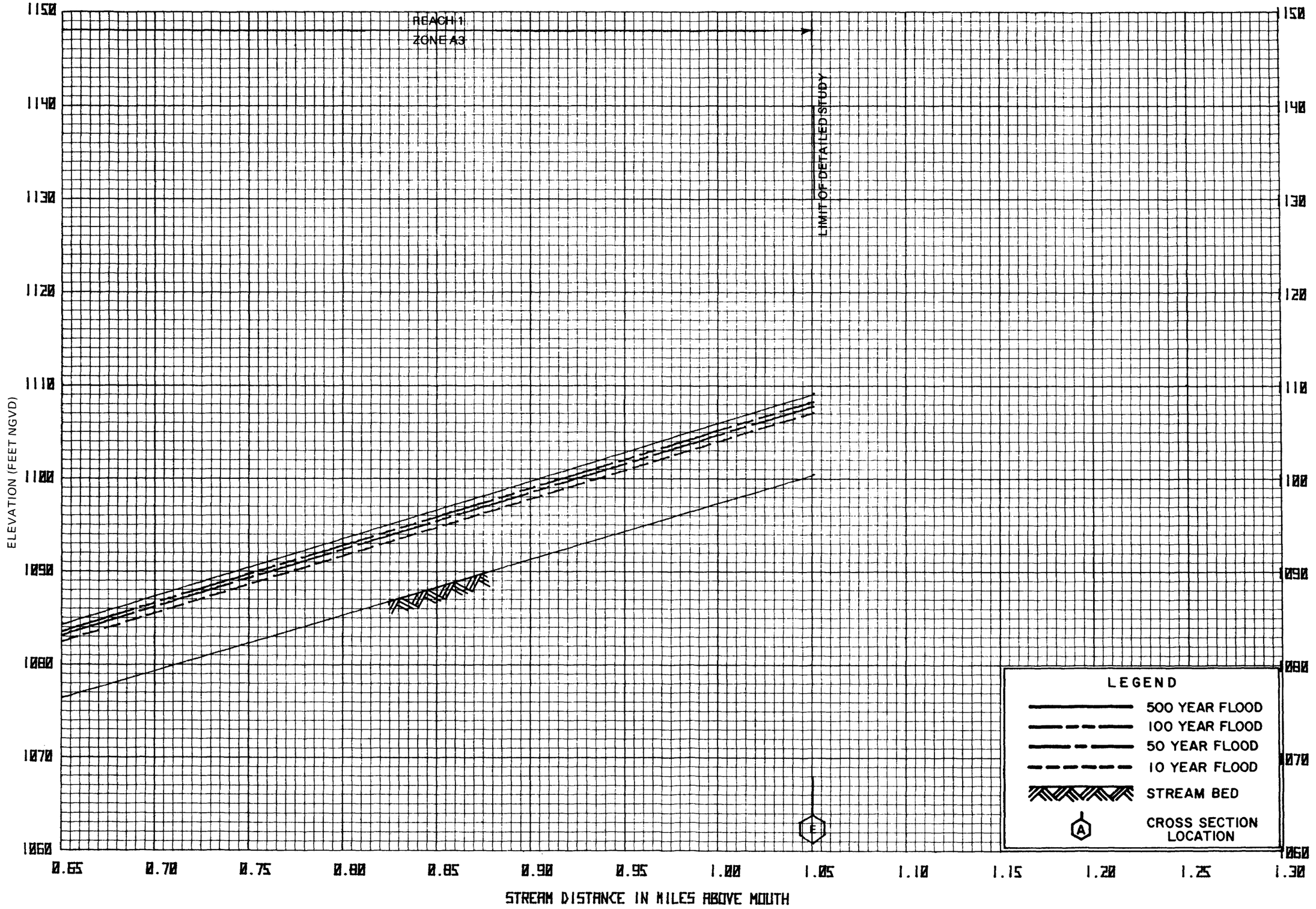
FLOOD PROFILES

S.F. TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

55P



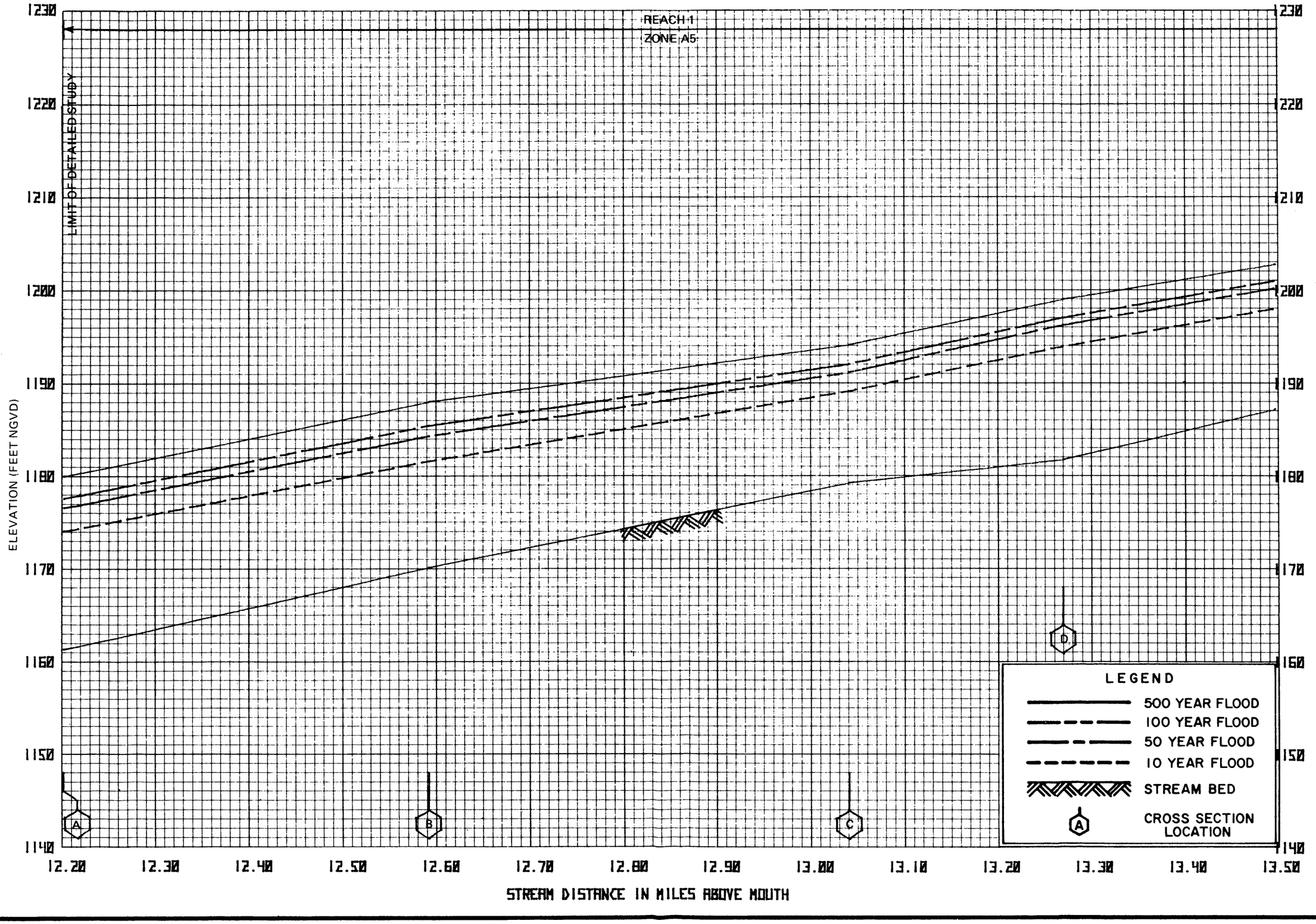
FLOOD PROFILES

S.F. TILTON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

56P



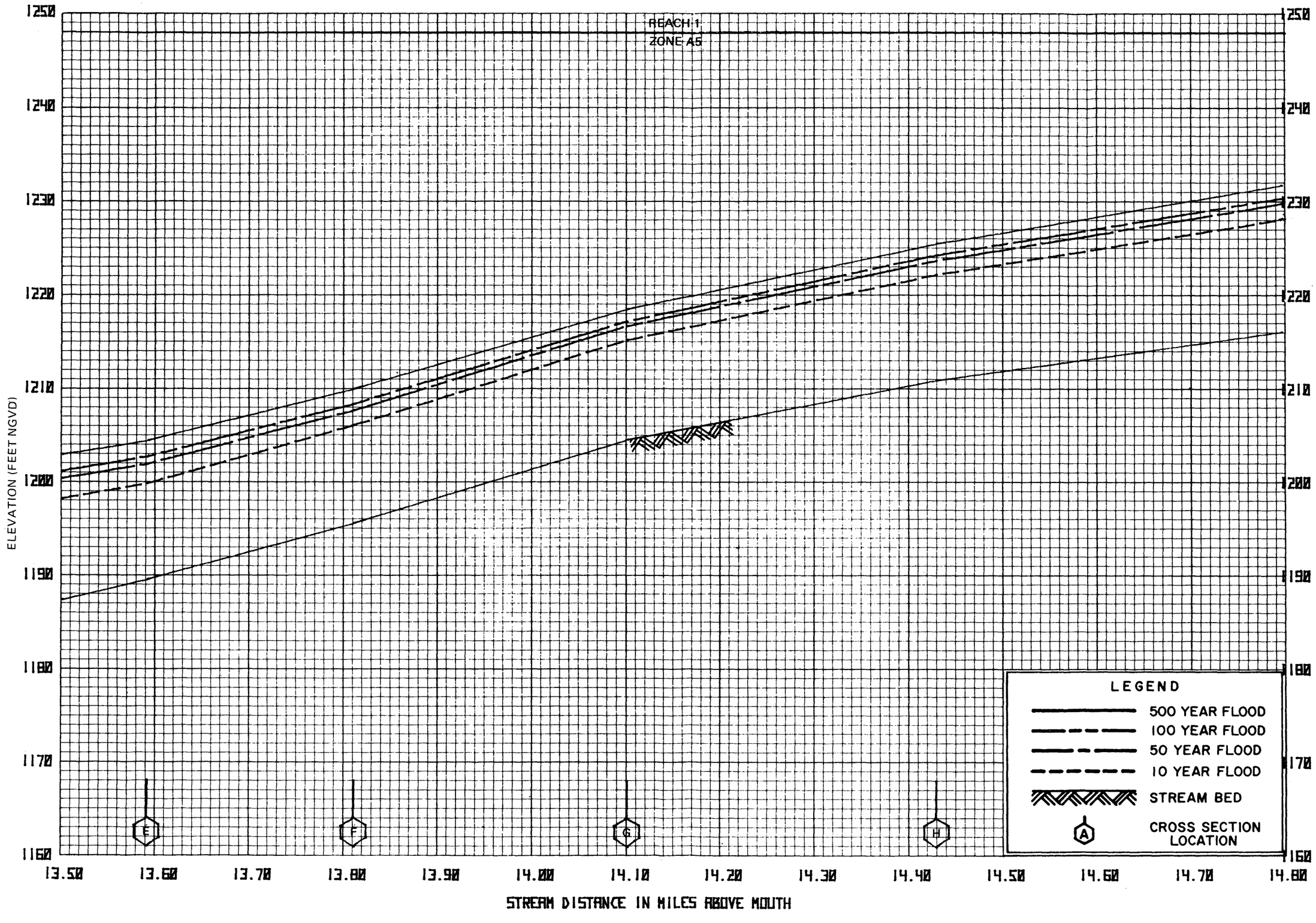
FLOOD PROFILES

CISPUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

57P



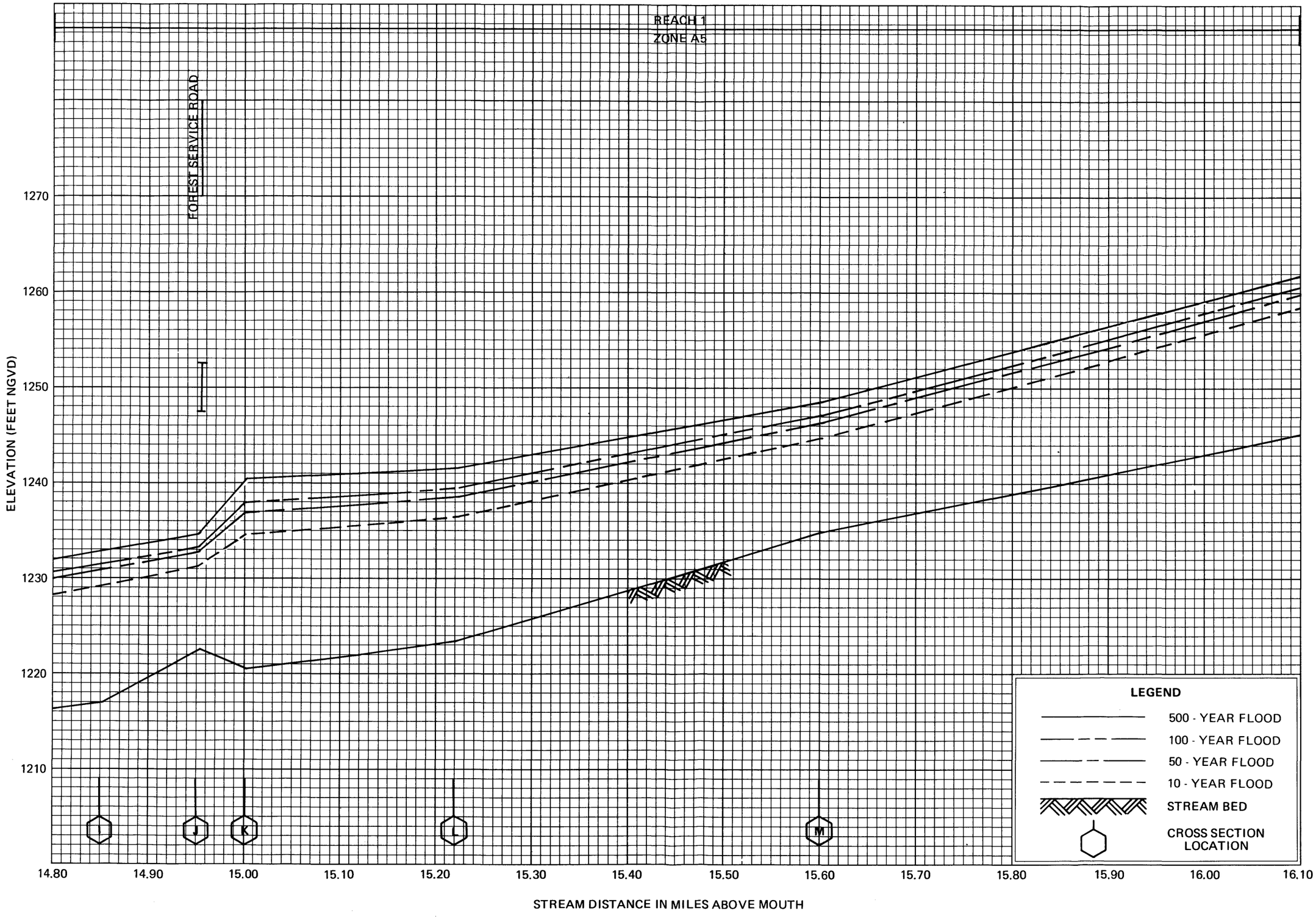
FLOOD PROFILES

CISPUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

58P

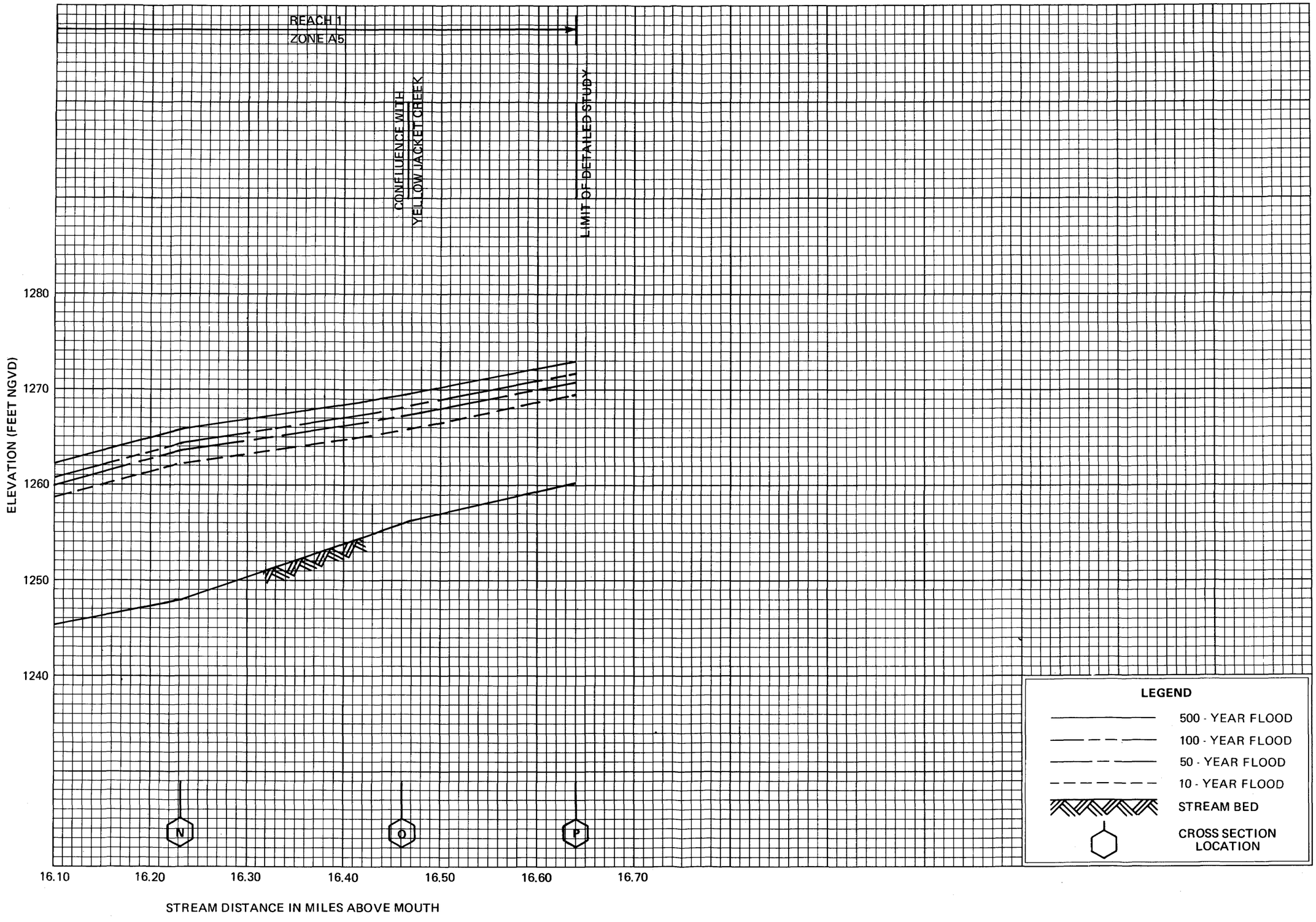


FLOOD PROFILES

CISPUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)



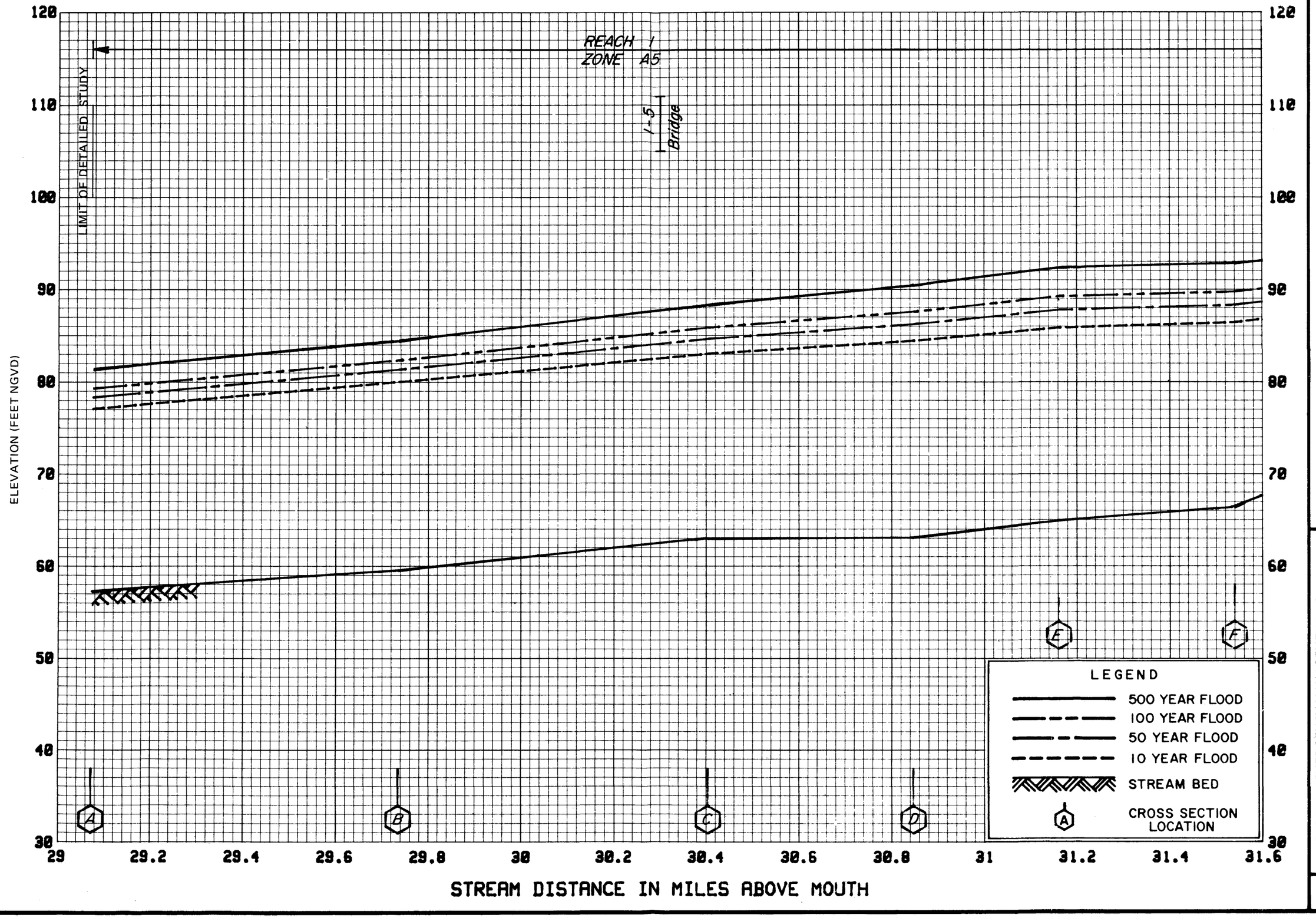
FLOOD PROFILES

CISPUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

60P



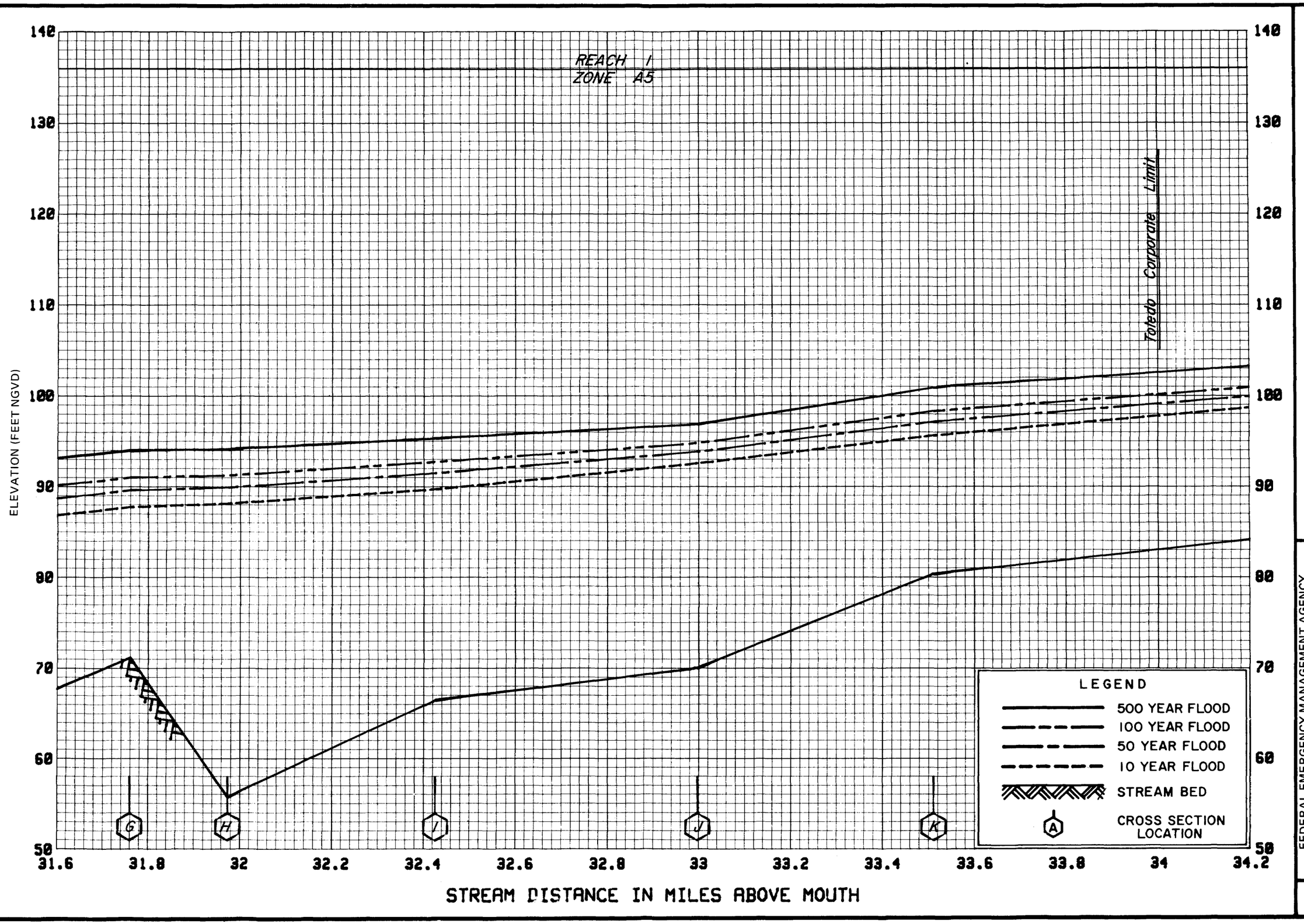
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

61P



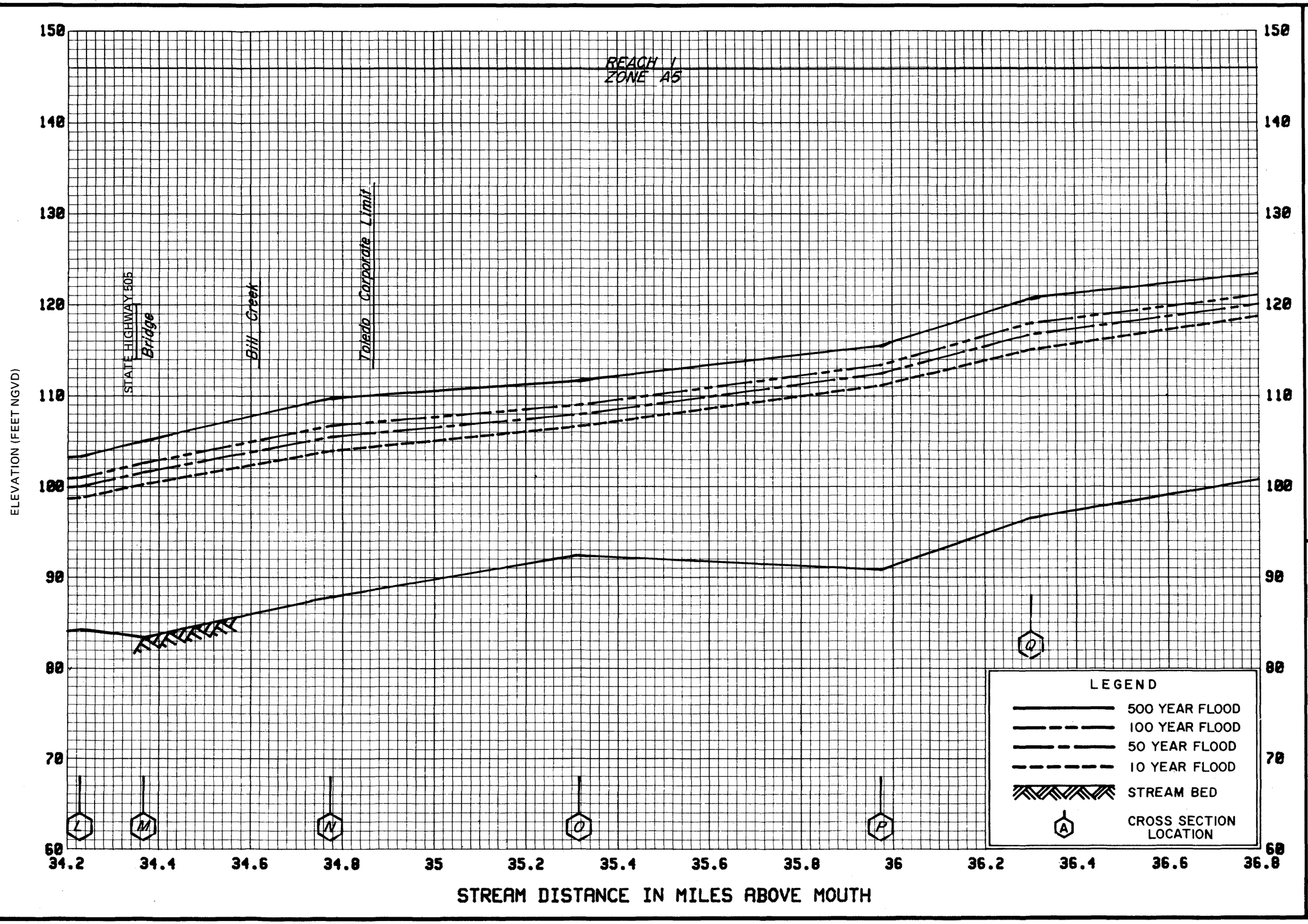
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

62P



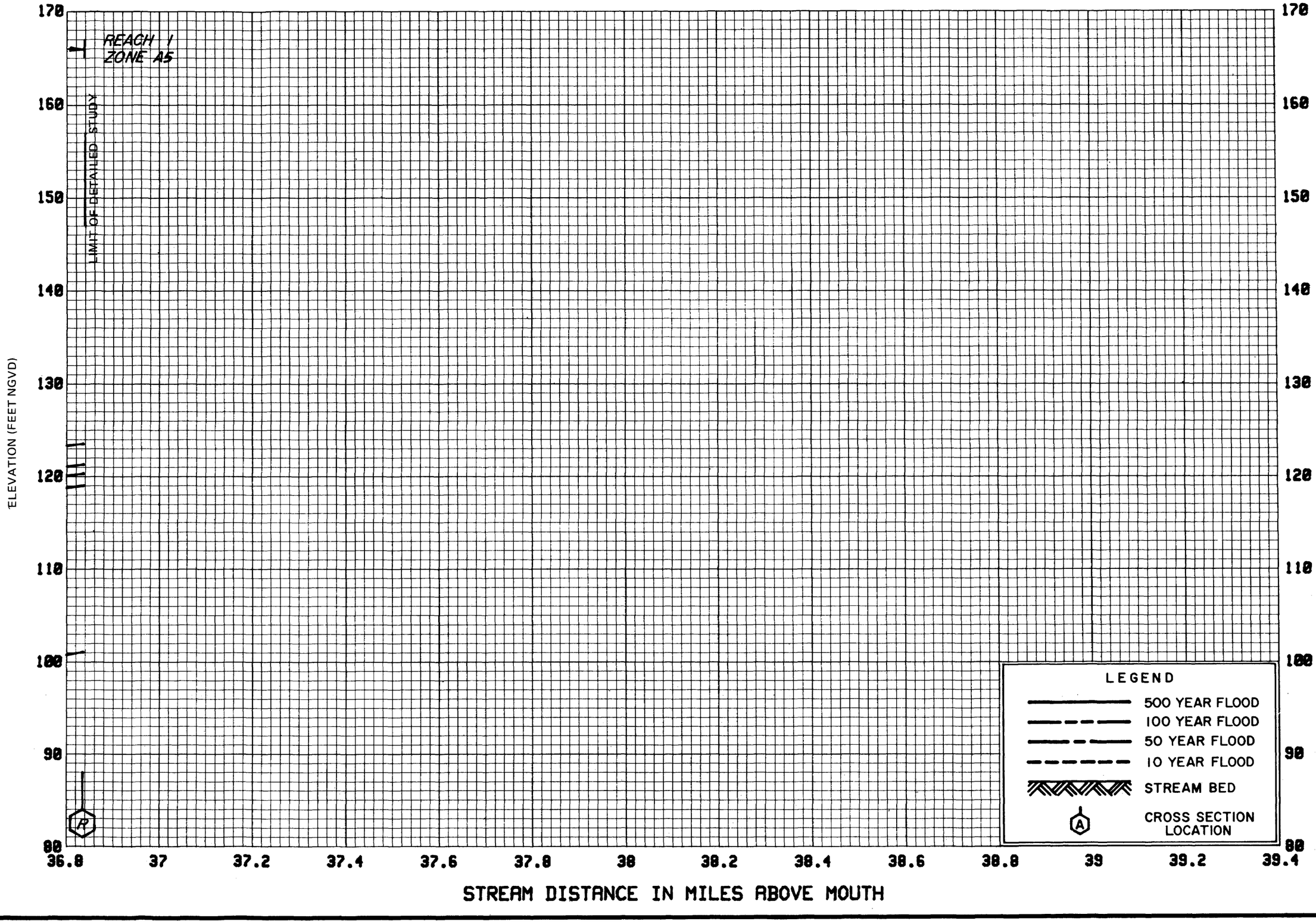
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

63P



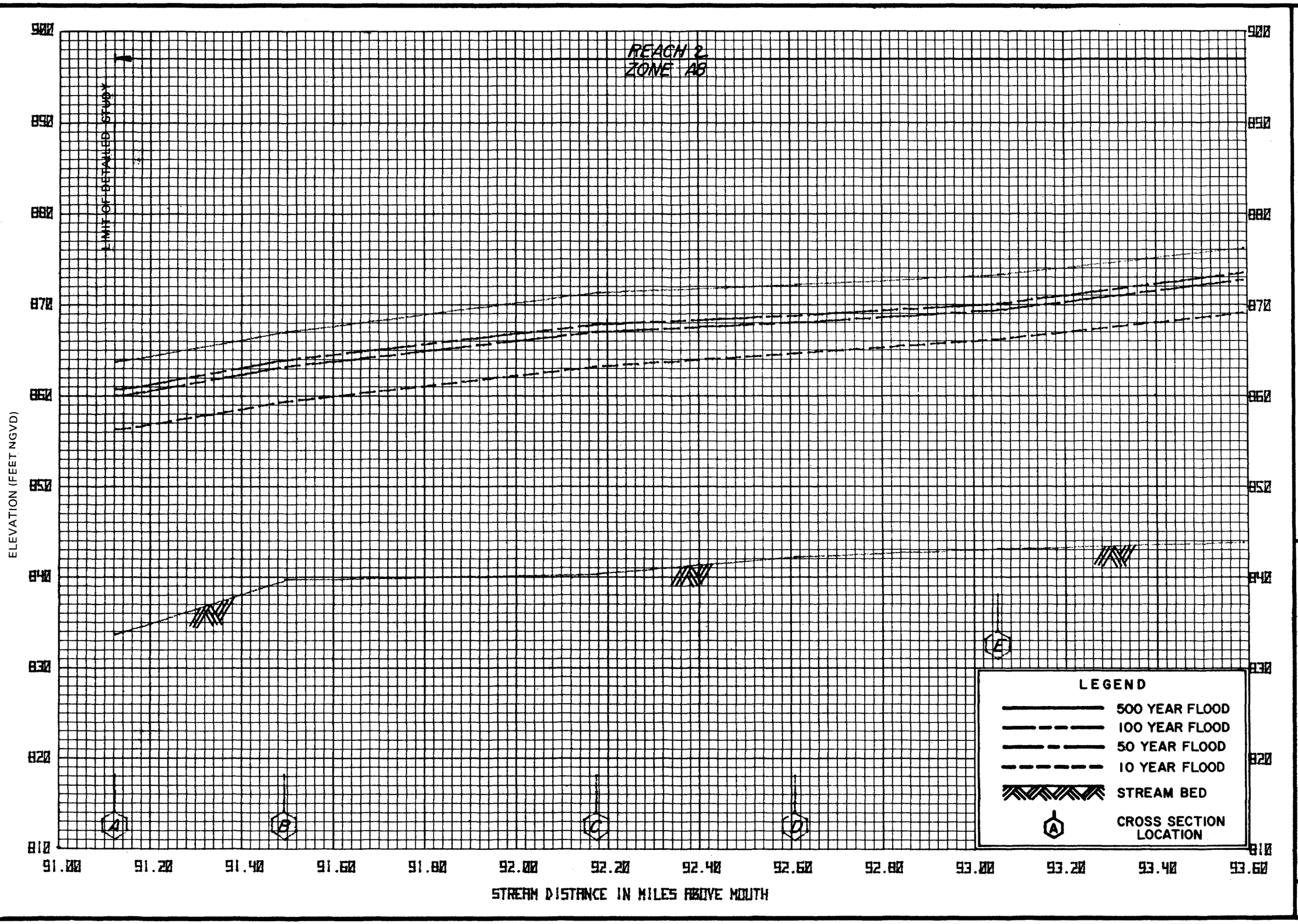
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

64P



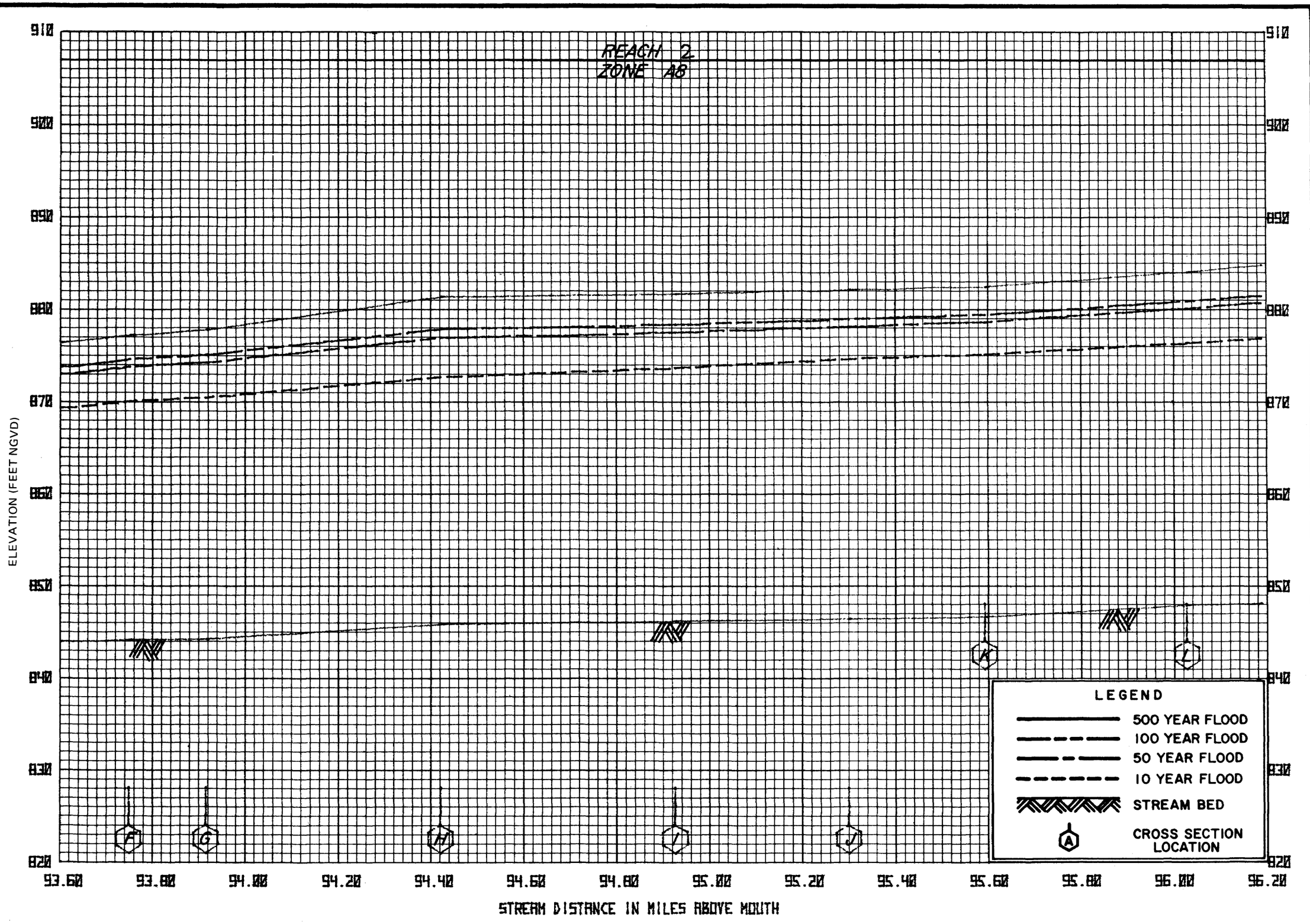
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

65P



FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

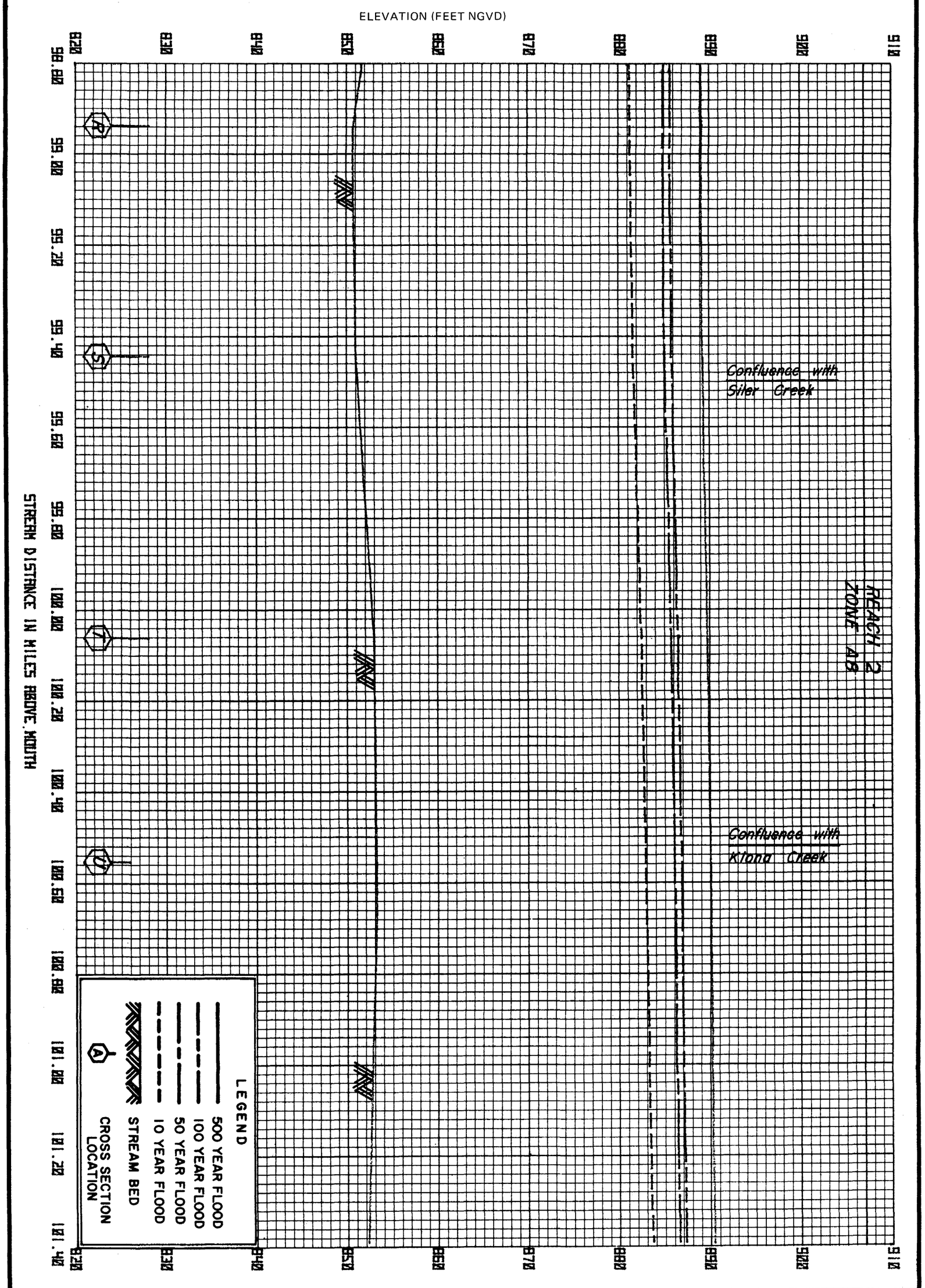
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS CO, WA
(UNINCORPORATED AREAS)

67P



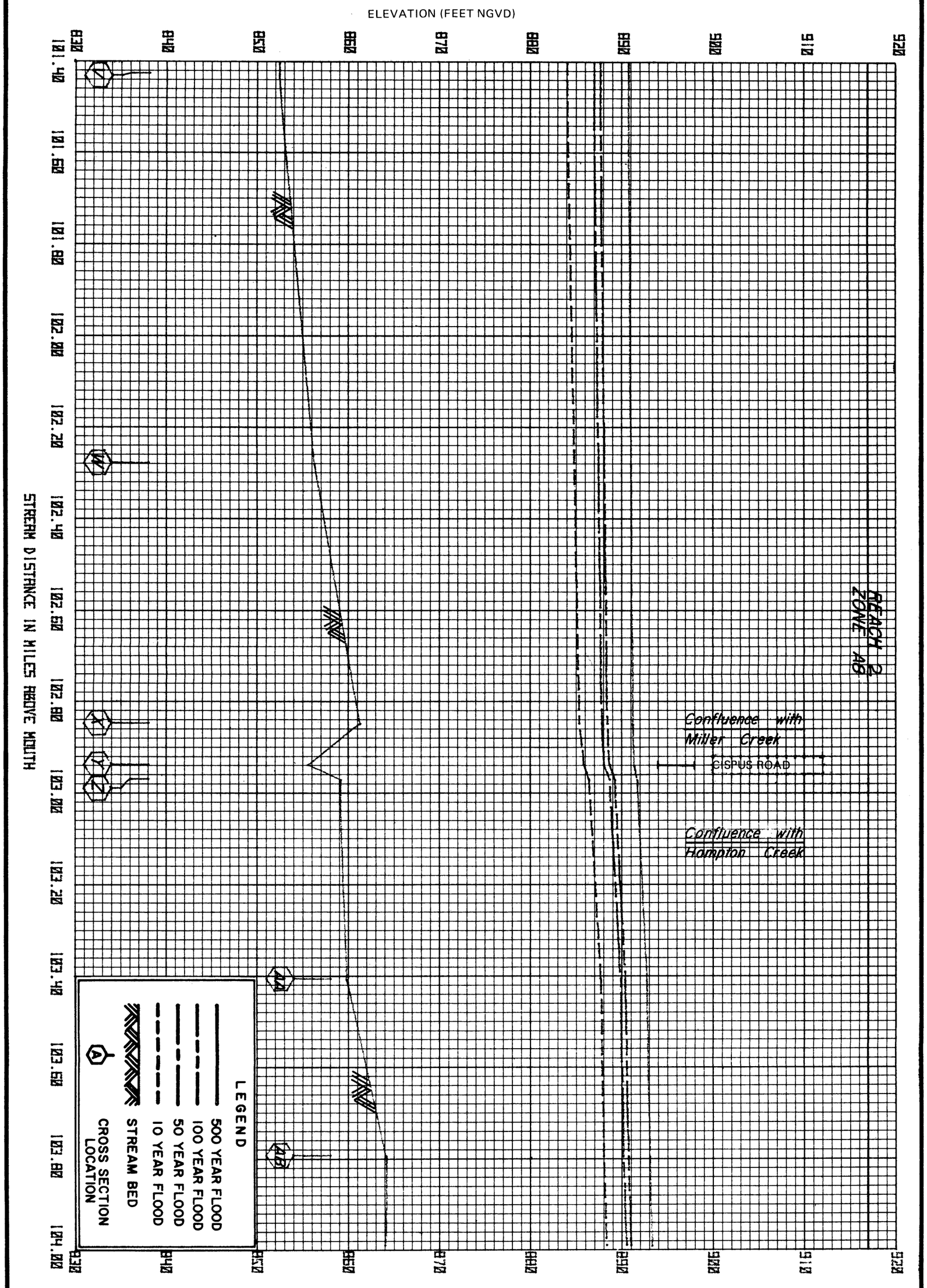
68P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

COWLITZ RIVER



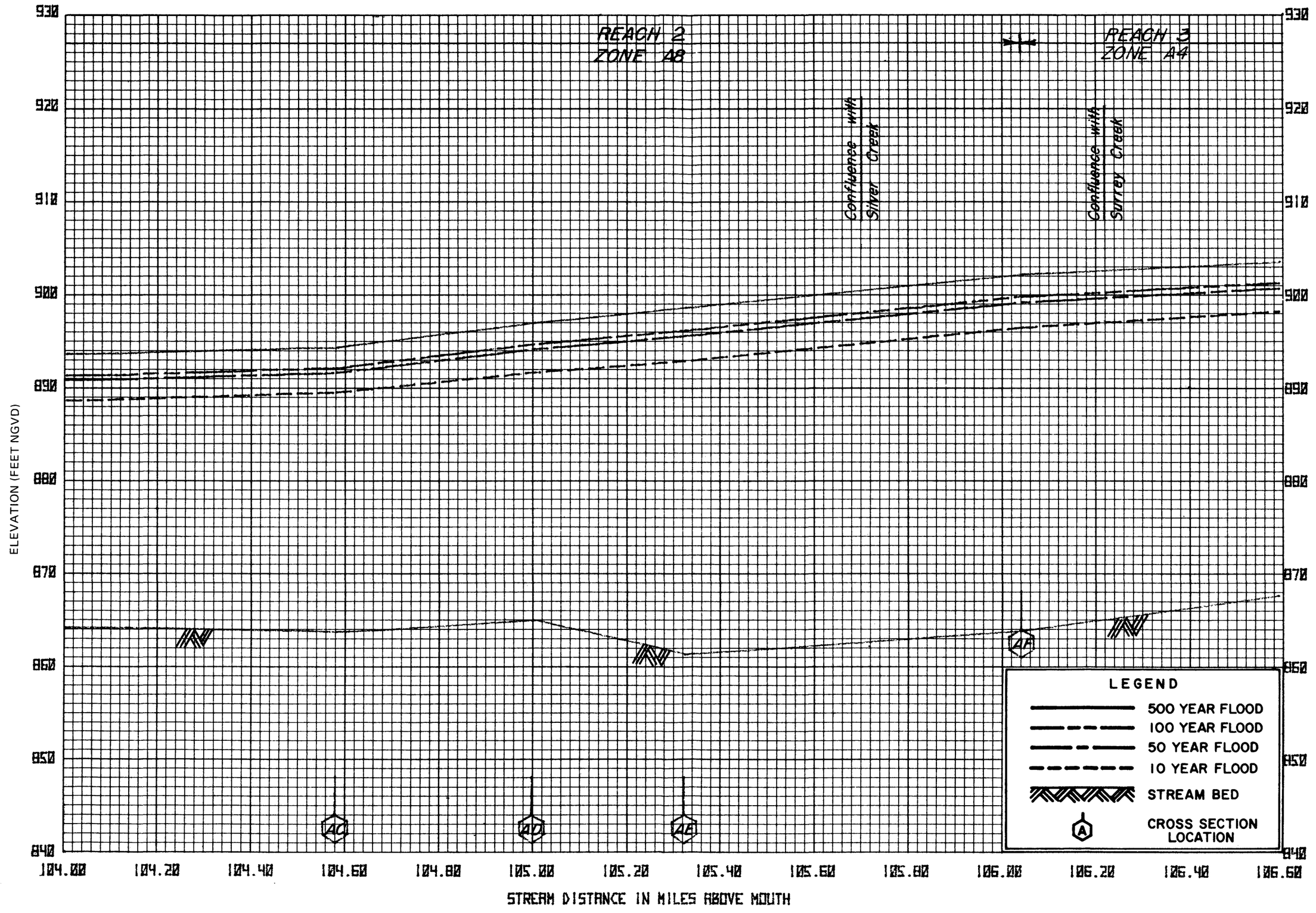
69P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

COWLITZ RIVER



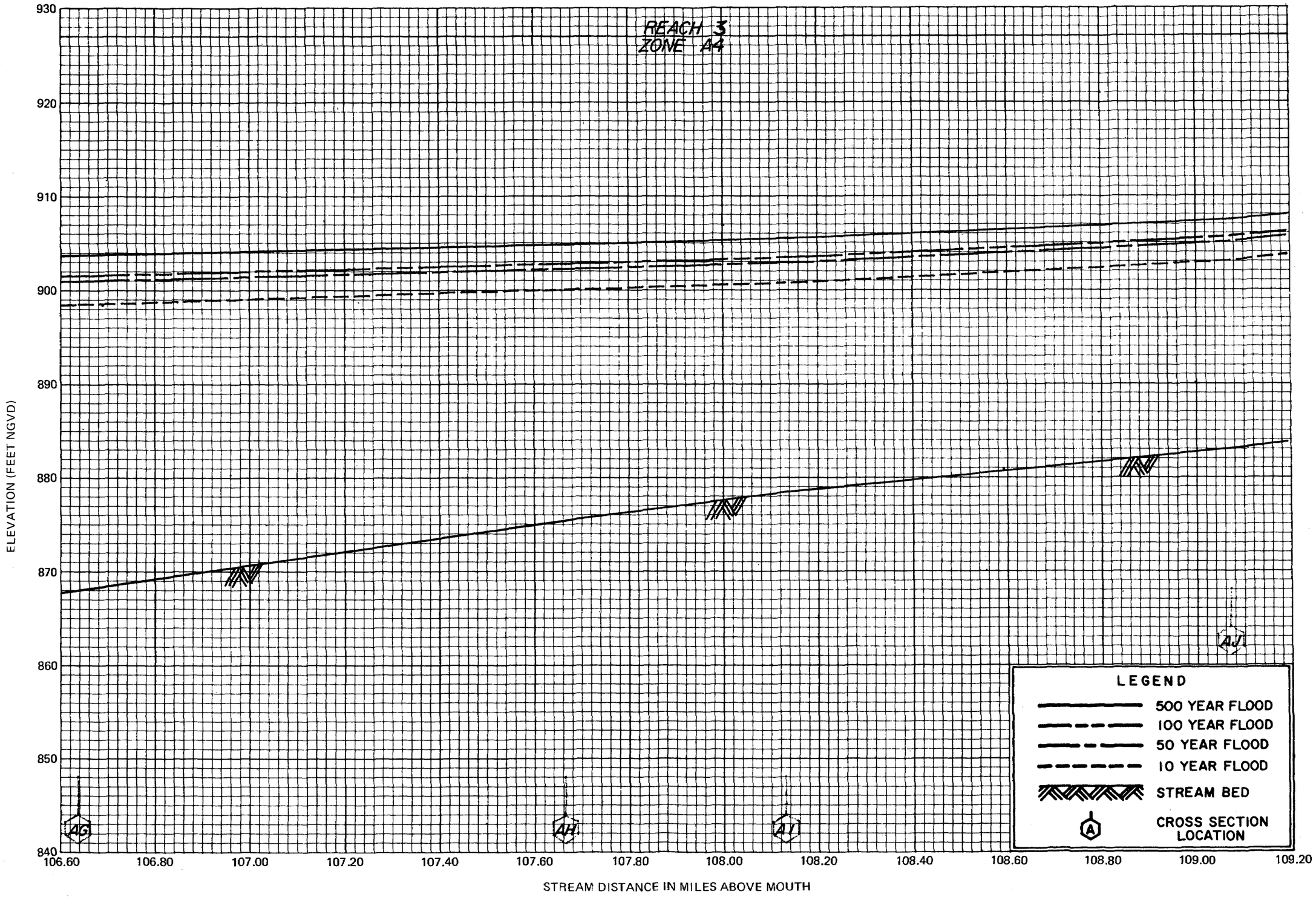
FLOOD PROFILES

CONLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

70P



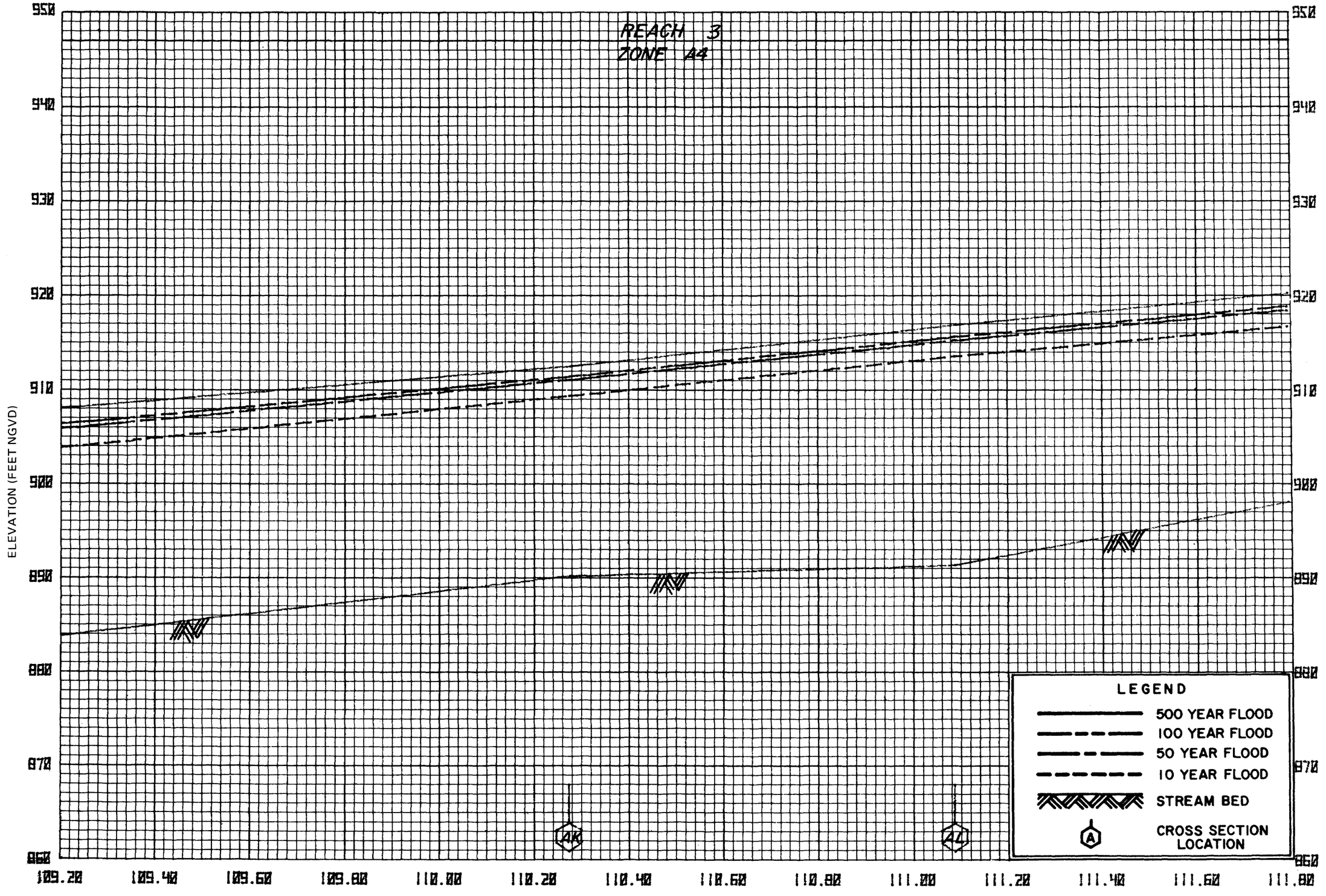
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

71P



FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

72P

REACH 3
ZONE A4

Confluence with Hopkins Creek

Confluence with Davis Creek

Confluence with Cougar Creek

ELEVATION (FEET NGVD)

960
950
940
930
920
910
900
890
880
870

111.80 112.00 112.20 112.40 112.60 112.80 113.00 113.20 113.40 113.60 113.80 114.00 114.20 114.40

STREAM DISTANCE IN MILES ABOVE MOUTH

4M 4N 4O

LEGEND

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

FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

73P

REACH 3
ZONE A4

Confluence with Kilborn Creek

Core Bridge

Confluence with Garrett Creek

ELEVATION (FEET NGVD)

980
970
960
950
940
930
920
910
900
890

114.40 114.60 114.80 115.00 115.20 115.40 115.60 115.80 116.00 116.20 116.40 116.60 116.80 117.00

STREAM DISTANCE IN MILES ABOVE MOUTH

AP AQ AR AS AT AU

LEGEND

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

FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

74P

REACH 3
ZONE A4

Confluence with Burton Creek

ELEVATION (FEET NGVD)

1010
1000
990
980
970
960
950
940
930
920

117.00 117.20 117.40 117.60 117.80 118.00 118.20 118.40 118.60 118.80 119.00 119.20 119.40 119.60

STREAM DISTANCE IN MILES ABOVE MOUTH

4W 4V 4X 4Y

LEGEND

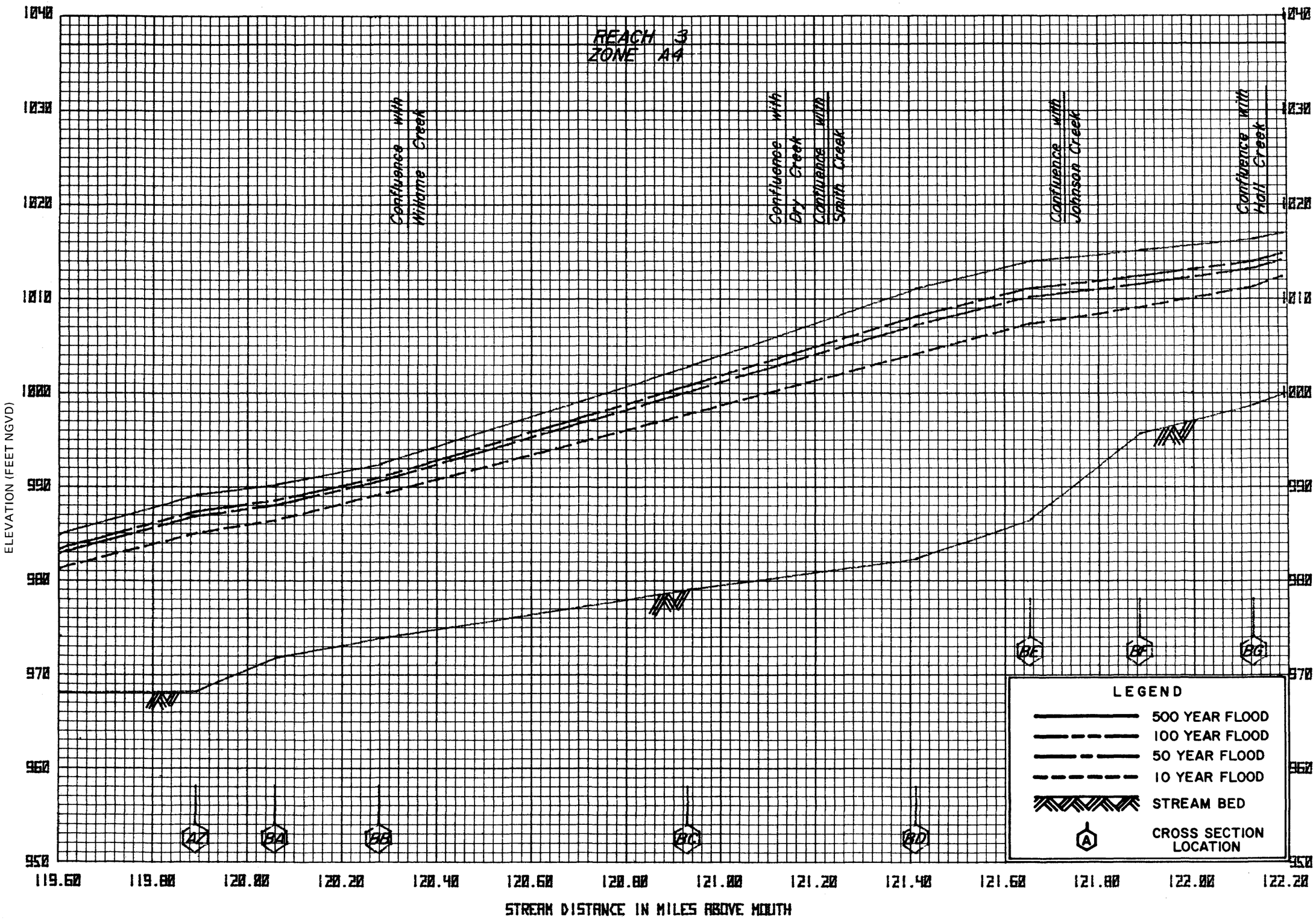
- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- A — CROSS SECTION LOCATION

FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREAS)



FLOOD PROFILES

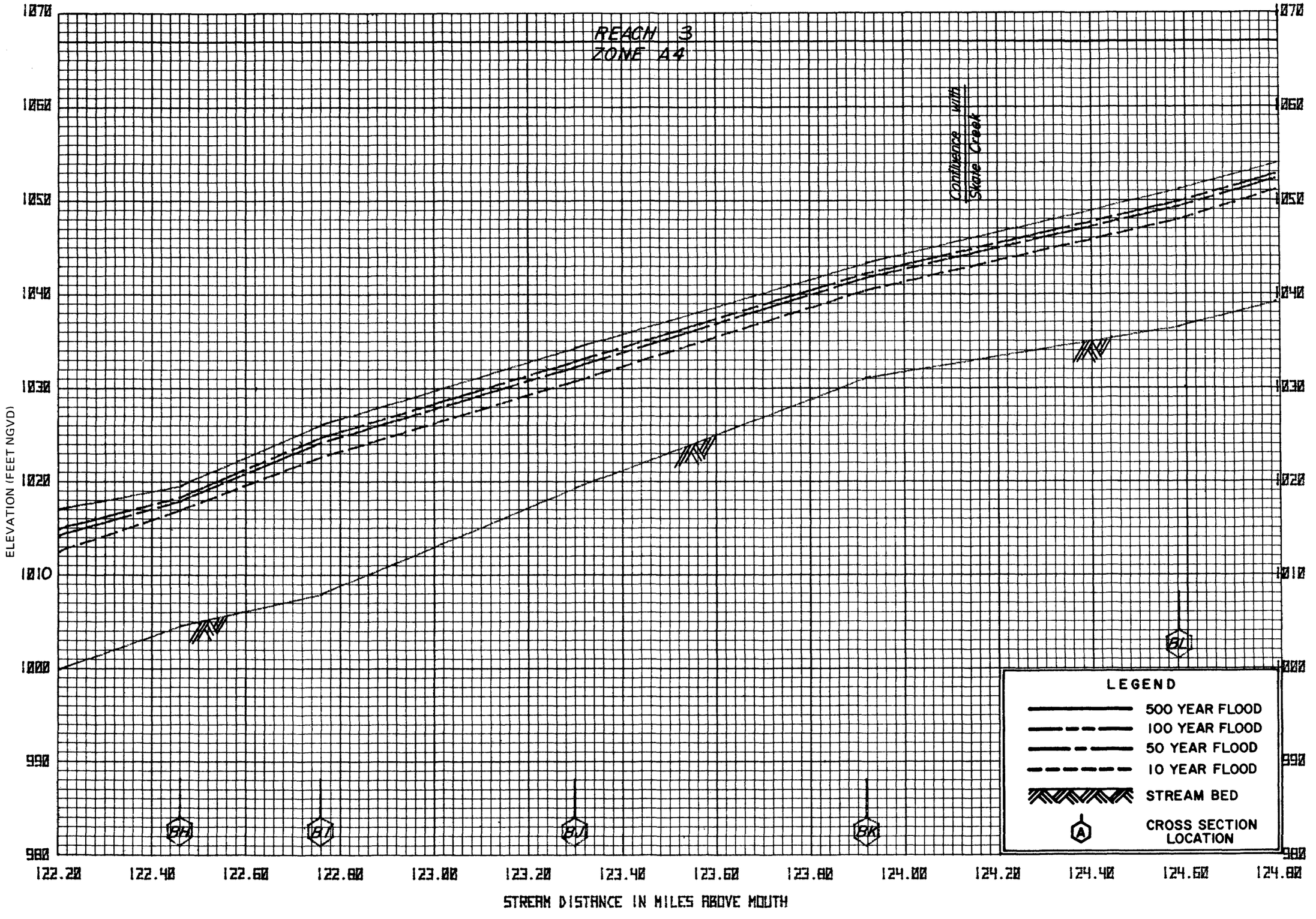
COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA

(UNINC. AREA)

76P



FLOOD PROFILES

CONLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

77P

REACH 3
ZONE AH

Skate Creek Road Bridge
at Packwood

Confluence
with Rainier Cr

ELEVATION (FEET NGVD)

1110
1100
1090
1080
1070
1060
1050
1040
1030
1020

BM BM BO BP BQ BR

124.80 125.00 125.20 125.40 125.60 125.80 126.00 126.20 126.40 126.60 126.80 127.00 127.20 127.40

STREAM DISTANCE IN MILES ABOVE MOUTH

LEGEND

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

FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREAS)

78P

REACH 3
ZONE A4

Confluence with Lake Creek

Confluence with Coal Creek

ELEVATION (FEET NGVD)

1170
1160
1150
1140
1130
1120
1110
1100
1090
1080

127.40 127.60 127.80 128.00 128.20 128.40 128.60 128.80 129.00 129.20 129.40 129.60 129.80 130.00

STREAM DISTANCE IN MILES ABOVE MOUTH

LEGEND

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

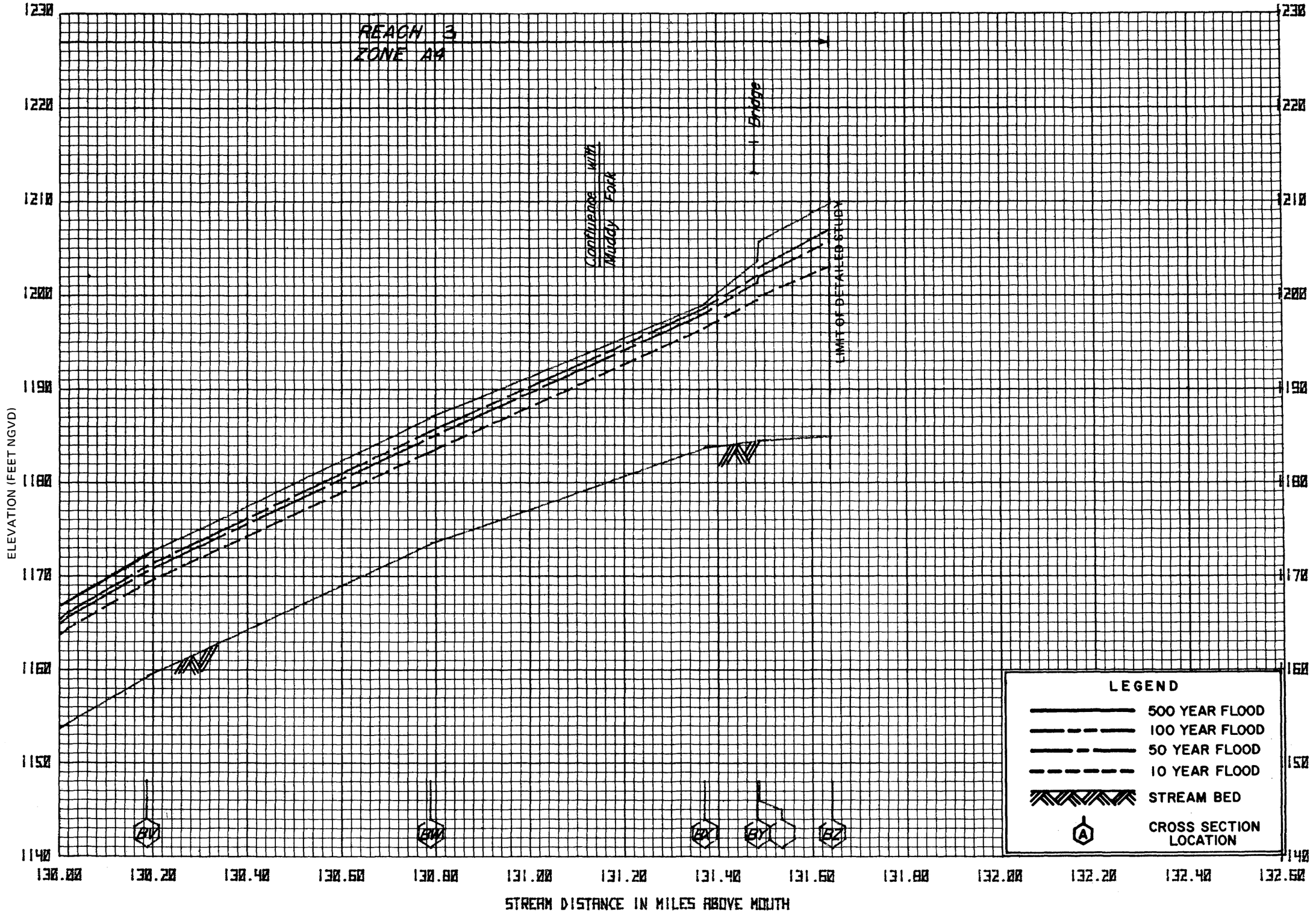
FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREAS)

79P



FLOOD PROFILES

COWLITZ RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

80P

REACH 1
ZONE A3

GOLD St. CULVERT

LOGAN St. CULVERT

CITY OF CENTRALIA
CORPORATE LIMITS

ELEVATION (FEET NGVD)

240
230
220
210
200
190
180
170
160
150

2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70

STREAM DISTANCE IN MILES ABOVE MOUTH

LEGEND

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

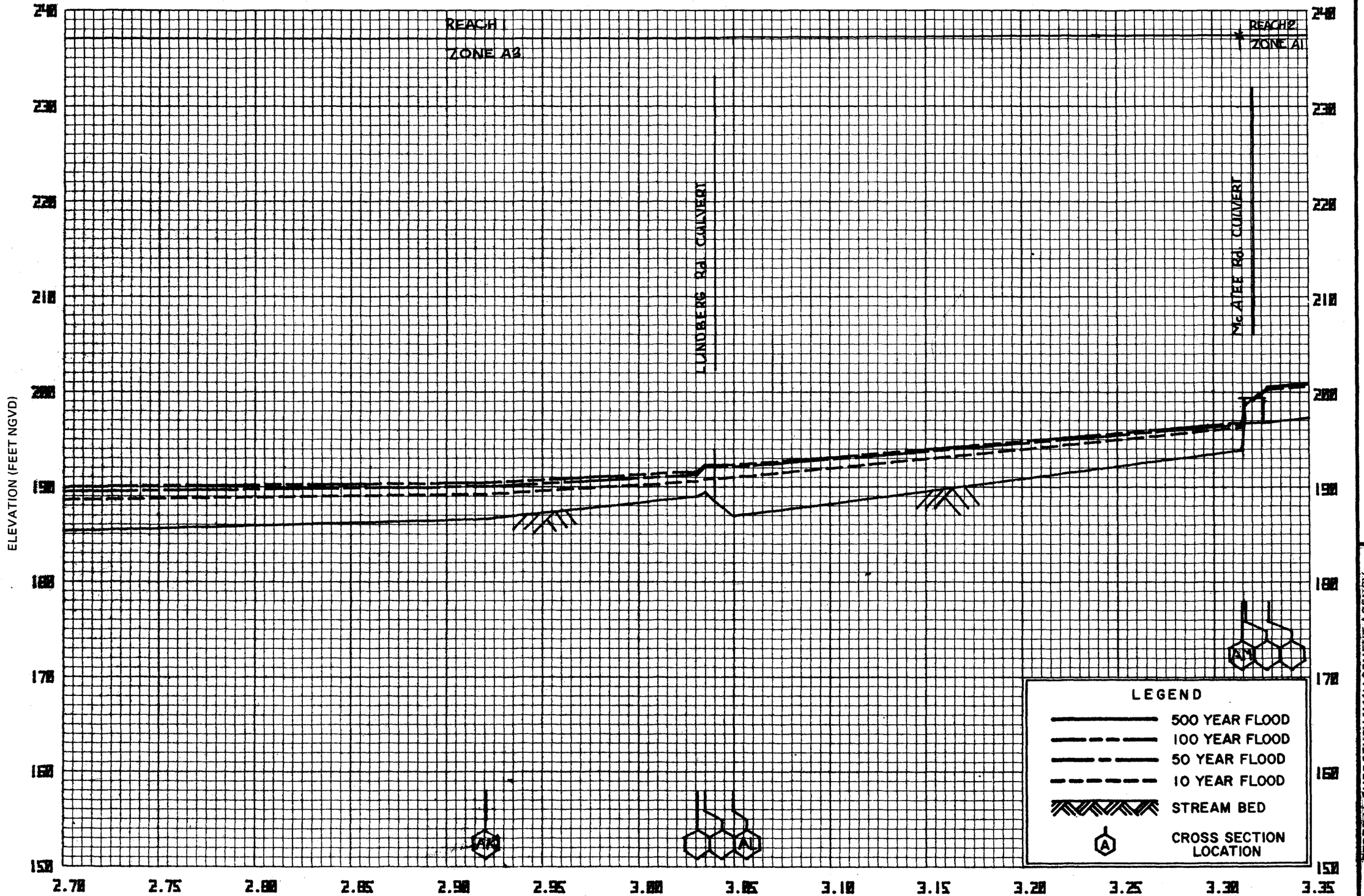
FLOOD PROFILES

CHINA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

81P



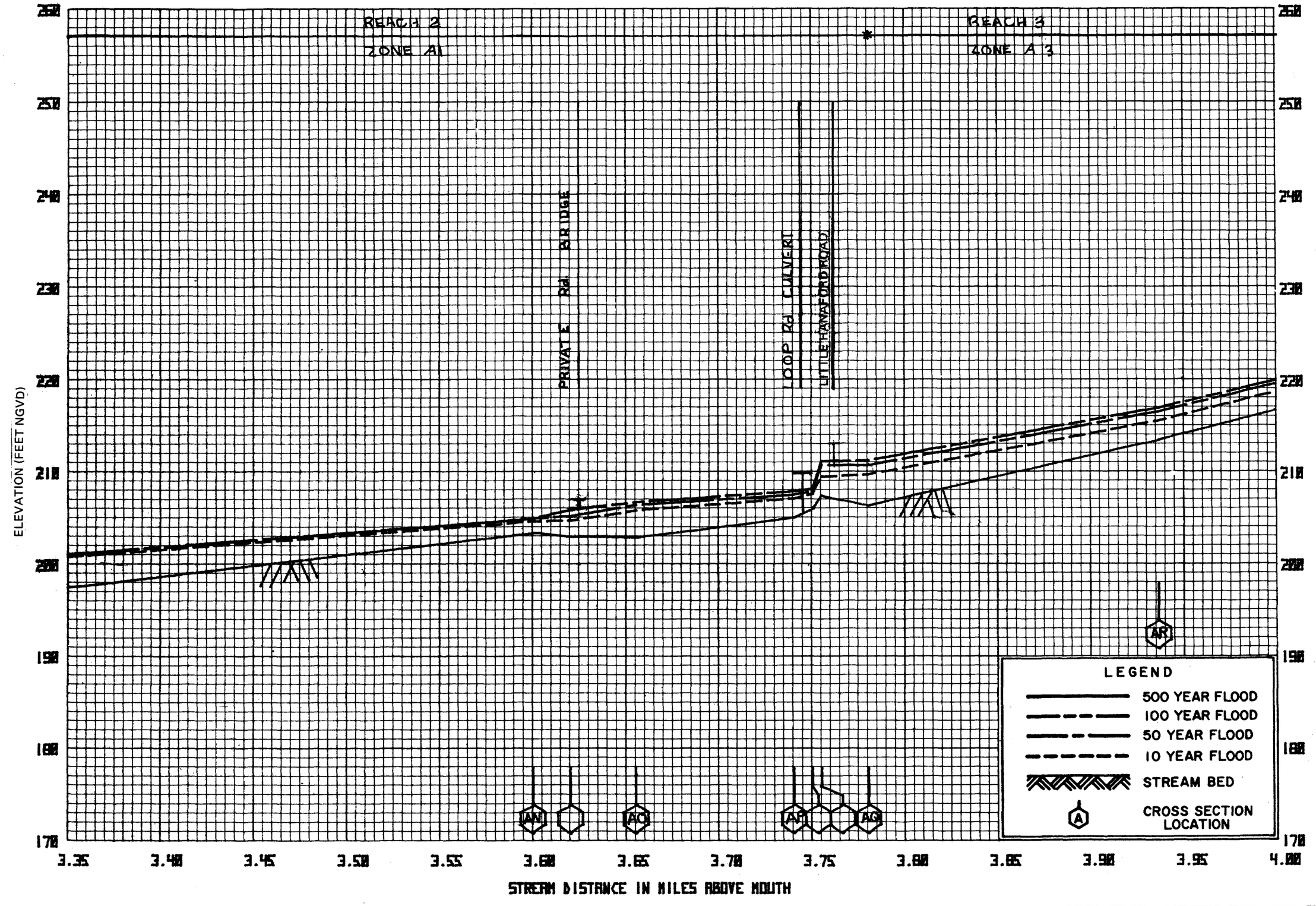
FLOOD PROFILES

CHINA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

82P



FLOOD PROFILES

CHINA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

83P

REACH 3
ZONE A3

REACH 2
ZONE A1

ELEVATION (FEET NGVD)

290
280
270
260
250
240
230
220
210
200

4.00 4.05 4.10 4.15 4.20 4.25 4.30 4.35 4.40 4.45 4.50 4.55 4.60 4.65

STREAM DISTANCE IN MILES ABOVE MOUTH

A4
A5

LEGEND

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

FLOOD PROFILES

CHINA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

84P

BACKWATER FROM SKOOKUMCHUCK RIVER
ZONE A4
REACH 1
ZONE A5
Reach 2
Zone A1
Reach 3
Zone A6
Skookumchuck River Confluence
UNION PACIFIC RAILROAD
Reynolds Ave.
Centralia City Limits
Roanoke St.
Centralia City Limits
Centralia City Limits
Carson Rd.
Private Rd.
Sawall Rd.
Lowery Rd.
LEWIS COUNTY LIMITS
ELEVATION (FEET NGVD)
240
230
220
210
200
190
180
170
160
150
AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP AQ AR AS AT
0 .2 .4 .6 .8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6
STREAM DISTANCE IN MILES ABOVE MOUTH

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

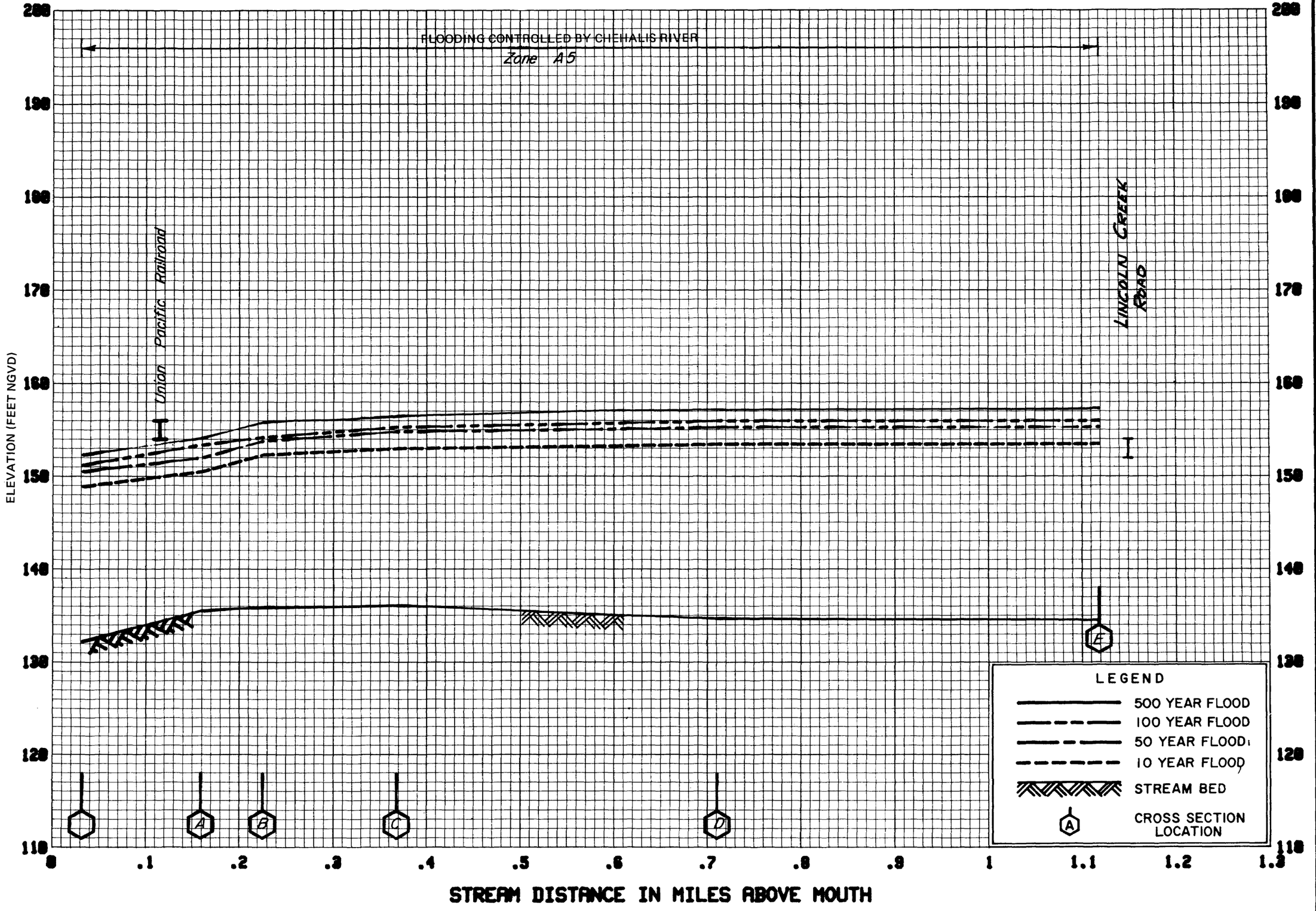
FLOOD PROFILES

COFFEE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

85P



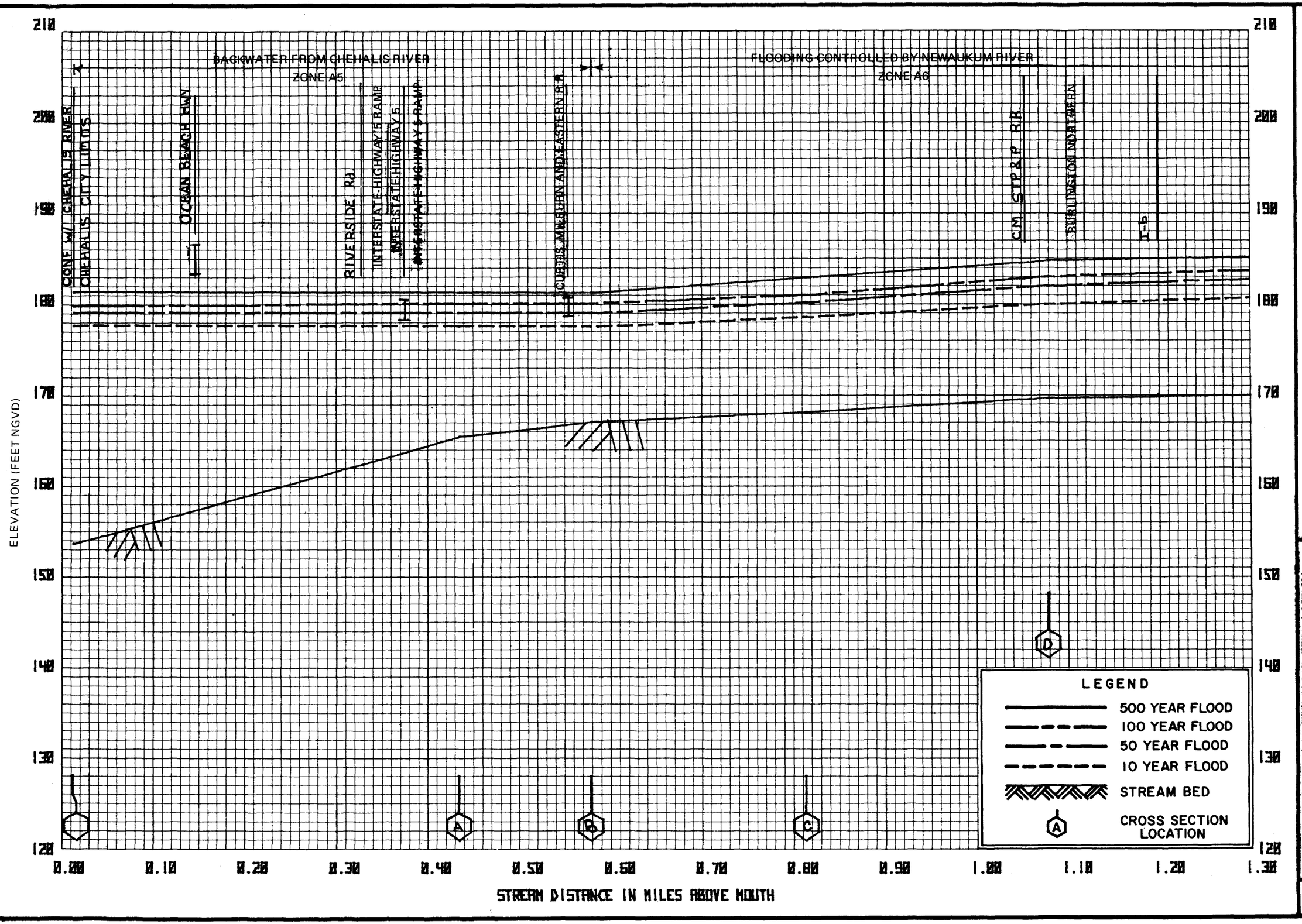
FLOOD PROFILES

LINCOLN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

86P



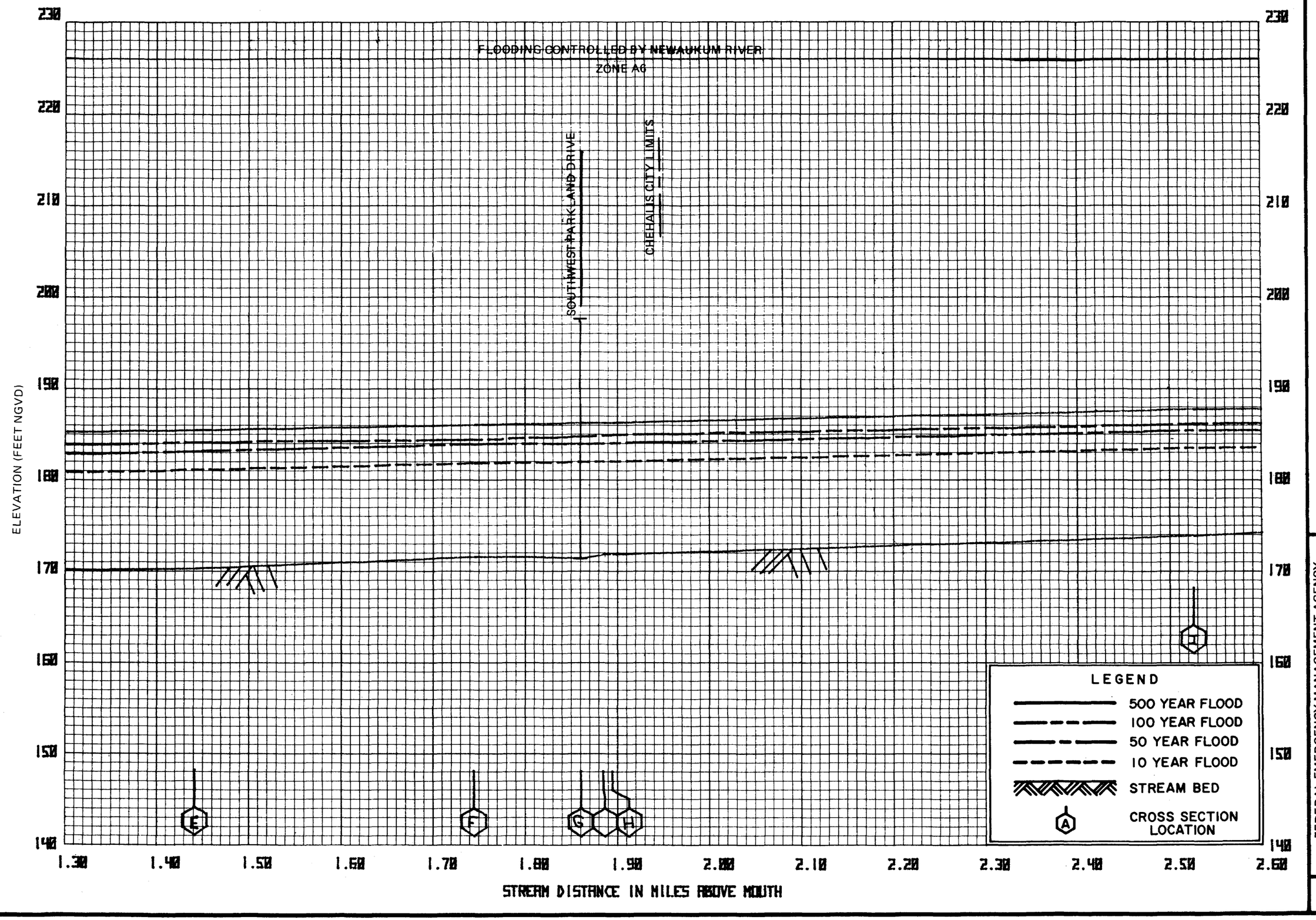
FLOOD PROFILES

DILLENBAUGH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

87P



FLOOD PROFILES

DILLENBAUGH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

88P

ELEVATION (FEET NGVD)

STREAM DISTANCE IN MILES ABOVE MOUTH

FLOODING CONTROLLED BY NEWAUKUM RIVER

ZONE A6

REACH 1

ZONE A2

BRIDGE @ TALL OAKS FARM

CONF W/
BERWICK CREEK

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

CROSS SECTION LOCATION

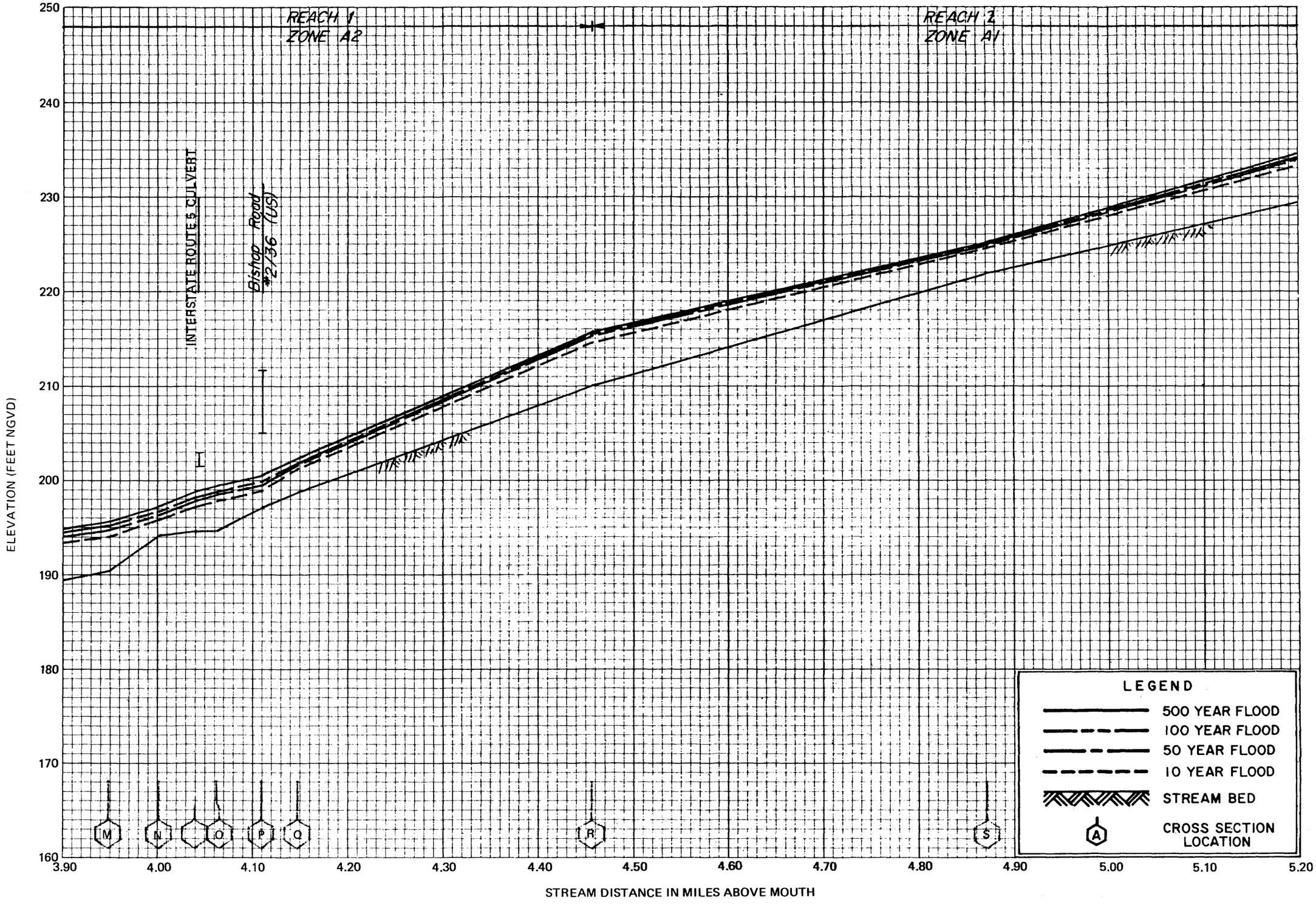
89P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

DILLENBAUGH CREEK



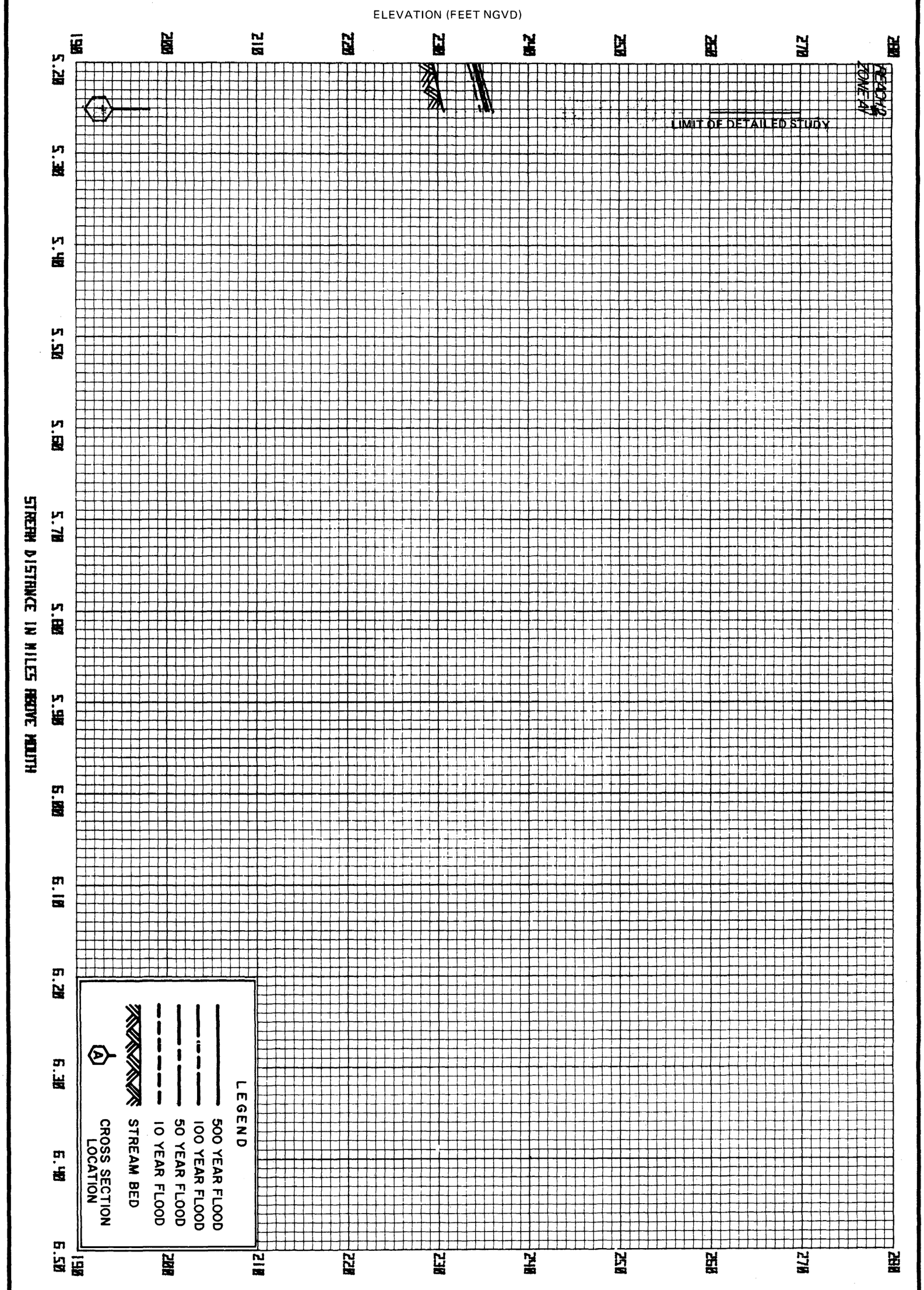
FLOOD PROFILES

DILLENBAUGH CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

90P



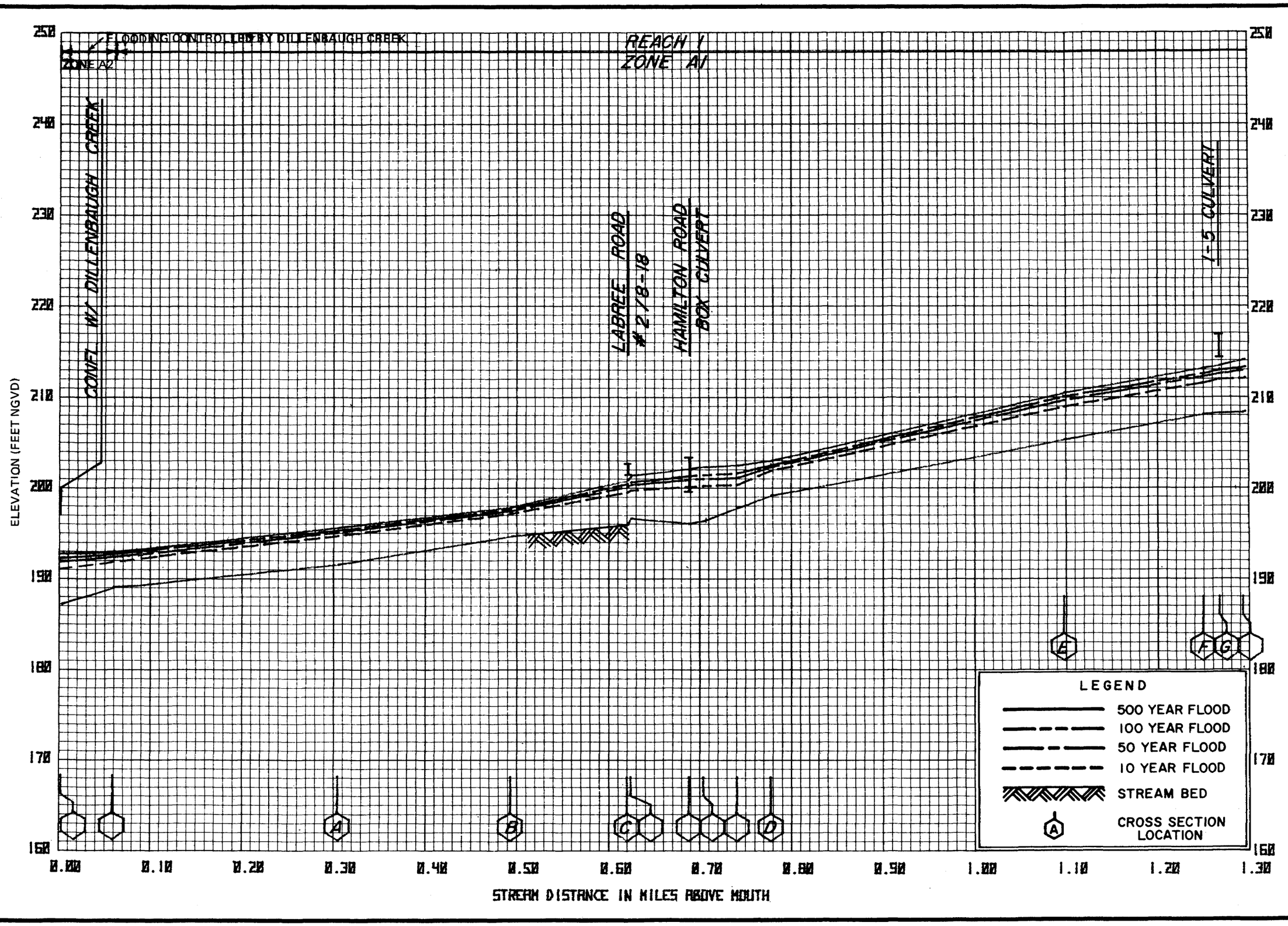
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

DILLENBAUGH CR

91P



FLOOD PROFILES

BERWICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

92P

REACH 1
ZONE A1

BORROW ROAD # 2/190

PRIVATE BRIDGE

BISHOP ROAD
CULVERT # 2/280

FOOT BRIDGE

ELEVATION (FEET NGVD)

260
250
240
230
220
210
200
190

1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6

STREAM DISTANCE IN MILES ABOVE MOUTH

H I J K L M N O

LEGEND

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

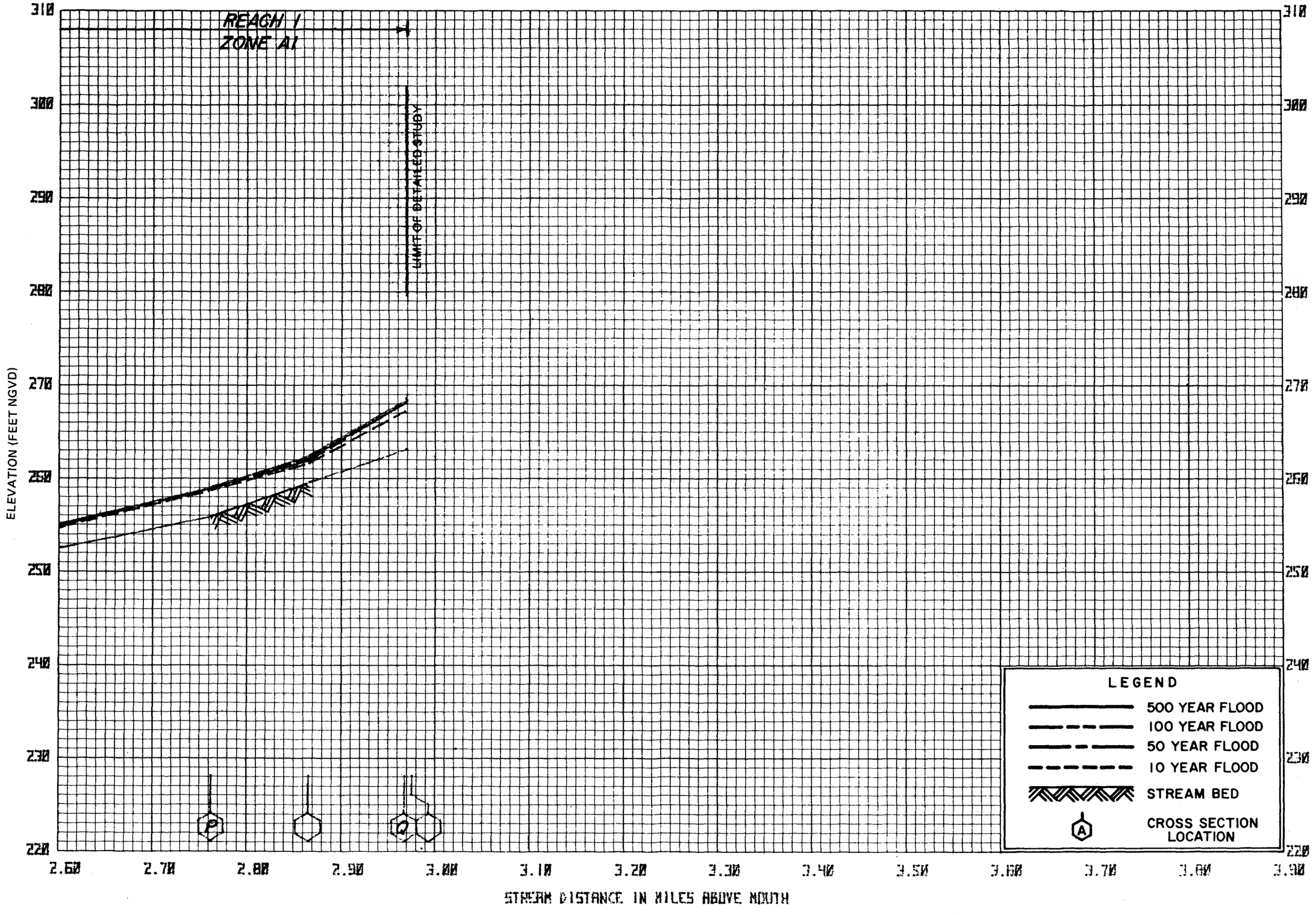
FLOOD PROFILES

BERWICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

93P



FLOOD PROFILES

BERWICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREAS)

94P

ELEVATION (FEET NGVD)

150 160 170 180 190 200 210 220 230 240

STREAM DISTANCE IN MILES ABOVE MOUTH

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30

CONFLUENCE W/ SKOOKUMCHUCK RIVER

BURLINGTON NORTHERN RAILROAD

BACKWATER FROM SKOOKUMCHUCK RIVER

ZONE A4

REACH 1

ZONE A3

A

B

C

D

E

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

CROSS SECTION LOCATION

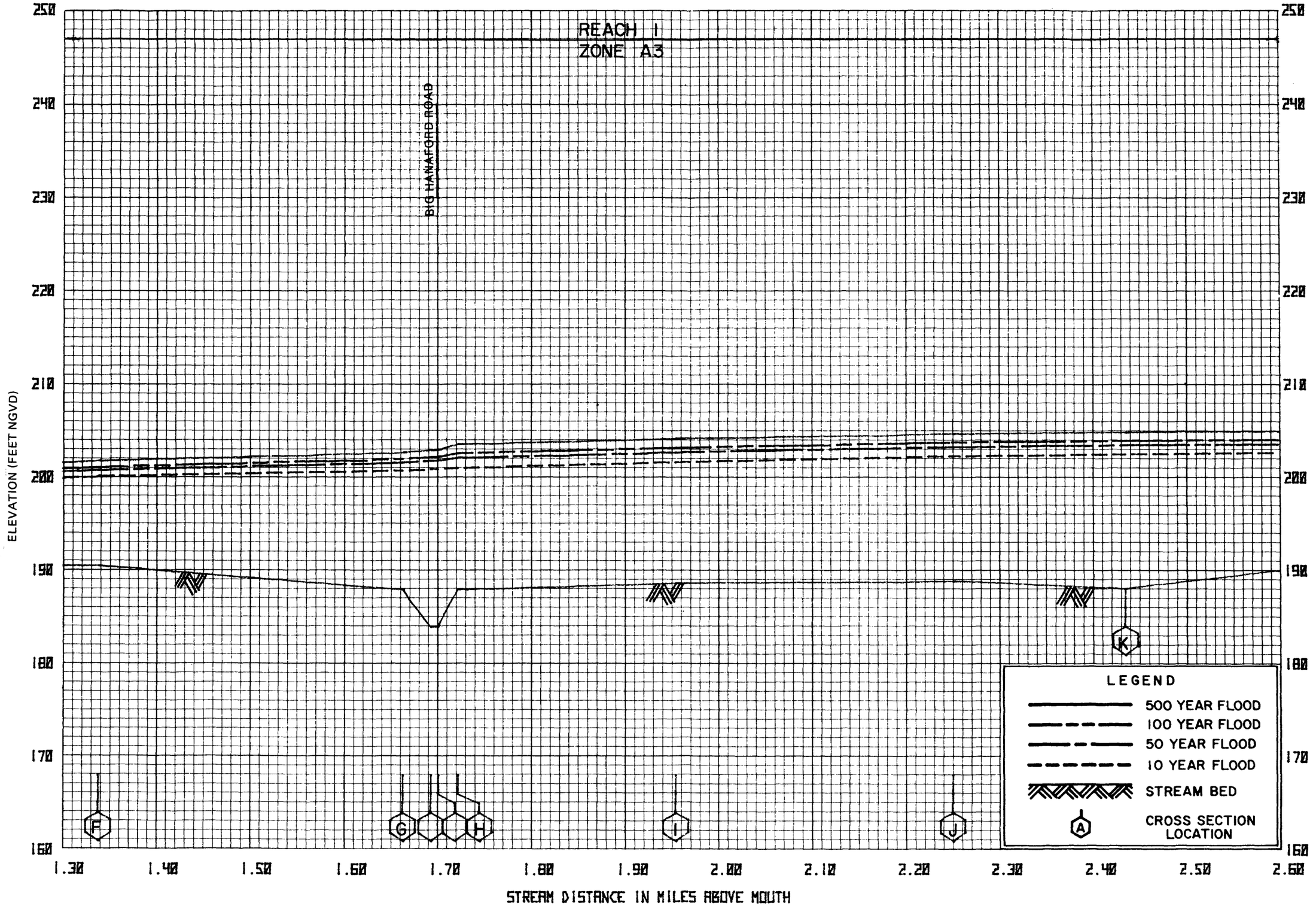
95P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WASH.
(UNINC. AREA)

FLOOD PROFILES

HANAFORD CREEK

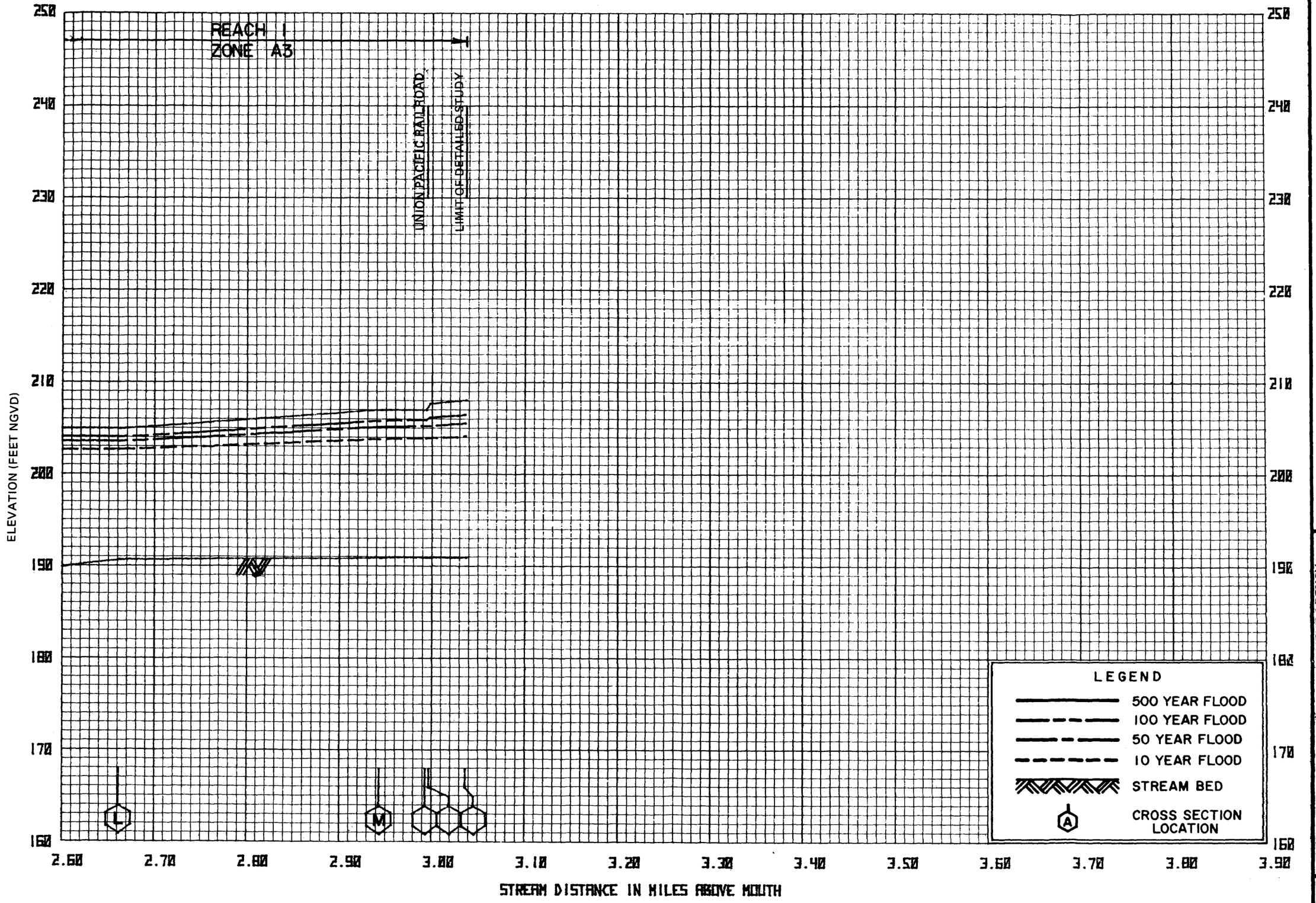


FLOOD PROFILES

HANAFORD CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WASH.
(UNINC. AREA)



FLOOD PROFILES

HANAFORD CREEK

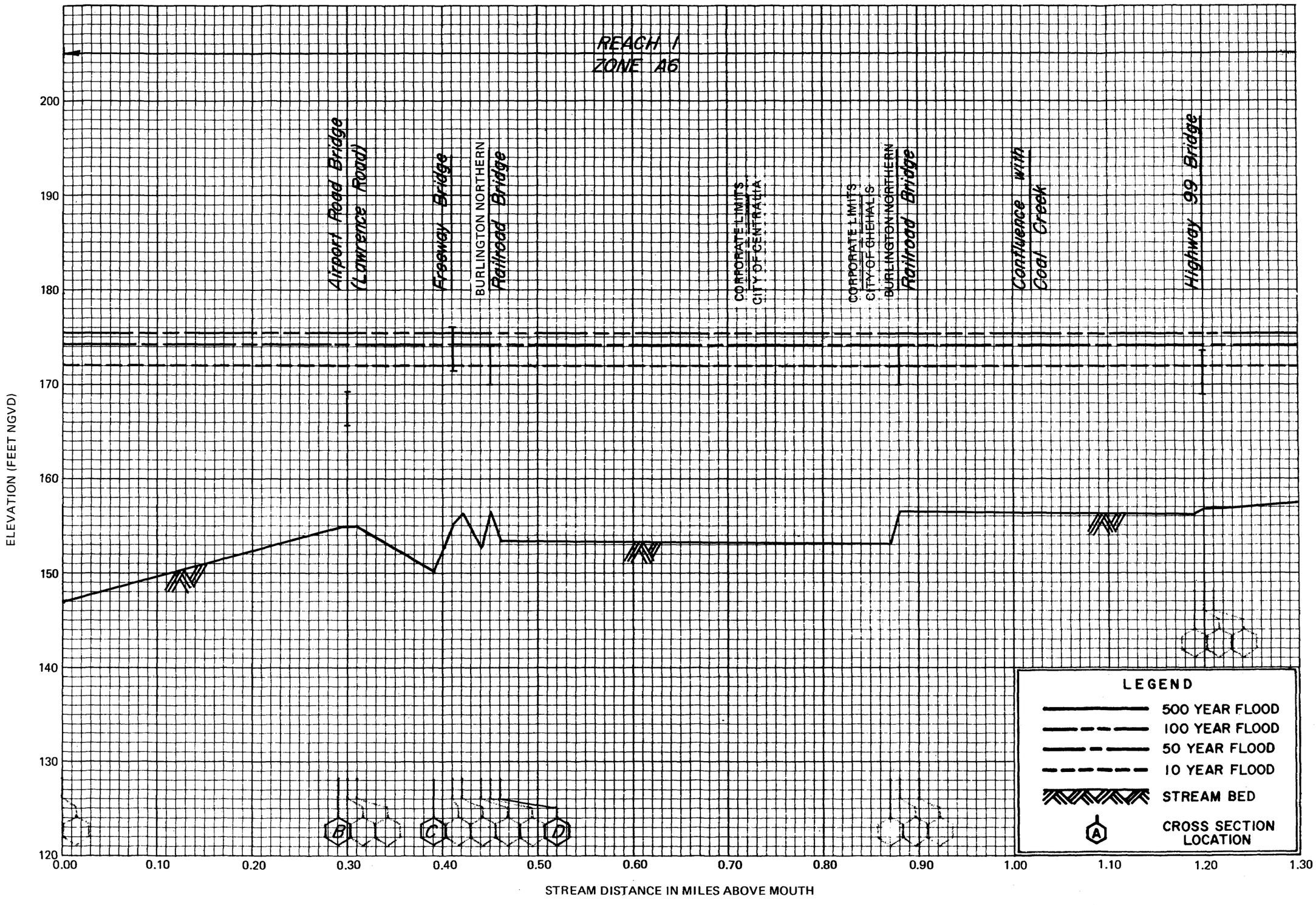
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WASH.
(UNINC. AREA)

97P

FLOOD PROFILES

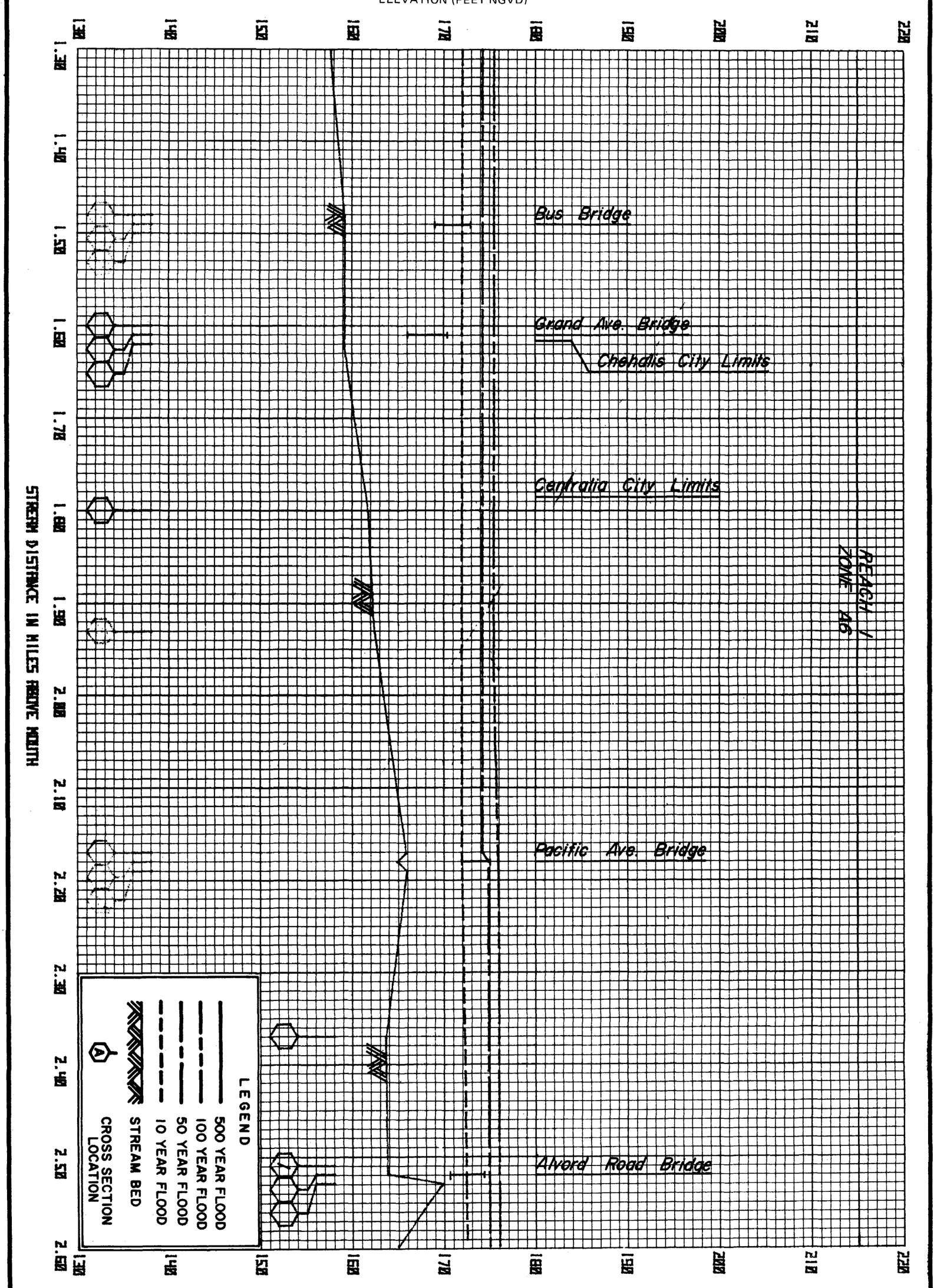
SALZER CREEK



FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

98P



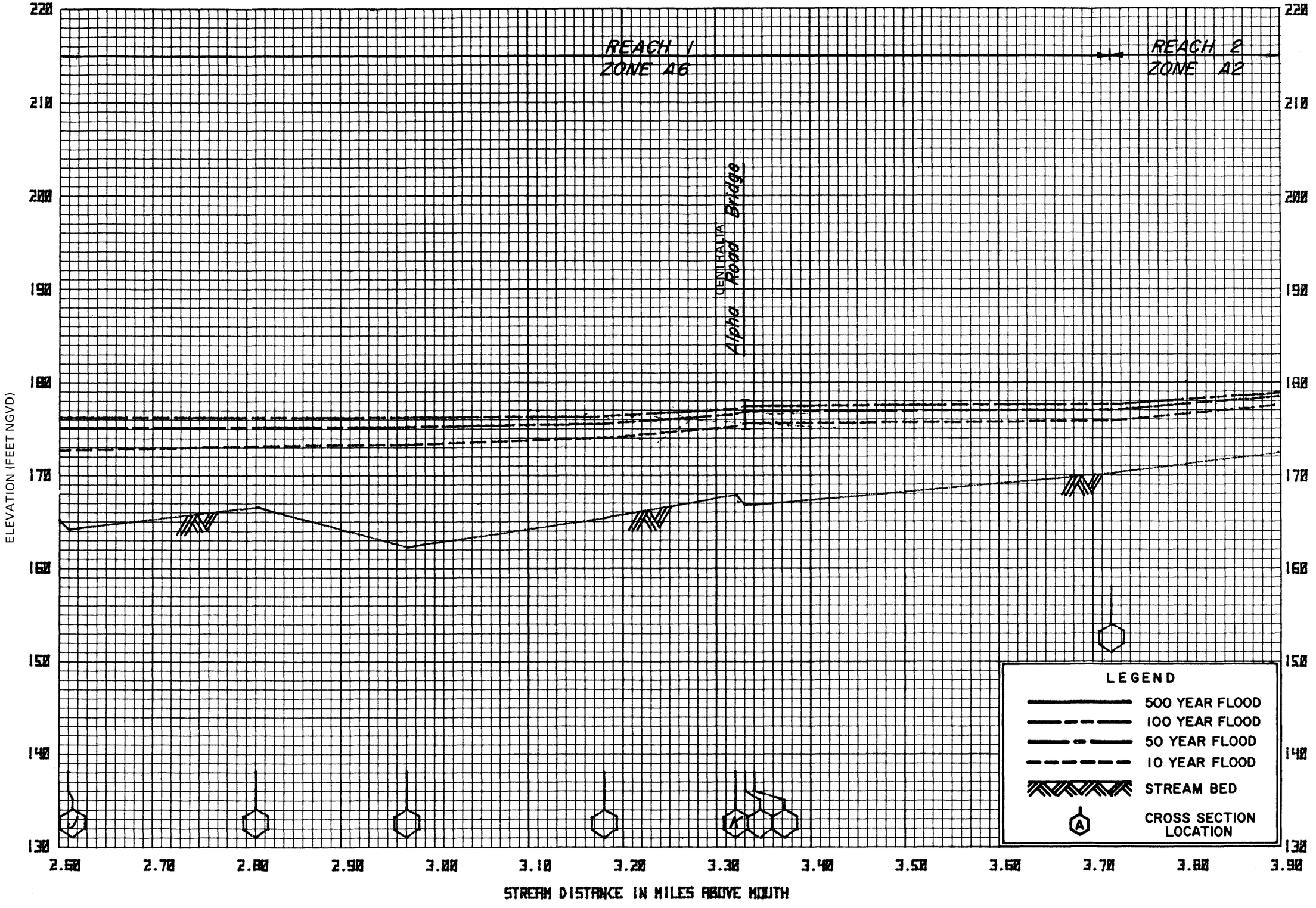
99P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINCORPORATED AREAS)

FLOOD PROFILES

SALZER CREEK



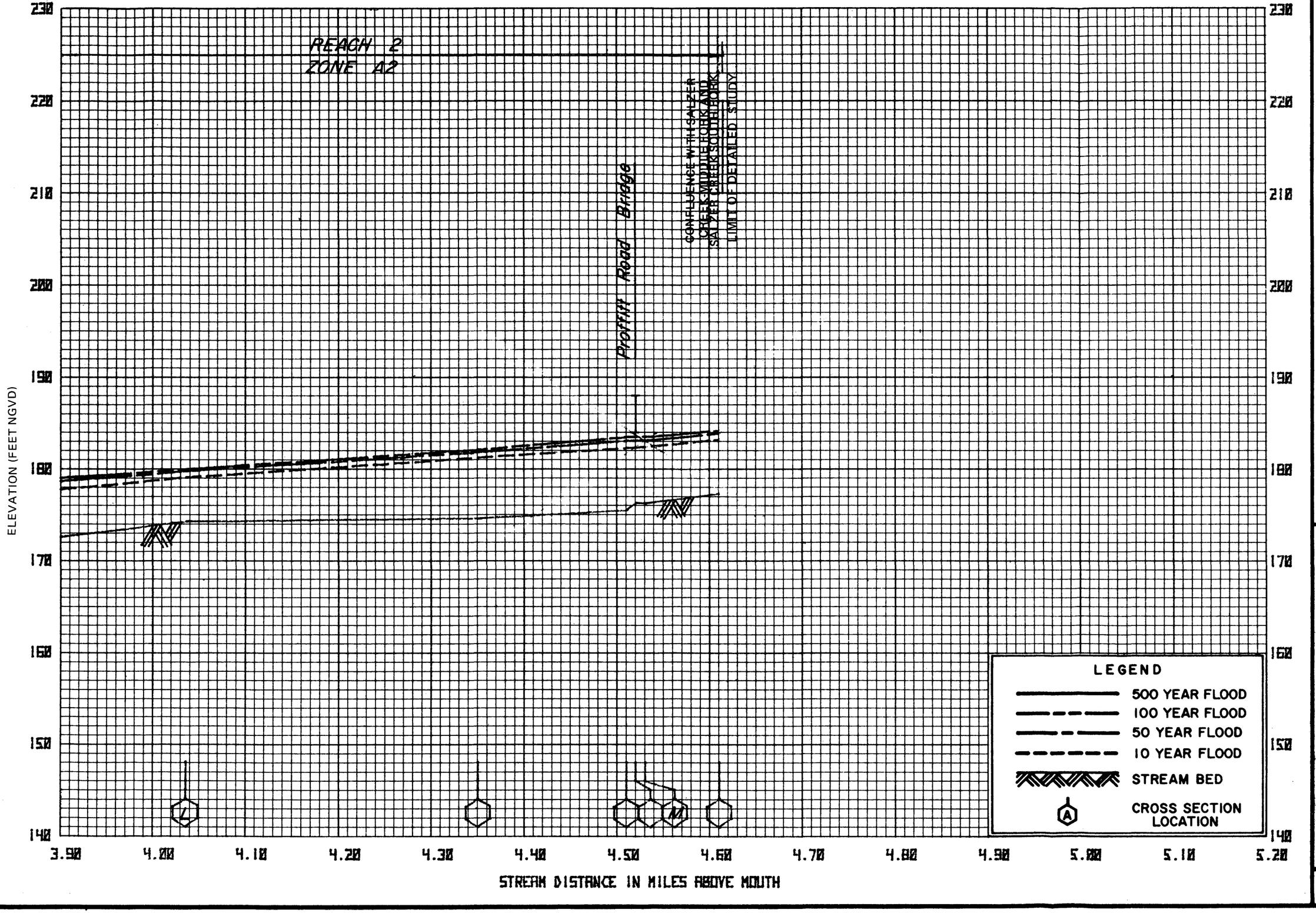
FLOOD PROFILES

SALZER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINCORPORATED AREAS)

100P



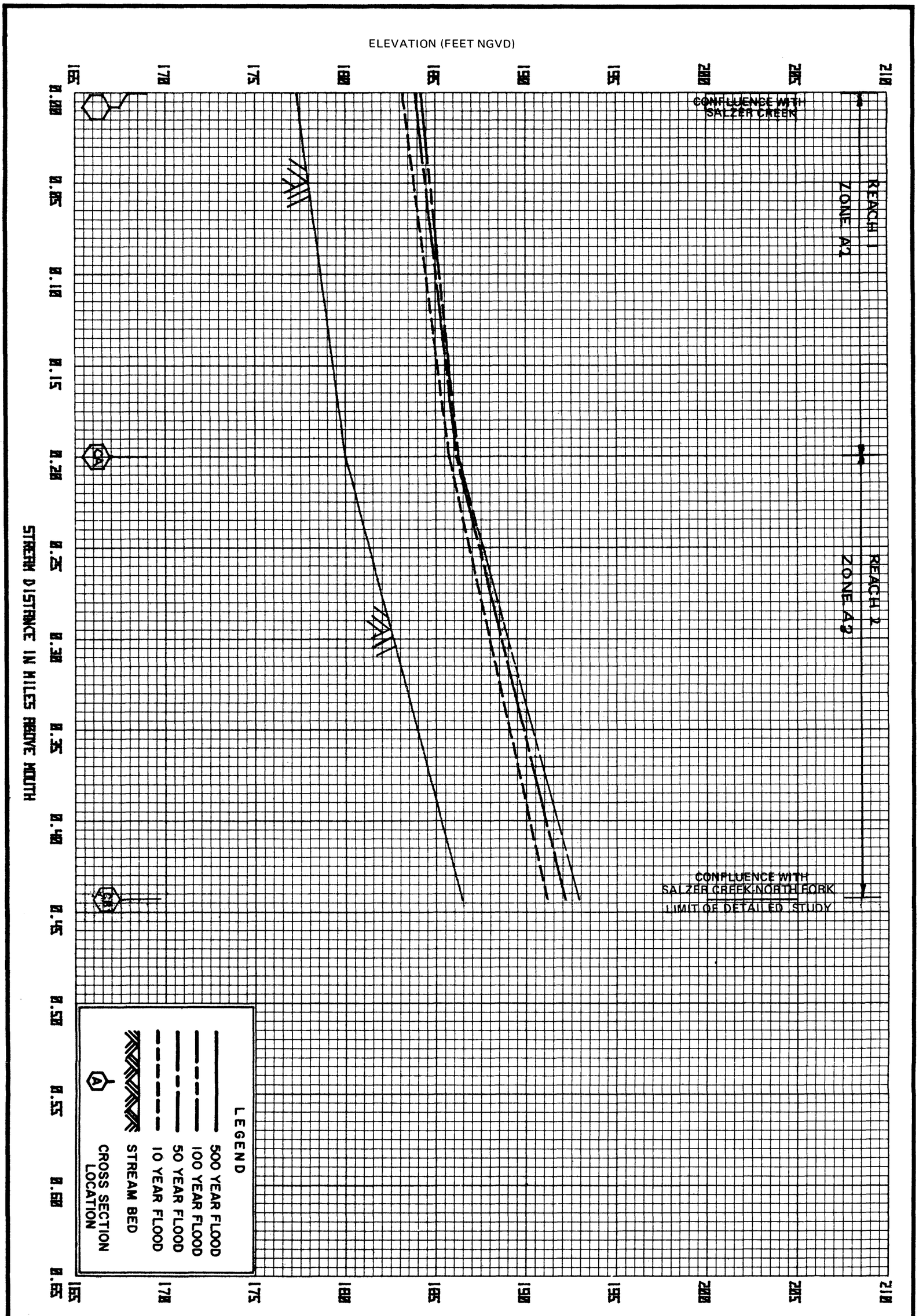
FLOOD PROFILES

SALZER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINCORPORATED AREAS)

101P



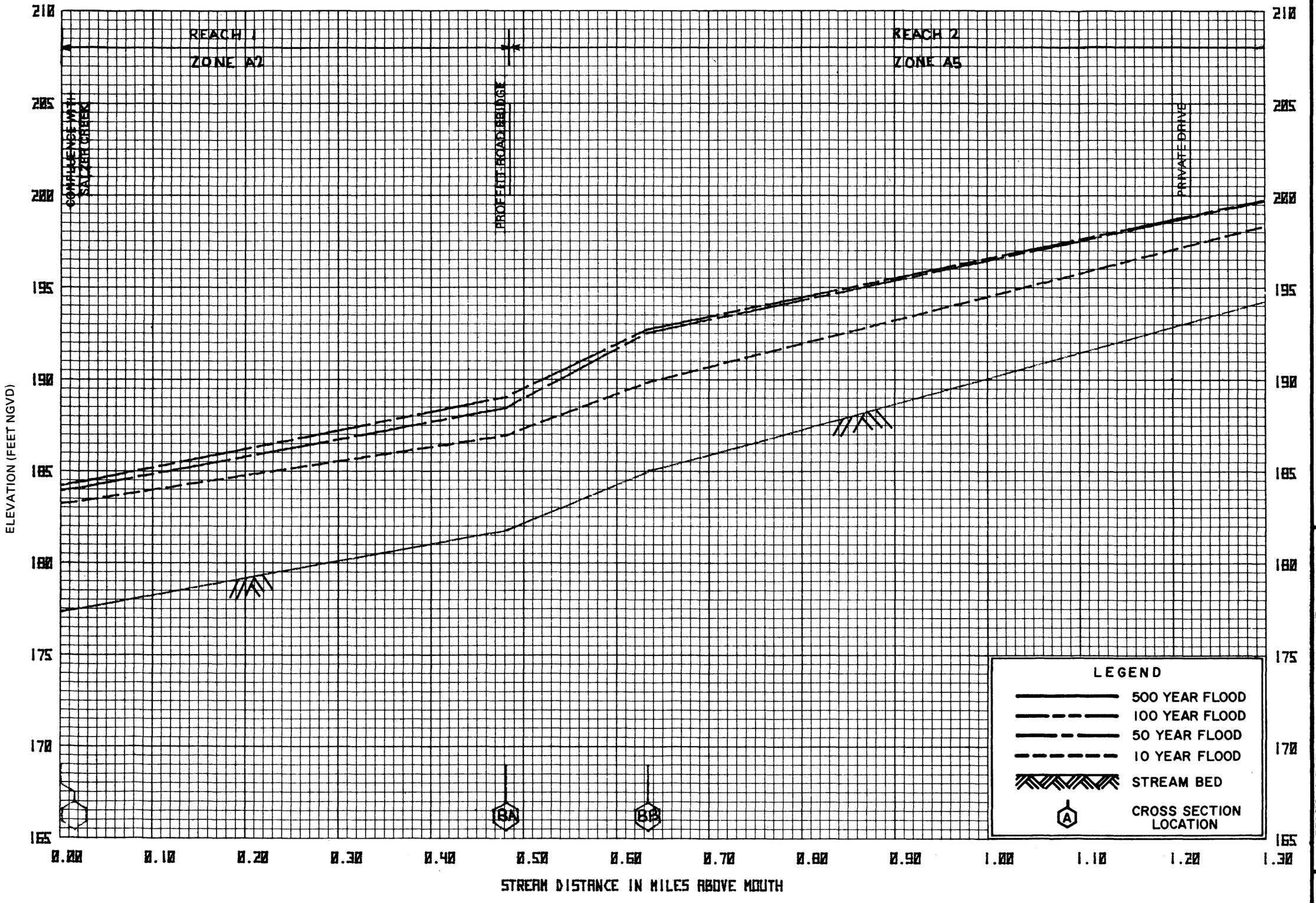
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINCORPORATED AREAS)

FLOOD PROFILES

SALZER CREEK-MIDDLE FORK

102P



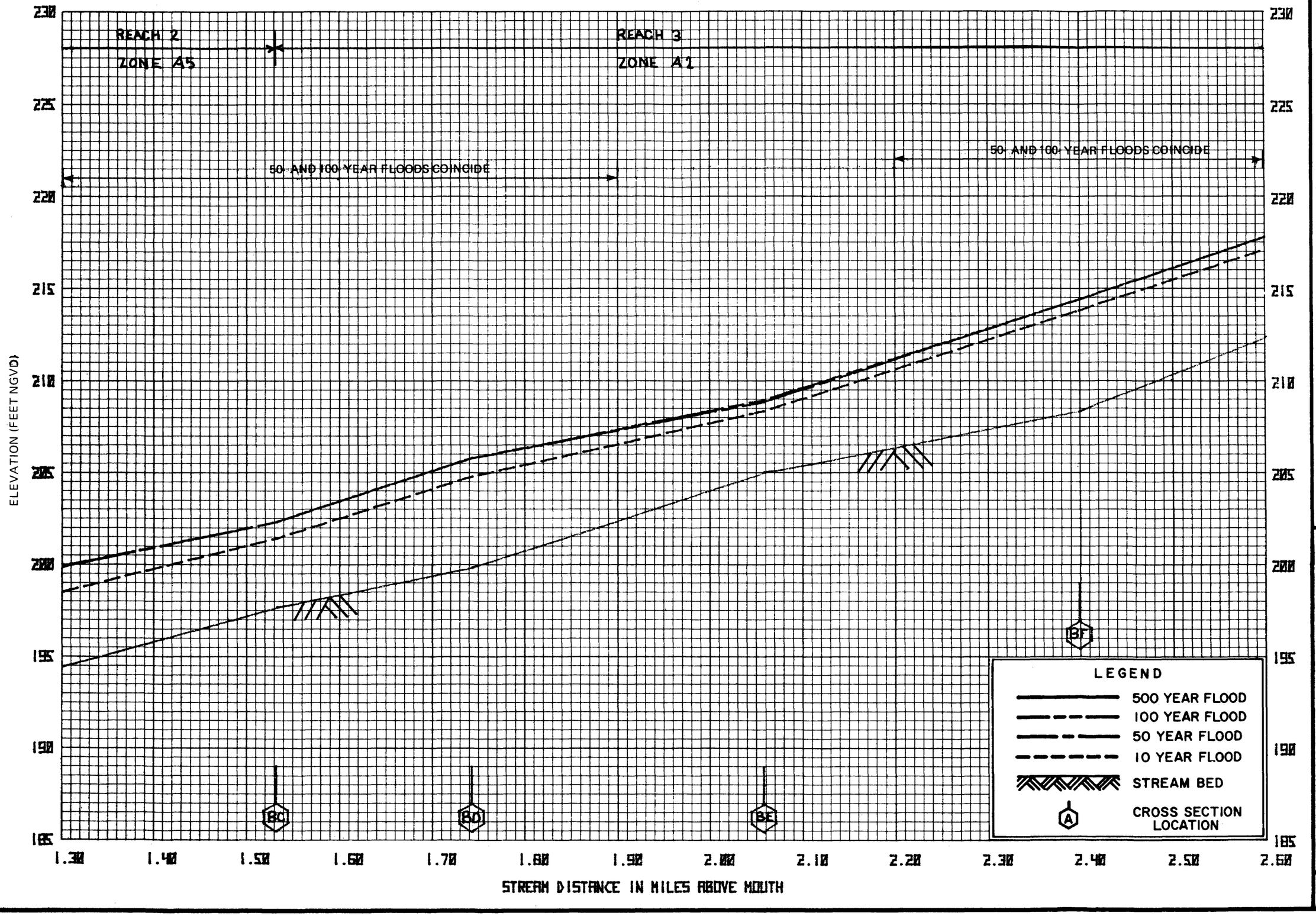
FLOOD PROFILES

SALZER CREEK-SOUTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

103P



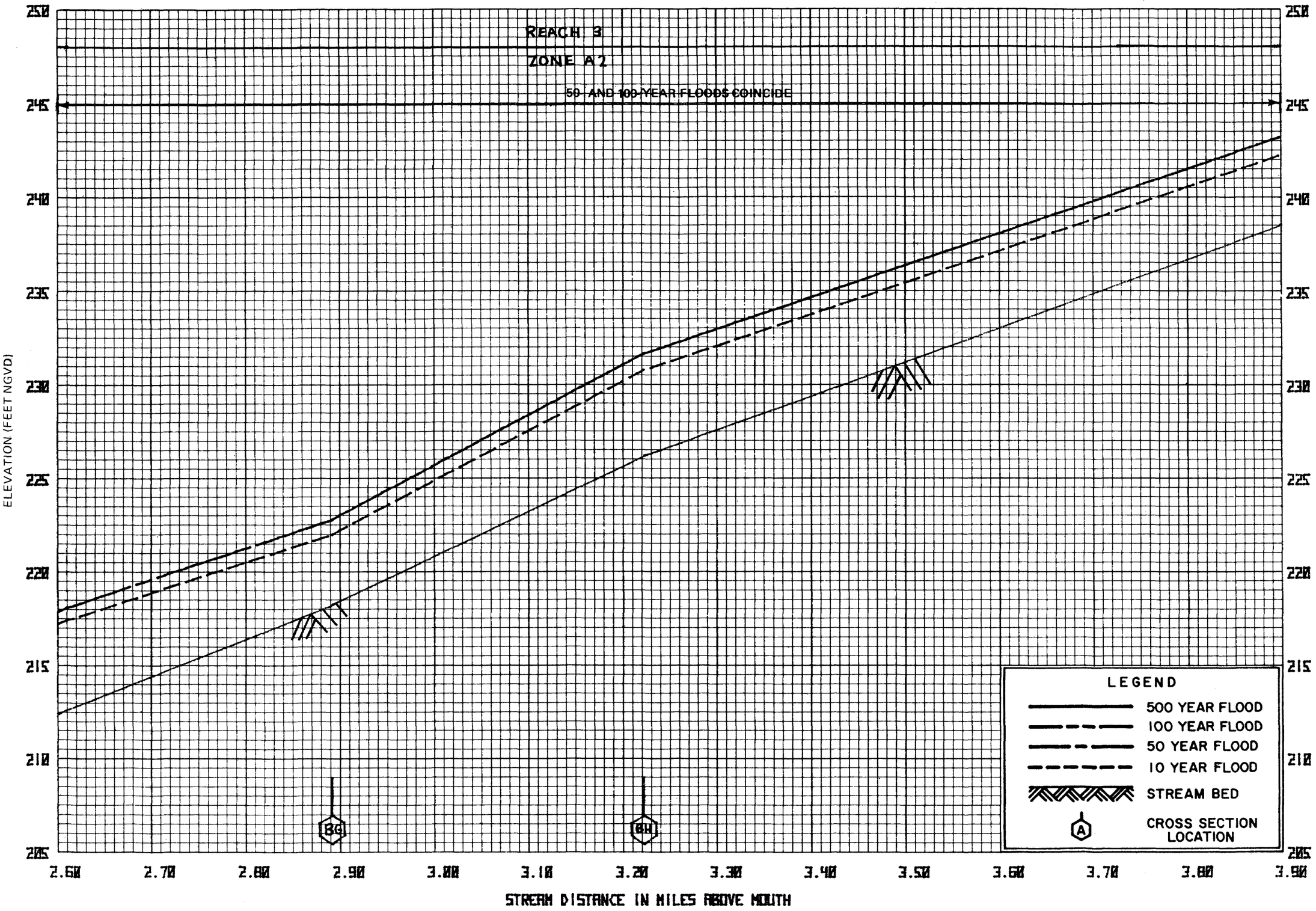
FLOOD PROFILES

SALZER CREEK-SOUTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

104P



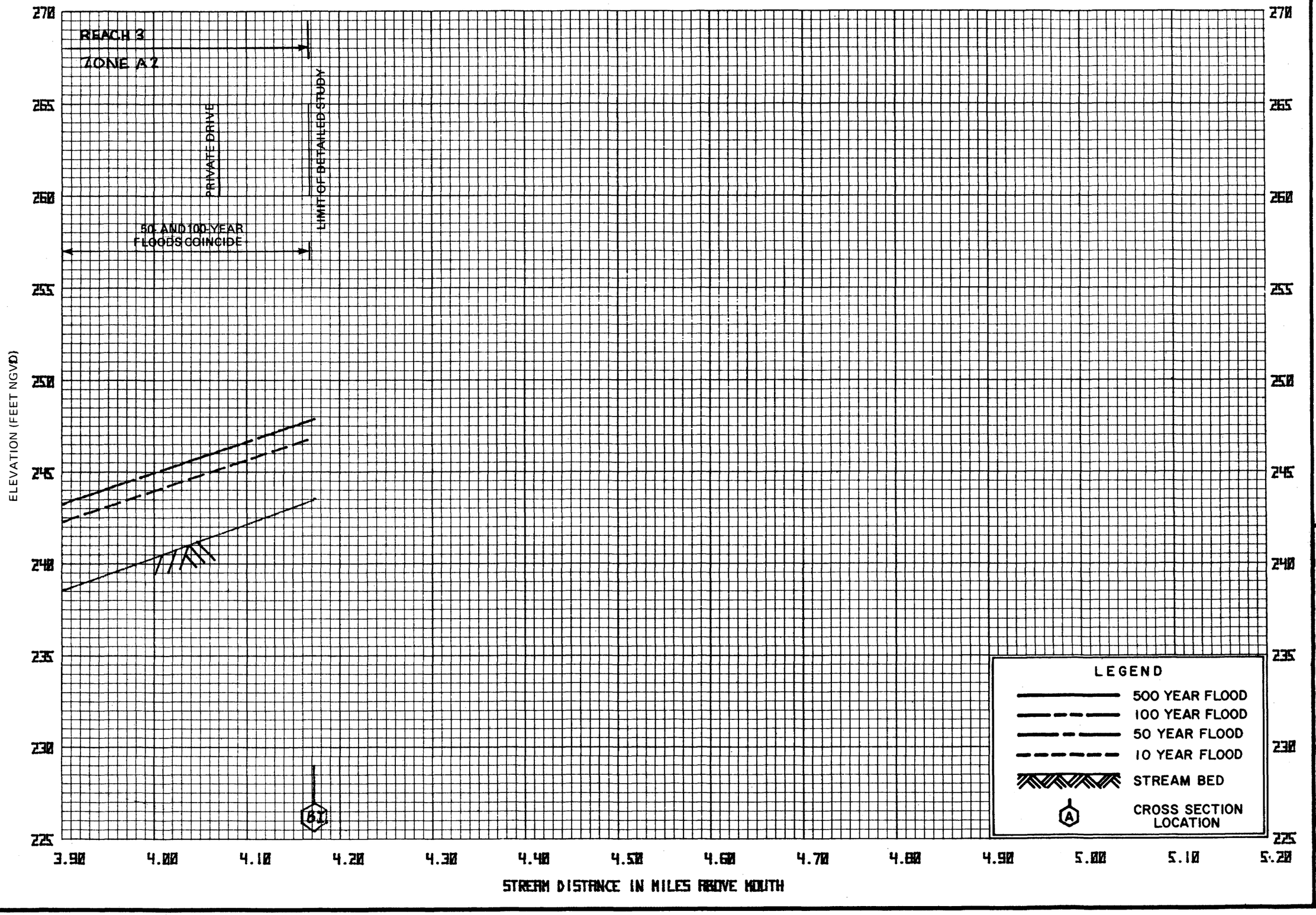
FLOOD PROFILES

SALZER CREEK-SOUTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

105P



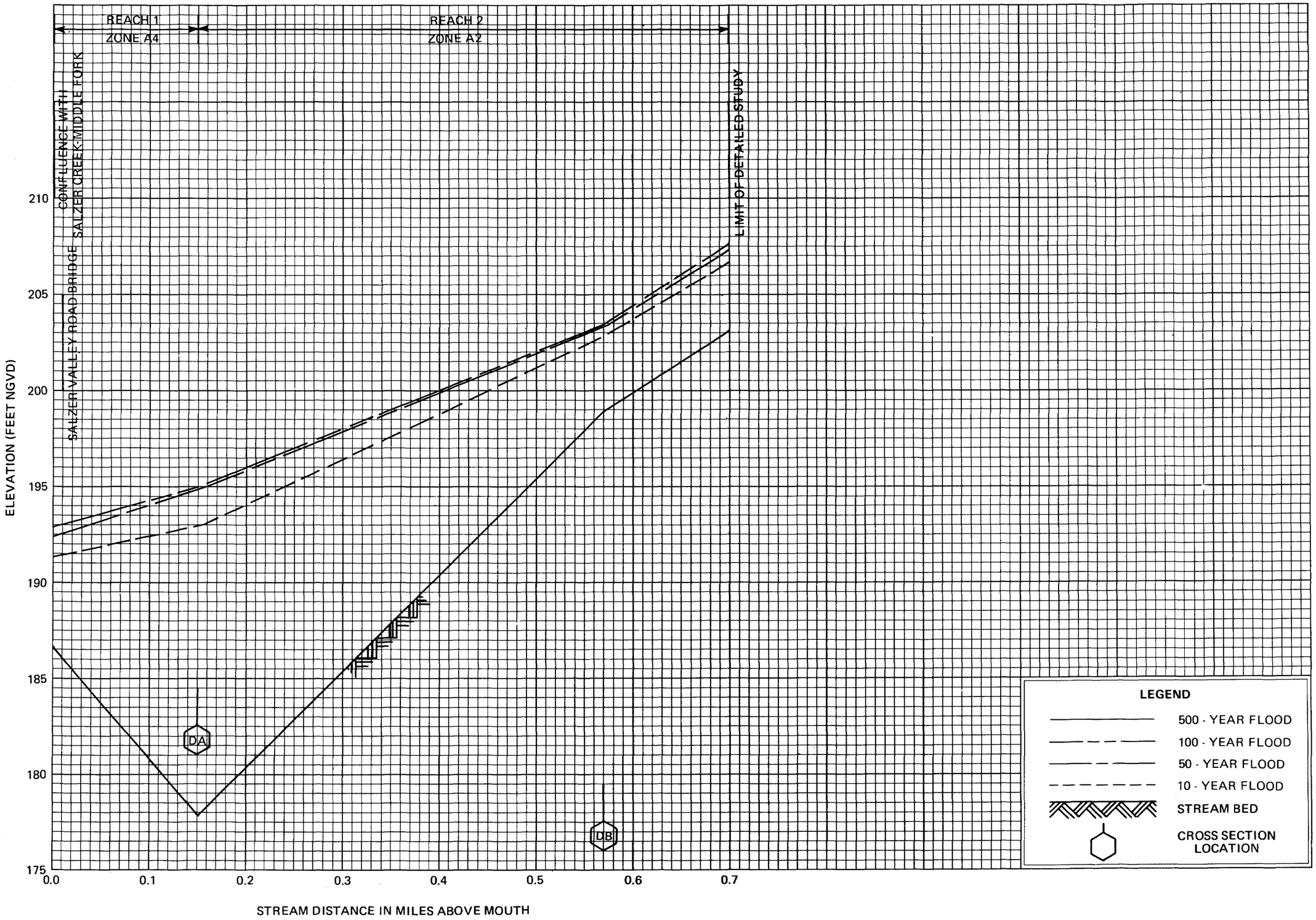
FLOOD PROFILES

SALZER CREEK-SOUTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

106P



FLOOD PROFILES

SALZER CREEK-NORTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

107P

FLOODING CONTROLED BY SOUTH FORK CHEHALIS RIVER

ZONE A5

REACH 1

ZONE A5

Confluence with South Fork Chehalis

CURTIS HILL ROAD BRIDGE

ELEVATION (FEET NGVD)

270
260
250
240
230
220
210
200
190
180

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30

STREAM DISTANCE IN MILES ABOVE MOUTH

A B C D

LEGEND

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

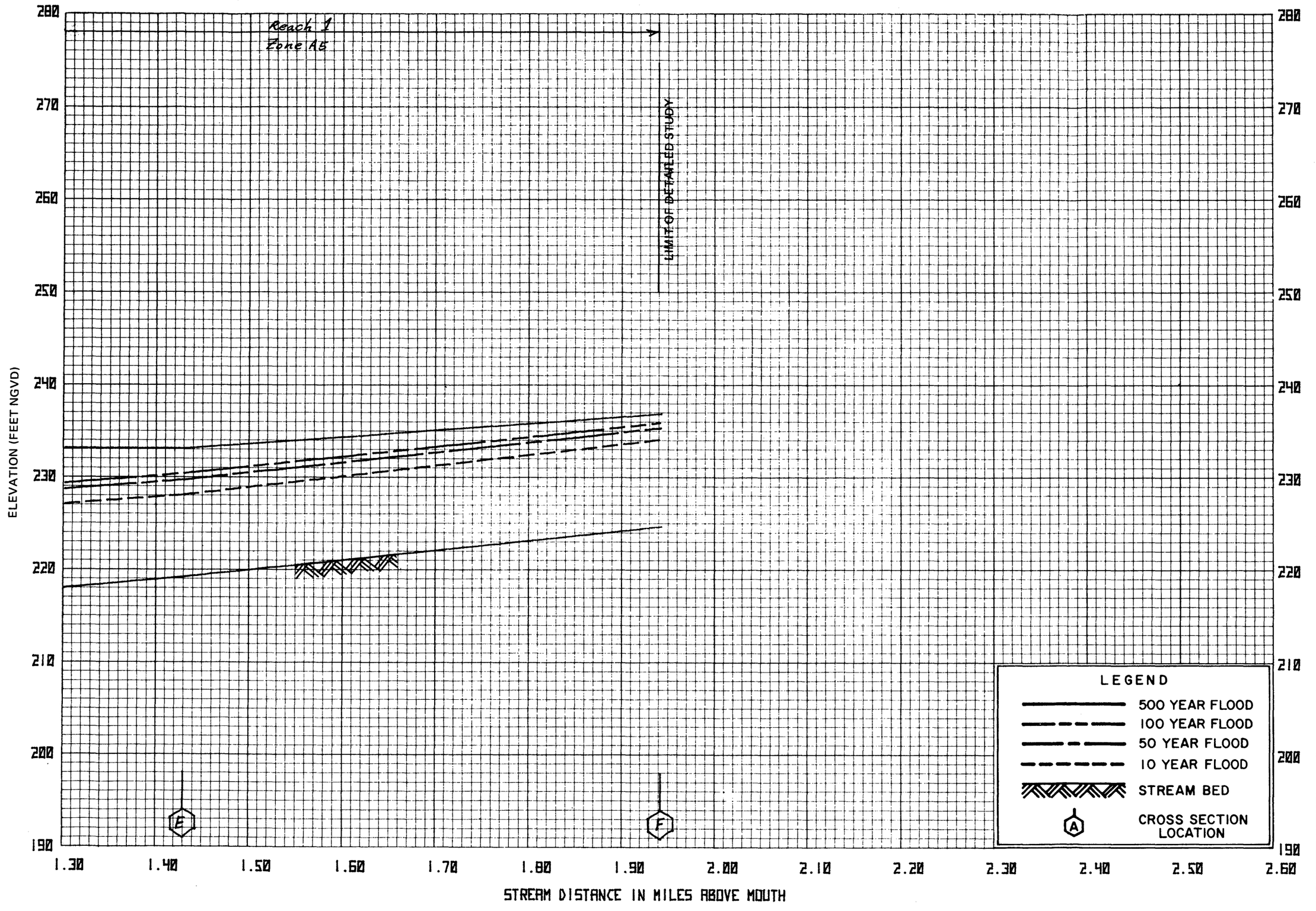
FLOOD PROFILES

LAKE CREEK (TRIBUTARY TO SOUTH FORK CHEHALIS RIVER)

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

108P



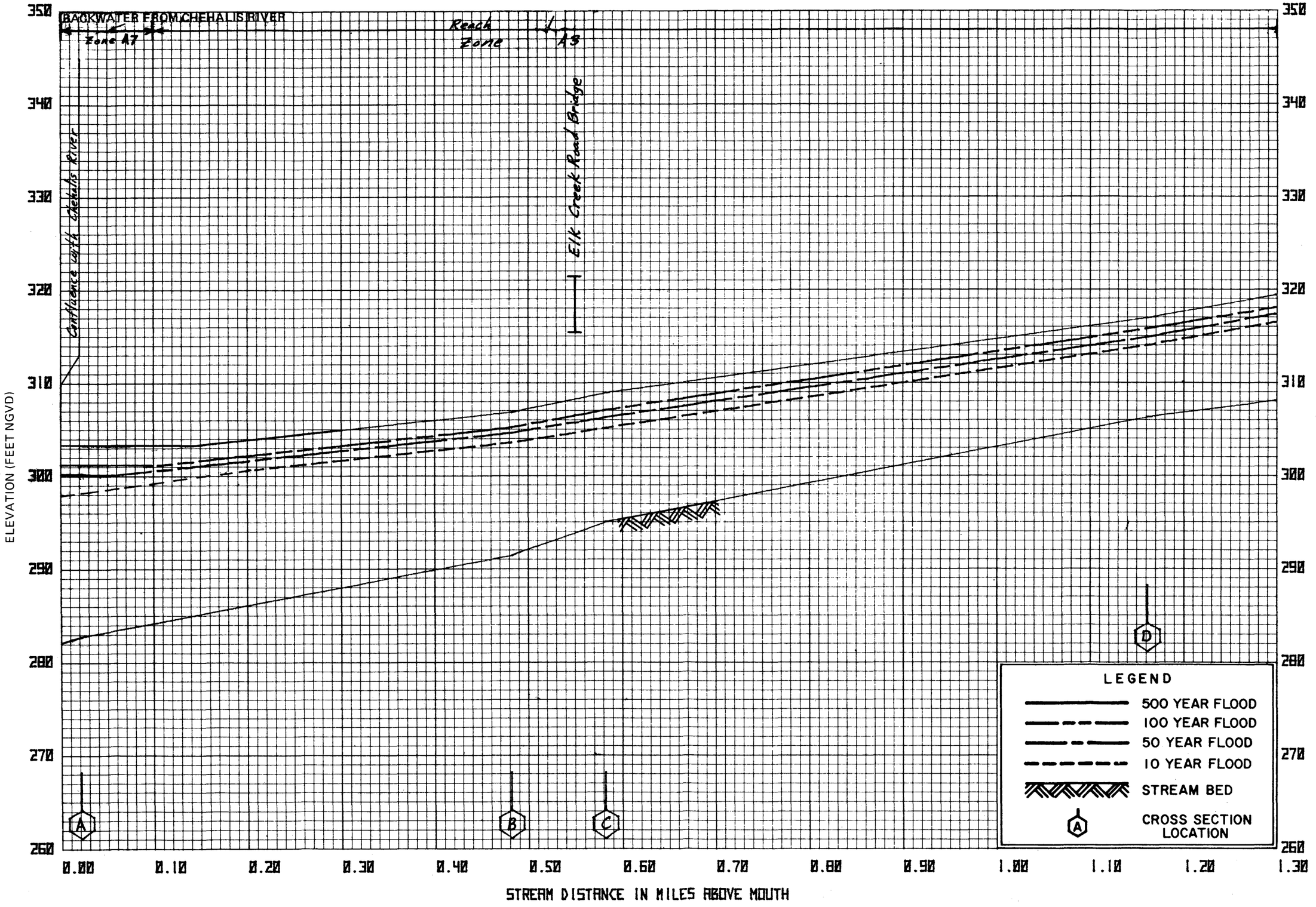
FLOOD PROFILES

LAKE CREEK (TRIBUTARY TO SOUTH FORK CHEHALIS RIVER)

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

109P



FLOOD PROFILES

ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

110P

REACH 1
ZONE A3

FOREST SERVICE ROAD N1000

ELEVATION (FEET NGVD)

370
360
350
340
330
320
310
300

1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60

STREAM DISTANCE IN MILES ABOVE MOUTH

E F G H

LEGEND

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

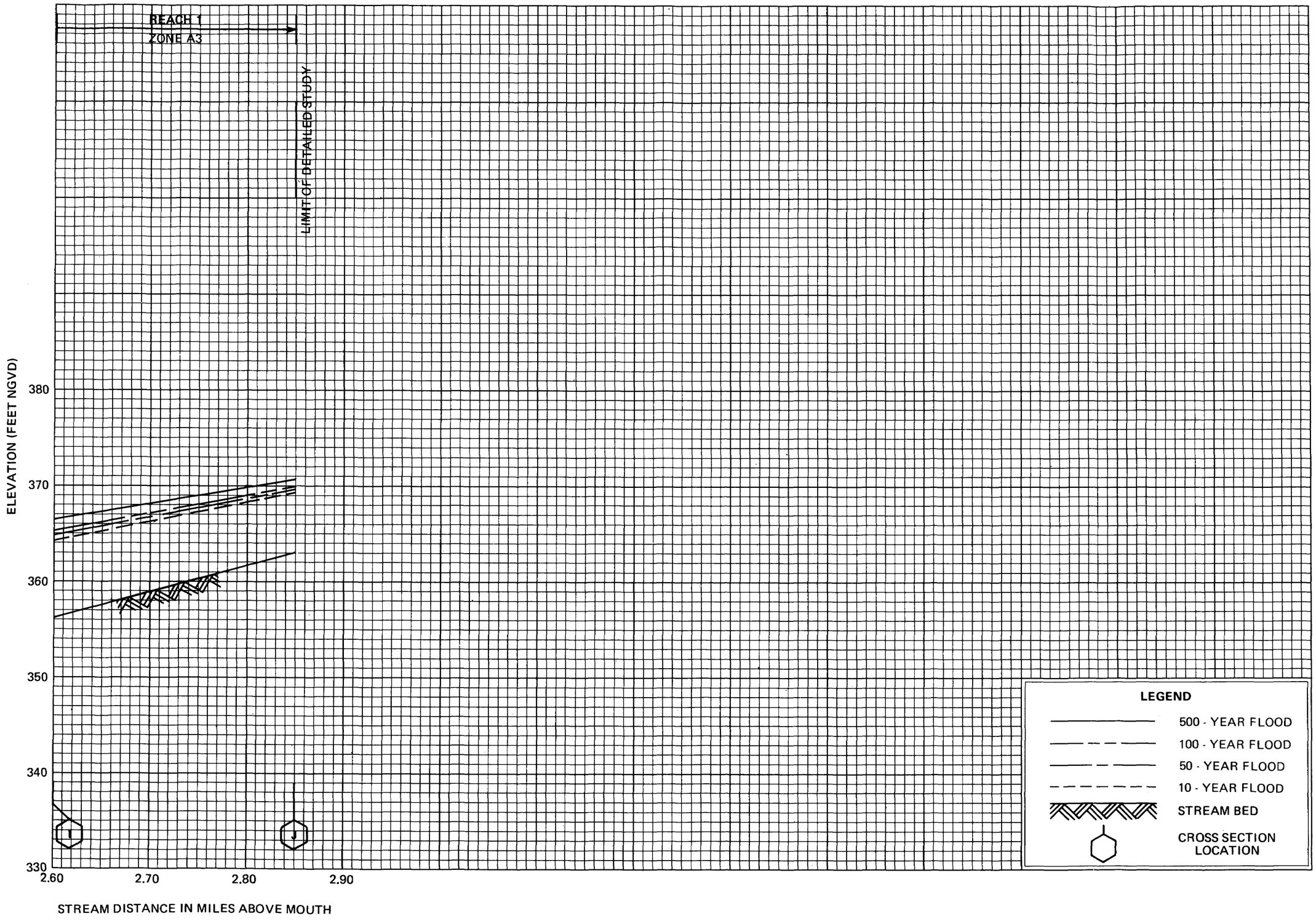
FLOOD PROFILES

ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

111P

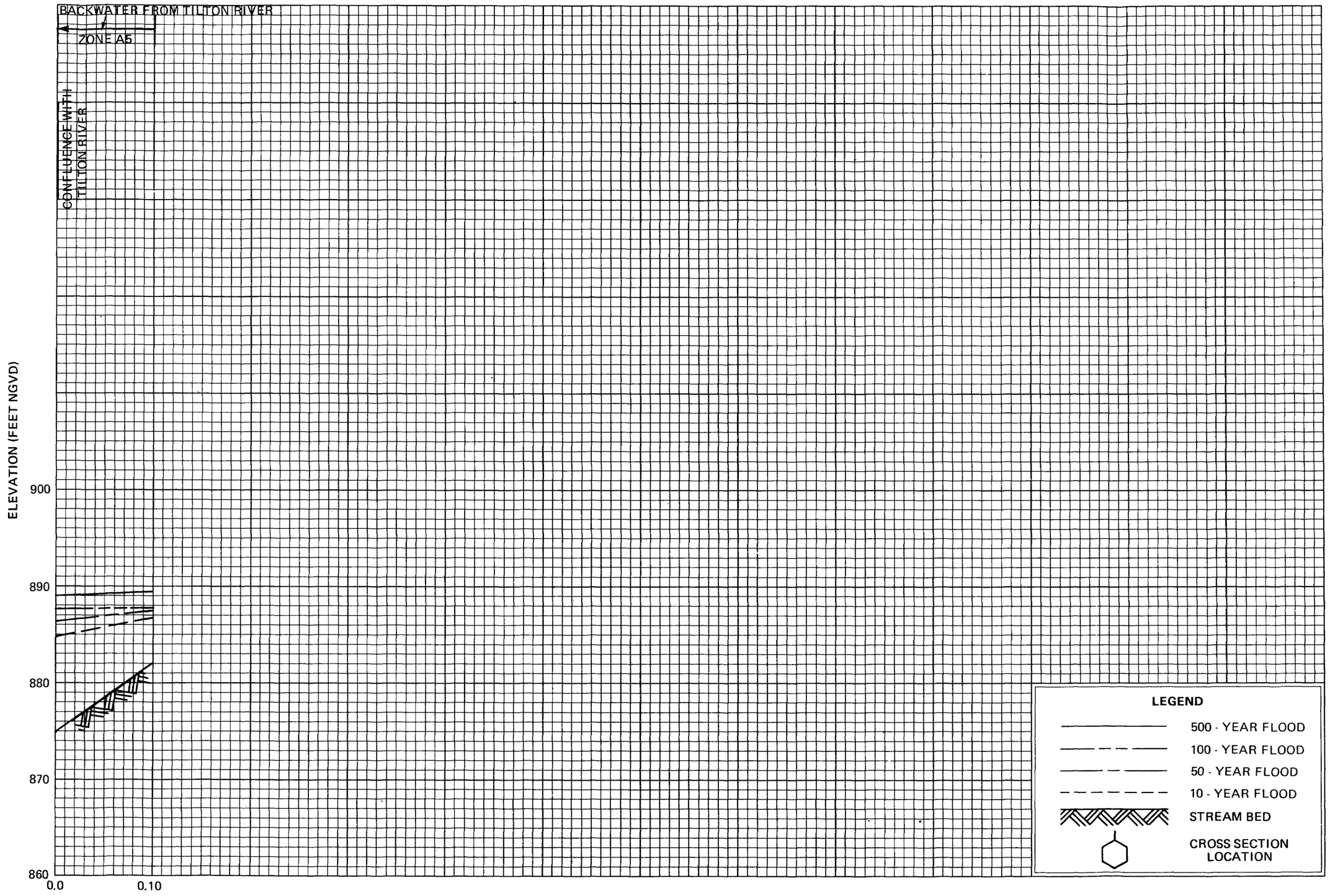


FLOOD PROFILES

ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)



FLOOD PROFILES

LAKE CREEK (TRIBUTARY TO TILTON RIVER)

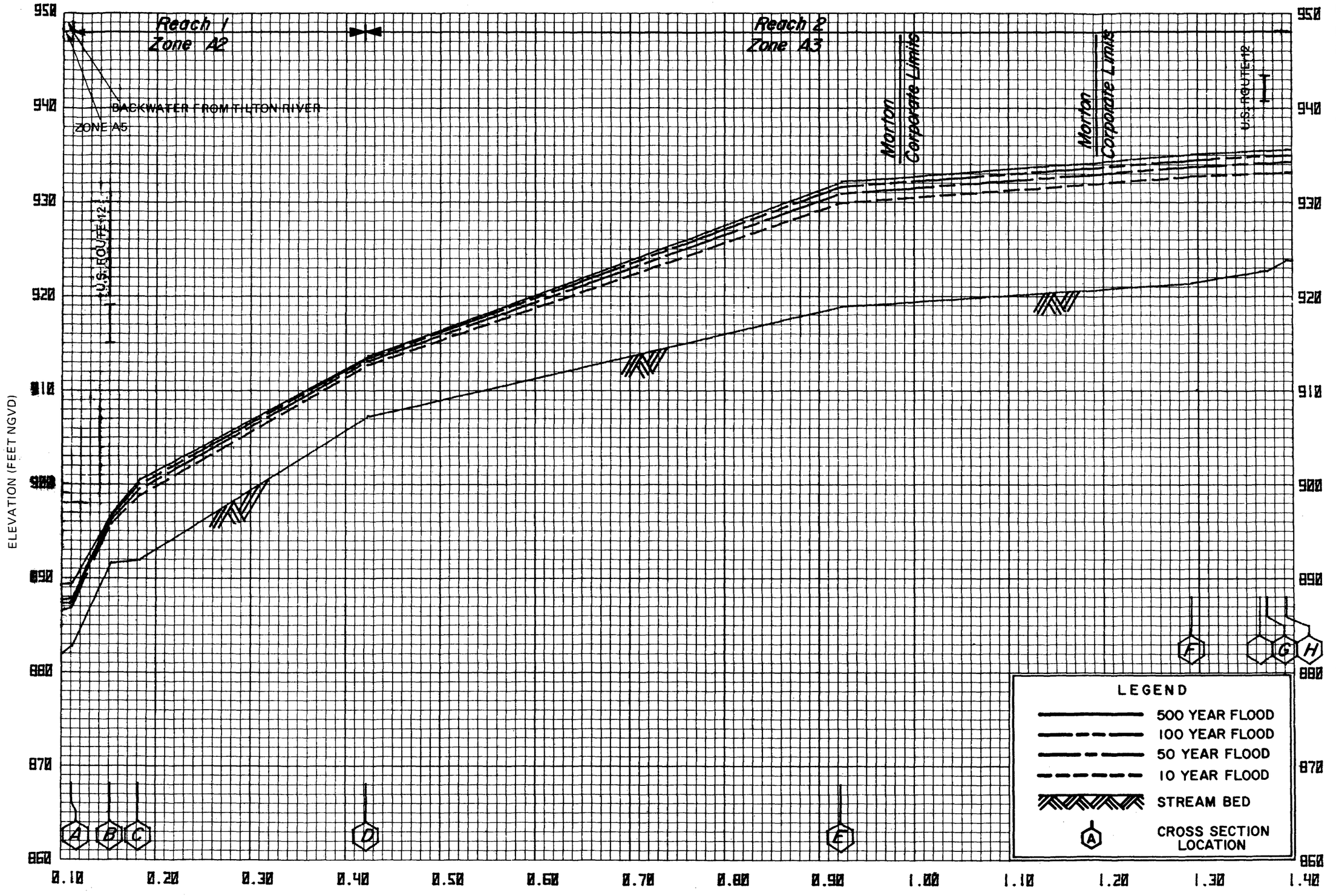
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

113P

FLOOD PROFILES

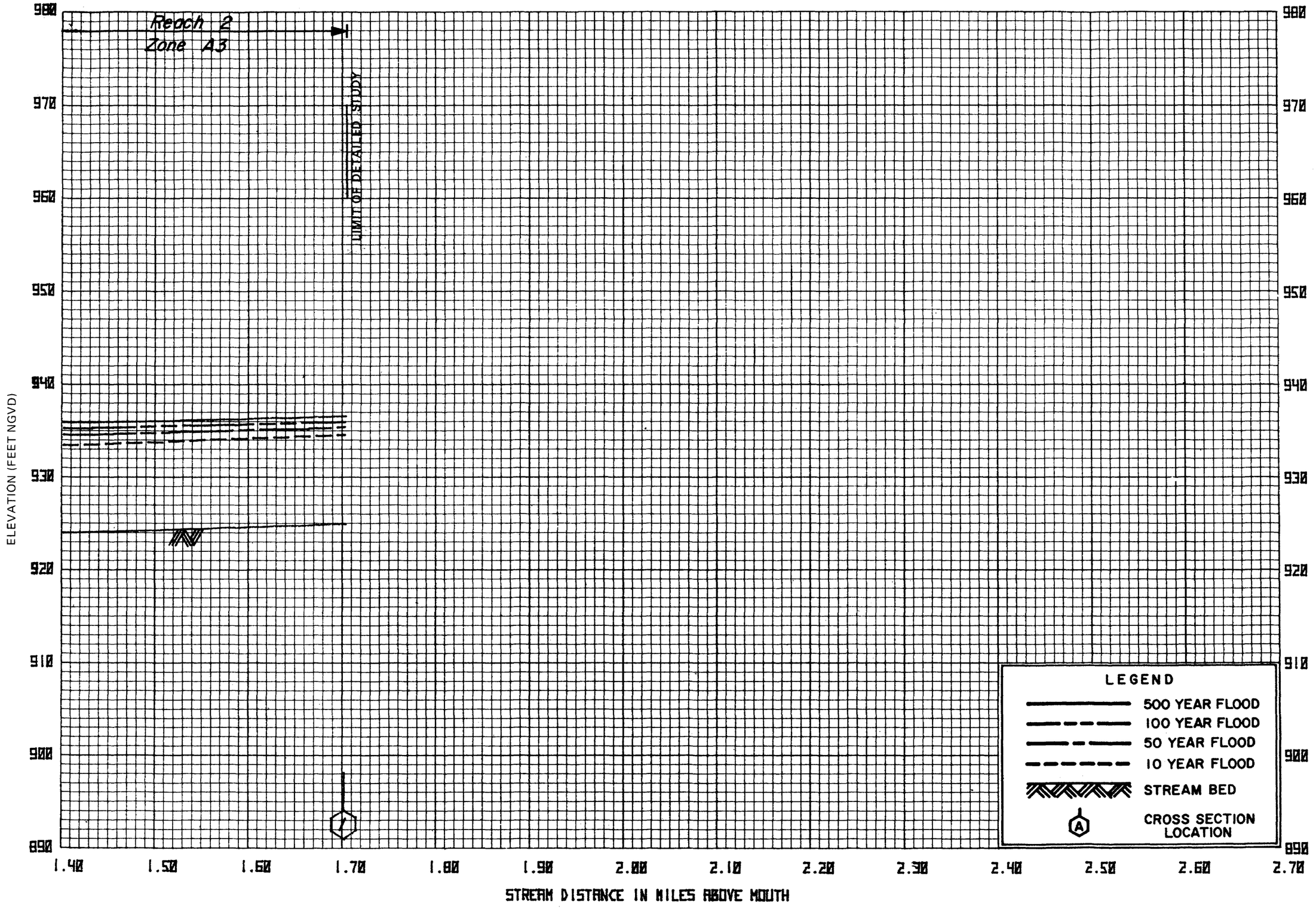
LAKE CREEK (TRIBUTARY TO TILTON RIVER)



FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

114P



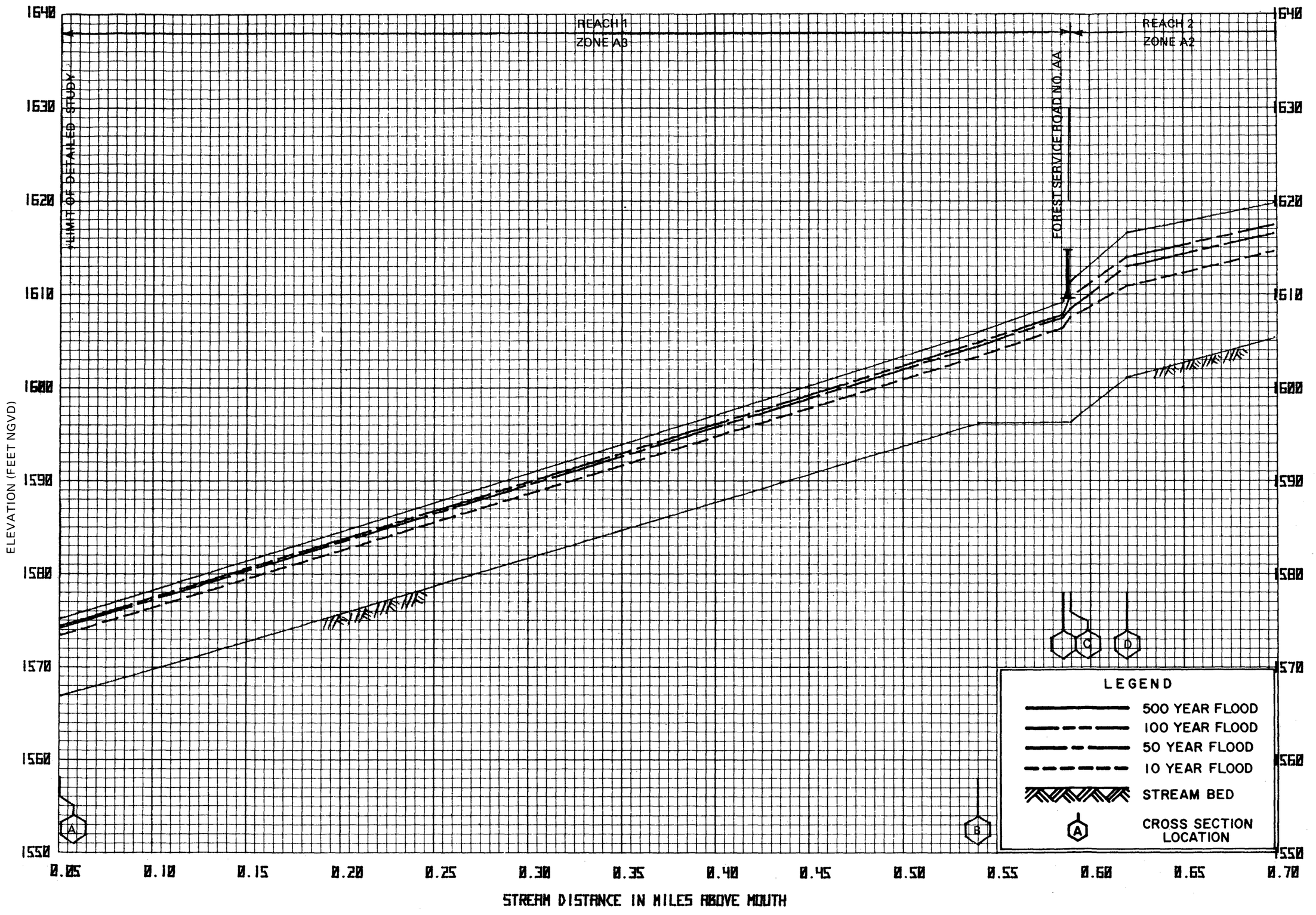
FLOOD PROFILES

LAKE CREEK (TRIBUTARY TO TILTON RIVER)

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

115P



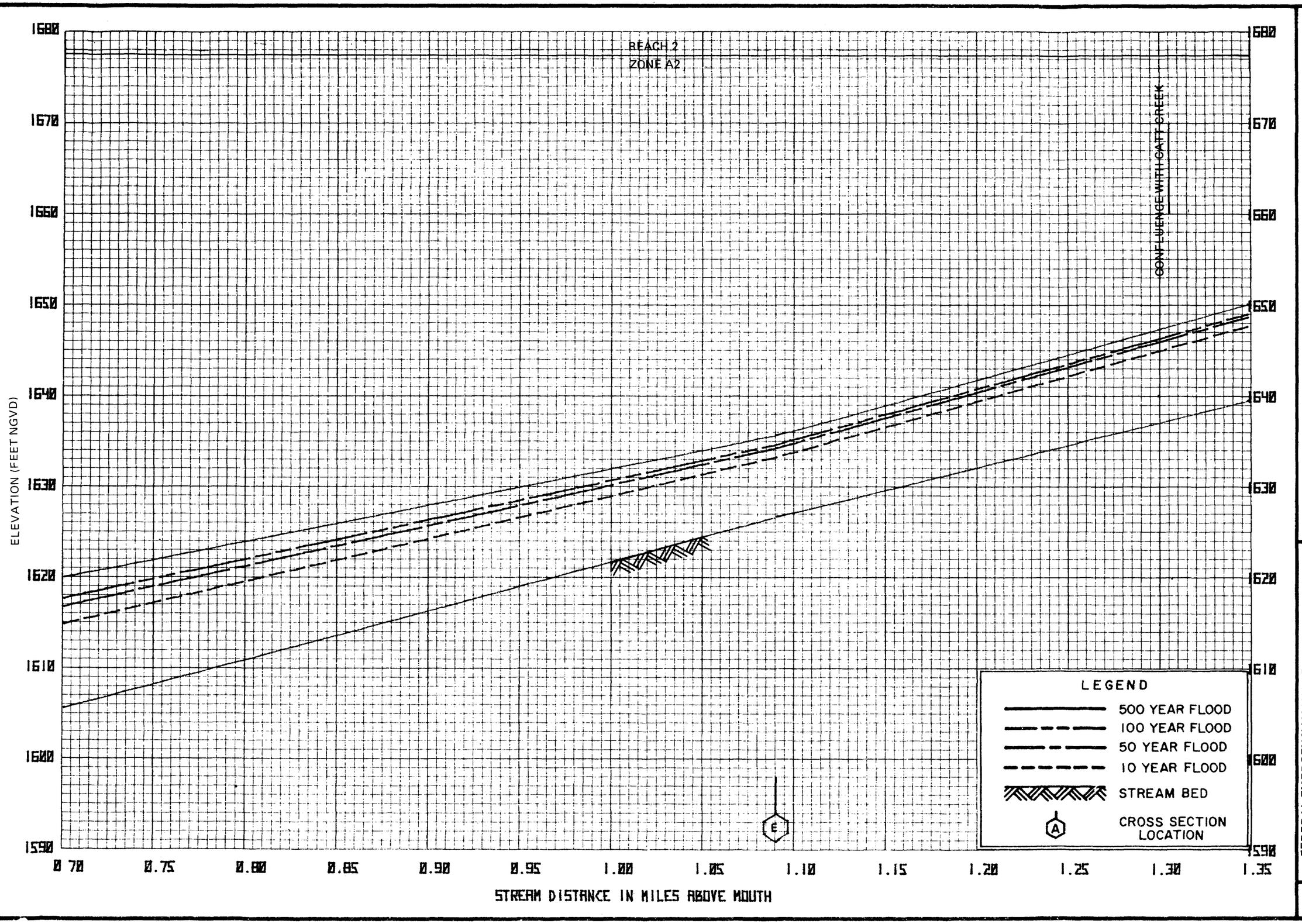
FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

116P



FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

117P

REACH 2
ZONE A2

OSBORN ROAD

FOREST SERVICE ROAD NO. 88

ELEVATION (FEET NGVD)

1710
1700
1690
1680
1670
1660
1650
1640
1630
1620

1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00

STREAM DISTANCE IN MILES ABOVE MOUTH

F G H I

LEGEND

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

FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

118P

REACH 2
ZONE A2

ELEVATION (FEET NGVD)

1760
1750
1740
1730
1720
1710
1700
1690
1680
1670

2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65

STREAM DISTANCE IN MILES ABOVE MOUTH

LEGEND

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

FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

119P

REACH 2
ZONE A2

OSBORN ROAD
FOREST SERVICE ROAD NO. 66

ELEVATION (FEET NGVD)

1790
1780
1770
1760
1750
1740
1730
1720
1710
1700

2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30

STREAM DISTANCE IN MILES ABOVE MOUTH

K L M N

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

FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

120P

REACH 2
ZONE A2

FOREST SERVICE ROAD NO. 00

ELEVATION (FEET NGVD)

1830
1820
1810
1800
1790
1780
1770
1760
1750
1740

3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95

STREAM DISTANCE IN MILES ABOVE MOUTH

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

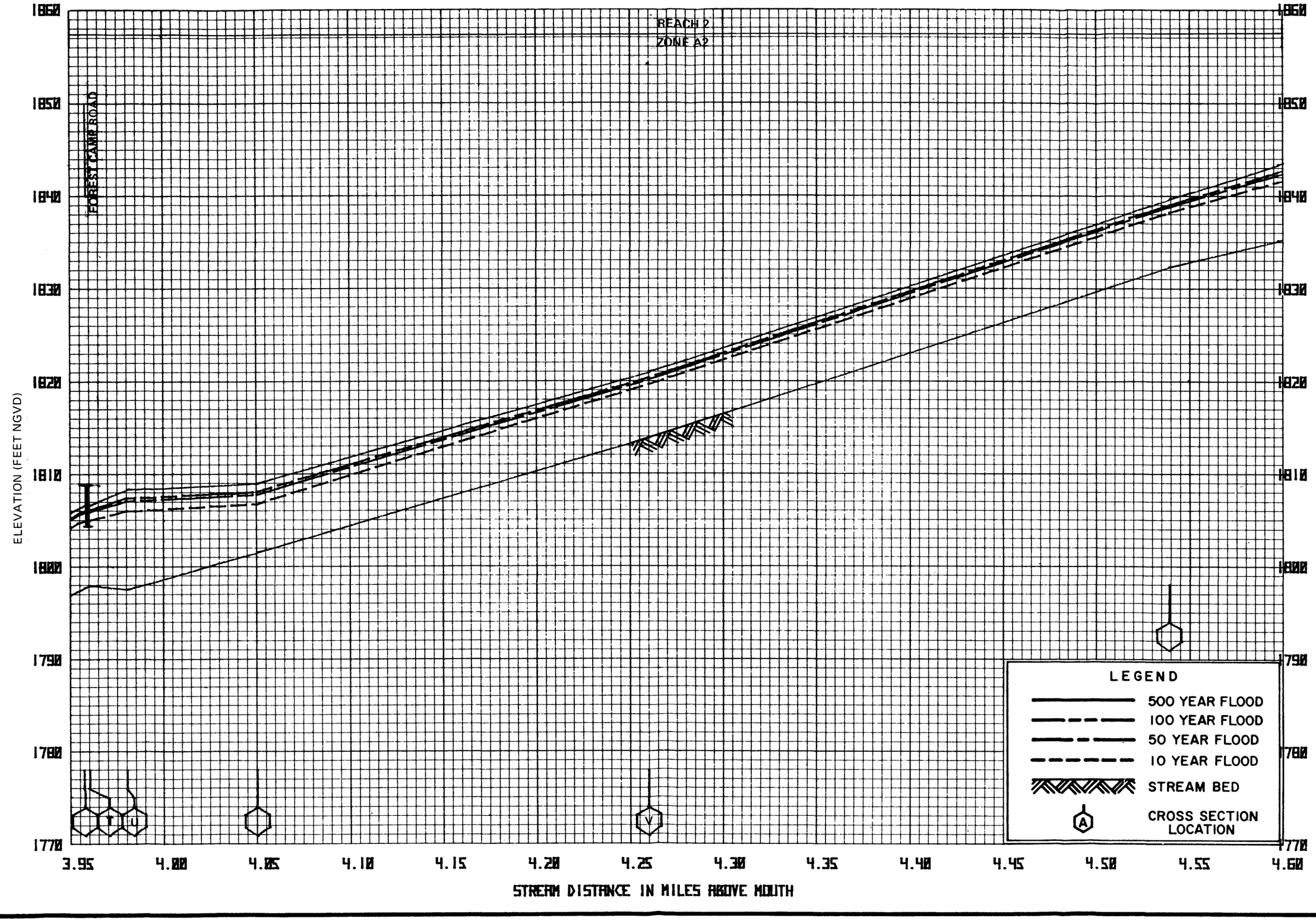
FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

121P



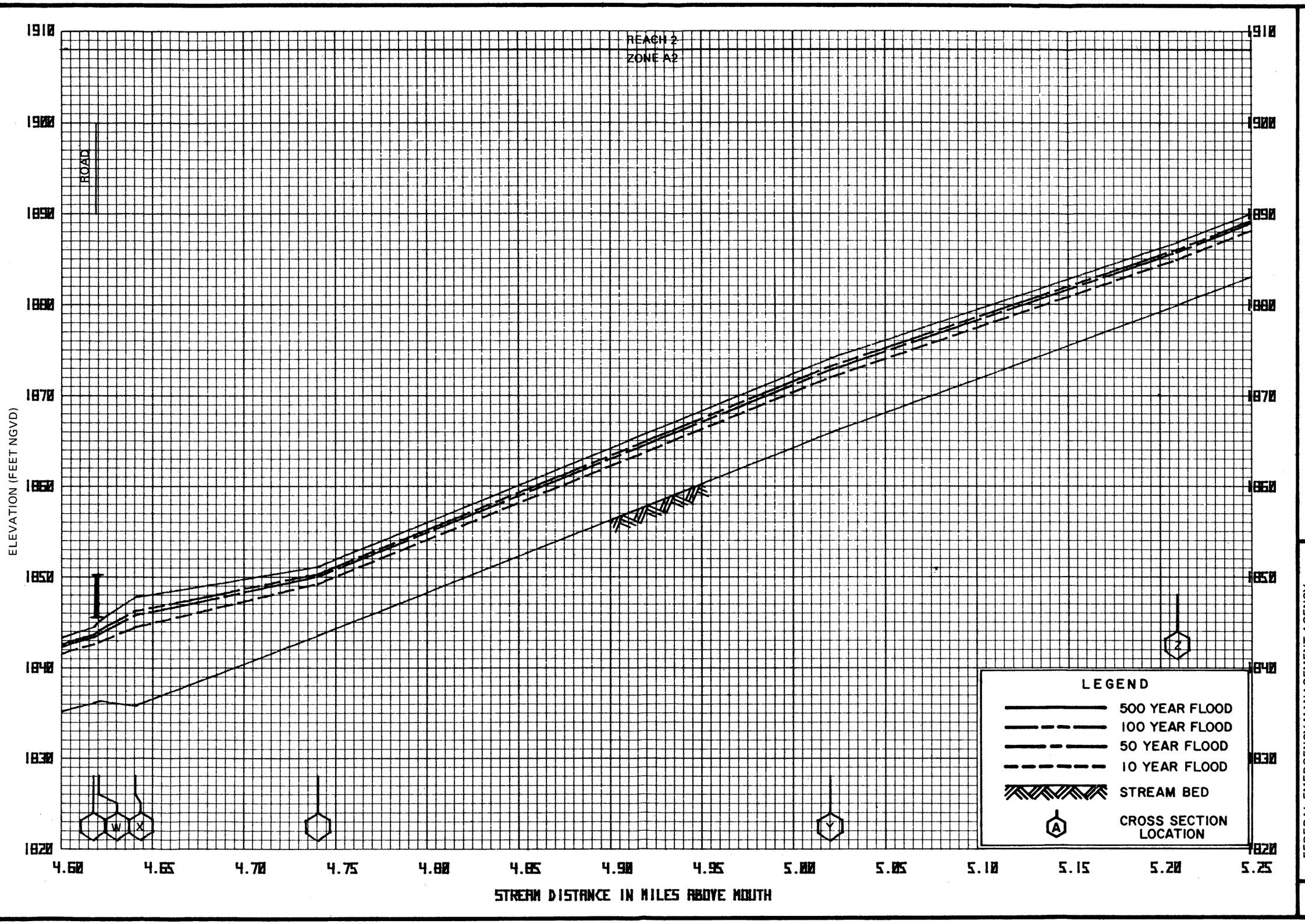
FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

122P



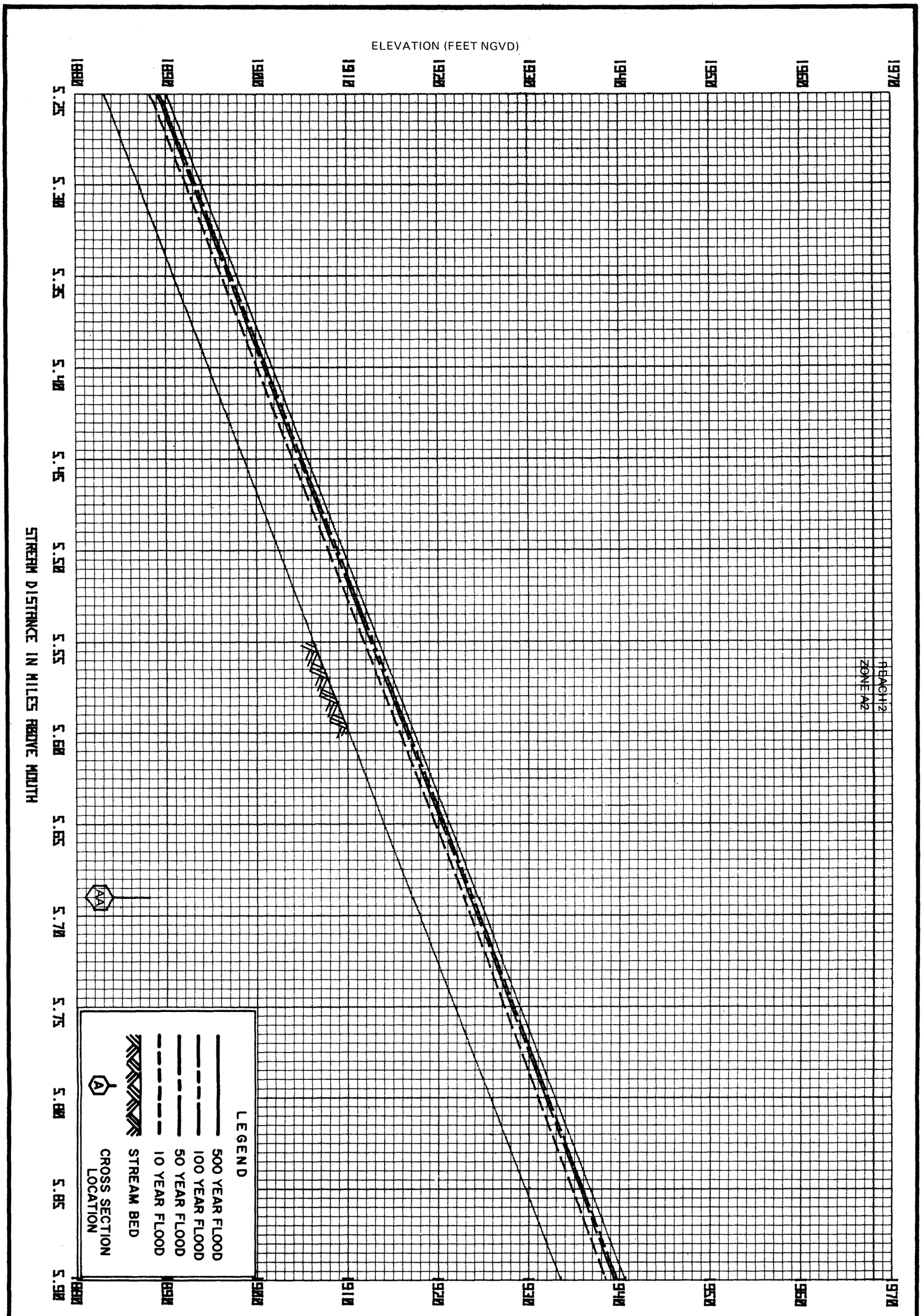
FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

123P



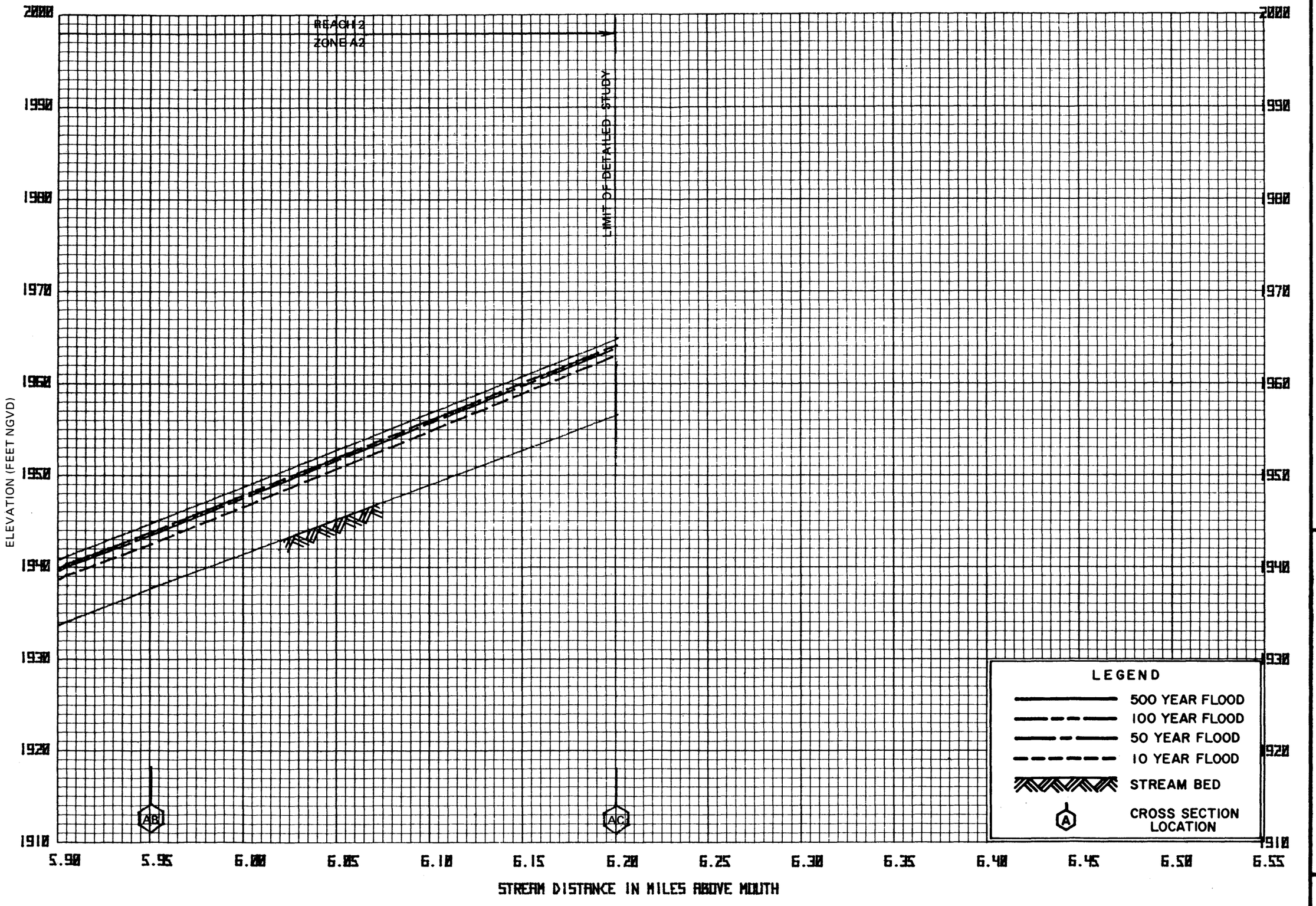
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

BIG CREEK

124P



FLOOD PROFILES

BIG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREAS)

125P

REACH 1
ZONE AB

Limit of Detailed Study
COUNTY LIMITS

Corporate Limit
TOWN OF VADER

BURLINGTON NORTHERN
RAILROAD BRIDGE

ELEVATION (FEET NGVD)

130
120
110
100
90
80
70
60
50
40

2.00 2.10 2.20 2.30 2.40 2.50 2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30

STREAM DISTANCE IN MILES ABOVE MOUTH

A B C D E F G

LEGEND

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

FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

126P

ELEVATION (FEET NGVD)

STREAM DISTANCE IN MILES ABOVE MOUTH

CONFLUENCE WITH STILLWATER CREEK

VADER ROAD (State Bridge 506/1104)

CONFLUENCE WITH McMURPHY CREEK

TOWN OF VADER Corporate Limit

REACH 1 ZONE AE

LEGEND

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

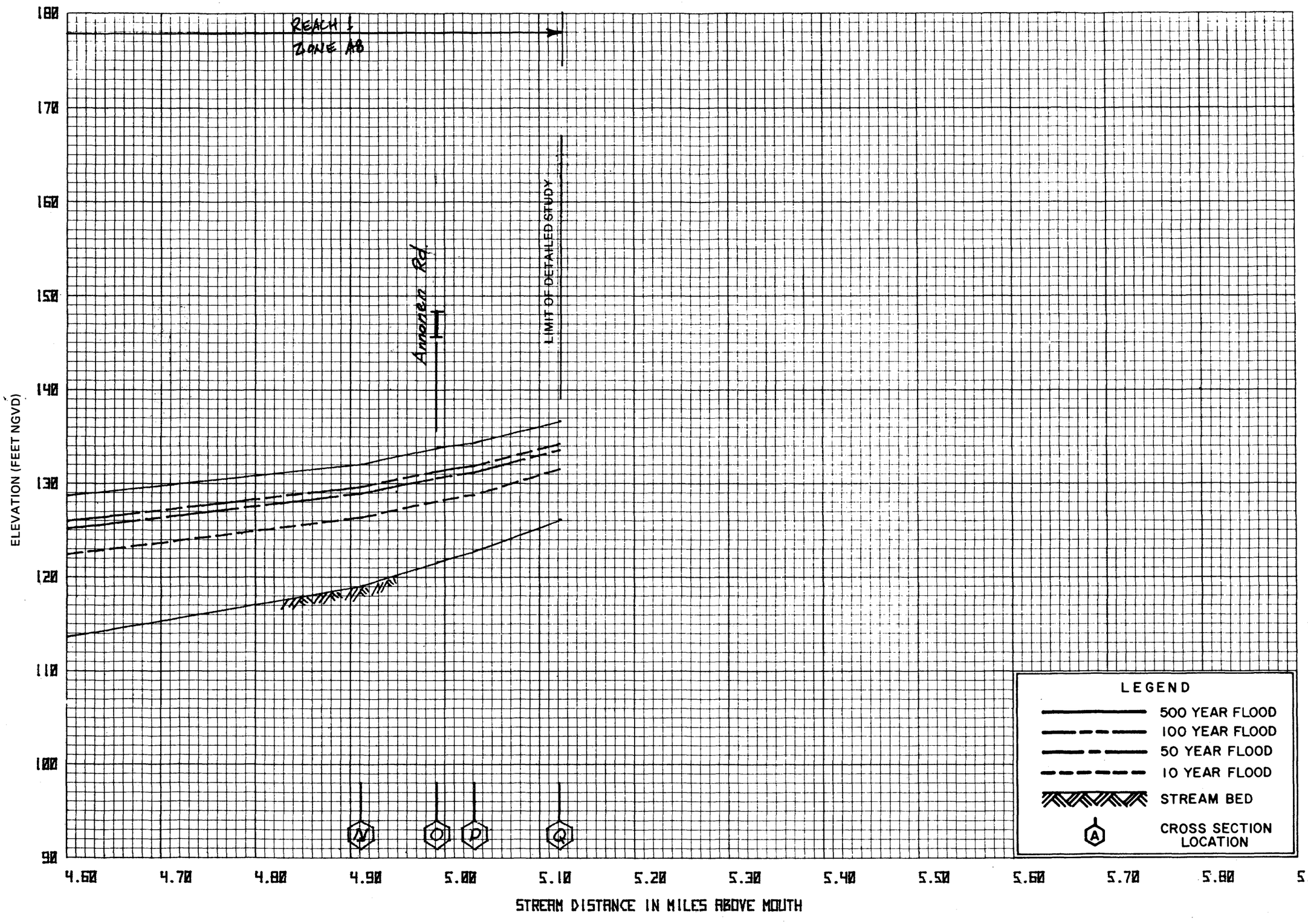
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

OLEQUA CREEK

127P



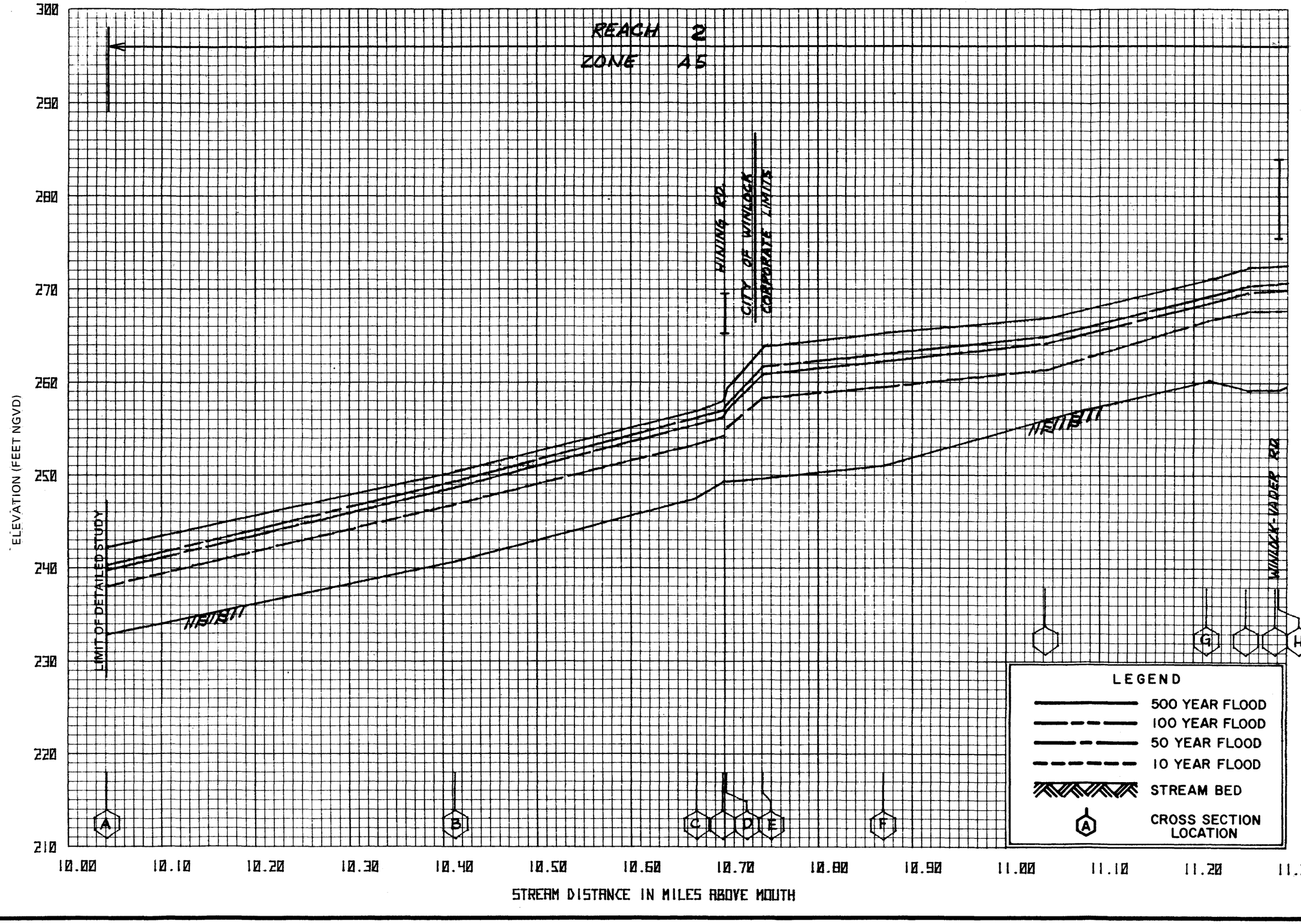
FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

128P



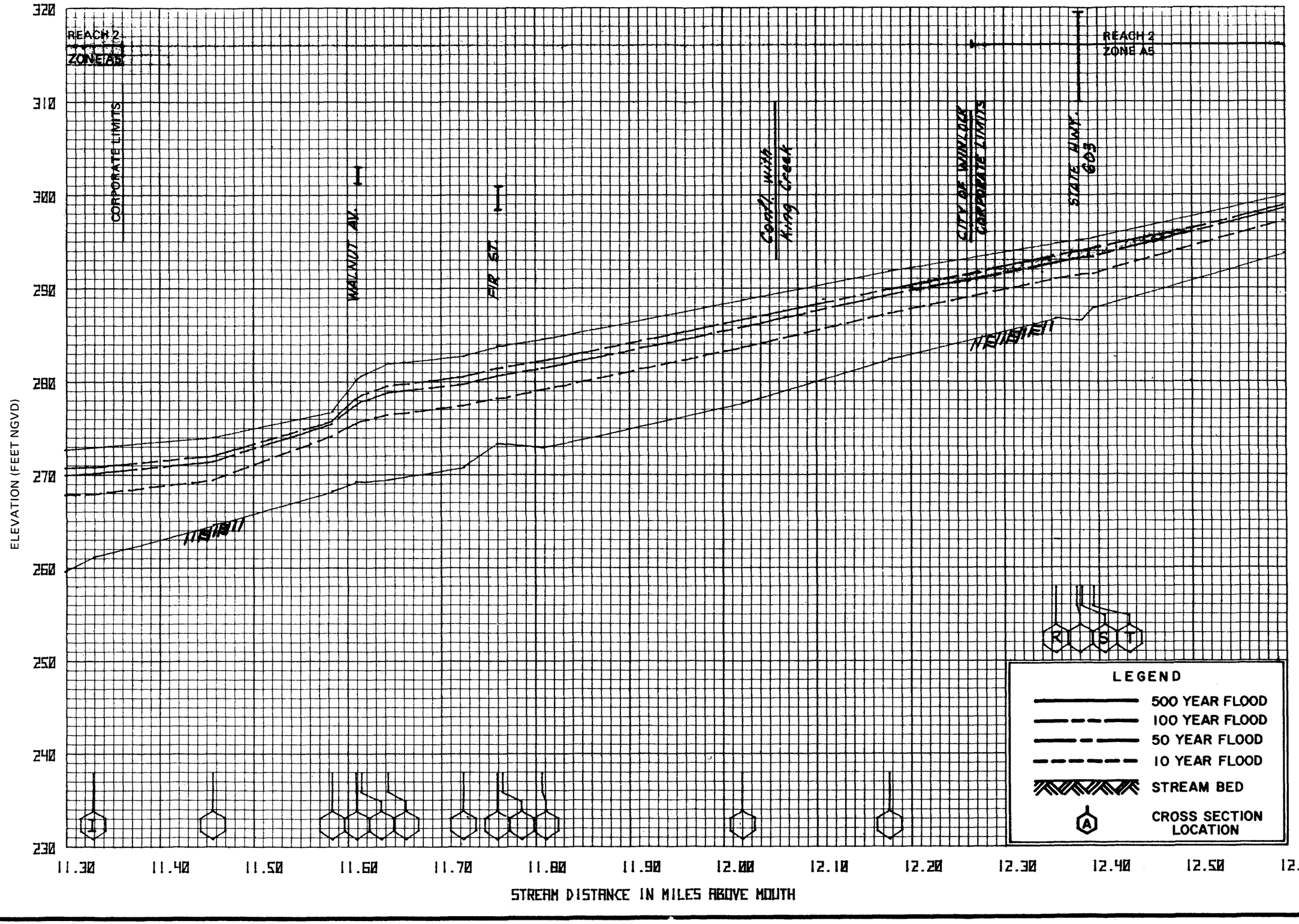
FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

129P



FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

130P

REACH 2
ZONE A5

REACH 3
ZONE A2

BV RR BRIDGE

ELEVATION (FEET NGVD)

370
360
350
340
330
320
310
300
290
280

12.60 12.70 12.80 12.90 13.00 13.10 13.20 13.30 13.40 13.50 13.60 13.70 13.80 13.90

STREAM DISTANCE IN MILES ABOVE MOUTH

U V W X

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

FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

131P

REACH 3

ZONE A2

WINKLER ROAD

SARGENT ROAD

ELEVATION (FEET NGVD)

430
420
410
400
390
380
370
360
350
340

13.90 14.00 14.10 14.20 14.30 14.40 14.50 14.60 14.70 14.80 14.90 15.00 15.10 15.20

STREAM DISTANCE IN MILES ABOVE MOUTH

Y Z AA AB AC AD AE AF

LEGEND

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

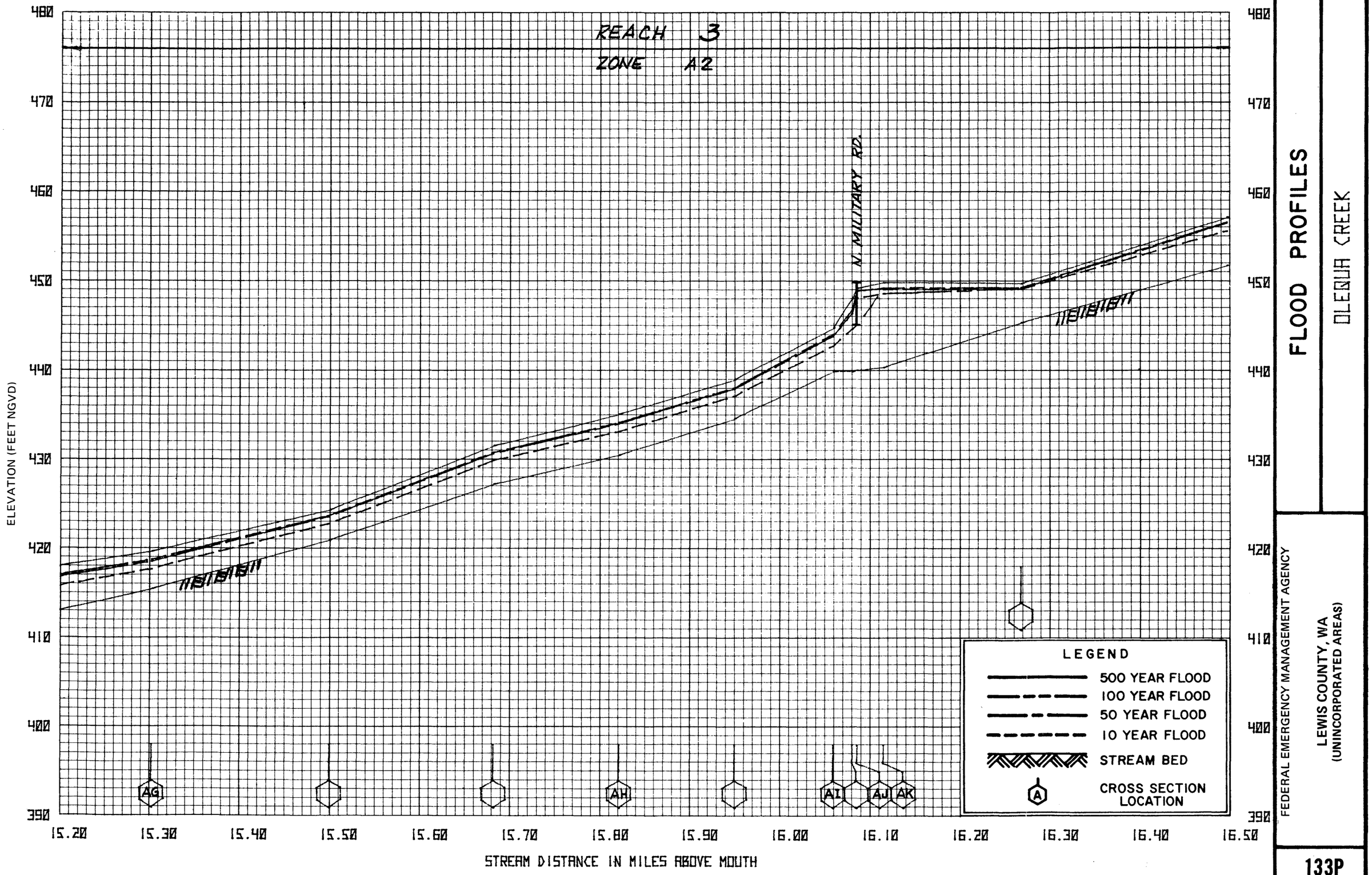
FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

132P



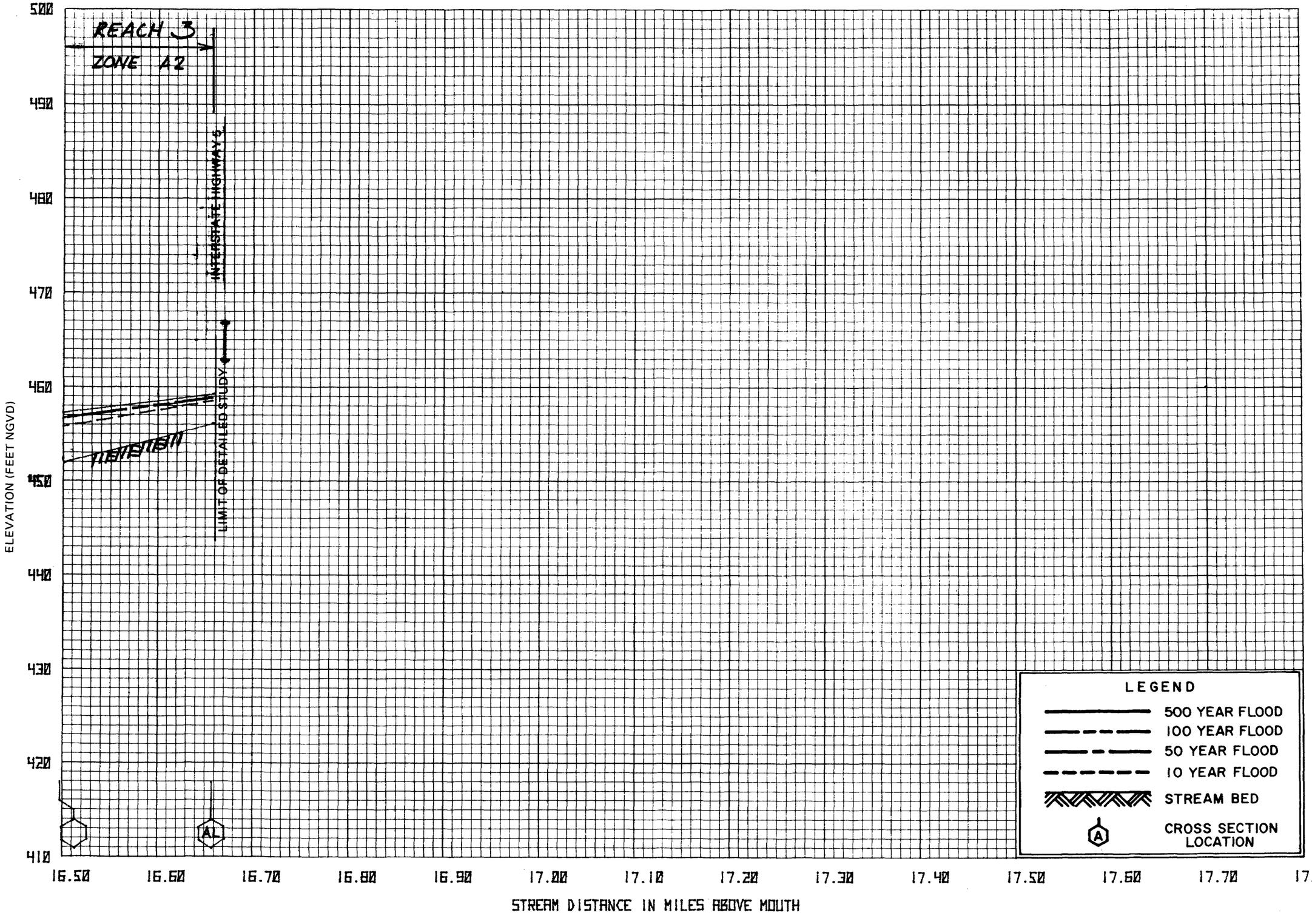
FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

133P



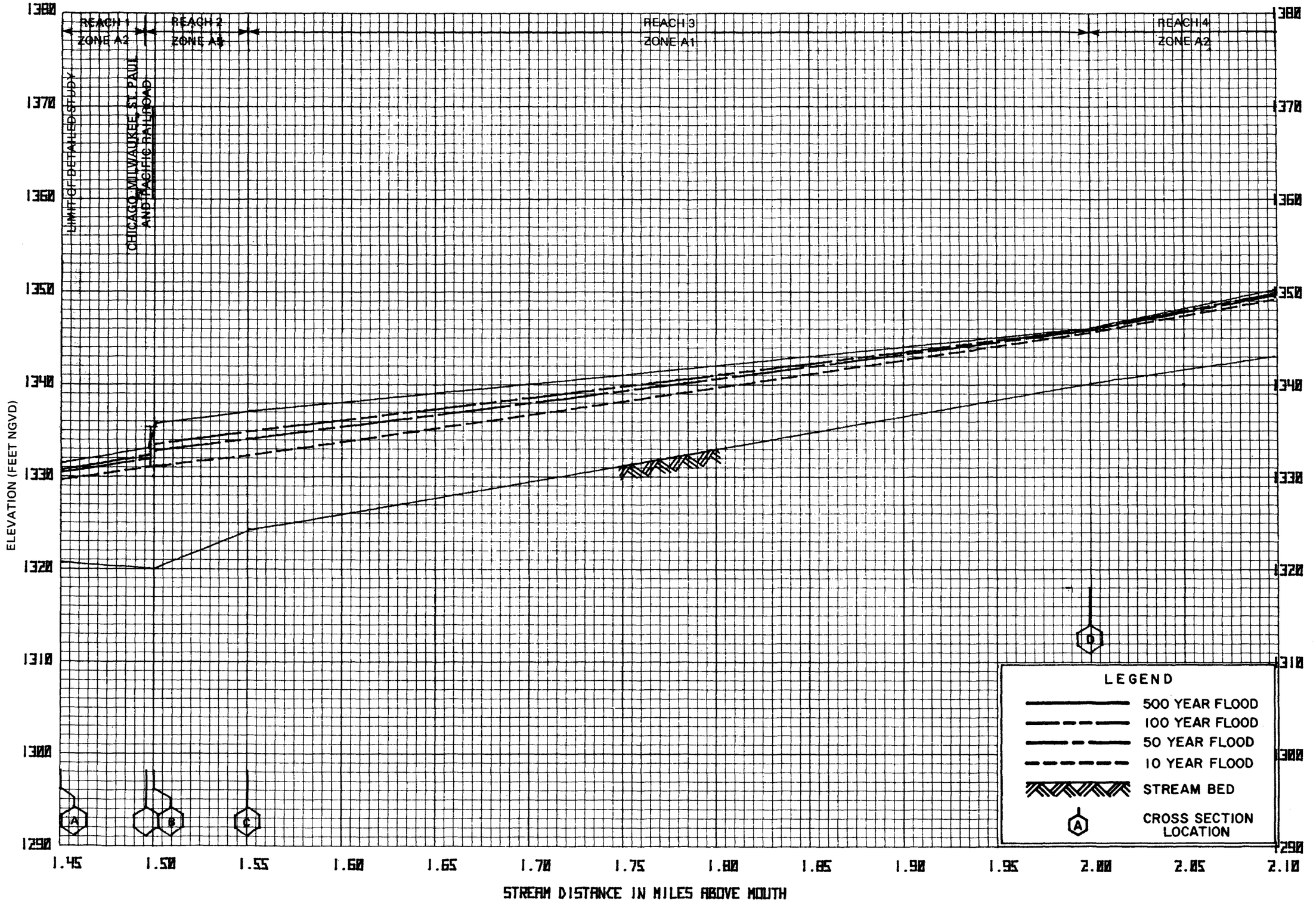
FLOOD PROFILES

OLEQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

134P



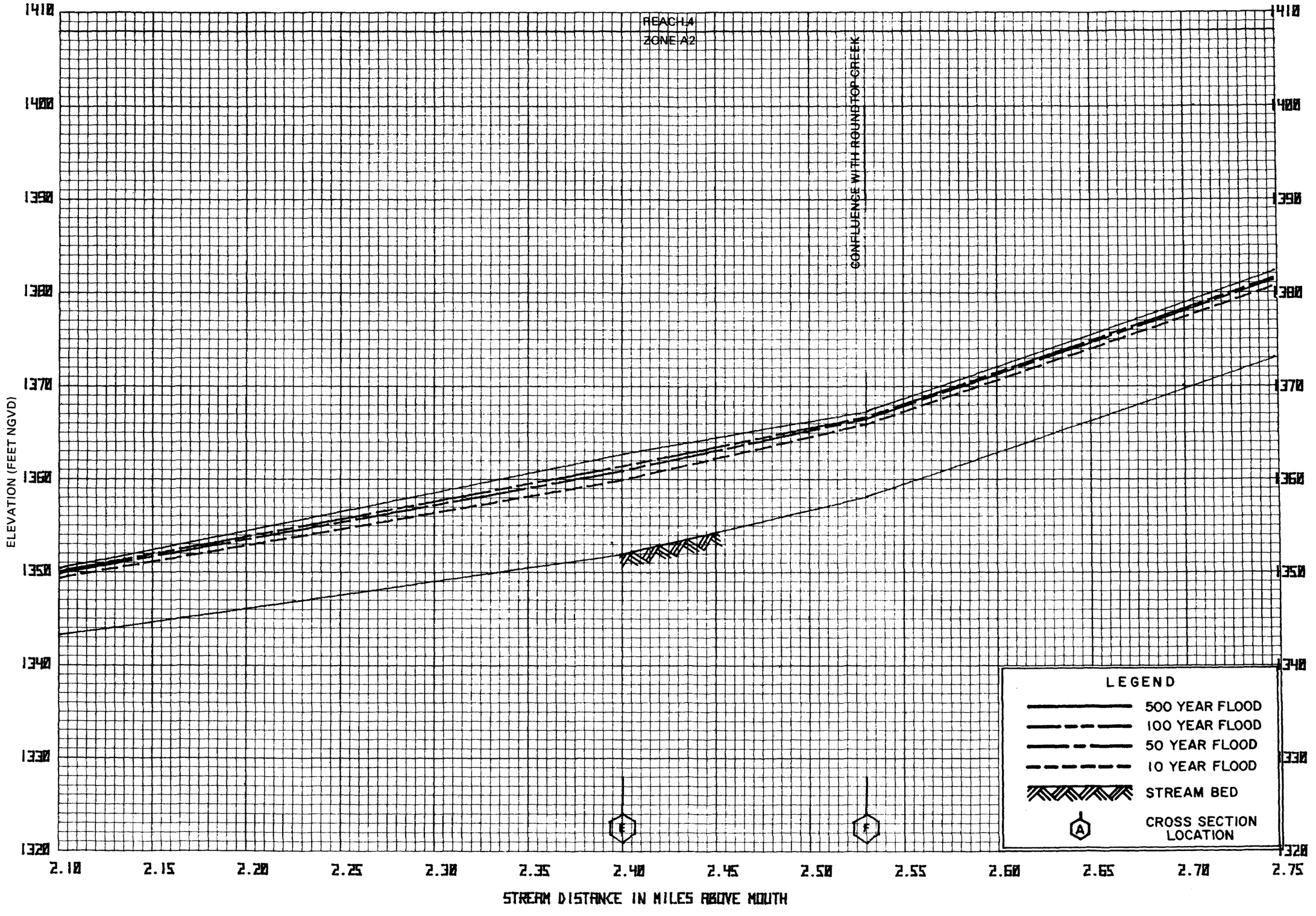
FLOOD PROFILES

MINERAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

135P



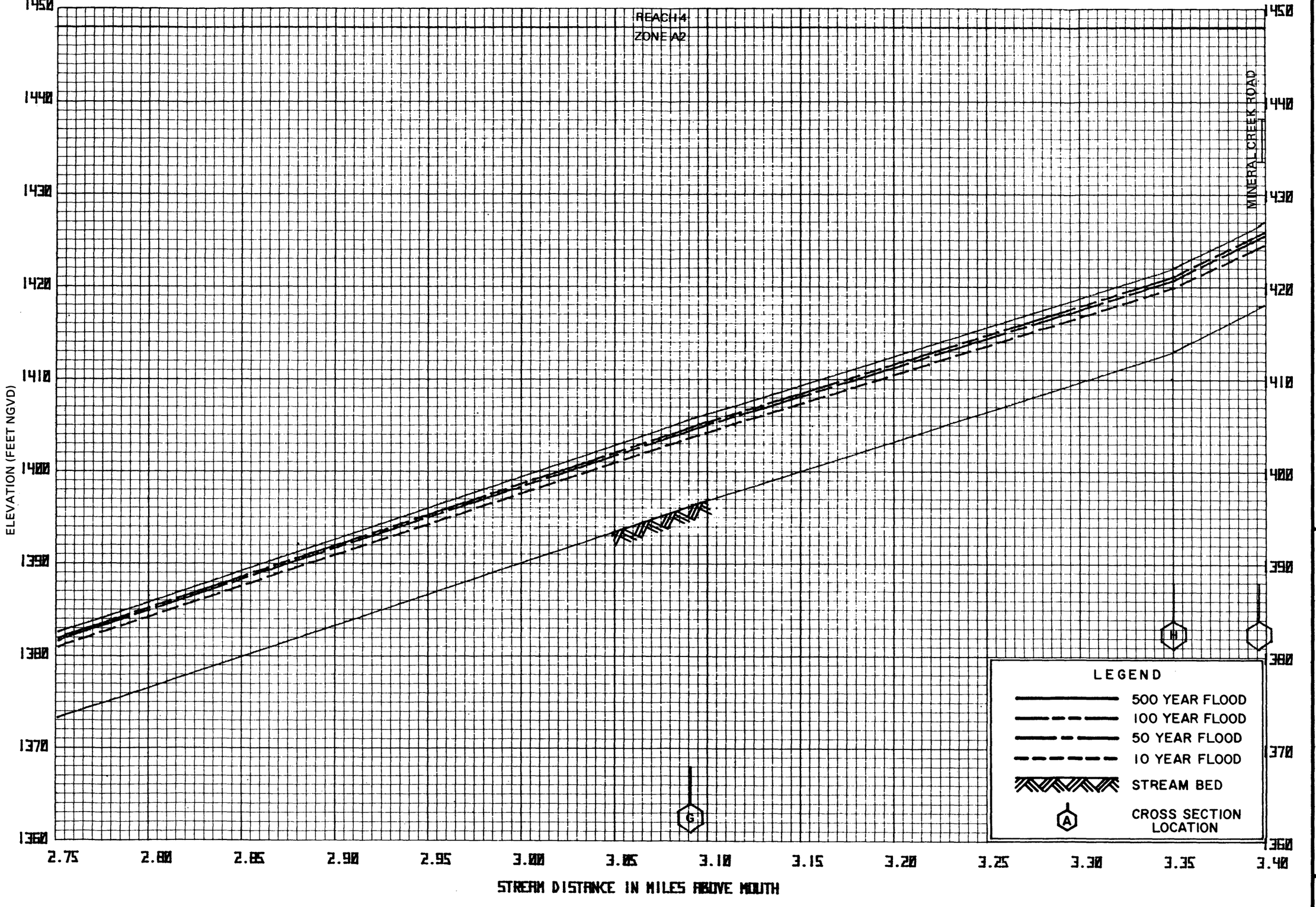
FLOOD PROFILES

MINERAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

136P



FLOOD PROFILES

MINERAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

137P

ELEVATION (FEET NGVD)

STREAM DISTANCE IN MILES ABOVE MOUTH

CONFLUENCE WITH NORTH FORK MINERAL CREEK

REACH 4
ZONE A2

LEGEND

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

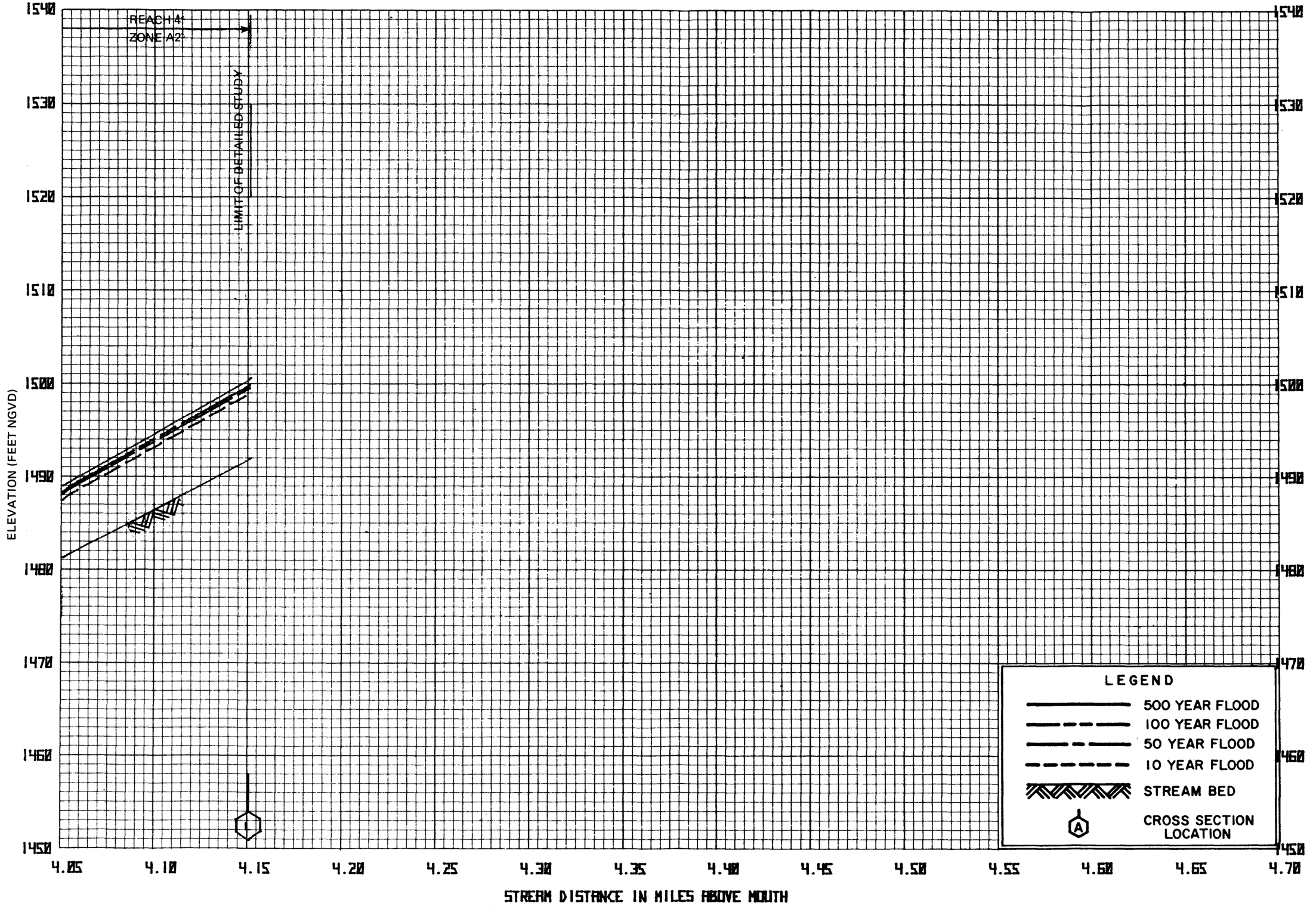
FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

FLOOD PROFILES

MINERAL CREEK

138P



FLOOD PROFILES

MINERAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

139P

FLOODING CONTROLLED BY MINERAL CREEK

Zone A2

Reach 1

Zone A2

Confluence with Mineral Creek

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD

Mineral Road

Limit of Detailed Study

ELEVATION (FEET NGVD)

1420
1410
1400
1390
1380
1370
1360
1350
1340
1330

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30

STREAM DISTANCE IN MILES ABOVE MOUTH

A B C D E

LEGEND

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

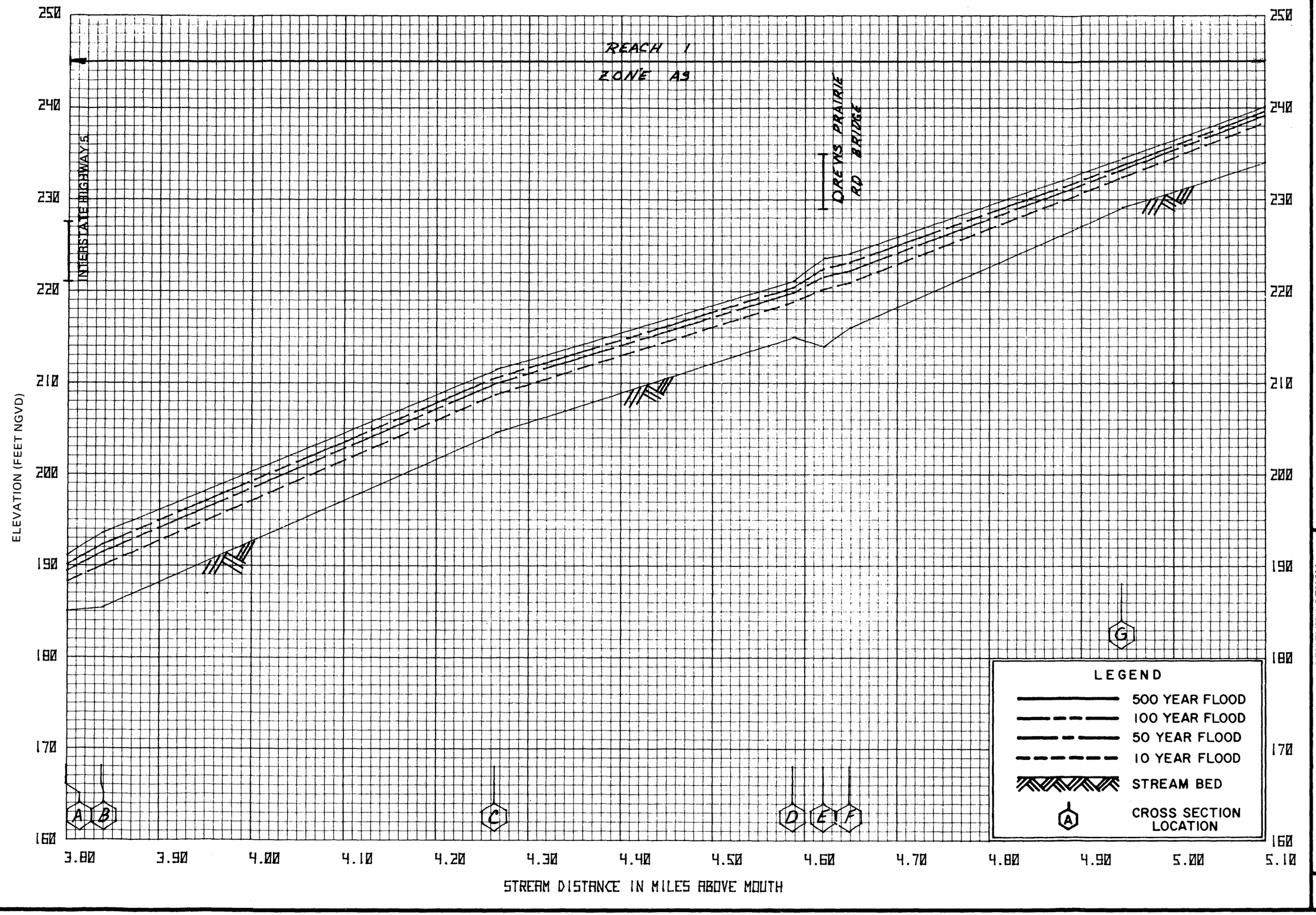
FLOOD PROFILES

ROUNDTOP CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

140P



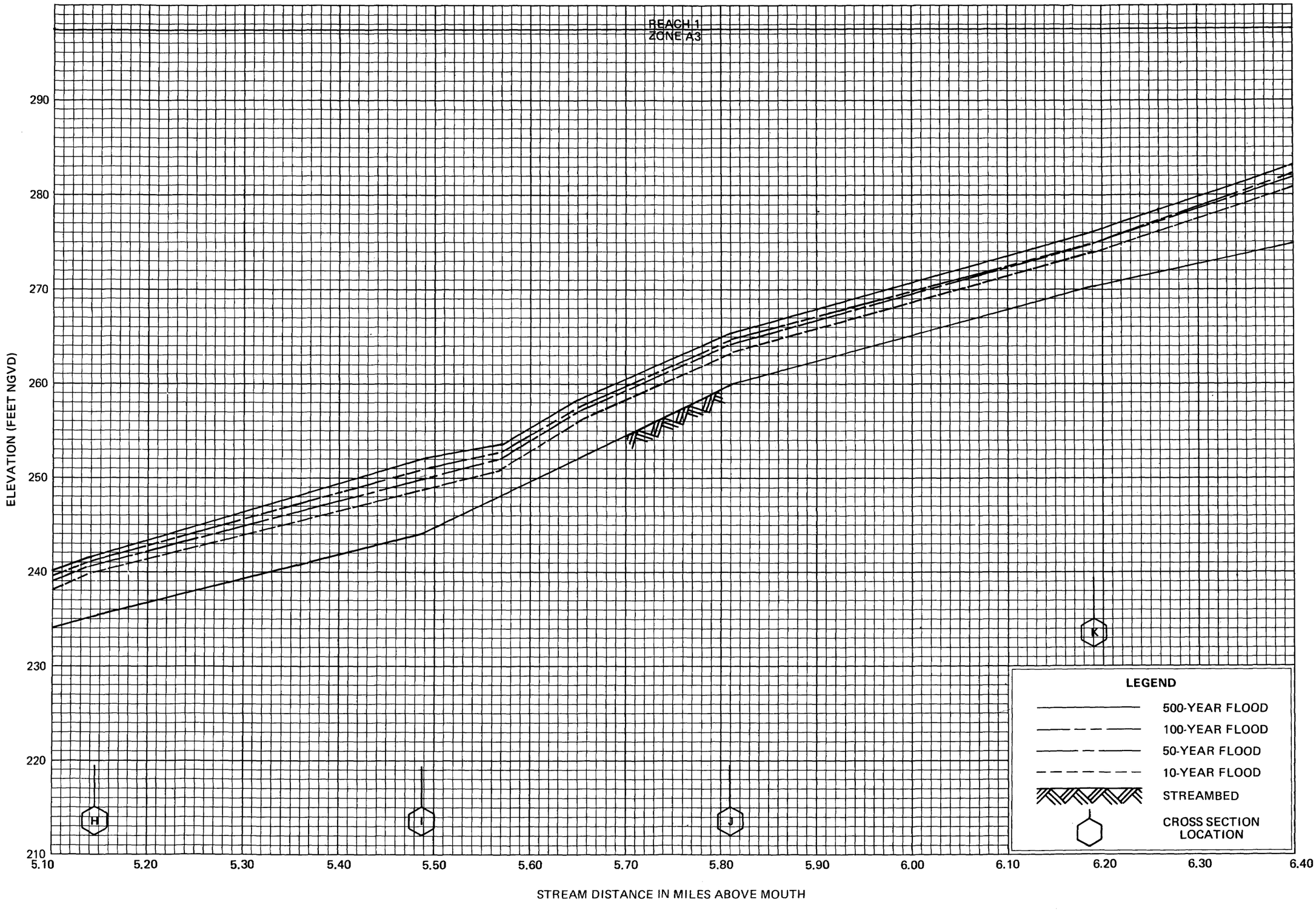
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

141P



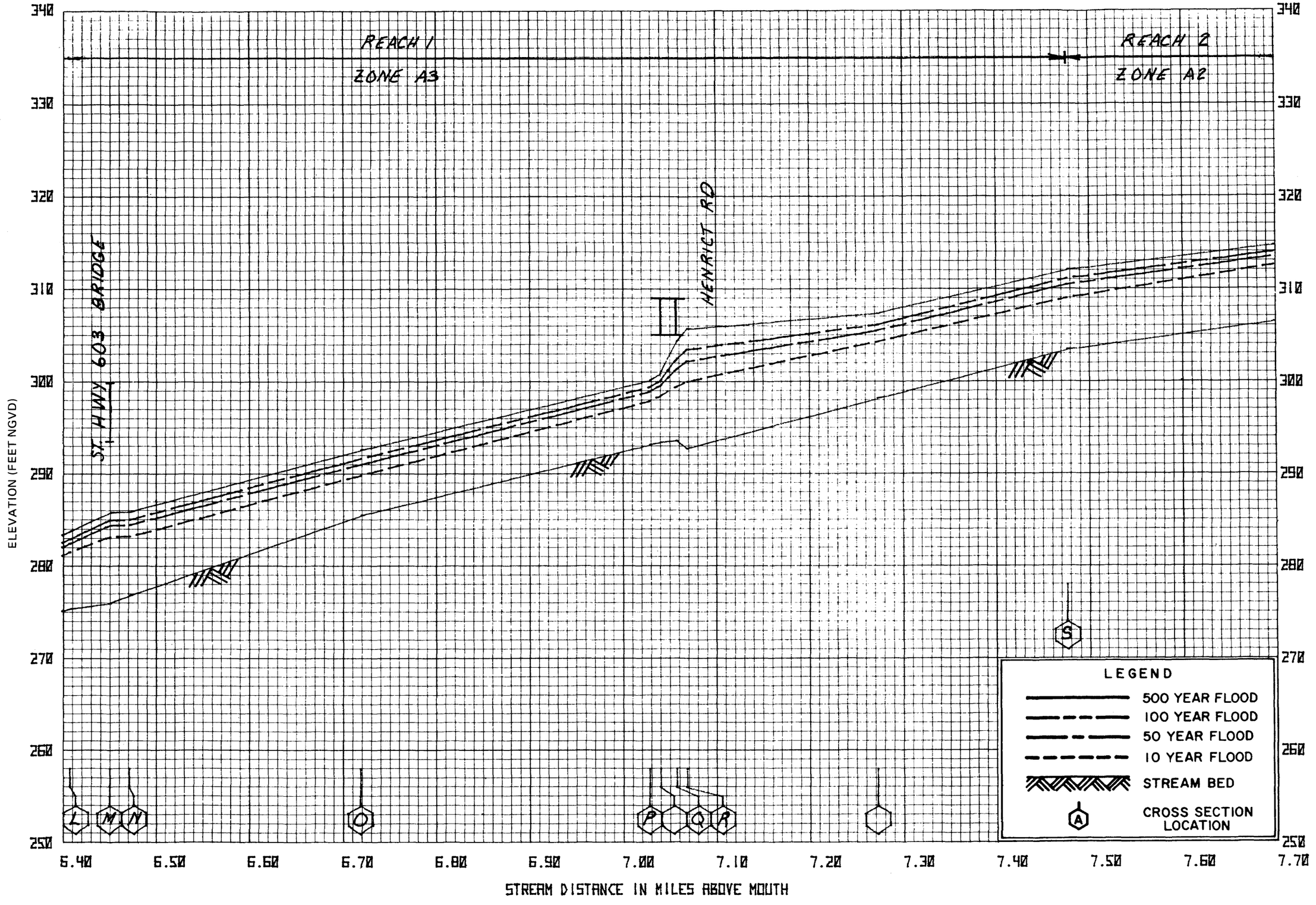
FLOOD PROFILES

LACAMAS CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

LEWIS COUNTY, WA.
(UNINCORPORATED AREAS)

142P



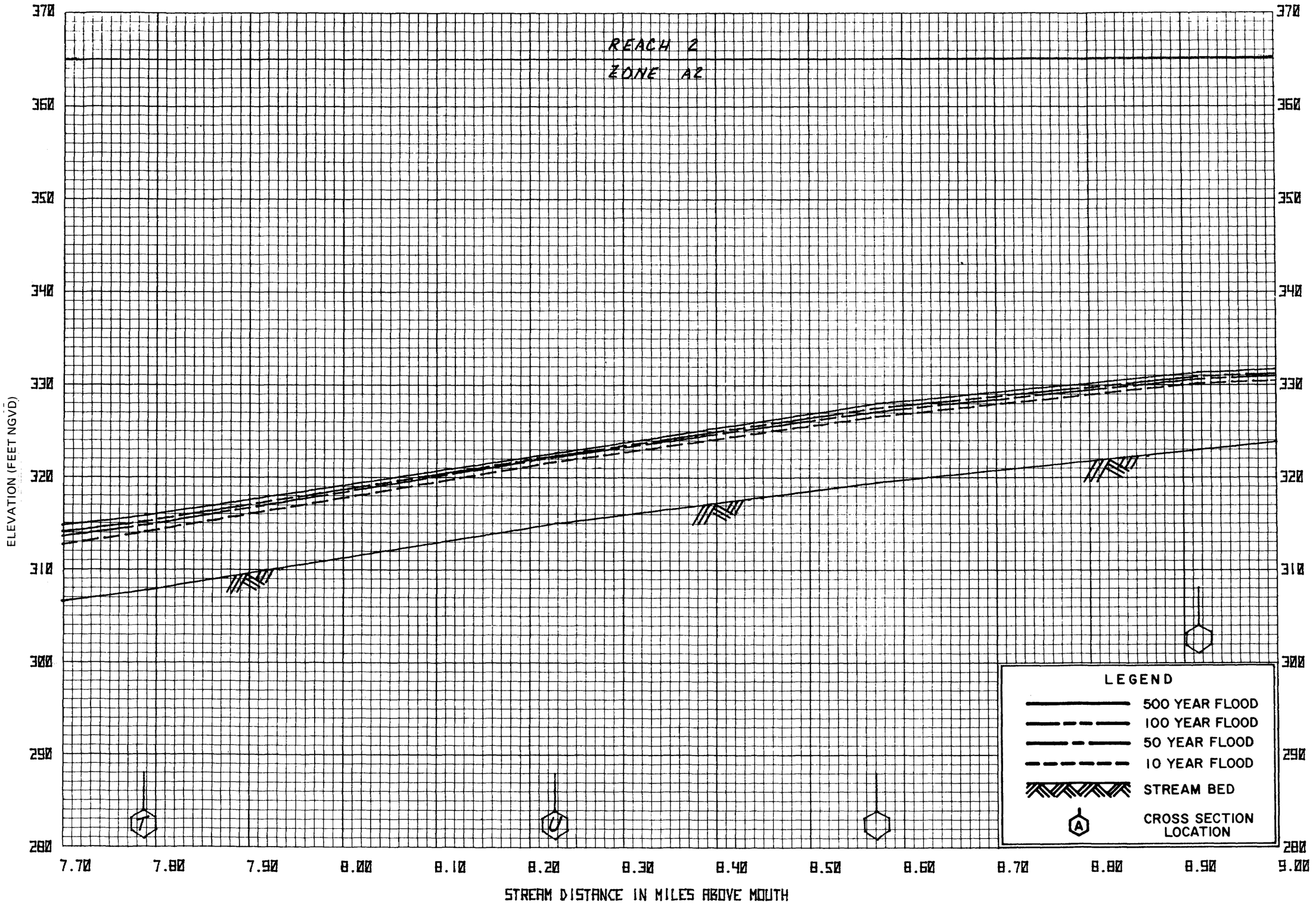
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

143P



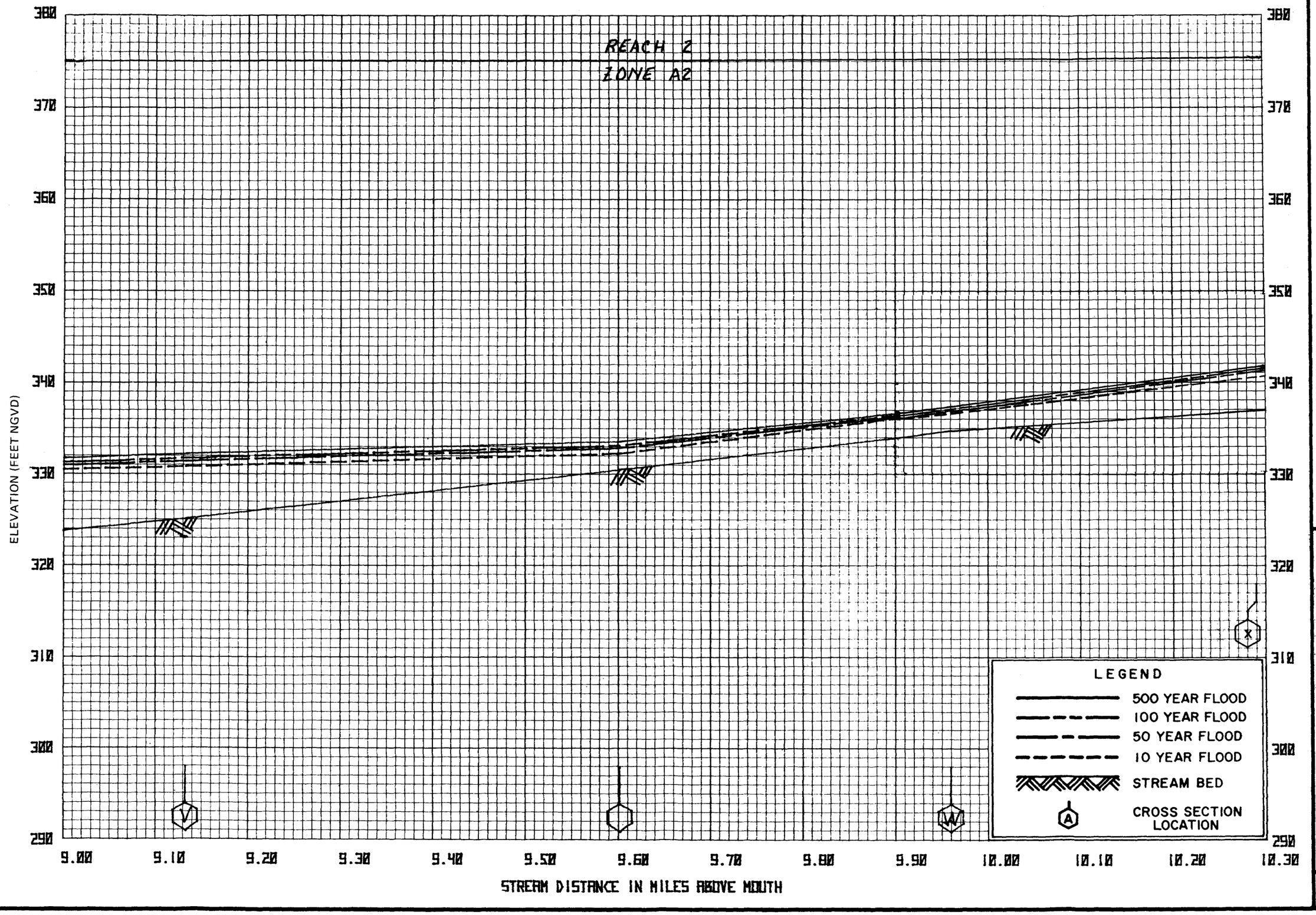
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

144P



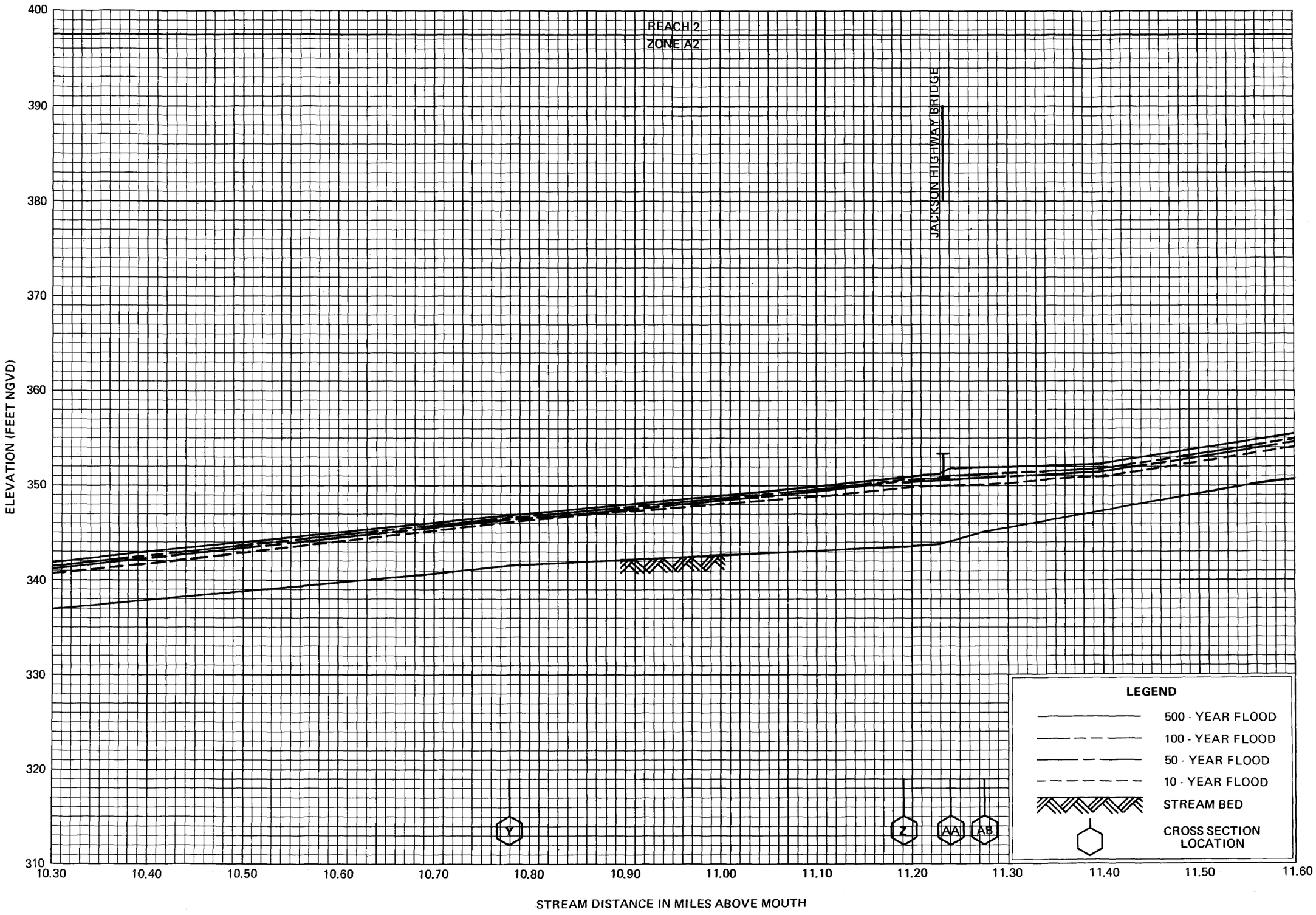
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

145P



FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINC. AREA)

146P

REACH 2
ZONE A2

OYLER RD BRIDGE

ELEVATION (FEET NGVD)

410
400
390
380
370
360
350
340
330
320

11.60 11.70 11.80 11.90 12.00 12.10 12.20 12.30 12.40 12.50 12.60 12.70 12.80 12.90

STREAM DISTANCE IN MILES ABOVE MOUTH

AC AD AE AF AG

LEGEND

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

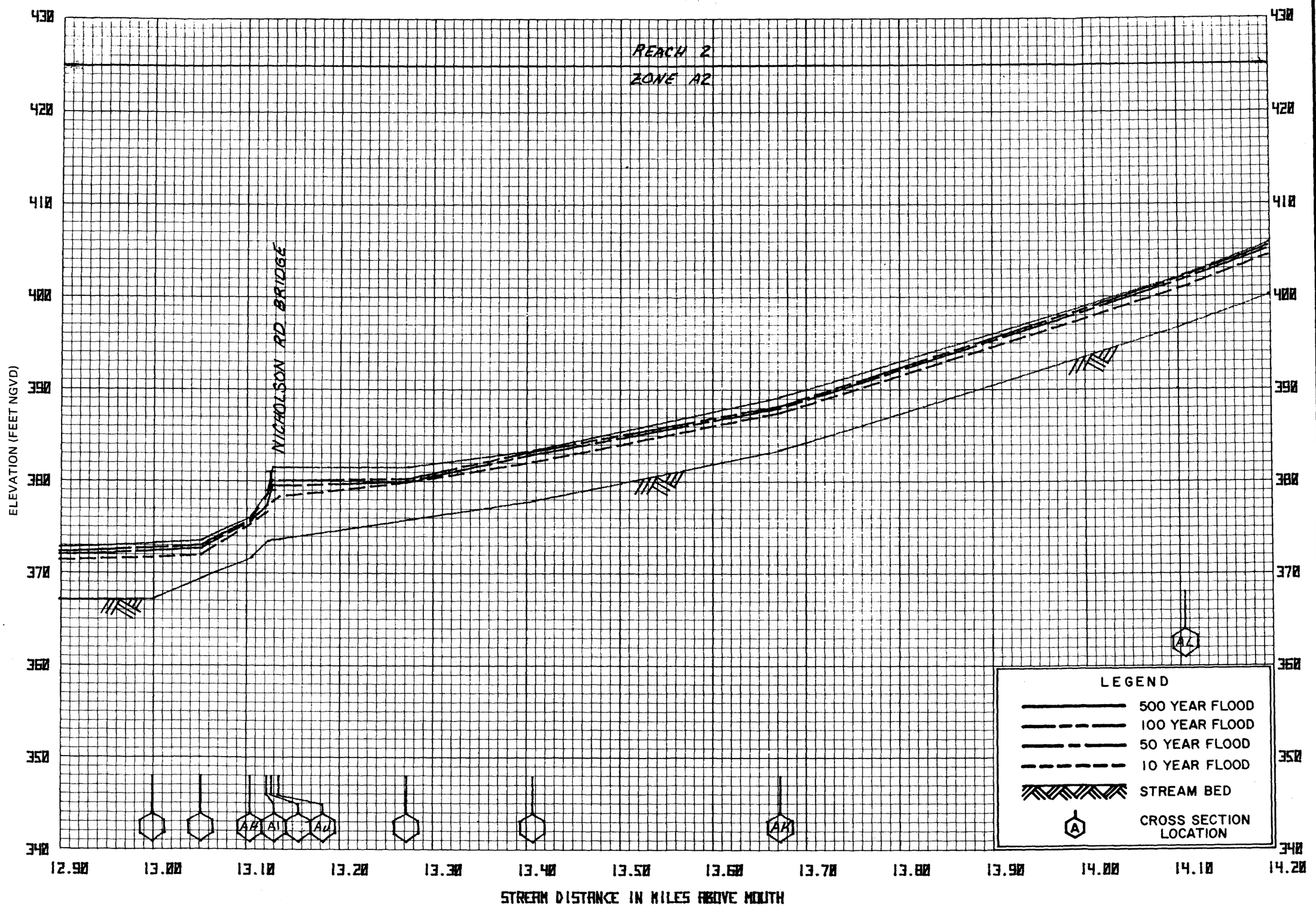
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

147P



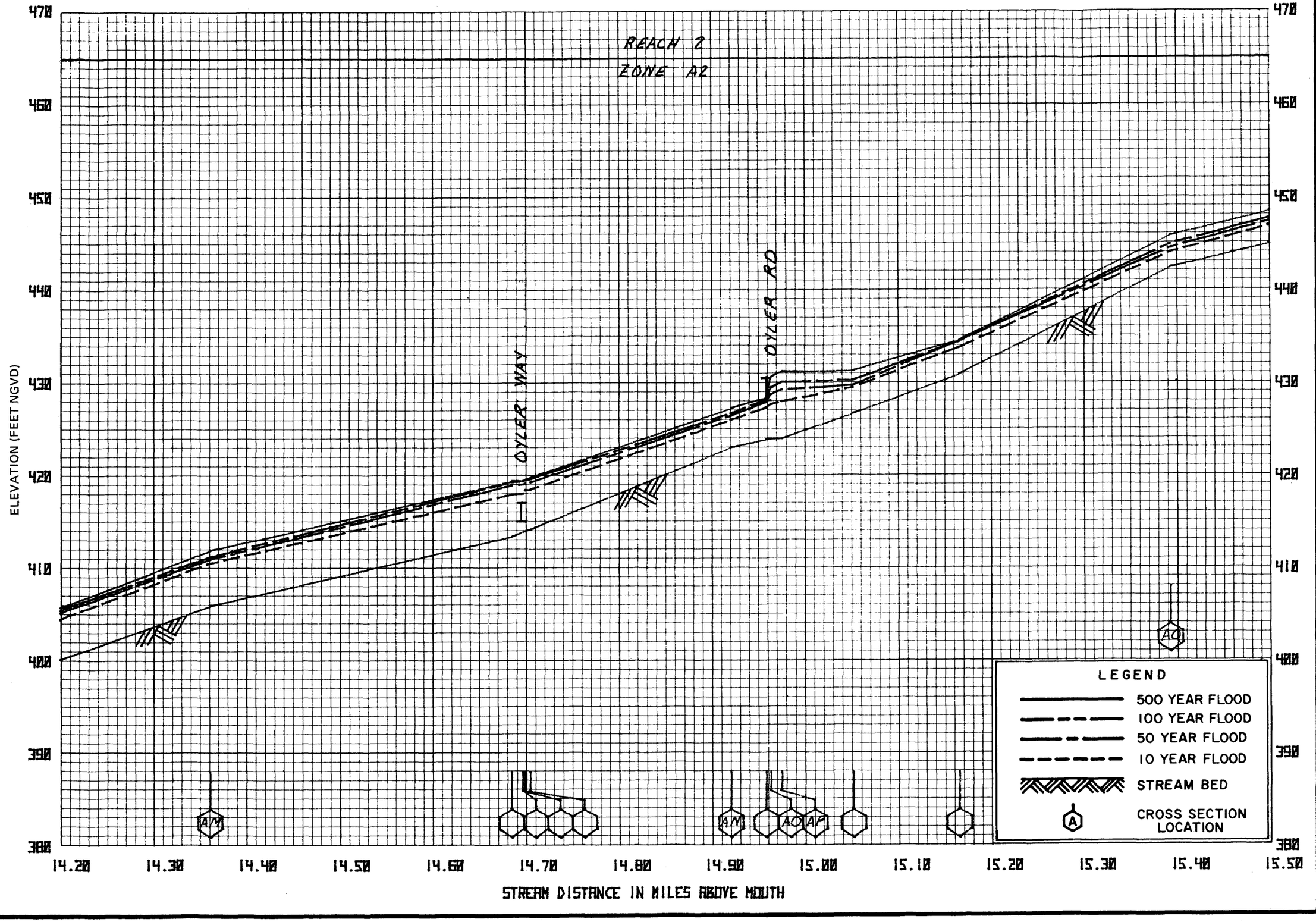
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

148P



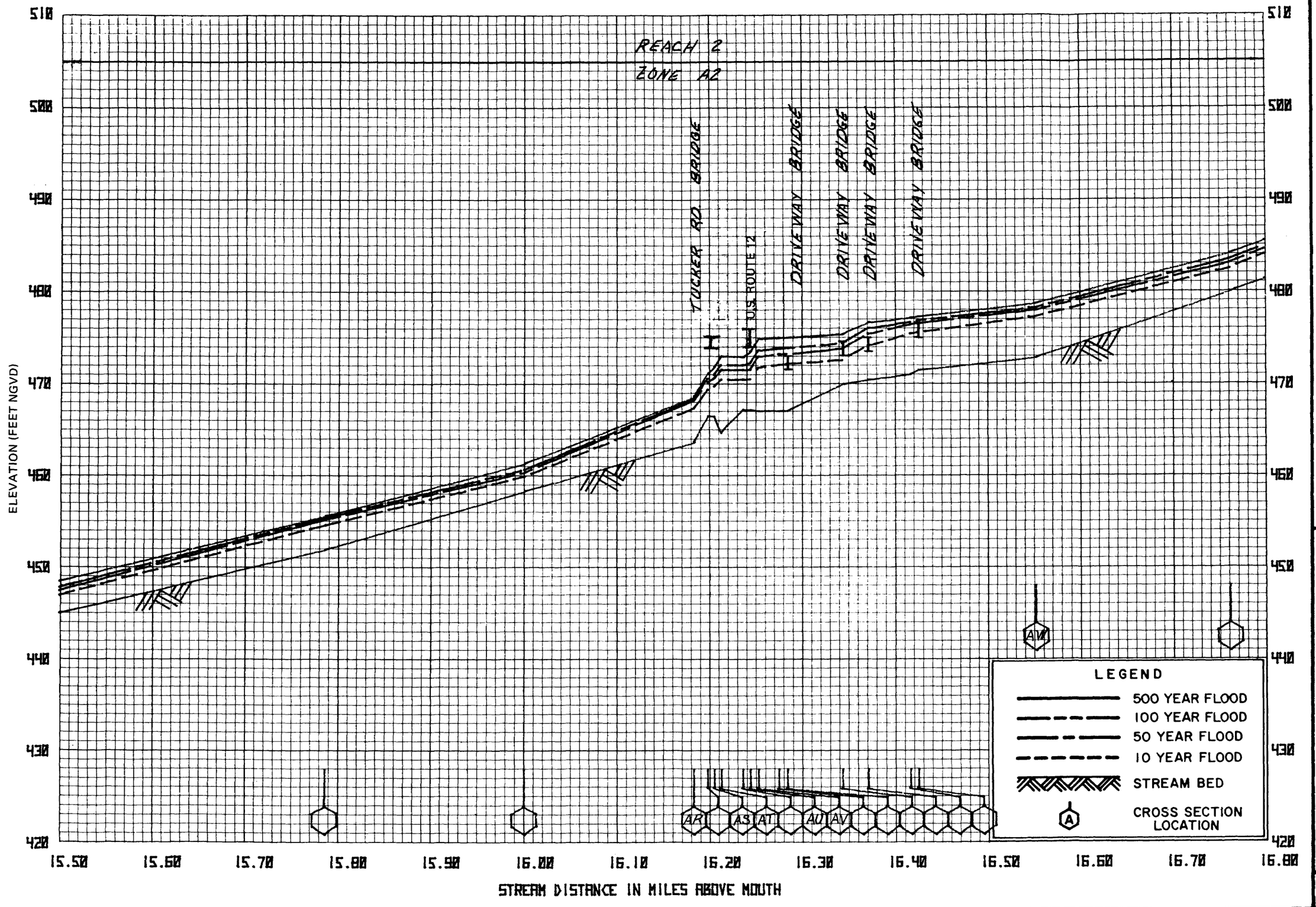
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

149P



FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

150P

REACH 2
ZONE AE

LEONARD RD BRIDGE

ELEVATION (FEET NGVD)

550
540
530
520
510
500
490
480
470
460

16.80 16.90 17.00 17.10 17.20 17.30 17.40 17.50 17.60 17.70 17.80 17.90 18.00 18.10

STREAM DISTANCE IN MILES ABOVE MOUTH

AX AY AZ BA BB

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

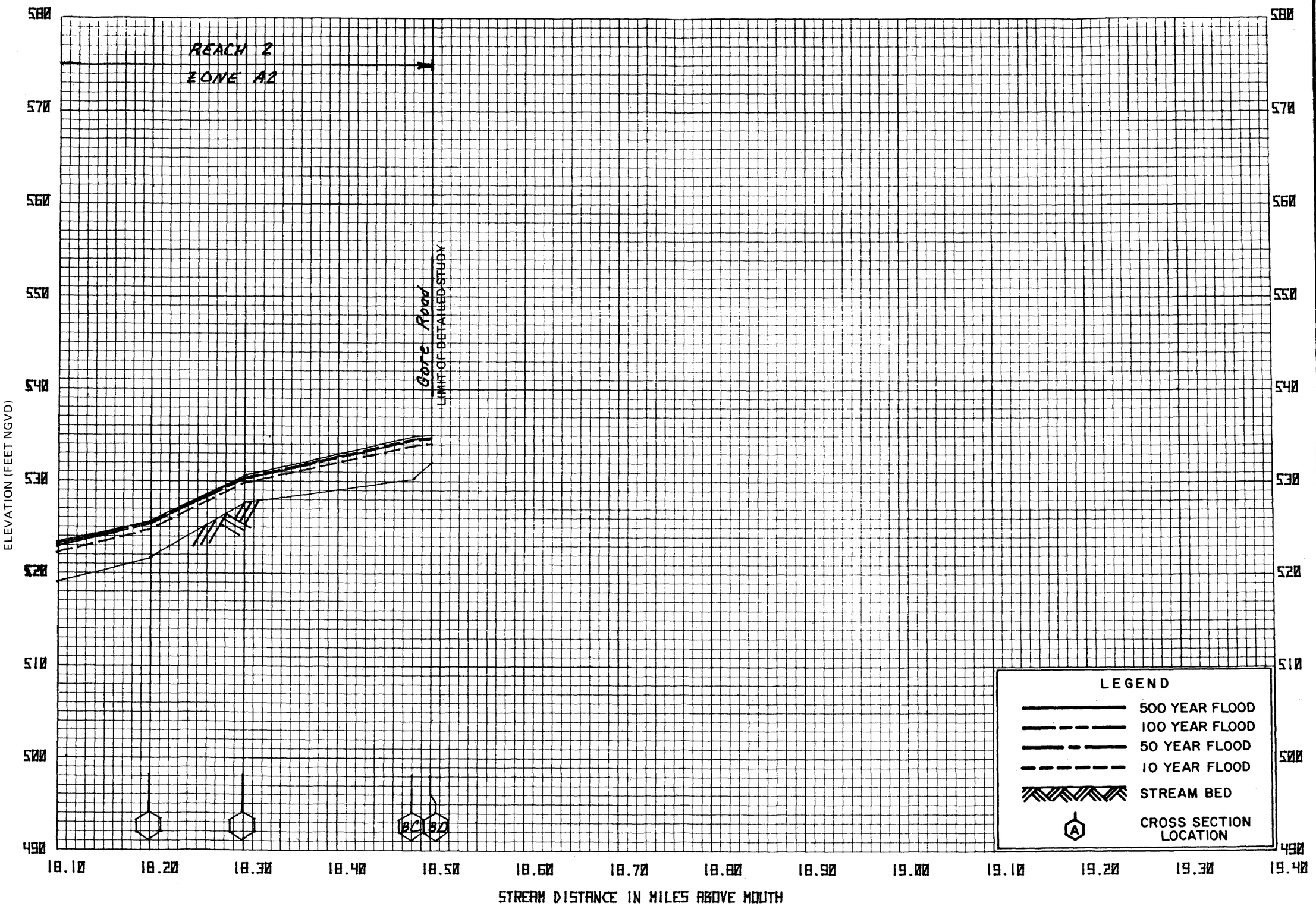
FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

151P

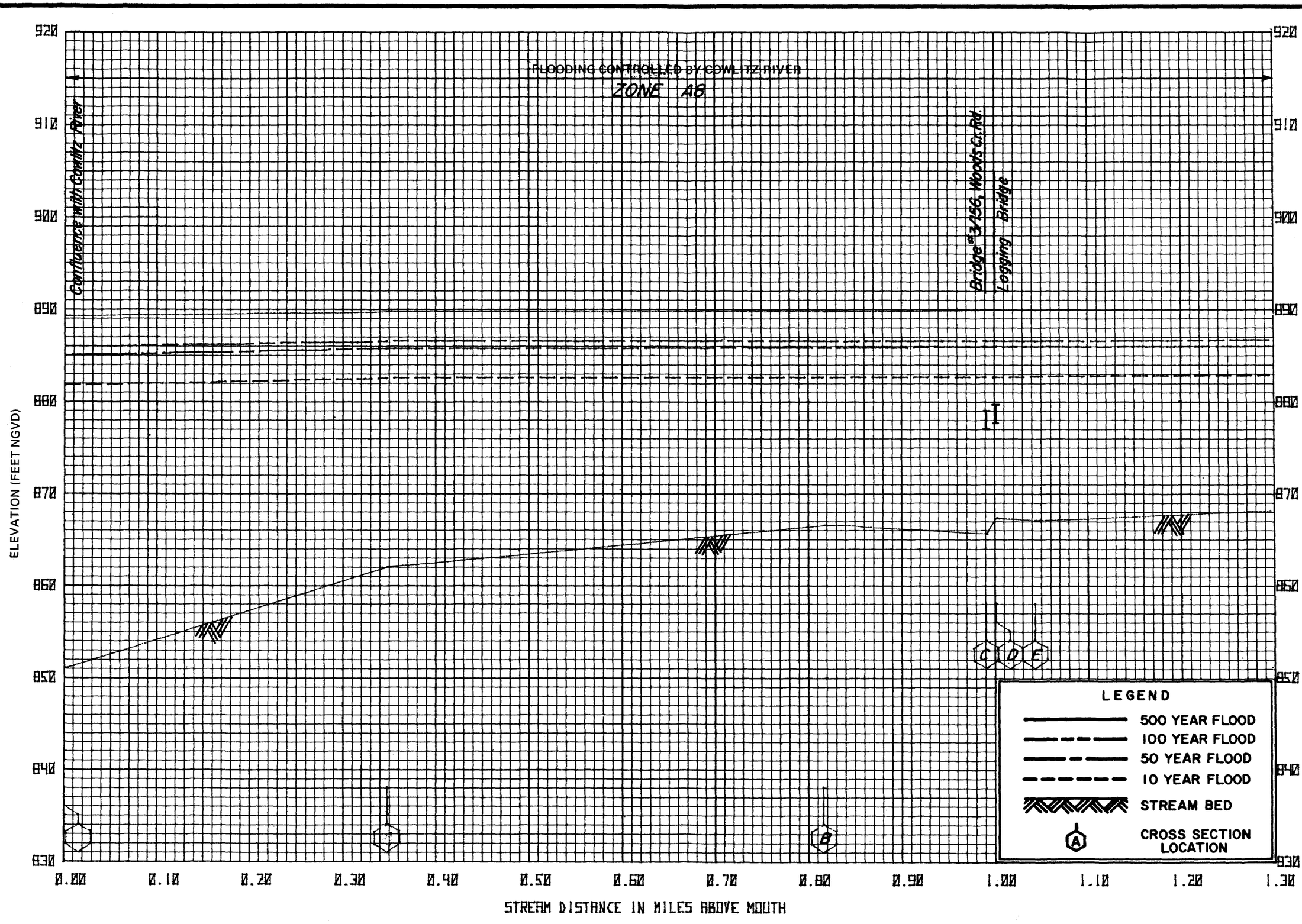


FLOOD PROFILES

LACAMAS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)



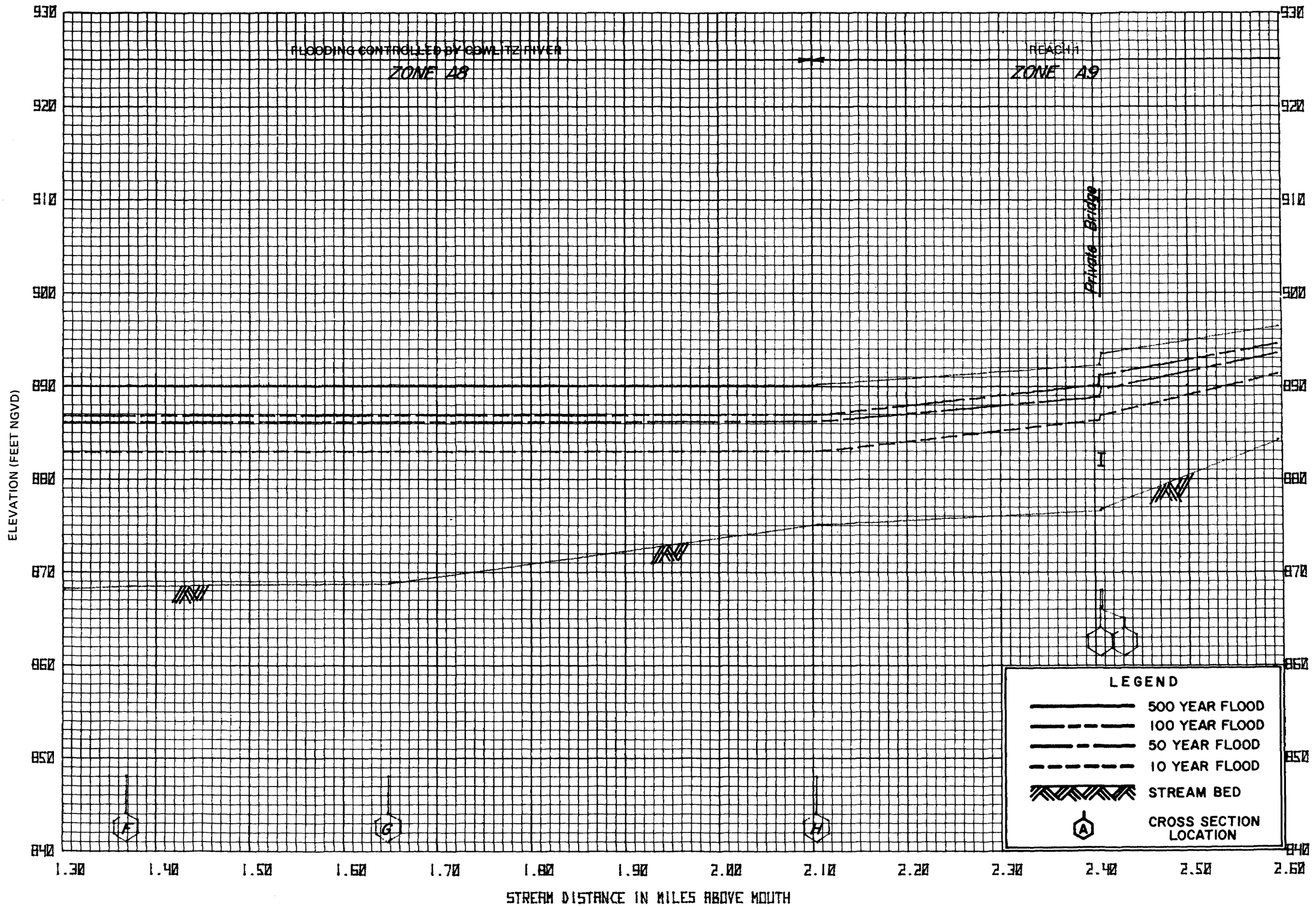
FLOOD PROFILES

SILER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

153P



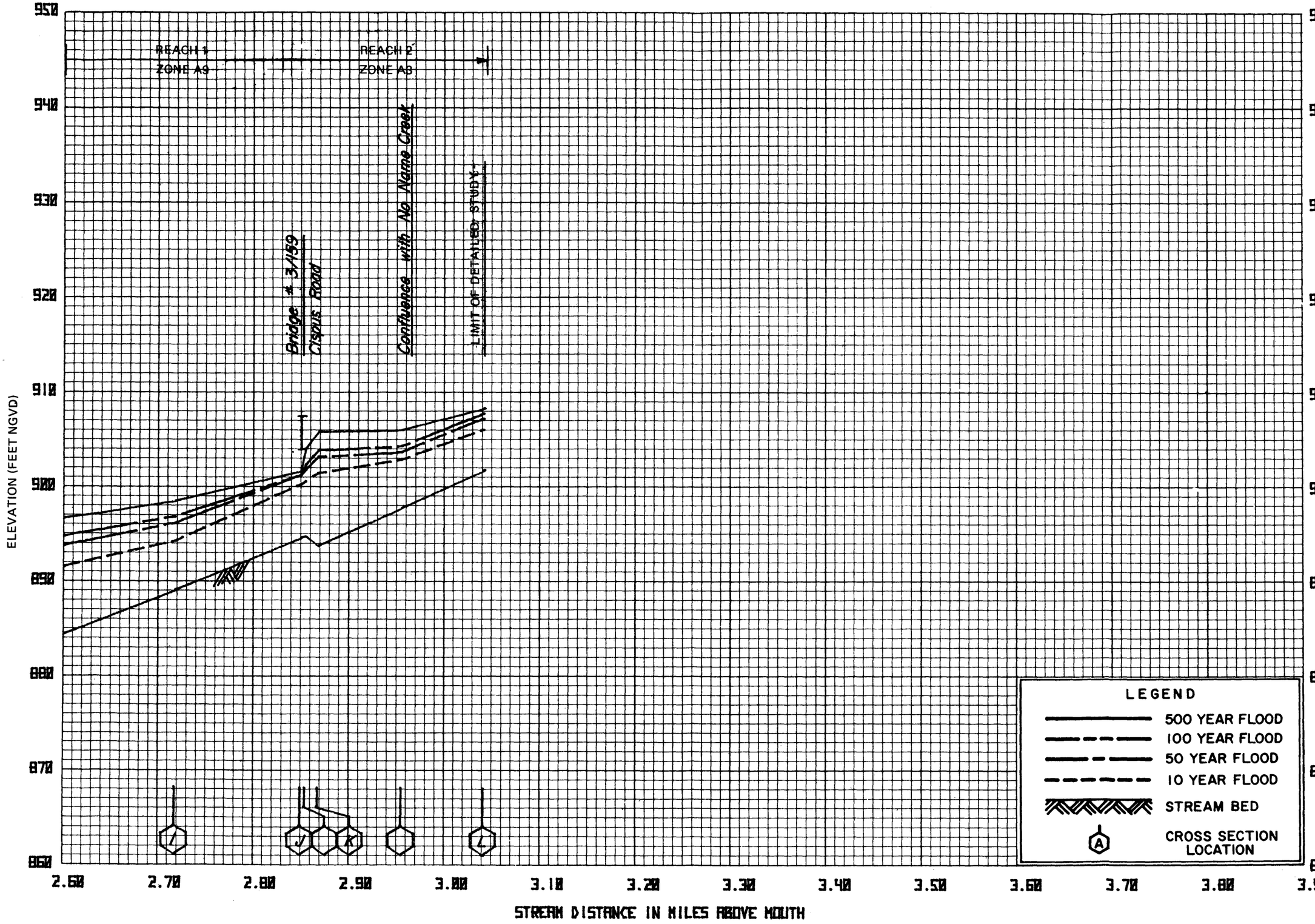
FLOOD PROFILES

SILER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

154P



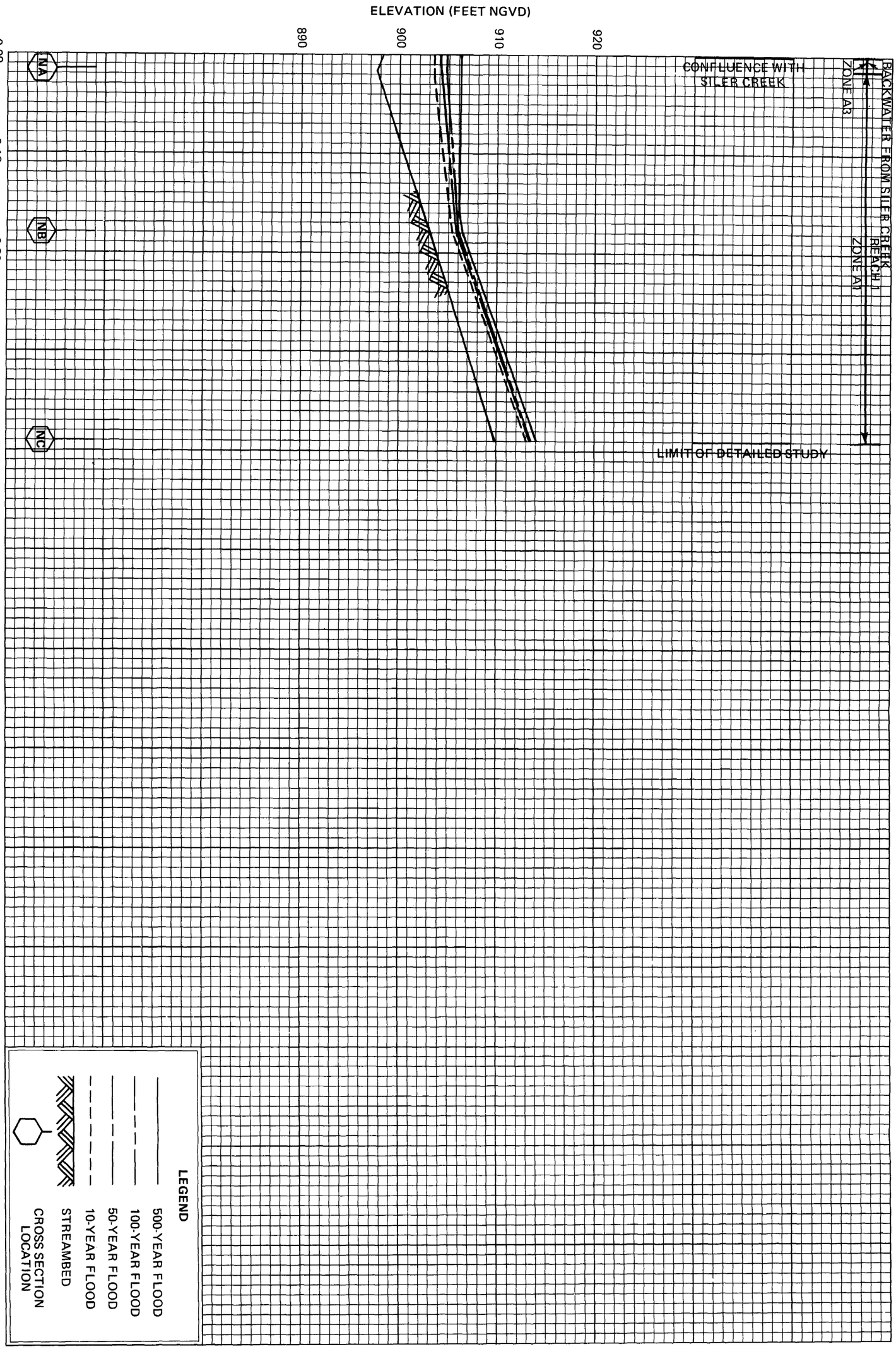
FLOOD PROFILES

SILER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

155P

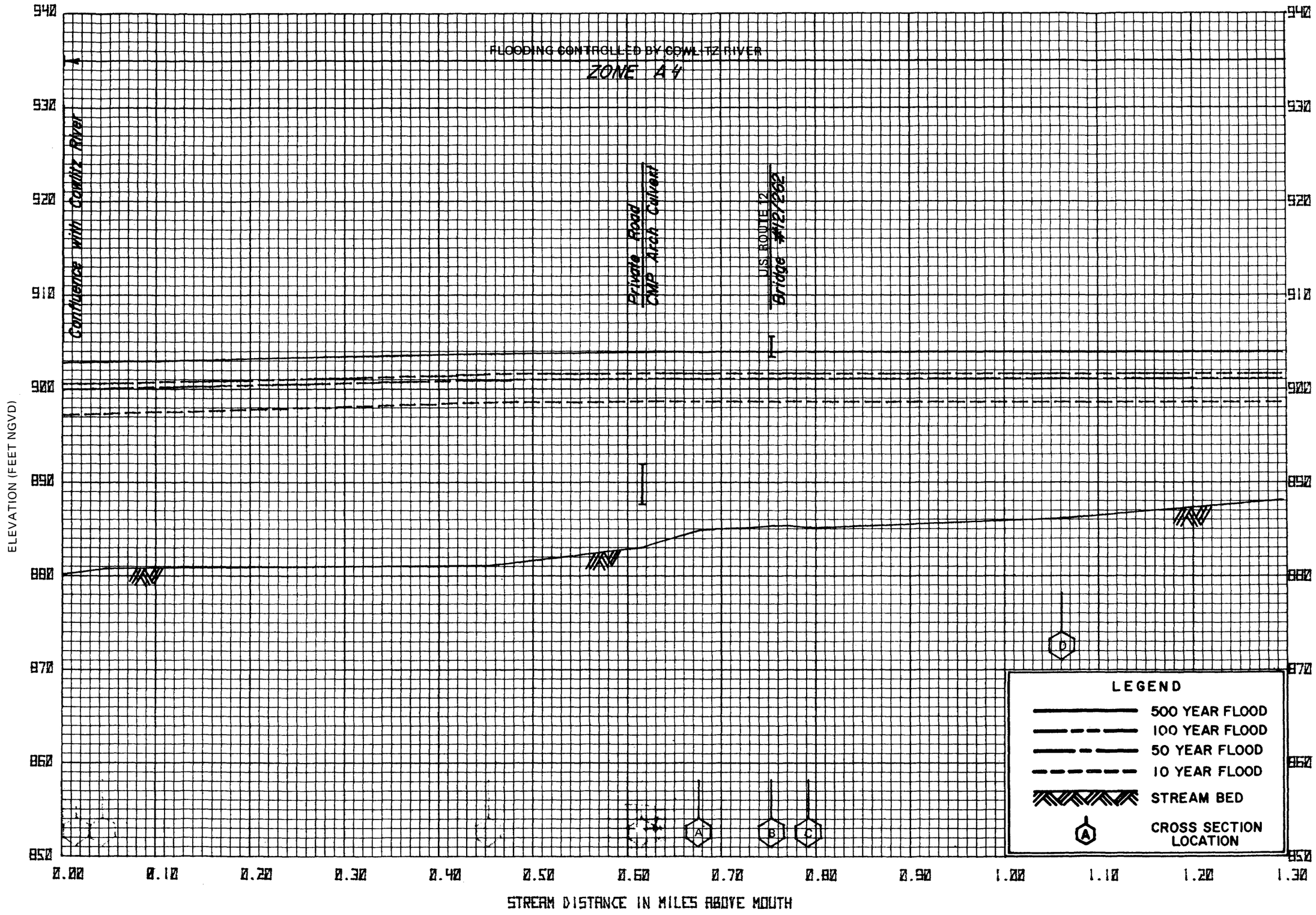


FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD PROFILES

NO NAME CREEK (TRIBUTARY TO SILER CREEK)



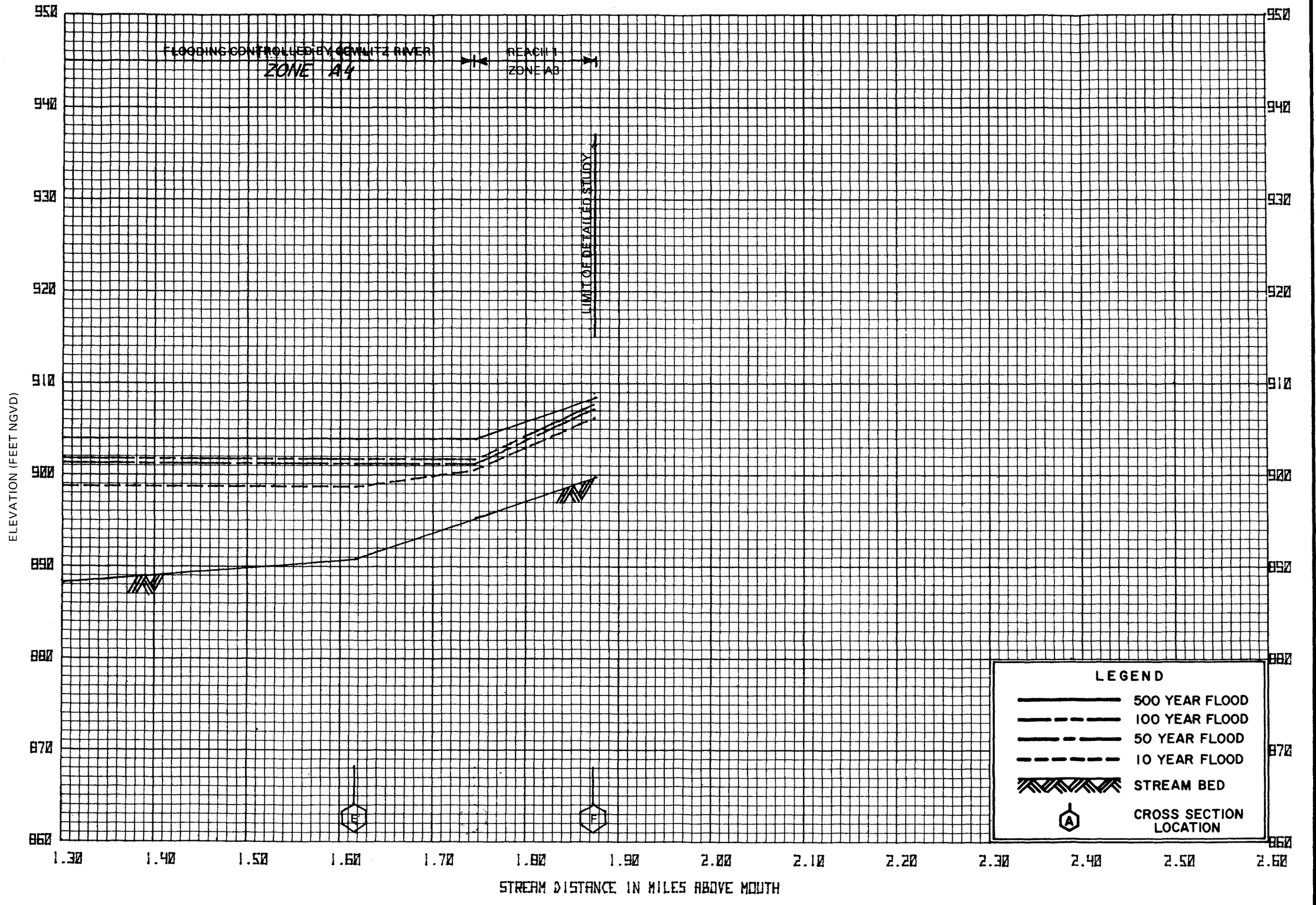
FLOOD PROFILES

SURREY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

157P



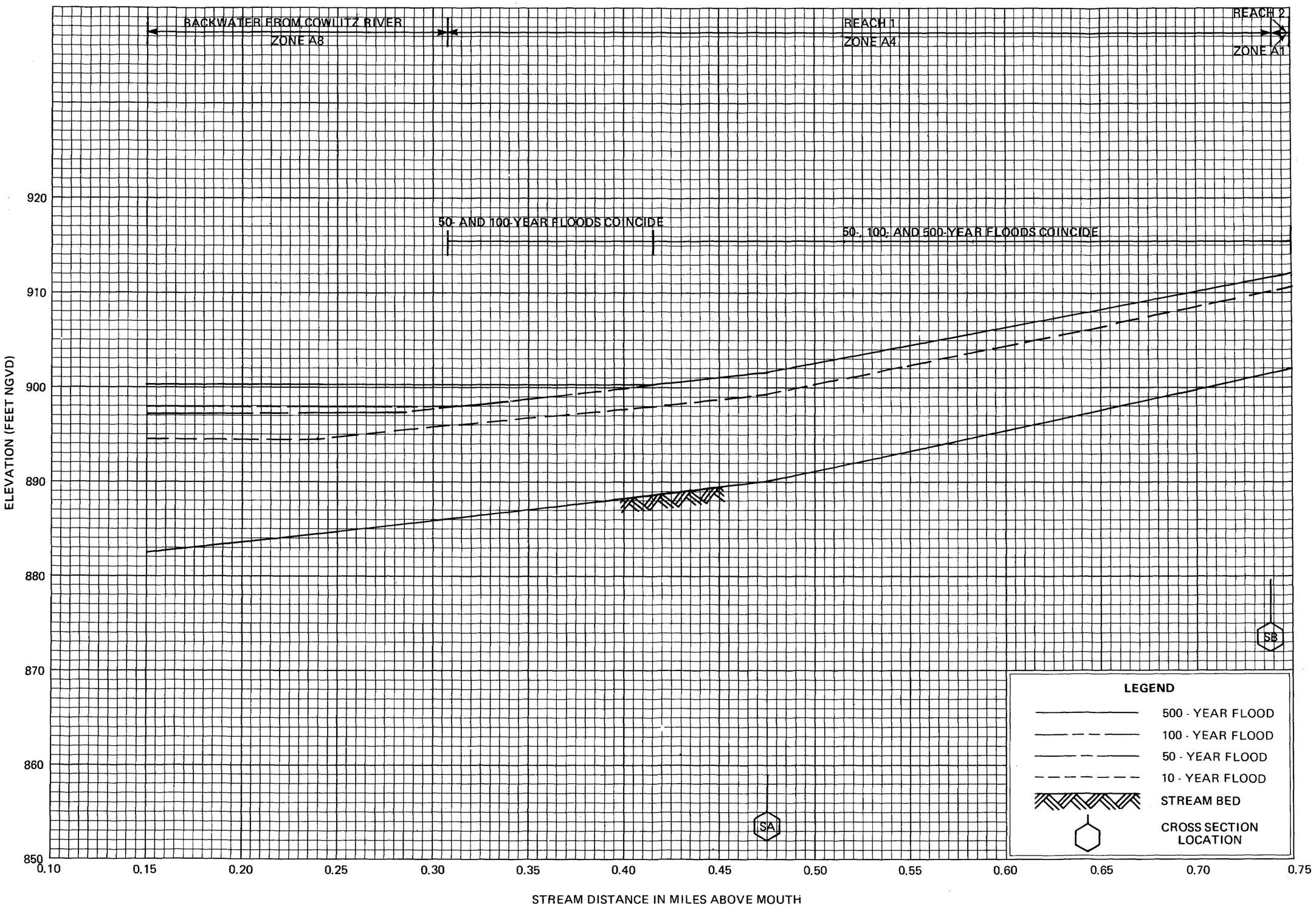
FLOOD PROFILES

SURREY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

158P



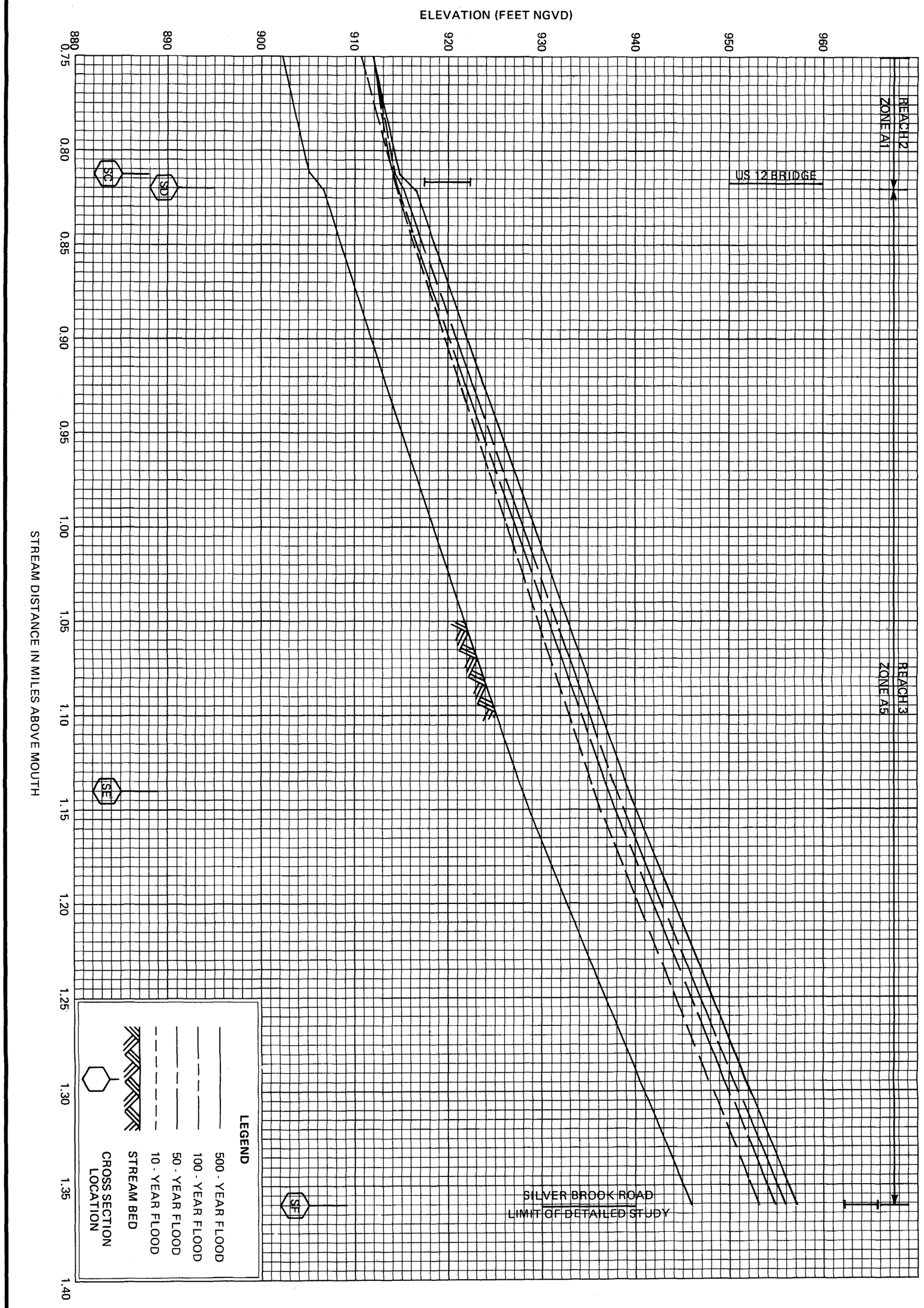
FLOOD PROFILES

SILVER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

159P



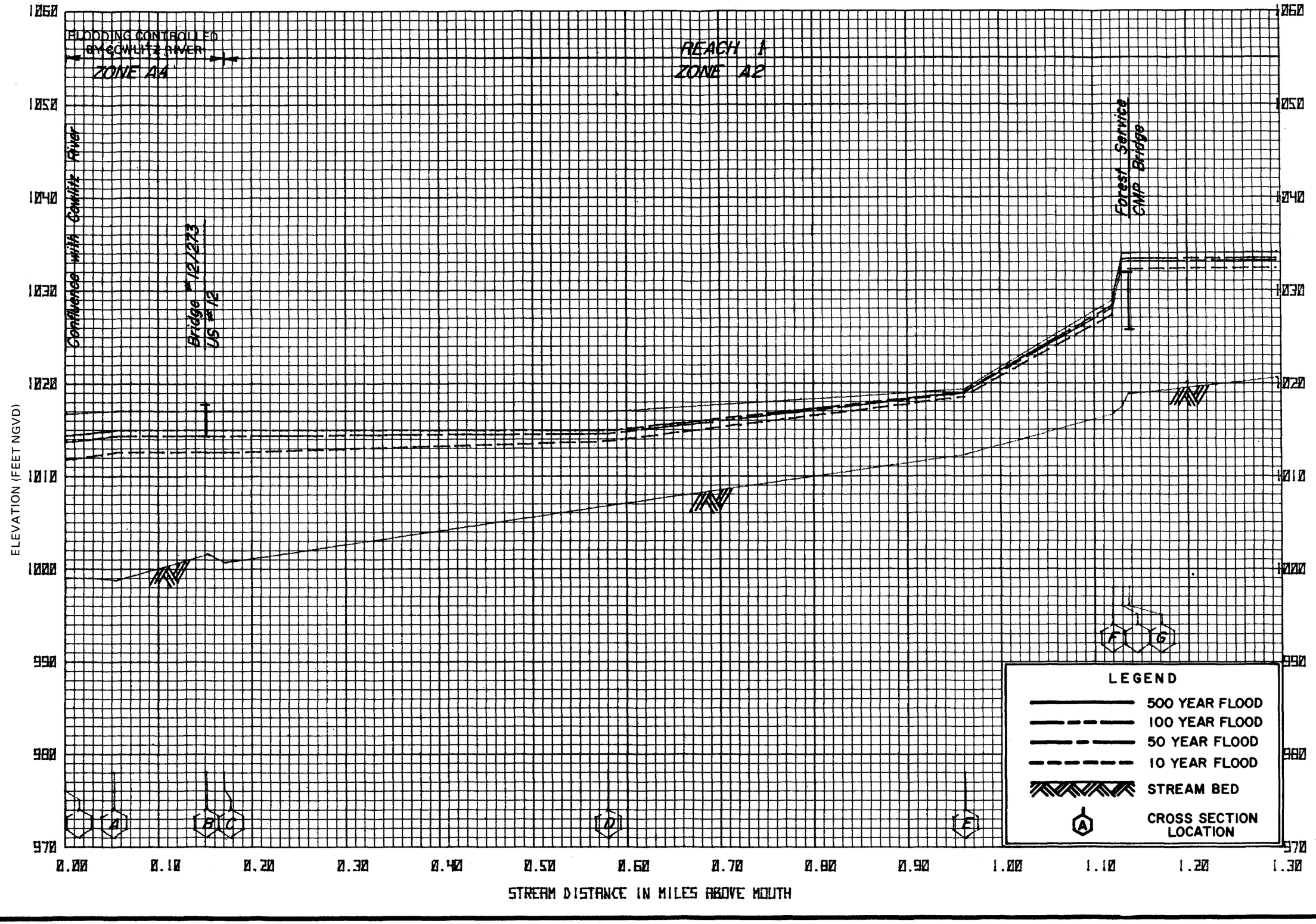
160P

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD PROFILES

SILVER CREEK



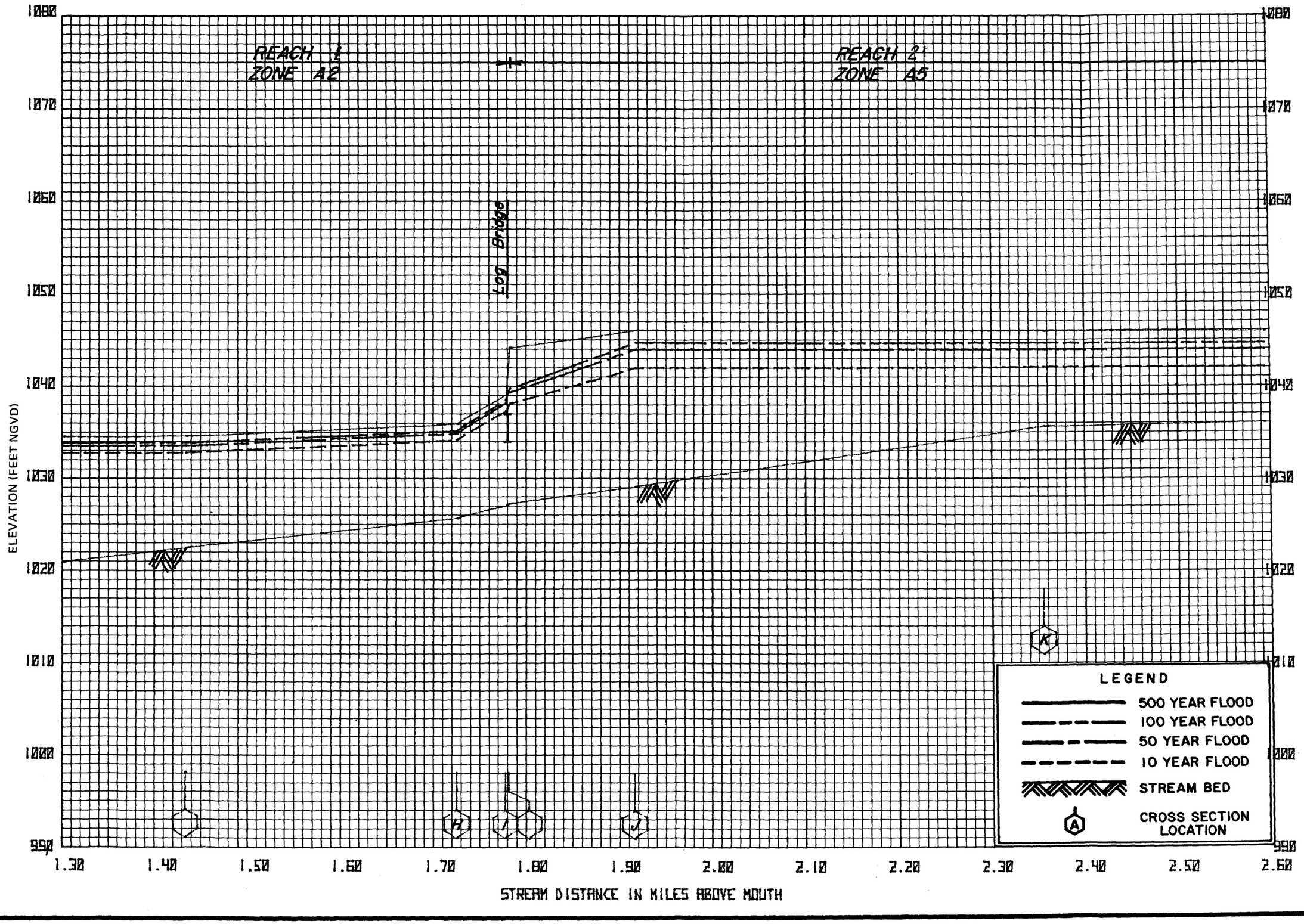
FLOOD PROFILES

HALL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

161P



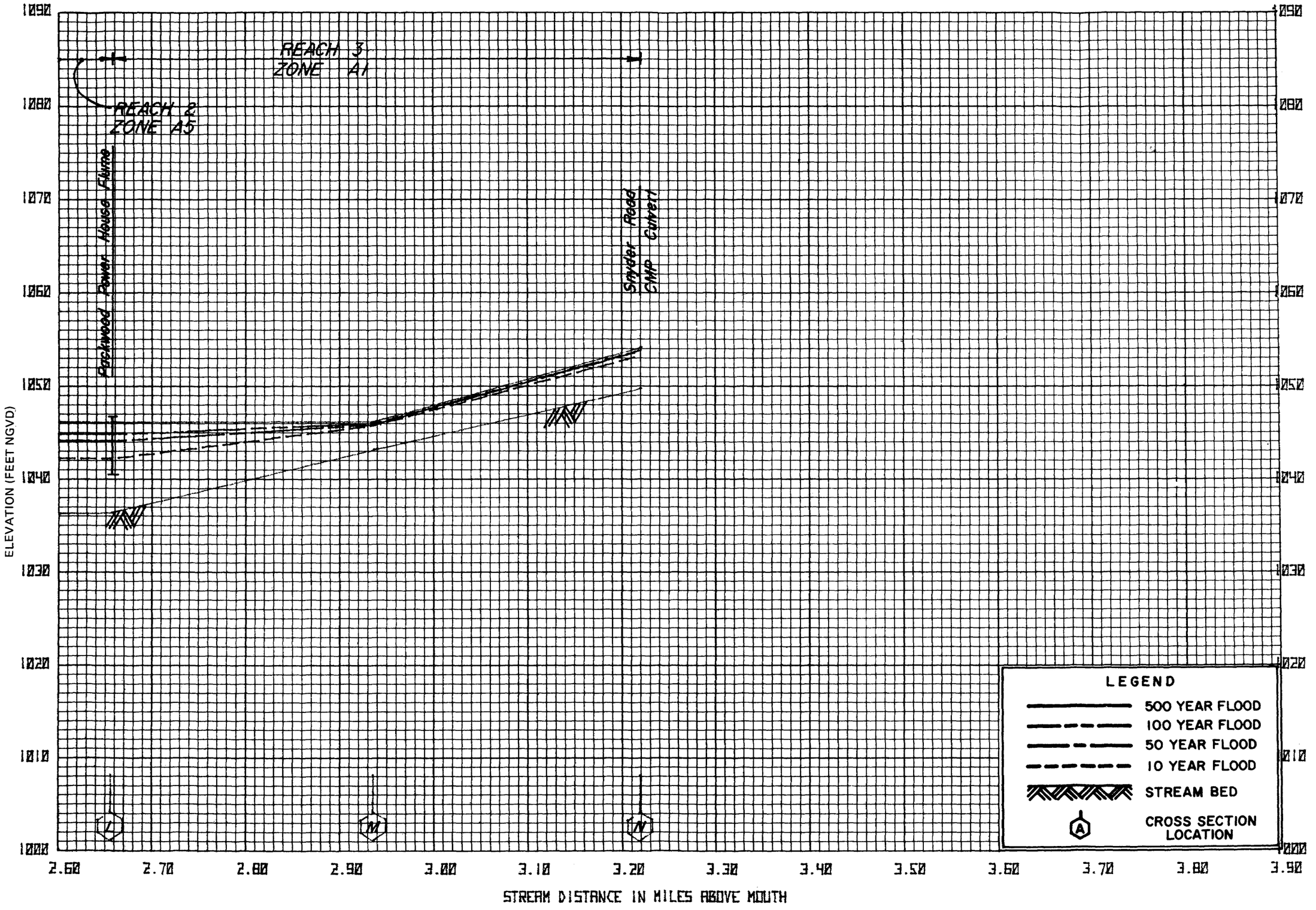
FLOOD PROFILES

HALL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

162P



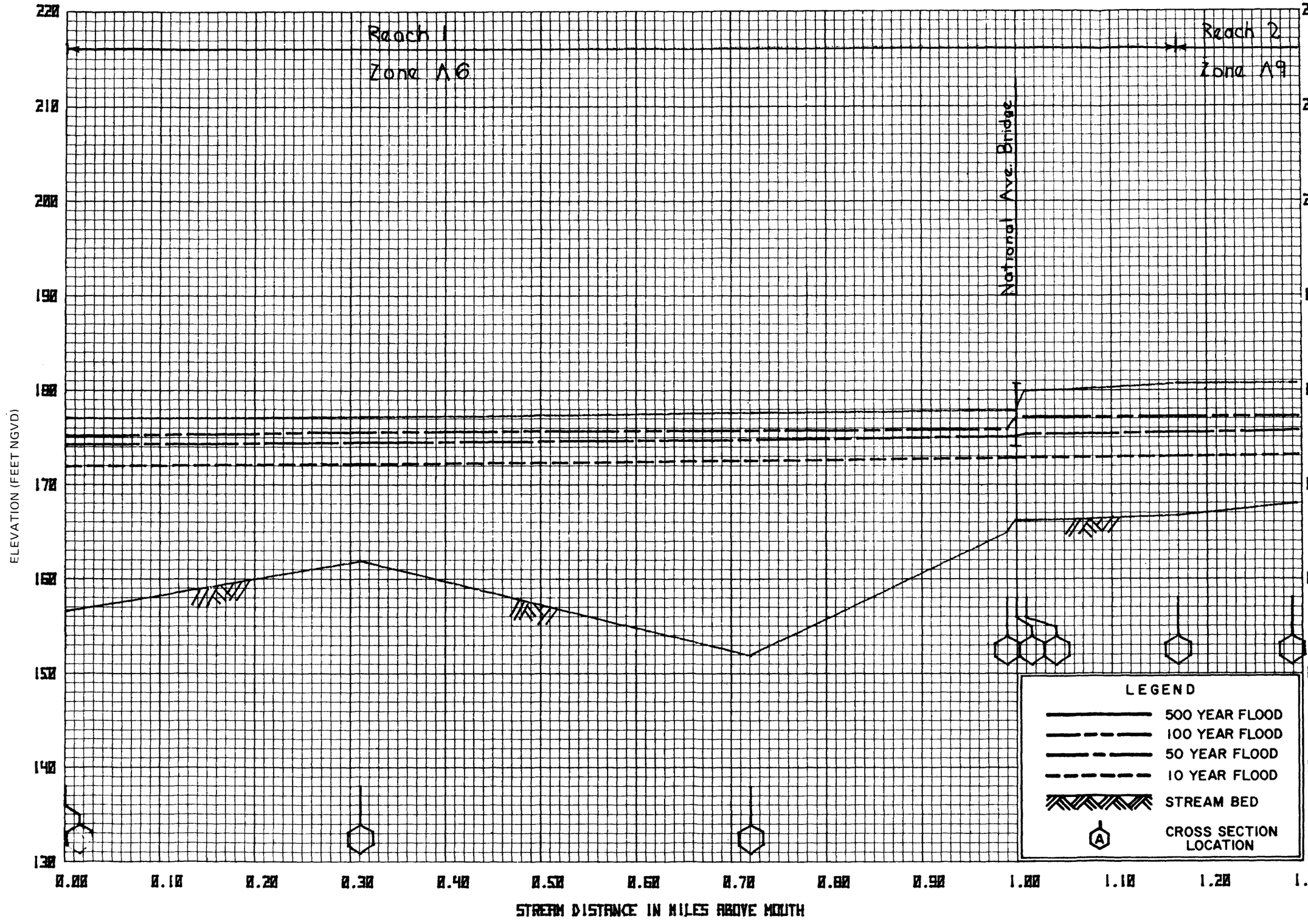
FLOOD PROFILES

HALL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA.
(UNINC. AREA)

163P



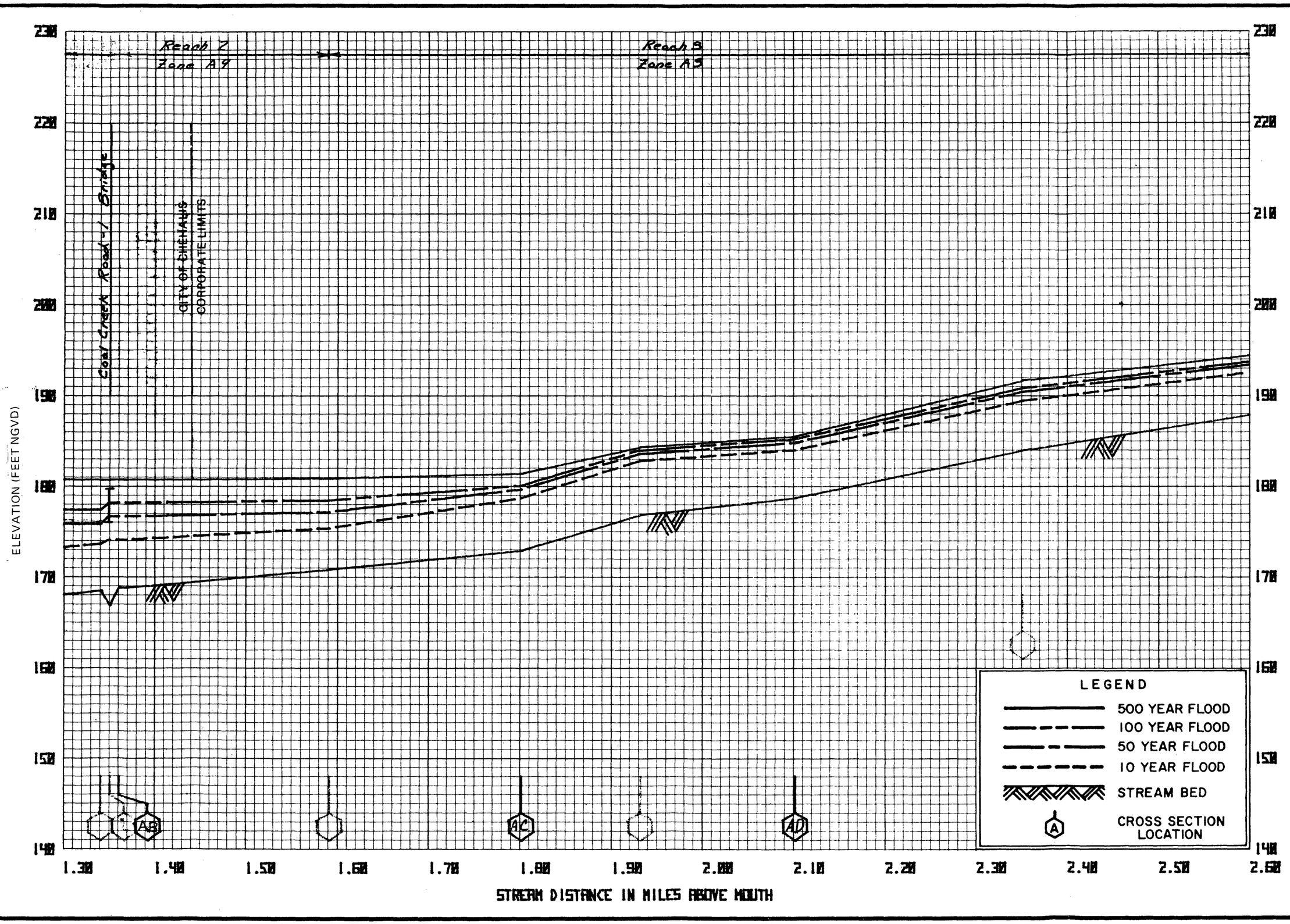
FLOOD PROFILES

COAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

164P



FLOOD PROFILES

COAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

165P

FLOOD PROFILES

COAL CREEK

Reach 3
Zone A3

Reach 4
Zone A2

Coal Creek Road - 2 Bridge

ELEVATION (FEET NGVD)

250
240
230
220
210
200
190
180
170
160

2.60 2.70 2.80 2.90 3.00 3.10 3.20 3.30 3.40 3.50 3.60 3.70 3.80 3.90

STREAM DISTANCE IN MILES ABOVE MOUTH

AE AF AG AH

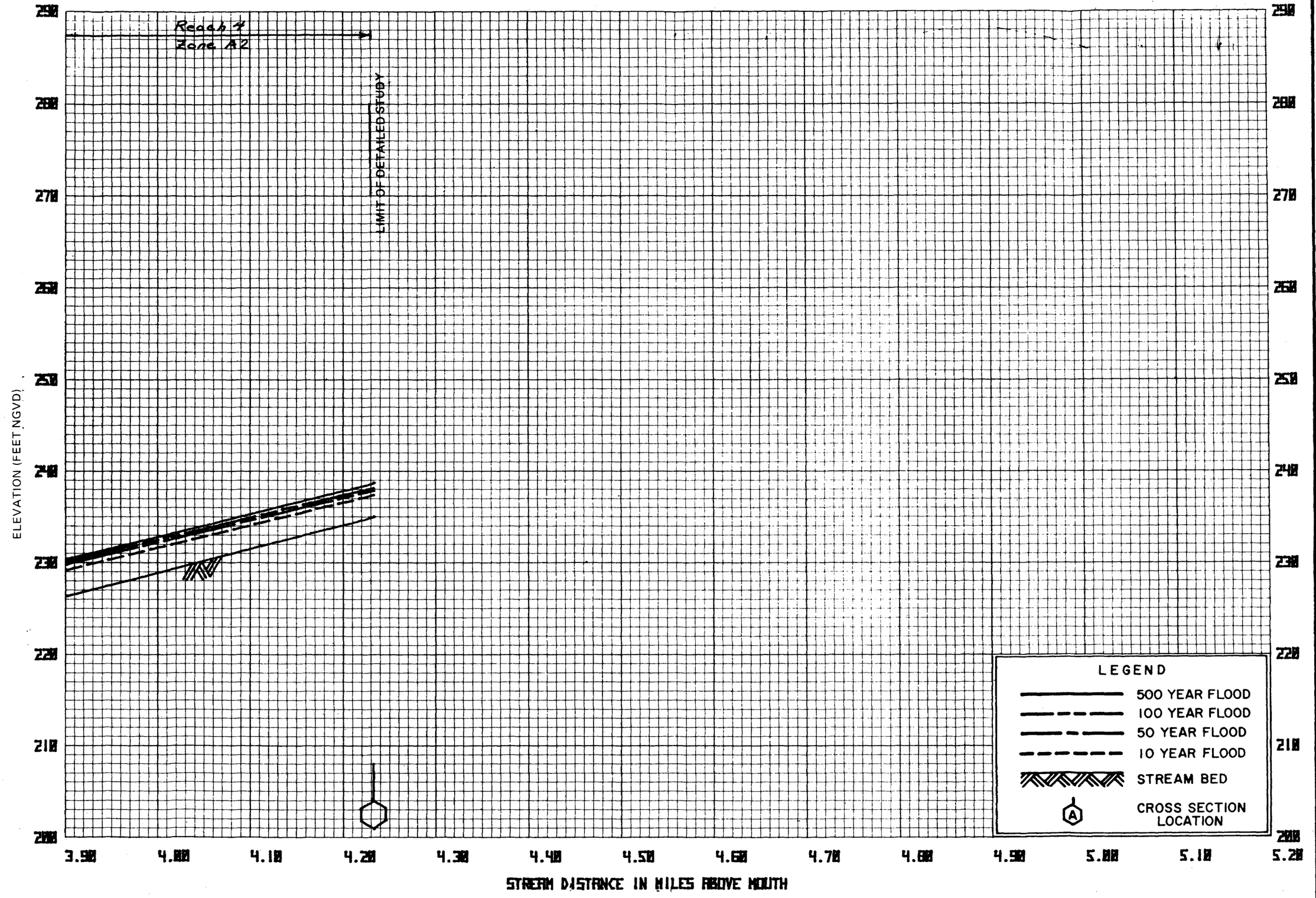
LEGEND

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

166P



FLOOD PROFILES

COAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEWIS COUNTY, WA
(UNINCORPORATED AREAS)

167P