

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

FLOOD-PLAIN DELINEATION

For

BULL RUN, LITTLE ROCKY RUN,
JOHNNY MOORE CREEK, AND
POPES HEAD CREEK BASINS

FAIRFAX COUNTY, VIRGINIA

Open-File Report 77-329

Prepared in cooperation with the
County of Fairfax

1977

CONVERSION FACTORS

Factors for converting English units to metric units are shown to four significant figures. However, in the text the metric equivalents are shown only to the number of significant figures consistent with the values for the English units.

<u>English</u>	<u>Multiply by</u>	<u>Metric</u>
acres	4.047×10^{-3}	km ² (square kilometers)
ft ³ /s (cubic feet per second)	2.832×10^{-2}	m ³ /s (cubic meters per second)
ft (feet)	3.048×10^{-1}	m (meters)
in (inches)	$2.540 \times 10^{+1}$	mm (millimeters)
mi (miles)	1.609	km (kilometers)
mi ² (square miles)	2.590	km ² (square kilometers)

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WRSIC ABSTRACT

Flood-Plain Delineation for Bull Run, Little Rocky Run, Johnny Moore Creek, and Popes Head Creek Basins

Water-surface profiles of the 25-, 50-, and 100-year recurrence interval discharges have been computed for all streams and reaches of channels in Fairfax County, Virginia having a drainage area greater than 1 square mile (2.59 km^2) except for Dogue Creek, Little Hunting Creek, and that portion of Cameron Run above Lake Barcroft. Maps having a 2-foot (0.60 m) contour interval and a horizontal scale of 1 inch (2.54 cm) equals 100 feet (30.5 m) were used for base on which flood boundaries were delineated for 25-, 50-, and 100-year floods to be expected in each basin under ultimate development conditions. This report is one of a series and presents a discussion of techniques employed in computing discharges and profiles as well as the flood profiles and maps on which flood boundaries have been delineated for that part of Bull Run, Little Rocky Run, Johnny Moore Creek, and Popes Head Creek Basins within Fairfax County.

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Flood-Plain Delineation for Bull Run, Little Rocky Run,
Johnny Moore Creek, and Popes Head Creek Basins

Fairfax County, Virginia

Pat L. Soule

ABSTRACT

Water-surface profiles of the 25-year and 100-year floods and maps on which the 25-, 50-, and 100-year flood boundaries are delineated for Little Rocky Run Basin, Johnny Moore Creek Basin, Popes Head Creek Basin and that part of Bull Run basin within Fairfax County are presented in this report.

The techniques used in the computation of the flood profiles and delineation of flood boundaries are presented, and specific hydraulic problems encountered within the study area are also included.

INTRODUCTION

Suburban areas in many parts of the United States have experienced remarkable growth over the last decade or so. Much of this growth, which replaced farms and woodlands with streets, housing developments and shopping centers, caused serious environmental problems. Continued growth and increased competition for desirable space have required careful guidance and planning of future development to insure optimum land use.

Fairfax County began to experience such growth during the early 1950's. In 1959 much of Fairfax County was still rural, but the desirability of regulating encroachment into the flood hazard areas became apparent and appropriate local legislation was enacted by Fairfax County. For the legislation to be effective, it was necessary to quantify the effect of development on floods and to delineate the boundaries of flood inundation.

Data collection in Bull Run, Little Rocky Run, Johnny Moore Creek, and Popes Head Creek basins began in 1962. The study continued through the release of maps and a letter report to the county of Fairfax in 1974.

This report is one of a series summarizing the results of the hydraulic analysis done under the cooperative program between the county of Fairfax and the Geological Survey. The hydrologic analysis has been published separately (Anderson, 1970).

Purpose and scope

The purpose of the study was to determine the boundaries of floods having recurrence intervals of 25-, 50-, and 100-years under conditions of ultimate development. The flood boundaries were to be delineated on large scale maps that would become a part of the zoning ordinance documents for Fairfax County. The maps also could be used for management, design, and land-use planning.

To achieve the objective of the study, it was necessary to analyze the effects of urbanization upon floodflows and to develop techniques to compute the flood magnitude from measurable basin parameters for any given recurrence interval and for any degree of development. Reasonably accurate methods were available for estimating the magnitude and frequency of floods expected from rural or undeveloped drainage basins. However, as a drainage basin is changed from rural to suburban or urban conditions, the magnitude and frequency of flooding is also changed. Changes in flood frequency and magnitude resulting from basin development had previously received only scant study because of the sparse data available.

The cooperative agreement between U.S. Geological Survey and Fairfax County, established a project to study the effects of basin development on floods and to delineate flood boundaries on specially prepared maps of stream valleys. The scope of the project included all of the basins in Fairfax County having a drainage area greater than 1 square mile (2.59 square kilometers). Excepted were the Dogue Creek and Little Hunting Creek basins, and the upper tributaries of Cameron Run basin, and Tripps Run and Holmes Run above Lake Barcroft. Studies of these basins were made by a private consulting firm. The maps were to have 2-foot (0.60 m) contours at a scale of 1 inch (2.54 cm) equals 100 feet (30.5 m). The project allowed for collection of basic data, for analytical investigation, and for definition of flood-prone areas.

Anderson (1970) described the procedures used and the results obtained in the analysis of the effect of urbanization on flooding. He presented mathematical and graphical relations that may be used to estimate the flood discharge at a given recurrence interval up to 100 years for sites in the Washington Metropolitan area having various degrees of development.

The purpose of this report is to provide a consolidated reference containing a summary of the techniques used in computation of flood profiles, a discussion of specific hydraulic problems encountered within the study area, a graphical presentation and listing of flood profiles, and the maps showing the area inundated by floods having recurrence intervals of 25-, 50-, and 100-years.

Description of Study Area

Fairfax County is in northern Virginia adjacent to and just west of Washington, D.C. (fig. 1). Fairfax County was formed by the division of the County of Prince William in 1742. From colonial days until World War II Fairfax County remained primarily rural. Following World War II, with the tremendous growth of Federal Government and influx of light industry, the County lost its primary agricultural character and became largely residential. The population grew from 41,000 in 1940 to 564,000 in 1974 and it is estimated that by the year 2000 Fairfax County will have a population between 1 and 1.5 million. More than 50 percent of the land area had been developed by 1974. (written comm., Fairfax County, 1974)

Bull Run forms part of the southeast boundary of Fairfax County. Bull Run and its tributaries drain the southwestern part of Fairfax County. Bull Run heads in Bull Run Mountains at elevations near 1200 feet and runs in a southeasterly direction discharging into Occoquan Reservoir with a normal pool elevation of 120 feet above mean sea level. Little Rocky Run, Johnny Moore Creek, Popes Head Creek, and that part of Bull Run Basin within Fairfax County lie between latitudes $38^{\circ}43'N$ and $38^{\circ}52'N$ and longitudes $77^{\circ}18'W$ and $77^{\circ}32'30''W$ (fig. 2).

The area covered by this report is bounded by Pohick and Accotink basins to the east, Wolf Run to the south, Difficult Run and Cub Run basins to the north, and Bull Run itself to the southwest. The entire Bull Run drainage basin includes a total area of approximately 194 square miles (502 km^2). That

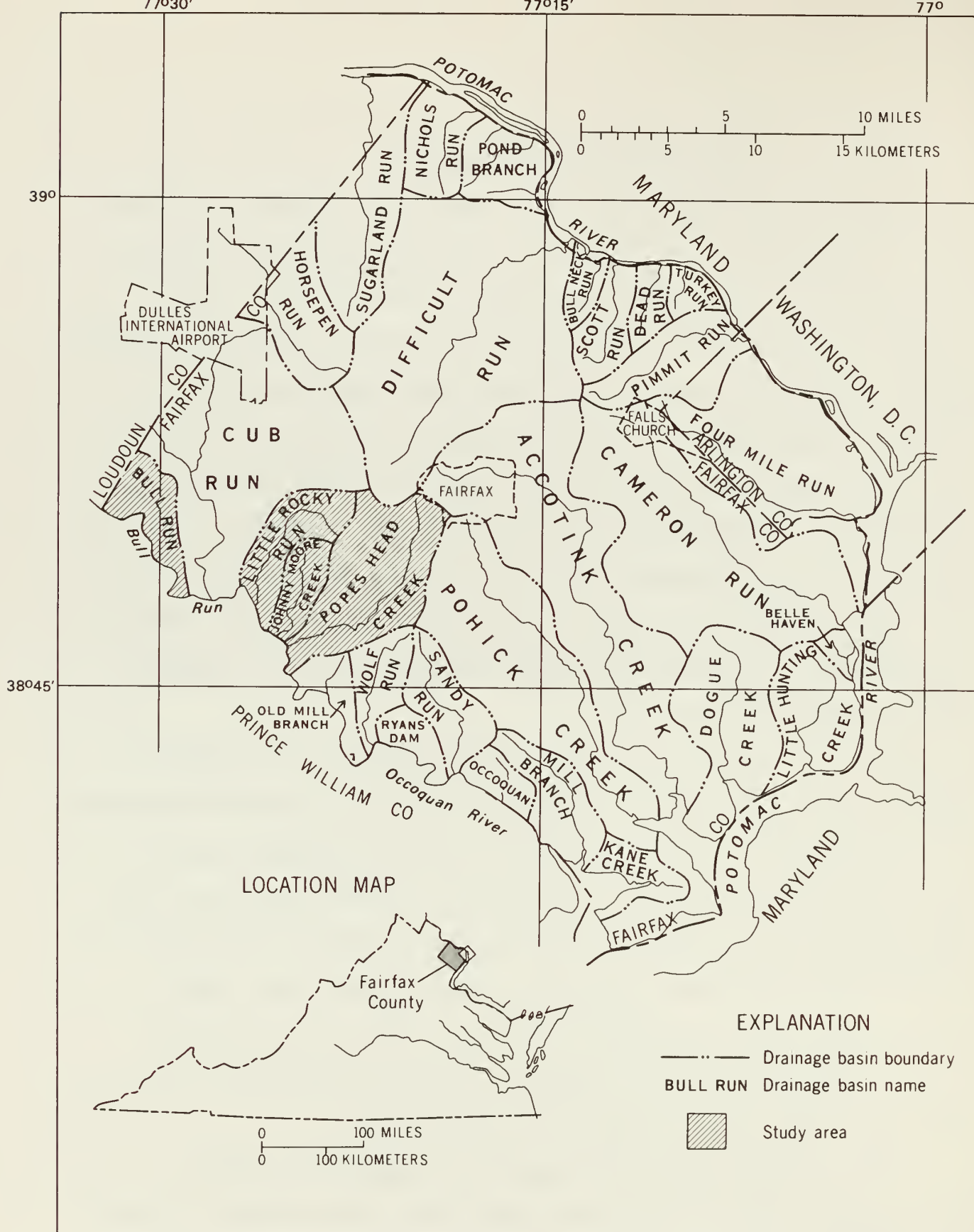


Figure 1. Location map of study area

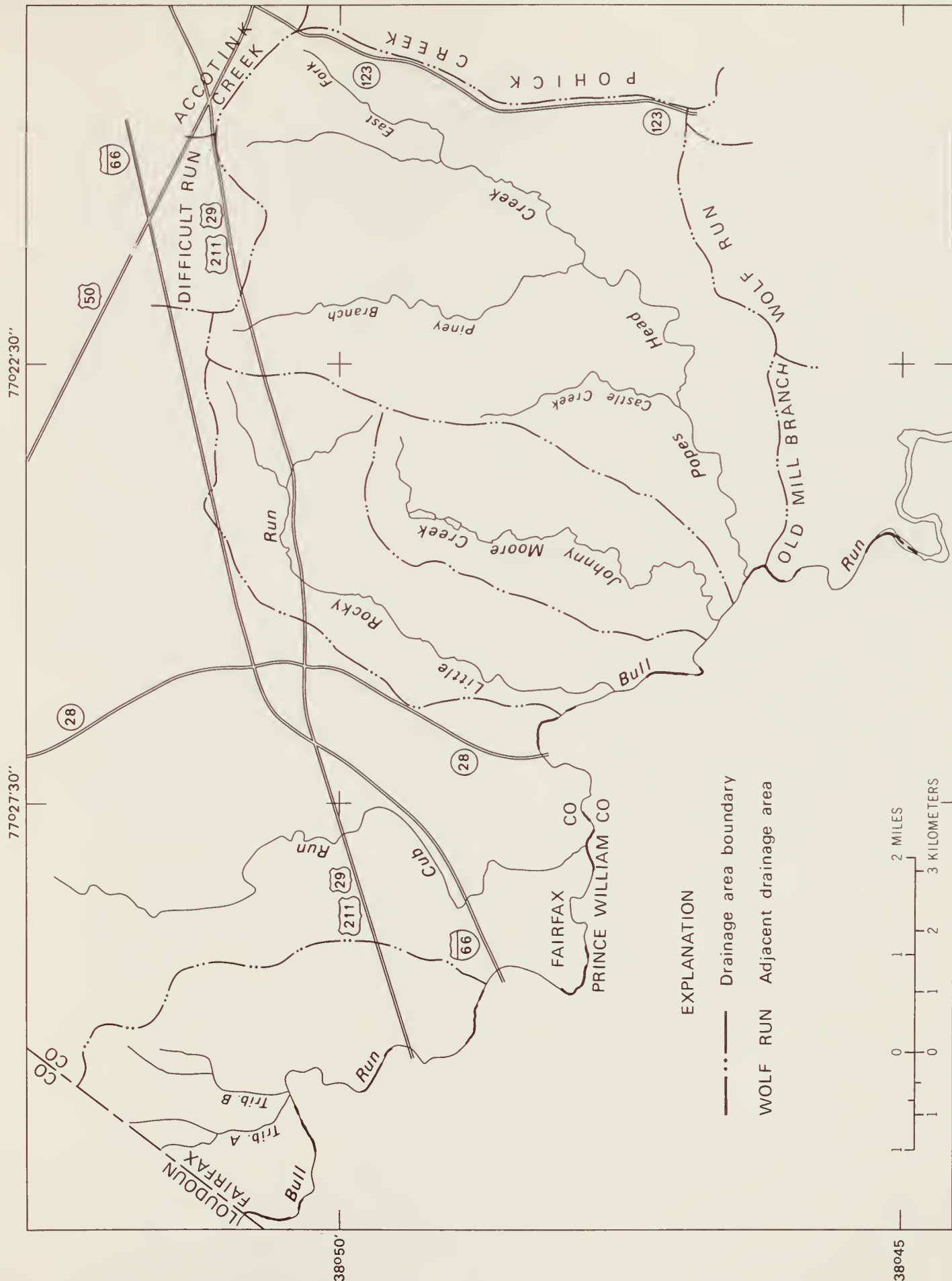


Figure 2. Map of Bull Run, Little Rocky Run, Johnny Moore Creek, and Popes Head Creek Basins

part of Bull Run and those tributaries within Fairfax County included in this report drain an area of approximately 33 square miles (85 km²).

The topographic features of the Bull Run basin vary from the relatively flat area of the upper Piedmont to the mountainous ridges and gaps of the Bull Run Mountains. Within Fairfax County, Bull Run tributaries 'A' and 'B' and Little Rocky Run are within the Piedmont Lowland physiographic province, and Johnny Moore Creek and Popes Head Creek Basins are within the Piedmont Upland physiographic province. That part of Bull Run basin within Fairfax County varies from a series of low ridges and hills to large areas of nearly level land in the west and northwest near Dulles Airport. Popes Head Creek and Johnny Moore Creek basins have well developed drainages, with steeper slopes along the stream courses and fairly steep channel slope, and in the area of the mouth of Cub Run and above within Fairfax County it has a low and fairly wide flood plain.

There has been little development within Little Rocky Run, Johnny Moore Creek, Popes Head Creek, and that part of the Bull Run basin discussed in this report. The centers of development are along the 166 corridor in Gainesville, Centreville, Chantilly and Fairfax City areas, more than 90 percent of the basin is vacant or devoted to agricultural uses. Future development will probably be along the 166 corridor, with Fairfax City, Chantilly and Centreville being the centers for that development within Fairfax County. Residential development will expand into the Little Rocky Run, Johnny Moore Creek, and Popes Head Creek basins

and on that high area overlooking Bull Run, but densities should be low, as planned development is for larger building lots and acreages.

Fieldwork in the study area was done in 1971 and 1972.

FLOOD-PLAIN MAPPING

Maps

The base maps on which flood boundaries are delineated have a 2-foot (0.60 m) contour interval and a horizontal scale of 1 inch (2.54 cm) equals 100 feet (30.5 m). Natural and manmade features along the stream are shown. The maps were compiled by the USGS from aerial photographs taken in 1967 of Bull Run basin, in 1970 of Little Rocky Run and Johnny Moore Creek basins, and in 1971 of Popes Head Creek basin. The maps include a 250-foot (76.2 m) grid based on the Virginia coordinate system, north zone.

Discharge

The flood areas delineated are those determined using ultimate-development discharges. Highly developed basins differ from natural basins in that for a given storm (1) runoff is greater, (2) discharge time is much shorter, and (3) floods of comparable magnitude have a higher frequency of occurrence. These factors were analyzed through a study of streamflow and precipitation records, most of which were collected in the vicinity of Washington, D.C. The report, "Effects of Urban Development on Floods in Northern Virginia", (Anderson, 1970) describes the analysis used and summarizes the conclusions of that analysis. The effects of imperviousness with respect to runoff volumes was evaluated by comparing typical runoff coefficients for natural and highly developed basins. Regression analysis was used; first to derive the relation of lag time (the time lapse from centroid of precipitation excess to the centroid of runoff) as a function of length-slope parameter; and second, to derive the relation of mean annual flood (2.33-year recurrence interval), adjusted for effects of imperviousness, as a function of drainage-basin area and lag time. An analysis of flood and rainfall frequencies was made to derive ratios of 25-, 50-, and 100-year floods to the mean annual flood for any percentage of imperviousness. Using the available information for a basin in the project area, the magnitude of the 2.33, 25-, 50-, and 100-year flood peaks can be computed from measurable basin parameters for any percentage of imperviousness in the ultimate development plan.

The term recurrence interval, as used here, is the average

interval of time within which a given flood discharge will be equaled or exceeded once. The recurrence interval is inversely related to the chance of a given flood being equaled or exceeded in any one year. Thus, the 100-year flood has a 1 percent chance of being equaled or exceeded in any one year. No periodicity is implied.

Profile Computation

Having computed the 25-, 50-, and 100-year floods at selected points by the methods set forth by Anderson (1970) the corresponding water-surface profiles were computed using the standard step method of backwater analysis. The method is based on a balance of energy between successive pairs of stream cross-sections. For tranquil flow the computations start at the farthest downstream section, or at a control section, and proceed upstream; but for supercritical flow the computations start at the most upstream section, or critical section, and proceed downstream until flow again becomes tranquil. Peak-discharge magnitudes varies with size of drainage area and were changed at selected points, such as above the confluence of a major tributary. The water-surface profile elevations are available for each cross-section. The cross-sections are referenced to an arbitrary base line, drawn to an approximate centroid of flow, and measured in an upstream direction from an arbitrary starting point. Profiles were computed in accordance with accepted methods of the Geological Survey.

Following are several general items pertaining to the profile computations:

1. Discharge magnitudes greater than that of the 100-year flood may occur. However, the rate of change of stage per unit discharge generally becomes comparatively less as the discharge increases.
2. No factors of safety were used in the computations. Bridges and culverts were assumed to be free of debris. Roughness coefficients (Manning's "n") were selected based on summer vegetation.
3. New construction and channelization work may modify hydraulic properties, thus changing the flood profiles in the future.

Delineation of Flood Boundaries

The first step in the delineation of flood areas was to transpose the flood profile elevation, computed at each cross section, onto the base maps on which channel cross-sections had initially been located. Delineation was then completed by interpreting elevations between these cross sections and between map contours on a straight line basis.

The maps show the 25- and 100-year flood boundaries generally and include the 50-year flood boundary in some places. In steep places there was insufficient space to show both the 25- and 100-year flood boundaries, and only the 100-year flood was delineated.

The delineation represents the average water-surface elevation. During actual floods, the water-surface may not be level across the stream.

FLOOD PROFILES

Flood-profile data tables for Little Rocky Run, Johnny Moore Creek, Popes Head Creek, and that part of Bull Run basin within Fairfax County are:

Table 1. Water-surface profile data for Bull Run

Table 2. Water-surface profile data for Bull Run tributary 'A'

Table 3. Water-surface profile data for Bull Run tributary 'B'

Table 4. Water-surface profile data for Little Rocky Run

Table 5. Water-surface profile data for Little Rocky Run tributary

Table 6. Water-surface profile data for Johnny Moore Creek

Table 7. Water-surface profile data for Popes Head Creek

Table 8. Water-surface profile data for East Fork Popes Head Creek

Table 9. Water-surface profile data for Piney Branch

Table 10. Water-surface profile data for Castle Creek

Table 11. Water-surface profile data for Castle Creek tributary

The tables were prepared so that the reader can locate the position for which information is desired on the flood plain maps included in this report, determine base-line stationing from the map by projection to the base line, and by use of the station number, find in the table the nearest section for which information was determined.

For each cross section used in profile computations, tables 1 to 11 summarize: (1) The base-line reference stationing of that section, (2) the imperviousness determined from "Fairfax County, A Comprehensive Plan for the Bull Run Planning District (Feb. 1969)" and County ultimate development plans used for computing discharge for the different recurrence interval flood at that point, (3) the

resulting discharge and the corresponding water-surface profile elevations for 25-, 50-, and 100-year floods.

Special Hydrologic and Hydraulic Condition

Special hydrologic and hydraulic conditions will be discussed in order.

1. The 25-, 50-, and 100-year discharges for the Bull Run basin were computed using mean annual discharges obtained as follows:
 - a. Below Cub Run the mean annual discharges were computed on the basis of 20 years of record (1951-70) for the gaging station "Bull Run at Manassas" and relationships developed by Anderson (1970).
 - b. Above Cub Run the mean annual discharges were computed using relationships developed by Anderson (1970).

2. Popes Head Creek parallels the Southern Railroad for about 4 miles. Several grade crossings and reaches where channelization has taken place are subject to change. Maintenance crews from time to time alter the channel or change the grade crossings to alleviate flood problems. The following reaches are mentioned specifically:

A. Section No. 10 to 12 (Sta 16+42 to 19+40).

The channel has been channelized to parallel the railroad grade, the banks are steep and the railroad grade is subject to erosion. Maintenance and alteration of this section would be expected during and after most major floods.

B. Section No. 60 to 84 (Sta. 145+25 to Sta. 187+19).

This reach is complicated by a bridge at the lower end of the reach, three contractions created by old grade crossings, and a section where the old channel has been cut off and channelization parallels the railroad. Flood profiles could be changed by future alterations to the channel or control features in the reach. The old channel north of the railroad between sections 71 and 81 has a 48-inch culvert inlet and 48-inch culvert outlet, both of which are subject to stoppage. The flood boundry was computed for the area north of the railroad, ignoring inflow and outflow thru these culverts. Inflow into the area was considered to be over tracks from the channel south of the tracks. Outflow was considered to be over the tracks. Outflow was considered to be over the tracks at the downstream end of the reach. Boundaries delineated are maximum limits of the 100-year recurrence interval flood.

BULL RUN BASIN

Table 1: Water-surface profile data for Bull Run

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second			Elevation, in feet			Remarks
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
1	775+60	Rural	20,000	26,000	31,000	127.4	128.2	129.3	Confluence with Occoquan River
2	785+94	Rural	20,000	26,000	31,000	127.5	128.3	129.4	
3	799+50	Rural	20,000	26,000	31,000	127.6	128.4	129.6	
4	810+04	Rural	20,000	26,000	31,000	127.7	128.5	129.7	
5	819+60	Rural	20,000	26,000	31,000	128.0	129.0	130.2	
6	830+31	Rural	20,000	26,000	31,000	128.0	129.0	130.2	
7	841+10	Rural	20,000	26,000	31,000	128.2	129.3	130.6	
8	847+60	Rural	20,000	26,000	31,000	128.2	129.3	130.6	
9	848+67								Old Yates Ford Road (State 612)
10	850+11	Rural	20,000	26,000	31,000	128.4	129.5	130.8	
11	850+63	Rural	20,000	26,000	31,000	128.4	129.5	130.8	
12	852+46	Rural	20,000	26,000	31,000	128.6	129.7	131.1	
13	856+33	Rural	20,000	26,000	31,000	128.7	129.8	131.2	
14	861+28	Rural	20,000	26,000	31,000	128.7	129.8	131.2	
15	866+31	Rural	20,000	26,000	31,000	128.8	130.0	131.4	
16	871+37	Rural	20,000	26,000	31,000	128.9	130.1	131.5	
17	876+90	Rural	20,000	26,000	31,000	129.0	130.3	131.7	
18	881+70	Rural	20,000	26,000	31,000	129.4	130.8	132.2	
19	885+97	Rural	20,000	26,000	31,000	129.4	130.8	132.2	
20	893+13	Rural	20,000	26,000	31,000	129.4	130.8	132.3	
21	900+11	Rural	20,000	26,000	31,000	129.6	131.0	132.6	
22	907+88	Rural	20,000	26,000	31,000	129.8	131.2	132.8	
23	914+25	Rural	20,000	26,000	31,000	129.8	131.2	132.8	
24	921+68	Rural	20,000	26,000	31,000	130.4	131.9	133.5	

^a Recurrence interval

BULL RUN BASIN
Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second			Elevation in feet			Remarks
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
25	930+45	Rural	20,000	26,000	31,000	130.6	132.2	133.8	
26	938+82	Rural	20,000	26,000	31,000	131.1	132.8	134.5	
27	943+65	Rural	20,000	26,000	31,000	131.1	132.8	134.5	
28	948+33	Rural	20,000	26,000	31,000	131.8	133.6	135.3	
29	954+20	Rural	20,000	26,000	31,000	132.4	134.4	136.3	
30	959+37	Rural	20,000	26,000	31,000	133.0	135.0	136.8	
31	964+81	Rural	20,000	26,000	31,000	133.2	135.3	137.1	
32	972+95	Rural	20,000	26,000	31,000	134.1	136.3	138.1	
33	979+57	Rural	20,000	26,000	31,000	134.7	137.0	138.9	
34	985+42	Rural	20,000	26,000	31,000	135.0	137.3	139.1	
35	990+89	Rural	20,000	26,000	31,000	135.3	137.6	139.4	
36	996+93	Rural	20,000	26,000	31,000	135.7	138.0	139.8	
37	1002+69	Rural	20,000	26,000	31,000	136.1	138.4	140.2	
38	1006+38	Rural	20,000	26,000	31,000	136.4	138.7	140.4	
39	1010+21	Rural	20,000	26,000	31,000	136.9	139.2	141.0	
40	1013+94	Rural	20,000	26,000	31,000	137.3	139.6	141.4	
41	1019+51	Rural	20,000	26,000	31,000	137.5	139.9	141.7	
42	1025+98	Rural	20,000	26,000	31,000	137.9	140.4	142.2	
43	1031+96	Rural	20,000	26,000	31,000	138.2	140.6	142.4	
44	1035+73	Rural	20,000	26,000	31,000	138.6	141.1	143.0	
45	1039+23	Rural	20,000	26,000	31,000	139.0	141.5	143.5	
46	1044+45	Rural	20,000	26,000	31,000	139.3	141.9	143.8	
47	1049+02	Rural	20,000	26,000	31,000	139.5	142.1	144.1	
48	1051+79	Rural	20,000	26,000	31,000	140.2	142.9	144.9	
49	1054+52	Rural	20,000	26,000	31,000	140.6	143.4	145.4	

^a Recurrence interval

BULL RUN BASIN
Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a 100-year ^a
50	1058+59	Rural	20,000	26,000	31,000	140.7	143.5 145.5
51	1062+02	Rural	20,000	26,000	31,000	141.1	143.9 145.9
52	1064+26	Rural	20,000	26,000	31,000	141.3	144.1 146.2
53	1066+55	Rural	20,000	26,000	31,000	141.4	144.1 146.2
54	1069+72	Rural	20,000	26,000	31,000	141.6	144.3 146.4
55	1073+08	Rural	20,000	26,000	31,000	141.9	144.7 146.8
56	1076+62	Rural	20,000	26,000	31,000	142.6	145.4 147.6
57	1080+83	Rural	20,000	26,000	31,000	142.9	145.8 147.9
58	1084+61	Rural	20,000	26,000	31,000	143.4	146.3 148.4
59	1085+60	Rural	20,000	26,000	31,000	143.4	146.3 148.4
60	1086+56	Rural	20,000	26,000	31,000	143.8	146.6 148.8
61	1090+18	Rural	20,000	26,000	31,000	143.9	146.7 148.9
62	1093+77	Rural	20,000	26,000	31,000	144.1	146.9 149.0
63	1097+53	Rural	20,000	26,000	31,000	144.7	147.6 149.7
64	1100+81	Rural	20,000	26,000	31,000	145.0	147.8 150.0
65	1105+05	Rural	20,000	26,000	31,000	145.7	148.5 150.6
66	1108+18	Rural	20,000	26,000	31,000	146.4	149.2 151.3
67	1111+74	Rural	20,000	26,000	31,000	146.8	149.6 151.7
68	1115+14	Rural	20,000	26,000	31,000	147.6	150.4 152.6
69	1119+20	Rural	20,000	26,000	31,000	147.8	150.6 152.7
70	1122+18	Rural	20,000	26,000	31,000	147.9	150.7 152.8
71	1125+70	Rural	20,000	26,000	31,000	148.0	150.8 153.0
72	1128+61	Rural	20,000	26,000	31,000	148.2	151.0 153.1
73	1132+67	Rural	20,000	26,000	31,000	148.9	151.8 154.0

^a Recurrence interval

BULL RUN BASIN
Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second			Elevation, in feet			Remarks
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
74	1136+05	Rural	20,000	26,000	31,000	149.6	152.6	154.8	Southern Railroad
75	1140+58	Rural	20,000	26,000	31,000	149.7	152.6	154.9	
76	1142+38								
77	1143+63	Rural	20,000	26,000	31,000	150.1	153.0	155.2	
78	1145+94	Rural	20,000	26,000	31,000	150.7	153.8	156.1	
79	1148+83	Rural	20,000	26,000	31,000	150.9	153.9	156.2	
80	1152+46	Rural	20,000	26,000	31,000	151.3	154.3	156.7	
81	1155+97	Rural	20,000	26,000	31,000	151.5	154.6	156.9	
82	1160+10	Rural	20,000	26,000	31,000	151.9	155.0	157.4	
83	1164+64	Rural	20,000	26,000	31,000	152.1	155.1	157.5	
84	1167+89	Rural	20,000	26,000	31,000	152.2	155.3	157.6	
85	1171+17	Rural	20,000	26,000	31,000	152.5	155.6	158.0	
86	1173+20	Rural	20,000	26,000	31,000	152.7	155.9	158.2	
87	1175+50	Rural	20,000	26,000	31,000	152.7	155.9	158.2	
88	1178+50	Rural	20,000	26,000	31,000	153.4	156.5	158.8	
89	1183+04	Rural	20,000	26,000	31,000	153.9	157.1	159.5	
90	1185+87	Rural	20,000	26,000	31,000	154.0	157.2	159.6	
91	1189+51	Rural	20,000	26,000	31,000	154.3	157.5	159.8	
92	1193+29	Rural	20,000	26,000	31,000	154.4	157.6	160.0	
93	1197+68	Rural	20,000	26,000	31,000	154.6	157.8	160.2	
94	1200+66	Rural	20,000	26,000	31,000	154.7	157.9	160.3	
95	1205+86	Rural	20,000	26,000	31,000	155.0	158.2	160.5	
96	1211+03	Rural	20,000	26,000	31,000	155.4	158.6	160.9	
97	1215+74	Rural	20,000	26,000	31,000	155.7	158.9	161.3	

^a Recurrence interval

BULL RUN BASIN

Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year ^a	100-year ^a	25-year ^a	100-year ^a	
98	1219+84	Rural	20,000	26,000	155.8	159.0	161.4
99	1224+68	Rural	20,000	26,000	156.0	159.2	161.6
100	1228+31	Rural	20,000	26,000	156.2	159.3	161.7
101	1231+05	Rural	20,000	26,000	156.3	159.5	161.9
102	1236+56	Rural	20,000	26,000	156.4	159.6	161.9
103	1240+80	Rural	20,000	26,000	156.5	159.7	162.0
104	1246+22	Rural	20,000	26,000	156.8	160.0	162.3
105	1250+52	Rural	20,000	26,000	157.0	160.1	162.4
106	1254+59	Rural	20,000	26,000	157.2	160.4	162.7
107	1258+65	Rural	20,000	26,000	157.4	160.5	162.8
108	1264+18	Rural	20,000	26,000	157.6	160.8	163.1
109	1268+43	Rural	20,000	26,000	157.8	160.9	163.3
110	1272+72	Rural	20,000	26,000	158.2	161.3	163.7
111	1276+28	Rural	20,000	26,000	158.5	161.6	163.9
112	1281+69	Rural	20,000	26,000	158.7	161.8	164.2
113	1285+90	Rural	20,000	26,000	158.8	161.9	164.3
114	1290+17	Rural	20,000	26,000	158.9	162.0	164.3
115	1294+35	Rural	20,000	26,000	159.2	162.2	164.6
116	1295+23						Centreville Road (State 28)
117	1296+71	Rural	20,000	26,000	159.3	162.4	164.7
118	1303+65	Rural	20,000	26,000	159.7	162.8	165.0
119	1308+96	Rural	20,000	26,000	159.9	162.9	165.2
120	1314+27	Rural	20,000	26,000	160.0	163.1	165.3
121	1320+52	Rural	20,000	26,000	160.1	163.2	165.4

^a Recurrence interval

BULL RUN BASIN
Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second			Elevation, in feet			Remarks
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
122	1326+56	Rural	20,000	26,000	31,000	160.3	163.3	165.5	Ordnance Road (State 616)
123	1331+56	Rural	20,000	26,000	31,000	160.4	163.4	165.6	
1123	1337+00	Rural	20,000	26,000	31,000	160.5	163.5	165.7	
124	1337+85								
1125	1338+32	Rural	20,000	26,000	31,000	160.8	163.7	165.8	
125	1345+00	Rural	20,000	26,000	31,000	160.9	163.7	165.8	
126	1354+53	Rural	20,000	26,000	31,000	160.9	163.8	165.9	
127	1364+00	Rural	20,000	26,000	31,000	161.1	163.9	166.0	
128	1374+39	Rural	20,000	26,000	31,000	161.4	164.1	166.2	
129	1385+59	Rural	9,800	13,100	16,400	161.5	164.2	166.2	
130	1396+17	Rural	9,800	13,100	16,400	161.6	164.3	166.3	Ordnance Road (State 616)
131	1408+80	Rural	9,800	13,100	16,400	161.7	164.4	166.4	
132	1417+76	Rural	9,800	13,100	16,400	161.8	164.4	166.4	
133	1425+38	Rural	9,800	13,100	16,400	161.8	164.4	166.4	
134	1437+36	Rural	9,800	13,100	16,400	162.0	164.5	166.5	
135	1448+94	Rural	9,800	13,100	16,400	162.4	164.6	166.6	
136	1458+73	Rural	9,800	13,100	16,400	162.8	164.8	166.7	
137	1467+93	Rural	9,800	13,100	16,400	163.3	165.1	166.9	
138	1477+12	Rural	9,800	13,100	16,400	164.4	165.8	167.4	
139	1487+27	Rural	9,800	13,100	16,400	165.4	166.7	168.0	
140	1491+20								Interstate 66
141	1491+73								Interstate 66
142	1493+68	Rural	9,800	13,100	16,400	167.0	169.9	171.5	
143	1501+00	Rural	9,800	13,100	16,400	167.8	170.2	171.7	
144	1506+24	Rural	9,800	13,100	16,400	168.1	170.4	171.9	
145	1512+07	Rural	9,800	13,100	16,400	168.5	170.7	172.2	

^a Recurrence interval

BULL RUN BASIN
Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year	50-year	100-year	25-year	50-year		100-year
146	1516+60	Rural	9,800	13,100	16,400	168.9	171.0	172.6	
147	1521+56	Rural	9,800	13,100	16,400	169.4	171.5	173.0	
148	1527+83	Rural	9,800	13,100	16,400	169.8	171.8	173.4	
149	1534+43	Rural	9,800	13,100	16,400	170.3	172.2	173.8	
150	1538+57	Rural	9,800	13,100	16,400	170.7	172.6	174.0	
151	1545+23	Rural	9,800	13,100	16,400	171.1	172.9	174.3	
152	1551+99	Rural	9,100	12,100	15,200	171.3	173.2	174.5	
153	1557+98	Rural	9,100	12,100	15,200	171.7	173.4	174.8	
154	1563+87	Rural	9,100	12,100	15,200	172.0	173.7	175.0	
155	1568+60	Rural	9,100	12,100	15,200	172.3	173.9	175.3	Lee Highway (U.S. 29-211)
156	1569+83								
157	1570+65	Rural	9,100	12,100	15,200	174.0	176.4	178.7	Old Stone Bridge
158	1571+13								
159	1571+90	Rural	9,100	12,100	15,200	174.0	176.5	178.7	
160	1578+16	Rural	9,100	12,100	15,200	174.2	176.6	178.8	
161	1585+78	Rural	9,100	12,100	15,200	174.6	176.8	178.9	
162	1592+40	Rural	9,100	12,100	15,200	175.1	177.1	179.2	
163	1599+19	Rural	9,100	12,100	15,200	175.6	177.5	179.5	
164	1608+02	Rural	9,100	12,100	15,200	176.2	178.0	180.0	
165	1616+09	Rural	9,100	12,100	15,200	176.8	178.6	180.5	
166	1624+28	Rural	9,100	12,100	15,200	177.4	179.1	180.9	
167	1629+13	Rural	9,100	12,100	15,200	177.8	179.4	181.2	
168	1637+68	Rural	9,100	12,100	15,200	178.4	180.0	181.6	
169	1644+07	Rural	9,100	12,100	15,200	179.1	180.5	182.0	
170	1650+20	Rural	9,100	12,100	15,200	179.6	181.0	182.4	

^a Recurrence interval

BULL RUN BASIN
Table 1: Water-surface profile data for Bull Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second			Elevation, in feet		Remarks
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	
171	1653+19	Rural	9,100	12,100	15,200	179.8	181.1	182.5
172	1662+00	Rural	9,100	12,100	15,200	180.3	181.5	182.9
173	1667+32	Rural	9,100	12,100	15,200	180.8	182.0	183.3
174	1672+75	Rural	9,100	12,100	15,200	181.2	182.5	183.9
175	1681+98	Rural	9,100	12,100	15,200	182.4	183.6	185.1
176	1692+39	Rural	9,100	12,100	15,200	183.7	185.2	186.7
177	1704+29	Rural	9,100	12,100	15,200	185.2	186.9	188.4
178	1711+74	Rural	9,100	12,100	15,200	186.0	187.8	189.4
179	1718+96	Rural	9,100	12,100	15,200	186.5	188.3	190.0
180	1724+37	Rural	9,100	12,100	15,200	186.9	188.6	190.3
181	1729+38	Rural	9,100	12,100	15,200	187.3	189.0	190.7
182	1735+10	Rural	9,100	12,100	15,200	187.8	189.6	191.2
183	1737+28	Rural	9,100	12,100	15,200	188.0	189.7	191.2
184	1741+20	Rural	9,100	12,100	15,200	188.7	190.5	192.2
185	1744+38	Rural	9,100	12,100	15,200	189.1	190.8	192.5
186	1748+85	Rural	5,800	7,700	9,600	189.7	191.4	193.0
187	1751+71	Rural	5,800	7,700	9,600	189.9	191.6	193.1
188	1756+49	Rural	5,800	7,700	9,600	190.4	192.0	193.5
189	1761+00	Rural	5,800	7,700	9,600	191.0	192.6	194.0
190	1764+42	Rural	5,800	7,700	9,600	191.6	193.2	194.6
	1765+18							

Fairfax-Loudoun County
Boundary

^a Recurrence interval

BULL RUN BASIN

Table 2: Water-surface profile data for Bull Run tributary 'A'

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks		
			25-year	100-year	25-year	100-year			
1	10+00	20	1,800	2,300	2,800	181.0	182.2	183.6	Confluence with Bull Run
2	15+10	20	1,800	2,300	2,800	181.4	182.4	183.7	
3	20+13	20	1,800	2,300	2,800	182.6	183.0	184.0	
4	23+78	20	1,800	2,300	2,800	183.8	184.3	184.9	
5	27+86	20	1,800	2,300	2,800	187.4	187.8	188.1	
6	33+20	20	1,800	2,300	2,800	189.5	189.8	190.2	
7	38+39	20	1,800	2,300	2,800	191.7	192.0	192.3	
8	42+50	20	1,800	2,300	2,800	193.8	194.2	194.6	
9	46+77	20	1,800	2,300	2,800	196.5	197.0	197.5	
10	47+45								
11	47+74	20	1,800	2,300	2,800	197.7	198.1	198.5	Sudley Road
12	49+91	20	1,800	2,300	2,800	198.2	198.6	199.1	
13	52+22	20	1,100	1,400	1,700	198.7	199.2	199.6	
14	54+80	20	1,100	1,400	1,700	199.6	200.2	200.4	
15	57+61	20	1,100	1,400	1,700	201.3	201.6	201.8	
16	60+04	20	1,100	1,400	1,700	202.5	202.8	202.9	
17	63+46	20	1,100	1,400	1,700	204.4	204.6	204.9	
18	66+38	20	1,100	1,400	1,700	205.7	206.0	206.2	
19	69+16	20	1,100	1,400	1,700	206.9	207.3	207.6	
20	71+09	20	1,100	1,400	1,700	208.2	208.6	208.9	
21	73+25	20	1,100	1,400	1,700	209.8	210.2	210.6	
22	76+12	20	1,100	1,400	1,700	211.7	212.1	212.4	
23	78+83	20	1,100	1,400	1,700	213.1	213.5	213.9	
24	80+78	20	1,100	1,400	1,700	213.9	214.3	214.6	
25	83+20	20	1,100	1,400	1,700	216.2	216.4	216.7	

^a Recurrence interval

BULL RUN BASIN
Table 2: Water-surface profile data for Bull Run tributary 'A' - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a		100-year ^a
26	84+97	20	1,100	1,400	1,700	217.2	217.6	217.8	
27	86+70	20	1,100	1,400	1,700	218.2	218.6	218.9	
28	89+38	20	1,100	1,400	1,700	220.1	220.4	220.6	
29	91+89	20	1,100	1,400	1,700	221.5	221.8	222.1	
30	94+13	20	1,100	1,400	1,700	222.1	222.3	222.6	
31	96+59	20	1,100	1,400	1,700	223.2	223.5	223.7	
32	98+56	20	1,100	1,400	1,700	224.4	224.8	225.0	
	99+43								Fairfax-Loudoun County Boundary
33	100+32	20	1,100	1,400	1,700	226.0	226.3	226.6	

^a Recurrence interval

BULL RUN BASIN

Table 3: Water-surface profile data for Bull Run tributary 'B'

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year	50-year	100-year	25-year	50-year		100-year
1	10+00	20	1,300	1,600	2,000	180.4	181.6	183.0	Confluence with Bull Run
2	13+74	20	1,300	1,600	2,000	181.7	182.2	183.2	
3	15+78	20	1,300	1,600	2,000	183.4	183.5	183.8	Bull Run Post Office Road
4	16+20	20	1,300	1,600	2,000	183.8	184.0	184.1	
5	16+54	20	1,300	1,600	2,000	184.4	184.5	184.7	
6	18+50	20	1,300	1,600	2,000	185.3	185.5	185.7	
7	20+81	20	1,300	1,600	2,000	186.9	187.2	187.4	
8	22+93	20	1,300	1,600	2,000	188.7	188.9	189.2	
9	25+27	20	1,300	1,600	2,000	190.2	190.5	190.7	
10	27+61	20	1,300	1,600	2,000	191.8	192.1	192.4	
11	29+70	20	1,300	1,600	2,000	193.5	193.7	194.1	
12	31+70	20	1,300	1,600	2,000	195.1	195.3	195.6	
13	34+12	20	1,300	1,600	2,000	196.9	197.1	197.4	
14	36+67	20	1,300	1,600	2,000	199.1	199.4	199.7	
15	38+63	20	1,300	1,600	2,000	201.3	201.6	201.9	
16	40+54	20	1,300	1,600	2,000	202.5	202.7	203.1	
17	42+35	20	1,300	1,600	2,000	203.4	203.5	203.7	
18	45+26	20	1,300	1,600	2,000	205.0	205.4	205.6	

^a Recurrence interval

LITTLE ROCKY RUN BASIN

Table 4: Water-surface profile data for Little Rocky Run

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year ^a	100-year ^a	25-year ^a	100-year ^a	
501	3+48	25	4200	5300	156.4	159.5	Confluence with Bull Run
502	7+60	25	4200	5300	156.4	159.5	
503	11+59	25	4200	5300	156.4	159.5	
504	15+30	25	4200	5300	156.4	159.5	
505	18+43	25	4200	5300	156.4	159.5	
506	22+20	25	4200	5300	156.4	159.5	
507	26+47	25	4100	5200	156.4	159.5	
508	30+12	25	4100	5200	156.6	159.6	
509	33+40	25	4100	5200	156.8	159.7	
510	36+44	25	4100	5200	156.9	159.8	
511	39+44	25	4100	5200	157.0	159.8	
512	42+71	25	4100	5200	157.5	160.0	
513	46+63	25	4100	5200	158.6	160.5	
514	49+00	25	4100	5200	159.7	161.2	Compton Rd. (State 658)
515	51+50	25	4100	5200	160.8	161.7	
516	54+20	25	4100	5200	161.6	162.4	
517	57+26	25	4100	5200	162.7	163.5	
518	59+77	25	4100	5200	164.3	165.0	
519	62+18	25	4100	5200	166.3	167.0	
520	64+53	25	3900	4900	168.5	169.1	
521	66+80	25	3900	4900	169.5	170.2	
522	69+34	25	3900	4900	171.0	171.7	
523	71+90	25	3900	4900	172.9	173.5	
524	74+43	25	3900	4900	175.0	175.7	
525	76+80	25	3900	4900	177.5	178.5	
526	79+80	25	3900	4900	179.1	179.8	
527	82+97	25	3900	4900	182.0	182.6	
528	85+40	25	3900	4900	185.6	186.2	
529	87+05	25	3900	4900	187.6	188.4	

^a Recurrence interval

LITTLE ROCKY RUN BASIN
Table 4: Water-surface profile data for Little Rocky Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year	50-year	100-year	25-year	50-year		100-year
530	88+30	25	3900	4900	5900	188.4	189.3	190.0	
531	90+18	25	3900	4900	5900	189.7	190.5	191.3	
532	91+80	25	3900	4900	5900	190.9	191.8	192.7	
533	93+40	25	3900	4900	5900	192.7	193.4	194.2	
534	95+12	25	3900	4900	5900	196.2	197.1	197.7	
535	96+87	25	3900	4900	5900	198.7	199.6	200.4	
536	98+88	25	3900	4900	5900	202.4	203.6	204.5	
537	100+81	25	3900	4900	5900	204.8	206.0	207.0	
538	102+28	25	3900	4900	5900	205.3	206.6	207.5	
539	104+66	25	3500	4400	5300	207.0	208.0	209.0	
540	106+26	25	3500	4400	5300	208.9	209.8	210.5	
541	107+13	25	3500	4400	5300	210.2	211.0	211.6	
542	108+08	25	3500	4400	5300	212.8	213.4	213.8	
543	109+50	25	3500	4400	5300	215.6	216.2	216.6	
544	111+24	25	3500	4400	5300	221.3	221.8	222.2	
545	112+32	25	3500	4400	5300	224.2	225.1	225.9	
546	113+20	25	3500	4400	5300	231.2	232.0	232.5	
547	114+27	25	3500	4400	5300	235.2	236.0	236.5	
548	115+38	25	3500	4400	5300	238.4	239.0	239.6	
549	116+90	25	3500	4400	5300	244.0	244.4	244.9	
550	118+72	30	3500	4400	5300	246.5	247.2	247.8	
551	121+00	30	3500	4400	5300	249.5	250.4	251.0	
552	122+78	30	3500	4400	5300	250.0	250.9	251.6	
553	124+79	30	3300	4200	5000	250.8	251.4	251.8	
554	126+87	30	3300	4200	5000	255.4	256.0	256.5	
555	129+55	30	3300	4200	5000	256.2	256.9	257.5	
556	131+68	30	3300	4200	5000	256.4	257.2	257.8	
557	133+18	30	3300	4200	5000	256.7	257.6	258.3	
558	134+06	30	3300	4200	5000	259.1	259.6	260.0	

^a Recurrence interval

LITTLE ROCKY RUN BASIN

Table 4: Water-surface profile data for Little Rocky Run - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second			Elevation, in feet			Remarks
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
559	135+90	30	3300	4200	5000	262.6	263.2	263.6	
560	136+83	30	3300	4200	5000	263.4	264.1	264.6	
561	137+64	30	3300	4200	5000	266.2	266.8	267.2	
562	138+50	30	3300	4200	5000	269.6	270.1	270.5	
563	139+28	30	3300	4200	5000	272.0	273.0	273.9	
564	140+48	30	3300	4200	5000	275.7	276.0	276.4	
565	141+98	30	3300	4200	5000	278.3	279.3	280.0	
566	142+92	30	3300	4200	5000	280.6	281.3	281.9	
567	144+03	30	3300	4200	5000	283.6	284.0	284.3	
568	145+32	30	3300	4200	5000	286.5	287.2	287.6	
569	147+87	30	3300	4200	5000	290.1	290.7	291.1	
570	150+69	30	3300	4200	5000	290.9	291.4	291.8	
271	154+00	30	3300	4200	5000	290.9	291.6	292.0	
572	157+35	35	2900	3600	4300	293.4	293.6	293.9	
573	160+14	35	2900	3600	4300	294.1	294.4	294.7	
574	162+60	35	2900	3600	4300	295.2	295.6	295.8	
575	165+00	35	2900	3600	4300	296.2	296.5	296.8	
576	167+68	35	2900	3600	4300	297.9	298.3	298.6	
577	170+17	35	2900	3600	4300	299.1	299.6	300.0	
578	173+12	35	2900	3600	4300	299.8	300.3	300.7	
579	175+69	35	2900	3600	4300	300.5	301.0	301.5	
580	178+03	35	2900	3600	4300	301.7	302.2	302.6	
581	180+75	35	2900	3600	4300	303.1	303.6	304.0	
582	181+27	35	2900	3600	4300	303.2	303.7	304.1	Braddock Rd (State 620)
583	181+57	35	2900	3600	4300	303.3	303.7	304.1	
584	183+63	35	2900	3600	4300	304.2	304.6	305.0	
585	186+30	35	2900	3600	4300	304.6	305.1	305.4	
586	188+84	35	2900	3600	4300	305.0	305.5	305.9	
587	191+37	35	2900	3600	4300	206.2	306.6	307.0	

^a Recurrence interval

LITTLE ROCKY RUN BASIN

Table 4: Water-surface profile data for Little Rocky Run - Continued

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks
			25-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
588	194+22	35	2900	3600	4300	307.2	307.5	307.8
589	196+63	35	2900	3600	4300	307.6	307.9	308.2
590	198+49	35	2900	3600	4300	308.2	308.6	309.0
591	199+08	30						Lee Highway, (U.S. 29-211)
592	200+08	30	2900	3600	4300	311.1	311.3	311.4
593	203+22	30	2900	3600	4300	311.5	311.8	312.0
594	206+26	30	2900	3600	4300	312.6	313.0	313.3
595	210+58	30	2900	3600	4300	314.5	315.0	315.4
596	213+73	30	2900	3600	4300	317.0	317.4	317.8
597	217+51	30	2400	3000	3600	318.4	318.8	319.2
598	219+38	30	2400	3000	3600	319.2	319.6	319.9
599	221+50	30	2400	3000	3600	321.0	321.3	321.7
600	221+90	30						Stringfellow Rd (State 645)
601	222+35	25	2400	3000	3600	323.7	323.9	324.0
602	224+76	25	2400	3000	3600	325.5	326.1	326.5
603	226+80	25	2400	3000	3600	328.0	328.5	328.9
604	229+00	25	2400	3000	3600	329.8	330.3	330.8
605	230+96	25	2400	3000	3600	331.1	331.6	332.0
606	232+95	25	2400	3000	3600	333.7	333.9	334.0
607	234+95	25	2400	3000	3600	334.2	334.5	334.8
608	236+71	25	2400	3000	3600	334.9	335.3	335.6
609	238+15	25	2400	3000	3600	335.5	335.9	336.3
610	240+10	25	2400	3000	3600	336.1	336.5	336.9
611	242+48	25	2400	3000	3600	338.2	338.7	339.1
612	243+44	25	2400	3000	3600	338.8	339.3	339.7
613	245+67	25	2400	3000	3600	340.6	341.0	341.3
614	248+65	25	2400	3000	3600	342.7	343.1	343.5
615	251+80	20	2400	3000	3600	344.8	345.3	345.7
616	254+18	20	2400	3000	3600	346.0	346.4	346.8
617	256+04	20	2400	3000	3600	346.4	346.9	347.3

^a Recurrence interval

LITTLE ROCKY RUN BASIN

Table 5: Water-surface profile data for Little Rocky Run tributary

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge,			Elevation,			Remarks
			in cubic feet per second			in feet			
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a	100-year ^a	
701	3+77	20	600	800	1000	317.7	318.1	318.5	Confluence with Little Rocky Run
702	5+62	20	600	800	1000	319.5	319.8	320.1	
703	7+34	20	600	800	1000	321.2	321.6	321.9	
704	9+36	20	600	800	1000	324.0	324.3	324.6	
705	11+89	20	600	800	1000	327.0	327.2	327.4	
706	12+38	20	600	800	1000	327.6	327.8	328.0	

^a Recurrence interval

JOHNNY MOORE CREEK BASIN
Table 6: Water-surface profile data for Johnny Moore Creek

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			100-year		50-year				
			25-year	100-year	25-year	50-year	100-year		
1	2+07	20	3300	4200	5200	150.8	153.8	156.2	
2	5+10	20	3300	4200	5200	150.9	153.9	156.2	
3	8+29	20	3300	4200	5200	150.9	153.9	156.2	
4	11+41	20	3300	4200	5200	151.0	154.0	156.3	
5	13+00	20	3300	4200	5200	151.0	154.0	156.3	
6	14+71	20	3300	4200	5200	151.4	154.1	156.4	
7	15+14	20	3300	4200	5200	151.8	154.3	156.5	
8	16+37	20	3300	4200	5200	152.8	154.8	156.9	
9	17+48	20	3300	4200	5200	154.3	155.4	157.1	
10	19+35	20	3300	4200	5200	155.4	156.4	157.8	
11	21+00	20	3300	4200	5200	157.2	157.8	158.9	
12	22+98	20	3300	4200	5200	159.5	159.9	160.6	
13	25+52	20	3300	4200	5200	161.6	162.1	162.7	
14	28+06	20	3300	4200	5200	164.5	165.0	165.5	
15	30+30	20	3300	4200	5200	166.1	166.6	167.2	
16	33+22	20	3300	4200	5200	168.6	169.1	169.5	
17	35+43	20	3300	4200	5200	170.1	170.7	171.4	
18	38+10	20	3300	4200	5200	172.2	172.7	173.2	
19	39+65	20	3300	4200	5200	174.2	174.7	175.1	
20	41+63	20	3300	4200	5200	175.8	176.4	176.8	
21	44+37	20	3300	4200	5200	179.5	180.1	180.6	
22	47+02	20	3300	4200	5200	182.9	183.8	184.9	
23	49+96	20	3300	4200	5200	184.2	184.9	185.8	
24	53+30	20	3300	4200	5200	185.8	186.4	187.1	
25	55+25	20	3300	4200	5200	187.0	187.6	188.3	
26	57+72	20	3300	4200	5200	188.4	188.9	189.6	
27	60+28	20	3300	4200	5200	189.9	190.3	190.9	

^a Recurrence interval

JOHNNY MOORE CREEK BASIN
Table 6: Water-surface profile data for Johnny Moore Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a 100-year ^a
28	62+23	20	3300	4200	5200	191.0	191.5 192.1
29	64+64	20	3300	4200	5200	192.9	193.6 194.2
30	67+70	20	3000	3800	4700	194.5	195.1 195.7
31	70+05	20	3000	3800	4700	196.2	196.8 197.5
32	72+51	20	3000	3800	4700	197.7	198.3 198.9
33	75+23	20	3000	3800	4700	200.2	200.7 201.2
34	77+87	20	3000	3800	4700	202.3	202.8 203.3
35	80+13	20	3000	3800	4700	203.6	204.0 204.4
36	82+13	20	3000	3800	4700	204.5	204.9 205.3
37	84+33	20	3000	3800	4700	206.3	206.6 207.0
38	87+50	20	3000	3800	4700	208.1	208.6 209.0
39	90+18	20	3000	3800	4700	208.9	209.4 209.9
40	92+10	20	3000	3800	4700	211.1	211.6 211.9
41	94+76	20	3000	3800	4700	213.3	213.6 214.0
42	96+37	20	3000	3800	4700	214.5	215.0 215.4
43	98+45	20	3000	3800	4700	216.0	216.3 216.6
44	100+76	20	3000	3800	4700	217.7	218.0 218.3
45	102+46	20	2600	3400	4100	219.4	219.8 220.1
46	104+74	20	2600	3400	4100	221.4	221.9 222.3
47	107+02	20	2600	3400	4100	222.8	223.4 223.8
48	109+09	20	2600	3400	4100	225.0	225.4 225.7
49	111+50	20	2600	3400	4100	226.7	227.2 227.5
50	113+96	20	2600	3400	4100	228.5	229.0 229.5
51	116+10	20	2600	3400	4100	230.3	230.8 231.3
52	119+32	20	2600	3400	4100	233.6	234.2 234.7
53	121+26	20	2600	3400	4100	235.3	235.8 236.4
54	123+48	20	2600	3400	4100	236.4	236.9 237.5

^a Recurrence interval

JOHNNY MOORE CREEK BASIN

Table 6: Water-surface profile data for Johnny Moore Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second			Elevation, in feet			Remarks
			25-year	50-year	100-year	25-year	50-year	100-year	
55	126+42	20	2600	3400	4100	238.5	239.1	239.7	
56	128+47	20	2600	3400	4100	240.2	240.6	241.2	
1056	129+72					240.5	241.0	241.4	Compton Road (State 658)
57	130+73	20	2600	3400	4100	241.6	242.0	242.4	
58	133+29	20	2600	3400	4100	243.6	243.9	244.4	
59	135+73	20	2600	3400	4100	244.8	245.3	245.8	
60	138+92	20	2600	3400	4100	245.9	246.4	247.0	
61	141+92	20	2600	3400	4100	247.3	247.8	248.2	
62	144+41	20	2600	3400	4100	249.3	249.7	250.0	
63	146+09	20	2600	3400	4100	250.8	251.4	251.7	
64	149+60	20	2300	2900	3500	253.1	253.7	254.1	
65	151+82	20	2300	2900	3500	255.5	256.0	256.5	
66	154+20	20	2300	2900	3500	257.2	257.5	258.0	
67	156+46	20	2300	2900	3500	258.1	258.5	258.9	
68	159+01	20	2000	2500	3100	259.3	259.8	260.2	
69	160+87	20	2000	2500	3100	260.8	261.2	261.7	
70	163+21	20	2000	2500	3100	262.5	263.0	263.6	
71	165+50	20	2000	2500	3100	264.0	264.4	264.9	
72	168+03	20	2000	2500	3100	265.3	265.7	266.2	
73	170+43	20	2000	2500	3100	266.8	267.1	267.5	
74	172+37	20	2000	2500	3100	268.0	268.4	268.7	
75	174+53	20	2000	2500	3100	269.5	269.8	270.2	
76	176+27	20	2000	2500	3100	270.9	271.2	271.6	
77	178+53	20	2000	2500	3100	272.9	273.2	273.7	
78	180+94	20	2000	2500	3100	274.6	275.0	275.4	
79	184+98	20	2000	2500	3100	276.2	276.6	277.0	

^a Recurrence interval

JOHNNY MOORE CREEK BASIN
Table 6: Water-surface profile data for Johnny Moore Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a		100-year ^a
80	185+92	20	2000	2500	3100	277.2	277.5	277.9	
81	189+07	20	2000	2500	3100	279.7	280.1	280.6	
82	192+16	20	2000	2500	3100	281.2	281.5	281.9	
83	194+32	20	2000	2500	3100	283.0	283.3	283.6	
84	195+99	20	2000	2500	3100	284.4	284.8	285.2	
85	197+48	20	2000	2500	3100	285.4	285.8	286.2	
86	199+43	20	2000	2500	3100	286.8	287.1	287.4	
87	202+53	20	2000	2500	3100	288.3	288.7	289.2	
88	205+53	20	1300	1600	2000	290.9	291.3	291.6	
89	208+16	20	1300	1600	2000	291.7	292.0	292.3	
90	209+86	20	1300	1600	2000	293.2	293.4	293.8	
91									Old Clifton Road (State 354)

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 7: Water-surface profile data for Popes Head Creek

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year	50-year	100-year	100-year	
1	1+27	25	8100	10200	12400	147.7	150.5
2	2+87	25	8100	10200	12400	147.9	150.6
3	4+48	25	8100	10200	12400	148.2	150.9
4	5+93	25	8100	10200	12400	148.7	151.2
5	6+85	25	8100	10200	12400	149.2	151.6
6	8+12	25	8100	10200	12400	149.6	152.1
7	10+10	25	8100	10200	12400	150.4	152.7
8	12+98	25	8100	10200	12400	151.4	153.5
9	14+55	25	8100	10200	12400	152.0	154.0
10	16+42	25	8100	10200	12400	157.0	158.5
11	17+88	25	8100	10200	12400	160.2	161.7
12	19+40	25	8100	10200	12400	164.8	166.7
13	21+12	25	8100	10200	12400	165.5	167.5
14	23+03	25	8100	10200	12400	165.6	167.6
15	24+97	25	8100	10200	12400	165.7	167.7
16	26+23	25	8100	10200	12400	165.7	167.7
17	28+67	25	8100	10200	12400	165.8	167.9
18	30+74	25	8100	10200	12400	166.1	168.1
19	33+09	25	8100	10200	12400	166.6	168.5
20	35+47	25	8000	10100	12300	167.3	169.3
21	38+23	25	8000	10100	12300	169.1	171.0
22	40+77	25	8000	10100	12300	169.8	171.6
23	43+47	25	8000	10100	12300	170.0	171.9
24	46+41	25	8000	10100	12300	170.1	172.0
25	50+37	25	8000	10100	12300	170.4	172.2
26	55+27	25	8000	10100	12300	171.0	172.6
27	57+71	25	7900	9900	12100	171.7	173.2
28	60+42	25	7900	9900	12100	172.6	173.8
29	64+22	25	7900	9900	12100	174.9	175.3
30	66+73	25	7900	9900	12100	177.0	177.6
31	69+77	25	7900	9900	12100	178.0	178.7
32	72+89	25	7900	9900	12100	178.6	179.4

Confluence with
Bull Run

^a Recurrence interval

POPES HEAD CREEK BASIN
Table 7: Water-surface profile data for Popes Head Creek - Continued

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year	50-year	100-year	25-year	50-year		100-year
33	75+93	25	7900	9900	12100	179.0	179.8	180.6	Southern Railroad
34	78+34	25	7900	9900	12100	179.4	180.3	181.1	
35	81+46	25	7900	9900	12100	180.0	181.1	181.9	
36	84+03	25	7900	9900	12100	180.6	181.7	182.6	
37	86+49	25	7900	9900	12100	181.7	182.7	183.6	
38	87+87								
39	88+80	25	7900	9900	12100	185.8	188.8	189.3	
40	91+81	25	7900	9900	12100	185.8	188.8	189.4	
41	94+42	25	7900	9900	12100	186.0	188.9	189.5	Clifton Road (State 645)
42	97+42	25	7900	9900	12100	186.0	188.9	189.5	
43	101+47	25	7900	9900	12100	186.8	189.3	190.0	
44	102+34	25	7900	9900	12100	186.8	189.3	190.0	
45	102+94	25	7900	9900	12100	187.4	189.6	190.2	
46	104+73	25	7900	9900	12100	187.4	189.6	190.3	
47	107+40	25	7900	9900	12100	187.6	189.7	190.4	
48	110+85	25	7900	9900	12100	188.1	190.0	190.8	
49	113+55	25	7900	9900	12100	188.9	190.6	191.4	Flow Bypassing Section
50	116+48	25	7900	9900	12100	190.0	191.4	192.3	
51	118+50	25	7900	9900	12100	190.7	192.0	192.9	
52	121+06	25	7900	9900	12100	191.4	192.6	193.5	
53	123+91	25	7000	8800	10700	192.0	193.1	194.0	
54	126+24	25	7000	8800	10700	193.0	194.1	195.0	
55	129+79	25	7000	8800	10700	194.2	195.2	196.2	
56	132+05	25	7000	8800	10700	194.6	195.6	196.5	
57	134+72	25	7000	8800	10700	195.3	196.3	197.2	Flow Bypassing Section
58	138+62	25	6700	7900	9000	196.7	197.5	198.3	
59	142+28	25	6700	7900	9000	197.9	198.6	199.2	Flow Bypassing Section
60	145+25	25	6700	7900	9000	200.3	200.8	201.3	
61	146+20								Southern Railroad
62	147+57	25	7000	8800	10700	203.5	204.7	205.8	
63	149+60	25	7000	8800	10700	203.6	204.7	205.9	Old railroad grade
64									

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 7: Water-surface profile data for Popes Head Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a		100-year ^a
65	150+98	25	7000	8800	10700	204.7	205.4	206.2	Old railroad grade
66	155+12	25	7000	8800	10700	205.0	205.8	206.6	
67	157+31	25	7000	8800	10700	205.1	205.9	206.7	
68	159+87	25	7000	8800	10700	205.8	206.6	207.5	
69	161+45	25	7000	8800	10700	207.2	208.0	208.9	
70	162+33								
71	163+02	25	7000	8800	10700	208.2	209.6	211.1	
601	New baseline for man made channel (0+00 bypass baseline = 163+35 original baseline)	25	7000	8800	10050	213.9	215.5	216.7	Flow bypassing section for 100 year profile
602	3+22	25	7000	8800	10050	218.8	220.5	221.5	" " " "
603	4+01	25	7000	8800	10050	220.5	222.5	223.6	" " " "
604	5+28	25	7000	8800	10150	222.2	224.3	225.4	" " " "
605	6+81	25	7000	8800	10450	223.6	225.8	226.8	" " " "
606	9+40	25	7000	8800	10700	225.6	227.9	229.1	" " " "
607	11+64	25	6770	8250	9750	226.7	228.9	230.3	Flow bypassing section
608	13+40	25	6770	8250	9750	227.6	229.6	231.0	" " " "
82	Return to original baseline (14+55 bypass baseline = 186+04 original baseline)	25	6770	8250	9750	228.1	230.0	231.4	Flow bypassing section
83	186+37								Old railroad grade
84	187+19	25	7000	8800	10700	228.1	230.1	231.5	
85	190+03	25	7000	8800	10700	228.2	230.2	231.6	
86	195+84	25	7000	8800	10700	228.4	230.4	231.8	
87	200+84	25	7000	8800	10700	228.7	230.7	232.1	
88	204+42	25	7000	8800	10700	229.0	230.9	232.4	
89	207+87	25	7000	8800	10700	229.2	231.2	232.6	
90	210+98	25	7000	8800	10700	229.4	231.4	232.8	
91	214+40	25	7000	8800	10700	229.8	231.7	233.0	
92	217+07	25	7000	8800	10700	230.2	232.0	233.3	
93	218+37	25	7000	8800	10700	230.4	232.1	233.4	Colchester Rd(State 612)
94	220+07	25	7000	8800	10700	230.5	232.2	233.5	
95	222+38	25	7000	8800	10700	231.0	232.6	233.9	
96	225+55	25	7000	8800	10700	231.5	233.0	234.2	

^a Recurrence interval

POPE HEAD CREEK BASIN
Table 7: Water-surface profile data for Popes Head Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks
			25-year ^a	50-year ^a	25-year ^a	50-year ^a	100-year ^a	
97	229+32	25	7000	8800	10700	232.0	233.4	234.6
98	232+81	25	7000	8800	10700	232.7	233.9	235.0
99	237+70	25	7000	8800	10700	234.1	235.0	235.9
100	239+40	25	6700	8400	10300	236.1	236.6	237.3
101	240+42							Old railroad grade
102	241+00	25	6700	8400	10300	241.9	244.9	246.2
103	242+66	25	6700	8400	10300	242.1	245.2	246.4
104	243+59							Southern Railroad
105	244+84	25	6700	8400	10300	243.4	246.5	248.6
106	247+51	25	6700	8400	10300	243.9	247.0	249.1
107	251+20	25	6700	8400	10300	244.1	247.1	249.2
108	254+23	25	6700	8400	10300	244.2	247.1	249.2
109	257+72	25	6700	8400	10300	244.4	247.3	249.3
110	261+73	25	6700	8400	10300	244.9	247.5	249.5
111	265+26	25	6700	8400	10300	245.6	247.9	249.8
112	268+53	25	4000	5100	6200	246.2	248.2	250.1
113	272+17	25	4000	5100	6200	247.2	248.8	250.5
114	275+87	25	4000	5100	6200	248.6	249.7	251.1
115	277+80	25	4000	5100	6200	249.0	250.0	251.3
116	279+70	30	4000	5100	6200	249.5	250.4	251.6
117	282+36	30	4000	5100	6200	252.1	252.5	252.9
118	285+66	30	3600	4500	5500	253.4	253.9	254.3
119	289+04	30	3600	4500	5500	254.7	255.2	255.7
120	292+13	30	3600	4500	5500	255.9	256.5	257.1
121	295+21	30	3600	4500	5500	256.9	257.6	258.2
122	298+45	30	3600	4500	5500	258.4	259.0	259.5
	299+60							Private road
123	300+28	30	3600	4500	5500	259.8	260.3	260.7
124	302+68	30	3600	4500	5500	261.3	261.9	262.4
125	305+22	30	3600	4500	5500	262.6	263.2	263.8
126	307+85	30	3300	4200	5100	264.0	264.5	265.0
127	309+78	30	3300	4200	5100	264.3	264.8	265.3
128	312+45	30	3300	4200	5100	265.0	265.6	266.1

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 7: Water-surface profile data for Popes Head Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks		
			25-year ^a	50-year ^a	100-year ^a	25-year ^a		50-year ^a	100-year ^a
129	314+86	30	3300	4200	5100	266.5	267.1	267.6	Popes Head Rd (State 654)
130	318+60	30	3300	4200	5100	268.9	269.5	269.9	
131	320+93	30	3300	4200	5100	270.2	270.8	271.4	
132	324+58	30	3300	4200	5100	272.2	272.8	273.2	
133	328+23	30	3300	4200	5100	273.7	274.2	274.6	
134	331+22	30	3300	4200	5100	274.9	275.4	275.8	
135	334+40	30	3300	4200	5100	275.8	276.2	276.7	
136	337+19	30	3300	4200	5100	277.7	278.2	278.6	
137	340+12	30	3300	4200	5100	279.7	280.2	280.6	
138	342+50	30	3300	4200	5100	281.3	282.0	282.5	
139	345+19	30	3300	4200	5100	282.8	283.5	284.1	
140	248+24	30	3300	4200	5100	284.3	285.0	285.7	
141	351+02	30	3300	4200	5100	285.6	286.3	287.0	
142	353+83	30	3300	4200	5100	287.0	287.8	288.5	
143	357+29	30	3300	4200	5100	288.7	289.4	290.2	
144	359+56	30	3300	4200	5100	289.6	290.2	290.8	
145	362+15	30	3300	4200	5100	290.3	290.9	291.6	
146	362+80	30	3300	4200	5100	290.8	291.3	291.8	
147	363+46	30	3300	4200	5100	390.9	291.4	291.9	
148	365+91	30	3300	4200	5100	291.6	292.1	292.7	
149	367+74	30	3300	4200	5100	292.7	293.3	293.9	
150	268+58	30	3300	4200	5100	292.9	293.6	294.2	
151	369+43	30	3300	4200	5100	294.6	294.8	295.0	
152	372+18	30	3300	4200	5100	295.5	296.0	296.5	
153	374+32	30	2200	2800	3400	296.0	296.5	297.1	
154	376+67	30	2200	2800	3400	297.1	297.7	298.1	
155	378+81	30	2200	2800	3400	298.6	299.3	299.9	
156	381+00	30	2200	2800	3400	299.9	300.5	301.0	
157	383+36	30	2200	2800	3400	301.7	302.2	302.7	
158	385+95	30	2200	2800	3400	304.2	304.8	305.2	
159	388+08	30	2200	2800	3400	305.9	306.7	307.4	
160	390+08	30	2200	2800	3400	306.4	307.1	307.8	

Popes Head Rd(State 654)

Private Rd.

Above East Fork

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 7: Water-surface profile data for Popes Head Creek - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year	50-year	100-year	25-year	50-year		100-year
161	391+67	30	2200	2800	3400	307.1	307.8	308.4	Braddock Rd (State 620)
162	394+42	30	2200	2800	3400	311.2	311.8	312.2	
163	396+55	30	1800	2200	2700	312.0	312.5	313.0	
164	399+35	30	1800	2200	2700	313.4	313.8	314.3	
165	401+88	30	1800	2200	2700	315.9	316.2	316.5	
166	404+27	30	1800	2200	2700	317.4	317.8	318.1	
167	406+87	30	1800	2200	2700	319.8	320.2	320.7	
168	409+21	30	1800	2200	2700	321.5	322.0	322.5	
169	411+20	30	1800	2200	2700	323.0	323.5	324.0	
170	413+37	30	1500	1800	2200	324.3	324.8	325.4	
171	415+45	30	1500	1800	2200	325.9	326.4	326.8	
172	417+56	30	1500	1800	2200	327.4	327.8	328.3	
173	419+39	30	1500	1800	2200	328.7	329.2	329.6	
174	421+03	30	1500	1800	2200	329.4	329.8	330.2	
175	421+52	30	1500	1800	2200	329.6	330.0	330.4	
176	421+92	30	1500	1800	2200	330.3	330.4	330.7	
177	424+38	30	1500	1800	2200	332.2	332.6	333.1	
178	426+82	30	1500	1800	2200	332.9	333.4	333.8	
179	429+10	30	1500	1800	2200	334.3	334.6	335.1	
180	431+37	30	1500	1800	2200	335.8	336.2	336.6	
181	433+80	30	1500	1800	2200	336.9	337.2	337.6	
182	436+26	30	1500	1800	2200	338.1	338.5	339.0	
183	437+90	30	1500	1800	2200	338.8	339.2	339.6	
184	439+41	30	1500	1800	2200	340.0	340.3	340.7	
185	440+73	30	1500	1800	2200	340.9	341.2	341.5	
186	442+67	30	1500	1800	2200	342.0	342.3	342.6	
187	444+38	30	1500	1800	2200	342.8	343.0	343.3	
188	446+37	30	1500	1800	2200	344.1	344.3	344.6	

^a Recurrence interval

POPES HEAD CREEK BASIN
Table 8: Water-surface profile data for East Fork Popes Head Creek

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year ^a	100-year ^a	25-year ^a	100-year ^a	
501	3+69	30	1500	2200	295.6	296.1	296.6 Confluence with Popes
502	6+07	30	1500	2200	297.0	297.4	297.9 Head Creek
503	7+59	30	1500	2200	299.1	299.5	299.8 Prestwick Drive
504	9+80	30	1500	2200	301.1	301.5	301.9
505	12+12	30	1500	2200	303.0	303.4	303.8
506	14+63	30	1500	2200	305.0	305.3	305.7
507	16+62	30	1500	2200	306.9	307.2	307.6
508	18+48	30	1300	1900	308.2	308.6	308.9
509	20+53	30	1300	1900	309.7	310.1	310.4
510	22+97	30	1100	1600	311.1	311.5	311.8
511	25+33	30	1100	1600	312.9	313.3	313.5
512	27+78	30	1100	1600	314.0	314.4	314.6
513	29+88	30	1100	1600	315.3	315.6	315.8
514	31+87	30	1100	1600	317.2	317.6	317.8

^a Recurrence interval

POPE HEAD CREEK BASIN
Table 9: Water-surface profile data for Piney Branch

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year	50-year	25-year	50-year	100-year		
400	2+39	25	3800	4800	5800	245.9	248.0	250.0	Confluence with Popes Head Creek and Fairfax Station Rd. (Rte.660)
401	3+92	25	3800	4800	5800	246.0	248.0	250.0	
402	6+83	25	3800	4800	5800	246.5	248.4	250.2	
403	9+58	25	3800	4800	5800	247.0	248.6	250.4	
404	12+38	25	3800	4800	5800	247.8	249.0	250.6	
405	15+77	25	3800	4800	5800	249.2	250.0	251.2	
406	19+53	25	3800	4800	5800	250.8	251.3	252.1	
407	22+40	25	3800	4800	5800	252.3	252.8	253.4	
408	25+16	25	3800	4800	5800	253.2	253.8	254.4	
409	27+57	25	3800	4800	5800	254.6	255.2	255.6	
410	30+04	25	3800	4800	5800	256.0	256.6	257.1	
411	32+29	25	3800	4800	5800	257.0	257.6	258.2	
412	35+91	25	3500	4400	5300	258.0	258.6	259.2	
413	39+15	25	3500	4400	5300	258.9	259.6	260.1	
414	42+78	25	3500	4400	5300	260.3	260.9	261.5	
415	45+44	25	3500	4400	5300	261.7	262.2	262.8	
416	48+11	25	3500	4400	5300	263.0	263.5	264.0	
417	50+90	25	3500	4400	5300	264.3	264.8	265.3	
418	53+32	25	3500	4400	5300	265.0	265.5	265.9	
419	56+89	25	3300	4200	5100	266.5	267.0	267.4	
420	59+40	25	3300	4200	5100	268.1	268.6	269.0	
421	62+53	25	3100	4000	4800	271.1	271.6	272.0	
422	65+23	25	3100	4000	4800	272.1	272.7	273.2	
423	67+36	25	3100	4000	4800	273.0	273.6	274.1	
424	69+54	25	3100	4000	4800	275.1	275.6	275.9	
425	71+75	25	3100	4000	4800	278.7	279.4	280.1	
426	73+20	25	3100	4000	4800	280.1	280.6	281.1	
427	75+07	25	3100	4000	4800	283.5	284.1	284.2	
428	75+55	25	3100	4000	4800	283.5	284.1	284.2	
429	75+94	25	3100	4000	4800	283.7	284.1	284.2	
430	77+07	25	3100	4000	4800	285.2	286.1	286.9	

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 9: Water-surface profile data for Piney Branch - Continued

Section Number	Base-line Station (feet)	Impervi- ousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year ^a	100-year ^a	25-year ^a	100-year ^a	
431	77+94	25	3100	4000	287.9	288.8	289.6
432	78+94	25	3100	4000	290.1	290.8	291.4
433	80+08	25	3100	4000	293.0	293.8	294.3
434	81+65	25	3100	4000	296.5	297.1	297.5
435	83+05	25	3100	4000	299.9	300.4	300.7
436	83+99	25	3100	4000	301.7	302.6	303.2
437	84+58	25	3100	4000	302.3	303.2	303.8
438	85+07	25	3100	4000	302.7	303.5	304.2
439	85+91	25	3100	4000	306.0	306.5	306.8
440	87+00	25	3100	4000	308.2	308.9	309.4
441	88+68	25	2600	3300	311.3	312.2	312.6
442	89+80	25	2600	3300	313.0	313.6	314.0
443	90+84	25	2600	3300	313.0	313.8	314.6
444	91+58	25	2600	3300	316.3	317.4	318.3
445	92+39	25	2600	3300	316.6	317.6	318.5
446	93+46	25	2600	3300	317.1	318.0	318.8
447	94+58	25	2600	3300	317.6	318.4	319.1
448	97+23	25	2600	3300	320.1	320.6	320.9
449	98+30	25	2600	3300	321.1	321.9	322.5
450	99+38	25	2600	3300	324.4	325.2	325.9
451	100+80	25	2600	3300	324.8	325.5	326.2
452	102+38	25	2600	3300	326.1	326.6	327.2
453	103+90	25	2600	3300	327.3	327.9	328.4
454	105+70	25	2600	3300	328.2	328.7	329.3
455	107+75	25	2600	3300	329.3	329.8	330.3
456	109+98	25	2600	3300	331.2	331.6	331.9
457	111+75	25	2600	3300	333.2	333.7	334.3
458	113+78	25	2600	3300	335.2	336.0	336.6
459	115+86	25	2600	3300	336.4	337.1	337.7
460	118+00	25	2600	3300	339.7	340.3	340.8
461	120+12	25	2600	3300	340.2	340.9	341.4

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 9: Water-surface profile data for Piney Branch - Continued

Section Number	Base-line Station (feet)	Impervi- busness (percent)	Discharge, in cubic feet per second		Elevation, in feet			Remarks	
			25-year ^a	50-year ^a	100-year ^a	25-year ^a	50-year ^a		100-year ^a
462	122+37	25	2600	3300	4000	341.7	342.2	342.7	Braddock Rd. (State 620)
463	123+97	25	2600	3300	4000	343.1	343.9	344.6	
464	126+01	25	2500	3200	3900	343.8	344.4	345.0	
465	128+94	25	2400	3000	3700	345.5	345.9	346.2	
466	131+04	25	2400	3000	3700	347.0	347.4	347.8	
467	133+42	25	2400	3000	3700	348.8	349.2	349.6	
468	135+63	25	2400	3000	3700	351.1	351.5	352.0	
469	137+66	25	2400	3000	3700	353.0	353.3	353.8	
470	139+77	25	2400	3000	3700	354.8	355.3	355.7	
471	142+00	25	2400	3000	3700	356.0	356.4	356.8	
472	143+47	30	2400	3000	3700	356.7	357.1	357.5	
473	145+96	30	1900	2400	2900	357.3	357.7	358.1	
474	147+93	30	1900	2400	2900	358.0	358.4	358.7	
475	150+09	30	1700	2100	2600	359.8	360.1	360.4	
476	152+96	30	1700	2100	2600	362.8	363.1	363.4	
477	155+33	30	1700	2100	2600	364.2	364.5	364.8	
478	157+60	30	1700	2100	2600	365.8	366.2	366.5	
479	159+62	30	1700	2100	2600	367.1	367.5	367.9	
480	161+68	30	1700	2100	2600	368.6	269.0	269.4	
481	163+37	30	1700	2100	2600	369.6	370.0	370.4	
482	165+31	30	1700	2100	2600	370.7	371.1	371.5	
483	166+85	30	1700	2100	2600	371.1	371.4	371.8	

^a Recurrence interval

POPES HEAD CREEK BASIN
Table 10: Water surface profile data for Castle Creek

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year ^a	50-year ^a	25-year ^a	50-year ^a	
200	8+46	25	2300	2900	193.5	194.3	Confluence with Popes Head Creek
201	11+71	25	2300	2900	196.0	196.5	
202	13+89	25	2300	2900	197.5	198.0	
203	15+90	25	2300	2900	199.8	200.3	
204	17+67	25	2300	2900	200.9	201.5	
205	19+28	25	2300	2900	204.1	204.7	
206	20+80	25	2300	2900	204.8	205.2	
207	21+18						Newman Road (State 659)
208	21+57	25	2300	2900	207.2	207.6	
209	23+63	25	2300	2900	209.7	210.3	
210	25+52	25	2300	2900	210.5	211.0	
211	27+19	25	2300	2900	211.1	211.6	
212	29+46	25	2300	2900	212.0	212.4	
213	31+60	25	1800	2300	213.8	214.2	
214	33+25	25	1800	2300	216.8	217.1	Private driveway
215	35+11	25	1800	2300	217.6	217.8	
216	37+17	25	1800	2300	219.3	219.6	
217	39+59	25	1800	2300	223.2	223.5	Private driveway
218	41+67	25	1800	2300	225.3	225.6	
219	44+80	25	1800	2300	227.7	228.0	
220	47+05	25	1800	2300	231.2	231.7	
221	48+92	25	1800	2300	232.8	233.4	
222	50+83	25	1800	2300	233.8	234.3	
223	52+61	25	1800	2300	235.8	236.2	Private driveway
224	54+24	25	1800	2300	237.0	237.4	
225	55+92	25	1800	2300	237.6	238.0	
226	57+68	25	1800	2300	239.5	239.8	
227	59+54	25	1800	2300	242.0	242.2	
228	61+34	25	1100	1400	243.5	243.8	
229	63+34	25	1100	1400	245.9	246.2	
230	65+75	25	1100	1400	248.6	249.1	
231	67+97	25	1100	1400	251.4	251.9	
232	69+19	25	1100	1400	252.8	253.4	

^a Recurrence interval

POPES HEAD CREEK BASIN

Table 11: Water-surface profile data for Castle Creek tributary

Section Number	Base-line Station (feet)	Imperviousness (per cent)	Discharge, in cubic feet per second		Elevation, in feet		Remarks
			25-year ^a	50-year ^a	100-year ^a	100-year ^a	
301	1+42	25	860	1100	1300	242.8	243.0
302	2+84	25	860	1100	1300	246.5	246.7
303	4+62	25	860	1100	1300	247.8	248.2
304	6+20	25	860	1100	1300	250.0	250.4
305	7+82	25	860	1100	1300	252.5	253.0
							243.2
							246.9
							248.5
							250.7
							253.3

Confluence with Castle Creek

Flood profiles (figs. 3-13) are included in this report, graphically presenting those water-surface profiles computed for the 25-year and 100-year floods and the channel bed profile along the thalweg of the stream. The 25-year flood profile was omitted in cases where it is very close to the 100-year profile and showing both would cause confusion.

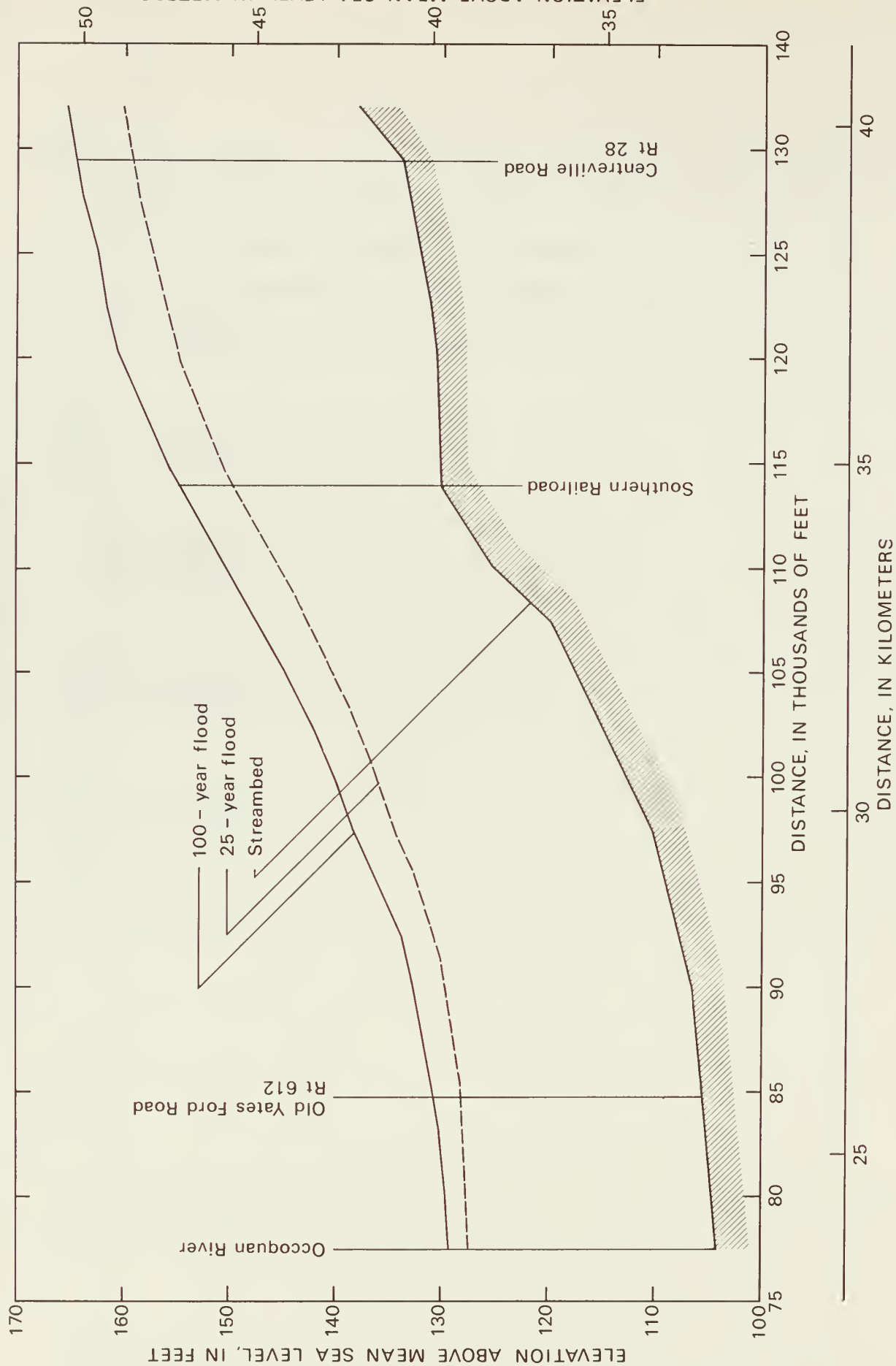


Figure 3. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Bull Run, Occoquan River to Centreville Road

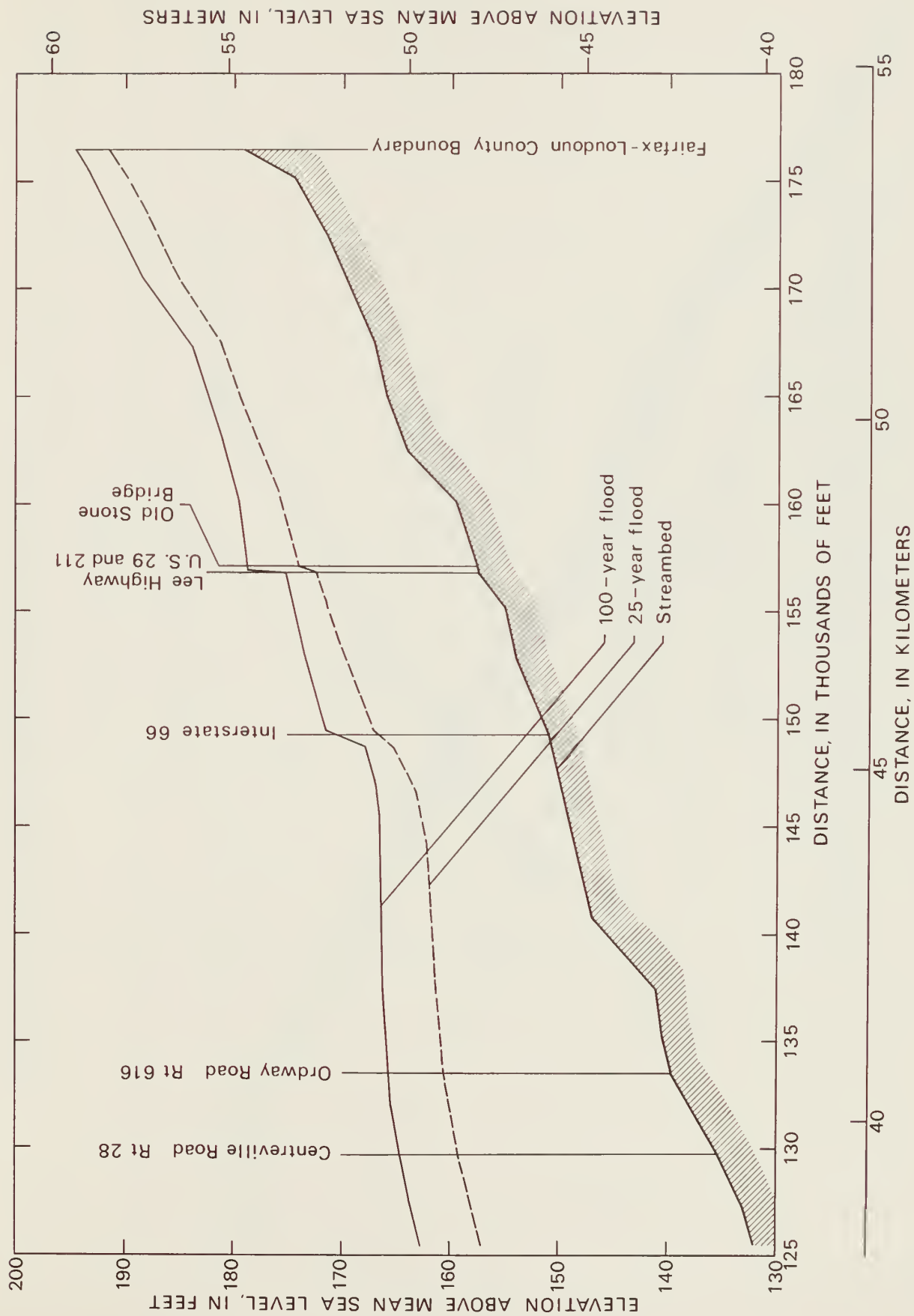


Figure 4. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Bull Run, Centreville Road to Fairfax-Loudoun Boundary

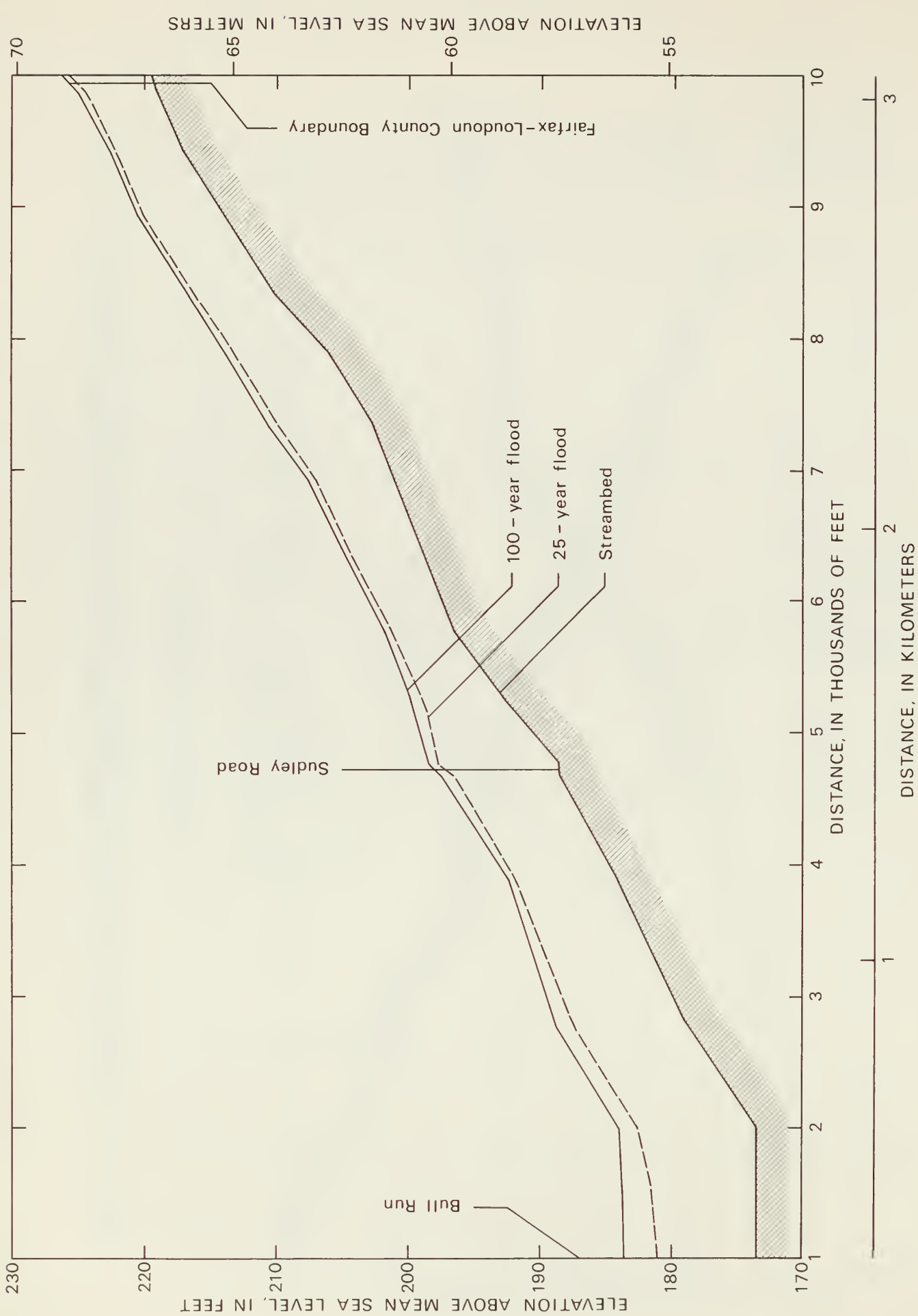


Figure 5. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Bull Run Unnamed tributary 'A'

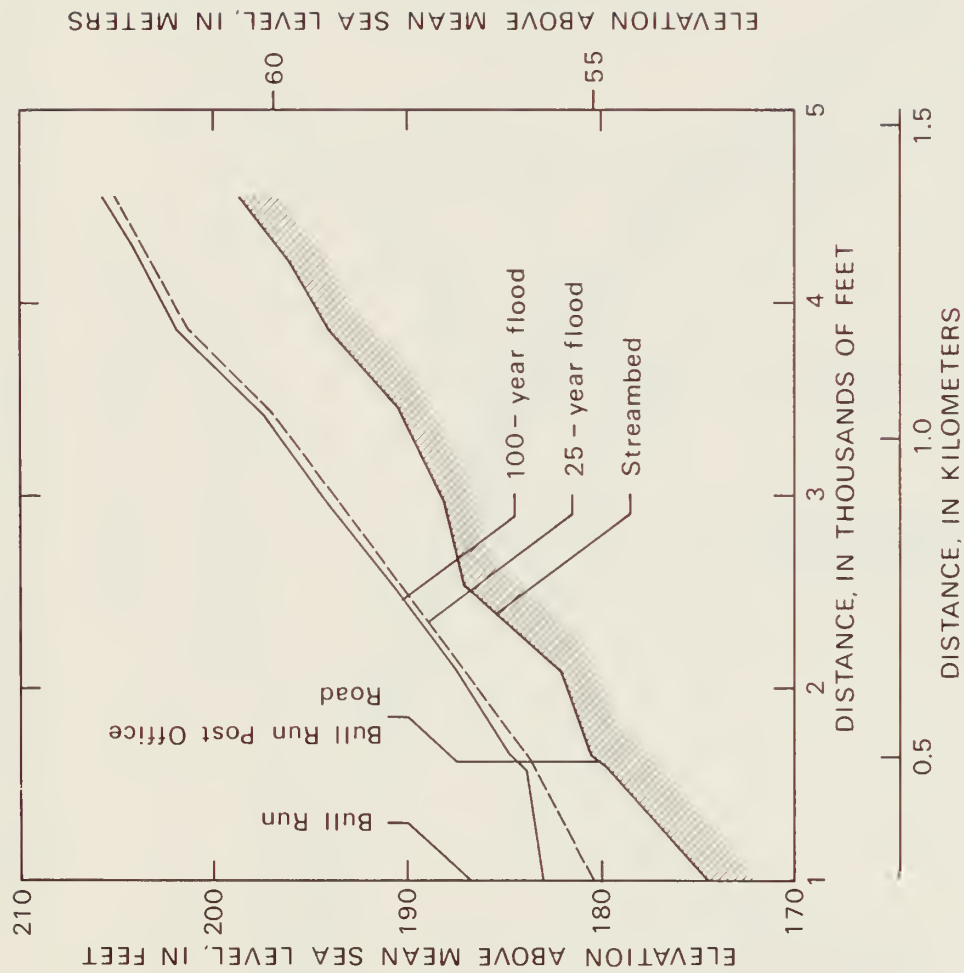


Figure 6. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Bull Run Unnamed tributary 'B'

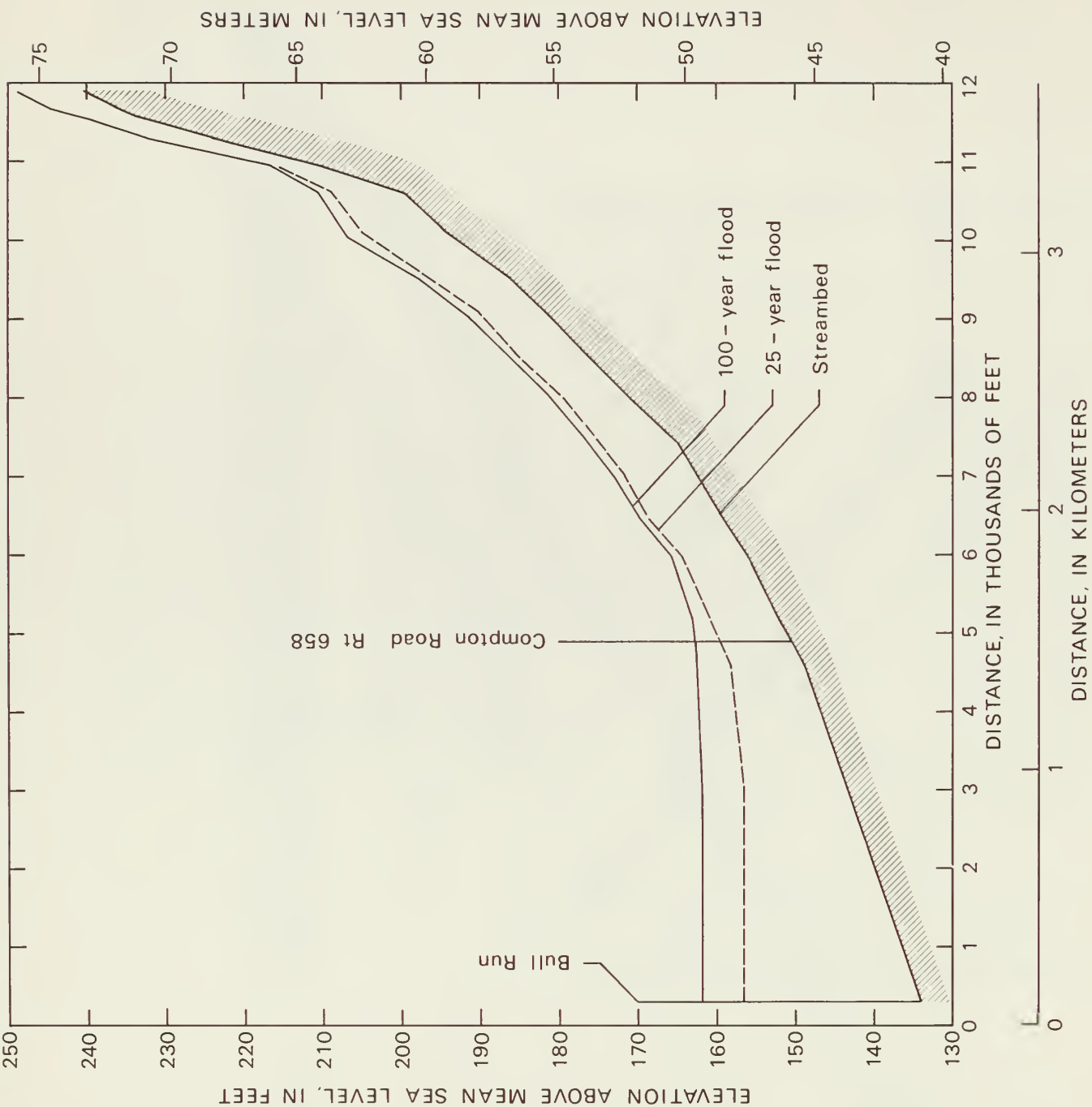


Figure 7. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Little Rocky Run, Mouth to below Braddock Road

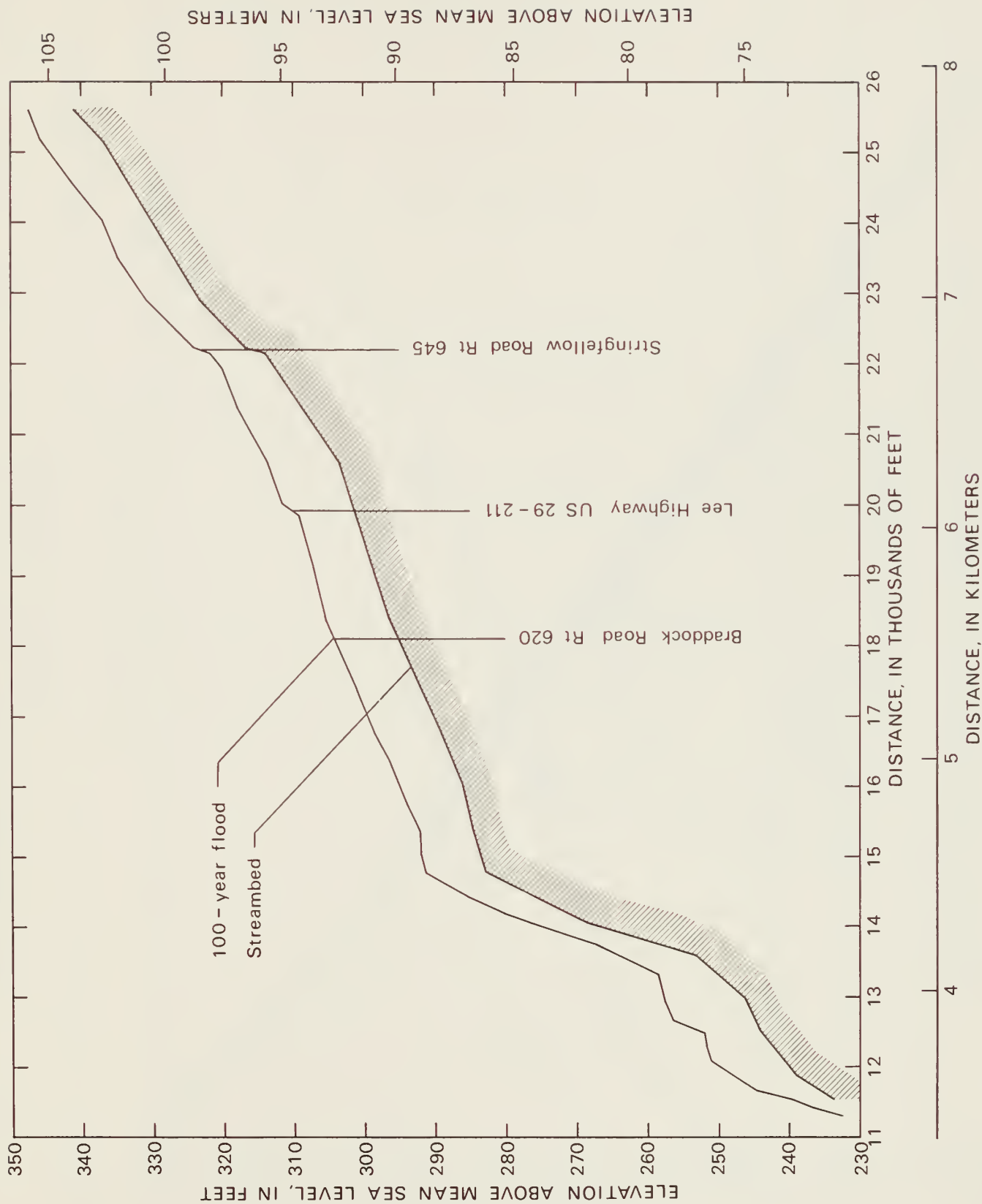


Figure 8. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Little Rocky Run, below Braddock Road to Stringfellow Road.

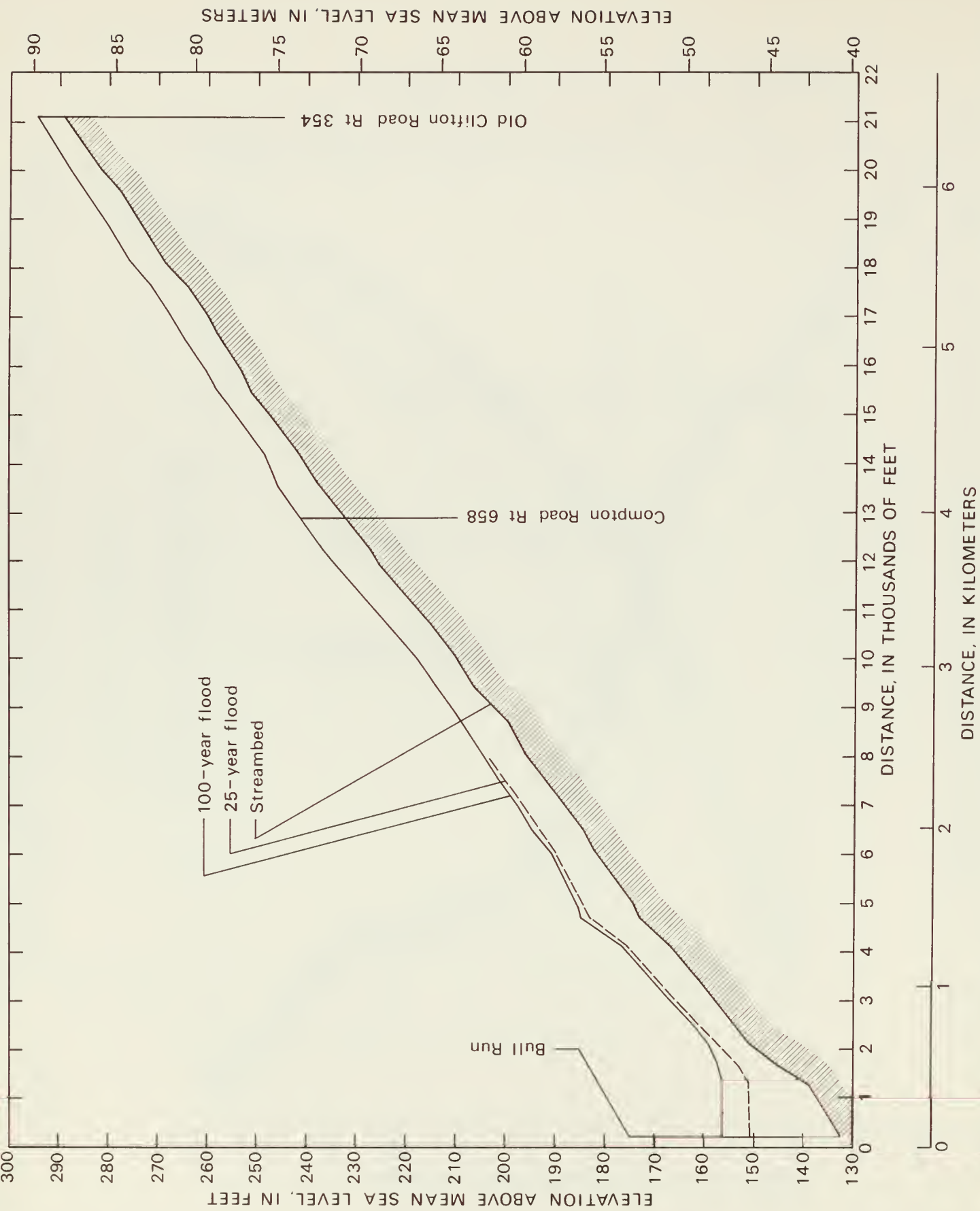


Figure 9. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Johnny Moore Creek

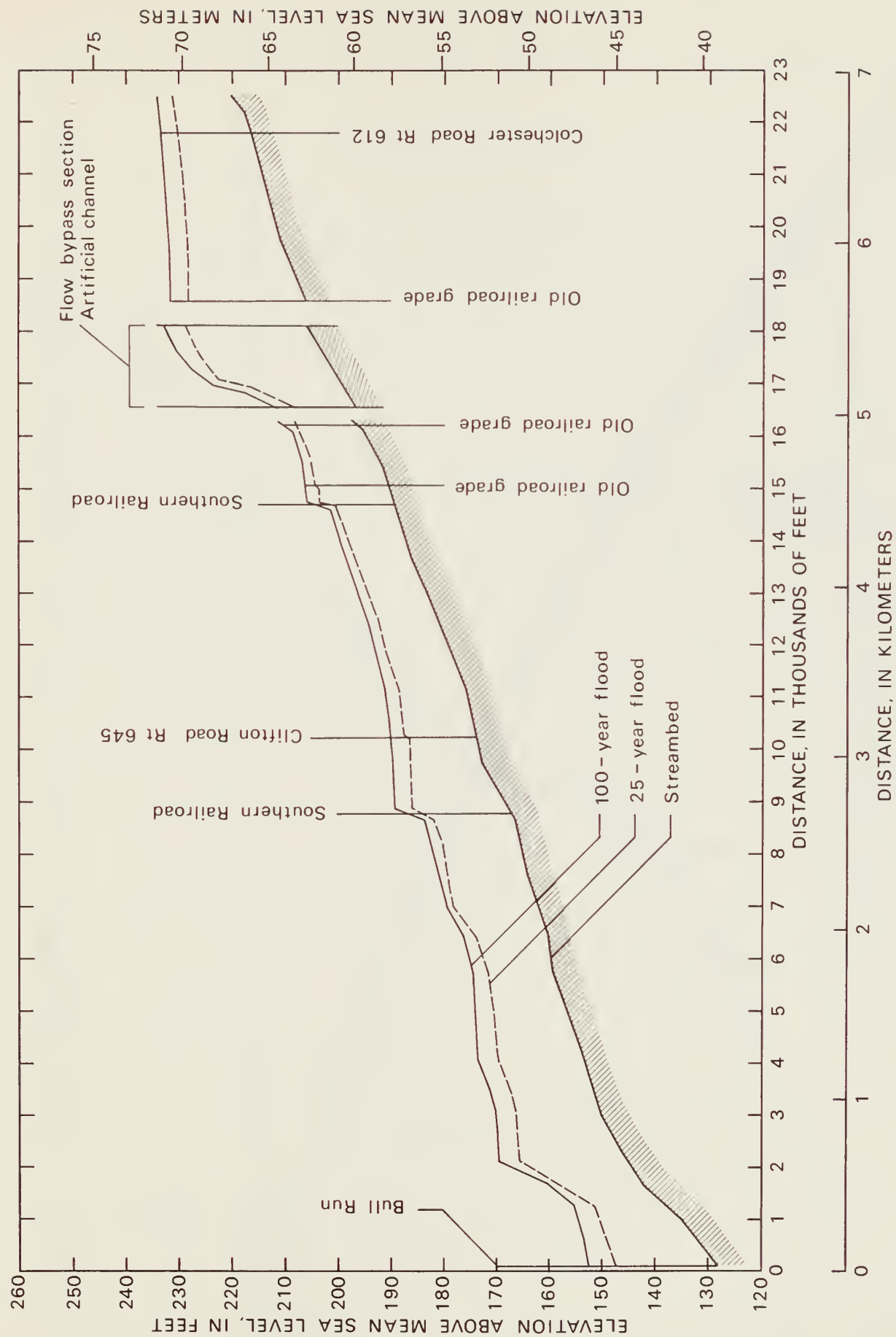


Figure 10. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Popes Head Creek, Mouth to Colchester Road

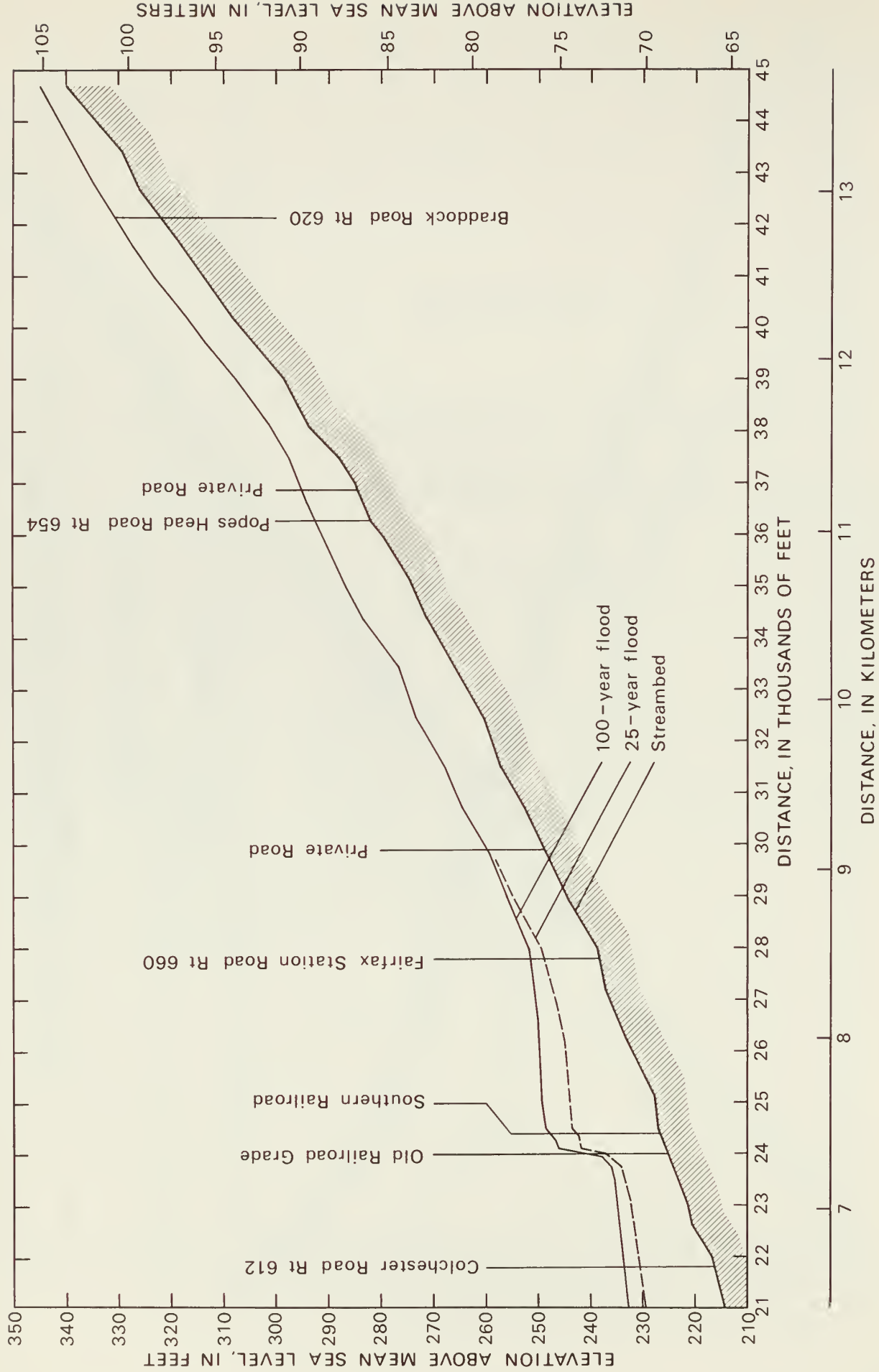


Figure 11. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Popes Head Creek, Colchester Road to above Braddock Road

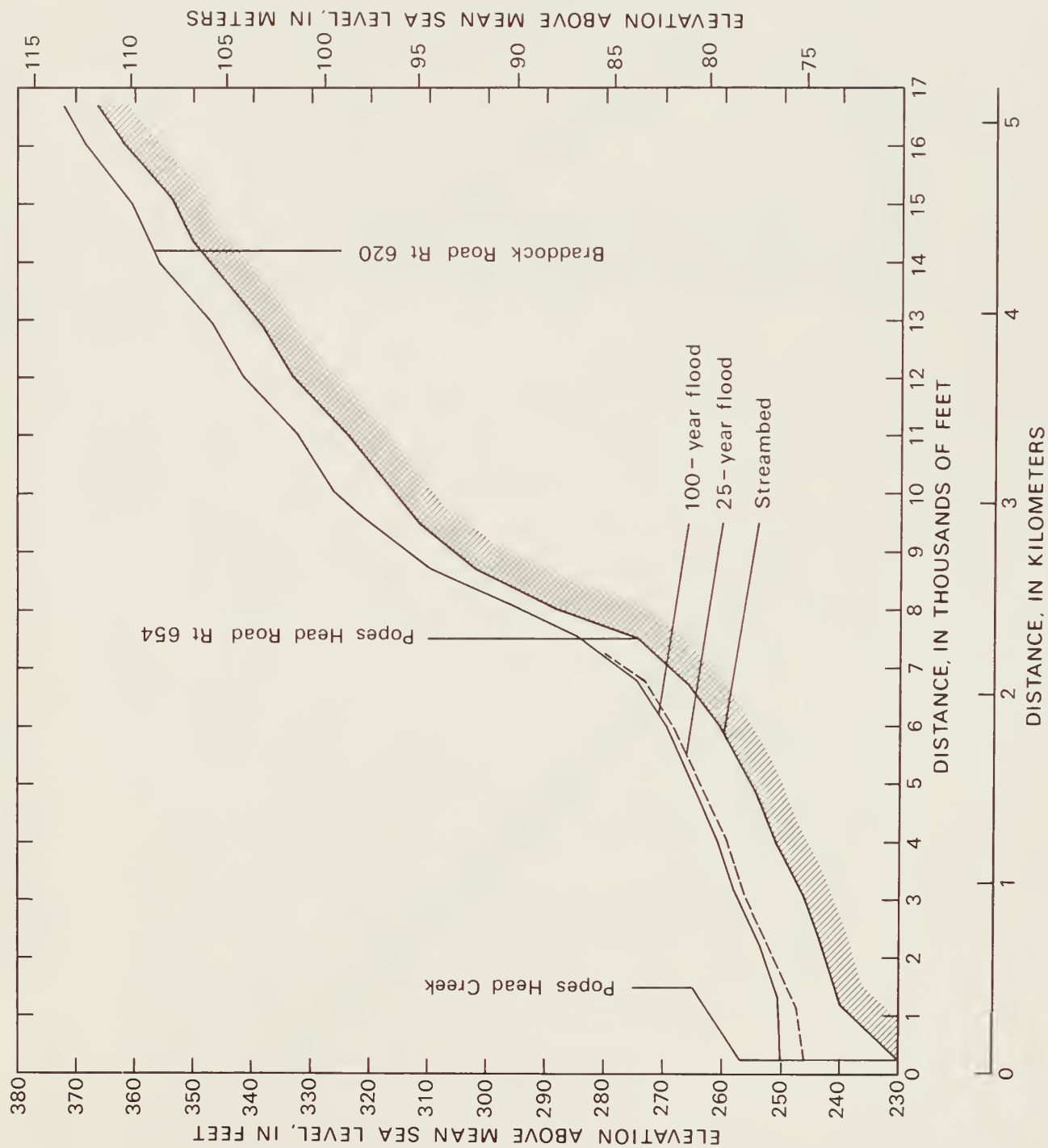


Figure 12. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Piney Branch

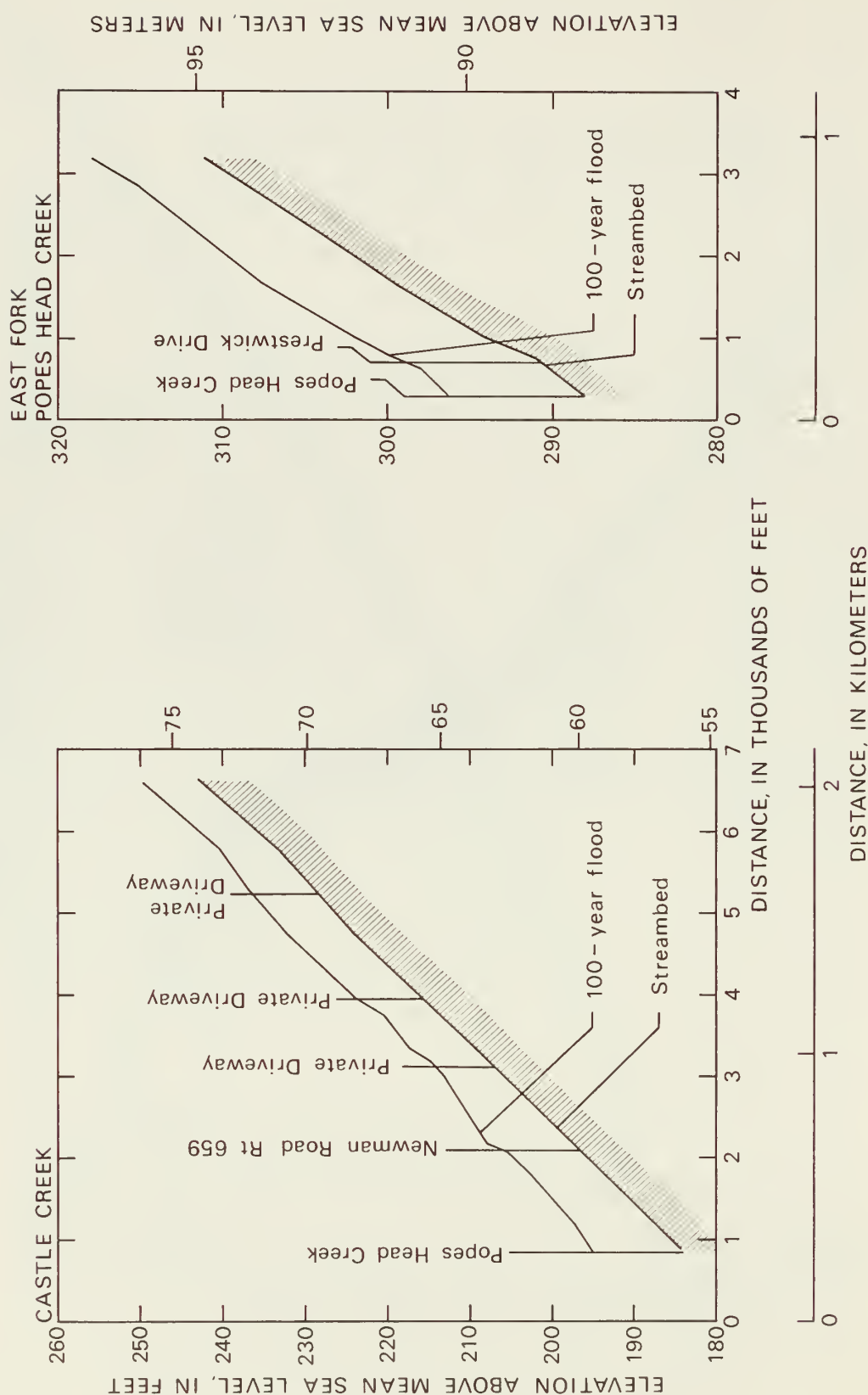
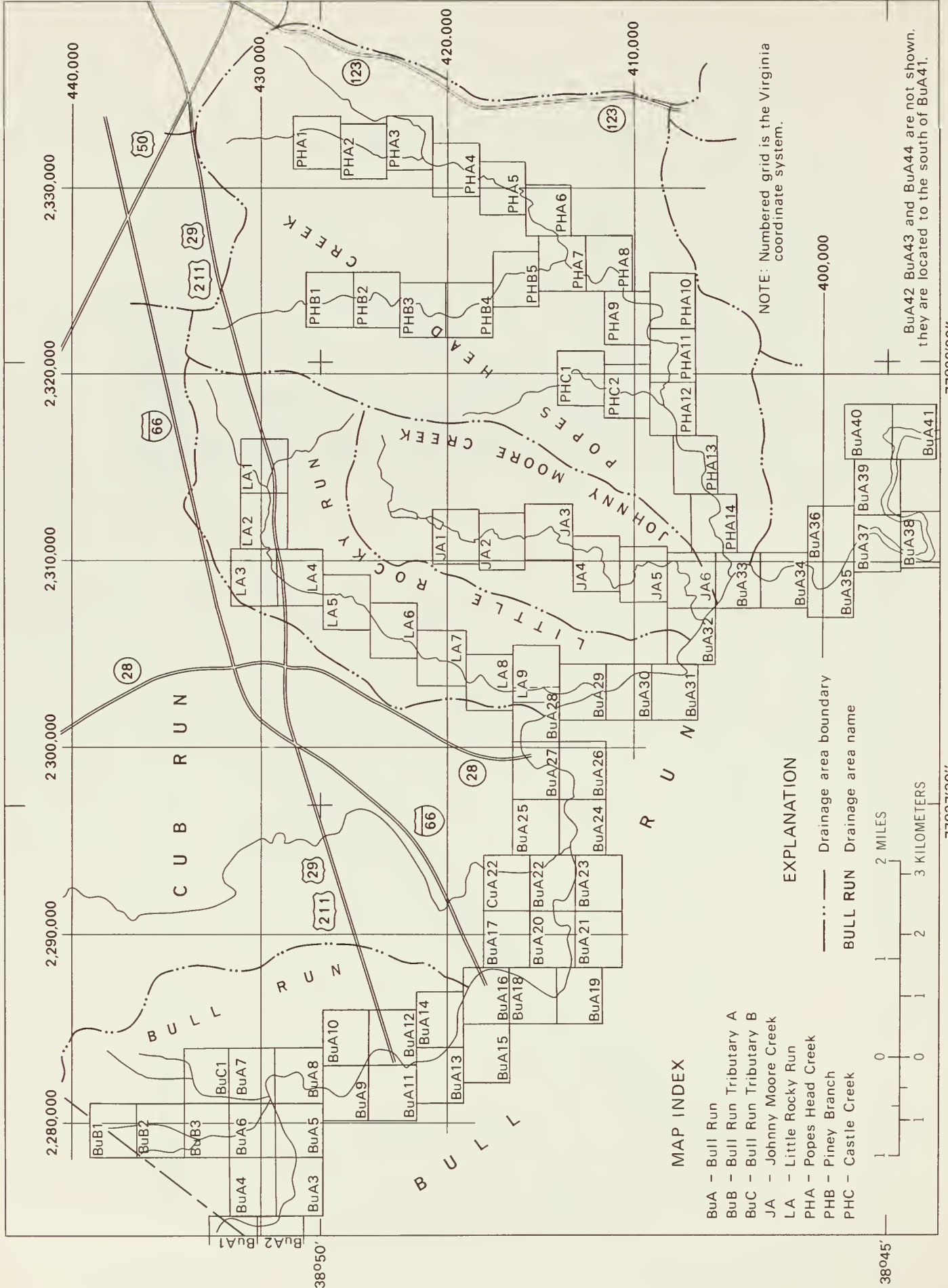


Figure 13. Graphs showing flood profiles for 25-year and 100-year recurrence interval discharges, Castle Creek and East Fork Popes Head Creek

FLOOD-PLAIN DELINEATION

Boundaries for 25-year, 50-year, and 100-year floods, assuming ultimate development, are delineated on 84 special large scale maps that were reduced to page size for this report (figs. 15-98). Copies of the maps at the original scale of 1 inch (2.54 cm) equals 100 feet (30.5 m) can be obtained from Fairfax County. Figure 14 is the index of sheets for Bull Run, Little Rocky Run, Johnny Moore Creek, and Popes Head Creek Basins.



EXPLANATION

- Drainage area boundary
- BULL RUN Drainage area name



MAP INDEX

- BuA - Bull Run
- BuB - Bull Run Tributary A
- BuC - Bull Run Tributary B
- JA - Johnny Moore Creek
- LA - Little Rocky Run
- PHA - Popes Head Creek
- PHB - Piney Branch
- PHC - Castle Creek

BuA42 BuA43 and BuA44 are not shown, they are located to the south of BuA41.

Figure 14. Index of flood maps

DELINEATION OF FLOOD-PRONE AREAS

BULL RUN, LITTLE ROCKY RUN, JOHNNY MOORE CREEK, AND POPES HEAD CREEK BASINS

Flood plain delineation by U.S. Geological Survey in cooperation with the County of Fairfax as a part of a study of urbanization effects upon flood discharges.

Topography from aerial photographs taken 1963 and 1970 250-foot grid based on Virginia coordinate system north zone.

Maps compiled by photogrammetric methods. Control and photogrammetric surveys are in accordance with National Map Accuracy Standards.

SYMBOLS

●	MANHOLE
●	UTILITY POLE
—X—X—X—	FENCE
-----	STREAM
⊠	TRANSMISSION TOWER
- - -25- - -	FLOOD-DELINEATION AND RECURRENCE INTERVAL

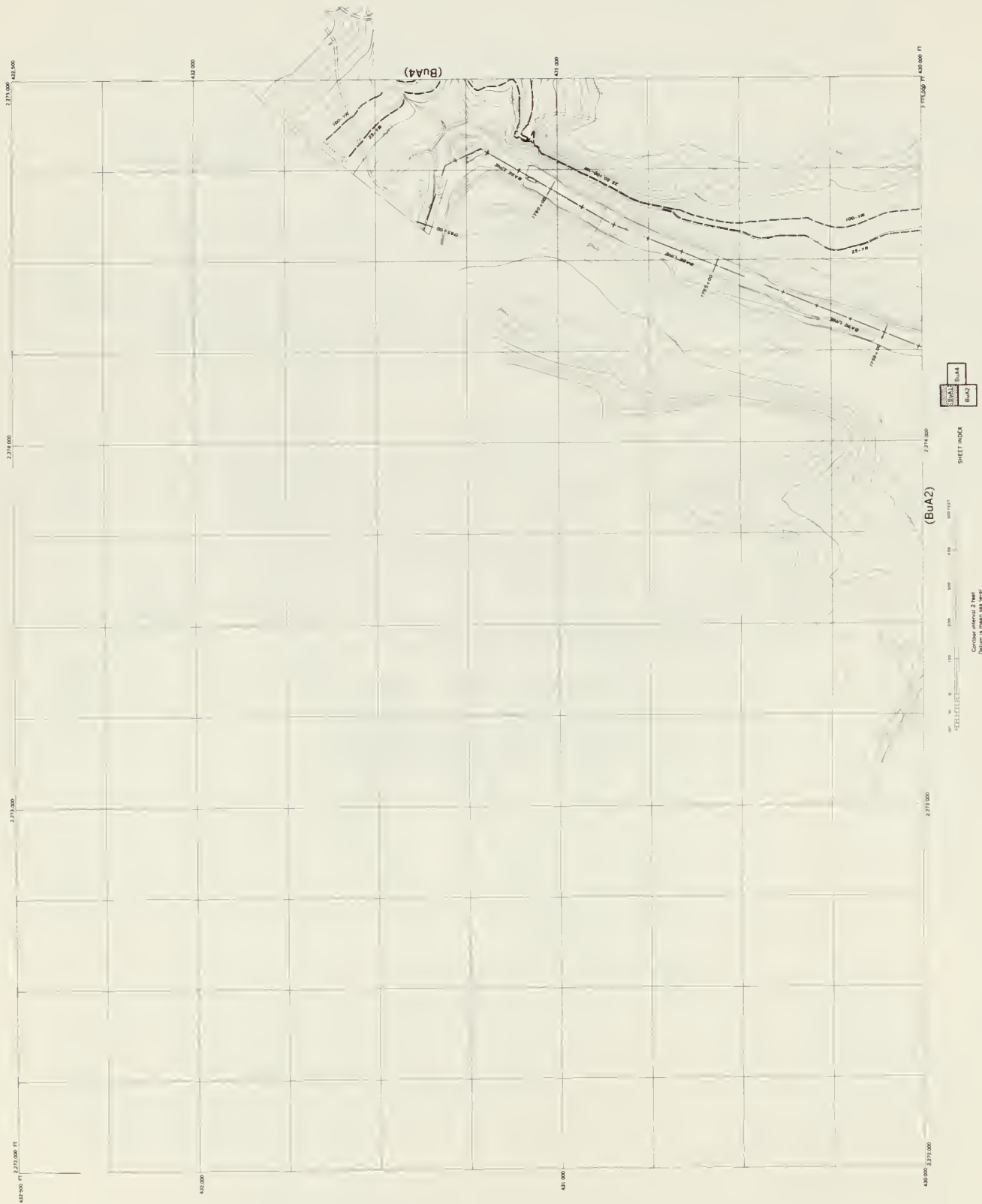


Figure 15. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-1

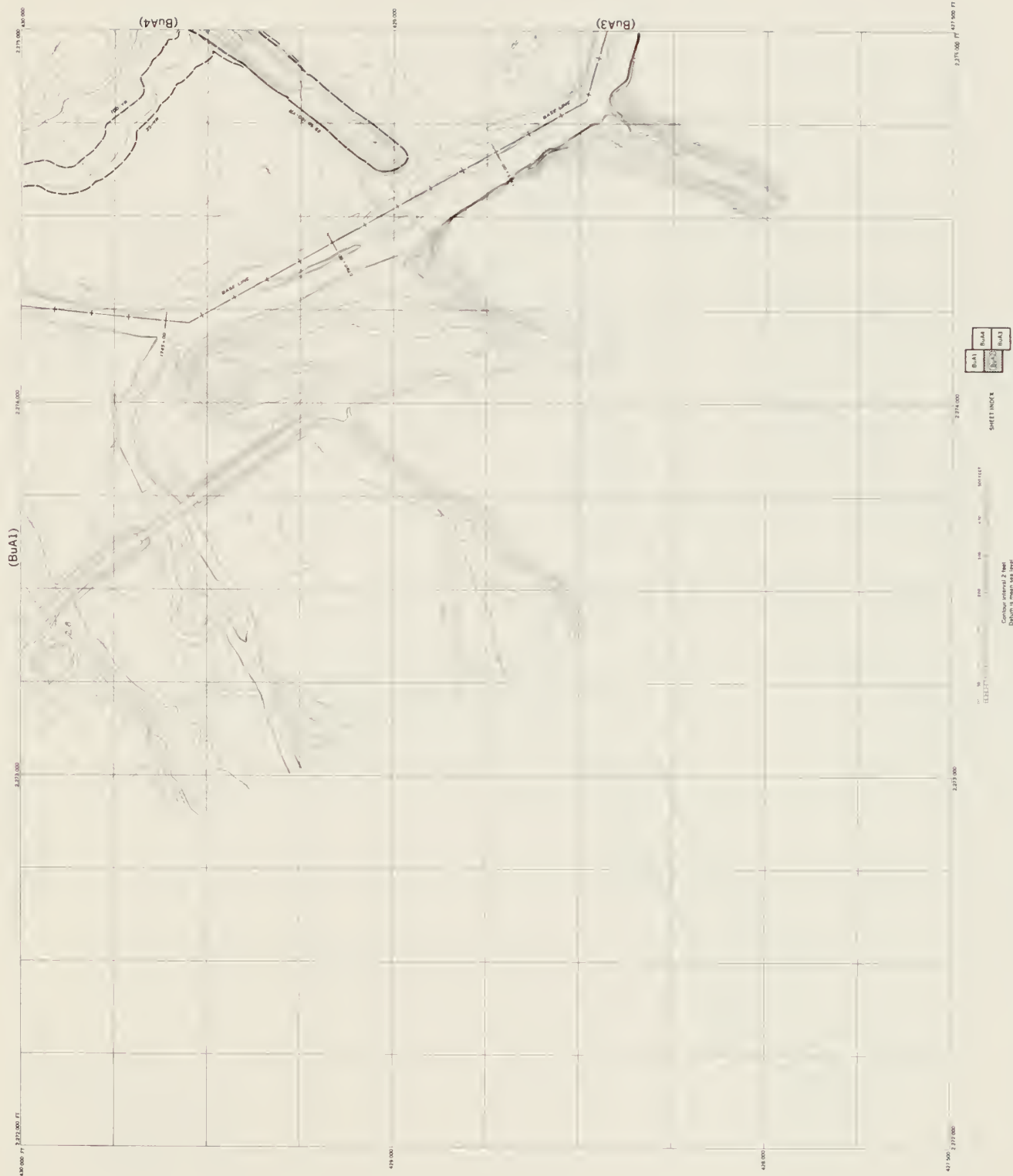


Figure 16. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-2



Figure 18. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-4



Figure 19. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-5



Figure 20. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-6

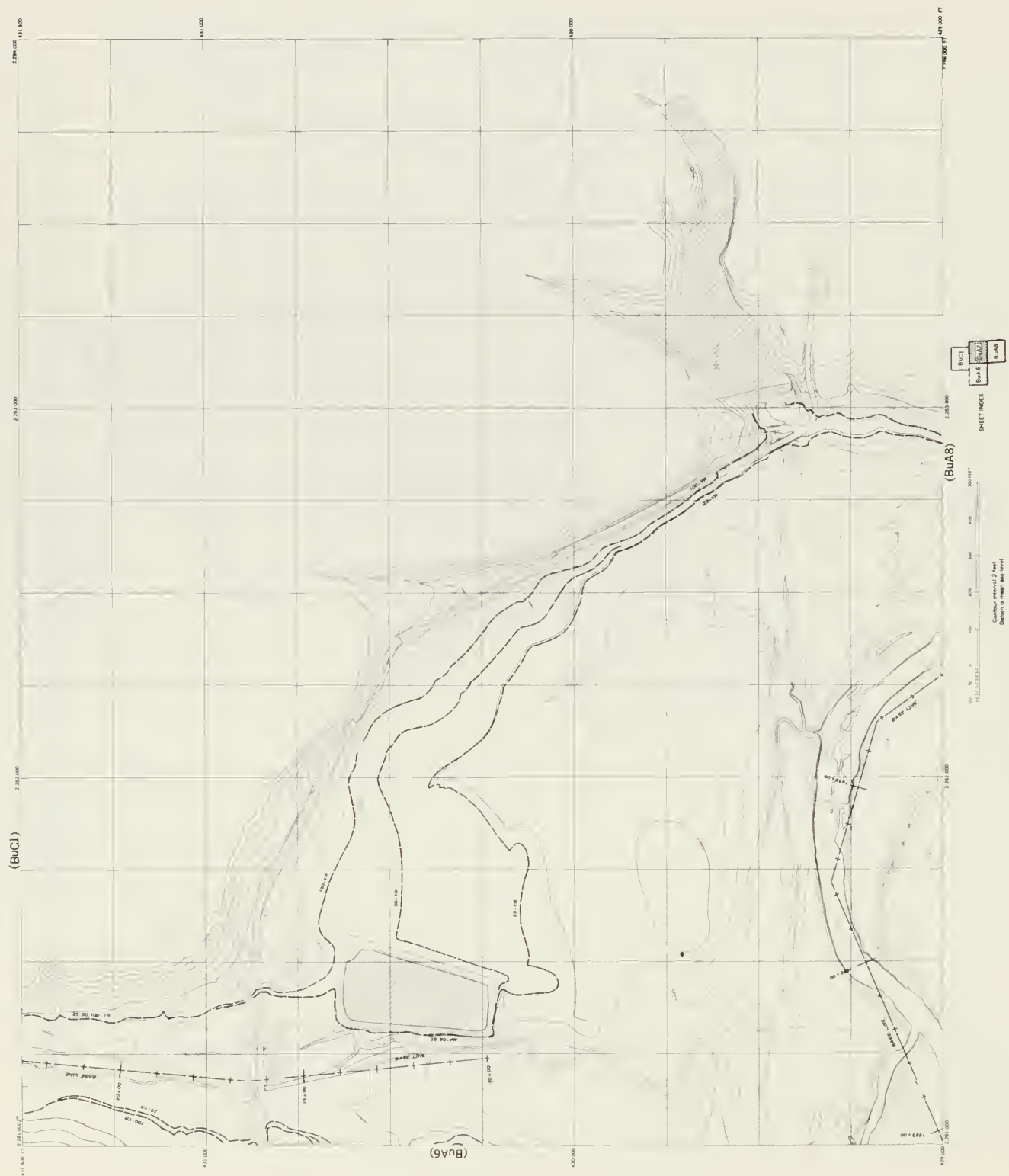


Figure 21. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-7



Figure 22. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-8

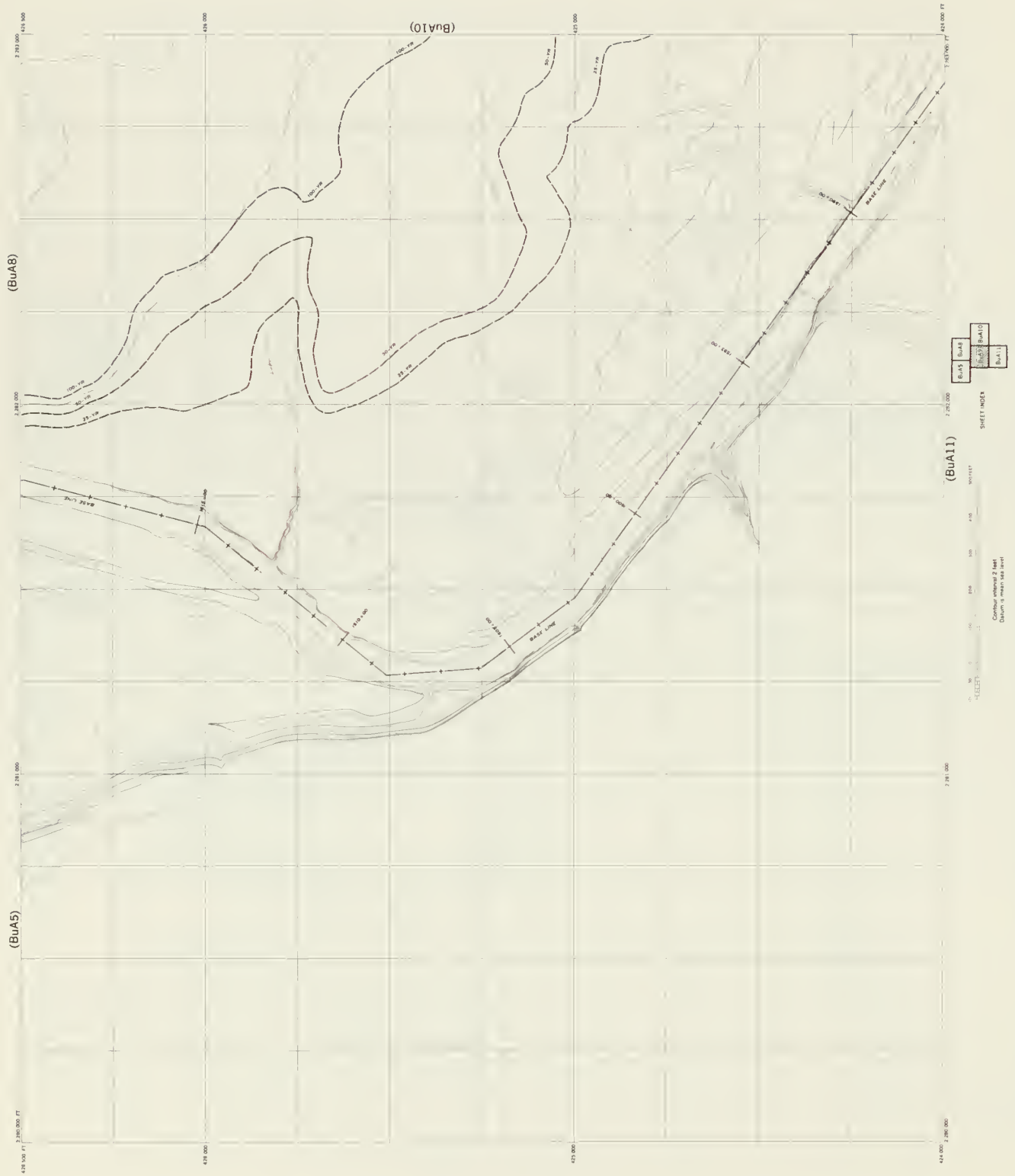


Figure 23. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-9

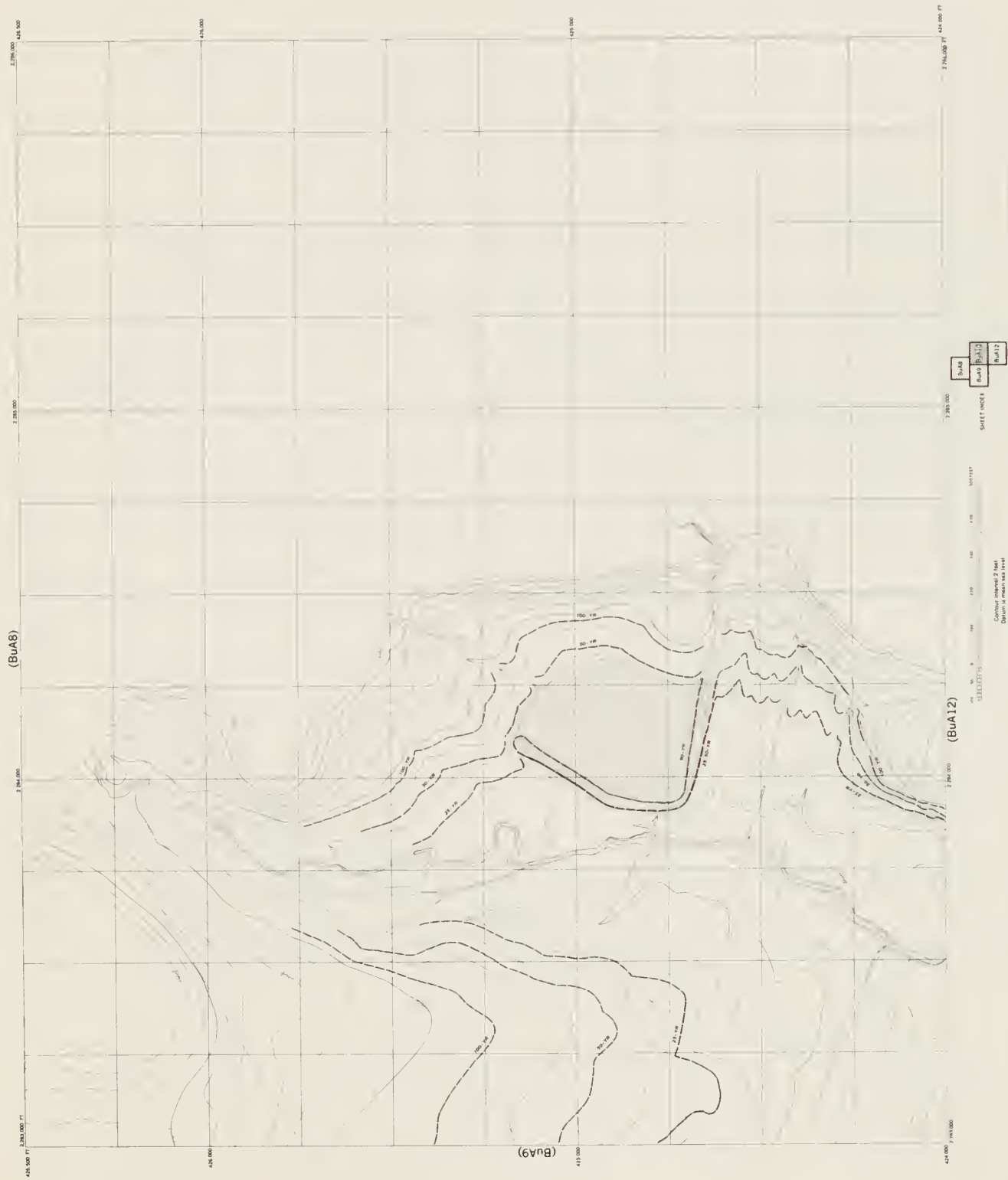


Figure 24. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-10

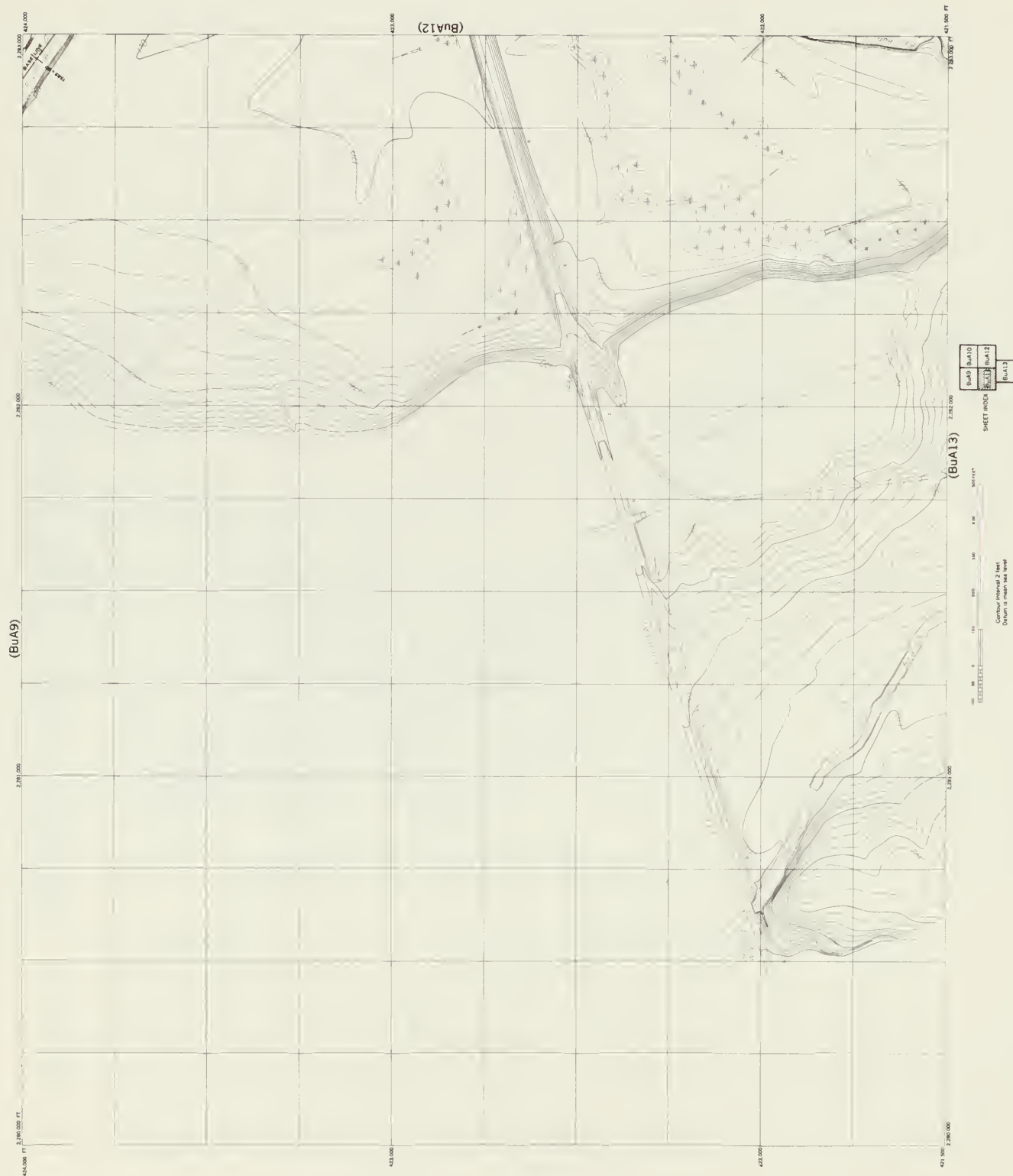


Figure 25. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-11

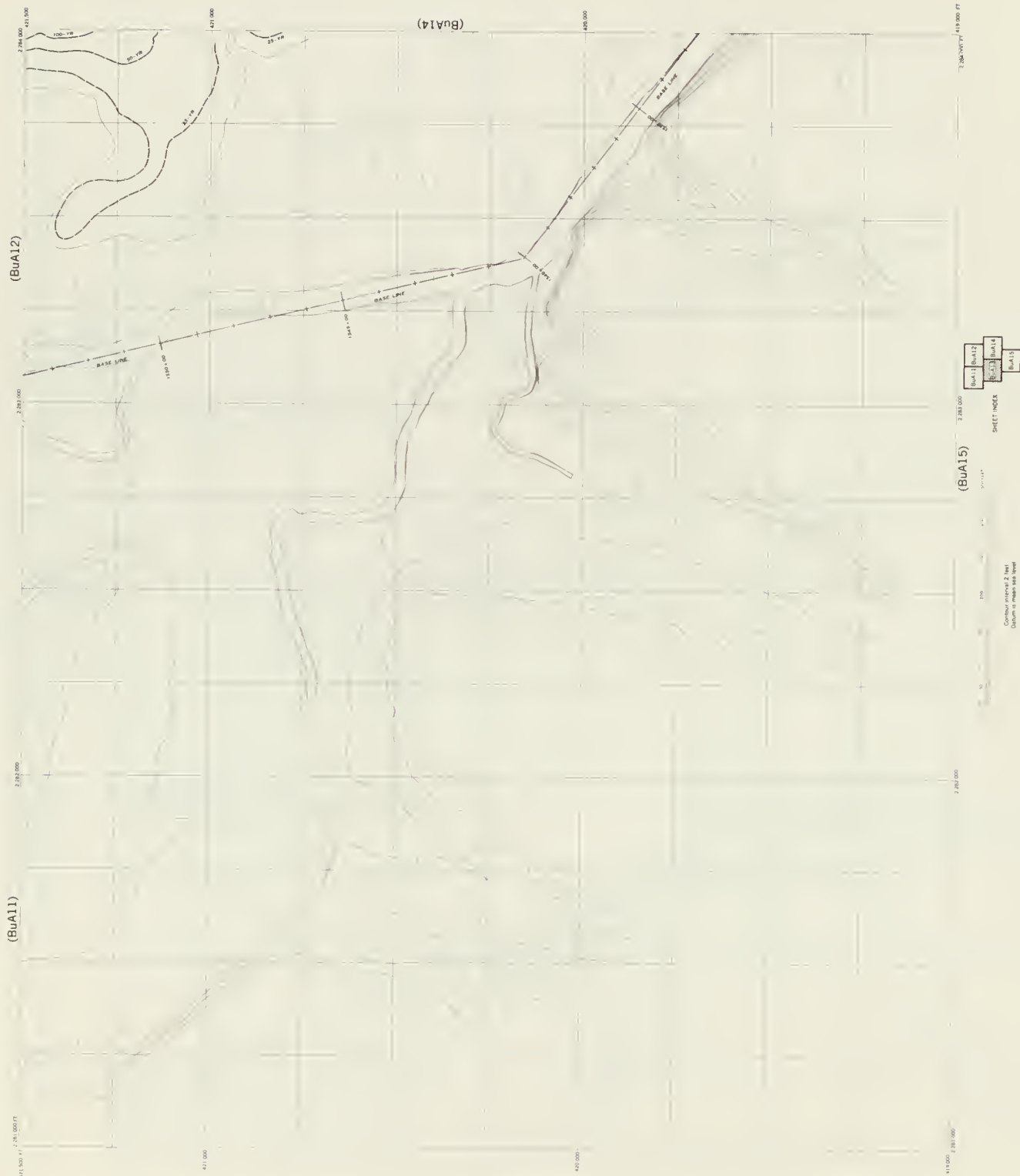


Figure 27. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-13

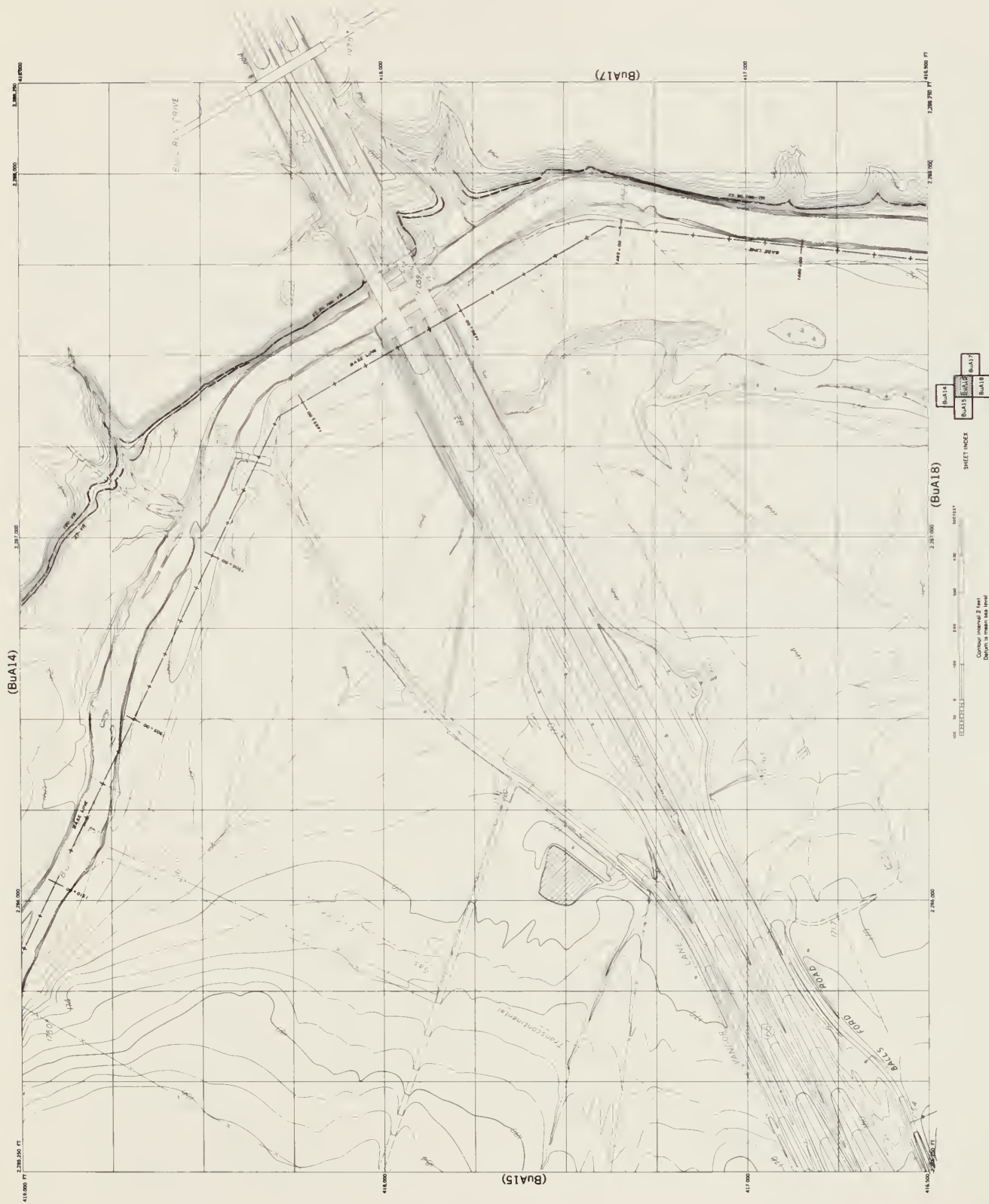


Figure 30. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-16

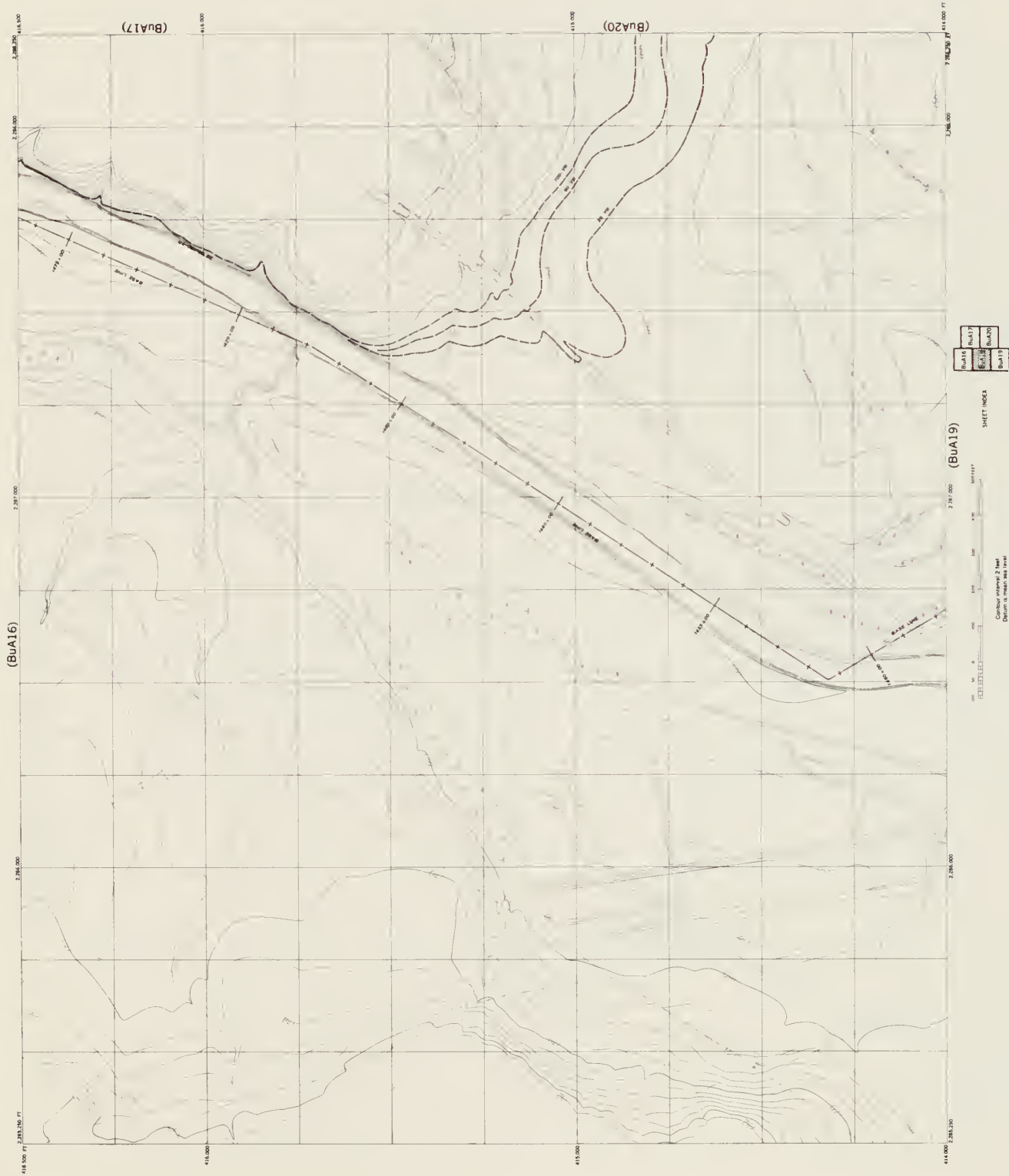


Figure 32. Topographic maps of stream valleys showing flood boundary delineation. Bull Run: BuA-18

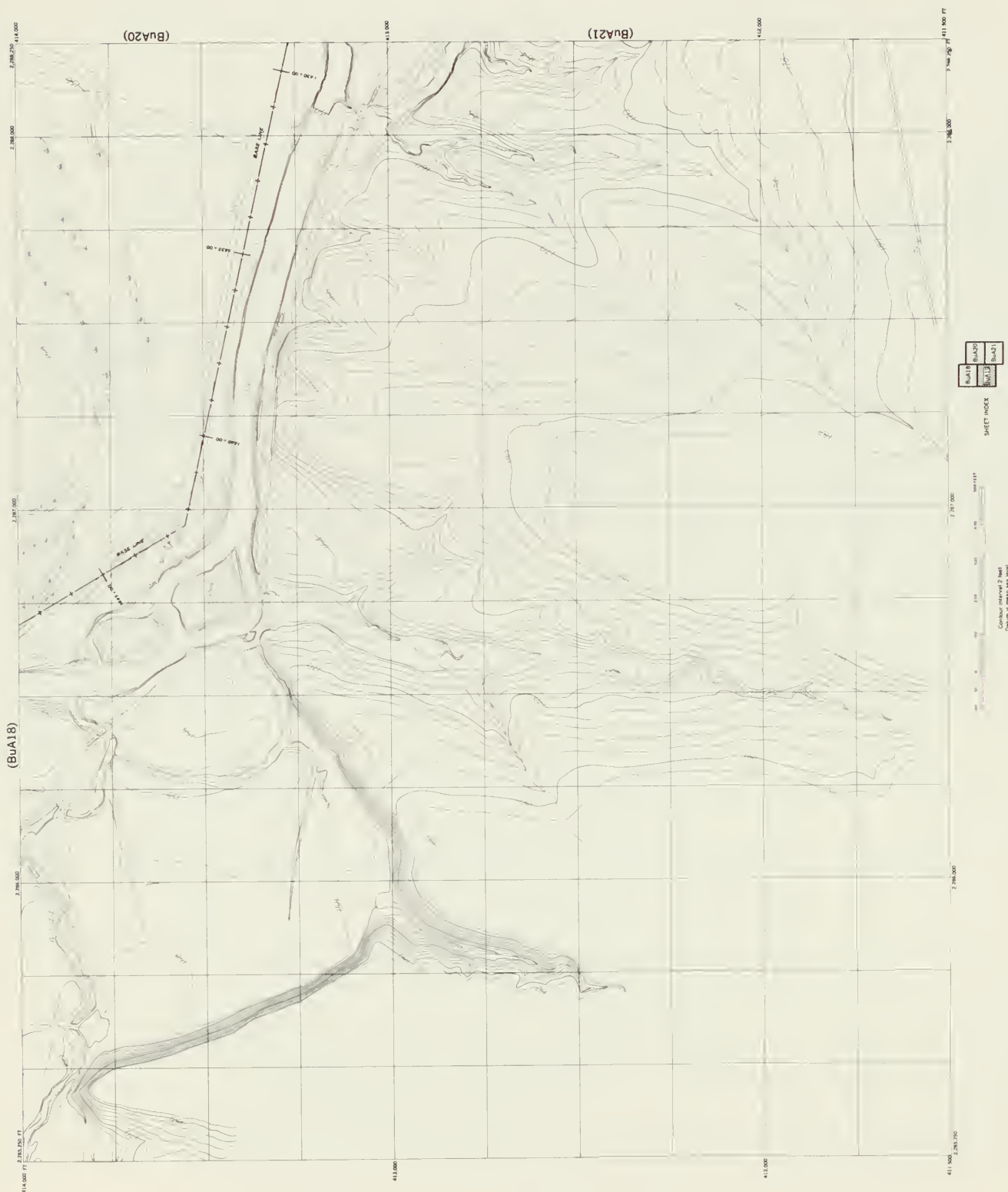


Figure 33. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-19

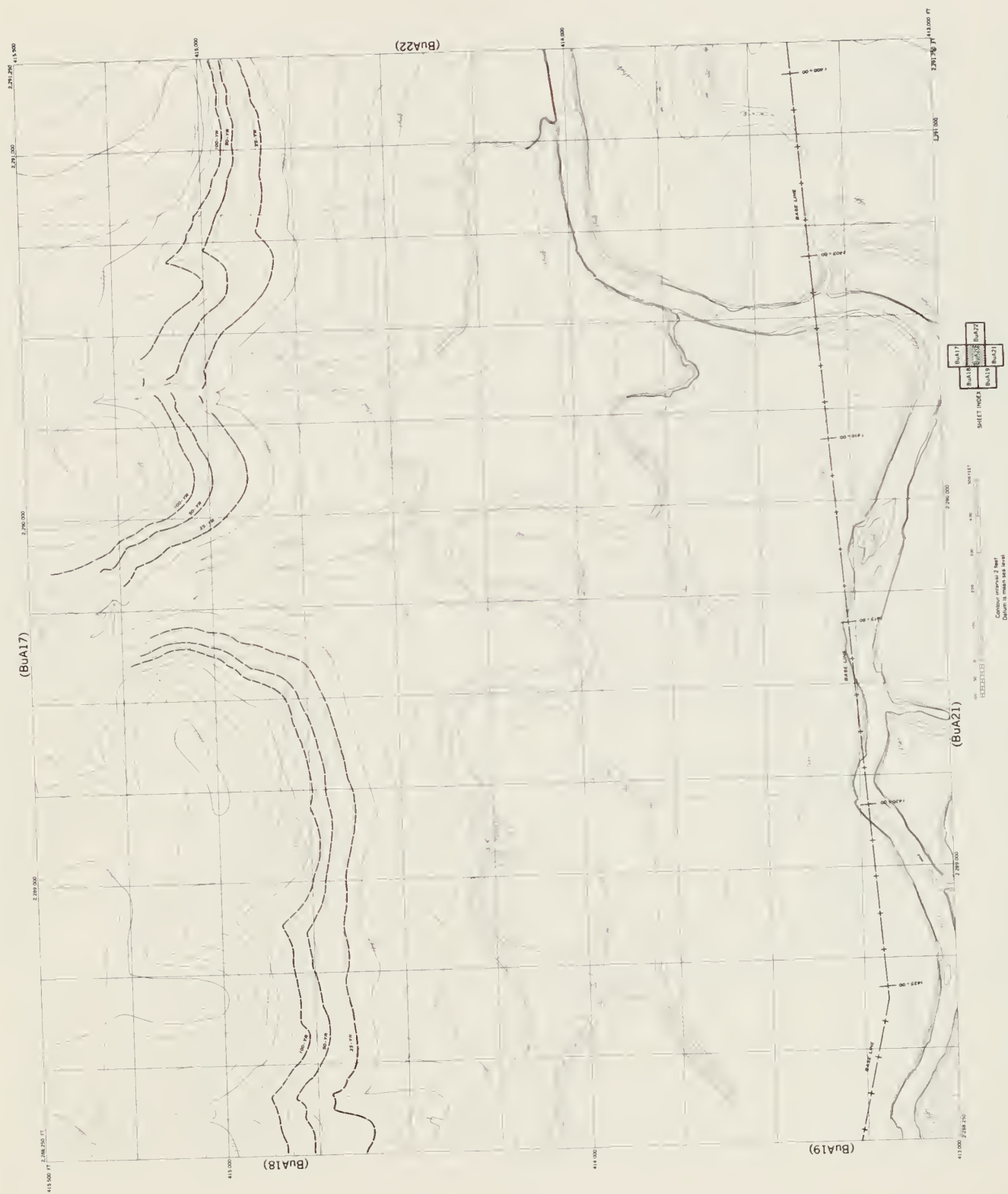


Figure 34. Topographic maps of stream valleys showing flood boundary delineation, Bull Run: BuA-20



Figure 35. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-21



Figure 36. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-22

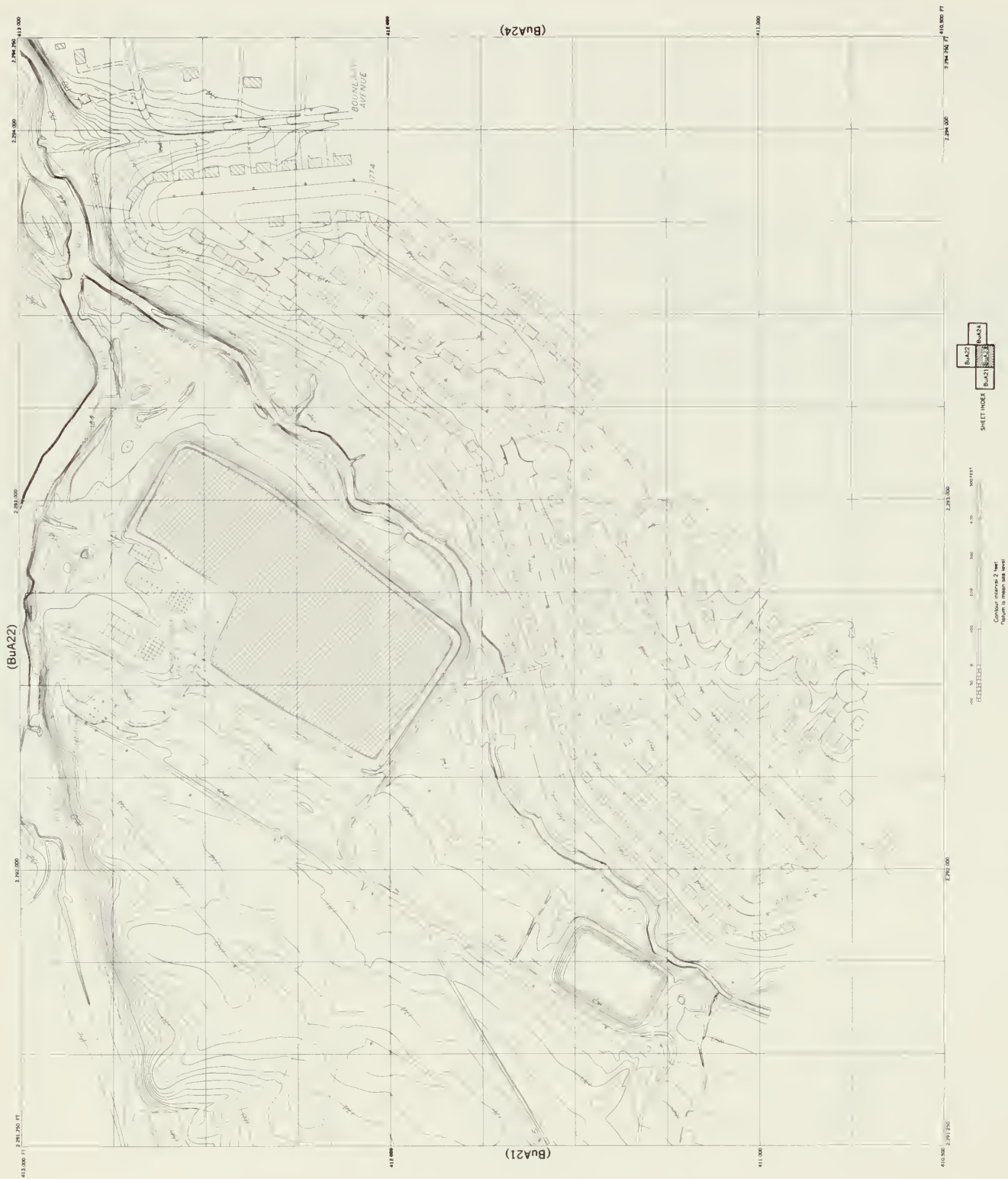


Figure 37. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-23

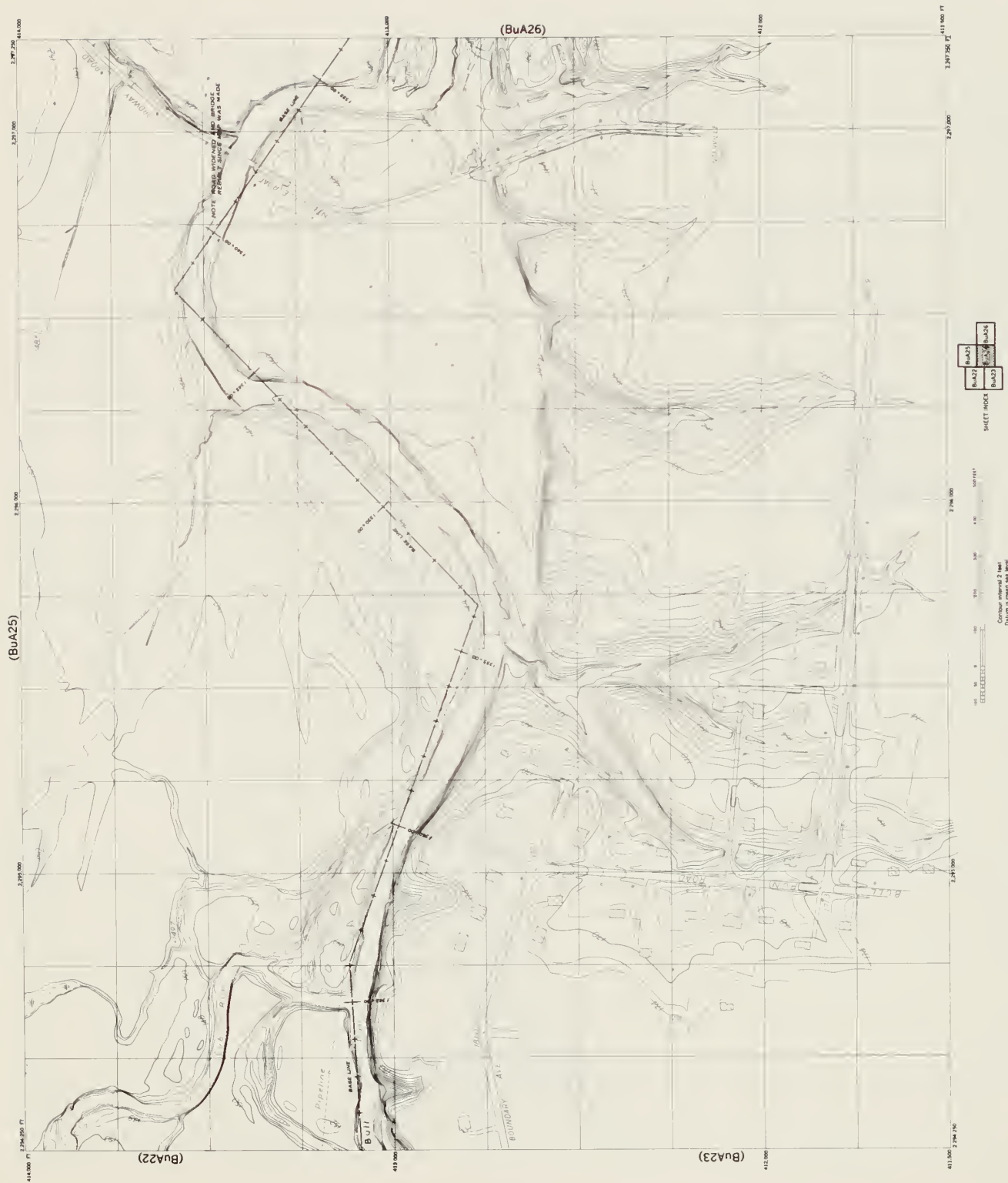


Figure 38. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-24

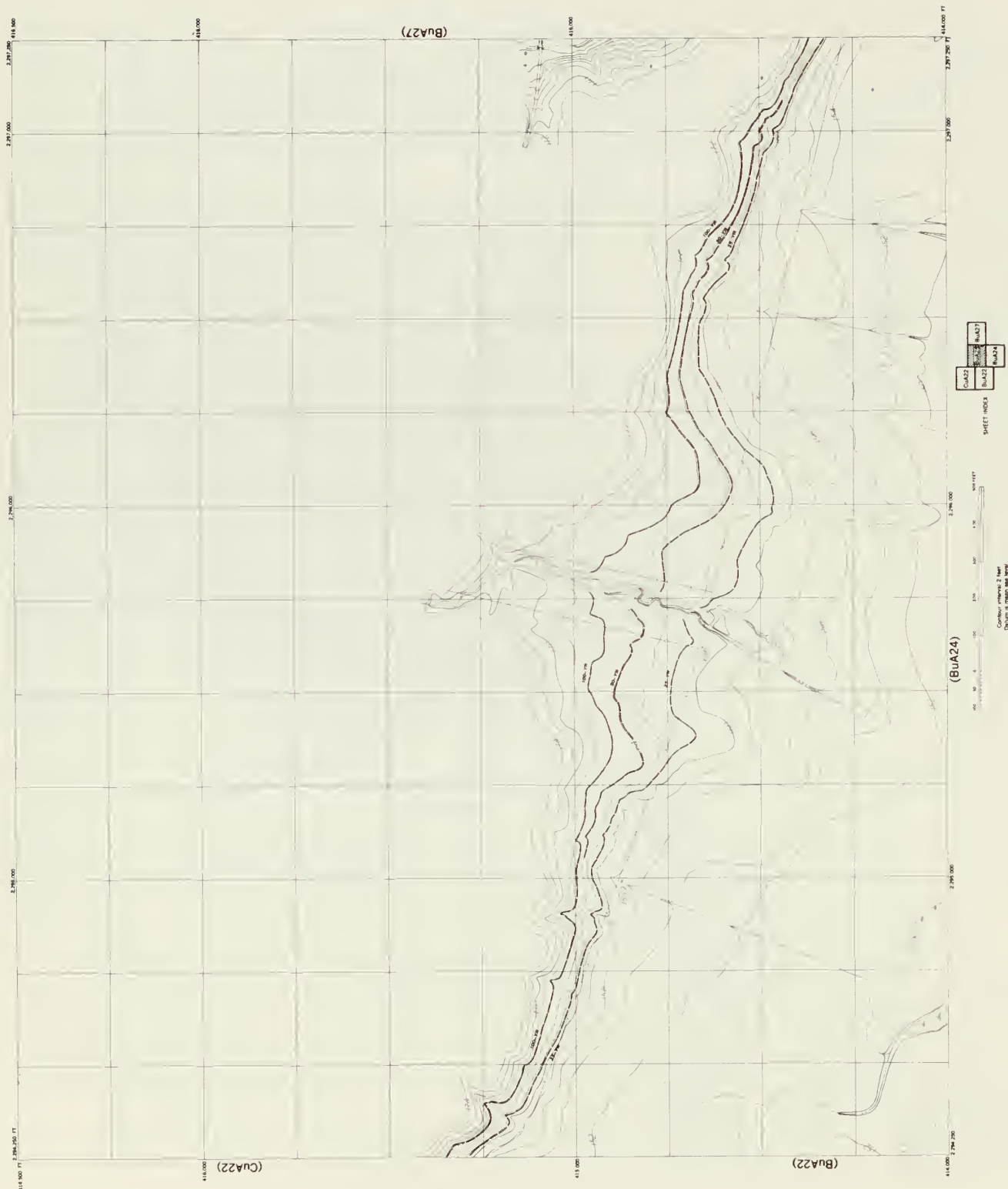


Figure 39. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-25



Figure 40. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-26

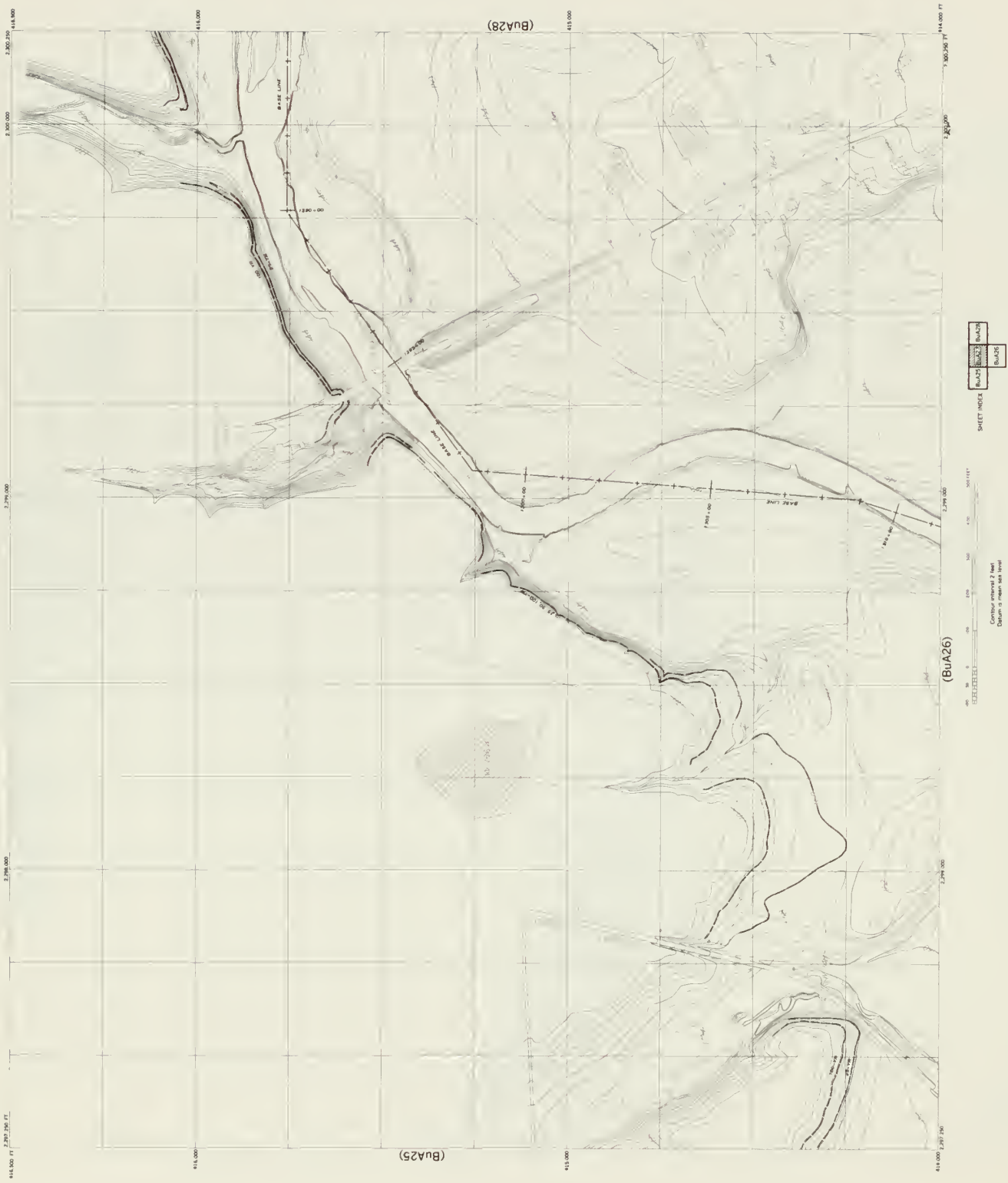


Figure 41. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-27

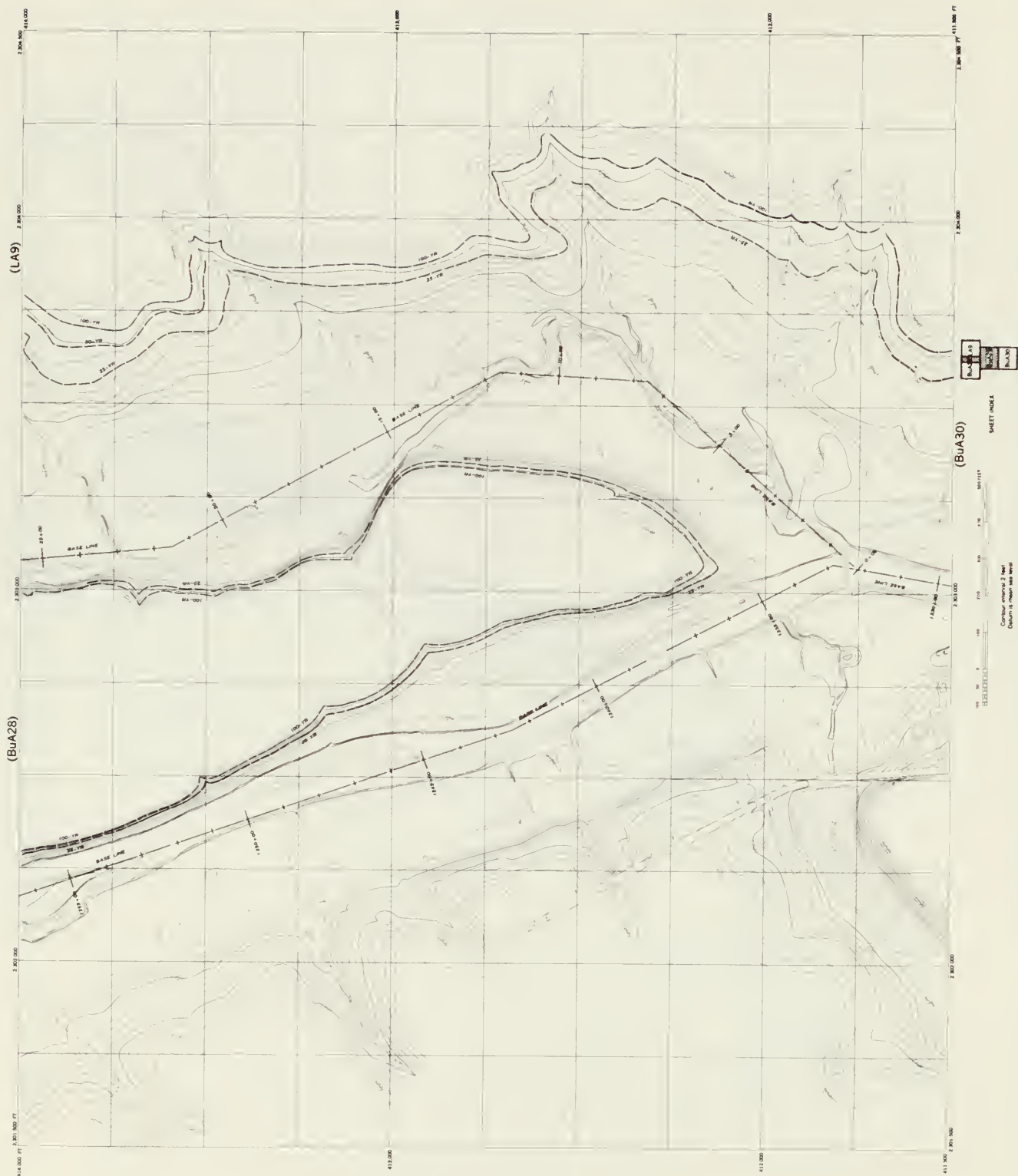


Figure 43. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-29

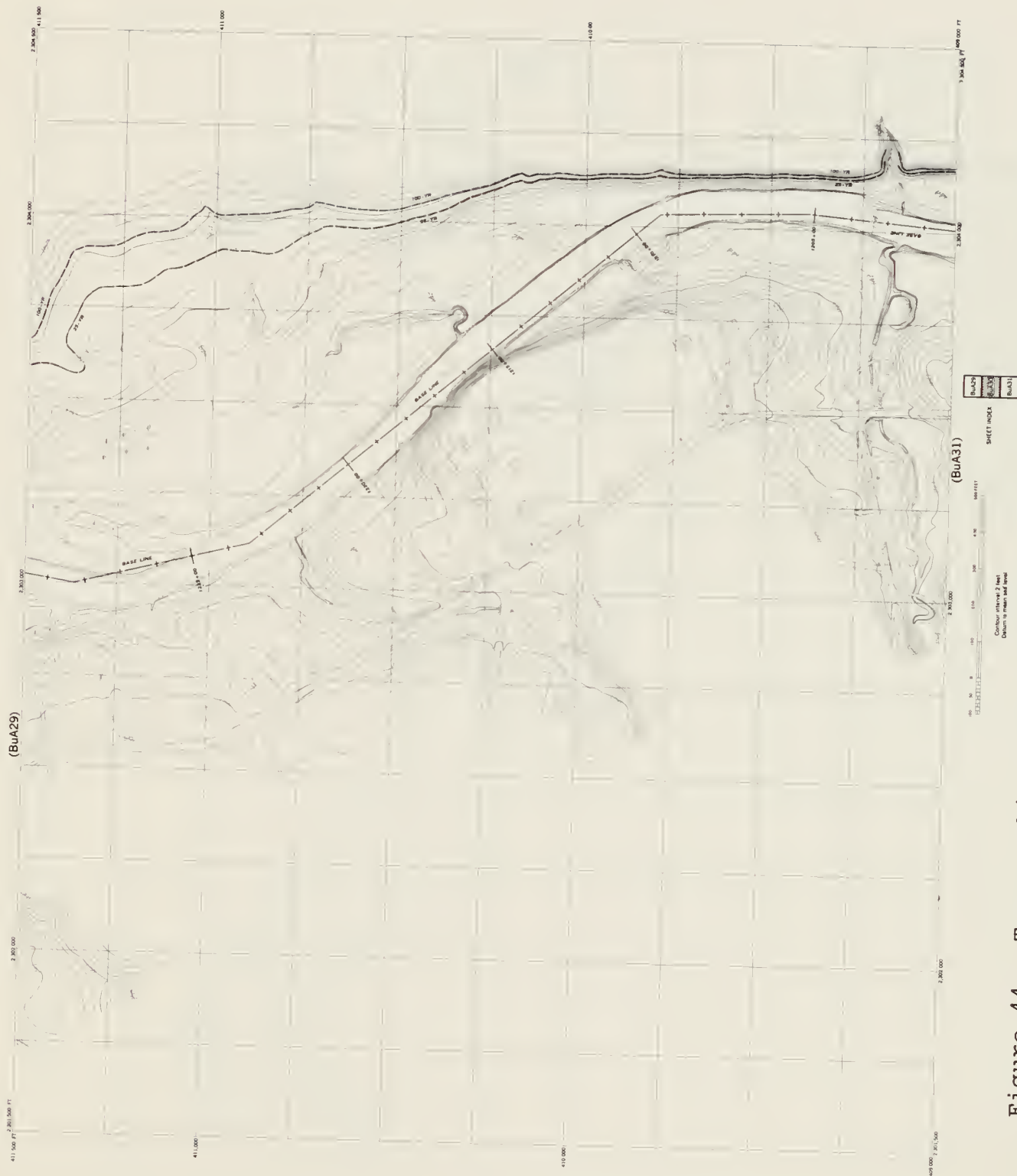


Figure 44. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-30

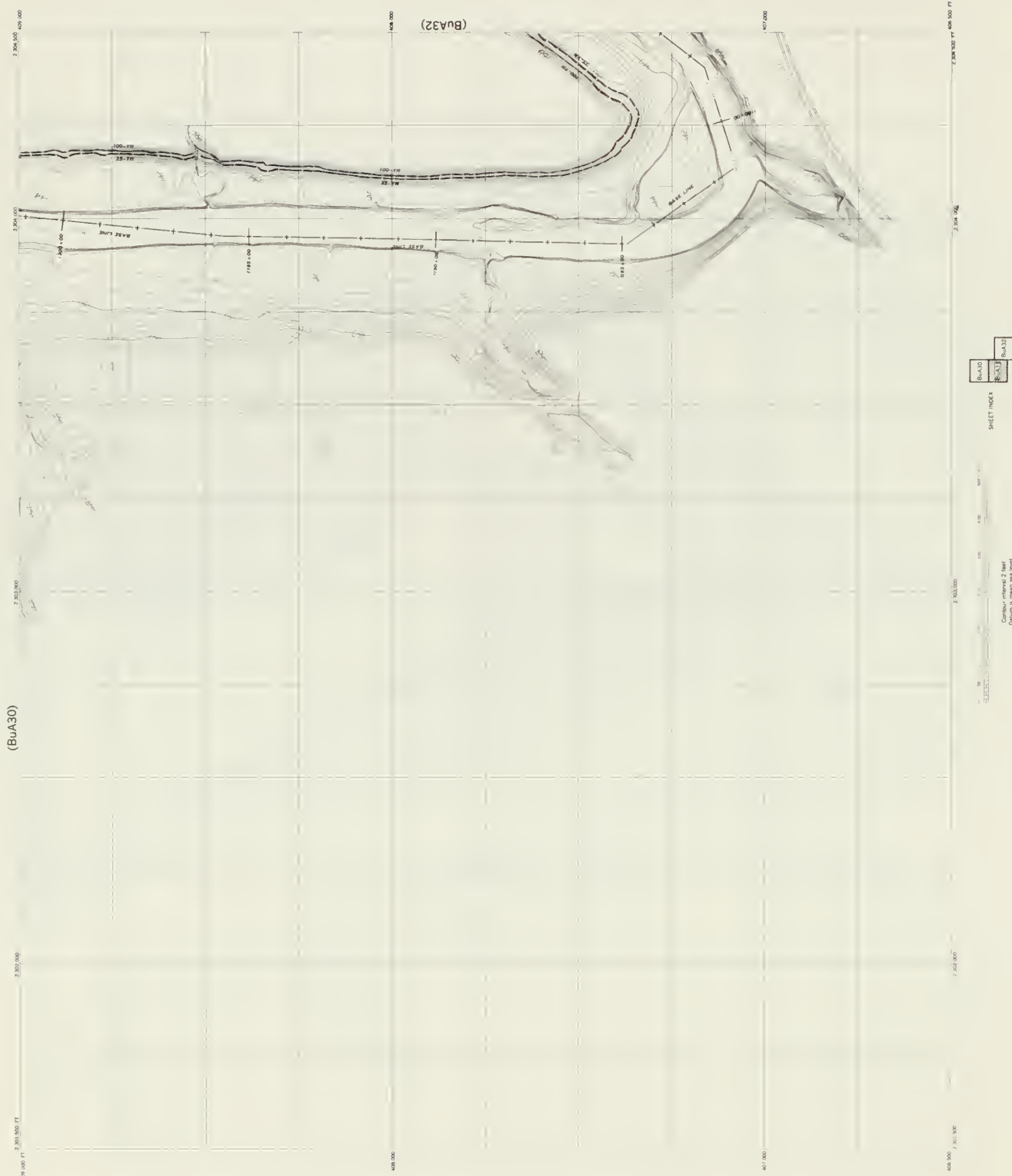


Figure 45. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-31

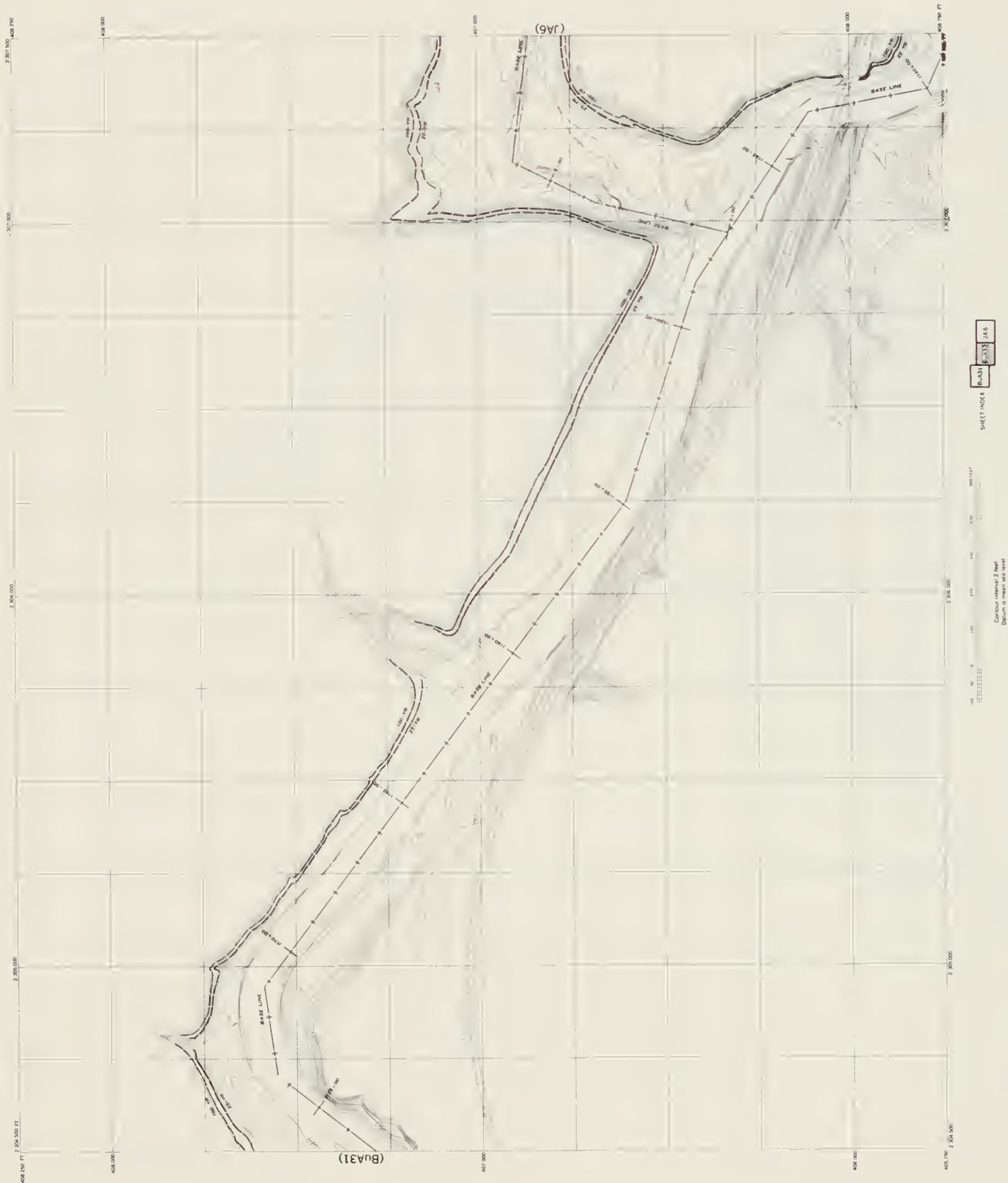


Figure 46. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-32

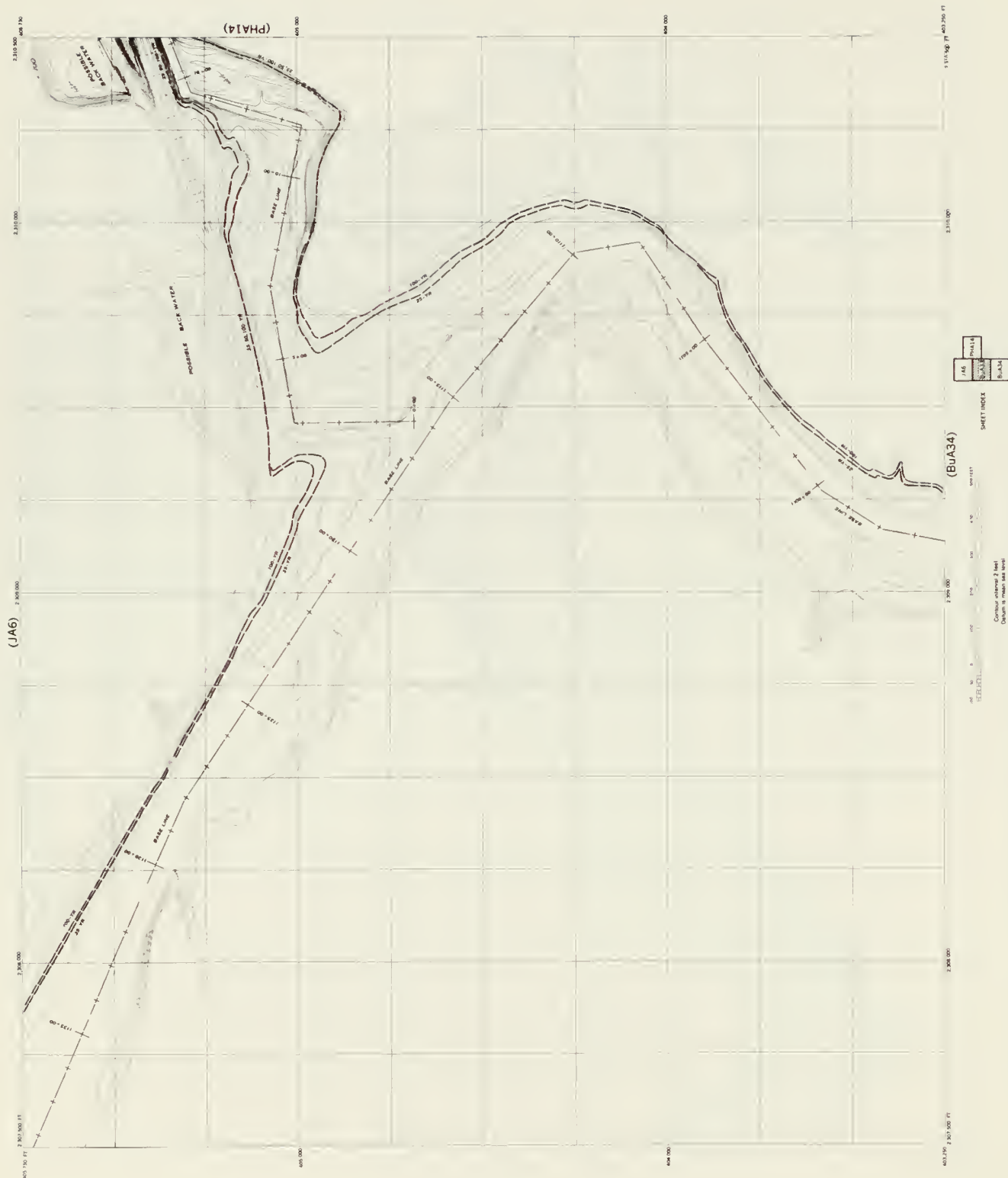


Figure 47. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-33



Figure 50. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-36

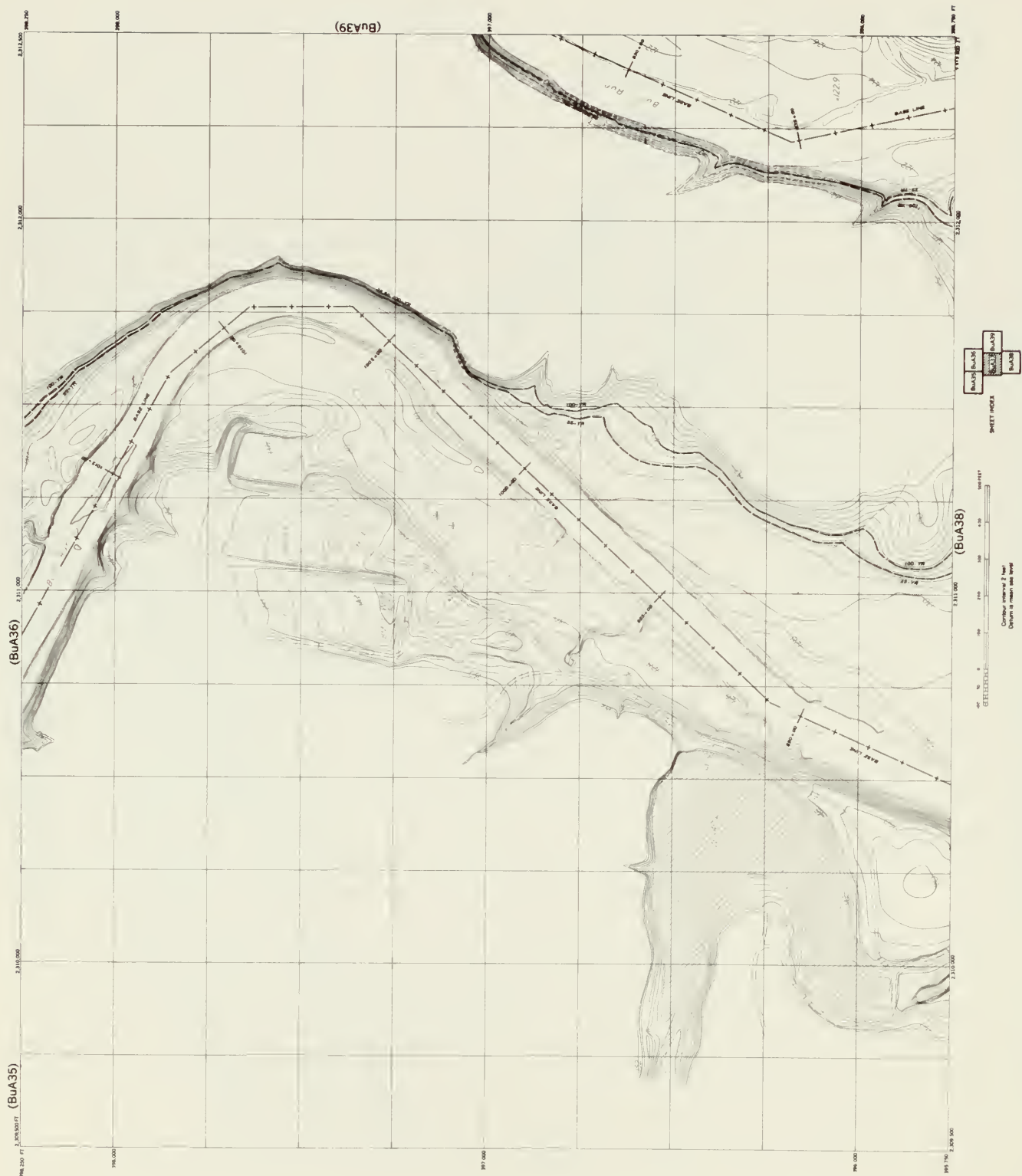


Figure 51. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-37

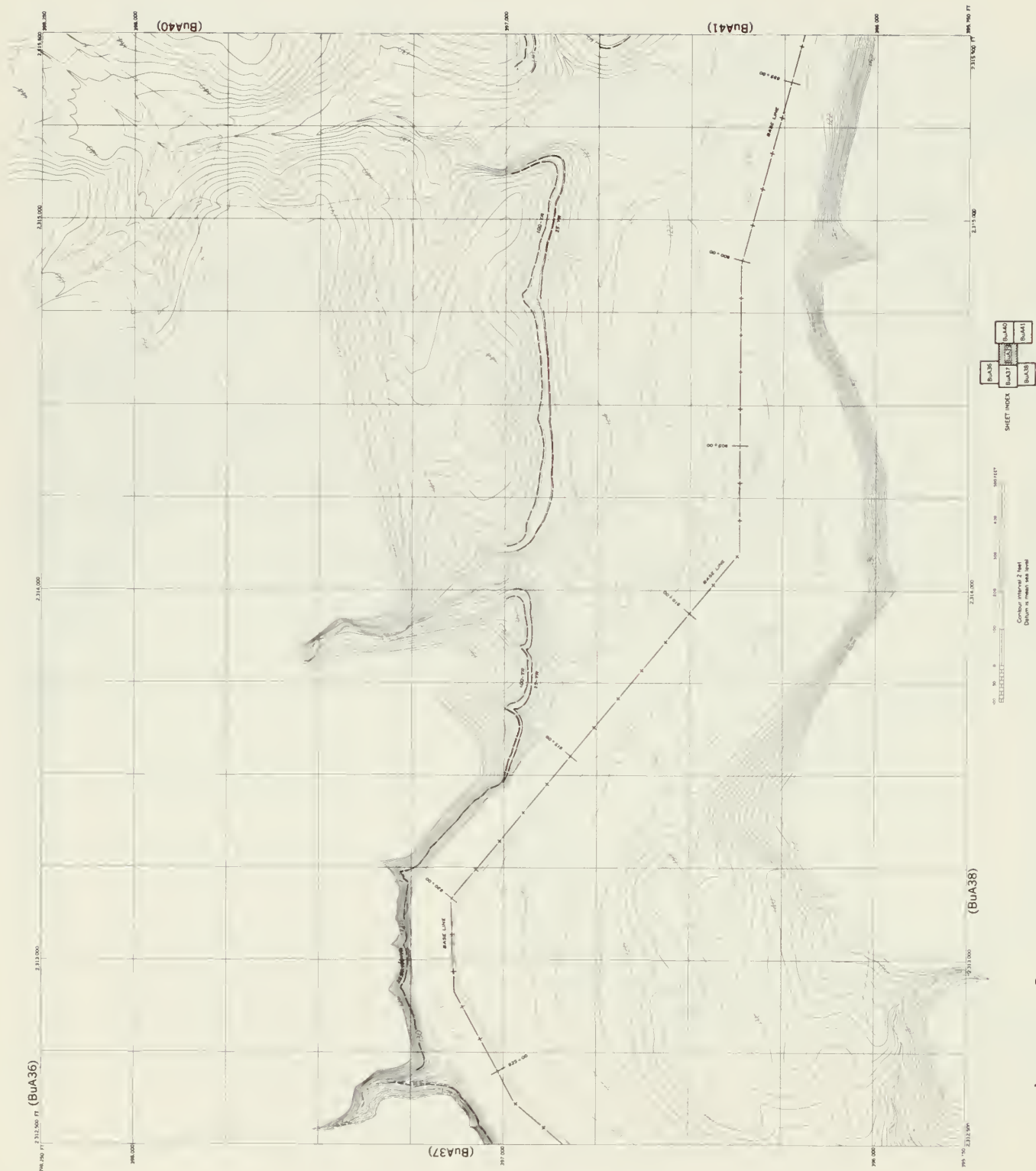


Figure 53. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-39



Figure 54. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-40

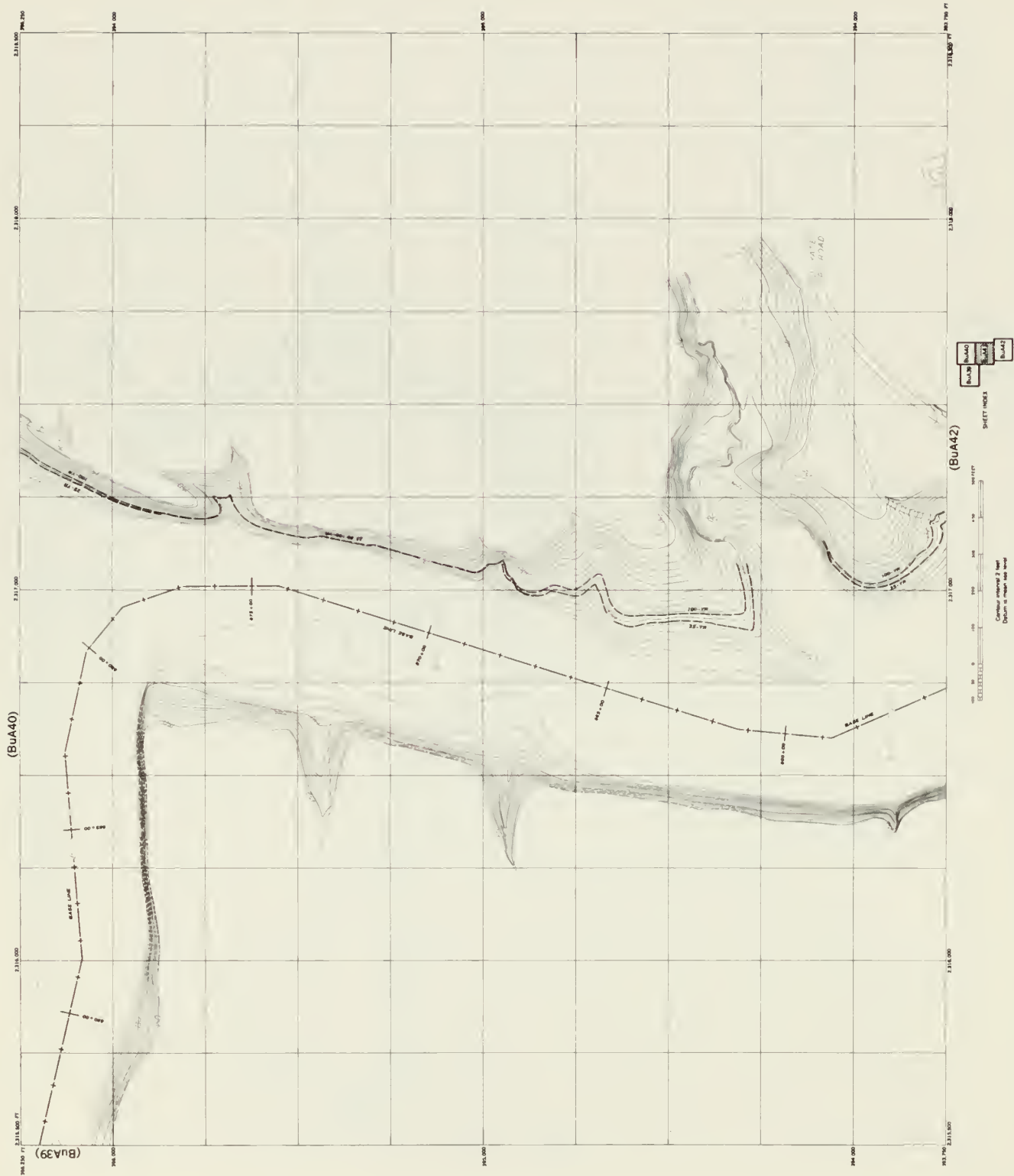


Figure 55. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-41

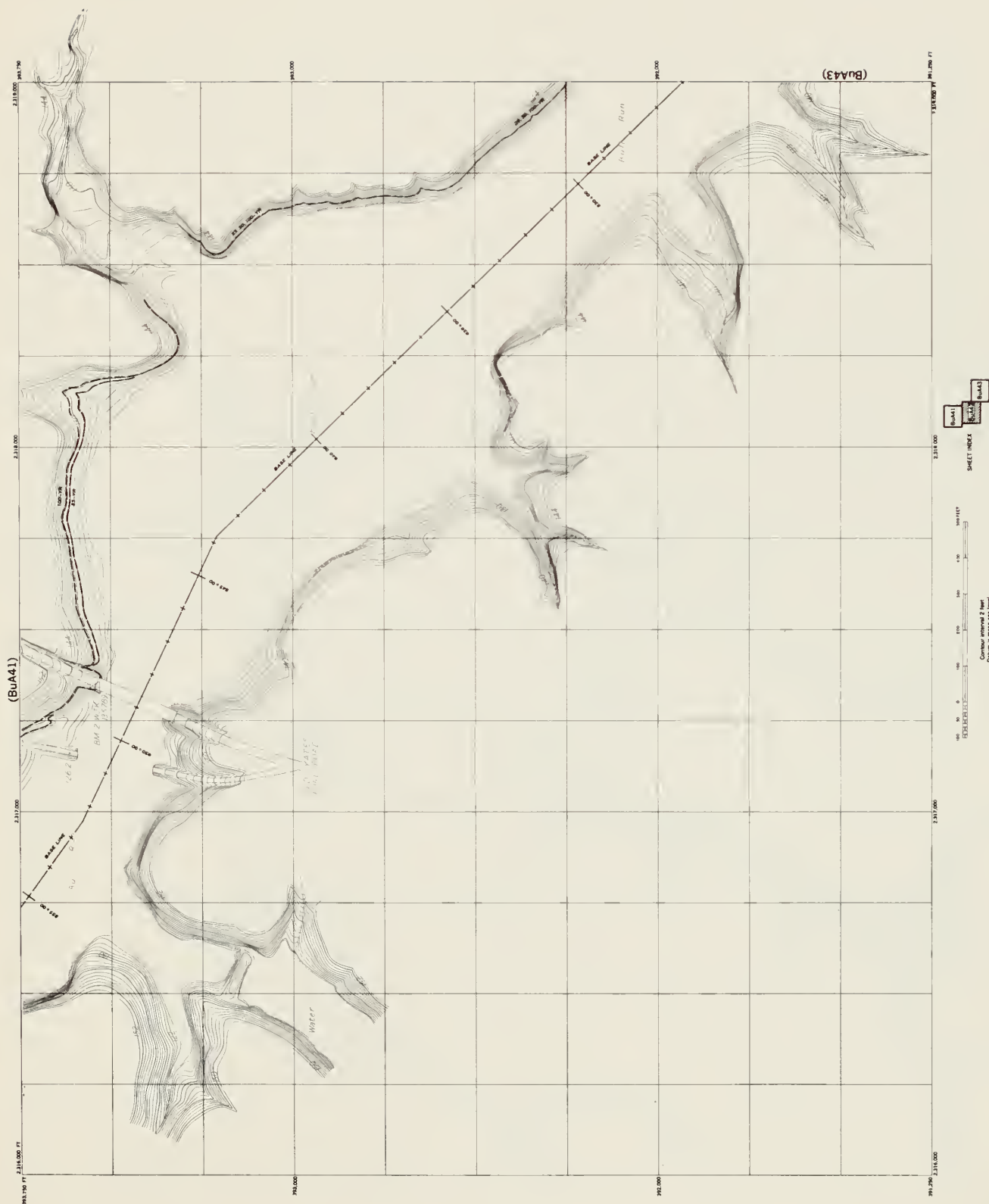


Figure 56. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-42

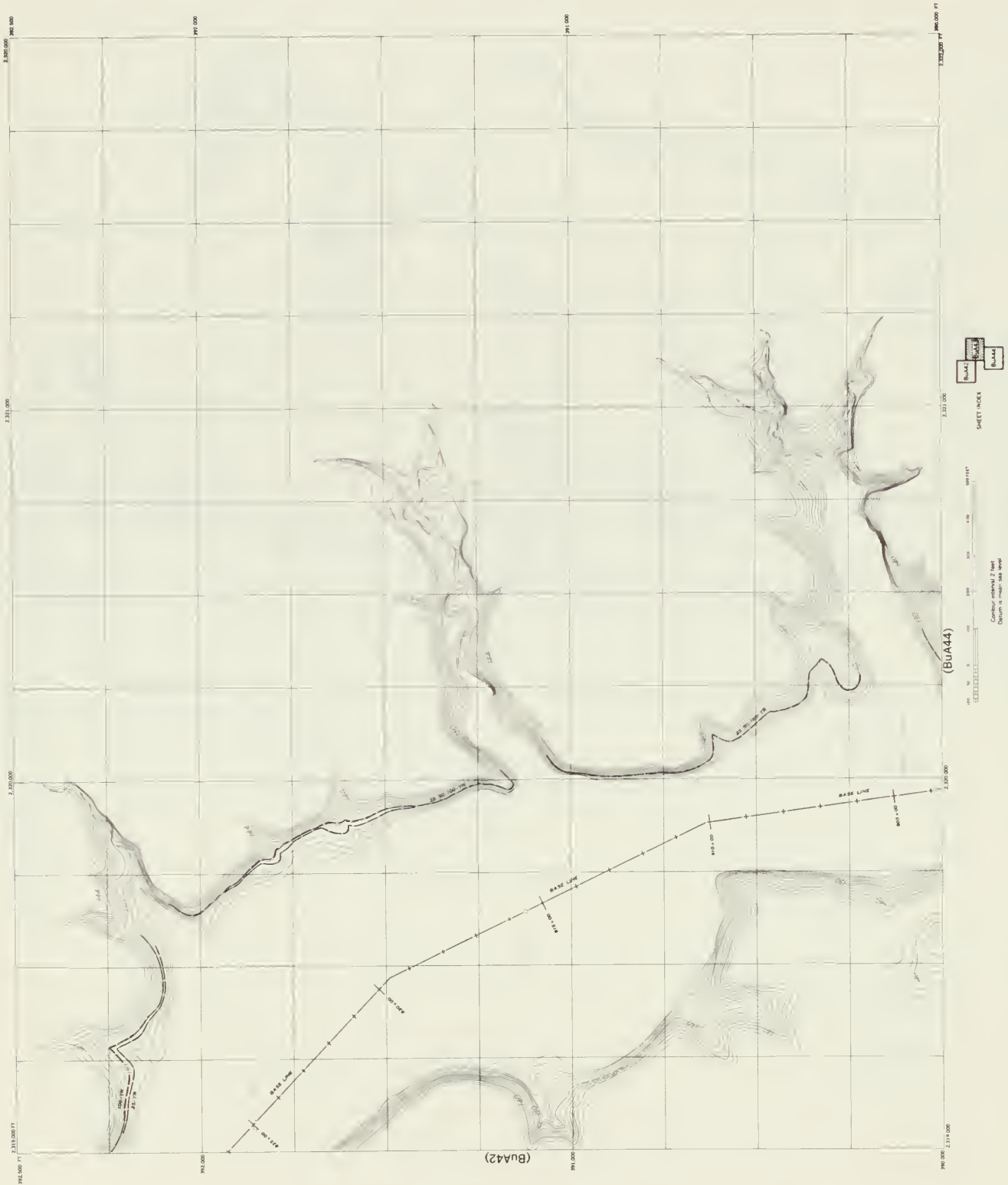


Figure 57. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-43

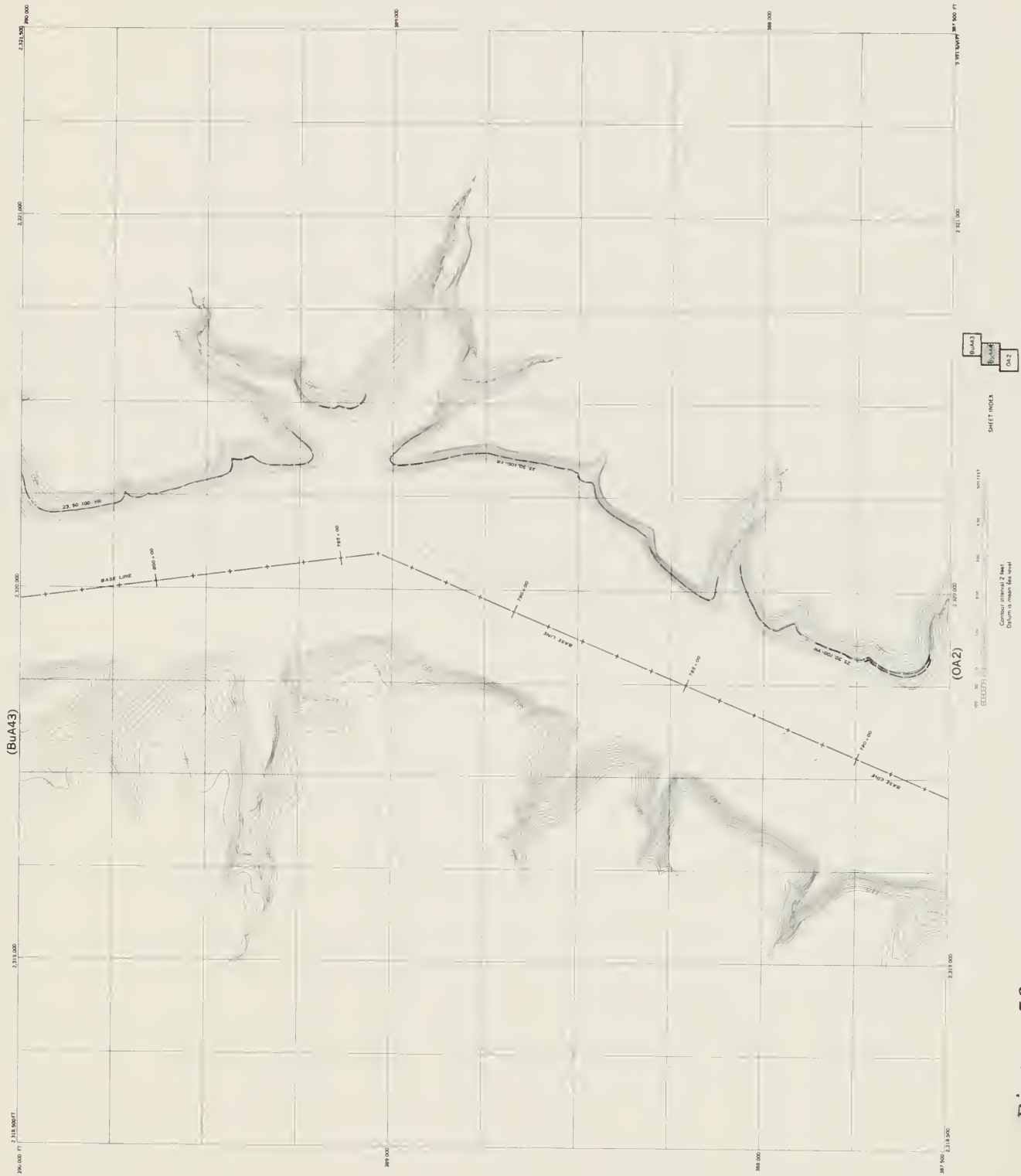


Figure 58. Topographic maps of stream valleys showing flood boundary delineation, Bull Run; BuA-44

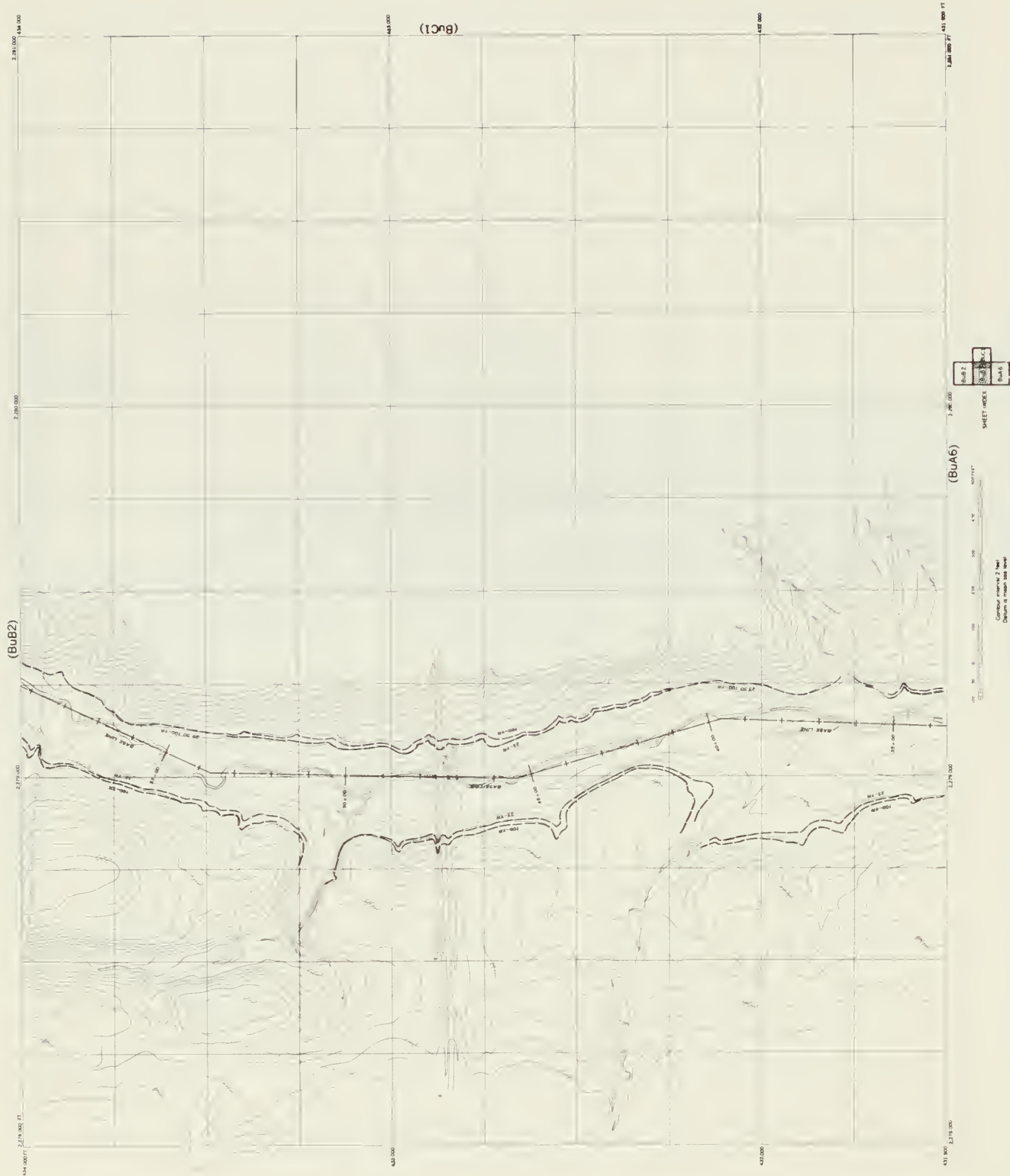


Figure 61. Topographic maps of stream valleys showing flood boundary delineation, Bull Run tributary 'A'; BuB-3

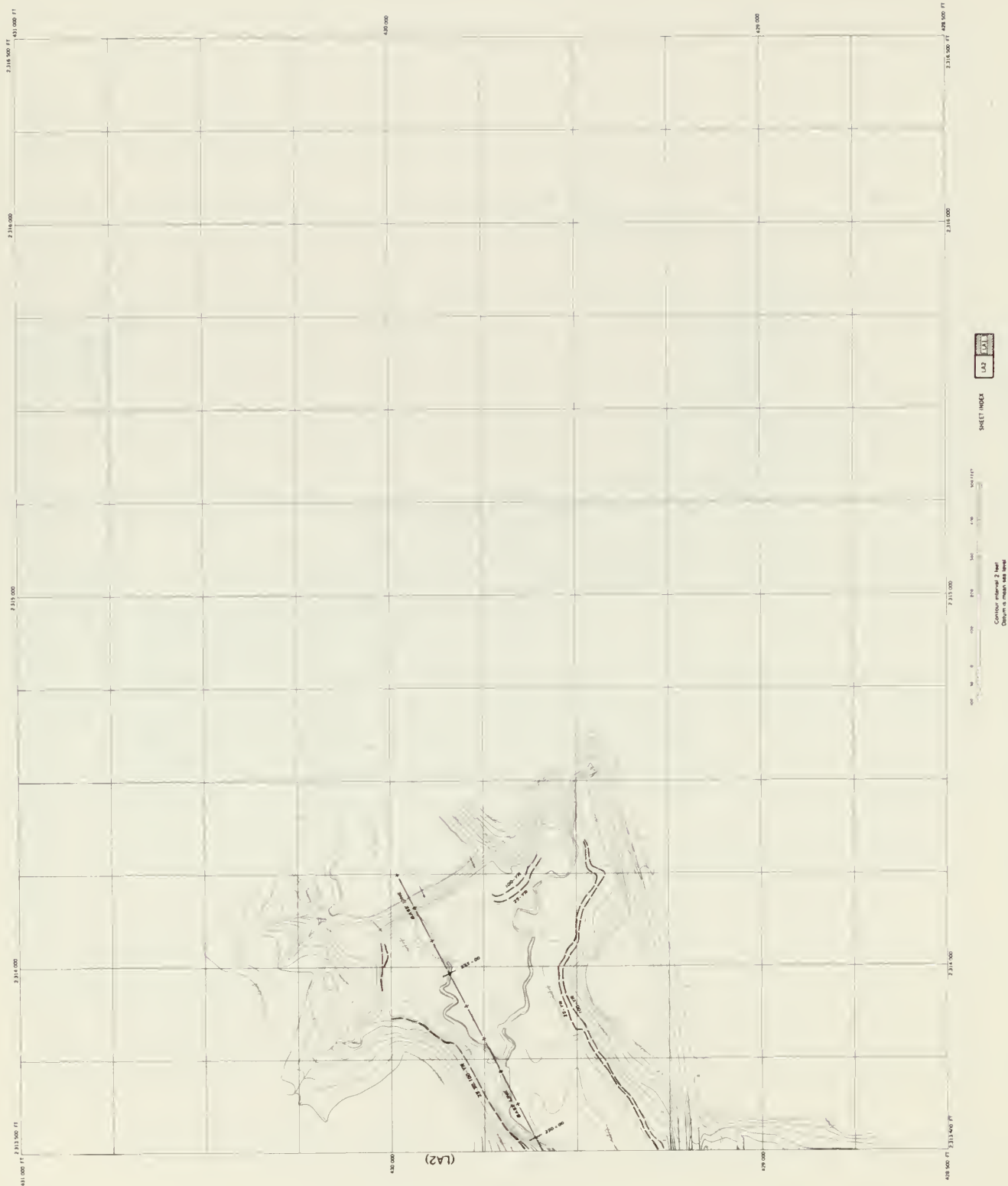


Figure 63. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-1



Figure 64. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-2

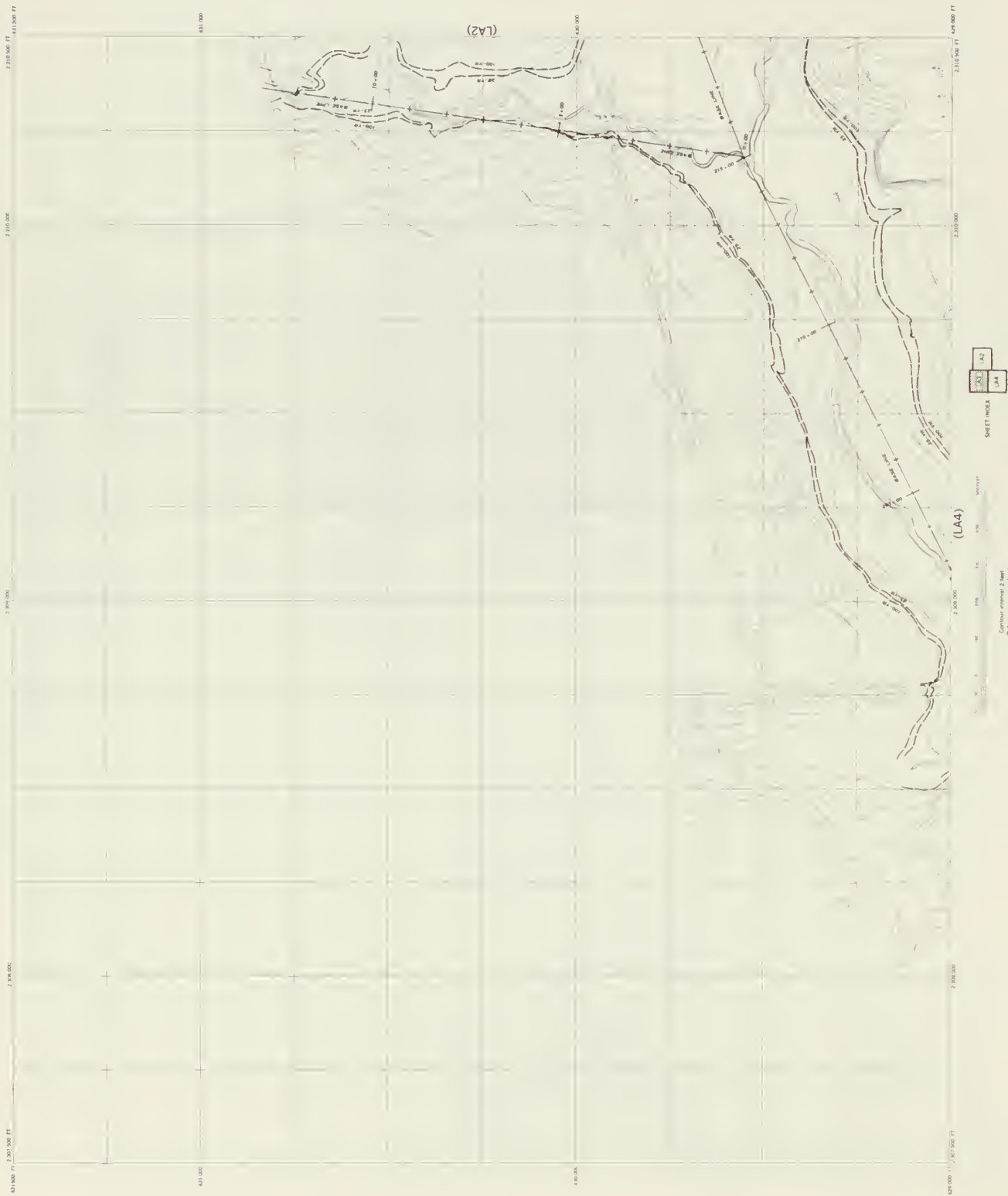


Figure 65. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-3

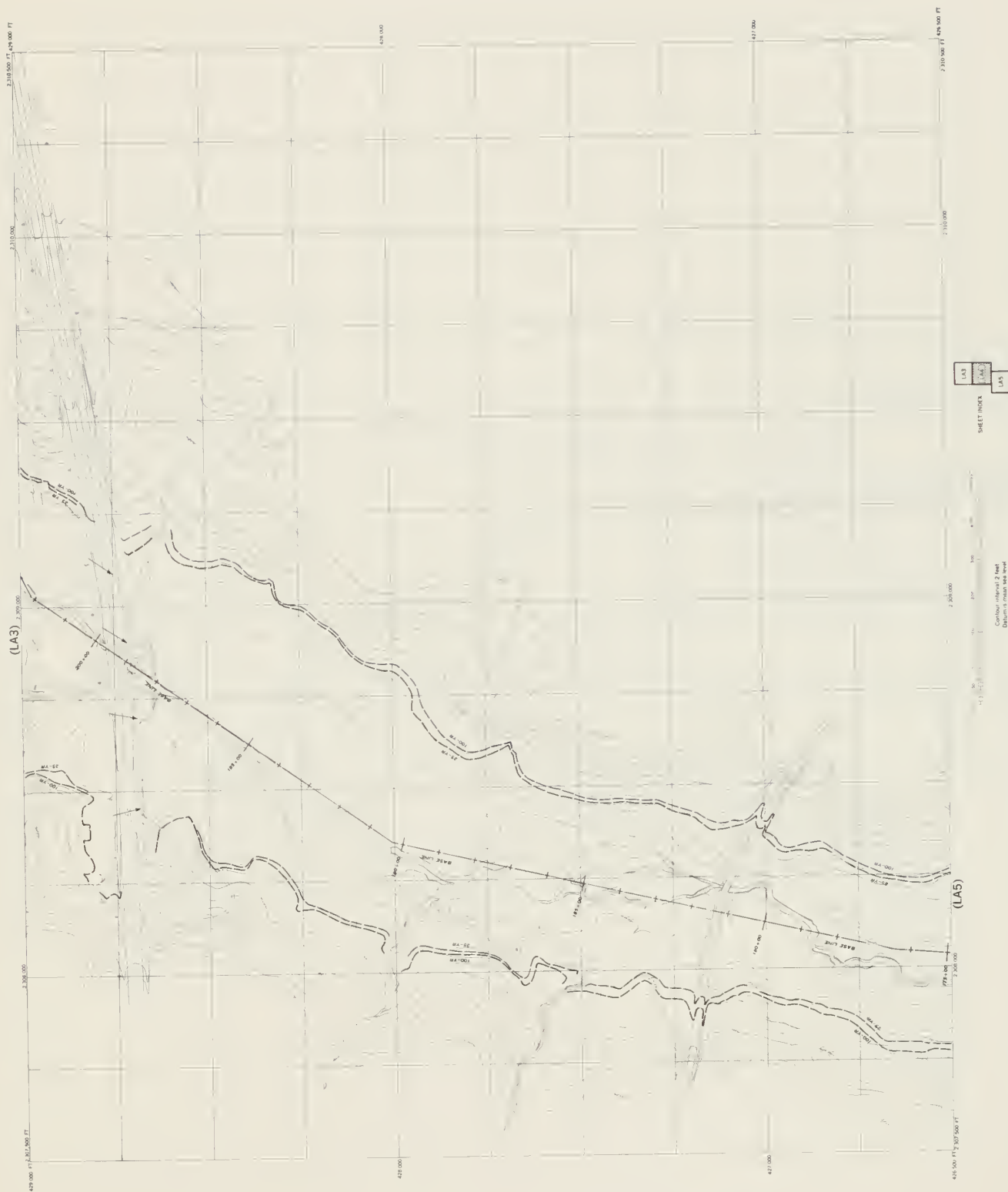


Figure 66. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-4

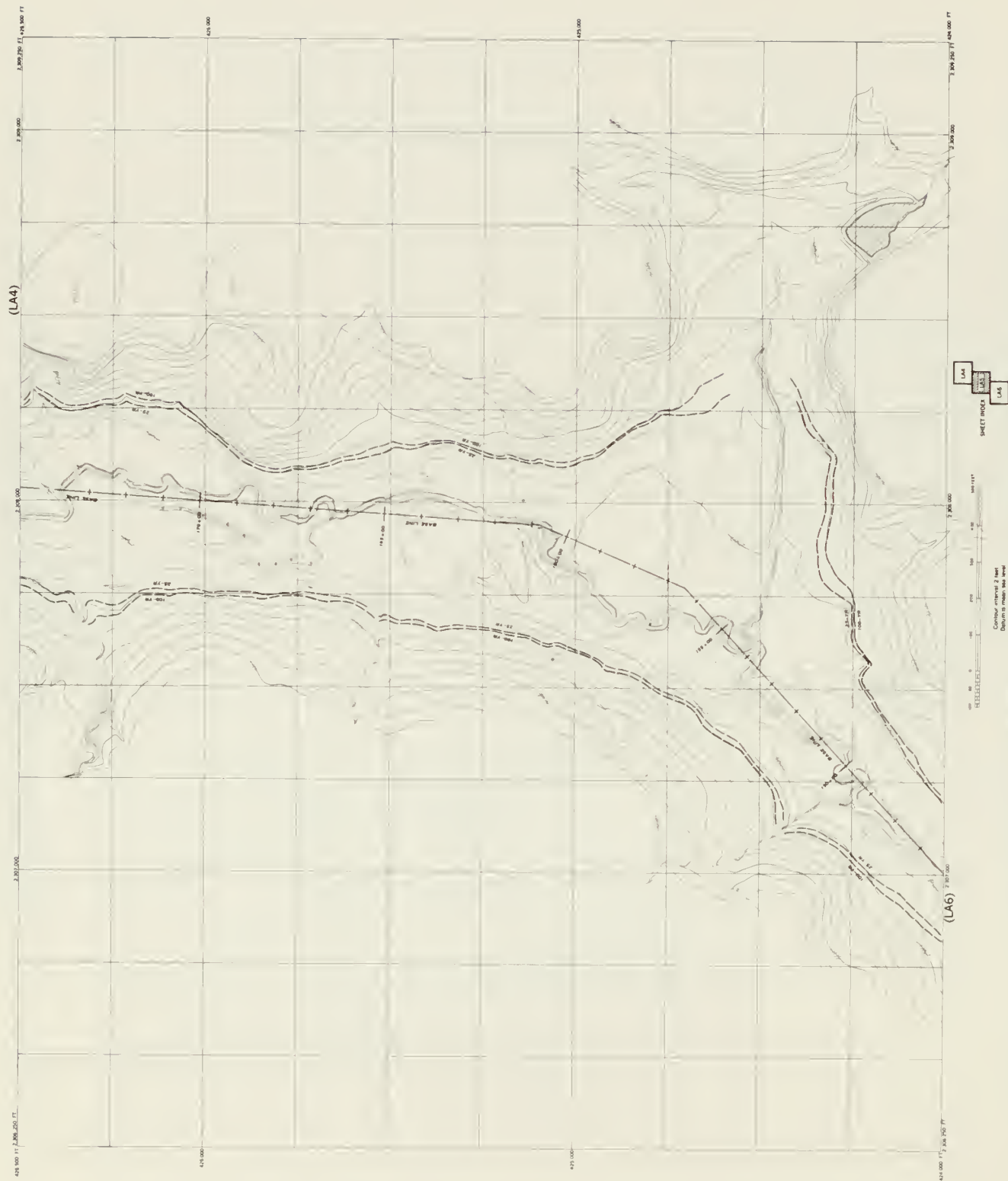


Figure 67. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-5

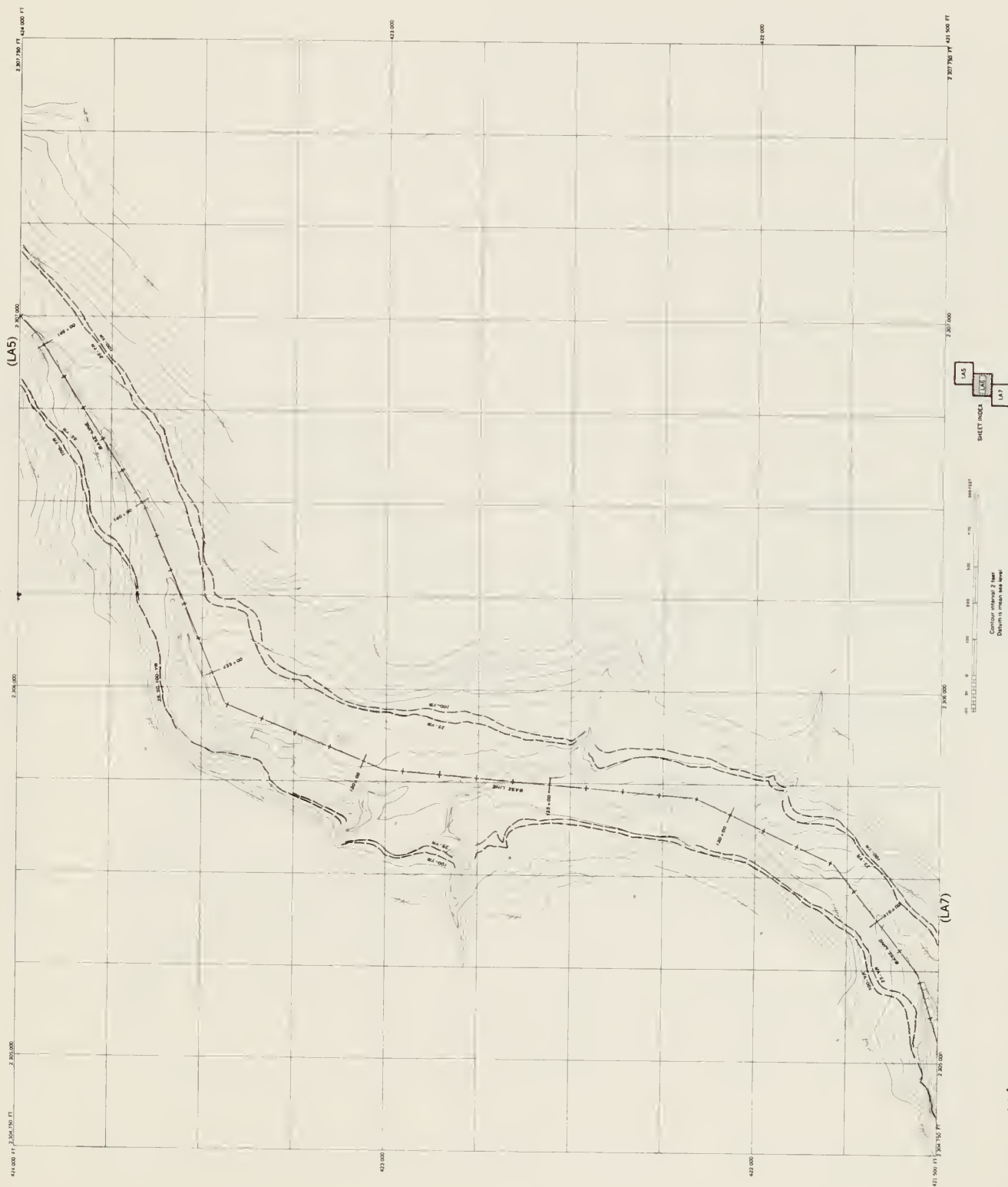


Figure 68. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-6

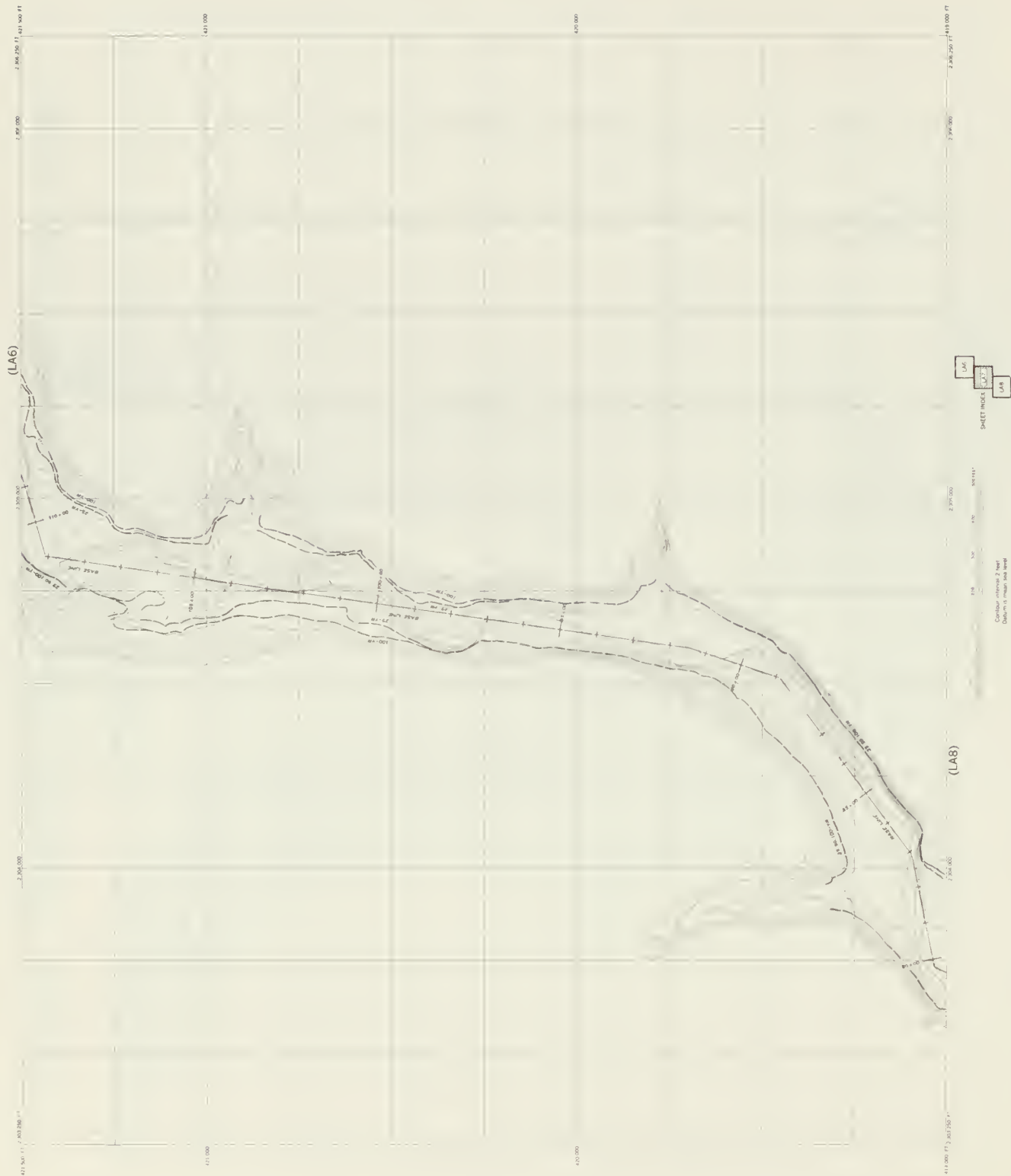


Figure 69. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-7



Figure 70. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-8

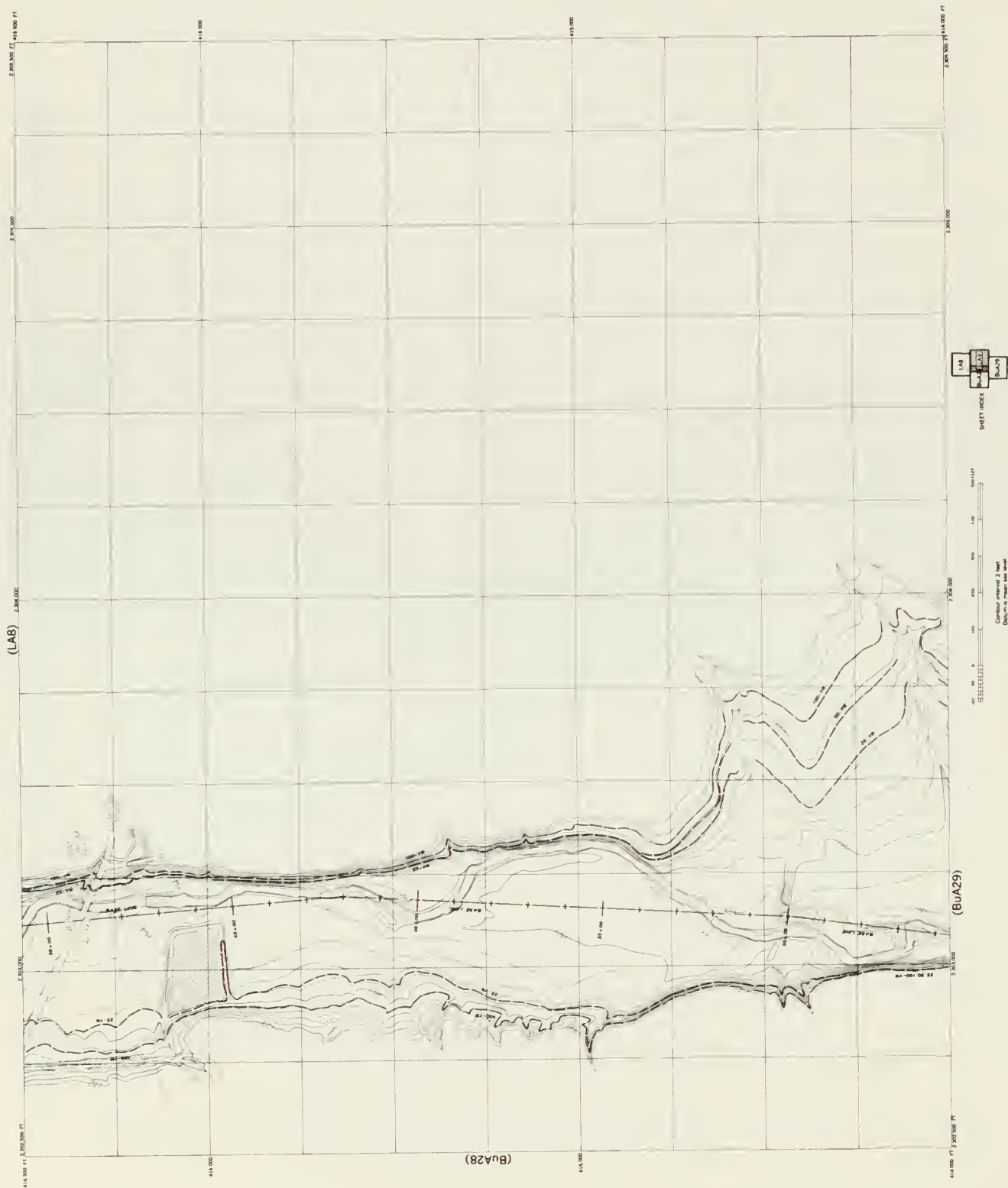


Figure 71. Topographic maps of stream valleys showing flood boundary delineation, Little Rocky Run; LA-9

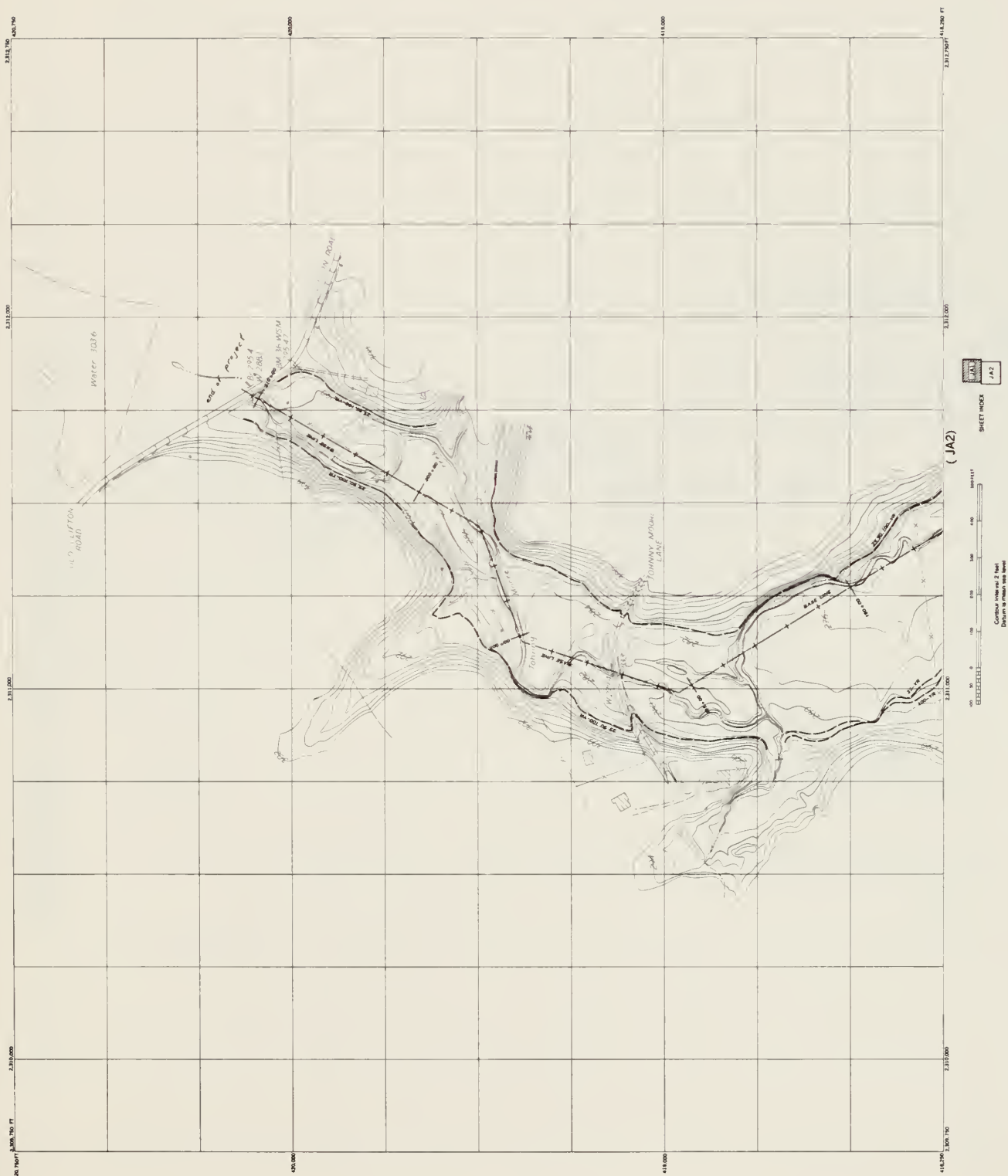


Figure 72. Topographic maps of stream valleys showing flood boundary delineation, Johnny Moore Creek; JA-1

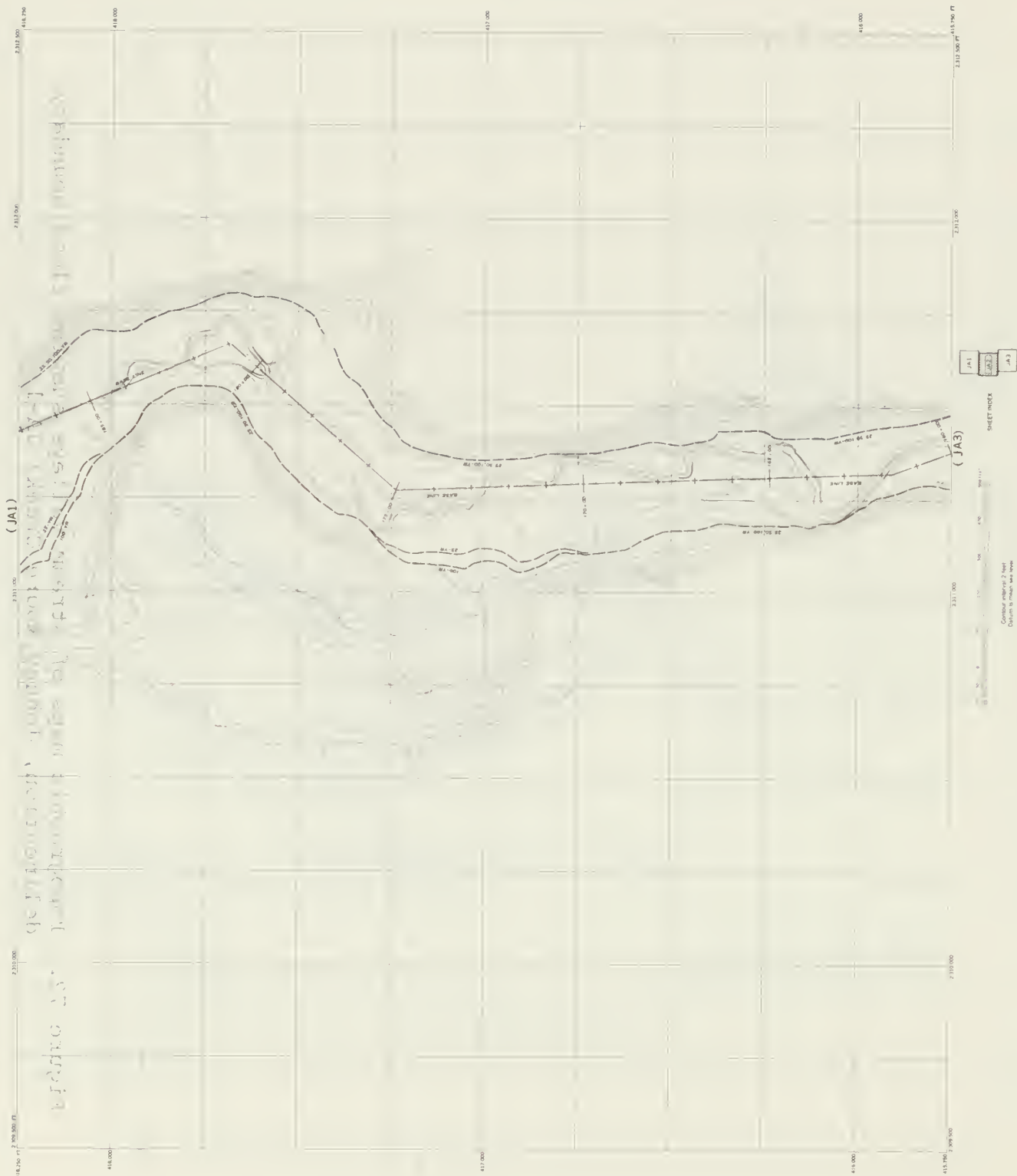


Figure 73. Topographic maps of stream valleys showing flood boundary delineation, Johnny Moore Creek; JA-2



Figure 75. Topographic maps of stream valleys showing flood boundary delineation, Johnny Moore Creek; JA-4



Figure 76. Topographic maps of stream valleys showing flood boundary delineation, Johnny Moore Creek; JA-5

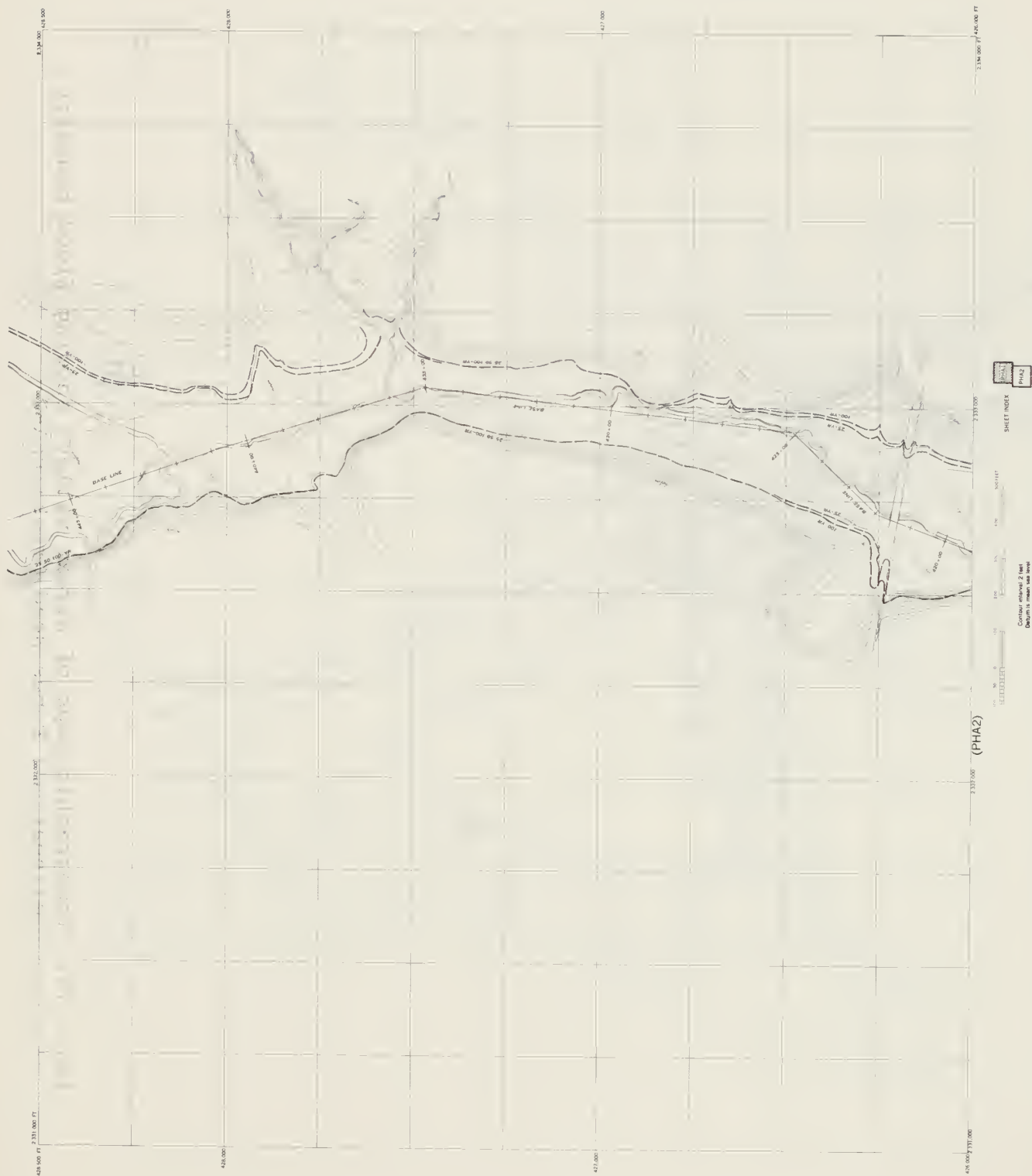


Figure 78. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-1

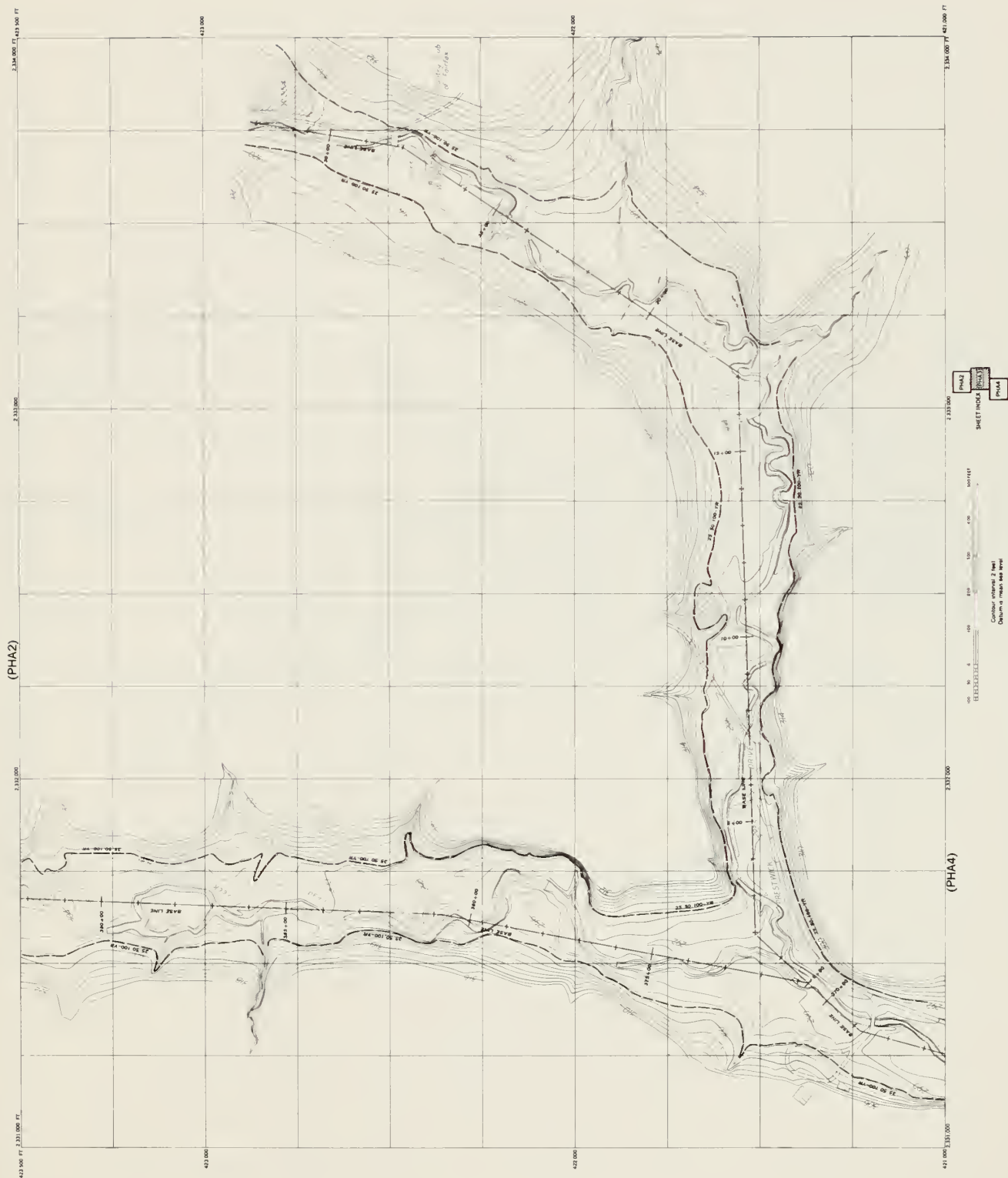


Figure 80. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-3

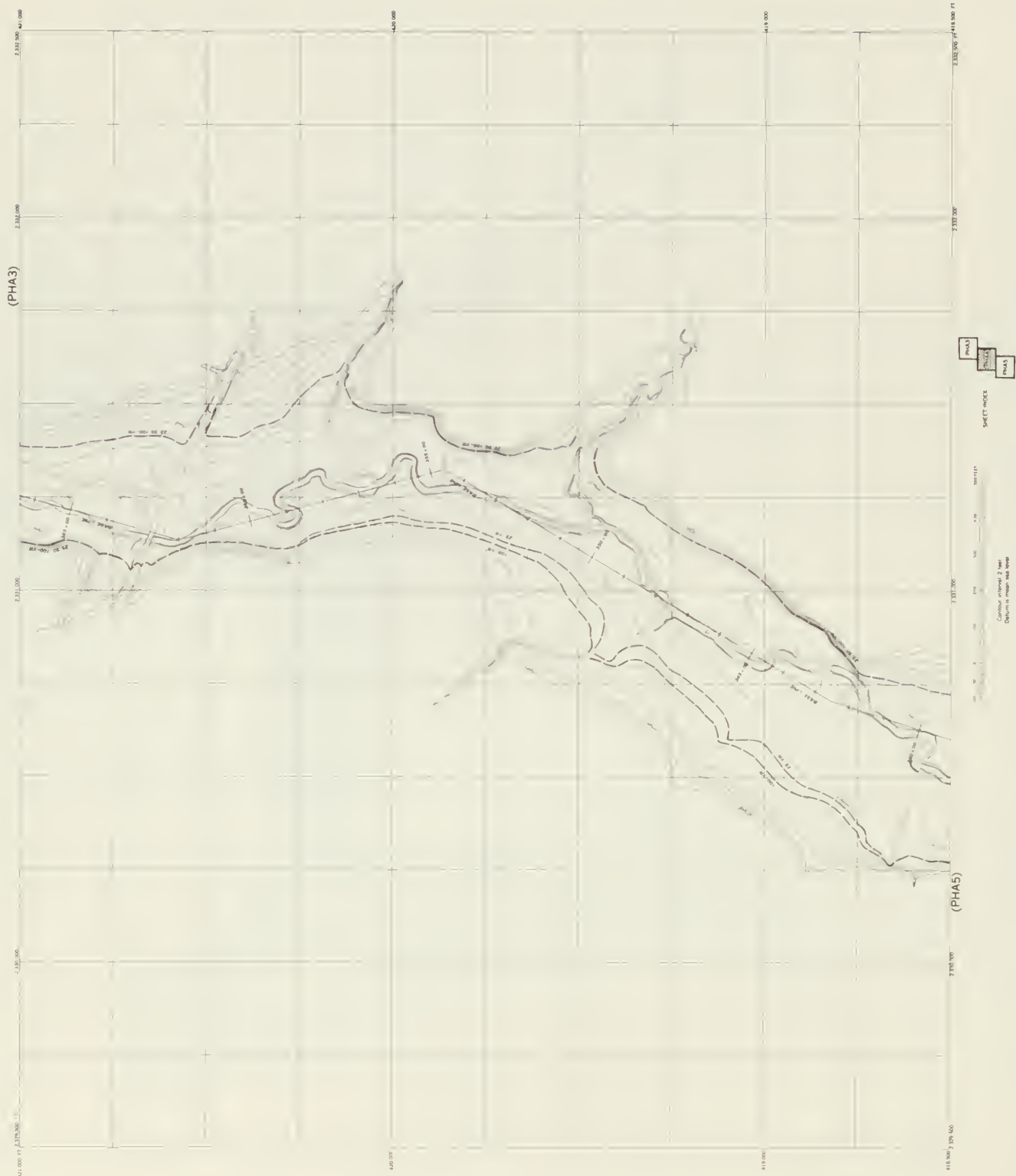


Figure 81. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-4



Figure 82. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-5

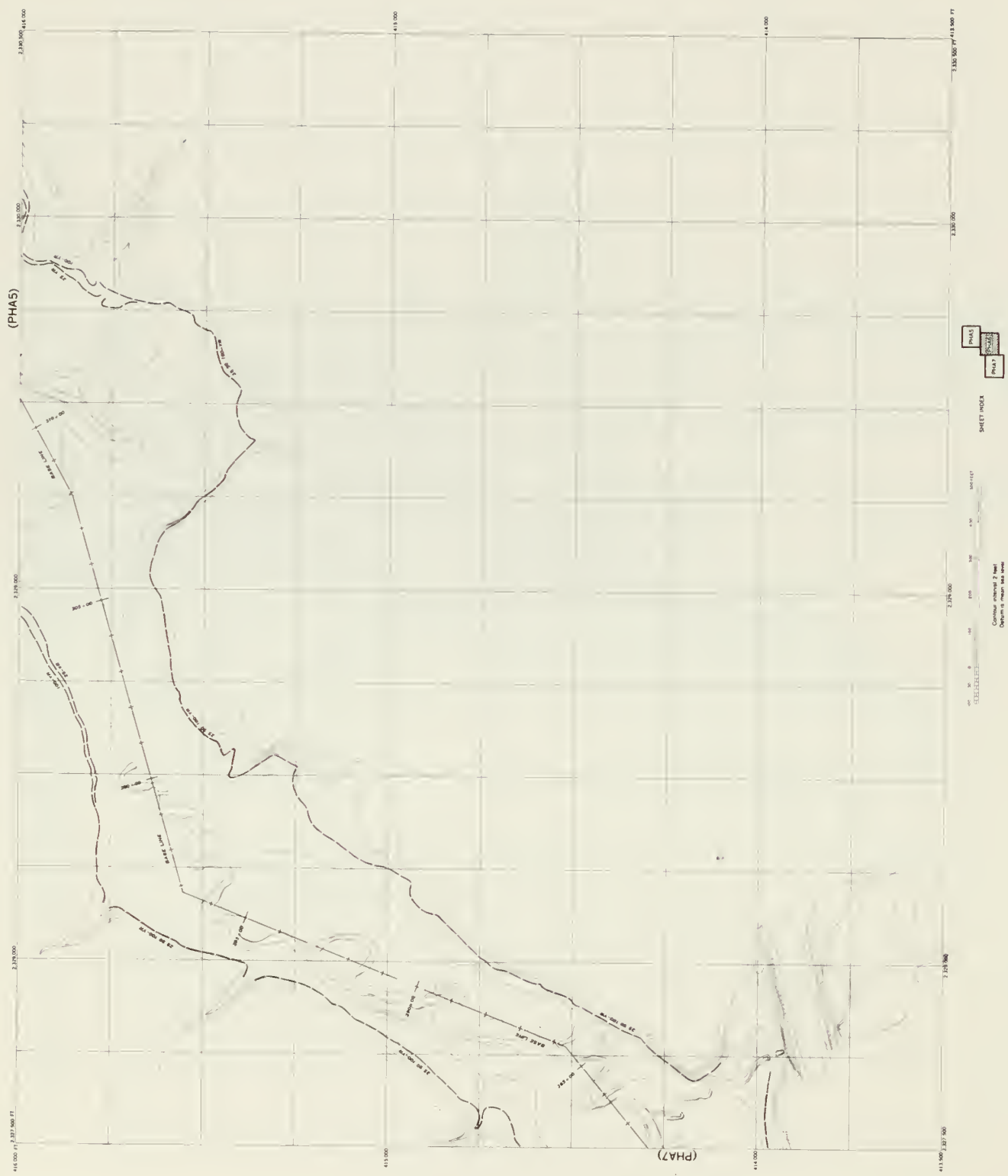


Figure 83. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PHA-6

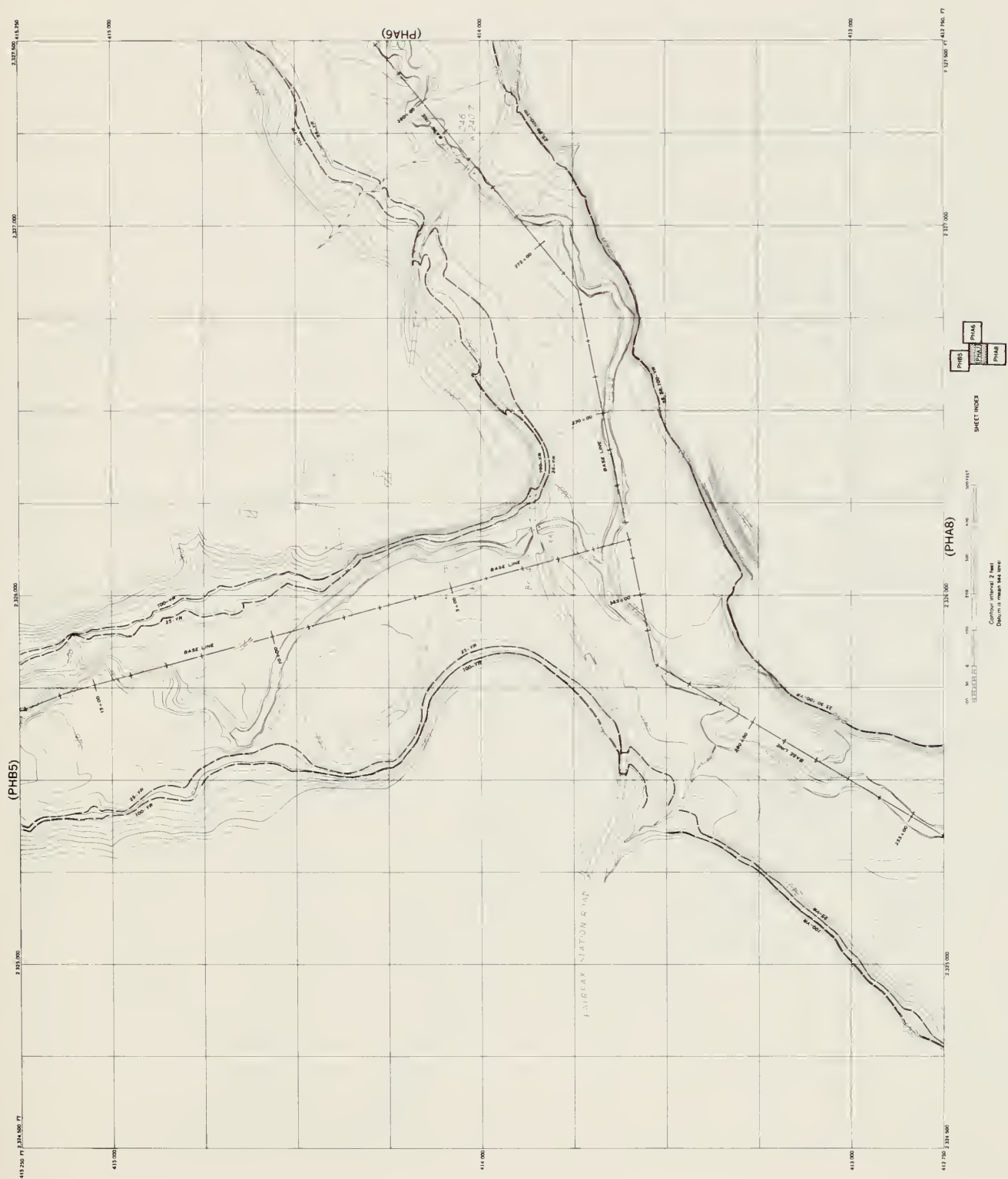


Figure 84. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PHA-7

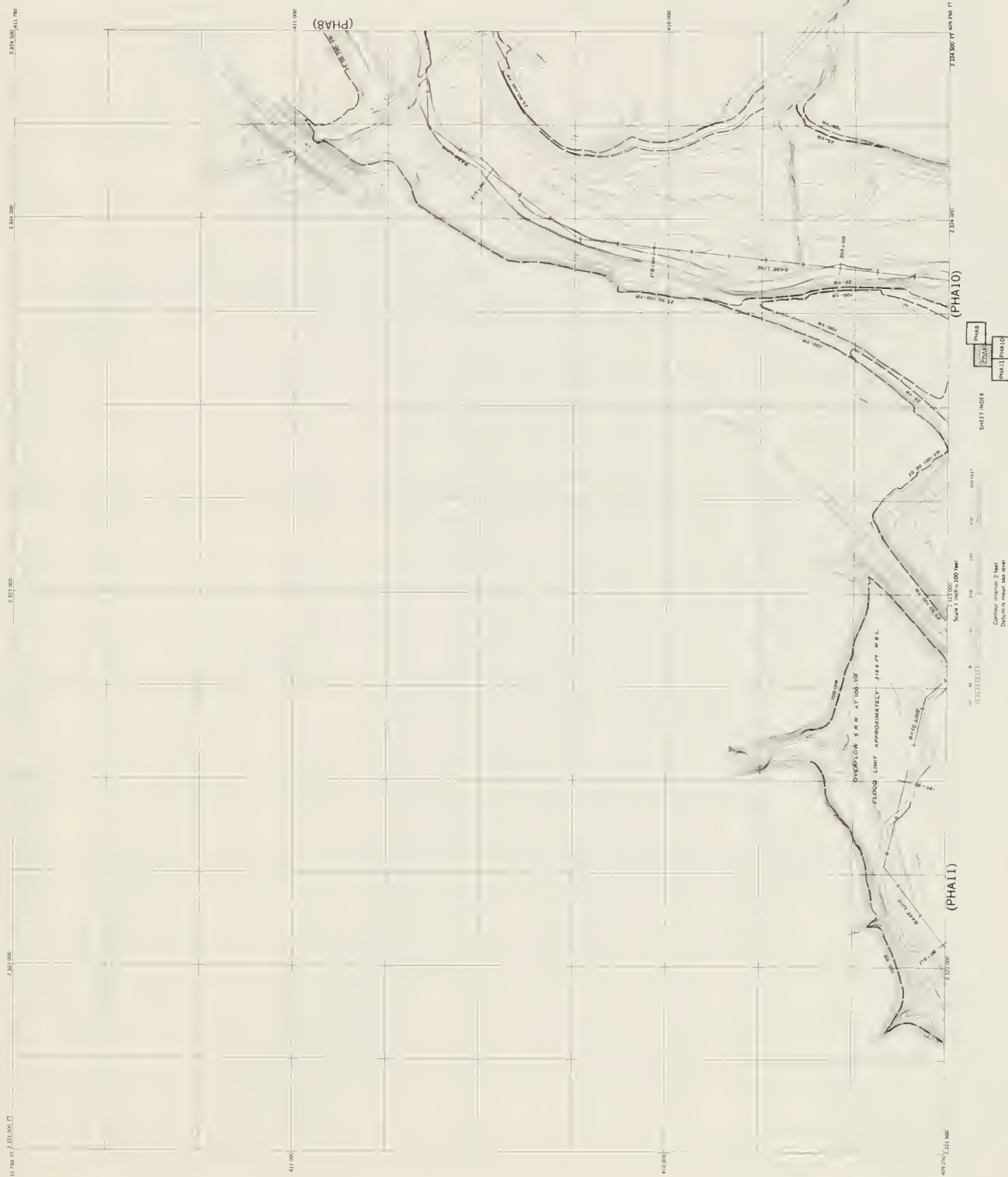


Figure 86. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-9

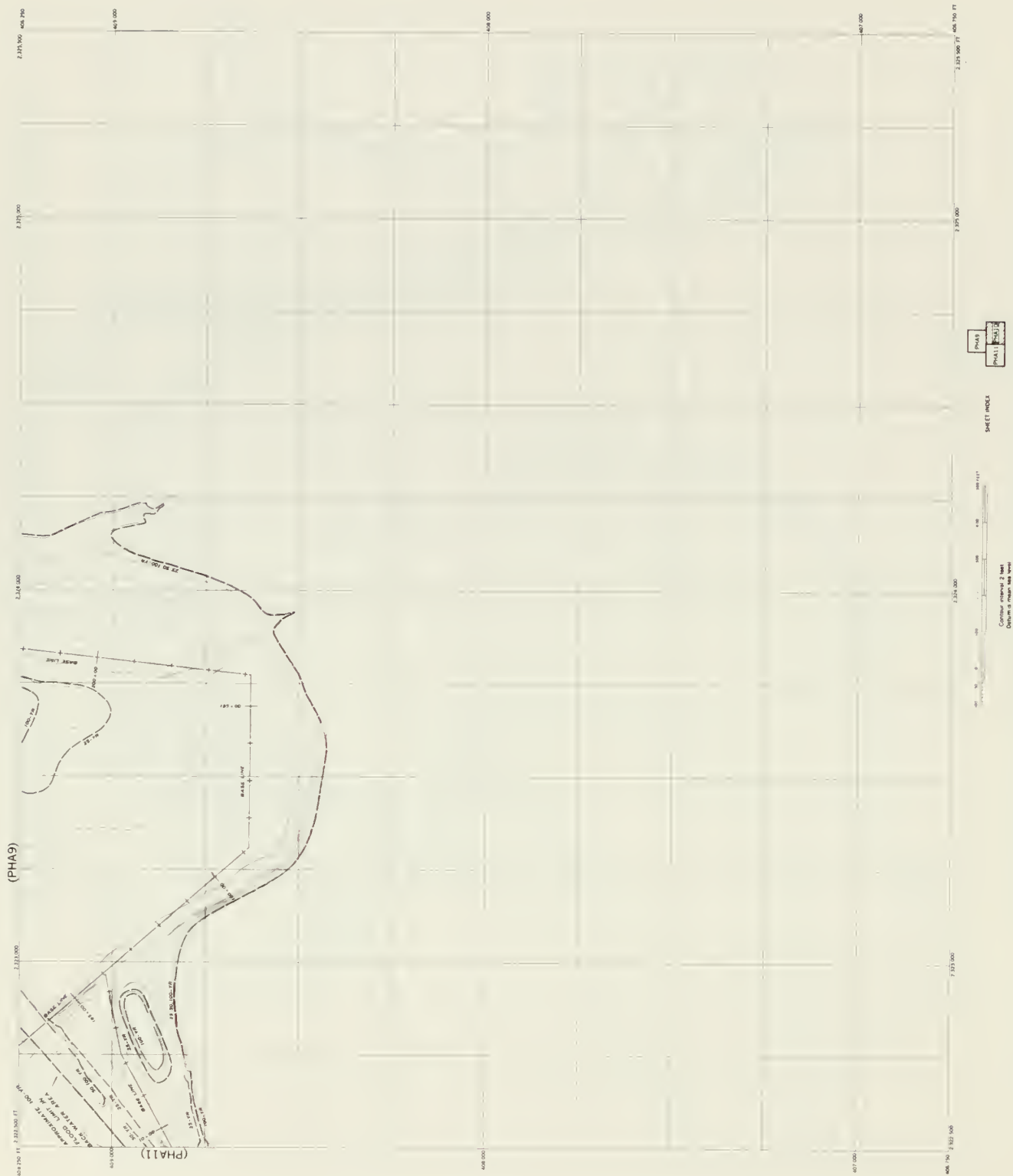


Figure 87. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-10

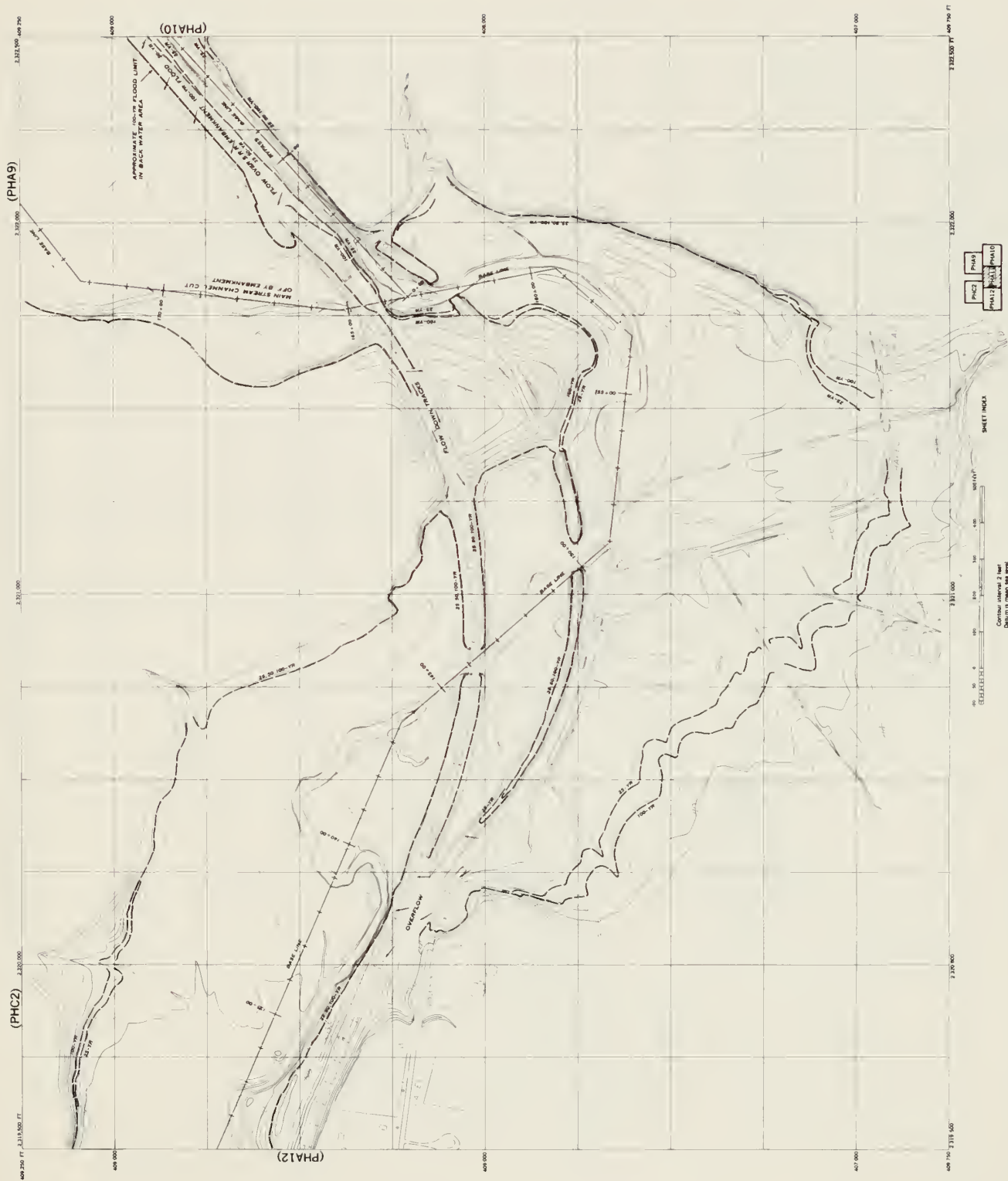


Figure 88. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-11



Figure 89. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-12



Figure 90. Topographic maps of stream valleys showing flood boundary delineation, Popes Head Creek; PhA-13



Figure 93. Topographic maps of stream valleys showing flood boundary delineation, Piney Branch; PhB-2



Figure 94. Topographic maps of stream valleys showing flood boundary delineation, Piney Branch; PhB-3

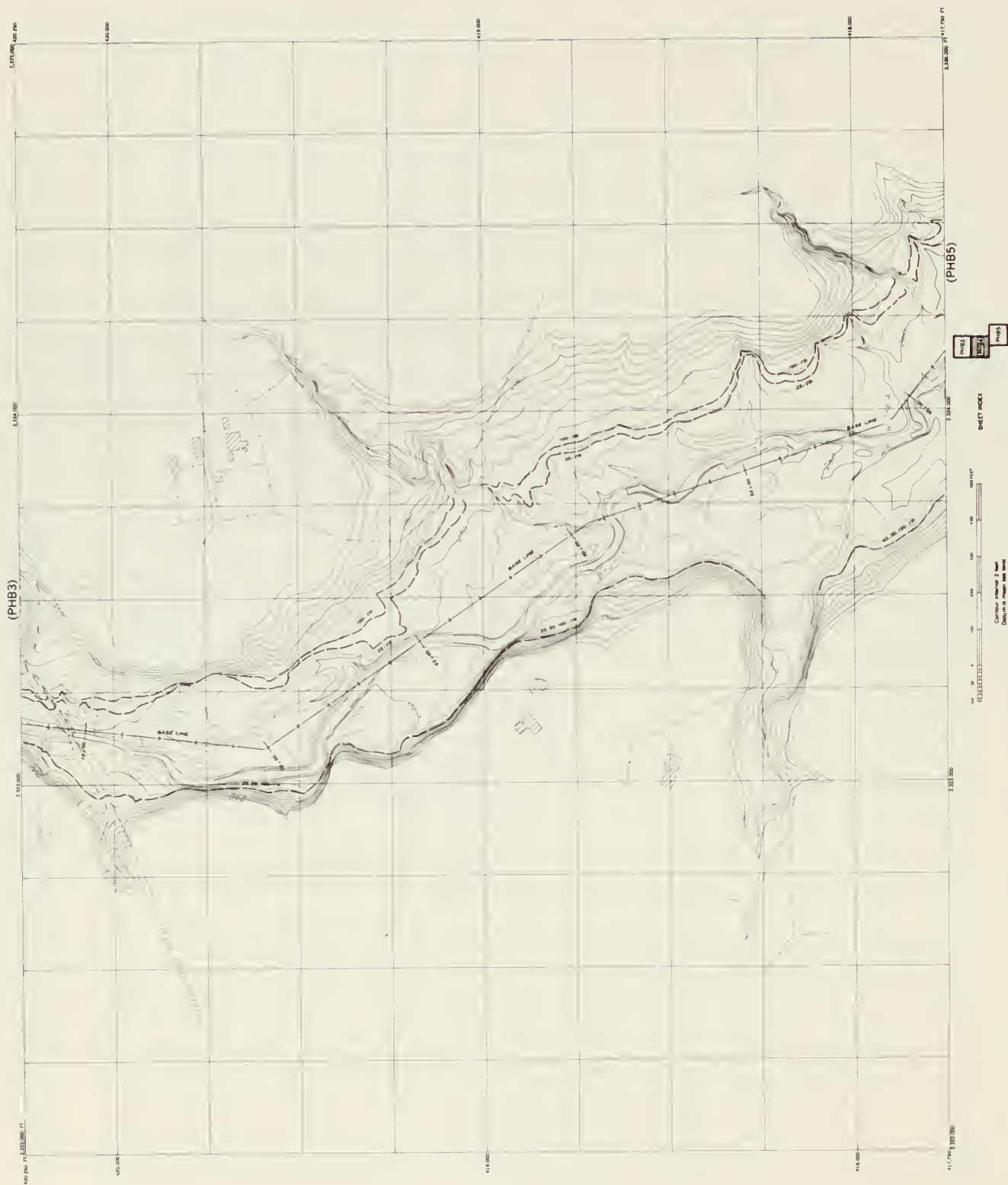


Figure 95. Topographic maps of stream valleys showing flood boundary delineation, Piney Branch; PhB-4

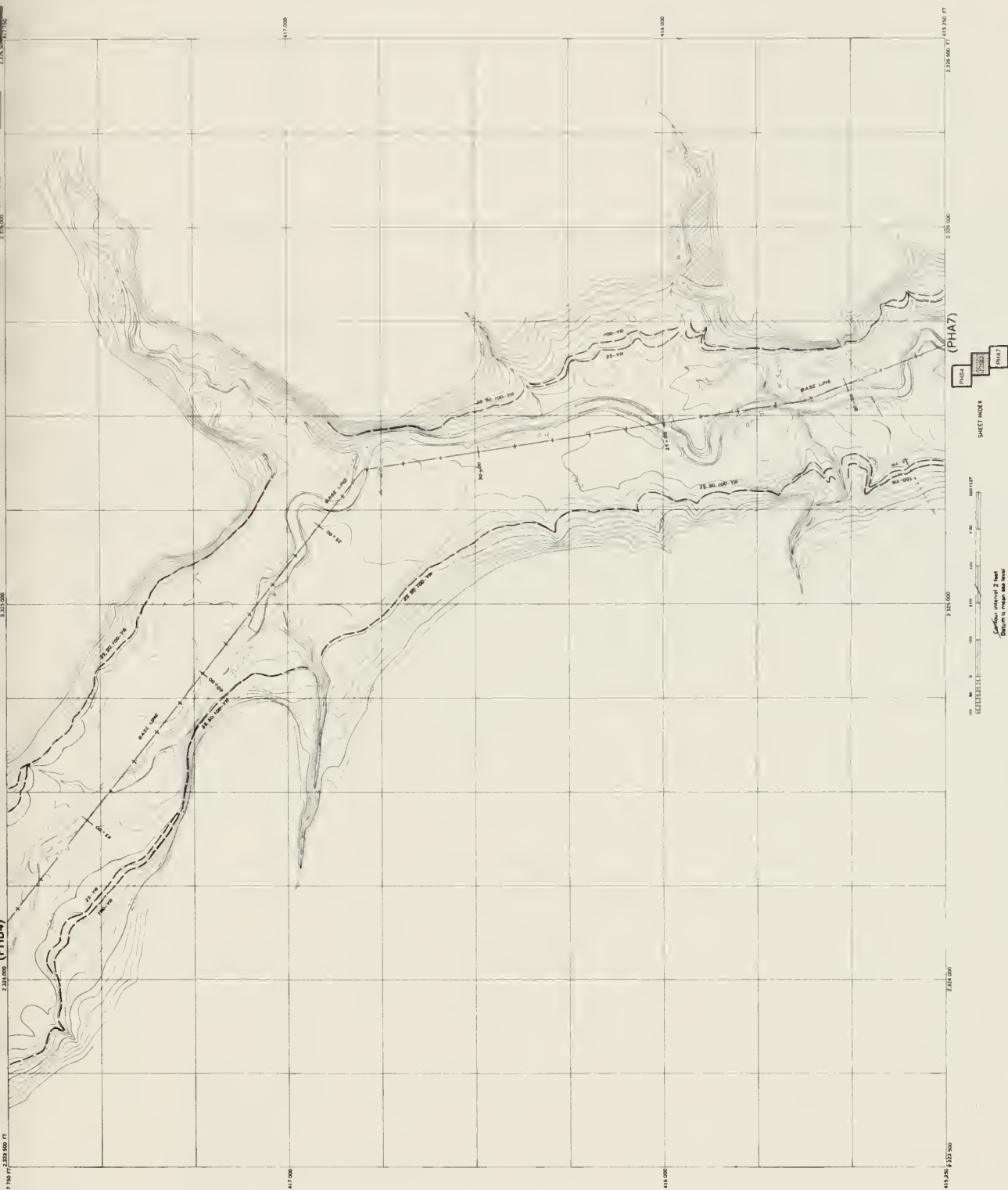


Figure 96. Topographic maps of stream valleys showing flood boundary delineation, Piney Branch; PhB-5

Figure 97. Topographic maps of stream valleys showing flood boundary delineation, Castle Creek; PhC-1

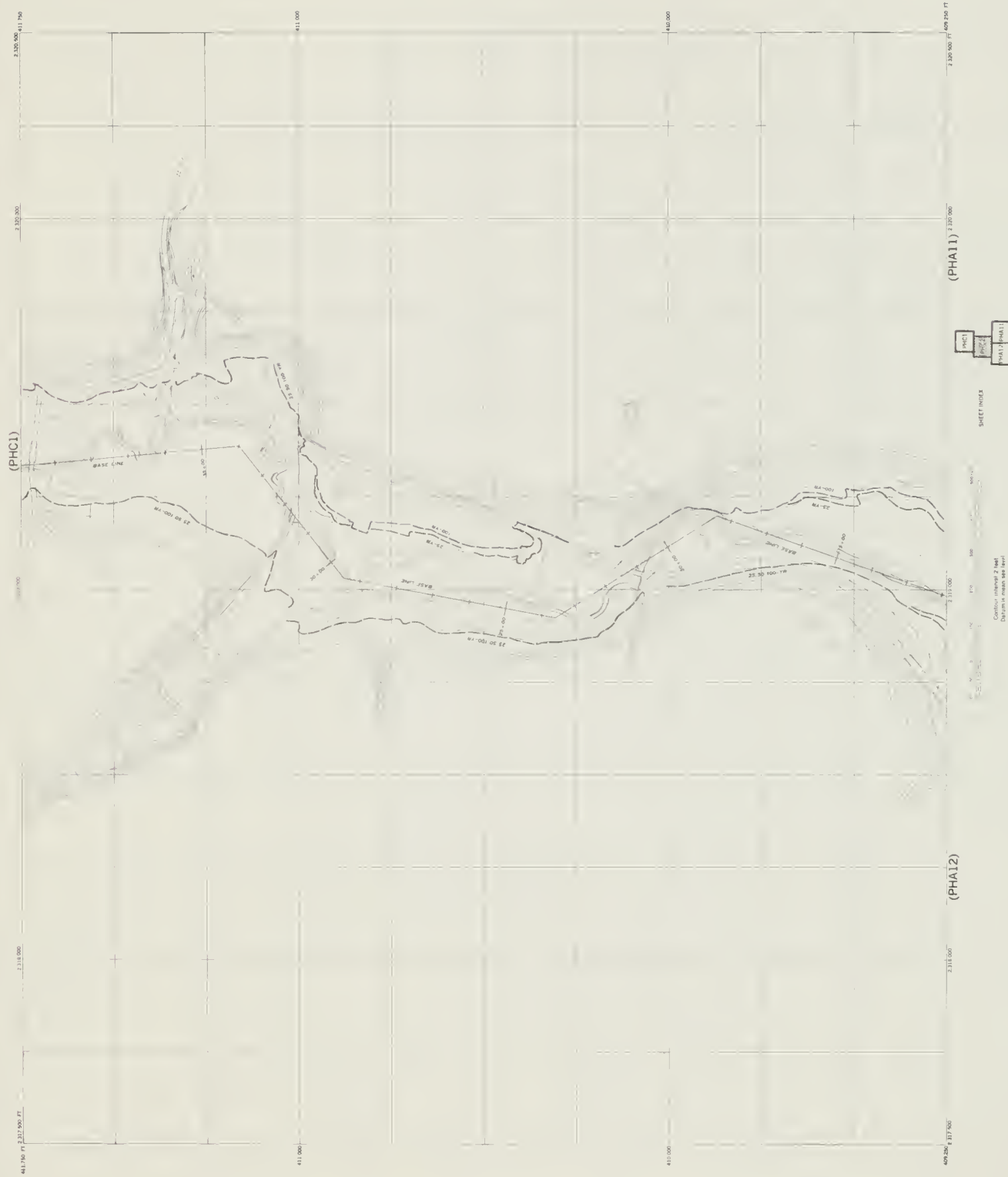


Figure 98. Topographic maps of stream valleys showing flood boundary delineation, Castle Creek; PhC-2

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- Anderson, D.G., 1970, Effects of urban development on floods in Northern Virginia: U.S. Geol. Survey Water-Supply Paper 2001-C, 22p.
- Bodhaine, G.L., 1968, Measurement of peak discharge at culverts by indirect methods: U.S. Geol. Survey Techniques of Water-Resources Inv., book 3, chap. A3, 60p.
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- Matthai, H.F., 1967, Measurement of peak discharge at width contractions by indirect methods: U.S. Geol. Survey Techniques of Water-Resources Inv., book 3, chap. A4, 44p.

