



**TETRA TECH**

# **Addendum to the Master Drainage Plan**

*for*

***Hopkinsville Surface and Stormwater Utility***





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*for*

***Hopkinsville Surface and Stormwater Utility  
101 North Main Street  
Hopkinsville, Kentucky 42240***

*May 23, 2007*



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## **1.0 INTRODUCTION**

The Hopkinsville Surface and Stormwater Utility selected Tetra Tech in May 2006 to develop a Master Drainage Plan that would address drainage and flooding problems in the City of Hopkinsville. Tetra Tech prepared the plan and submitted it to the utility board in a report dated January 22, 2007. The report consisted of three parts: (1) identification of surface drainage projects to improve the existing drainage system of pipes, culverts, and channels throughout the city, (2) flood mitigation measures for the South Fork of the Little River, and (3) flood mitigation measures for the North Fork of the Little River.

This addendum was prepared to:

- Provide information to better explain the operation of the North Fork watershed lakes
- Address the impact of the Eagle Way bridges on flood levels on the North Fork and South Fork of the Little River
- Address the impact of the Pennyrile Parkway extension on flood levels on the South Fork of the Little River
- Address the impact of cleaning the river on flood levels

## **2.0 NORTH FORK WATERSHED LAKES**

The Master Drainage Plan indicated that the North Fork watershed lakes currently provide significant flood control for the North Fork. In addition, the report showed that even if the water supply volume of the lakes were used for additional flood control (by lowering the water level), the additional flood reduction in the city would only be 0.5 to 1.0 foot. Figure 1 through Figure 5 of this addendum provides information that helps to explain these results.

Figure 1 shows the current water supply volume and flood control volume for each lake. For comparison purposes, it also shows the runoff volume of 4.1 inches for each watershed. This number was used because it is the 100-year 3-hour design storm for the city. Figure 1 shows that each watershed lake currently provides significant flood control. As shown in Table 1 below, Lake Tandy has a storage capacity of 88% of the runoff volume, while Lake Morris has a storage

capacity of 184%, Lake Boxley has a storage capacity of 87%, and Lake Blythe has a storage capacity of 78%.

**TABLE 1 - NORTH FORK WATERSHED LAKES  
EXISTING FLOOD STORAGE**

Lake	Existing Flood Storage (million gallons) A	Runoff Volume of 4.1 inches (million gallons) B	Storage Capacity as a Percent of Runoff Volume (A/B)
Tandy	380	434	88
Morris	980	534	184
Boxley	600	690	87
Blythe	190	245	78

Figure 2 through Figure 5 shows the 100-year inflow and outflow hydrograph for each watershed lake. As shown in Table 2 below, Lake Tandy reduces the peak flow by 75%, while Lake Morris reduces it by 92%, Lake Boxley by 79%, and Lake Blythe by 73%.

**TABLE 2 - NORTH FORK WATERSHED LAKES  
100-YEAR PEAK FLOW REDUCTION**

Lake	Peak Inflow (cfs)	Peak Outflow (cfs)	Percent Reduction
Tandy	1462	360	75
Morris	2429	193	92
Boxley	1466	308	79
Blythe	1246	342	73

### 3.0 EAGLE WAY BRIDGES

Figure 6 through Figure 12 shows the flood profiles provided by AMEC as part of their work in Hopkinsville related to updating the floodplain maps. Figure 6 shows the South Fork at Eagle Way and a small (less than one foot) difference in the 100-year water level between the upstream and downstream side of the bridge. Figure 10 shows the North Fork at Eagle Way and no

difference in the 100-year water level between the upstream and downstream side of the bridge. This indicates that the bridge structures are not creating a significant obstruction to flow.

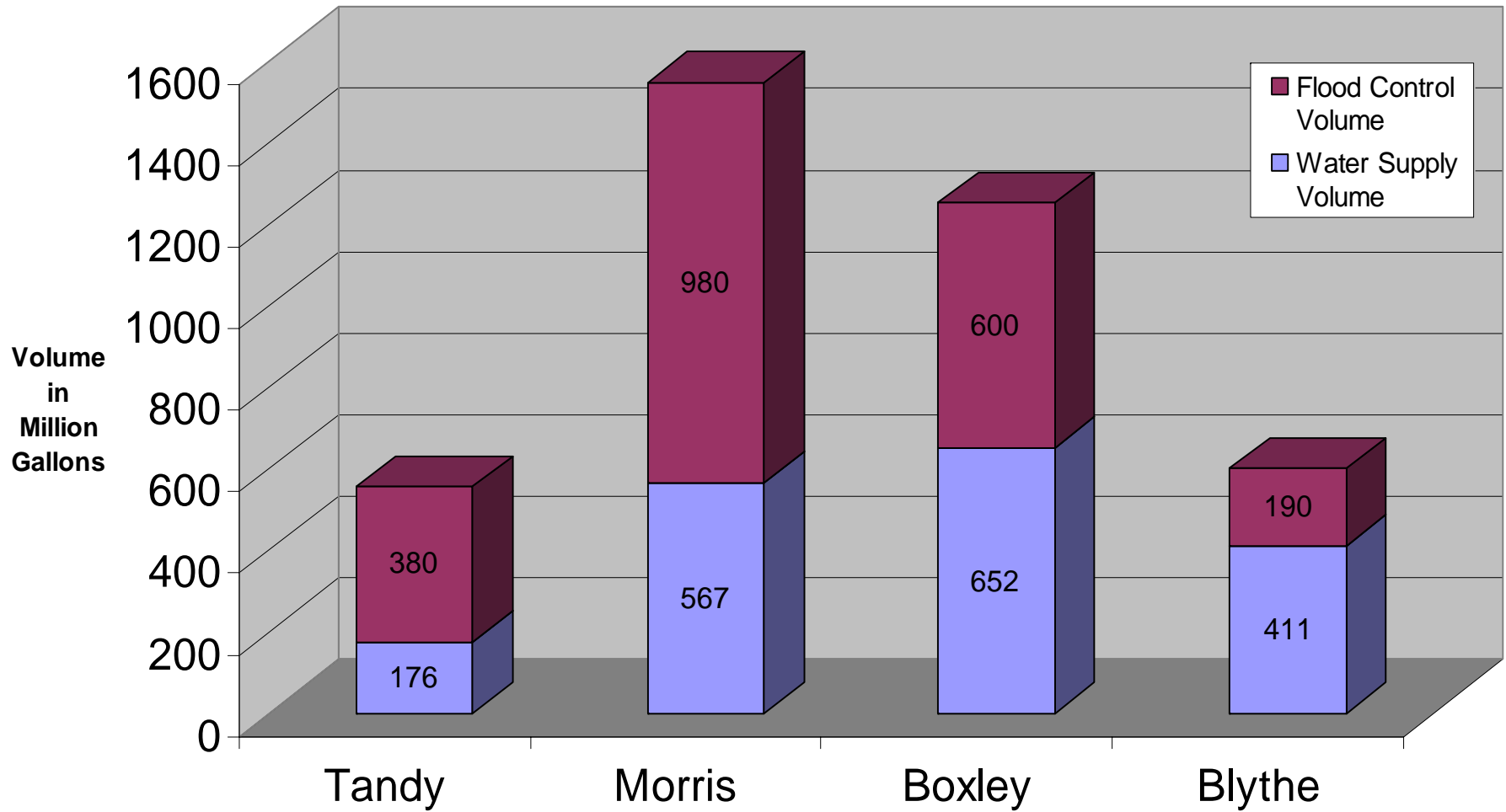
#### **4.0 PENNYRILE PARKWAY EXTENSION**

Figures 13 and 14 show the extension of the Pennyrile Parkway. The parkway crosses the 100-year floodplain of a tributary to the South Fork at Eagle Way. However, it appears the parkway will not cause an obstruction to water flowing in the South Fork itself based on the location of the parkway relative to the location of the floodway and the flow path of the water.

#### **5.0 CLEANING THE RIVER**

Routine cleaning of the river of logjams and other debris is necessary to maintain the capacity of the open channel and to prevent clogging of culverts and bridges, thus preventing even higher flood levels. Removal of vegetation and trees along the stream banks would not significantly reduce flood levels and could destabilize the stream banks and cause erosion.

# N. Fork Watershed Lakes



**4.1 inches of runoff equals:**

Lake Tandy, 3900 acres, - 434 million gallons  
Lake Morris, 4800 acres, - 534 million gallons  
Lake Boxley, 6200 acres, - 690 million gallons  
Lake Blythe, 2200 acres, - 245 million gallons

Figure No. 1

# Tandy Reservoir

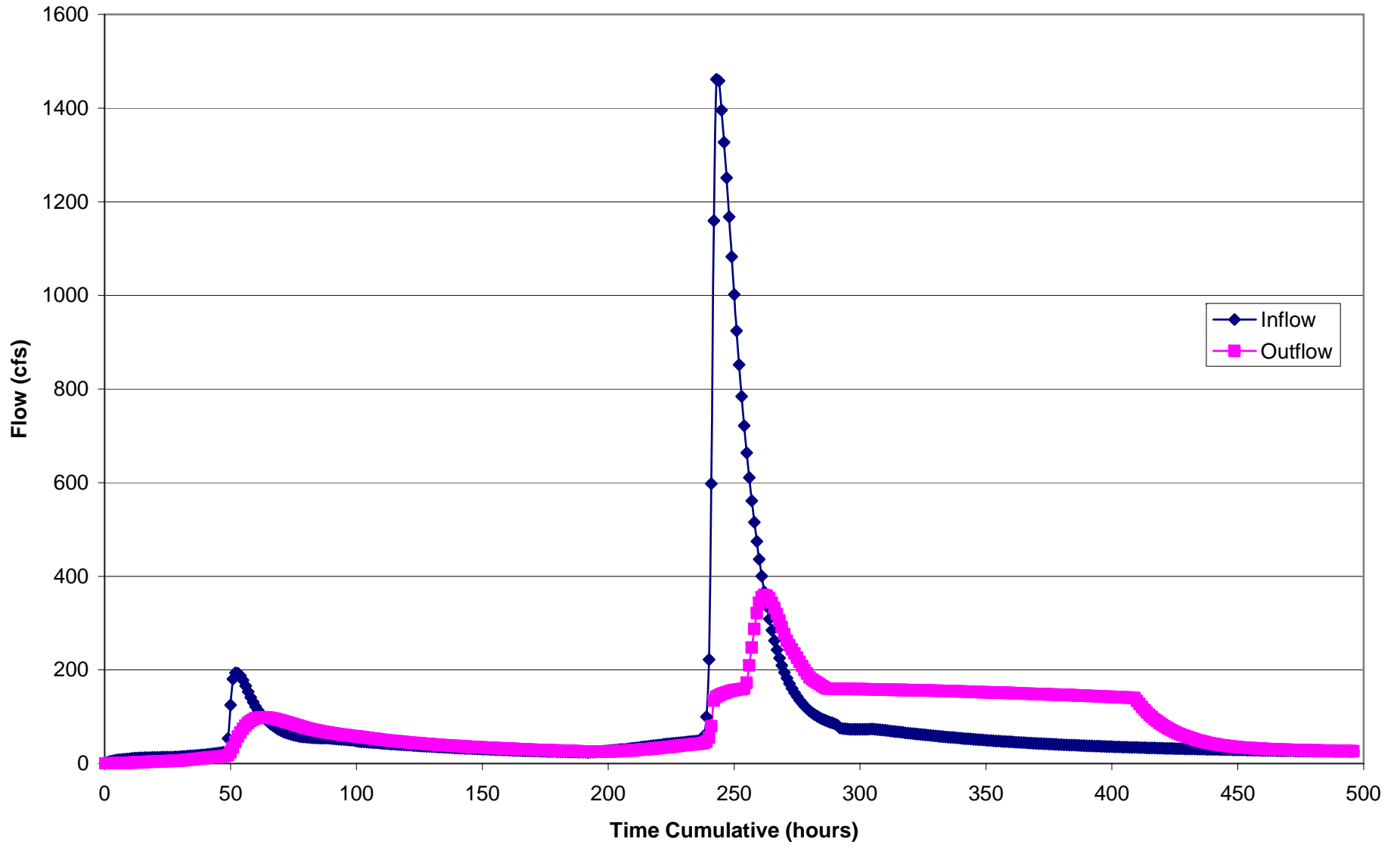


Figure No. 2

# Morris Reservoir

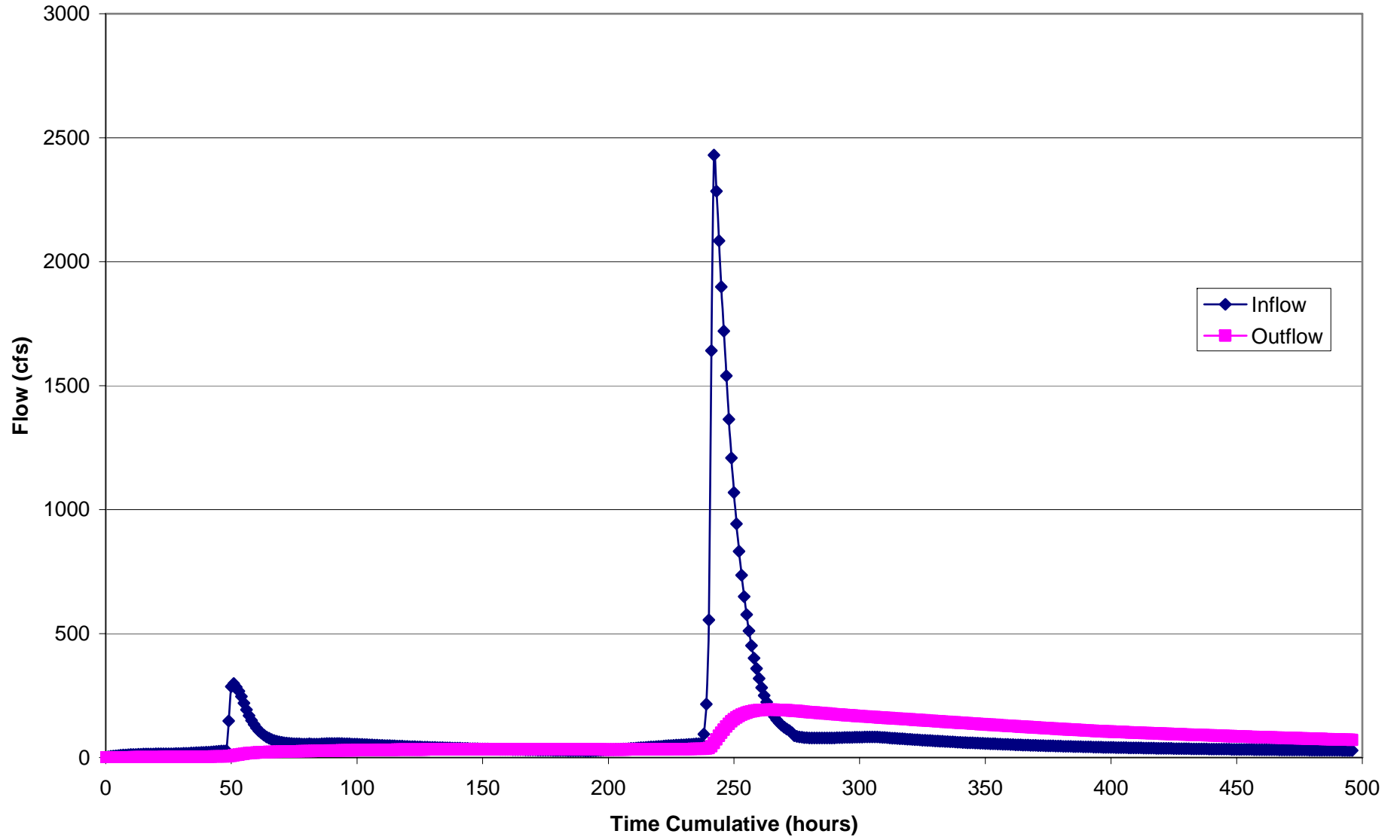


Figure No. 3

# Boxley Reservoir

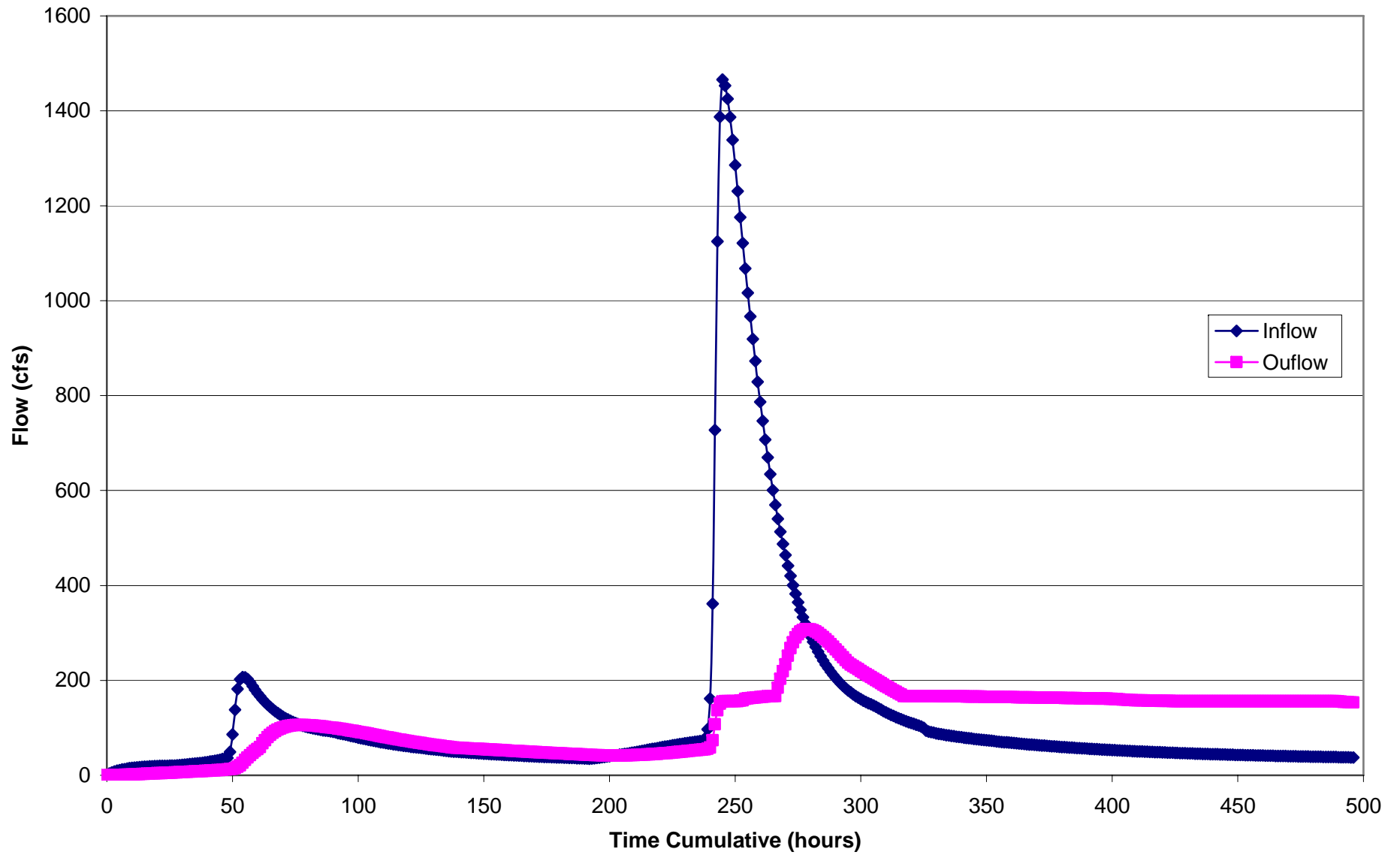


Figure No. 4

# Blythe Reservoir

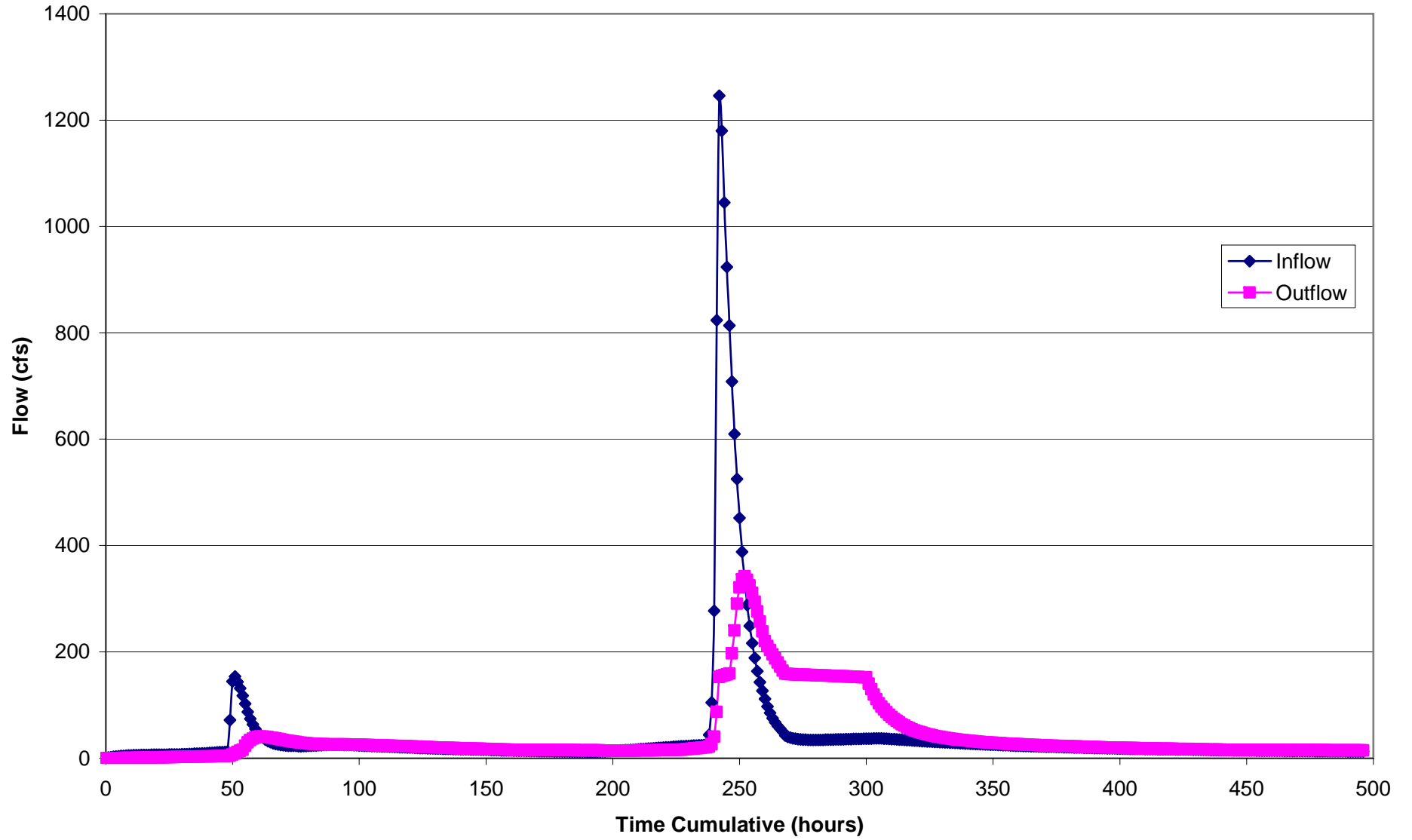
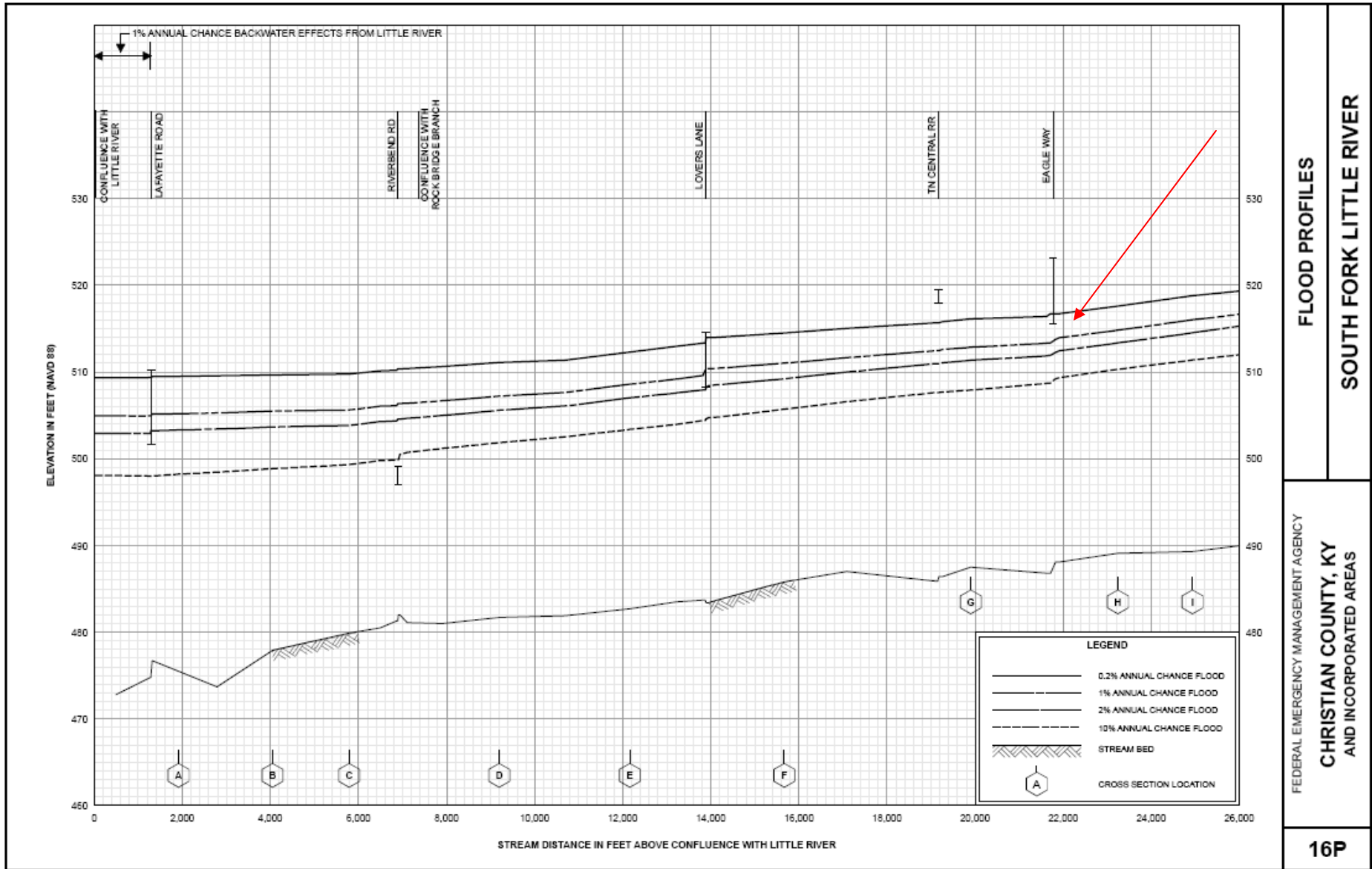


Figure No. 5



**FLOOD PROFILES**  
**SOUTH FORK LITTLE RIVER**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**CHRISTIAN COUNTY, KY**  
AND INCORPORATED AREAS

Figure No. 6

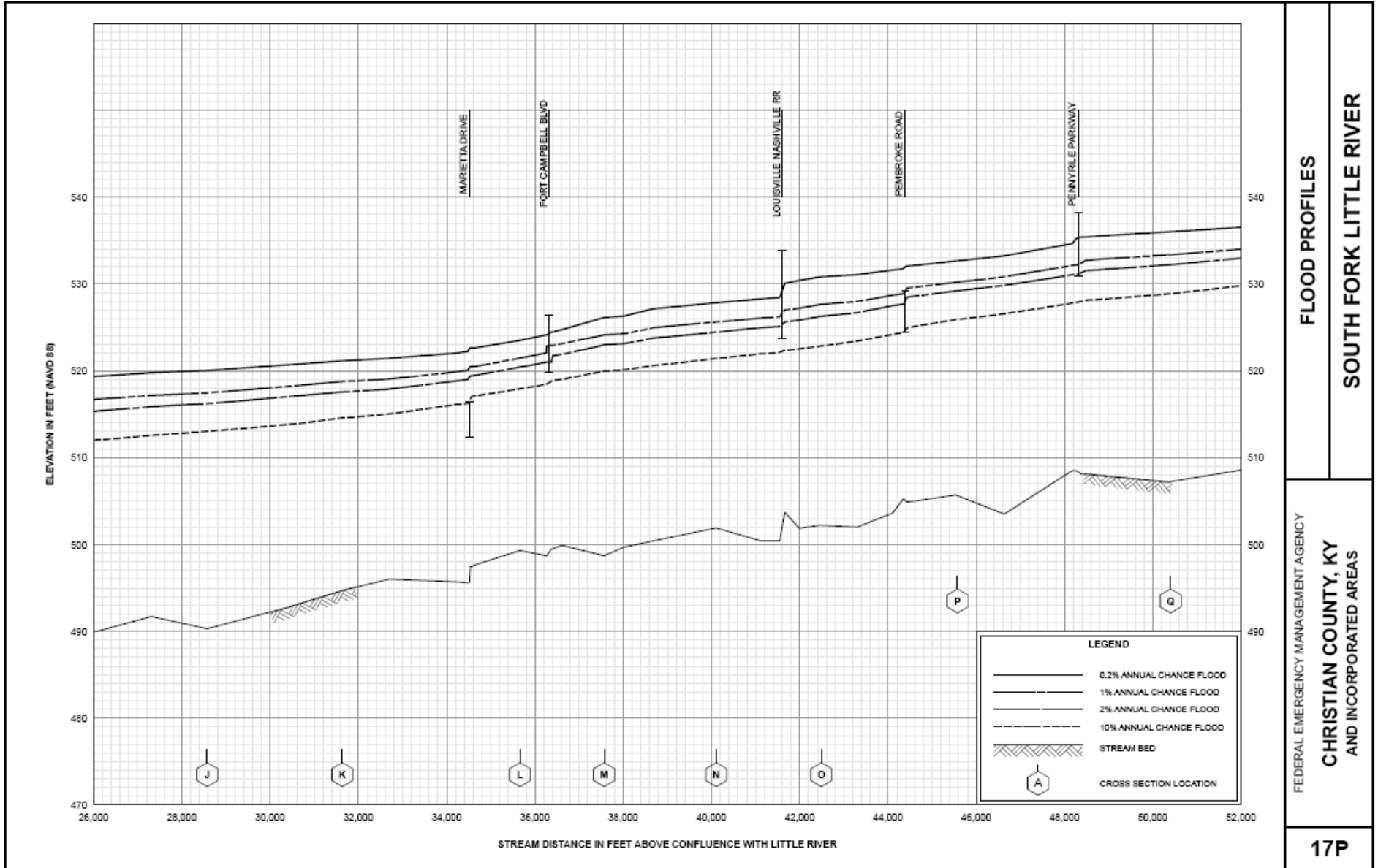


Figure No. 7

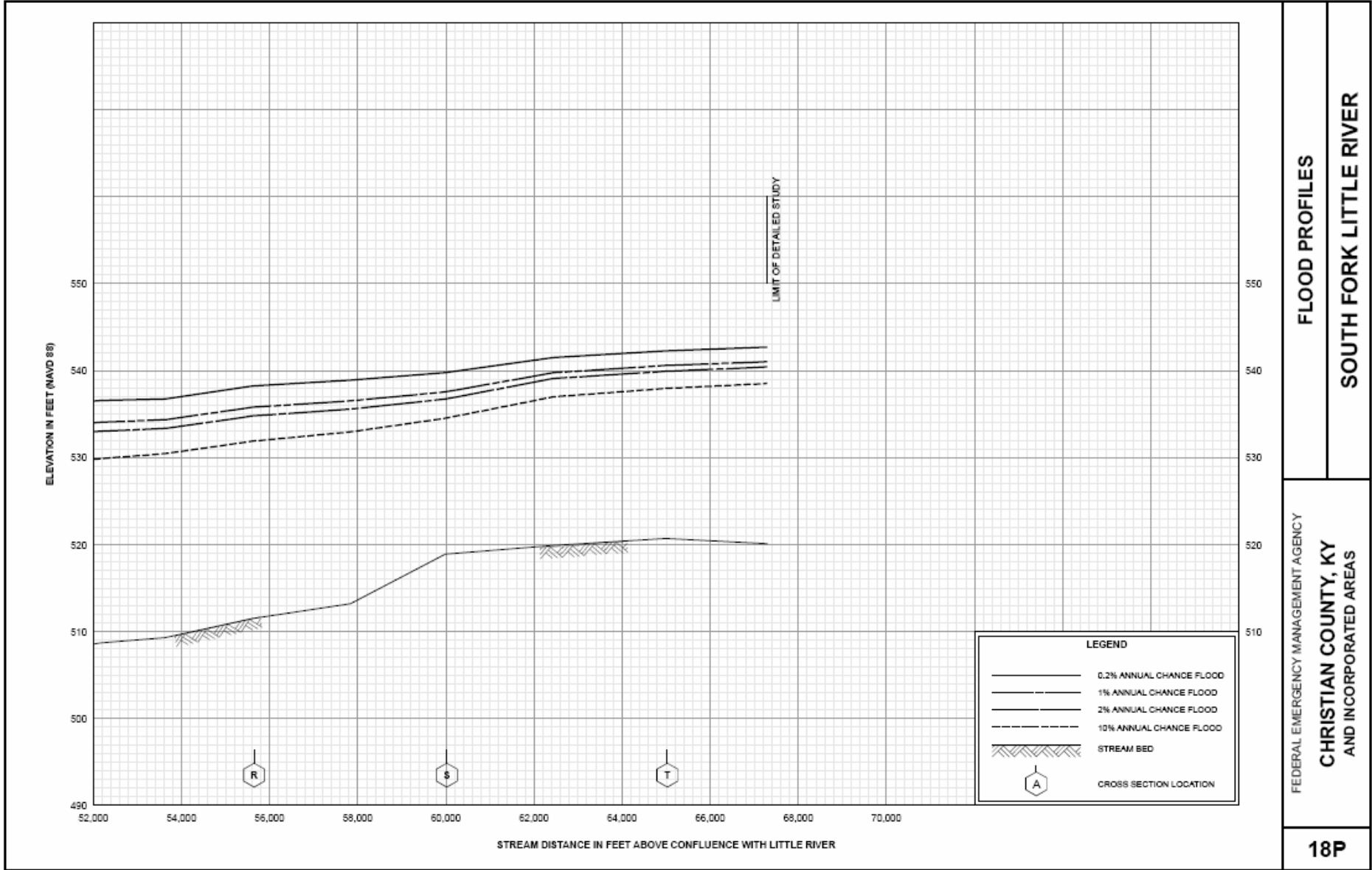


Figure No. 8

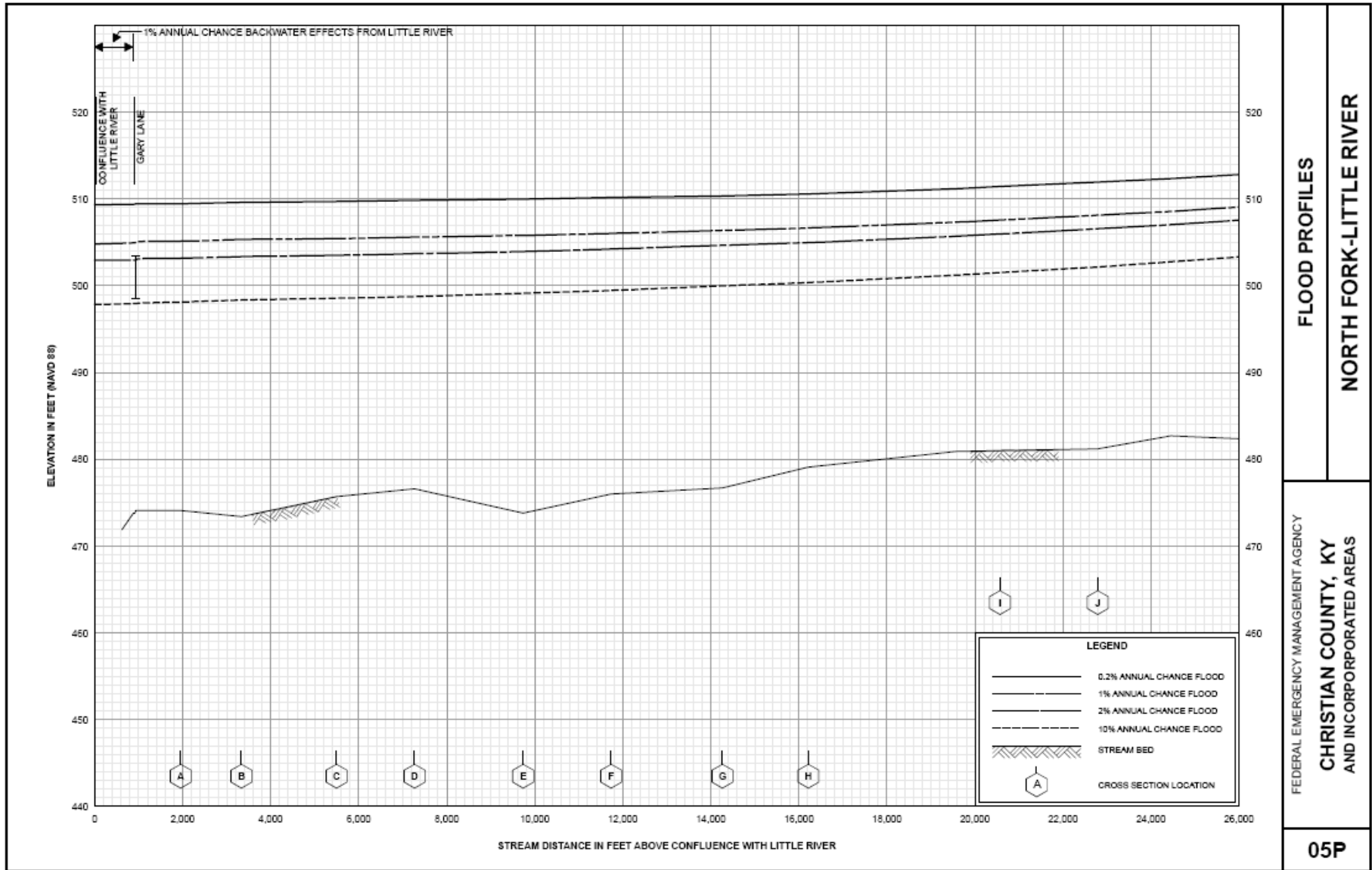


Figure No. 9

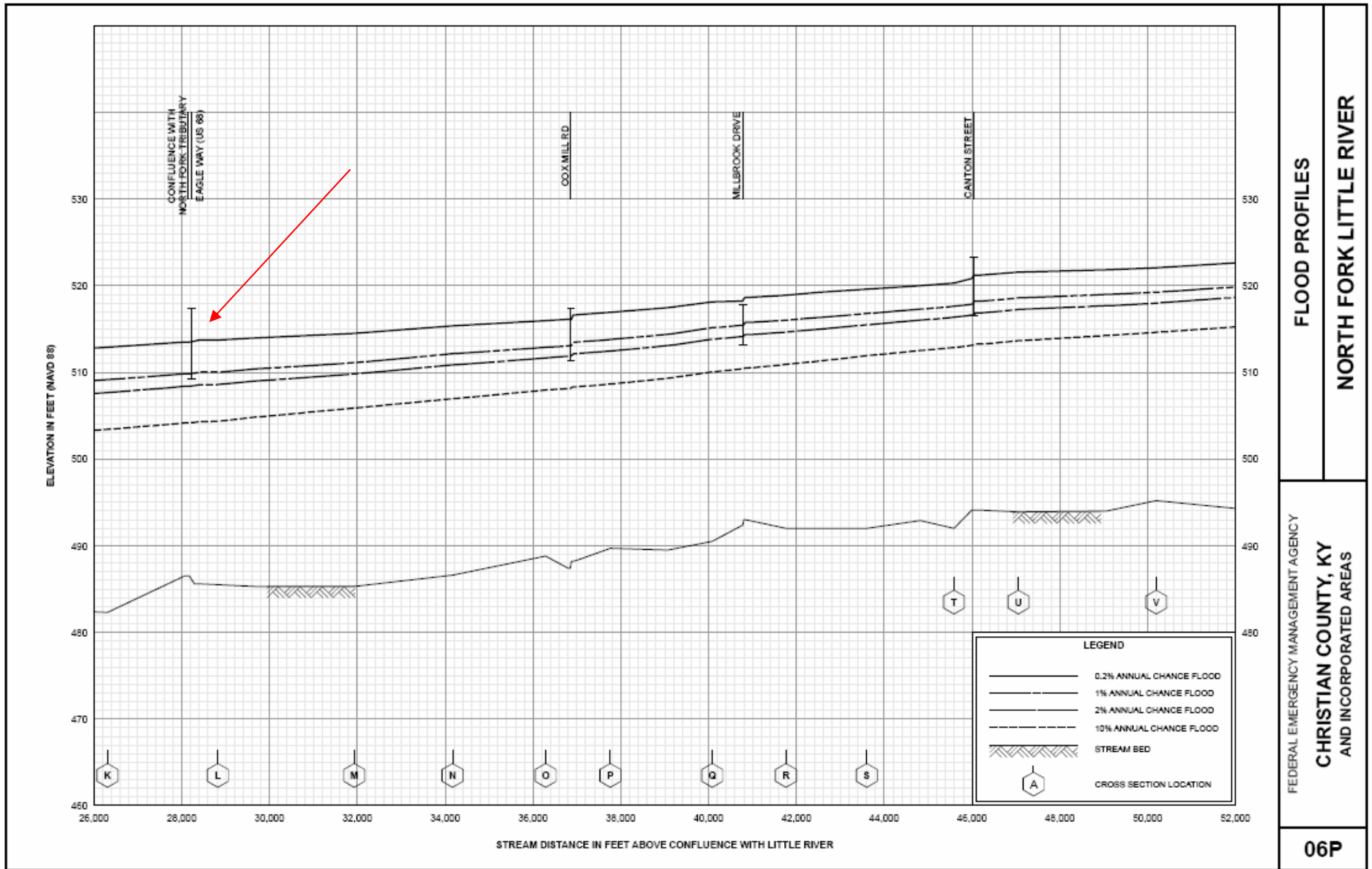


Figure No. 10

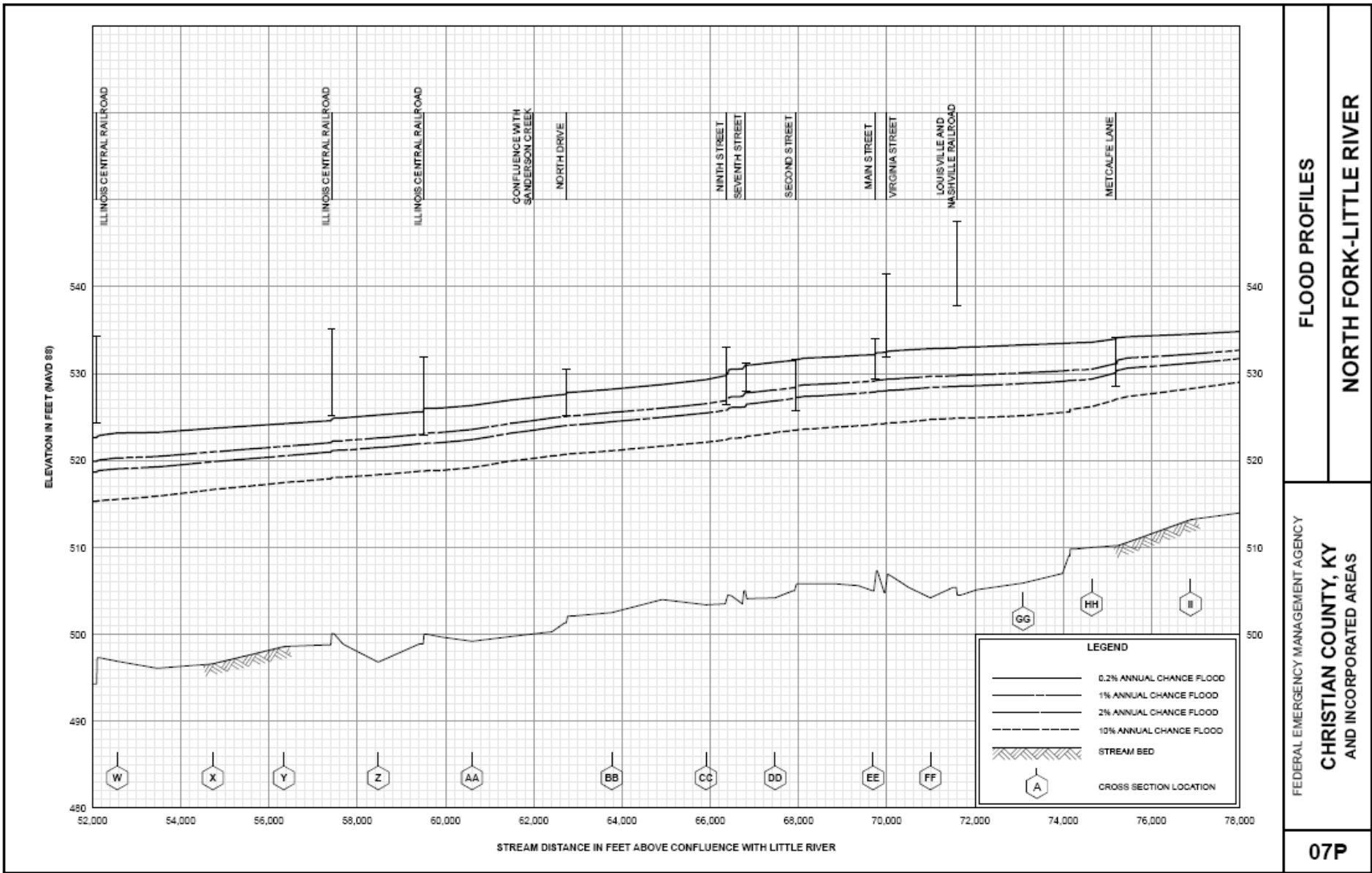


Figure No. 11

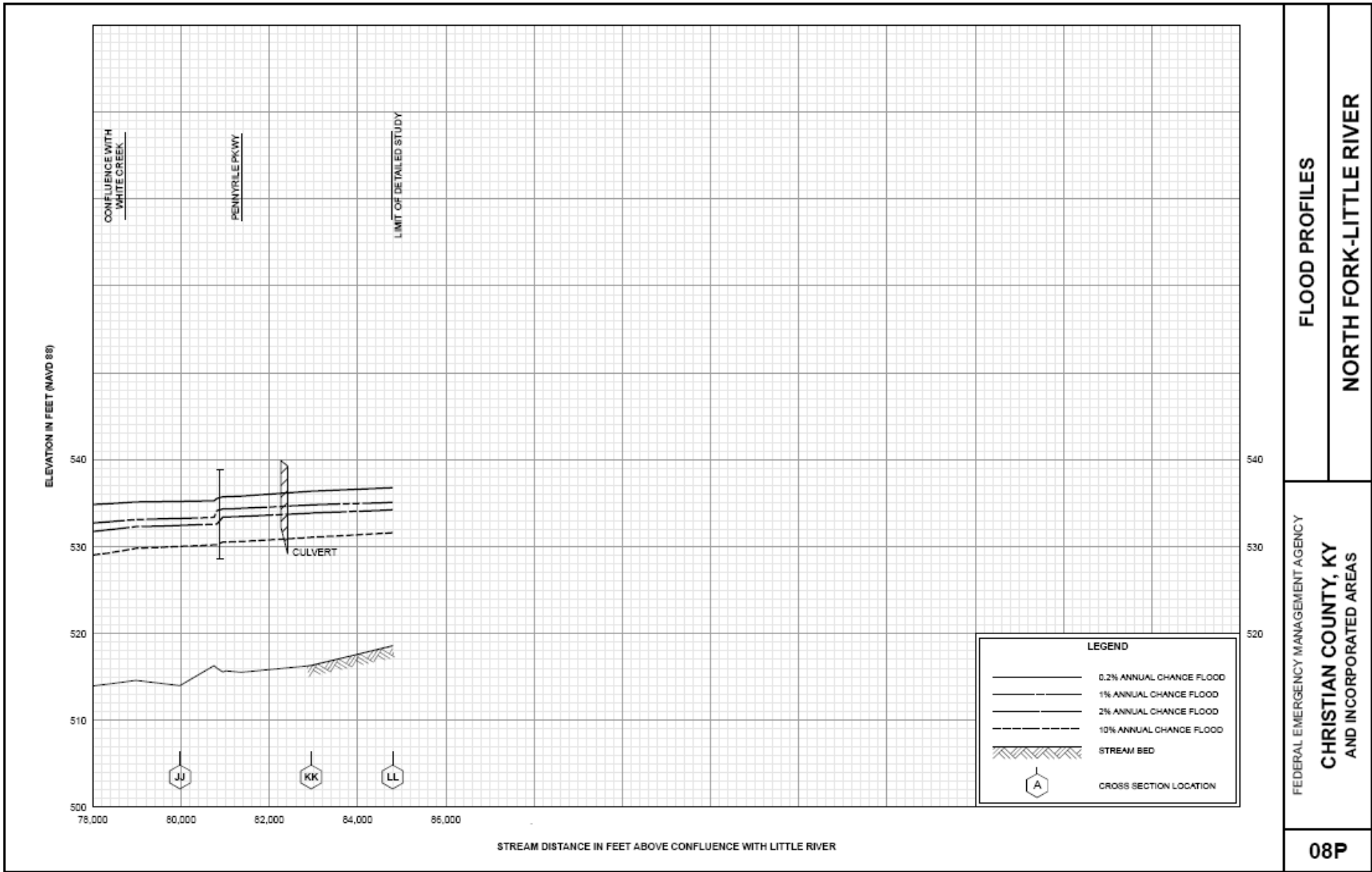


Figure No. 12



# Edward T Breathitt Parkway Extension

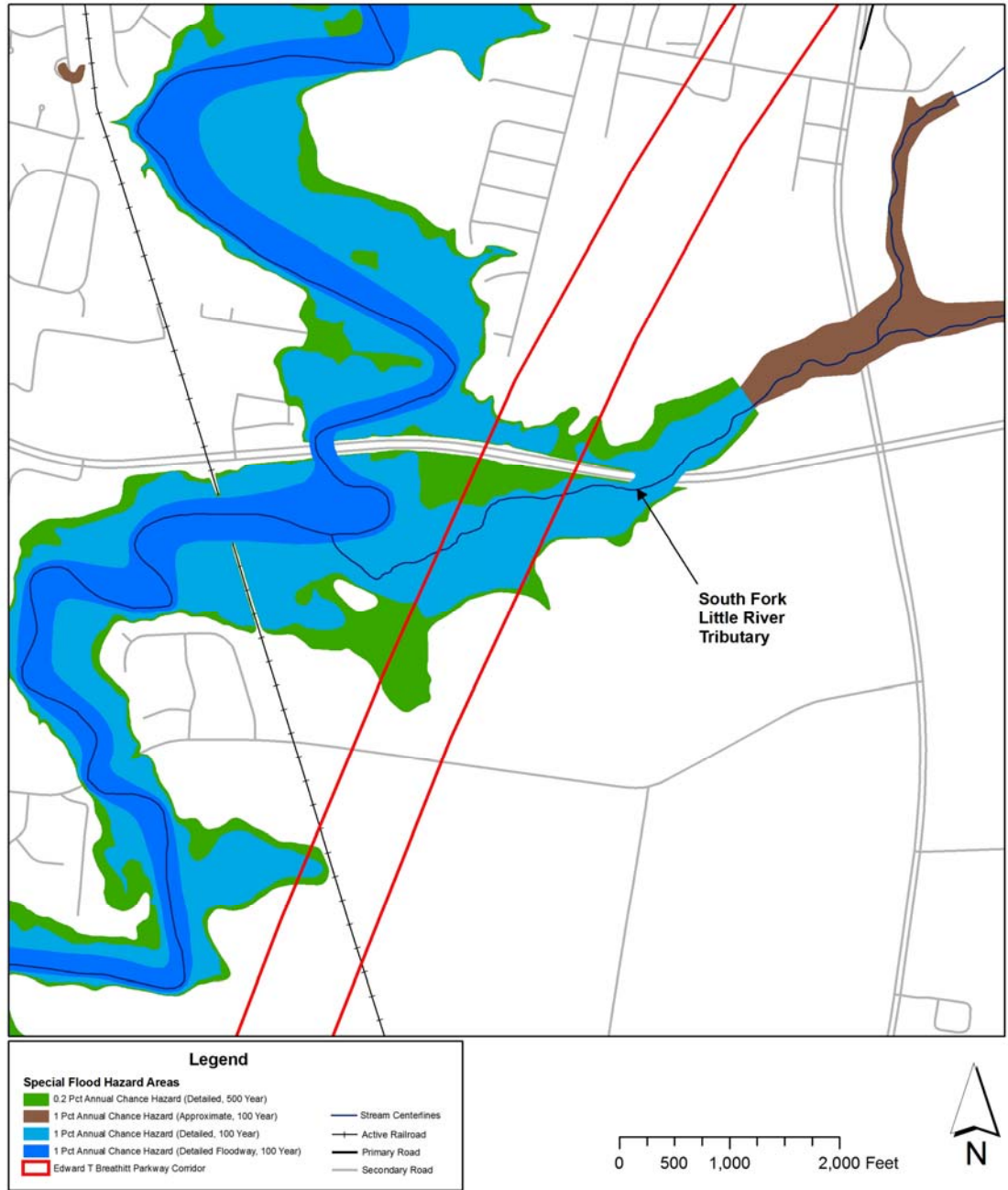


Figure No. 14



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