

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1



CLARK COUNTY, KENTUCKY AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
CLARK COUNTY UNINCORPORATED AREAS	210278
WINCHESTER, CITY OF	210056



FEMA

REVISED: PRELIMINARY

FLOOD INSURANCE STUDY NUMBER
21049CV000B

Version Number 2.3.3.2

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Volume 1

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Lower Howard Creek Tributary H2	06 P
Lower Howard Creek Tributary H3	07 P
Lower Howard Creek Tributary H4	08 P
Lower Howard Creek Tributary H5	09 P
Lower Howard Creek Tributary H6	10 P
Lower Howard Creek Tributary H7	11 P
Lower Howard Creek Tributary H8	12 P
Lower Howard Creek Tributary H9	13-14 P
Lower Howard Creek Tributary H10	15-16 P
Lower Howard Creek Tributary H11	17 P
Sinkhole A	18 P
Strodes Creek	19-21 P
Strodes Creek Tributary S1	22-23 P
Strodes Creek Tributary S2	24 P
Strodes Creek Tributary S3	25-27 P
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Strodes Creek Tributary S5	30 P
Strodes Creek Tributary S6	31 P
Town Branch	32-34 P
Town Branch Tributary T1	35 P

Flood Profiles

Panel

Town Branch Tributary T2

36-37 P

Town Branch Tributary T3

38-39 P

Town Branch Tributary T4

40 P

Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT CLARK COUNTY, KENTUCKY

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60.3, *Criteria for land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after

the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community’s regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Clark County, Kentucky.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the 8-digit Hydrologic Unit Codes (HUC-8) sub-basins affecting each, are shown in Table 1. The Flood Insurance Rate Map (FIRM) panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

The location of flood hazard data for participating communities in multiple jurisdictions is also indicated in the table.

Jurisdictions that have no identified SFHAs as of the effective date of this study are indicated in the table. Changed conditions in these communities (such as urbanization or annexation) or the availability of new scientific or technical data about flood hazards could make it necessary to determine SFHAs in these jurisdictions in the future.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Clark County (Unincorporated Areas)	210278	05100102, 05100204, 05100205	21049C0025C, 21049C0036C, 21049C0037C, 21049C0038C, 21049C0039C, 21049C0043C, 21049C0045C, 21049C0050C, 21049C0075C, 21049C0090D, 21049C0095D, 21049C0100C, 21049C0101C, 21049C0102C, 21049C0103C, 21049C0104C, 21049C0106C, 21049C0110C, 21049C0115D, 21049C0120D, 21049C0140D, 21049C0150C, 21049C0175C, 21049C0180D, 21049C0185D, 21049C0205D, 21049C0210C	

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Winchester, City of	210056	05100102, 05100205	21049C0037C, 21049C0038C, 21049C0039C, 21049C0043C, 21049C0045C, 21049C0101C, 21049C0102C, 21049C0103C, 21049C0104C, 21049C0106C, 21049C0110C	

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 31, “Map Repositories,” within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

The initial Countywide FIS Report for Clark County became effective on June 5, 2012. Refer to Table 28 for information about subsequent revisions to the FIRMs.

- Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood

Boundary and Floodway Map panels. In addition, former flood hazard zone designations have been changed as follows:

<u>Old Zone</u>	<u>New Zone</u>
A1 through A30	AE
B	X (shaded)
C	X (unshaded)

- FEMA does not impose floodplain management requirements or special insurance ratings based on Limit of Moderate Wave Action (LiMWA) delineations at this time. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. If the LiMWA is shown on the FIRM, it is being provided by FEMA as information only. For communities that do adopt Zone VE building standards in the area defined by the LiMWA, additional Community Rating System (CRS) credits are available. Refer to Section 2.5.4 for additional information about the LiMWA.

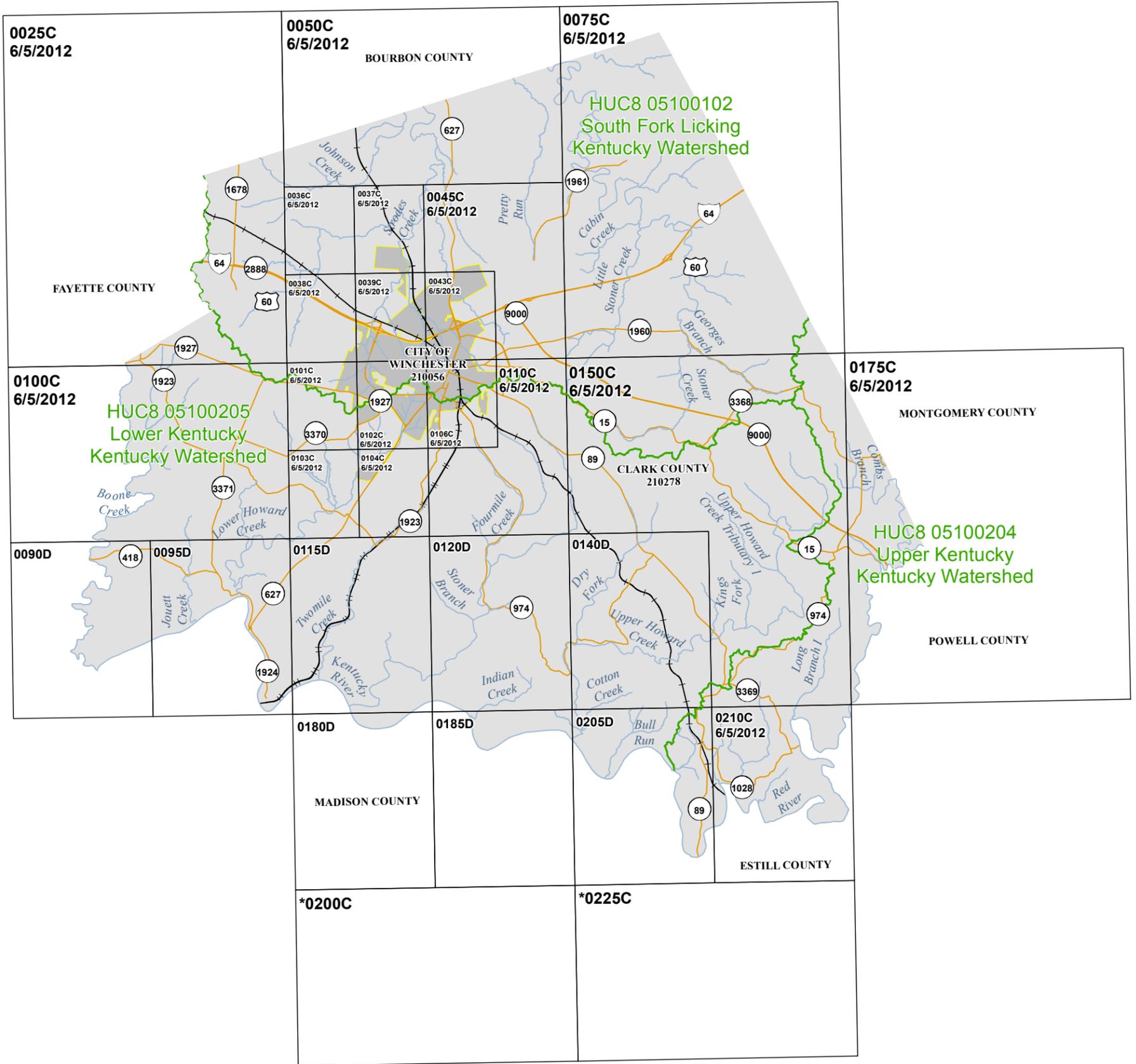
The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at <http://www.fema.gov> or contact your appropriate FEMA Regional Office for more information about this program.

- Previous FIS Reports and FIRMs may have included levees that were accredited as providing protection from the 1% annual chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees with providing protection from the base flood, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled “Mapping of Areas Protected by Levee Systems.”

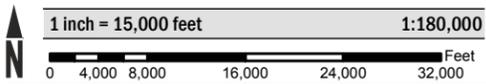
Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 9 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE national levee database. For all other levees, the user is encouraged to contact the appropriate local community.

- FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at <http://www.fema.gov>.

Figure 1: FIRM Panel Index



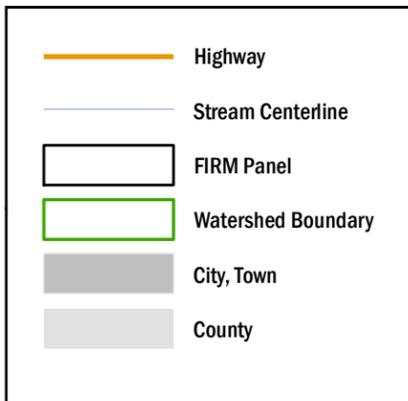
ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before 2/26/2016.



Map Projection:
State Plane Lambert Conformal Conic,
Kentucky Zone 1600; North American Datum 1983

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

CLARK COUNTY, KENTUCKY and Incorporated Areas

PANELS PRINTED:

0025, 0036, 0037, 0038, 0039, 0043, 0045, 0050, 0075, 0090, 0095, 0100, 0101, 0102, 0103, 0104, 0106, 0110, 0115, 0120, 0140, 0150, 0175, 0180, 0185, 0205, 0210



FEMA

MAP NUMBER
21049CIND0B

MAP REVISED
PRELIMINARY



*PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 28 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

Coastal Base Flood Elevations are not applicable to this FIS project.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

Figure 2: FIRM Notes to Users

PROJECTION INFORMATION: The projection used in the preparation of the map was Kentucky State Plane Single Zone. The horizontal datum was North American Datum of 1983 (NAD83). Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

*NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242*

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 31 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by the U.S. Geological Survey, National Geodetic Survey, National Atlas, Kentucky Transportation Cabinet (KYTC), Kentucky GeoNet, U.S. Army Corps of Engineers, Federal Emergency Management Agency, and the National Agriculture Imagery Program (NAIP). Ortho imagery was provided by NAIP in 2012, has a 1 meter ground resolution. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Figure 2: FIRM Notes to Users

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Clark County, Kentucky, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 28 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Clark County, Kentucky, effective **88/88/8888**.

COASTAL BARRIER RESOURCES (CBRS) NOTE: This section is not applicable to this FIS project.

LIMIT OF MODERATE WAVE ACTION: This section is not applicable to this FIS project.

ACCREDITED LEVEE NOTES TO USERS: This section is not applicable to this FIS project.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: This section is not applicable to this FIS project.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*



Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)

- Zone A The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
- Zone AE The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone, either at cross section locations or as static whole-foot elevations that apply throughout the zone.
- Zone AH The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
- Zone AO The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
- Zone AR The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- Zone A99 The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
- Zone V The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
- Zone VE Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.



Regulatory Floodway determined in Zone AE.

Figure 3: Map Legend for FIRM

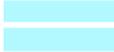
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.
	Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. See Notes to Users for important information.
OTHER AREAS	
	Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible
	Unshaded Zone X: Areas determined to be outside the 0.2% annual chance flood hazard
FLOOD HAZARD AND OTHER BOUNDARY LINES	
 (ortho)	Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)
 (vector)	
	Limit of Study
	Jurisdiction Boundary
	Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet
GENERAL STRUCTURES	
 <i>Aqueduct Channel Culvert Storm Sewer</i>	Channel, Culvert, Aqueduct, or Storm Sewer
 <i>Dam Jetty Weir</i>	Dam, Jetty, Weir
	Levee, Dike, or Floodwall accredited or provisionally accredited to reduce the flood risk from the 1% annual chance flood.
	Levee, Dike or Floodwall not accredited to reduce the flood risk from the 1% annual chance flood.
 <i>Bridge</i>	Bridge

Figure 3: Map Legend for FIRM

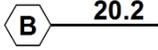
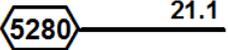
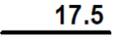
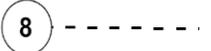
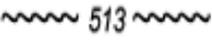
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): <i>CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas. See Notes to Users for important information.</i>	
 CBRS AREA 09/30/2009	Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.
 OTHERWISE PROTECTED AREA 09/30/2009	Otherwise Protected Area
REFERENCE MARKERS	
 22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
	Base Flood Elevation Line (shown for flooding sources for which no cross sections or profile are available)
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity

Figure 3: Map Legend for FIRM

BASE MAP FEATURES	
<i>Missouri Creek</i> 	River, Stream or Other Hydrographic Feature
	Interstate Highway
	U.S. Highway
	State Highway
	County Highway
MAPLE LANE 	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
 <i>RAILROAD</i>	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
4276^{000m}E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1% annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2% annual chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Clark County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1% annual chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 23), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1% and 0.2% annual chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1% annual chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Clark County, KY, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 13. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1% annual chance floodplain corresponds to the SFHAs. The 0.2% annual chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

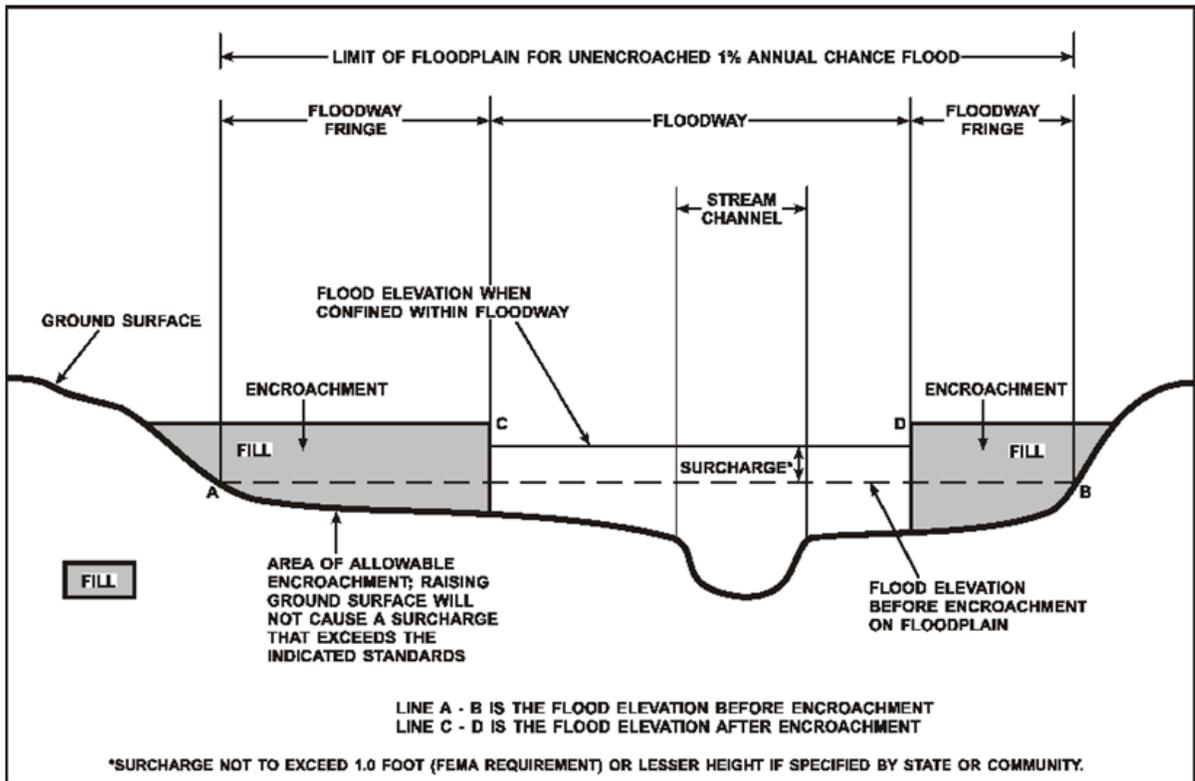
2.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1% annual chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1% annual chance flood. The floodway fringe is the area between the floodway and the 1% annual chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water-surface elevation of the 1% annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. Regulations for Kentucky require communities in Clark County to limit increases caused by encroachment to 1.0 foot and several communities have adopted additional restrictions. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Boone Creek	Clark County (Unincorporated)	Confluence with Kentucky River	County Boundary	05100205	15.5		N	Y	July 2009
Boone Creek Tributary 1	Clark County (Unincorporated)	Confluence with Boone Creek	Approximately 0.3 miles upstream of confluence of Boone Creek Tributary 1.1	05100205	2.4		N	Y	July 2009
Boone Creek Tributary 1.1	Clark County (Unincorporated)	Confluence with Boone Creek Tributary 1	Approximately 0.9 miles upstream of Basin Springs Rd	05100205	0.9		N	Y	July 2009
Boone Creek Tributary 1.2	Clark County (Unincorporated)	Confluence with Boone Creek Tributary 1	Approximately 0.2 miles upstream of KY-1927	05100205	2.8		N	Y	July 2009
Boone Creek Tributary 1.2.1	Clark County (Unincorporated)	Confluence with Boone Creek Tributary 1.2	Approximately 0.7 miles upstream of confluence with Boone Creek Tributary 1.2	05100205	0.7		N	Y	July 2009
Boone Creek Tributary 2	Clark County (Unincorporated)	Confluence with Boone Creek	Approximately 0.4 miles upstream of confluence with Boone Creek Tributary 2.1	05100205	0.7		N	Y	July 2009
Boone Creek Tributary 2.1	Clark County (Unincorporated)	Confluence with Boone Creek Tributary 2	Approximately 0.5 miles upstream of confluence with Boone Creek Tributary 2	05100205	0.5		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Bull Run	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 0.7 miles upstream of Red River Rd	05100205	2.9		N	Y	July 2009
Bull Run Tributary 1	Clark County (Unincorporated)	Confluence with Bull Run	Approximately 0.3 miles upstream of confluence of Bull Run Tributary 1.1	05100205	0.7		N	Y	July 2009
Bull Run Tributary 1.1	Clark County (Unincorporated)	Confluence with Bull Run Tributary	Approximately 0.5 miles upstream of Red River Rd	05100205	0.5		N	Y	July 2009
Cabin Creek	Clark County (Unincorporated)	Confluence with Little Stoner Creek	Approximately 0.2 miles upstream of Cabin Creek Rd	05100102	2.3		N	Y	July 2009
Cabin Creek Tributary 1	Clark County (Unincorporated)	Confluence with Cabin Creek	Approximately 0.6 miles upstream of confluence with Cabin Creek	05100102	0.6		N	Y	July 2009
Combs Branch	Clark County (Unincorporated)	Confluence with Lulbegrud Creek	Approximately 0.6 miles upstream of KY-1960	05100204	1.9		N	Y	July 2009
Combs Branch Tributary 1	Clark County (Unincorporated)	Confluence with Combs Branch	Approximately 0.9 miles upstream of confluence with Combs Branch	05100204	0.9		N	Y	July 2009
Cooperas Creek	Clark County (Unincorporated)	Confluence with Lulbegrud Creek	County Boundary	05100204	0.7				July 2009
Cotton Creek	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 0.9 miles upstream of Red River Rd	05100205	1.9		N	Y	July 2009
Donaldson Creek	Clark County (Unincorporated)	County Boundary	County Boundary	05100102	2.5		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Donaldson Creek Tributary 1	Clark County (Unincorporated)	Confluence with Donaldson Creek	Approximately 0.7 miles upstream of confluence with Donaldson Creek	05100102	0.7		N	Y	July 2009
Dry Fork	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 0.8 miles upstream of Pilot View Rd	05100205	4.7		N	Y	July 2009
Dry Fork Tributary 1	Clark County (Unincorporated)	Confluence with Dry Fork	Approximately 1.1 miles upstream of Pilot View Rd	05100205	1.1		N	Y	July 2009
Dumford Hollow	Clark County (Unincorporated)	Confluence with Kentucky River Tributary 1	Approximately 0.6 miles upstream of confluence of Dumford Hollow Tributary 1	05100205	1.3		N	Y	July 2009
Dumford Hollow Tributary 1	Clark County (Unincorporated)	Confluence with Dumford Hollow	Approximately 0.7 miles upstream of confluence with Dumford Hollow	05100205	0.7		N	Y	July 2009
East Fork Fourmile Creek	Clark County (Unincorporated)	Confluence with Fourmile Creek	Approximately 0.5 miles upstream of Rocky-Top Ln	05100205	5.8		N	Y	July 2009
Fourmile Creek	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 2.4 miles upstream of confluence of East Fork Fourmile Creek	05100205	11.8		N	Y	July 2009
Fourmile Creek Tributary 1	Clark County (Unincorporated)	Confluence with Fourmile Creek	Approximately 0.8 miles upstream of Rocky-Top Ln	05100205	3.1		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Fourmile Creek Tributary 2	Clark County (Unincorporated)	Confluence with Fourmile Creek	Approximately 0.9 miles upstream of KY-974	05100205	0.9		N	Y	July 2009
Georges Branch	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 210 feet upstream of KY-1960	05100102	2.9		N	Y	July 2009
Georges Branch Tributary 3	Clark County (Unincorporated)	Confluence with Georges Branch	Approximately 0.8 miles upstream of KY-1960	05100102	0.9		N	Y	July 2009
Goose Creek	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 85 feet upstream of Goose Creek Rd	05100102	1.1		N	Y	July 2009
Goose Creek Tributary 1	Clark County (Unincorporated)	Confluence with Goose Creek	Approximately 0.5 miles upstream of confluence with Goose Creek	05100102	0.5		N	Y	July 2009
Hancock Creek	Clark County (Unincorporated)	Confluence with Strodes Creek	Approximately 1.2 miles upstream of US-60	05100102	7.3		N	Y	July 2009
Hancock Creek Tributary 1	Clark County (Unincorporated)	Confluence with Hancock Creek	Approximately 0.1 miles upstream of Hancock Valley Dr	05100102	2.1		N	Y	July 2009
Hancock Creek Tributary 2	Clark County (Unincorporated)	Confluence with Hancock Creek	Approximately 1.1 miles upstream of US-60	05100102	2.4		N	Y	July 2009
Hancock Creek Tributary 3	Clark County (Unincorporated)	Confluence with Hancock Creek	Approximately 0.8 miles upstream of confluence with Hancock Creek	05100102	0.8		N	Y	July 2009
Harris Branch	Clark County (Unincorporated)	Confluence with Fourmile Creek	Approximately 0.8 miles upstream of Four Mile Rd	05100205	0.8		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Hoods Creek	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek	Approximately 0.2 miles upstream of confluence of Hoods Creek Tributary 1	05100102	5.4		N	Y	July 2009
Hoods Creek Tributary 1	Clark County (Unincorporated)	Confluence with Hoods Creek	Approximately 0.3 miles upstream of confluence with Hoods Creek	05100102	0.3		N	Y	July 2009
Indian Creek	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 0.2 miles upstream of confluence of Indian Creek Tributary 1	05100205	2.2		N	Y	July 2009
Indian Creek Tributary 1	Clark County (Unincorporated)	Confluence with Indian Creek	Approximately 0.6 miles upstream of confluence with Indian Creek	05100205	0.6		N	Y	July 2009
Johnson Creek	Clark County (Unincorporated)	County Boundary	Approximately 1.3 miles upstream of confluence of Johnson Creek Tributary 1	05100102	6.3		N	Y	July 2009
Johnson Creek Tributary 1	Clark County (Unincorporated)	Confluence with Johnson Creek	Approximately 0.5 miles upstream of Van Meter Rd	05100102	0.9		N	Y	July 2009
Johnson Creek Tributary 2	Clark County (Unincorporated)	Confluence with Johnson Creek	Approximately 1.6 miles upstream of confluence with Johnson Creek	05100102	1.7		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Johnson Creek Tributary 3	Clark County (Unincorporated)	Confluence with Johnson Creek	Approximately 0.8 miles upstream of confluence with Johnson Creek	05100102	0.8		N	Y	July 2009
Johnson Creek Tributary 4	Clark County (Unincorporated)	Confluence with Johnson Creek	Approximately 1.4 miles upstream of confluence with Johnson Creek	05100102	1.4		N	Y	July 2009
Jouett Creek	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 1.6 miles upstream of KY-418	05100205	3.4		N	Y	July 2009
Kentucky River	Clark County (Unincorporated)	Southwestern corner of Clark County	Northwestern corner of Estill County	05100205	20.2		Y	Y	July 2009
Kentucky River Tributary 1	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 0.7 miles upstream of confluence of Dumford Hollow	05100205	0.9		N	Y	July 2009
Kings Fork	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 1.4 miles upstream of KY-89	05100205	1.7		N	Y	July 2009
Little Howard Creek	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 1.4 miles upstream of confluence with Upper Howard Creek	05100205	1.4		N	Y	July 2009
Little Stoner Creek	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.2 miles upstream of confluence of Little Stoner Creek Tributary 1	05100102	3.7		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Little Stoner Creek Tributary 1	Clark County (Unincorporated)	Confluence with Little Stoner Creek	Approximately 0.3 miles upstream of Morris Rd	05100102	1.8		N	Y	July 2009
Little Stoner Creek Tributary 2	Clark County (Unincorporated)	Confluence with Little Stoner Creek	Approximately 0.6 miles upstream of confluence of Little Stoner Creek Tributary 2.1	05100102	1.7		N	Y	July 2009
Little Stoner Creek Tributary 2.1	Clark County (Unincorporated)	Confluence with Little Stoner Creek Tributary 2	Approximately 0.3 miles upstream of confluence with Little Stoner Creek Tributary 2	05100102	0.3		N	Y	July 2009
Log Lick Creek	Clark County (Unincorporated)	Confluence with Red River	Approximately 0.4 miles upstream of KY-3369	05100204	3.4		N	Y	July 2009
Log Lick Creek Tributary 1	Clark County (Unincorporated)	Confluence with Log Lick Creek	Approximately 0.8 miles upstream of confluence with Log Lick Creek	05100204	0.8		N	Y	July 2009
Long Branch	Clark County (Unincorporated)	Confluence with Fourmile Creek	Approximately 0.3 miles upstream of KY-974	05100205	0.8		N	Y	July 2009
Long Branch I	Clark County (Unincorporated)	Confluence with Lulbegrud Creek	Approximately 0.7 miles upstream of Rabbittown Rd	05100204	3.4		N	Y	July 2009
Lower Howard Creek	Clark County (Unincorporated)	Approximately 0.4 miles upstream of Reservoir Lane	Approximately 250 feet upstream of Colby Road (KY-1927)	05100205	3.5		Y	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Lower Howard Creek	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 0.4 miles upstream of Reservoir Ln	05100205	7.1		N	Y	July 2009
Lower Howard Creek Tributary 1	Clark County (Unincorporated)	Confluence with Lower Howard Creek	Approximately 3.1 miles upstream of confluence with Lower Howard Creek	05100205	3.1		N	Y	July 2009
Lower Howard Creek Tributary 1.1	Clark County (Unincorporated)	Confluence with Lower Howard Creek Tributary 1	Approximately 1.3 miles upstream of confluence with Lower Howard Creek Tributary 1	05100205	1.3		N	Y	July 2009
Lower Howard Creek Tributary 7	Clark County (Unincorporated)	Confluence with Lower Howard Creek	Approximately 0.7 miles upstream of confluence with Lower Howard Creek	05100205	0.7		N	Y	July 2009
Lower Howard Creek Tributary H1	Clark County (Unincorporated), City of Winchester	Confluence with Lower Howard Creek Tributary H2	Approximately 500 feet upstream of Boone Avenue (KY-627)	05100205	0.4		Y	Y	December 1986
Lower Howard Creek Tributary H10	Clark County (Unincorporated)	Confluence with Lower Howard Creek Tributary H9	Just downstream of McClure Road	05100205	0.5		Y	Y	December 1986
Lower Howard Creek Tributary H11	Clark County (Unincorporated)	Confluence with Lower Howard Creek Tributary H7	Approximately 700 feet upstream of Hillcrest Drive	05100205	0.3		Y	Y	December 1986
Lower Howard Creek Tributary H2	Clark County (Unincorporated), City of Winchester	Confluence with Lower Howard Creek	Approximately 650 feet upstream of Colby Road	05100205	0.3		Y	Y	December 1986

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Lower Howard Creek Tributary H3	Clark County (Unincorporated), City of Winchester	Approximately 150 feet upstream Windridge Road	Approximately 550 feet upstream of Ashford Drive	05100205	0.3		Y	Y	December 1986
Lower Howard Creek Tributary H4	Clark County (Unincorporated), City of Winchester	Confluence with Lower Howard Creek	Approximately 250 feet upstream of Windridge Drive	05100205	0.3		Y	Y	December 1986
Lower Howard Creek Tributary H5	Clark County (Unincorporated), City of Winchester	Confluence with Lower Howard Creek	Approximately 450 feet upstream of Vaught Road	05100205	0.6		Y	Y	December 1986
Lower Howard Creek Tributary H6	Clark County (Unincorporated), City of Winchester	Confluence with Lower Howard Creek Tributary H5	Approximately 0.2 miles upstream of Vocational School Road	05100205	0.3		Y	Y	December 1986
Lower Howard Creek Tributary H7	Clark County (Unincorporated)	Confluence with Lower Howard Creek	McClure Road	05100205	0.9		Y	Y	December 1986
Lower Howard Creek Tributary H8	Clark County (Unincorporated)	Confluence with Lower Howard Creek Tributary H7	Just downstream of West Meade Drive	05100205	0.4		Y	Y	December 1986
Lower Howard Creek Tributary H9	Clark County (Unincorporated)	Confluence with Lower Howard	Just downstream of McClure Road	05100205	0.9		Y	Y	December 1986
Lulbegrud Creek	Clark County (Unincorporated)	Confluence with Red River	County Boundary	05100204	17.2		N	Y	July 2009
Lulbegrud Creek Tributary 1	Clark County (Unincorporated)	Confluence with Lulbegrud Creek	Approximately 120 feet upstream of KY-974	05100204	1.2		N	Y	July 2009
North Branch Lulbegrud Creek	Clark County (Unincorporated)	Confluence with Lulbegrud Creek	County Boundary	05100204	0.2		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Pretty Run	Clark County (Unincorporated)	County Boundary	Approximately 1.7 miles upstream of Gay Evans Rd	05100102	5.7		N	Y	July 2009
Red River	Clark County (Unincorporated)	Confluence with Kentucky River	Confluence of Lulbegrud Creek	05100204	10.7		N		July 2009
Red River Tributary 1	Clark County (Unincorporated)	Confluence with Red River	Approximately 0.7 miles upstream of KY-1028	05100204	1.7		N	Y	July 2009
Red River Tributary 23	Clark County (Unincorporated)	Confluence with Red River	Approximately 0.2 miles upstream of Vienna Rd	05100204	1.3		N	Y	July 2009
Sinkhole A	Clark County (Unincorporated), City of Winchester	Approximately 100 feet downstream Hamilton Street	Blair Avenue	05100102	0.2		Y	Y	December 1986
Stoner Branch	Clark County (Unincorporated)	Confluence with Fourmile Creek	Approximately 1.5 miles upstream of confluence with Fourmile Creek	05100205	1.5		N	Y	July 2009
Stoner Creek	Clark County (Unincorporated)	County Boundary	Approximately 0.5 miles upstream of KY-15	05100102	26.7		N	Y	July 2009
Stoner Creek Tributary 1	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.2 miles upstream of Stoner Ephesus Rd	05100102	0.6		N	Y	July 2009
Stoner Creek Tributary 2	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 1.2 miles upstream of Dykes Ln	05100102	1.4		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Stoner Creek Tributary 3	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.5 miles upstream of confluence with Stoner Creek	05100102	0.6		N	Y	July 2009
Stoner Creek Tributary 4	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.3 miles upstream of I-64	05100102	0.8		N	Y	July 2009
Stoner Creek Tributary 5	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.8 miles upstream of Wades Mill Rd	05100102	2.4		N	Y	July 2009
Stoner Creek Tributary 5.1	Clark County (Unincorporated)	Confluence with Stoner Creek Tributary 5	Approximately 0.6 miles upstream of confluence with Stoner Creek Tributary 5	05100102	0.6		N	Y	July 2009
Stoner Creek Tributary 5.2	Clark County (Unincorporated)	Confluence with Stoner Creek Tributary 5	Approximately 1.2 miles upstream of Big Stoner Rd	05100102	1.3		N	Y	July 2009
Stoner Creek Tributary 6	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.9 miles upstream of confluence with Stoner Creek	05100102	0.9		N	Y	July 2009
Stoner Creek Tributary 7	Clark County (Unincorporated)	Confluence with Stoner Creek	Approximately 0.6 miles upstream of confluence with Stoner Creek	05100102	0.6		N	Y	July 2009
Strodes Creek	Clark County (Unincorporated)	Approximately 300 feet upstream of confluence with Hancock Creek	Approximately 0.9 miles upstream of Pioneer Drive	05100102	5.6		Y	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Strodes Creek	Clark County (Unincorporated)	County Boundary	Approximately 300 feet upstream of confluence of Hancock Creek	05100102	5.5		N	Y	July 2009
Strodes Creek Tributary 9	Clark County (Unincorporated)	Confluence with Strodes Creek	Approximately 0.2 miles upstream of KY-627	05100102	0.9		N	Y	July 2009
Strodes Creek Tributary S1	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek	Colby Road	05100102	1		Y	Y	December 1986
Strodes Creek Tributary S2	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek Tributary 1	Approximately 100 feet upstream of Skylark Road	05100102	0.4		Y	Y	December 1986
Strodes Creek Tributary S3	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek; approximately 300 feet upstream of Oxford Drive	Just downstream of Bypass Road (KY-1958); approximately 500 feet upstream of Kittison Drive	05100102	0.9		Y	Y	December 1986
Strodes Creek Tributary S4	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek	Approximately 200 feet upstream of Bon Haven Avenue	05100102	1.5		Y	Y	December 1986
Strodes Creek Tributary S5	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek	Approximately 0.2 miles upstream of the Confluence with Strodes Creek	05100102	0.3		Y	Y	December 1986

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Strodes Creek Tributary S6	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek Tributary 1	Brooks Place Way	05100102	0.2		Y	Y	December 1986
Town Branch	Clark County (Unincorporated), City of Winchester	Confluence with Strodes Creek	Approximately 400 feet upstream Madison Avenue	05100102	1.6		Y	Y	December 1986
Town Branch Tributary T1	Clark County (Unincorporated), City of Winchester	Confluence with Town Branch	Approximately 100 feet upstream West Washington Street	05100102	0.4		Y	Y	December 1986
Town Branch Tributary T2	Clark County (Unincorporated)	Confluence with Town Branch	Approximately 0.2 miles upstream of Ironworks Road (KY-15)	05100102	1.7		Y	Y	December 1986
Town Branch Tributary T3	Clark County (Unincorporated), City of Winchester	Confluence with Town Branch	Just downstream East Clark Drive	05100102	1.2		Y	Y	December 1986
Town Branch Tributary T4	Clark County (Unincorporated), City of Winchester	Confluence with Town Branch Tributary T1	Approximately 150 feet upstream Washington Square	05100102	0.1		Y	Y	December 1986
Twomile Creek	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 0.3 miles upstream of Railroad	05100205	7.0		N	Y	July 2009
Upper Howard Creek	Clark County (Unincorporated)	Confluence with Kentucky River	Approximately 2.3 miles upstream of KY-9000	05100205	18.5		N	Y	July 2009

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi ²) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Upper Howard Creek Tributary 1	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 0.2 miles upstream of Fox Quisenberry Rd	05100205	2.9		N	Y	July 2009
Upper Howard Creek Tributary 2	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 2.0 miles upstream of confluence with Upper Howard Creek	05100205	2.0		N	Y	July 2009
Upper Howard Creek Tributary 3	Clark County (Unincorporated)	Confluence with Upper Howard Creek	Approximately 0.2 miles upstream of Latimore Rd	05100205	0.9		N	Y	July 2009
West Fork Lower Howard Creek	Clark County (Unincorporated)	Confluence with Lower Howard Creek	Approximately 2.2 miles upstream of confluence with Lower Howard Creek	05100205	2.2		N	Y	July 2009
Woodruff Creek	Clark County (Unincorporated)	Confluence with Strodes Creek	Approximately 2.3 miles upstream of KY-627	05100102	3.1		N	Y	July 2009

All floodways that were developed for this FIS project are shown on the FIRM using the symbology described in Figure 3. In cases where the floodway and 1% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The Base Flood Elevation (BFE) is the elevation of the 1% annual chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

2.4 Non-Encroachment Zones

Some States and communities use non-encroachment zones to manage floodplain development. While not a FEMA designated floodway, the non-encroachment zone represents that area around the stream that should be reserved to convey the 1% annual chance flood event. This section is not applicable to this Flood Risk Project.

Regulations for Kentucky require communities in Clark County to limit increases caused by encroachment to 1 foot and several communities have adopted additional restrictions for non-encroachment areas.

Non-encroachment determinations may be delineated where it is not possible to delineate floodways because specific channel profiles with bridge and culvert geometry were not developed. Any non-encroachment determinations for this FIS project have been tabulated for selected cross sections and are shown in Table 25, "Flood Hazard and Non-Encroachment Data for Selected Streams."

2.5 Coastal Flood Hazard Areas

This section is not applicable to this FIS project.

2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this FIS project.

Figure 5: Wave Runup Transect Schematic

[Not Applicable to this FIS Project]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this FIS project.

2.5.3 Coastal High Hazard Areas

This section is not applicable to this FIS project.

Figure 6: Coastal Transect Schematic

[Not Applicable to this FIS Project]

2.5.4 Limit of Moderate Wave Action

This section is not applicable to this FIS project.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3, “Map Legend for FIRM.” Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in the unincorporated and incorporated areas of Clark County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Clark County (Unincorporated Areas)	A, AE, X
City of Winchester	A, AE, X

3.2 Coastal Barrier Resources System

The Coastal Barrier Resources Act (CBRA) of 1982 was established by Congress to create areas along the Atlantic and Gulf coasts and the Great Lakes, where restrictions for Federal financial assistance including flood insurance are prohibited. In 1990, Congress passed the Coastal Barrier Improvement Act (CBIA), which increased the extent of areas established by the CBRA and added “Otherwise Protected Areas” (OPA) to the system. These areas are collectively referred to as the John H. Chafee Coastal Barrier Resources System (CBRS). The CBRS boundaries that have been identified in the project area are in Table 4, “Coastal Barrier Resources System Information.”

Table 4: Coastal Barrier Resources System Information

[Not Applicable to this FIS Project]

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 5 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 5: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Lower Kentucky	05100205	Kentucky River	Begins at confluence with Ohio River and extends southeast, affecting the southern half of Clark County	3,240
South Fork Licking	05100102	Licking River	Encompasses the northern part of Clark County	930
Upper Kentucky	05100204	Kentucky River	Encompasses the eastern county boundary	1,080

4.2 Principal Flood Problems

Table 6 contains a description of the principal flood problems that have been noted for Clark County by flooding source.

Table 6: Principal Flood Problems

Flooding Source	Description of Flood Problems
Sinkhole A	Located between Rowland Avenue and Baldwin Avenue within karst area adjacent to the headwaters of Town Branch. An uncompleted storm sewer system does not provide an outlet for excess runoff.
Town Branch	Poynterville is flooded annually by backwater from an undersized railroad culvert, causing extensive damage.
Strodes Creek & Strodes Creek Tributary S3	Winchester Shopping Plaza is subject to flooding from a ponding effect caused by a combination of hydraulic structures. (Clark 1986, Winchester 1986)

Table 7 contains information about historic flood elevations in the communities within Clark County.

Table 7: Historic Flooding Elevations

[Not Applicable to this FIS Project]

4.3 Non-Levee Flood Protection Measures

Table 8 contains information about non-levee flood protection measures within Clark County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Table 8: Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Strodes Creek	N/A	Culvert	On the headwaters of Strodes Creek	Undersized stone masonry culvert provide some floodwater protection by retarding the flood flows
Strodes Creek Tributary S1	N/A	Culvert	Just before confluence with Strodes Creek	Undersized stone masonry culvert provide some floodwater protection by retarding the flood flows
Town Branch Tributary T2	N/A	Culvert	Under abandoned railroad spur line downstream of State Route 15	Undersized stone masonry culvert provide some floodwater protection by retarding the flood flows (Clark 1986, Winchester 1986)

4.4 Levees

This section is not applicable to this FIS project.

Table 9: Levees

[Not Applicable to this FIS Project]

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2% annual chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 27, “Incorporated Letters of Map Change”, which include Letters of Map Revision (LOMRs). For more information about LOMRs, refer to Section 6.5, “FIRM Revisions.”

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 13. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 10. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected flooding sources. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 11. Stream gage information is provided in Table 12.

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Kentucky River	At River Mile Station 209.7	N/A*	77,000	*	98,200	77,000	126,200
Kentucky River	At River Mile Station 191.6	N/A*	76,100	*	90,900	96,700	109,000
Lower Howard Creek	Just upstream of Reservoir Court	4.9	2,880	*	4,820	5,790	8,450
Lower Howard Creek	Just upstream of North Old Boonesboro Road	4.4	2,810	*	4,690	5,630	8,200
Lower Howard Creek	At approximately 0.3 miles upstream of Patton Lane	3.5	2,490	*	4,100	4,900	7,060
Lower Howard Creek	At approximately 0.3 miles downstream of Boonesboro Road	2.4	1,760	*	2,880	3,430	4,920
Lower Howard Creek	At approximately 0.2 miles upstream of Boonesboro Road (southern crossing)	1.6	1,310	*	2,110	2,500	3,530
Lower Howard Creek	Just upstream of Boonesboro Road (northern crossing)	0.9	800	*	1,270	1,500	2,110
Lower Howard Creek	At approximately 0.1 mile upstream of KY-1958 Bypass	0.6	570	*	880	1,030	1,440
Lower Howard Creek	At approximately 250 feet upstream of Colby Road	0.08	110	*	180	210	290
Lower Howard Creek Tributary H1	At confluence with Lower Howard Creek Tributary H2	0.17	230	*	332	375	477
Lower Howard Creek Tributary H2	At confluence with Lower Howard Creek	0.33	424	*	621	705	902
Lower Howard Creek Tributary H3	At confluence with Lower Howard Creek	0.09	115	*	171	195	251

*Not calculated for this FIS project

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Lower Howard Creek Tributary H4	At confluence with Lower Howard Creek	0.14	127	*	194	224	287
Lower Howard Creek Tributary H5	At confluence with Lower Howard Creek	0.45	410	*	625	717	934
Lower Howard Creek Tributary H6	At confluence with Lower Howard Creek Tributary H5	0.14	155	*	231	263	338
Lower Howard Creek Tributary H7	Just upstream of Old Boonesboro Road	0.78	628	*	967	1,113	1,478
Lower Howard Creek Tributary H8	Just downstream of West Meade Drive	0.15	151	*	233	268	352
Lower Howard Creek Tributary H9	Just downstream of McClure Road	0.04	77	*	116	133	168
Lower Howard Creek Tributary H10	Just downstream of McClure Road	0.06	89	*	134	152	197
Lower Howard Creek Tributary H11	At Hillcrest Drive	0.07	81	*	122	140	181
Sinkhole A	At approximately 100 feet upstream of Louisville & Nashville Railroad	0.09	110	*	169	190	248
Strodes Creek	At confluence with Hancock Creek	11.7	3,536	*	5,134	5,876	7,841
Strodes Creek	Just upstream of railroad	11.4	3,502	*	5,067	5,791	7,704
Strodes Creek	Just downstream of the confluence of Town Branch	10.8	3,581	*	5,146	5,893	7,849

*Not calculated for this FIS project

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Strodes Creek	At approximately 0.4 miles downstream of railroad	5.7	1,955	*	2,608	2,899	3,574
Strodes Creek	Just upstream of railroad	4.3	1,535	*	1,974	2,131	2,529
Strodes Creek	At Interstate 64	4.0	1,442	*	1,882	2,037	2,434
Strodes Creek	At Lexington Road	3.4	1,283	*	2,066	2,453	3,487
Strodes Creek	At approximately 210 feet upstream of West Fulton Road	2.3	895	*	1,422	1,683	2,376
Strodes Creek	At approximately 1.2 miles upstream of Frontier Way	1.1	349	*	587	707	1,030
Strodes Creek Tributary S1	At confluence with Strodes Creek Tributary S1	1.08	327	*	403	433	513
Strodes Creek Tributary S2	At confluence with Strodes Creek Tributary S1	0.23	0.23	*	*	*	*
Strodes Creek Tributary S3	At confluence with Strodes Creek	0.50	428	*	625	709	923
Strodes Creek Tributary S4	At confluence with Strodes Creek	0.24	252	*	372	419	530
Strodes Creek Tributary S5	At confluence with Strodes Creek	0.85	600	*	882	985	1,190
Strodes Creek Tributary S6	At confluence with Strodes Creek Tributary S1	0.21	241	*	355	405	520
Town Branch	At confluence of Town Branch Tributary T3	2.82	1,579	*	2,232	2,476	2,967

*Not calculated for this FIS project

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Town Branch Tributary T1	At confluence with Town Branch	0.30	368	*	545	620	796
Town Branch Tributary T2	At confluence with Town Branch	0.92	510	*	773	885	1,116
Town Branch Tributary T3	At Interstate 64	0.20	268	*	396	450	577
Town Branch Tributary T4	At Interstate 64	0.10	131	*	193	219	281

*Not calculated for this FIS project

Figure 7: Frequency Discharge-Drainage Area Curves

[Not Applicable to this FIS Project]

Table 11: Summary of Non-Coastal Stillwater Elevations

[Not Applicable to this FIS Project]

Table 12: Stream Gage Information used to Determine Discharges

[Not Applicable to this FIS Project]

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 24, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 13. Roughness coefficients are provided in Table 14. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Boone Creek	Confluence with Kentucky River	County Boundary	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Boone Creek Tributary 1	Confluence with Boone Creek	Approximately 0.3 miles upstream of confluence of Boone Creek Tributary 1.1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Boone Creek Tributary 1.1	Confluence with Boone Creek Tributary 1	Approximately 0.9 miles upstream of Basin Springs Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Boone Creek Tributary 1.2	Confluence with Boone Creek Tributary 1	Approximately 0.2 miles upstream of KY-1927	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Boone Creek Tributary 1.2.1	Confluence with Boone Creek Tributary 1.2	Approximately 0.7 miles upstream of confluence with Boone Creek Tributary 1.2	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Boone Creek Tributary 2	Confluence with Boone Creek	Approximately 0.4 miles upstream of confluence with Boone Creek Tributary 2.1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Boone Creek Tributary 2.1	Confluence with Boone Creek Tributary 2	Approximately 0.5 miles upstream of confluence with Boone Creek Tributary 2	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Bull Run	Confluence with Kentucky River	Approximately 0.7 miles upstream of Red River Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Bull Run Tributary 1	Confluence with Bull Run	Approximately 0.3 miles upstream of confluence of Bull Run Tributary 1.1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Bull Run Tributary 1.1	Confluence with Bull Run Tributary	Approximately 0.5 miles upstream of Red River Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Cabin Creek	Confluence with Little Stoner Creek	Approximately 0.2 miles upstream of Cabin Creek Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Cabin Creek Tributary 1	Confluence with Cabin Creek	Approximately 0.6 miles upstream of confluence with Cabin Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Combs Branch	Confluence with Lulbegrud Creek	Approximately 0.6 miles upstream of KY-1960	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Combs Branch Tributary 1	Confluence with Combs Branch	Approximately 0.9 miles upstream of confluence with Combs Branch	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Cooperas Creek	Confluence with Lulbegrud Creek	County Boundary	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Cotton Creek	Confluence with Upper Howard Creek	Approximately 0.9 miles upstream of Red River Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Donaldson Creek	County Boundary	County Boundary	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Donaldson Creek Tributary 1	Confluence with Donaldson Creek	Approximately 0.7 miles upstream of confluence with Donaldson Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Dry Fork	Confluence with Upper Howard Creek	Approximately 0.8 miles upstream of Pilot View Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Dry Fork Tributary 1	Confluence with Dry Fork	Approximately 1.1 miles upstream of Pilot View Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Dumford Hollow	Confluence with Kentucky River Tributary 1	Approximately 0.6 miles upstream of confluence of Dumford Hollow Tributary 1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Dumford Hollow Tributary 1	Confluence with Dumford Hollow	Approximately 0.7 miles upstream of confluence with Dumford Hollow	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
East Fork Fourmile Creek	Confluence with Fourmile Creek	Approximately 0.5 miles upstream of Rocky-Top Ln	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Fourmile Creek	Confluence with Kentucky River	Approximately 2.4 miles upstream of confluence of East Fork Fourmile Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Fourmile Creek Tributary 1	Confluence with Fourmile Creek	Approximately 0.8 miles upstream of Rocky-Top Ln	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Fourmile Creek Tributary 2	Confluence with Fourmile Creek	Approximately 0.9 miles upstream of KY-974	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Georges Branch	Confluence with Stoner Creek	Approximately 210 feet upstream of KY-1960	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Georges Branch Tributary 3	Confluence with Georges Branch	Approximately 0.8 miles upstream of KY-1960	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Goose Creek	Confluence with Stoner Creek	Approximately 85 feet upstream of Goose Creek Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Goose Creek Tributary 1	Confluence with Goose Creek	Approximately 0.5 miles upstream of confluence with Goose Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Hancock Creek	Confluence with Strodes Creek	Approximately 1.2 miles upstream of US-60	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Hancock Creek Tributary 1	Confluence with Hancock Creek	Approximately 0.1 miles upstream of Hancock Valley Dr	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Hancock Creek Tributary 2	Confluence with Hancock Creek	Approximately 1.1 miles upstream of US-60	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Hancock Creek Tributary 3	Confluence with Hancock Creek	Approximately 0.8 miles upstream of confluence with Hancock Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Harris Branch	Confluence with Fourmile Creek	Approximately 0.8 miles upstream of Four Mile Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Hoods Creek	Confluence with Strodes Creek	Approximately 0.2 miles upstream of confluence of Hoods Creek Tributary 1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Hoods Creek Tributary 1	Confluence with Hoods Creek	Approximately 0.3 miles upstream of confluence with Hoods Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Indian Creek	Confluence with Kentucky River	Approximately 0.2 miles upstream of confluence of Indian Creek Tributary 1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Indian Creek Tributary 1	Confluence with Indian Creek	Approximately 0.6 miles upstream of confluence with Indian Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Johnson Creek	County Boundary	Approximately 1.3 miles upstream of confluence of Johnson Creek Tributary 1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Johnson Creek Tributary 1	Confluence with Johnson Creek	Approximately 0.5 miles upstream of Van Meter Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Johnson Creek Tributary 2	Confluence with Johnson Creek	Approximately 1.6 miles upstream of confluence with Johnson Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Johnson Creek Tributary 3	Confluence with Johnson Creek	Approximately 0.8 miles upstream of confluence with Johnson Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Johnson Creek Tributary 4	Confluence with Johnson Creek	Approximately 1.4 miles upstream of confluence with Johnson Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Jouett Creek	Confluence with Kentucky River	Approximately 1.6 miles upstream of KY-418	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Kentucky River	Southwestern corner of Clark County	Northwestern corner of Estill County	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	Original model from HEC-2 used to construct georeferenced HEC-RAS model
Kentucky River Tributary 1	Confluence with Kentucky River	Approximately 0.7 miles upstream of confluence of Dumford Hollow	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Kings Fork	Confluence with Upper Howard Creek	Approximately 1.4 miles upstream of KY-89	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Little Howard Creek	Confluence with Upper Howard Creek	Approximately 1.4 miles upstream of confluence with Upper Howard Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Little Stoner Creek	Confluence with Stoner Creek	Approximately 0.2 miles upstream of confluence of Little Stoner Creek Tributary 1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Little Stoner Creek Tributary 1	Confluence with Little Stoner Creek	Approximately 0.3 miles upstream of Morris Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Little Stoner Creek Tributary 2	Confluence with Little Stoner Creek	Approximately 0.6 miles upstream of confluence of Little Stoner Creek Tributary 2.1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Little Stoner Creek Tributary 2.1	Confluence with Little Stoner Creek Tributary 2	Approximately 0.3 miles upstream of confluence with Little Stoner Creek Tributary 2	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Log Lick Creek	Confluence with Red River	Approximately 0.4 miles upstream of KY-3369	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Log Lick Creek Tributary 1	Confluence with Log Lick Creek	Approximately 0.8 miles upstream of confluence with Log Lick Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Long Branch	Confluence with Fourmile Creek	Approximately 0.3 miles upstream of KY-974	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Long Branch I	Confluence with Lulbegrud Creek	Approximately 0.7 miles upstream of Rabbittown Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Lower Howard Creek	Approximately 0.4 miles upstream of Reservoir Lane	Approximately 250 feet upstream of Colby Road (KY-1927)	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Lower Howard Creek	Confluence with Kentucky River	Approximately 0.4 miles upstream of Reservoir Ln	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Lower Howard Creek Tributary 1	Confluence with Lower Howard Creek	Approximately 3.1 miles upstream of confluence with Lower Howard Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Lower Howard Creek Tributary 1.1	Confluence with Lower Howard Creek Tributary 1	Approximately 1.3 miles upstream of confluence with Lower Howard Creek Tributary 1	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Lower Howard Creek Tributary 7	Confluence with Lower Howard Creek	Approximately 0.7 miles upstream of confluence with Lower Howard Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Lower Howard Creek Tributary H1	Confluence with Lower Howard Creek Tributary H2	Approximately 500 feet upstream of Boone Avenue (KY-627)	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H10	Confluence with Lower Howard Creek Tributary H9	Just downstream of McClure Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H11	Confluence with Lower Howard Creek Tributary H7	Approximately 700 feet upstream of Hillcrest Drive	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Lower Howard Creek Tributary H2	Confluence with Lower Howard Creek	Approximately 650 feet upstream of Colby Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H3	Approximately 150 feet upstream Windridge Road	Approximately 550 feet upstream of Ashford Drive	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H4	Confluence with Lower Howard Creek	Approximately 250 feet upstream of Windridge Drive	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H5	Confluence with Lower Howard Creek	Approximately 450 feet upstream of Vaught Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H6	Confluence with Lower Howard Creek Tributary H5	Approximately 0.2 miles upstream of Vocational School Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H7	Confluence with Lower Howard Creek	McClure Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H8	Confluence with Lower Howard Creek Tributary H7	Just downstream of West Meade Drive	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lower Howard Creek Tributary H9	Confluence with Lower Howard	Just downstream of McClure Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Lulbegrud Creek	Confluence with Red River	County Boundary	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Lulbegrud Creek Tributary 1	Confluence with Lulbegrud Creek	Approximately 120 feet upstream of KY-974	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
North Branch Lulbegrud Creek	Confluence with Lulbegrud Creek	County Boundary	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Pretty Run	County Boundary	Approximately 1.7 miles upstream of Gay Evans Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Red River	Confluence with Kentucky River	Confluence of Lulbegrud Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Red River Tributary 1	Confluence with Red River	Approximately 0.7 miles upstream of KY-1028	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Red River Tributary 23	Confluence with Red River	Approximately 0.2 miles upstream of Vienna Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Sinkhole A	Approximately 100 feet downstream Hamilton Street	Blair Avenue	Regression Equation	WSP-2	December 1986	AE	None
Stoner Branch	Confluence with Fourmile Creek	Approximately 1.5 miles upstream of confluence with Fourmile Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek	County Boundary	Approximately 0.5 miles upstream of KY-15	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Stoner Creek Tributary 1	Confluence with Stoner Creek	Approximately 0.2 miles upstream of Stoner Ephesus Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 2	Confluence with Stoner Creek	Approximately 1.2 miles upstream of Dykes Ln	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 3	Confluence with Stoner Creek	Approximately 0.5 miles upstream of confluence with Stoner Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 4	Confluence with Stoner Creek	Approximately 0.3 miles upstream of I-64	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 5	Confluence with Stoner Creek	Approximately 0.8 miles upstream of Wades Mill Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 5.1	Confluence with Stoner Creek Tributary 5	Approximately 0.6 miles upstream of confluence with Stoner Creek Tributary 5	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 5.2	Confluence with Stoner Creek Tributary 5	Approximately 1.2 miles upstream of Big Stoner Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Stoner Creek Tributary 6	Confluence with Stoner Creek	Approximately 0.9 miles upstream of confluence with Stoner Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Stoner Creek Tributary 7	Confluence with Stoner Creek	Approximately 0.6 miles upstream of confluence with Stoner Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Strodes Creek	Approximately 300 feet upstream of confluence with Hancock Creek	Approximately 0.9 miles upstream of Pioneer Drive	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Strodes Creek	County Boundary	Approximately 0.1 miles upstream of confluence of Hancock Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Strodes Creek Trib 9	Confluence with Strodes Creek	Approximately 0.2 miles upstream of KY-627	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Strodes Creek Tributary S1	Confluence with Strodes Creek	Colby Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Strodes Creek Tributary S2	Confluence with Strodes Creek Creek Tributary 1	Approximately 100 feet upstream of Skylark Road	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Strodes Creek Tributary S3	Confluence with Strodes Creek; approximately 300 feet upstream of Oxford Drive	Just downstream of Bypass Road (KY-1958); approximately 500 feet upstream of Kittison Drive	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Strodes Creek Tributary S4	Confluence with Strodes Creek	Approximately 200 feet upstream of Bon Haven Avenue	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Strodes Creek Tributary S5	Confluence with Strodes Creek	Approximately 0.2 miles upstream of the Confluence with Strodes Creek	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Strodes Creek Tributary S6	Confluence with Strodes Creek Tributary 1	Brooks Place Way	Regression Equation	HEC-RAS v. 4.0	July 2009	AE	None
Town Branch	Confluence with Strodes Creek	Approximately 400 feet upstream Madison Avenue	Regression Equation	WSP-2	December 1986	AE	None
Town Branch Tributary T1	Confluence with Town Branch	Approximately 100 feet upstream West Washington Street	Regression Equation	WSP-2	December 1986	AE	None
Town Branch Tributary T2	Confluence with Town Branch	Approximately 0.2 miles upstream of Ironworks Road (KY-15)	Regression Equation	WSP-2	December 1986	AE	None
Town Branch Tributary T3	Confluence with Town Branch	Just downstream East Clark Drive	Regression Equation	WSP-2	December 1986	AE	None
Town Branch Tributary T4	Confluence with Town Branch Tributary T1	Approximately 150 feet upstream Washington Square	Regression Equation	WSP-2	December 1986	AE	None
Twomile Creek	Confluence with Kentucky River	Approximately 0.3 miles upstream of Railroad	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits		Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
	Downstream Limit	Upstream Limit					
Upper Howard Creek	Confluence with Kentucky River	Approximately 2.3 miles upstream of KY-9000	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Upper Howard Creek Tributary 1	Confluence with Upper Howard Creek	Approximately 0.2 miles upstream of Fox Quisenberry Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Upper Howard Creek Tributary 2	Confluence with Upper Howard Creek	Approximately 2.0 miles upstream of confluence with Upper Howard Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Upper Howard Creek Tributary 3	Confluence with Upper Howard Creek	Approximately 0.2 miles upstream of Latimore Rd	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
West Fork Lower Howard Creek	Confluence with Lower Howard Creek	Approximately 2.2 miles upstream of confluence with Lower Howard Creek	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None
Woodruff Creek	Confluence with Strodes Creek	Approximately 2.3 miles upstream of KY-627	Regression Equation	HEC-RAS v. 3.1.2	July 2009	A	None

Table 14: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
Kentucky River	0.030-0.038	0.070-0.120
Lower Howard Creek	0.04	0.06-0.11
Strodes Creek	0.045	0.06-0.11

5.3 Coastal Analyses

This section is not applicable to this FIS project.

Table 15: Summary of Coastal Analyses

[Not Applicable to this FIS Project]

5.3.1 Total Stillwater Elevations

This section is not applicable to this FIS project.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas

[Not Applicable to this FIS Project]

Table 16: Tide Gage Analysis Specifics

[Not Applicable to this FIS Project]

5.3.2 Waves

This section is not applicable to this FIS project.

5.3.3 Coastal Erosion

This section is not applicable to this FIS project.

5.3.4 Wave Hazard Analyses

This section is not applicable to this FIS project

Table 17: Coastal Transect Parameters

[Not Applicable to this FIS Project]

Figure 9: Transect Location Map

[Not Applicable to this FIS Project]

5.4 Alluvial Fan Analyses

This section is not applicable to this FIS project.

Table 18: Summary of Alluvial Fan Analyses

[Not Applicable to this FIS Project]

Table 19: Results of Alluvial Fan Analyses

[Not Applicable to this FIS Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please contact information services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

The datum conversion calculated for the previous Clark County FIS for the entire county was -0.51 feet.

Table 20: Countywide Vertical Datum Conversion

[Not Applicable to this FIS Project]

Table 21: Stream-Based Vertical Datum Conversion

[Not Applicable to this FIS Project]

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA’s FIRM database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA’s *Guidelines and Standards for Flood Risk Analysis and Mapping*, <http://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>.

Base map information shown on the FIRM was derived from the sources described in Table 22.

Table 22: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophoto	NAIP	2012	2 feet	Color orthoimagery was provided for the county
Political boundaries	KY Geonet	2012	N/A	Municipal and county boundaries
Transportation Features	KY Geonet	2012	N/A	Roads and railroads
Surface Water Features	KY Geonet	2012	N/A	Modeling streams were derived from NHD stream centerlines digitized to the NAIP 2012 Imagery and supplemented by source LiDAR

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

Table 23: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Scale	Contour Interval	Citation
Clark County	Kentucky River	LiDAR	1 meter GSD	2 ft.	KYGeonet
Clark County	All within Clark County other than the Kentucky River	NED 1/3 Arc Second Digital Elevation Model	1:24,000	10 meter	USGS
City of Winchester	All within City of Winchester	Topographical data	1"=200'	5 foot contours	Clark County GIS

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH ² (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Kentucky River								
A	172.83	443/232	22,381	4.3	590.9	590.9	591.4	0.5
B	173.81	404/174	20,241	4.8	591.3	591.3	591.8	0.5
C	174.10	347/98	18,251	5.3	591.5	591.5	592.0	0.5
D	175.25	709/250	25,081	3.9	592.3	592.3	592.8	0.5
E	175.88	360/213	17,483	5.5	592.5	592.5	593.0	0.5
F	176.55	415/174	20,172	4.8	593.2	593.2	593.7	0.5
G	177.17	694/236	23,053	4.2	593.8	593.8	594.4	0.6
H	177.65	688/249	20,951	4.6	594.0	594.0	594.7	0.7
I	178.34	746/582	22,417	4.3	594.8	594.8	595.5	0.7
J	179.81	753/227	23,268	4.2	595.7	595.7	596.5	0.8
K	180.07	1,013/235	29,198	3.3	596.0	596.0	596.8	0.8
L	180.60	643/177	21,377	4.5	596.3	596.3	597.0	0.7
M	181.38	489/362	19,468	5.0	596.9	596.9	597.6	0.7
N	182.87	505/104	19,769	4.9	598.2	598.2	598.9	0.7
O	183.91	607/197	22,255	4.4	599.2	599.2	599.9	0.7
P	186.15	1,044/257	29,310	3.3	600.7	600.7	601.5	0.8
Q	186.67	816/207	25,127	3.9	600.9	600.9	601.7	0.8
R	187.14	935/146	25,625	3.8	601.3	601.3	602.1	0.8
S	188.10	800/436	24,895	3.9	601.9	601.9	602.7	0.8
T	188.56	400/216	18,371	5.3	602.1	602.1	602.9	0.8
U	189.59	412/125	19,198	5.0	603.4	603.4	603.9	0.5
V	191.13	664/212	23,303	4.2	604.4	604.4	605.2	0.8

¹Stream distance in miles above confluence with Ohio River

²Width/Width within county

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

KENTUCKY RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek								
A	2,311	107	775	13.1	851.4	851.4	852.2	0.8
B	3,356	187	1,106	5.2	858.2	858.2	858.9	0.7
C	3,748	81	789	7.3	860.6	860.6	860.8	0.2
D	4,534	140	1,200	4.7	863.1	863.1	864.0	0.9
E	4,923	135	924	6.1	864.1	864.1	864.9	0.8
F	6,017	143	1,159	4.9	868.6	868.6	869.5	0.9
G	6,811	100	815	6.0	874.2	874.2	875.1	0.9
H	7,642	138	852	5.8	877.9	877.9	878.4	0.5
I	8,168	167	1,123	4.4	881.7	881.7	882.3	0.6
J	8,558	85	596	8.2	882.7	882.7	883.1	0.4
K	8,807	106	644	7.6	884.1	884.1	884.4	0.3
L	9,130	121	870	3.9	887.0	887.0	887.7	0.7
M	9,826	163	886	3.9	889.9	889.9	890.3	0.4
N	10,984	32	282	12.2	892.2	892.2	892.9	0.7
O	11,443	67	518	9.2	895.6	895.6	896.4	0.8
P	12,527	120	1,378	3.5	905.3	905.3	906.1	0.8
Q	13,416	144	1,219	3.9	905.4	905.4	906.4	1.0
R	14,509	66	456	8.3	906.1	906.1	906.9	0.8
S	15,100	100	402	6.4	908.9	908.9	909.1	0.2
T	15,781	140	612	4.6	912.1	912.1	912.2	0.1
U	16,495	109	1,148	1.5	922.0	922.0	922.0	0.0
V	17,215	58	375	5.5	922.1	922.1	922.2	0.1

¹Stream distance in feet above Reservoir Lane Bridge

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek (continued)								
W	17,712	83	454	4.2	923.8	923.8	923.8	0.0
X	17,954	47	189	9.3	924.5	924.5	925.3	0.8
Y	18,376	70	379	3.5	929.0	929.0	929.4	0.4
Z	18,953	19	32	8.0	932.0	932.0	932.0	0.0
AA	19,743	11	26	9.9	948.1	948.1	948.1	0.0
AB	20,592	16	63	3.3	961.1	961.1	962.0	0.8

¹Stream distance in feet above Reservoir Lane Bridge

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H1								
A	450	12	51	7.3	945.6	945.6	946.6	1.0
B	1,330	32	129	2.4	959.2	959.2	960.2	1.0
C	1,875	15	5	2.9	969.7	969.7	970.7	1.0
D	2,200	16	32	4.5	971.3	971.3	972.3	1.0

¹Stream distance in feet above confluence with Lower Howard Creek Tributary H2

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H2								
A	420	24	52	6.4	941.2	941.2	942.2	1.0
B	847	21	66	5.0	946.8	946.8	947.8	1.0
C	1,083	56	118	2.8	958.1	958.1	959.1	1.0
D	1,240	34	110	3.0	958.3	958.3	959.3	1.0
E	1,642	8	37	4.7	961.6	961.6	962.6	1.0

¹Stream distance in feet above confluence with Lower Howard Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H3								
A	520	10	20	6.3	929.8	929.8	930.8	1.0
B	710	10	28	7.0	935.1	935.1	936.1	1.0
C	1,645	11	47	3.8	950.1	950.1	951.1	1.0

¹Stream distance in feet above confluence with Lower Howard Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H4								
A	320	84	448	0.5	922.5	922.5	923.5	1.0
B	1,240	20	41	5.4	934.7	934.7	935.7	1.0

¹Stream distance in feet above confluence with Lower Howard Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H4

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H5								
A	620	69	239	3.0	909.6	909.4 ²	910.4	1.0
B	2,070	37	120	5.3	921.8	921.8	922.8	1.0

¹Stream distance in feet above confluence with Lower Howard Creek

²Elevation computed without consideration of backwater effects from Lower Howard Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H6								
A	260	18	58	4.5	929.3	929.3	930.3	1.0
B	490	43	164	1.6	934.7	934.7	935.7	1.0
C	1,020	30	138	1.9	940.3	940.3	941.3	1.0

¹Stream distance in feet above confluence with Lower Howard Creek Tributary H5

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H7								
A	490	48	189	5.9	891.0	889.1 ²	890.1	1.0
B	1,208	39	135	7.8	895.1	895.1	896.1	1.0
C	1,522	30	105	9.5	898.4	898.4	899.4	1.0
D	2,186	53	177	5.2	903.9	903.9	904.9	1.0
E	2,626	57	180	5.1	907.7	907.7	908.7	1.0
F	3,456	37	84	6.0	914.7	914.7	915.7	1.0
G	4,166	10	66	7.1	922.1	922.1	923.1	1.0
H	4,718	10	35	8.5	929.1	929.1	930.1	1.0

¹Stream distance in feet above confluence with Lower Howard Creek

²Elevation computed without consideration of backwater effects from Lower Howard Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H7

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H8								
A	300	22	70	5.4	912.5	912.5	913.5	1.0
B	835	15	62	5.2	918.4	918.4	919.4	1.0
C	1,324	17	56	5.8	926.2	926.2	927.2	1.0
D	1,709	16	56	5.8	932.7	932.7	933.7	1.0
E	2,187	19	67	4.0	938.1	938.1	939.1	1.0

¹Stream distance in feet above confluence with Lower Howard Creek Tributary H7

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H8

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H9								
A	480	65	78	7.6	880.2	880.2	881.2	1.0
B	1,760	31	88	3.6	896.3	896.3	897.3	1.0
C	2,611	78	100	2.8	910.1	910.1	911.1	1.0
D	3,364	16	47	5.2	921.2	921.2	922.2	1.0
E	3,889	12	43	4.4	927.5	927.5	928.5	1.0
F	4,669	11	30	4.4	944.0	944.0	945.0	1.0

¹Stream distance in feet above confluence with Lower Howard Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H9

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H10								
A	370	24	50	5.4	902.0	902.0	903.0	1.0
B	736	24	51	4.8	907.8	907.8	908.8	1.0
C	1,426	16	42	5.2	920.5	920.5	921.5	1.0
D	1,964	16	45	4.1	926.7	926.7	927.7	1.0
E	2,764	15	39	3.9	939.9	939.9	940.9	1.0

¹Stream distance in feet above confluence with Lower Howard Creek Tributary H9

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H10

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Lower Howard Creek Tributary H11								
A	260	13	22	3.4	903.0	903.0	904.0	1.0
B	640	17	20	3.7	909.8	909.8	910.8	1.0
C	1,510	20	33	4.2	928.0	928.0	929.0	1.0

¹Stream distance in feet above confluence with Lower Howard Creek Tributary H7

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER HOWARD CREEK TRIBUTARY H11

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Sinkhole A								
A	100	11	22	8.8	978.9	978.9	979.9	1.0
B	800	112	83	2.3	982.2	982.2	983.2	1.0

¹Stream distance in feet above Louisville and Nashville Railroad

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

SINKHOLE A

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek								
A	316.8	95	810	7.3	869.1	869.1	869.2	0.1
B	1,739.9	100	820	7.2	873.2	873.2	873.6	0.4
C	2,874.6	181	1,344	4.3	876.3	876.3	877.2	0.9
D	4,242.8	233	2,016	2.9	882.7	882.7	883.1	0.4
E	5,533.5	416	2,399	2.4	883.6	883.6	884.5	0.9
F	7,103.9	180	1,126	5.2	885.0	885.0	886.0	1.0
G	8,560.3	79	492	12.0	888.0	888.0	888.1	0.1
H	10,303.4	350	3,056	1.9	893.2	893.2	894.1	0.9
I	11,581.2	345	2,071	2.9	894.0	894.0	894.9	0.9
J	13,511.3	144	777	3.7	896.2	896.2	897.0	0.8
K	15,337.9	102	617	4.7	900.3	900.3	900.9	0.6
L	16,040.2	130	494	5.9	902.3	902.3	902.7	0.4
M	16,969.5	129	975	2.2	905.6	905.6	906.4	0.8
N	18,054.2	152	1,064	2.0	906.8	906.8	907.5	0.7
O	18,658.1	92	743	2.7	910.0	910.0	910.8	0.8
P	19,647.1	210	2,102	1.0	916.1	916.1	916.8	0.7
Q	20,981.7	51	521	4.7	919.6	919.6	920.1	0.5
R	22,474.7	117	437	5.6	922.1	922.1	922.1	0.0
S	23,374.5	53	507	3.3	925.7	925.7	926.1	0.4
T	23,709.5	52	384	4.4	926.6	926.6	927.0	0.4
U	24,489.4	13	123	5.8	928.1	928.1	928.4	0.3
V	25,534.4	95	937	0.8	936.3	936.3	936.9	0.6

¹Stream distance in feet above confluence with Hancock Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek (continued)								
W	26,952.4	96	781	0.9	941.9	941.9	942.0	0.1
X	28,230.5	86	250	2.8	941.9	941.9	942.1	0.2
Y	30,023.4	28	111	6.4	952.3	952.3	952.8	0.5

¹Stream distance in feet above confluence with Hancock Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek Tributary S1								
A	110	61	333	1.3	927.3	920.2 ²	921.2	1.0
B	440	37	149	2.9	927.3	921.1 ²	922.1	1.0
C	775	87	124	3.5	927.3	921.5 ²	922.5	1.0
D	1,380	23	74	4.1	927.3	922.8 ²	923.8	1.0
E	2,170	437	N/A	N/A	936.4	936.4	937.4	1.0
F	2,680	351	N/A	N/A	936.5	936.5	937.5	1.0
G	3,330	147	1,137	0.6	941.3	941.3	942.3	1.0
H	4,555	26	108	5.0	945.7	945.7	946.7	1.0
I	5,270	39	93	4.3	952.7	952.7	954.7	1.0

¹Stream distance in feet above confluence with Strodes Creek

²Elevation computed without consideration of backwater effects from Strodes Creek

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek Tributary S2								
A	675	17	37	3.4	927.1	927.1	928.1	1.0
B	1,170	10	25	3.8	932.5	932.5	933.5	1.0

¹Stream distance in feet above confluence with Strodes Creek Tributary S1

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK TRIBUTARY S2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek Tributary S3								
A	2,025	93	480	1.3	928.2	928.2	929.2	1.0
B	2,460	61	231	2.7	929.0	929.0	930.0	1.0
C	2,950	30	93	5.8	932.3	932.3	933.3	1.0
D	3,500	35	108	5.0	936.6	936.6	937.6	1.0
E	4,150	58	266	1.7	947.7	947.7	948.7	1.0
F	4,830	60	291	1.4	953.1	953.1	954.1	1.0
G	5,400	28	89	4.1	958.9	958.9	959.9	1.0
H	5,830	43	101	3.6	961.4	961.4	962.4	1.0

¹Stream distance in feet above confluence with Strodes Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK TRIBUTARY S3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek Tributary S4								
A	1,020	57	198	4.4	904.9	904.9	905.9	1.0
B	2,250	50	161	4.7	912.4	912.4	913.4	1.0
C	3,300	25	107	6.0	920.3	920.3	921.3	1.0
D	4,460	47	149	3.8	930.5	930.5	931.5	1.0
E	5,340	37	155	2.7	939.2	939.2	940.2	1.0
F	6,080	62	190	2.2	946.8	946.8	947.8	1.0
G	6,520	31	59	5.9	953.9	953.9	954.9	1.0
H	7,240	23	78	3.7	960.3	960.3	961.3	1.0
I	7,725	12	41	5.5	964.8	964.8	965.8	1.0

¹Stream distance in feet above confluence with Strodes Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK TRIBUTARY S4

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek Tributary S5								
A	300	95	298	3.3	920.1	918.1 ²	919.1	1.0
B	640	109	547	1.8	920.1	918.5 ²	919.5	1.0
C	1,425	73	328	3.0	920.1	920.1 ²	921.1	1.0

¹Stream distance in feet above confluence with Strodes Creek

²Elevation computed without consideration of backwater effects from Strodes Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK TRIBUTARY S5

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Strodes Creek Tributary S6								
A	620	24	81	5.0	940.5	940.5	941.5	1.0
B	1,240	15	46	6.3	950.1	950.1	951.1	1.0

¹Stream distance in feet above confluence with Strodes Creek Tributary S1

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

STRODES CREEK TRIBUTARY S6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Town Branch								
A	1,460	133	664	3.8	890.1	890.1	891.1	1.0
B	2,760	165	619	4.0	893.2	893.2	894.2	1.0
C	5,030	139	652	3.8	900.5	900.5	901.5	1.0
D	7,270	235	1,300	1.5	913.1	913.1	914.1	1.0
E	9,000	196	1,135	1.7	914.3	914.3	915.3	1.0
F	10,370	157	622	3.1	915.9	915.9	916.9	1.0

¹Stream distance in feet above confluence with Strodes Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TOWN BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Town Branch Tributary T1								
A	1,150	50	103	5.1	942.6	942.6	943.6	1.0
B	2,050	26	72	4.2	950.2	950.2	951.2	1.0

¹Stream distance in feet above confluence with Town Branch

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TOWN BRANCH TRIBUTARY T1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Town Branch Tributary T2								
A	570	86	239	3.7	917.1	917.1	918.1	1.0
B	1,180	63	211	4.2	919.6	919.6	920.6	1.0
C	2,270	89	310	3.0	929.0	929.0	930.0	1.0
D	3,880	30	153	4.7	938.0	938.0	939.0	1.0
E	4,600	44	168	3.8	943.5	943.5	944.5	1.0
F	5,200	61	266	2.4	945.3	945.3	946.3	1.0
G	5,900	19	76	7.3	952.4	952.4	953.4	1.0
H	6,640	34	131	3.5	955.6	955.6	956.6	1.0
I	7,120	27	82	5.6	961.5	961.5	962.5	1.0
J	8,015	73	300	2.0	968.2	968.2	969.2	1.0
K	8,285	52	122	4.5	972.9	972.9	973.9	1.0

¹Stream distance in feet above confluence with Town Branch

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TOWN BRANCH TRIBUTARY T2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Town Branch Tributary T3								
A	650	48	117	6.7	909.0	909.0	910.0	1.0
B	1,405	42	159	4.4	914.2	914.2	915.2	1.0
C	2,660	27	110	5.2	924.4	924.4	925.4	1.0
D	3,325	56	151	3.8	928.5	928.5	929.5	1.0
E	3,860	19	70	6.4	933.9	933.9	934.9	1.0
F	4,150	23	129	3.5	939.5	939.5	940.5	1.0
G	4,965	16	58	5.5	947.9	947.9	948.9	1.0
H	5,360	17	66	2.8	955.9	955.9	956.9	1.0
I	5,960	9	19	6.9	965.2	965.2	966.2	1.0

¹Stream distance in feet above confluence with Town Branch

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TOWN BRANCH TRIBUTARY T3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Town Branch Tributary T4								
A	180	34	95	2.3	944.9	944.9	945.9	1.0
B	700	33	71	3.1	953.8	953.8	954.8	1.0

¹Stream distance in feet above confluence with Town Branch Tributary T1

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TOWN BRANCH TRIBUTARY T4

Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not Applicable to this FIS Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable to this FIS project.

Table 26: Summary of Coastal Transect Mapping Considerations

[Not Applicable to this FIS Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions to FIS projects may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 31, “Map Repositories”).

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA. A LOMA cannot be issued for properties located on the PFD (primary frontal dune).

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill”. Visit the “Flood Map-Related Fees” section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loma for the “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill” or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the “Flood Map-Related Fees” section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit <http://www.fema.gov> and download the form “MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision”. Visit the “Flood Map-Related Fees” section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Clark County FIRM are listed in Table 27.

Table 27: Incorporated Letters of Map Change

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
N/A	N/A	N/A	N/A

* There are no incorporated LOMCs in Clark County

6.5.4 Physical Map Revisions

PMRs are an official republication of a community’s NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community’s chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit <http://www.fema.gov> and visit the “Flood Map Revision Processes” section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Clark County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBM) and/or Flood Boundary and Floodway Maps (FBFM) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 28, "Community Map History." A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.
- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or "pending" (for Preliminary FIS Reports) is shown. If the community is listed in Table 28 but not identified on the map, the community is treated as if it were unmapped.
- *Initial FHBM Effective Date* is the effective date of the first Flood Hazard Boundary Map (FHBM). This date may be the same date as the Initial NFIP Map Date.
- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.
- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community. This is the first effective date that is shown on the FIRM panel.
- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as Physical Map Revisions (PMR) of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Clark County FIRMs in countywide format was 06/05/2012.

Table 28: Community Map History

Community Name	Initial Identification Date (First NFIP Map Published)	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Clark County (Unincorporated Areas)	08/05/1977	08/05/1977	None	12/04/1986	06/05/2012
City of Winchester	05/31/1974	05/31/1974	09/03/1976	07/03/1986	06/05/2012

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 29 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 29: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Kentucky River and Approximate Studies	6/5/2012	AMEC Earth & Environmental	EMA 2007-CA-5772	July 2009	Clark County Unincorporated Areas and the City of Winchester
Sinkhole A, Town Branch, tributaries to Town Branch (T1-T4), tributaries to Lower Howard Creek (H1-H11) and Tributaries to Strodes Creek (S1-S6)	Later included in FISs dated 12/4/1986 and 7/3/1986	U.S. Department of Agriculture, Soil Conservation Service	N/A	January 1979	Clark County Unincorporated Areas and the City of Winchester

7.2 Community Meetings

The dates of the community meetings held for this FIS project and any previous FIS projects are shown in Table 30. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 30: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Clark County (Unincorporated Areas)		9/12/2012	Discovery	Representatives of FEMA, KDOW, U.S. Army Corps of Engineers (Huntington District), the study contractor, and local community officials
		11/3/2015, 11/4/2015	Flood Risk Review Meeting	Representatives of FEMA, KDOW, USGS, AECOM, Stantec, Bluegrass ADD, and local community officials
			Resilience	TBD
			CCO Open House	TBD
City of Winchester		9/12/2012	Discovery	Representatives of FEMA, KDOW, U.S. Army Corps of Engineers (Huntington District), the study contractor, and local community officials
		11/3/2015, 11/4/2015	Flood Risk Review Meeting	Representatives of FEMA, KDOW, USGS, AECOM, Stantec, Bluegrass ADD, and local community officials
			Resilience	TBD
			CCO Open House	TBD

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see <http://www.fema.gov>.

Table 31 is a list of the locations where FIRMs for Clark County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 31: Map Repositories

Community	Address	City	State	Zip Code
Clark County (Unincorporated Areas)	34 South Main Street	Winchester	KY	40391
City of Winchester	32 Wall Street	Winchester	KY	40391

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 32.

Table 32 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the state NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of state and local GIS data in their state.

Table 32: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	http://www.fema.gov
NFIP website	http://www.fema.gov/national-flood-insurance-program
NFHL Dataset	http://msc.fema.gov
FEMA Region IV	Federal Regional Office, 3003 Chamblee Tucker Rd, Atlanta, GA 30341 (770) 220-5200
Other Federal Agencies	
USGS website	http://www.usgs.gov
Hydraulic Engineering Center website	http://www.hec.usace.army.mil

Table 32: Additional Information

State Agencies and Organizations	
State NFIP Coordinator	Alex J. VanPelt Environmental Scientist IV Floodplain Management Branch Kentucky Division of Water 200 Fair Oaks Lane Frankfort, KY 40601 (502) 564-3410 alex.vanpelt@ky.gov
State GIS Coordinator	Kent Anness Kentucky Division of Geographic Information 100 Fair Oaks Frankfort, KY 40601 (502) 564-6268 kent.anness@ky.gov
Statewide Regulatory Coordinator	Carey Johnson Coordinating Technical Program Manager Kentucky Division of Water 200 Fair Oaks Lane Frankfort, KY 40601 (502) 564-3410 Carey.Johnson@ky.gov

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

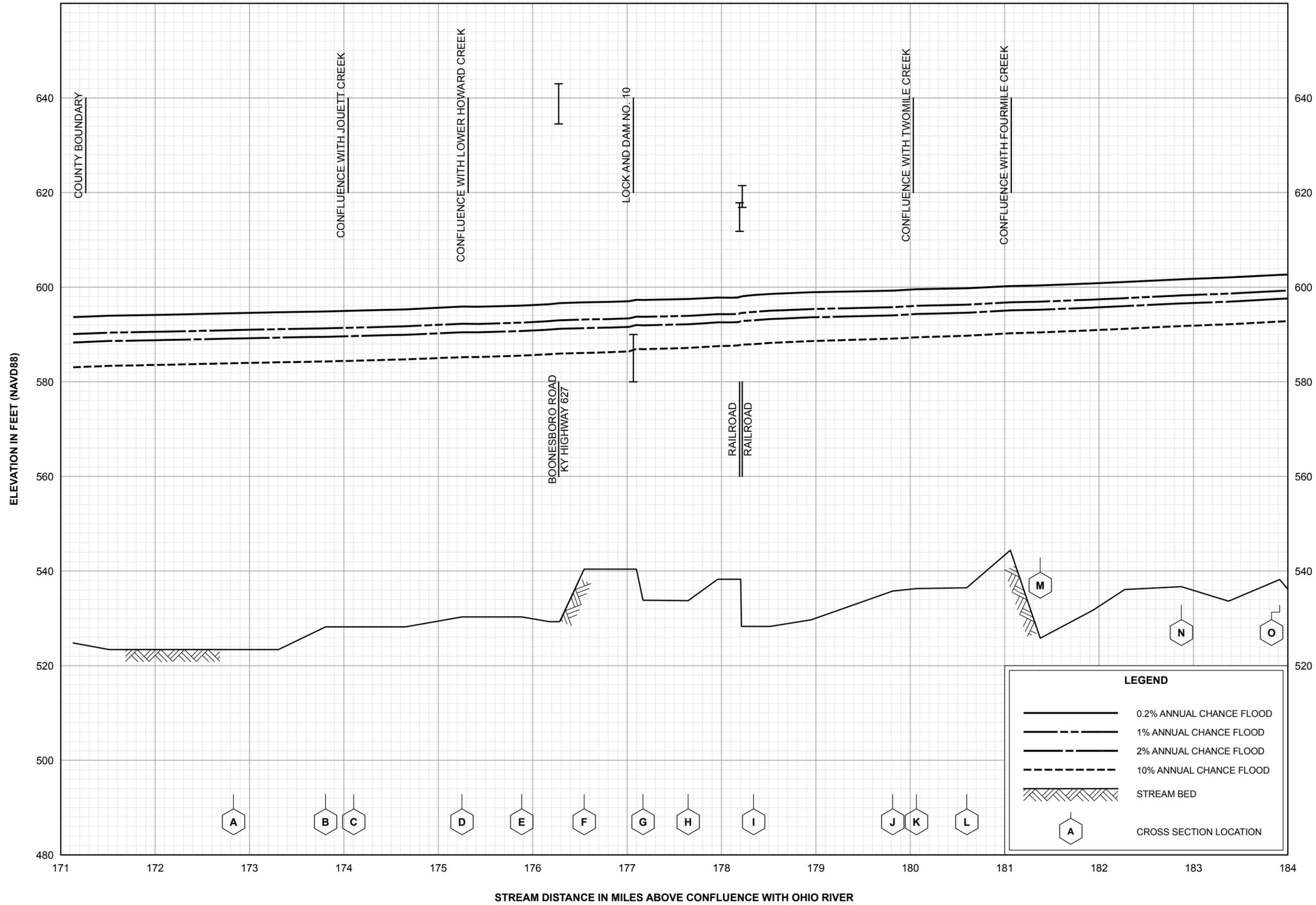
Table 33 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 33: Bibliography and References

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
ACWI 2005	Advisory Committee on Water Information (ACWI)	Bulletin 17-B Guidelines for Determining Flood Flow Frequency: Frequently Asked Questions	Subcommittee on Hydrology: Hydrologic Frequency Analysis Work Group		2005	
Clark 1986	Federal Emergency Management Agency	Flood Insurance Study, Clark County Unincorporated Areas, Kentucky		Washington D.C.	December 4, 1986	
Clark 2012	Federal Emergency Management Agency	Flood Insurance Study, Clark County Unincorporated Areas, Kentucky		Washington D.C.	June 5, 2012	
EPA 2014	Environmental Protection Agency	Surf Your Watershed	Office of Water	Washington D.C.	Accessed: September 2014	http://cfpub.epa.gov/surf/locate/index.cfm
Hodgkins 2003	U.S. Geological Survey Water Resources Investigations Report 03-4180	"Estimating the Magnitude of Peak Flows for Streams in Kentucky for Selected Recurrence Intervals."	Hodgkins, G.A. and Martin, G.R.		2003	
USACE 1972	U.S. Army Corps of Engineers	TP-39: A Method for Analyzing Effects of Dam Failures in Design Studies	USACE Hydrologic Engineering Center	Davis, CA	1972	
USACE 2010	U.S. Army Corps of Engineers	HEC-RAS, River Analysis System User's Manual, Version 4.1	Hydrologic Engineering Center	Davis, CA	2010	

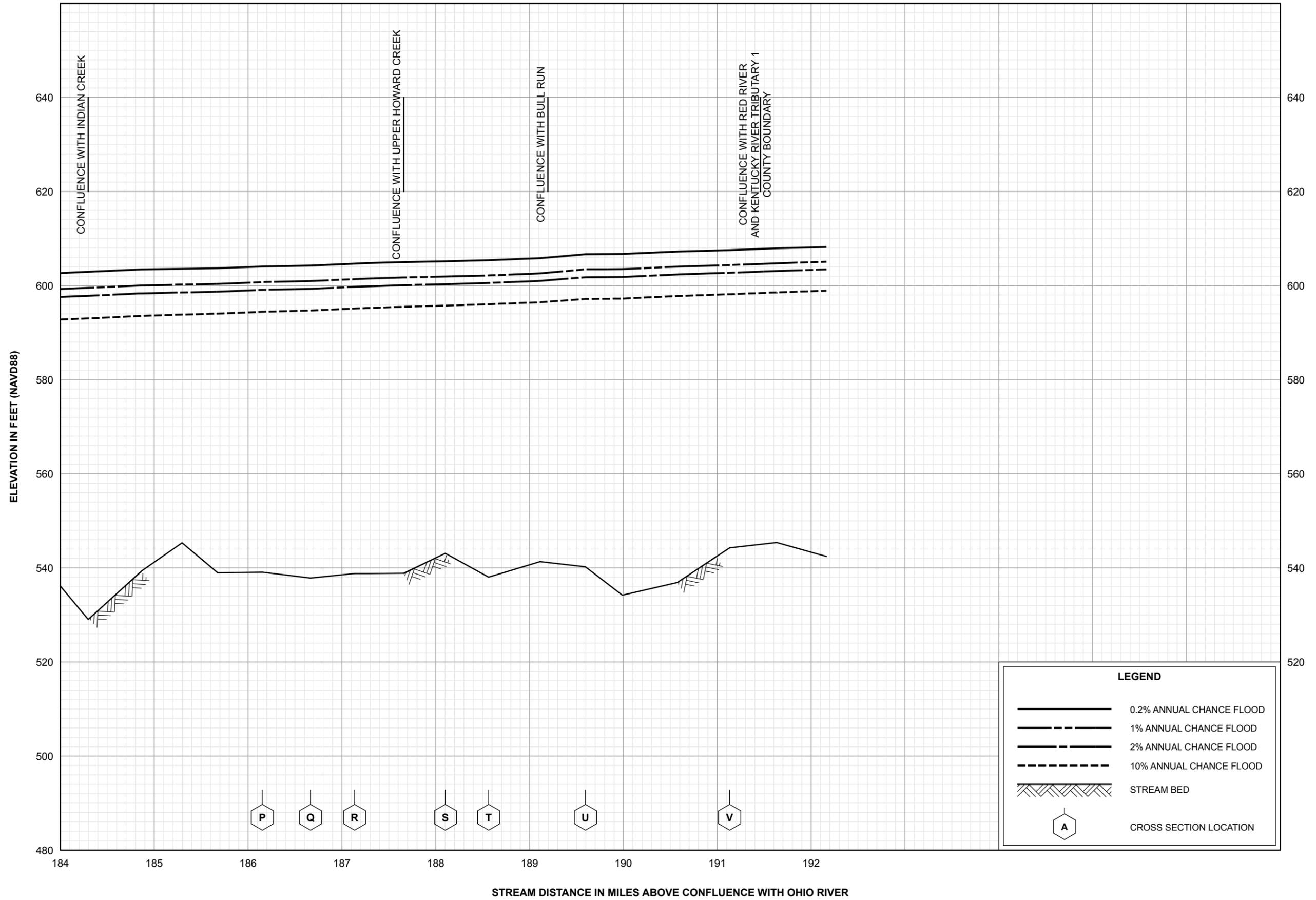
Table 33: Bibliography and References

Citation in this FIS	Publisher/ Issuer	<i>Publication Title, "Article,"</i> Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USDA 1979	U.S. Department of Agriculture	Flood Hazard Study, Lower Howard Creek and Tributaries, Strodes Creek and Tributaries,, Town Branch and Tributaries, in the City of Winchester and Clark County, Kentucky,	Soil Conservation Service	Washington D.C.	January 1979	
USGS 1982	U.S. Geological Survey Office of Water Data Coordination	Guidelines for Determining Flood Flow Frequency, Bulletin 17-B of the Hydrology Subcommittee	U.S. Interagency Advisory Committee on Water Data	Reston, VA	1982	
Winchester 1986	Federal Emergency Management Agency	Flood Insurance Study, City of Winchester, Kentucky		Washington D.C.	July 3, 1986	



FLOOD PROFILES
KENTUCKY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS

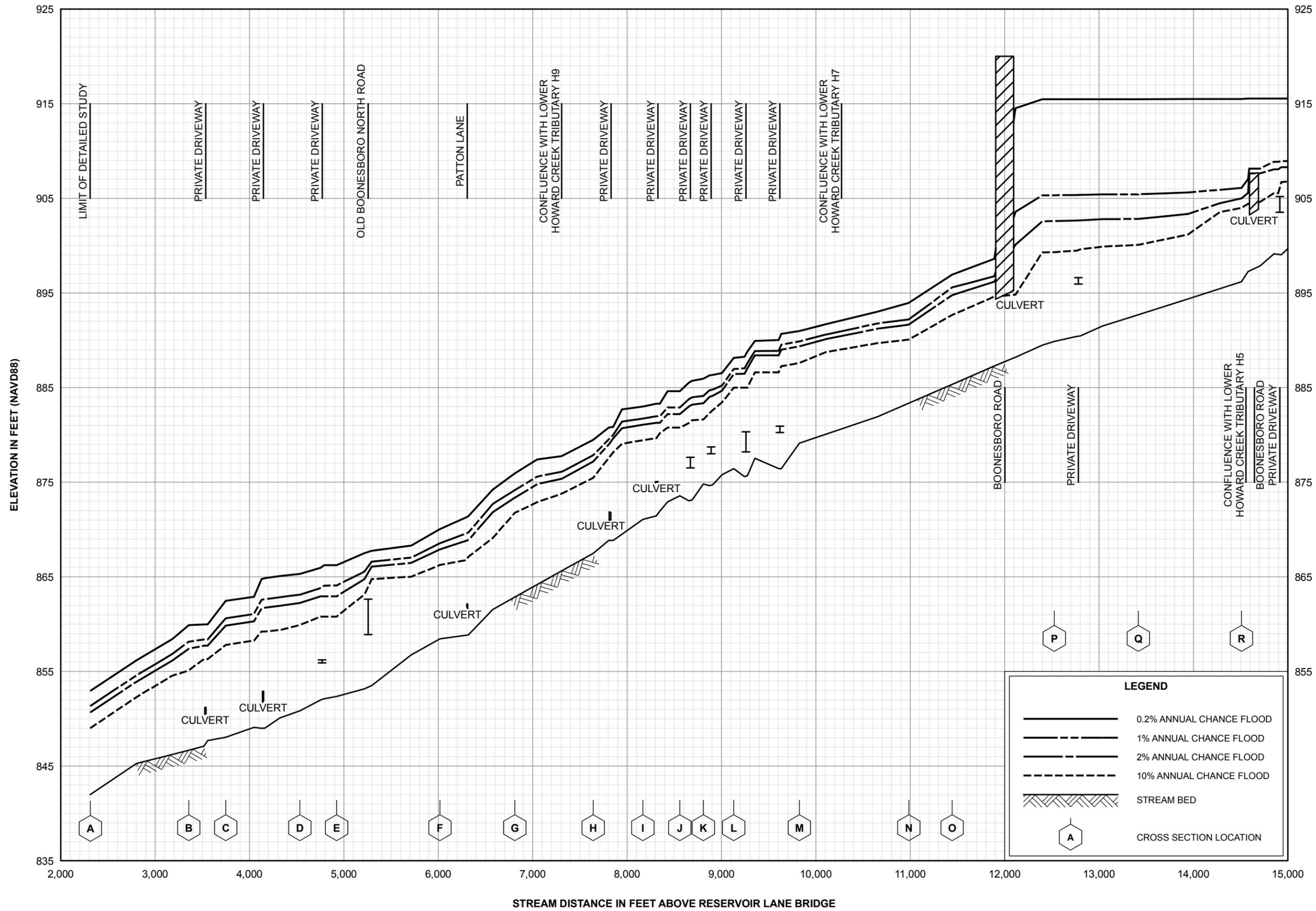


FLOOD PROFILES
KENTUCKY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS

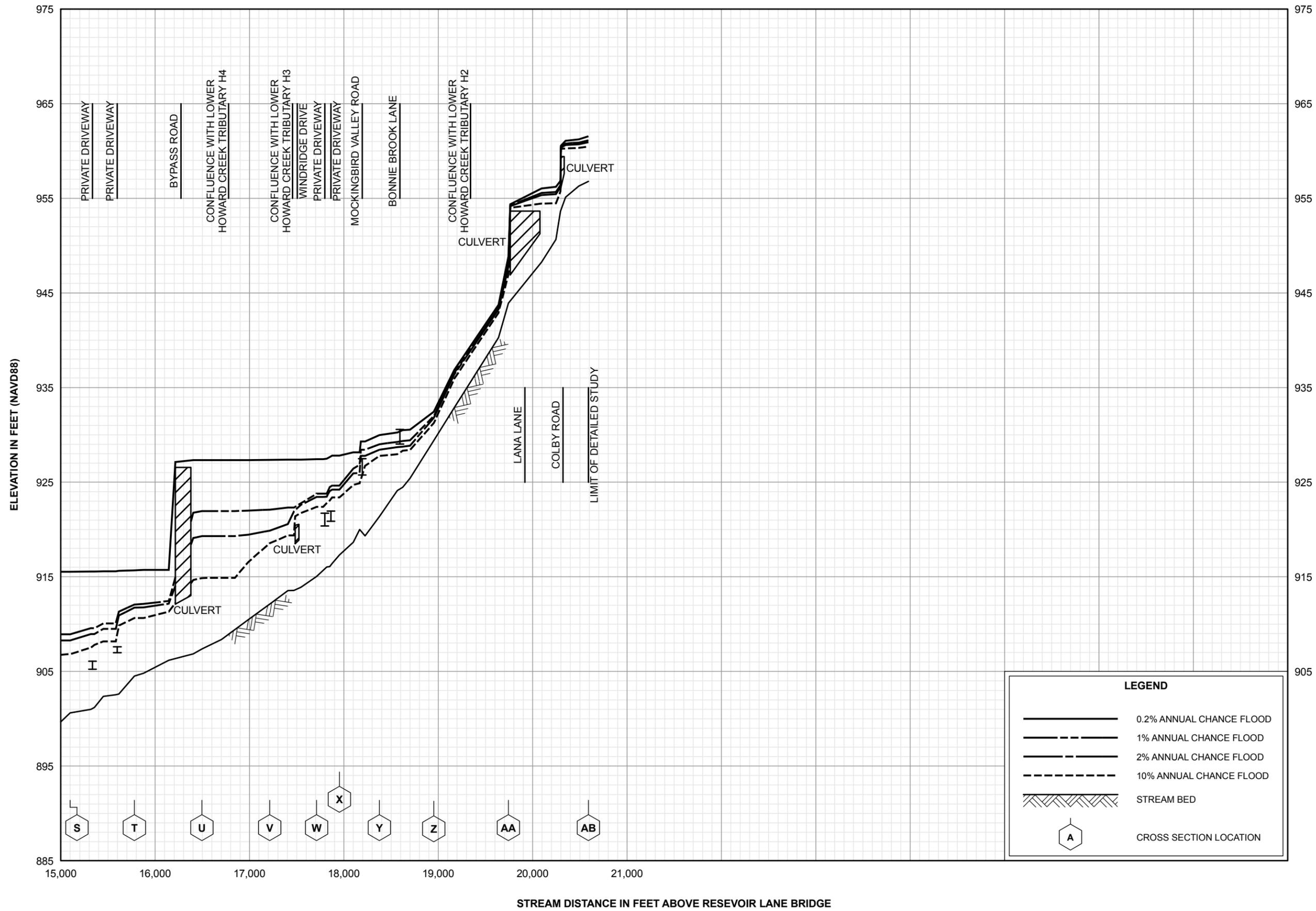
LEGEND

	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION



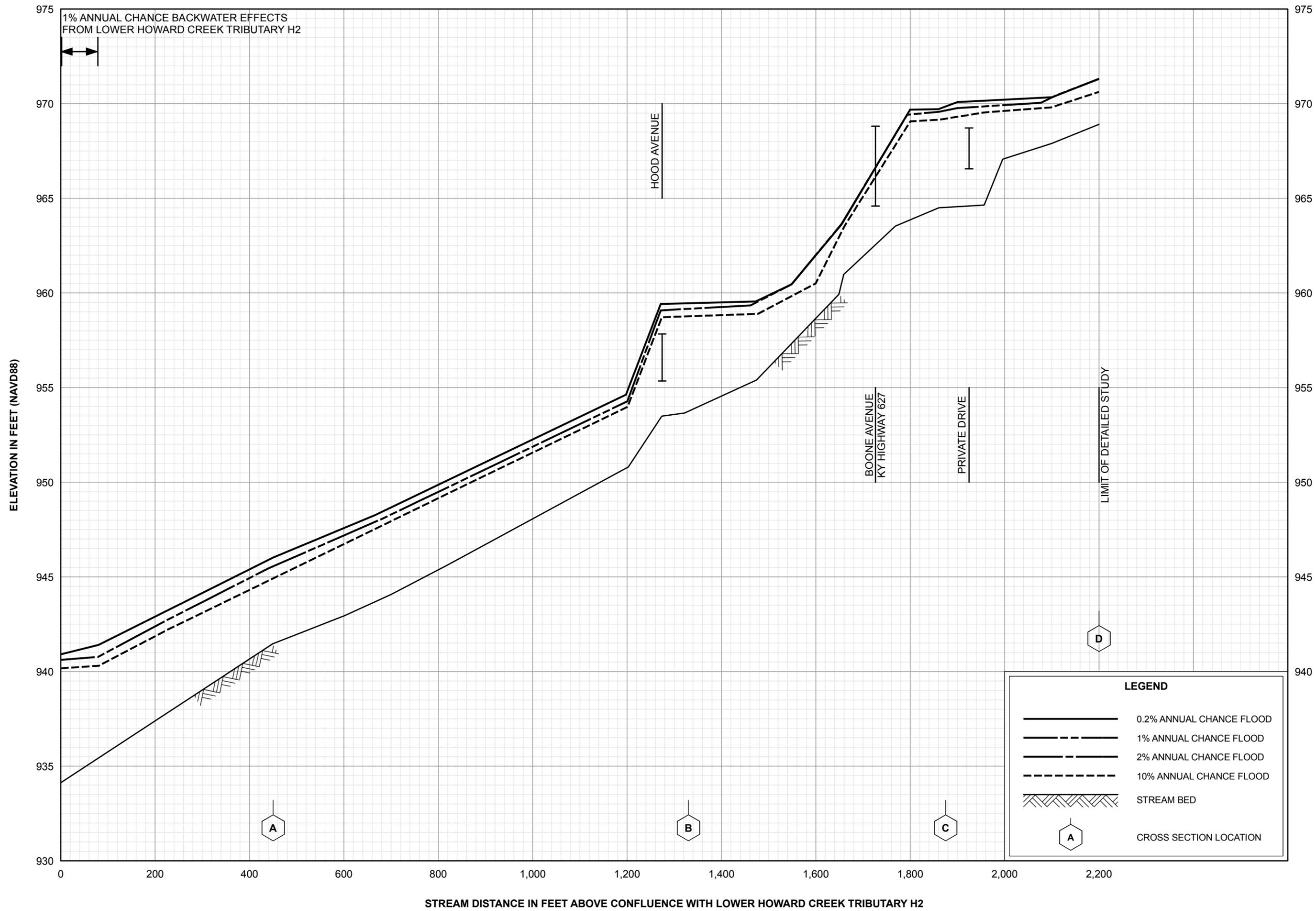
FLOOD PROFILES
LOWER HOWARD CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY
AND INCORPORATED AREAS



LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- - - 1% ANNUAL CHANCE FLOOD
- - - - 2% ANNUAL CHANCE FLOOD
- - - - - 10% ANNUAL CHANCE FLOOD
- ▨ STREAM BED
- ⬡ A CROSS SECTION LOCATION

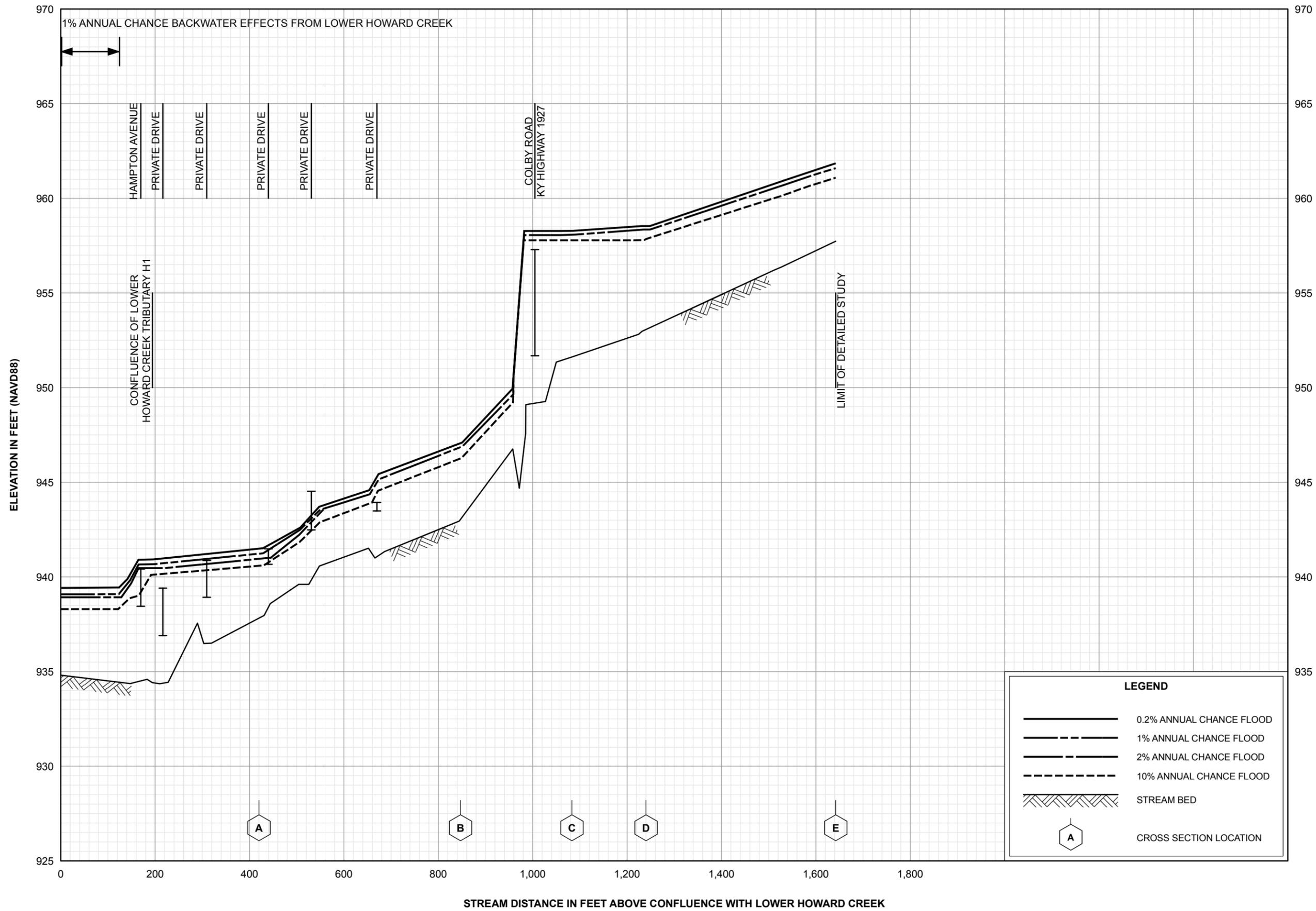


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H1

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

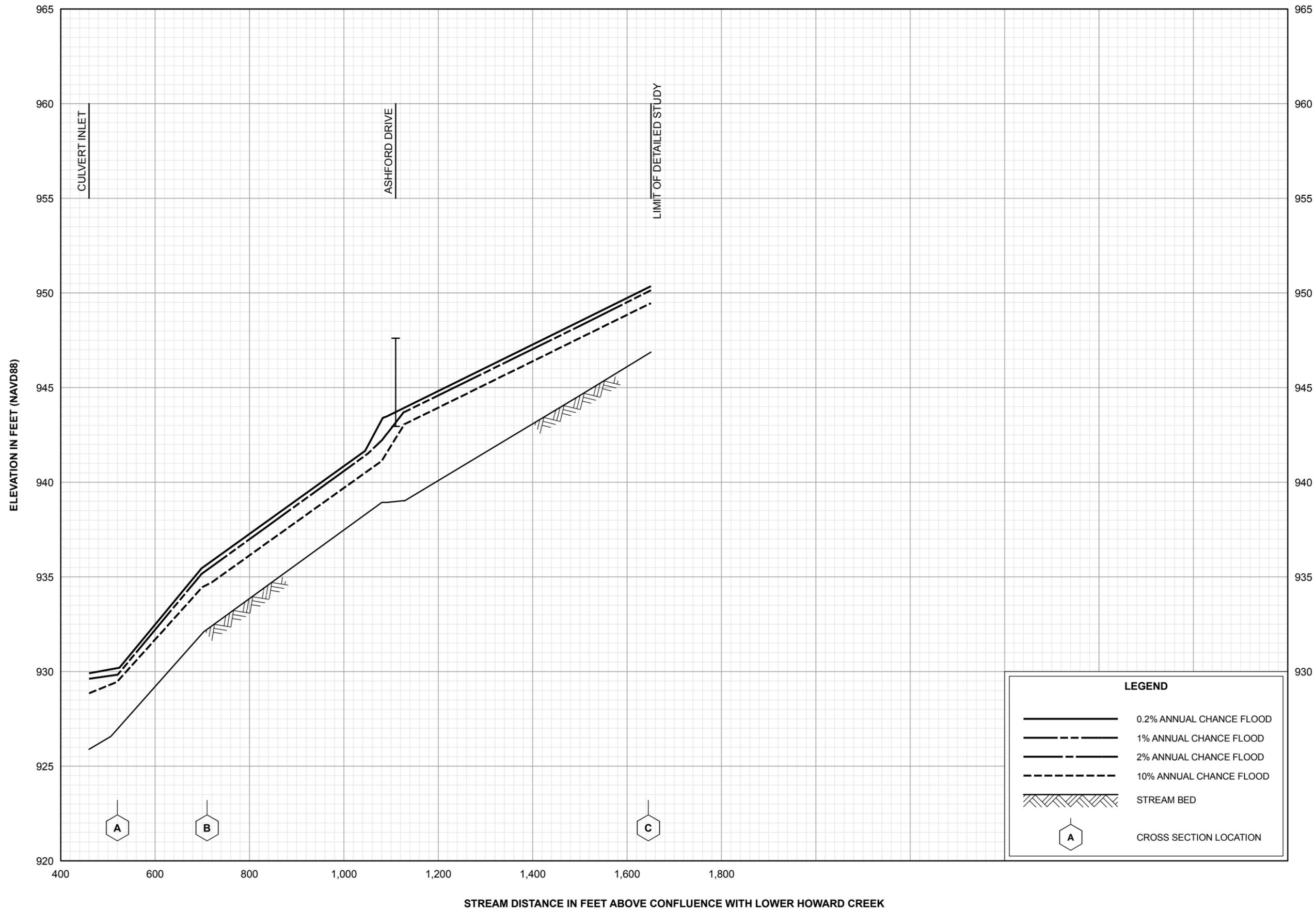


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



LEGEND

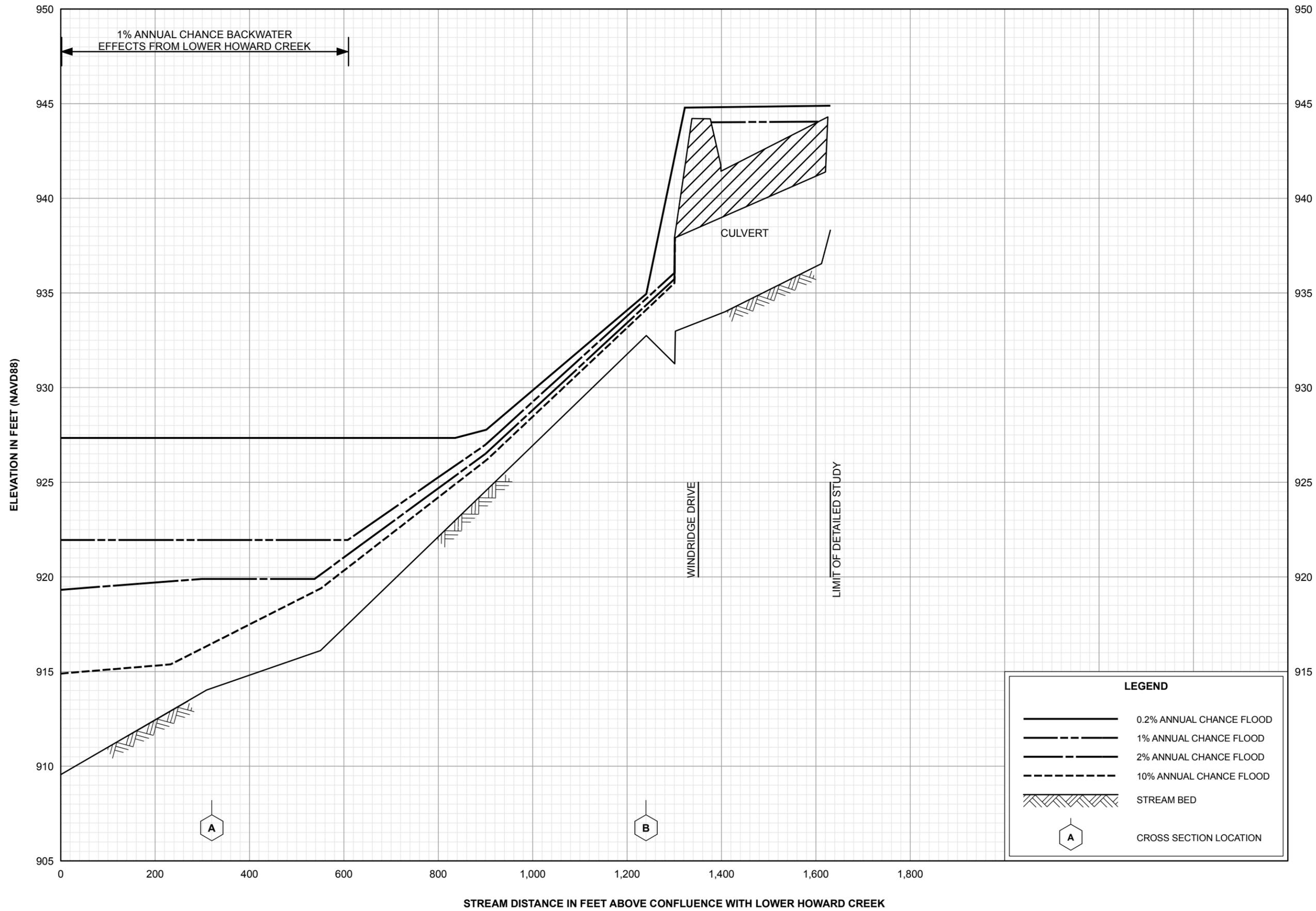
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-  1% ANNUAL CHANCE FLOOD
-  2% ANNUAL CHANCE FLOOD
-  10% ANNUAL CHANCE FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H3

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

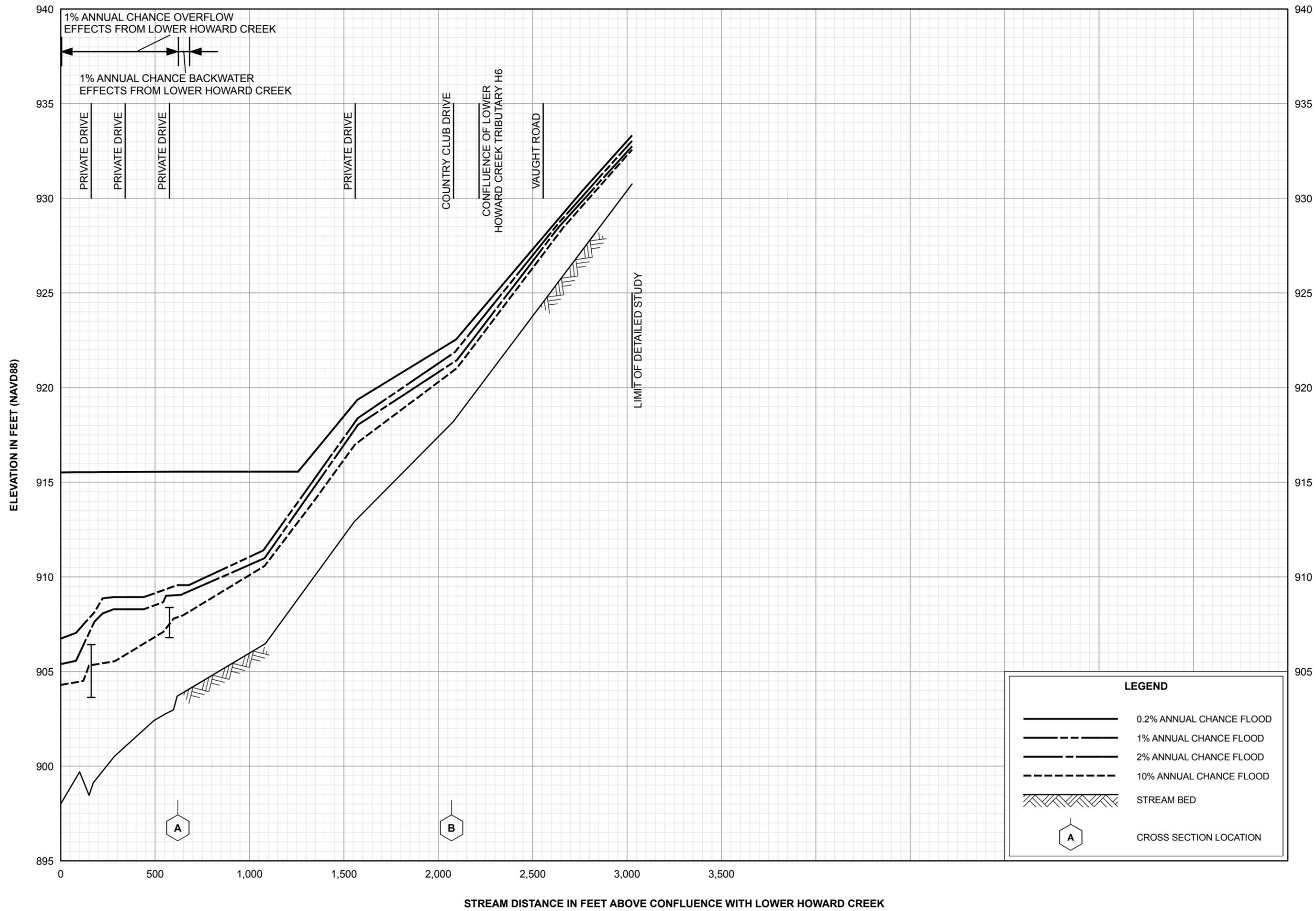


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H4

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

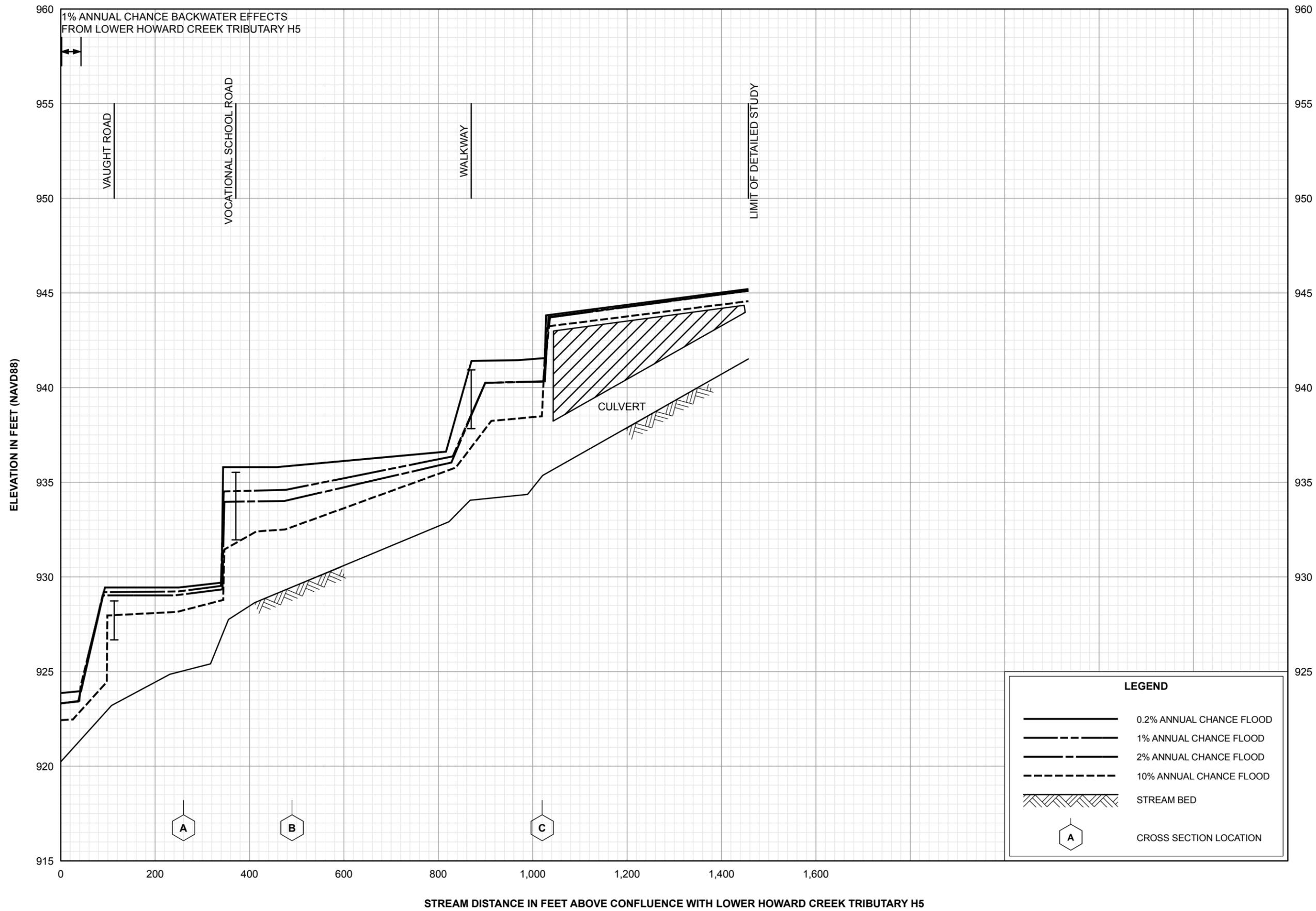
FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, KY
AND INCORPORATED AREAS

FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H5

09P



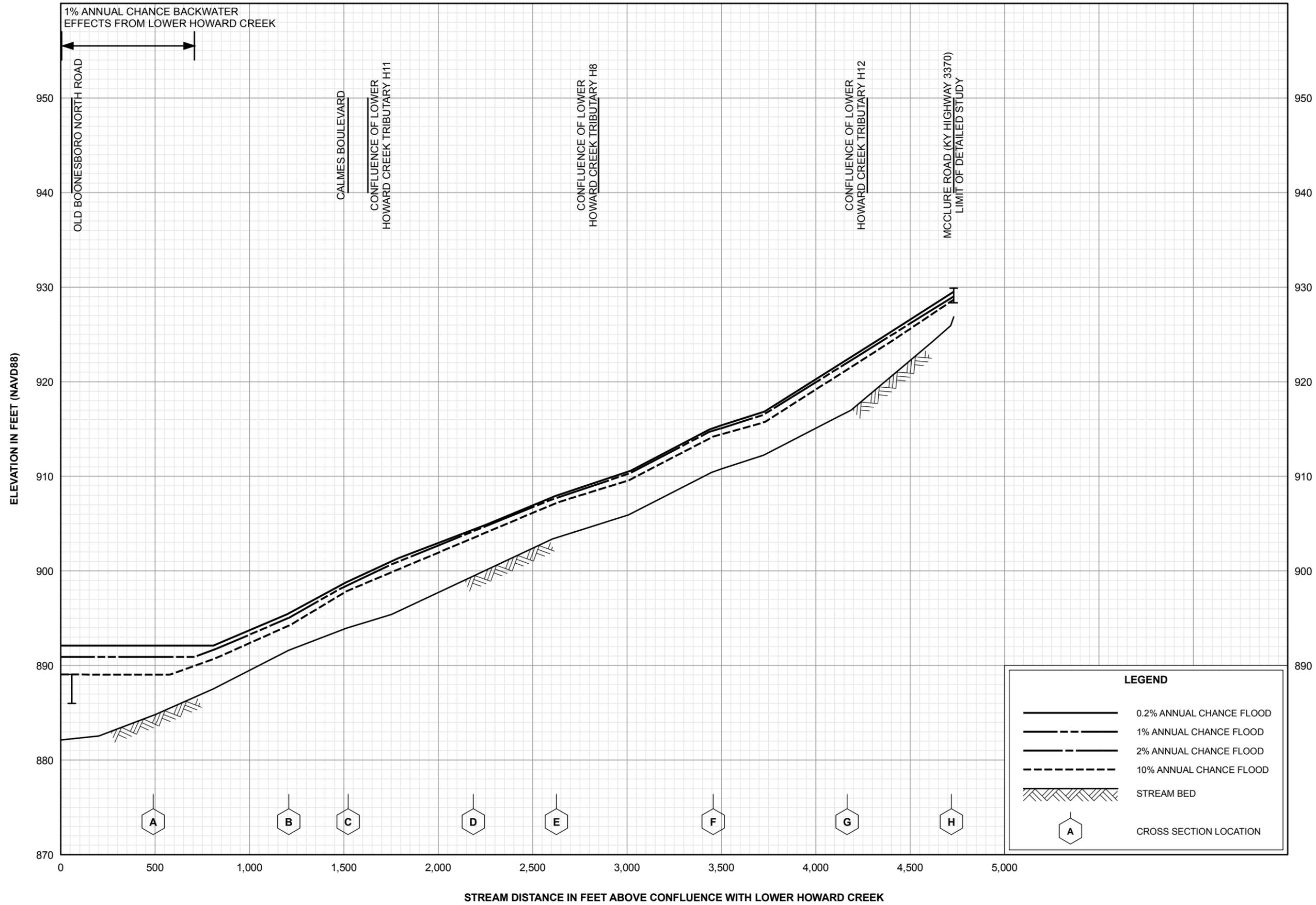
LEGEND	
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	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H6

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

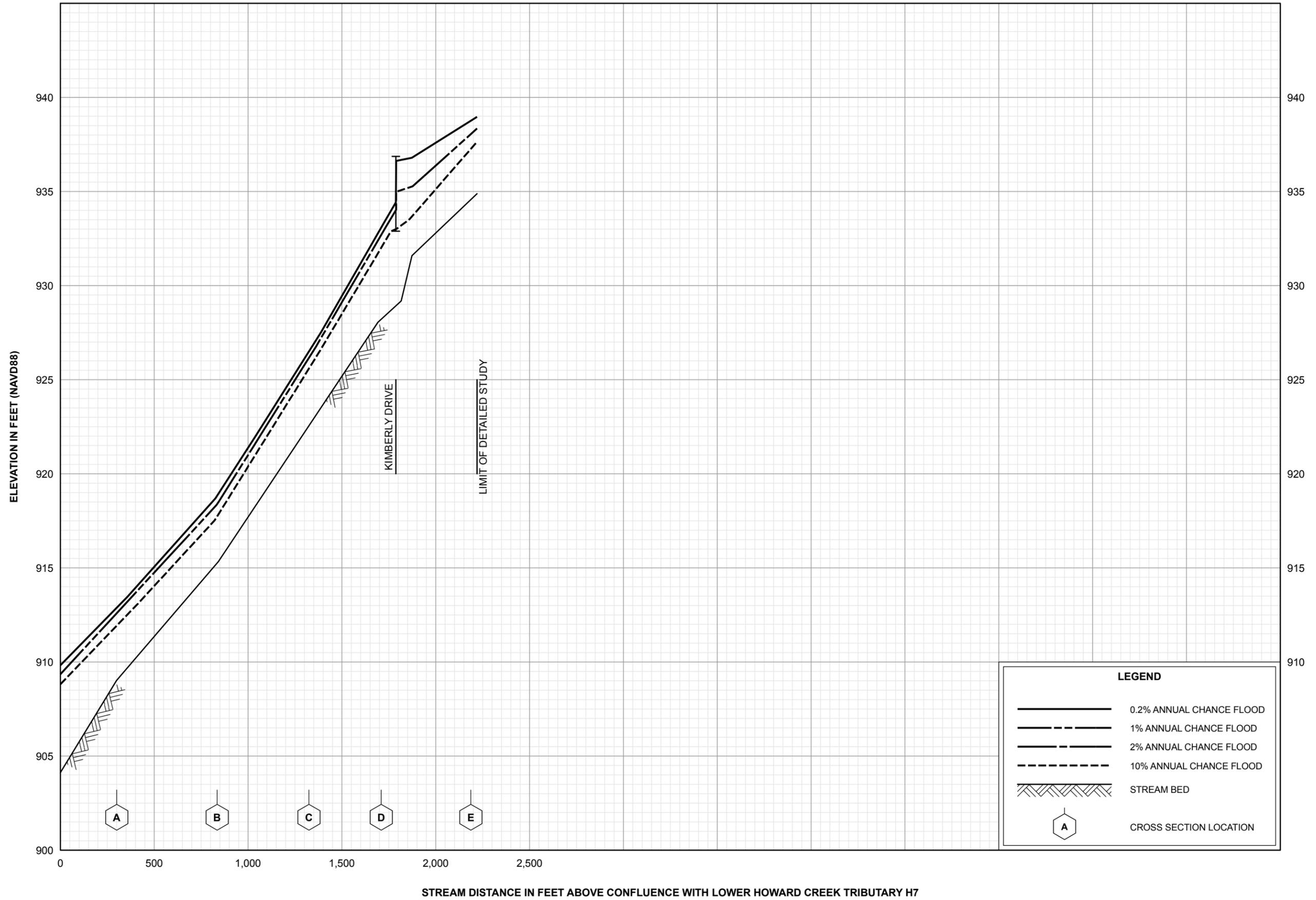


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H7

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



LEGEND

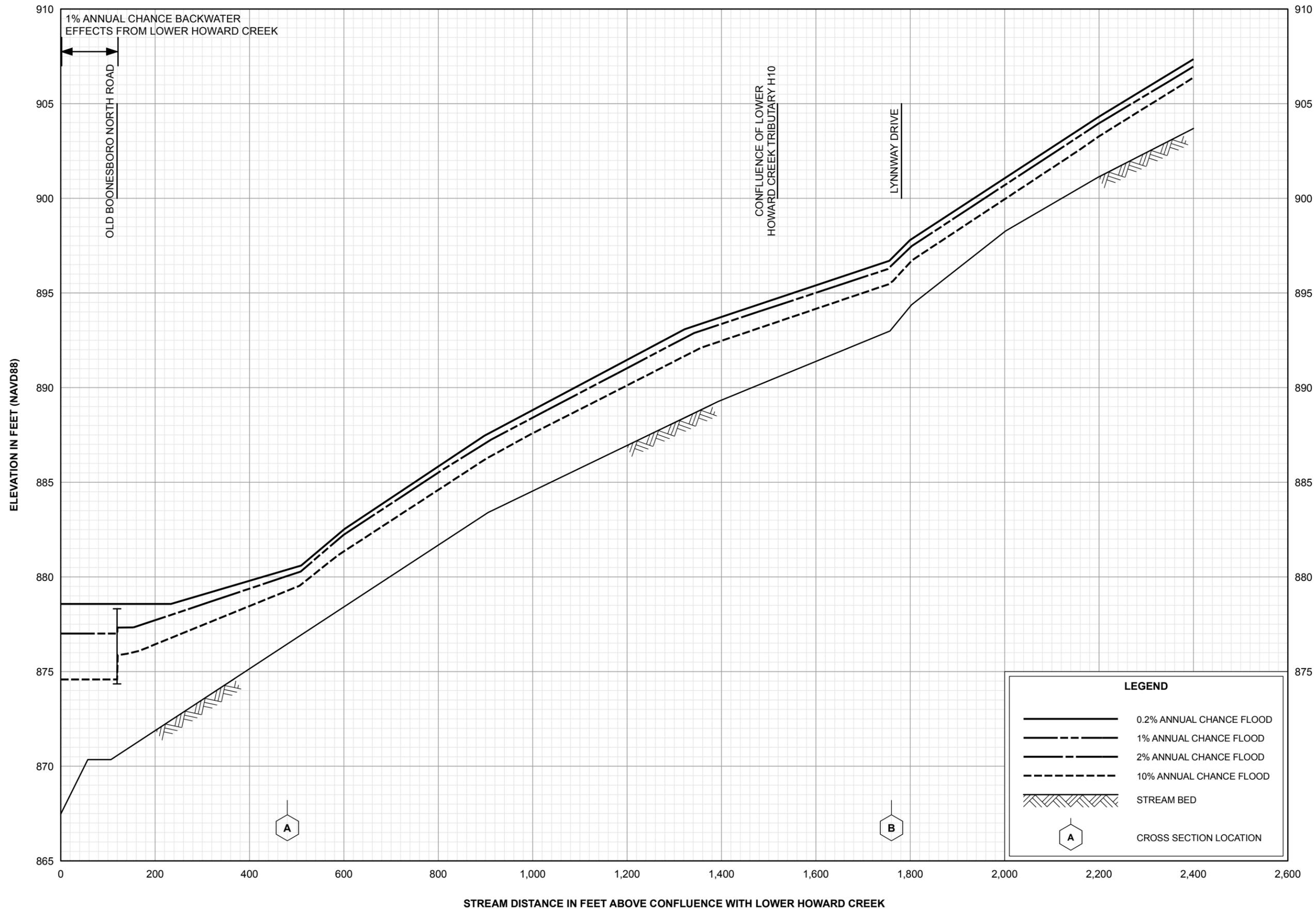
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-  1% ANNUAL CHANCE FLOOD
-  2% ANNUAL CHANCE FLOOD
-  10% ANNUAL CHANCE FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H8

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

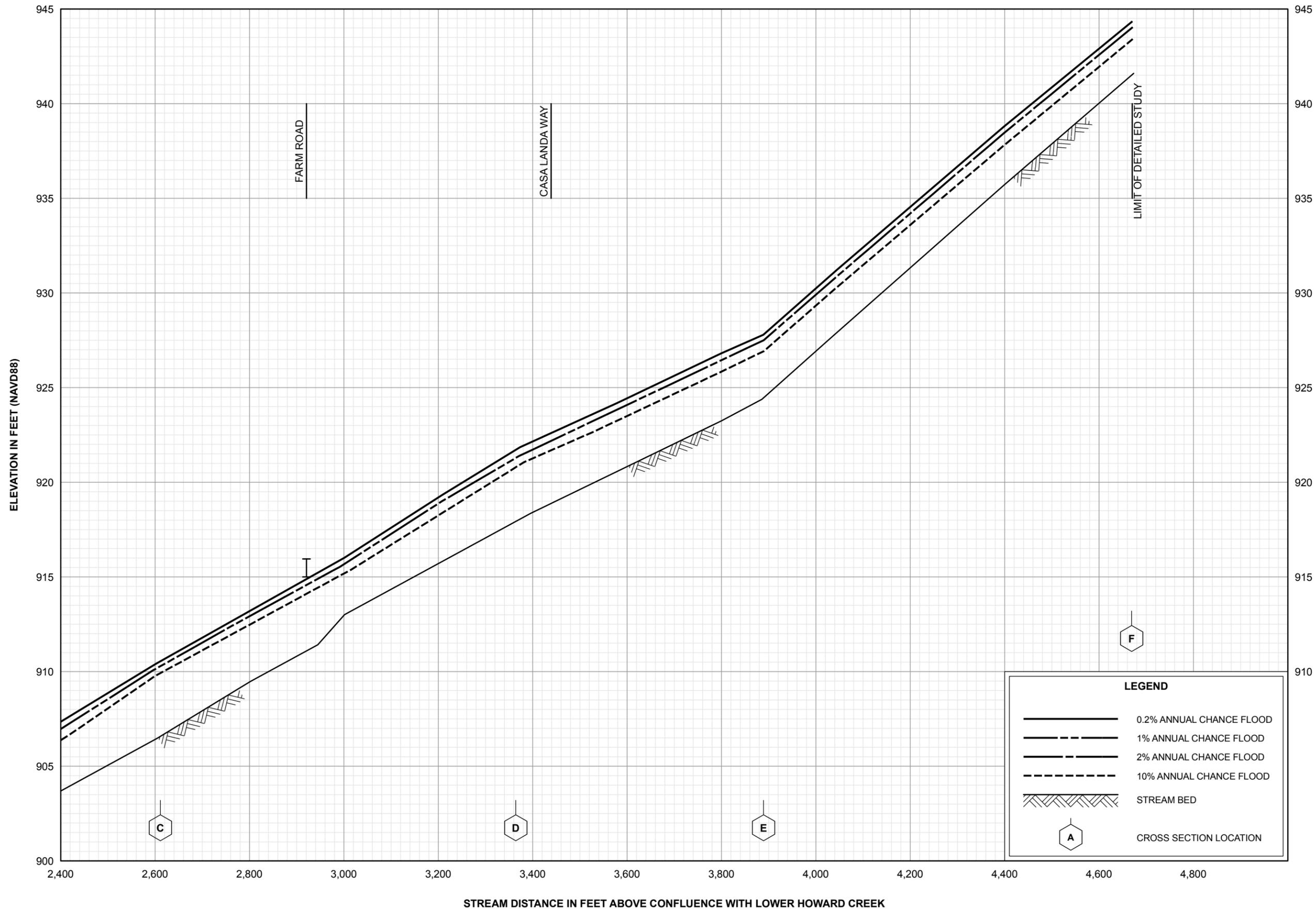


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H9

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

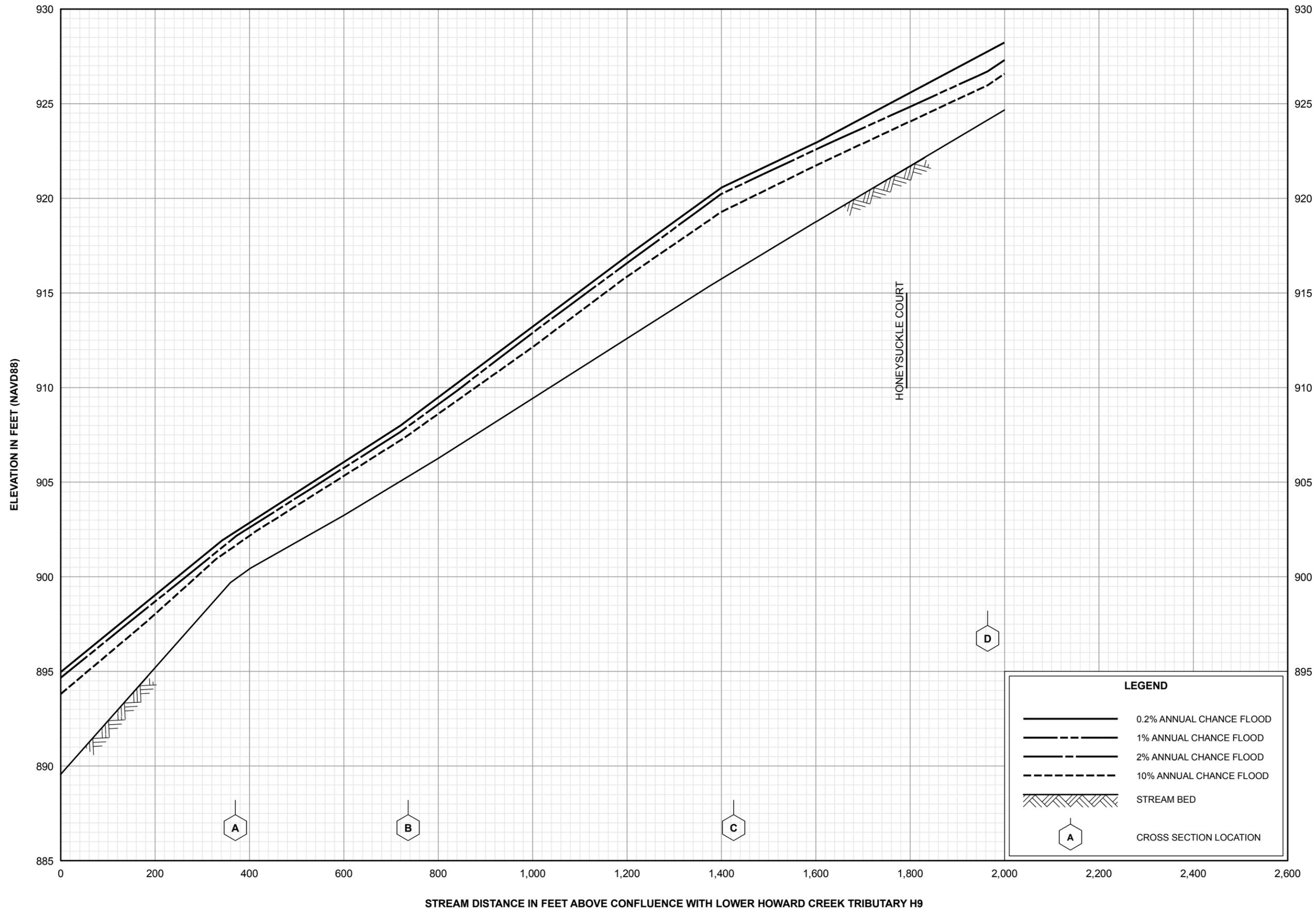


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H9

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

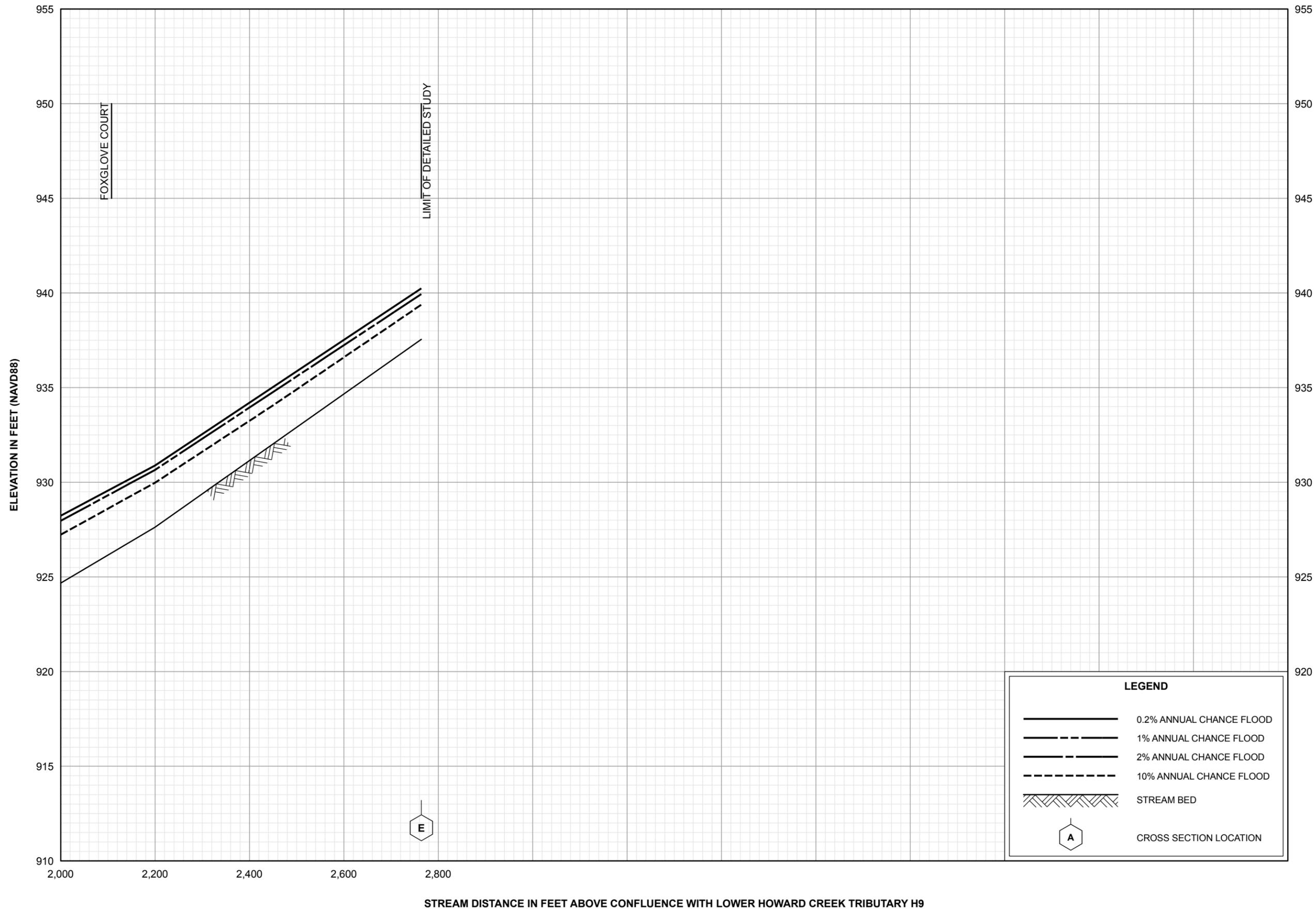


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H10

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

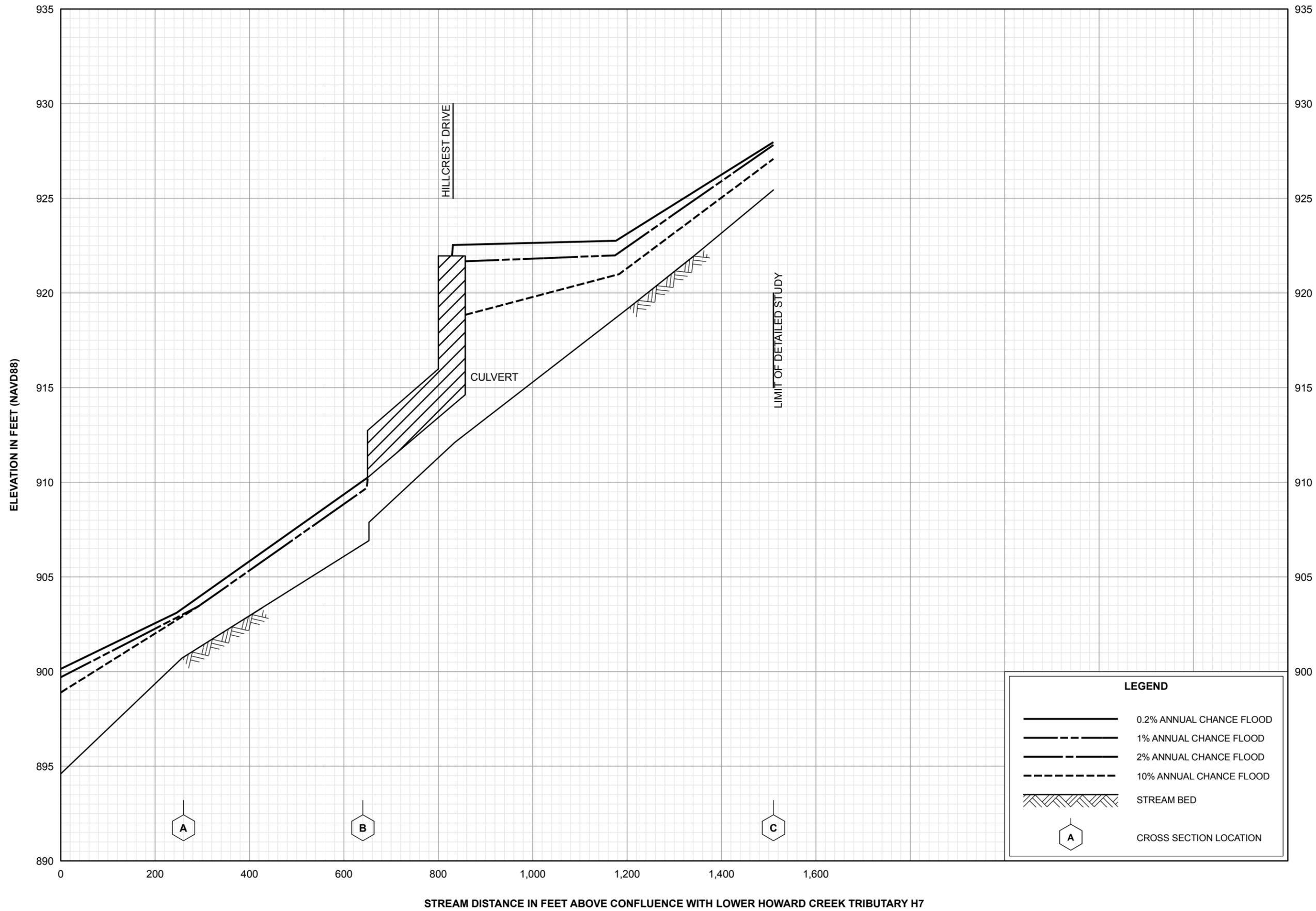


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H10

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

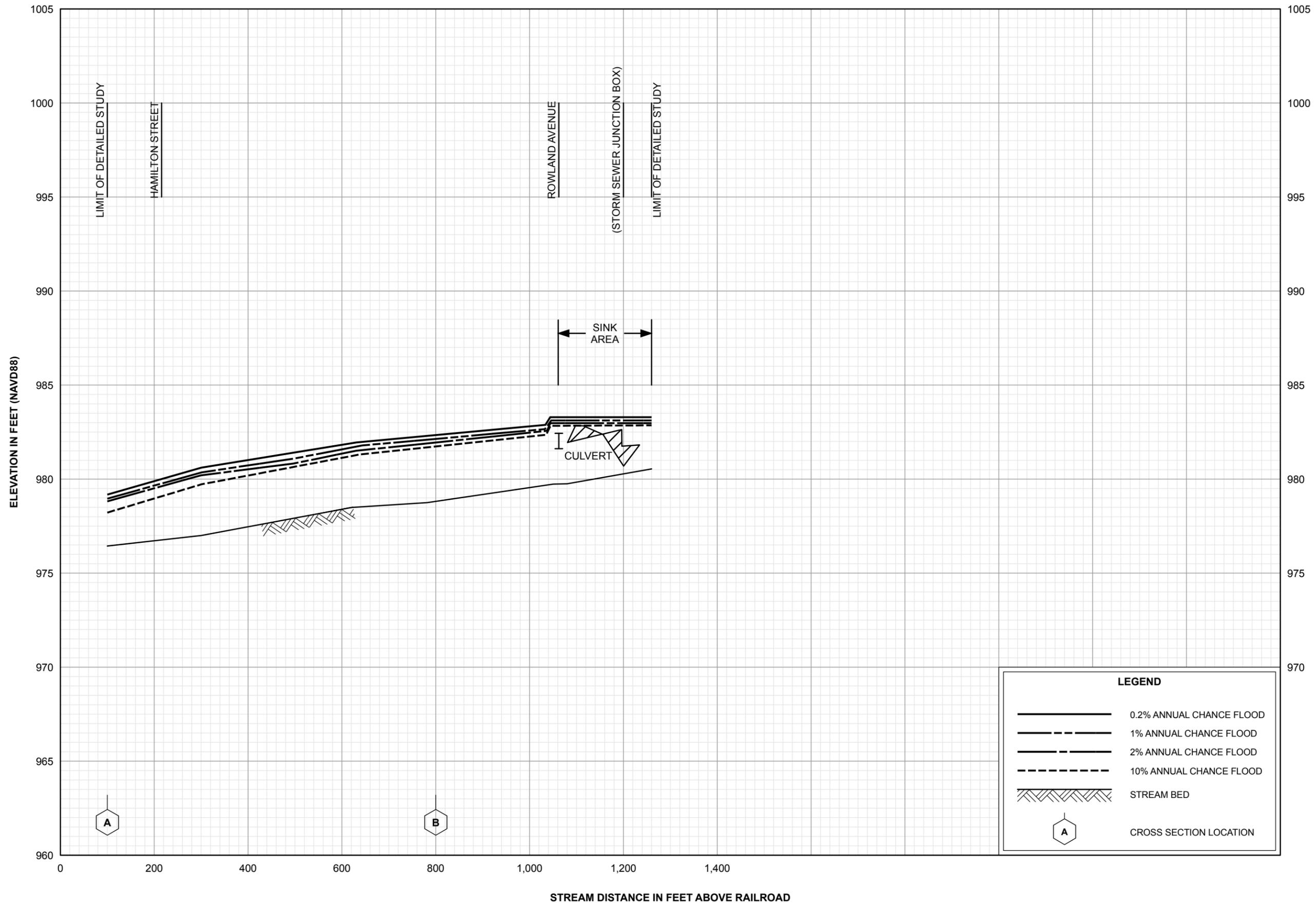


FLOOD PROFILES

LOWER HOWARD CREEK TRIBUTARY H11

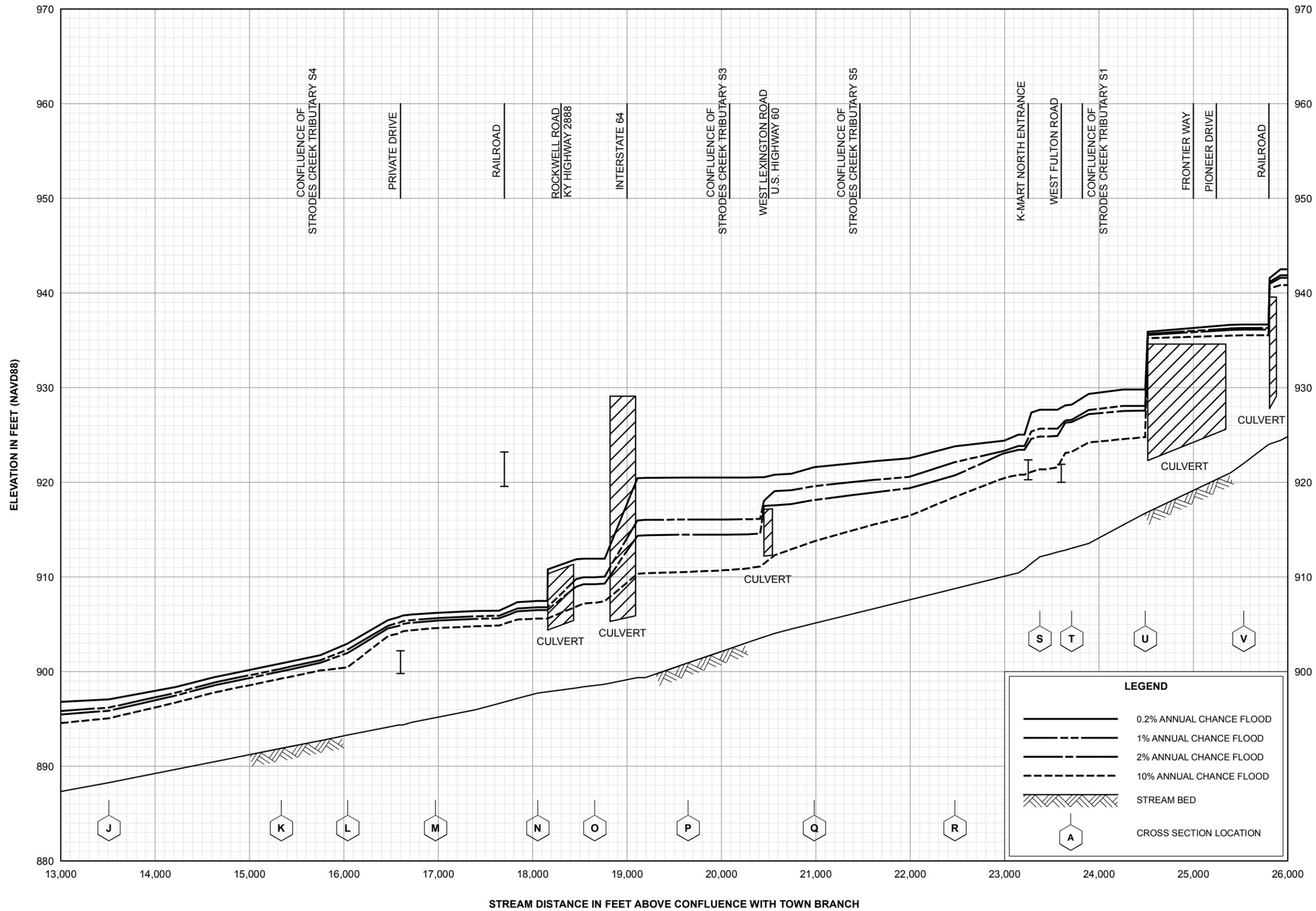
FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



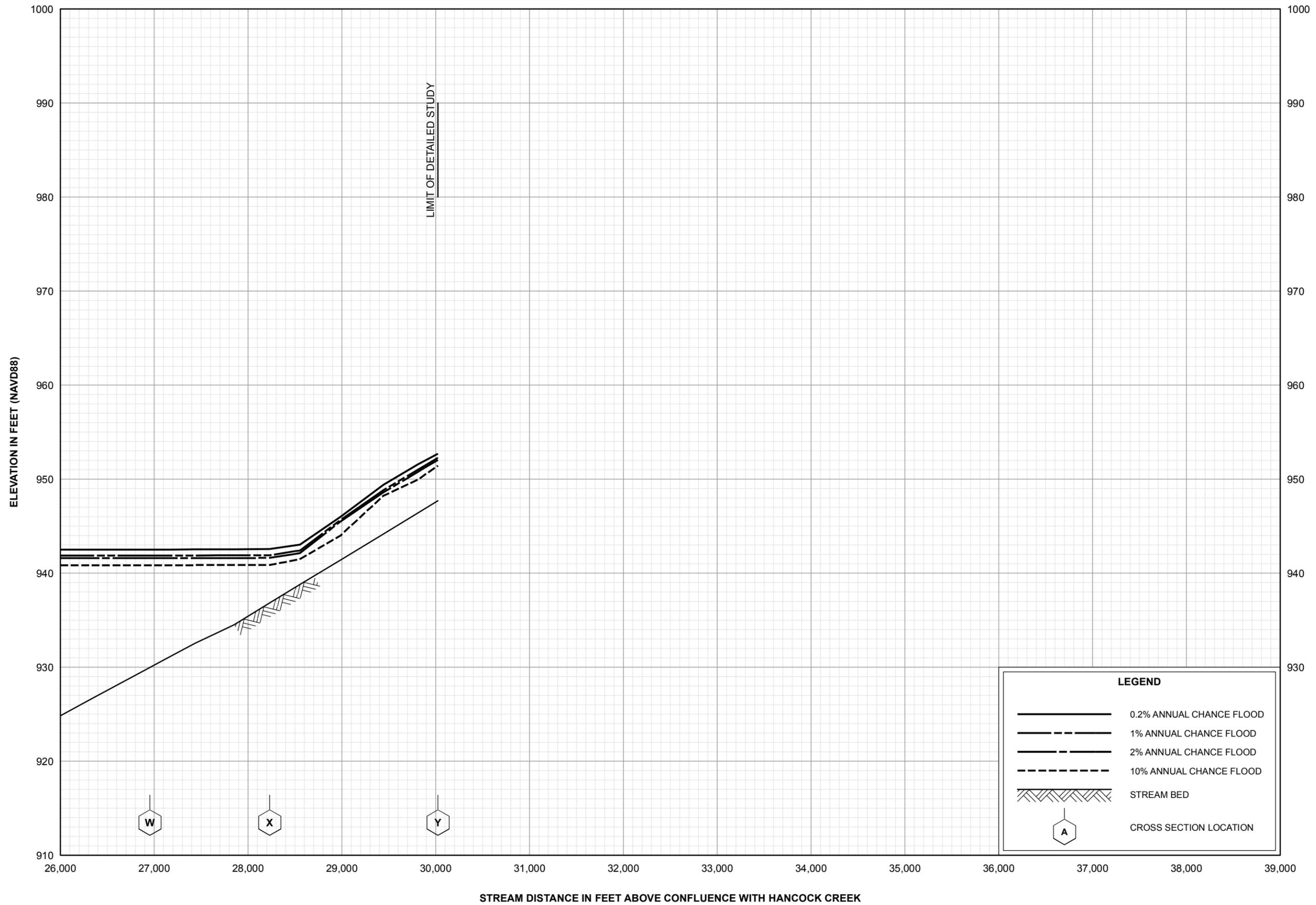
FLOOD PROFILES
SINKHOLE A

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS



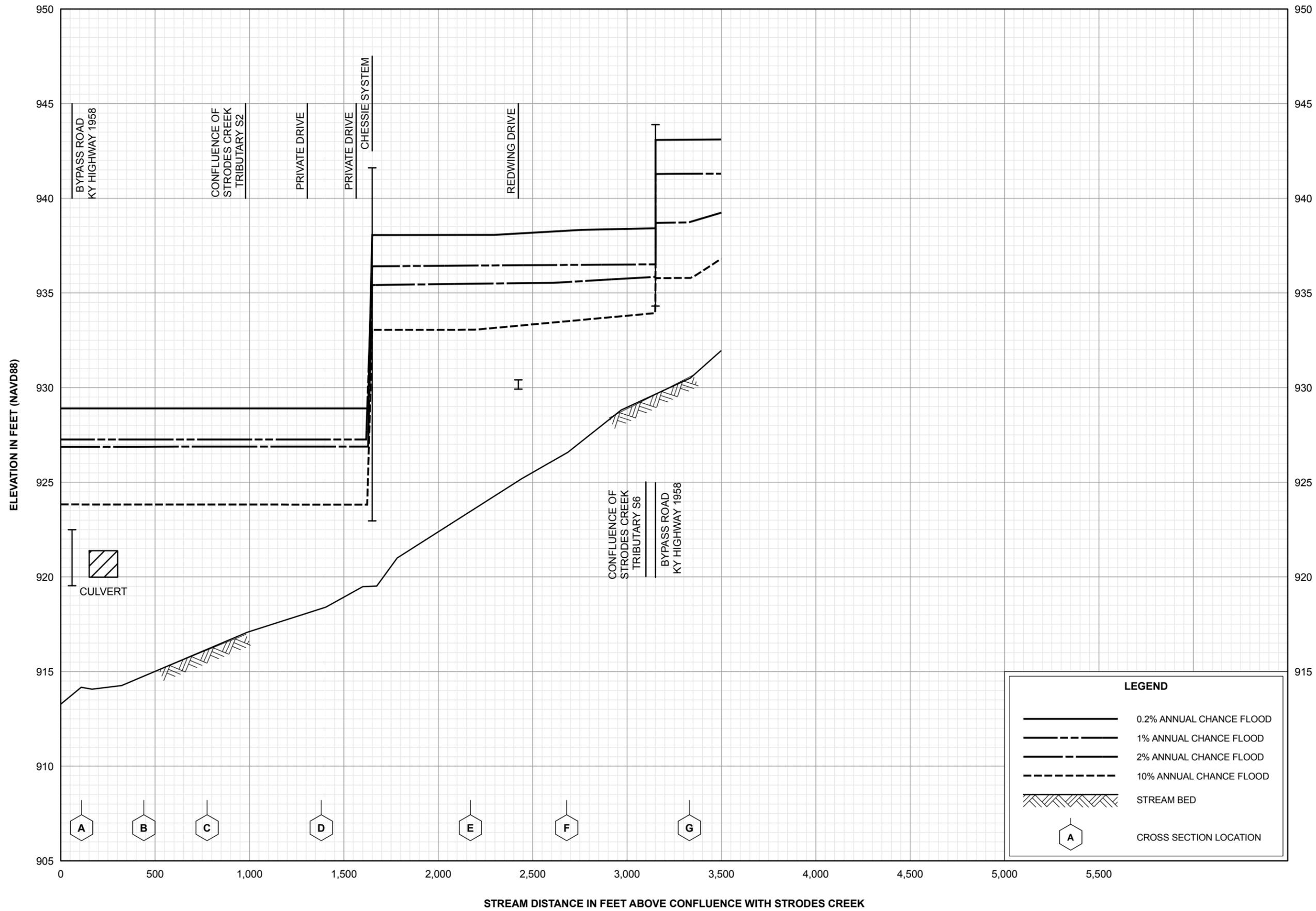
FLOOD PROFILES
STRODES CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS



FLOOD PROFILES
STRODES CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS

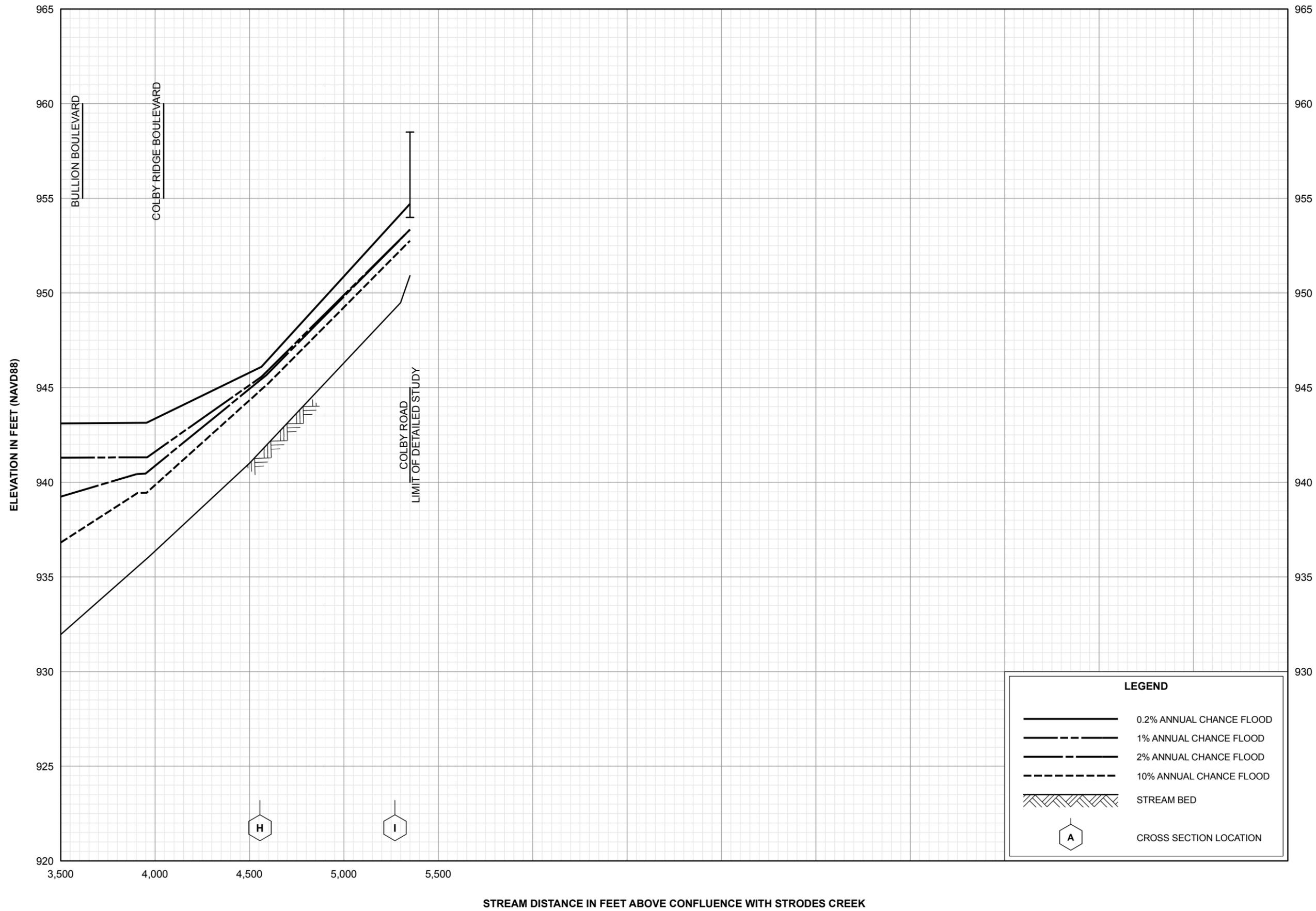


FLOOD PROFILES
STRODES CREEK TRIBUTARY S1

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS

LEGEND

	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

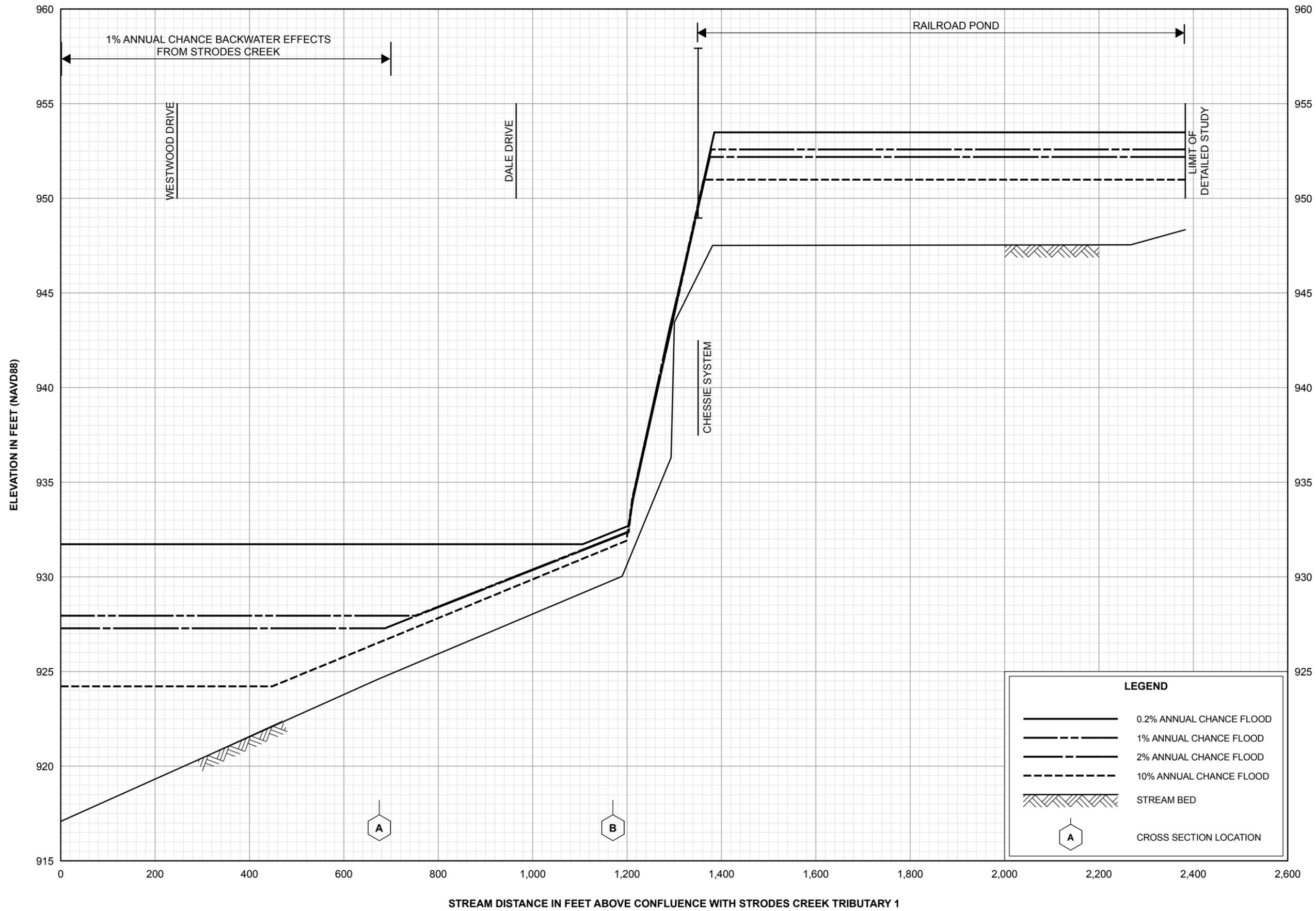


LEGEND

-  0.2% ANNUAL CHANCE FLOOD
-  1% ANNUAL CHANCE FLOOD
-  2% ANNUAL CHANCE FLOOD
-  10% ANNUAL CHANCE FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

FLOOD PROFILES
STRODES CREEK TRIBUTARY S1

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS



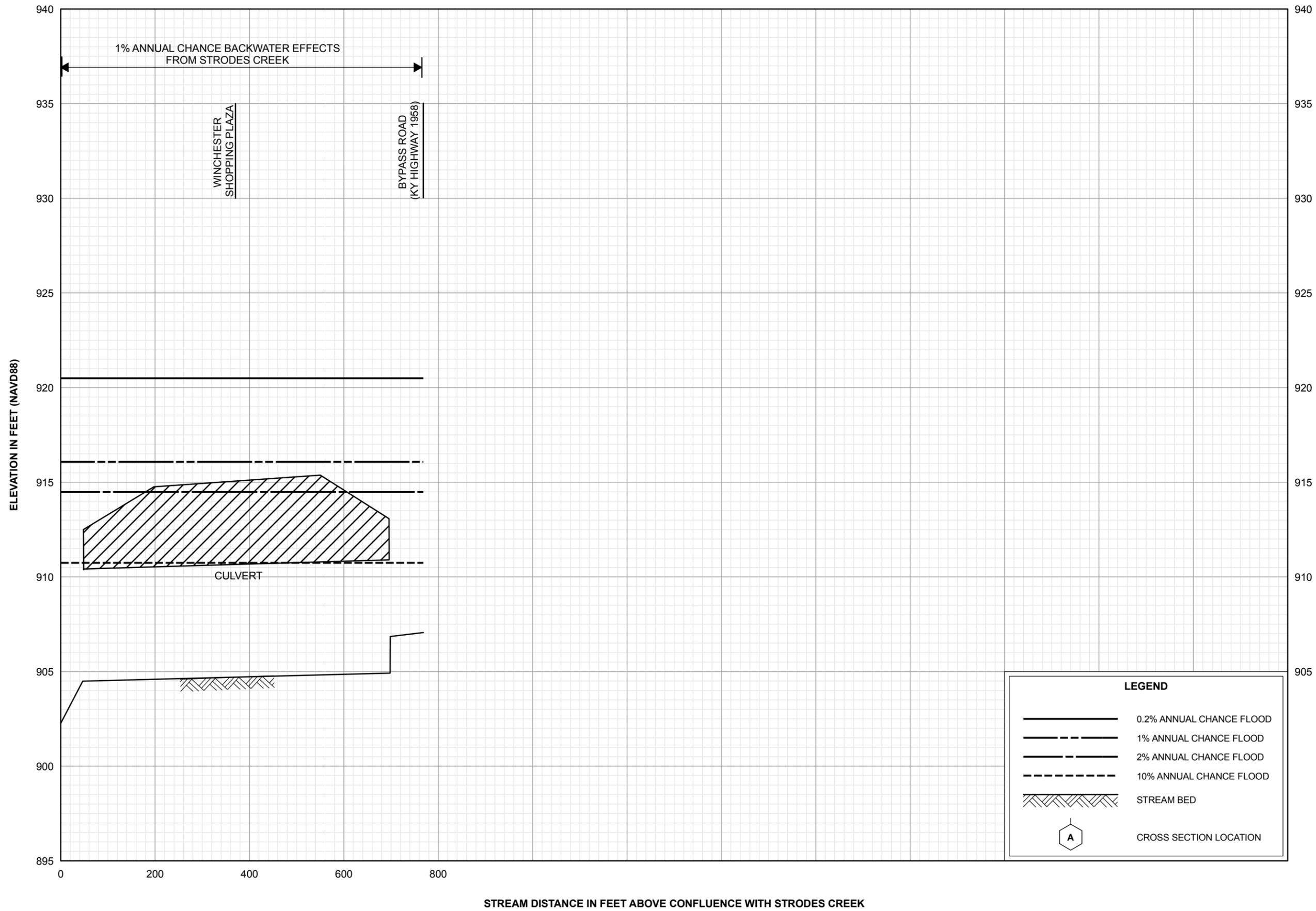
LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES

STRODES CREEK TRIBUTARY S2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

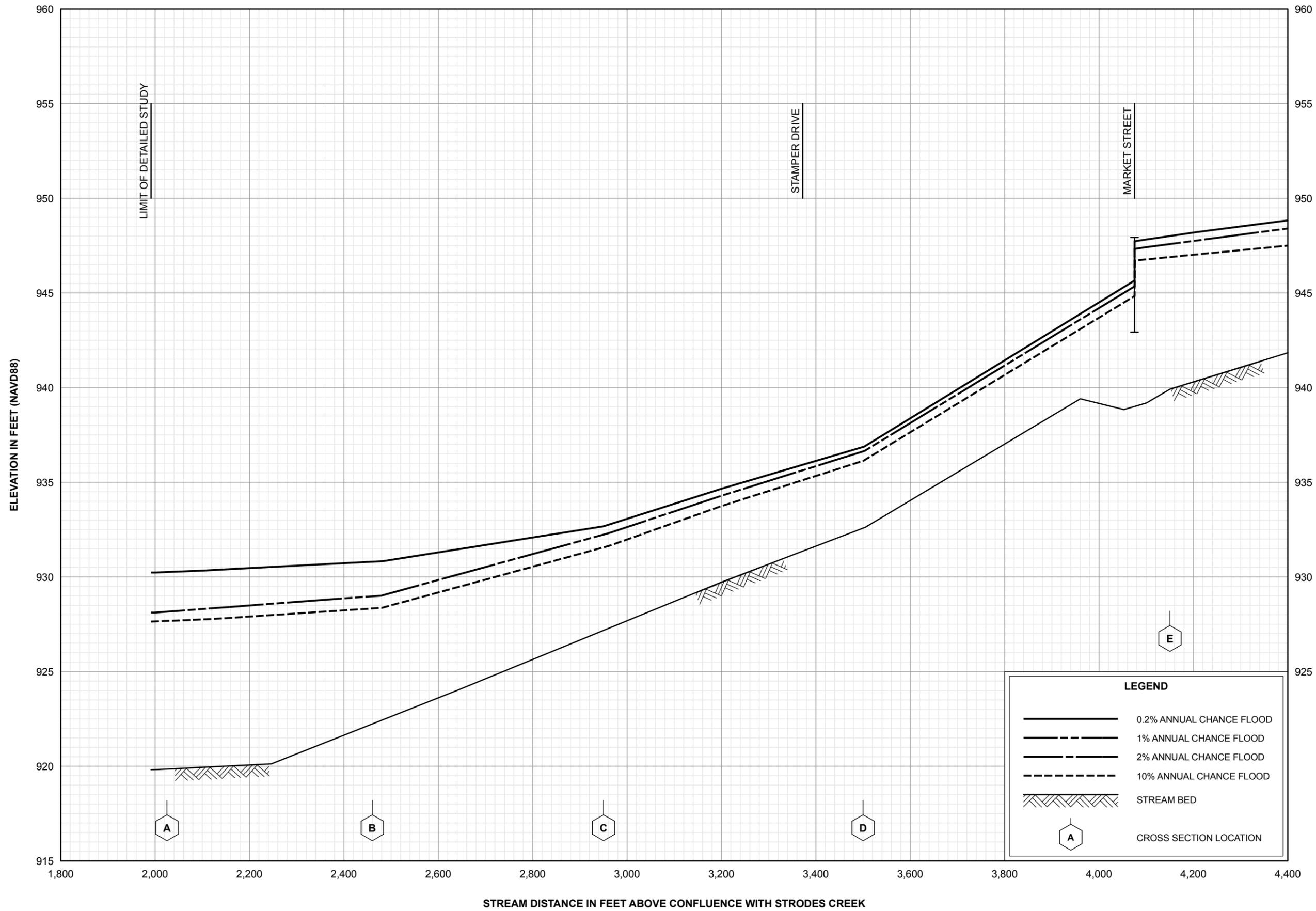


FLOOD PROFILES

STRODES CREEK TRIBUTARY S3

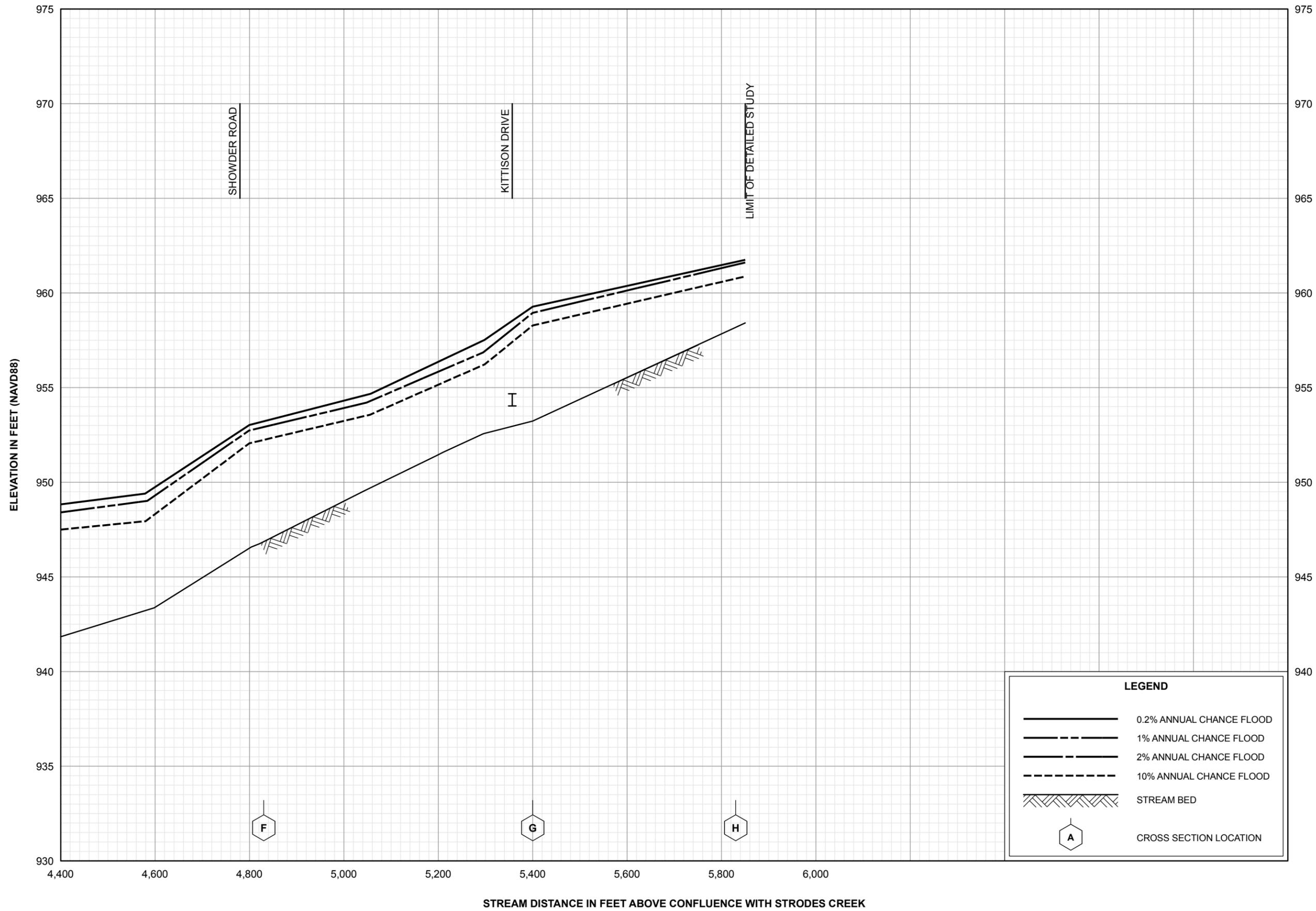
FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



FLOOD PROFILES
STRODES CREEK TRIBUTARY S3

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
 AND INCORPORATED AREAS

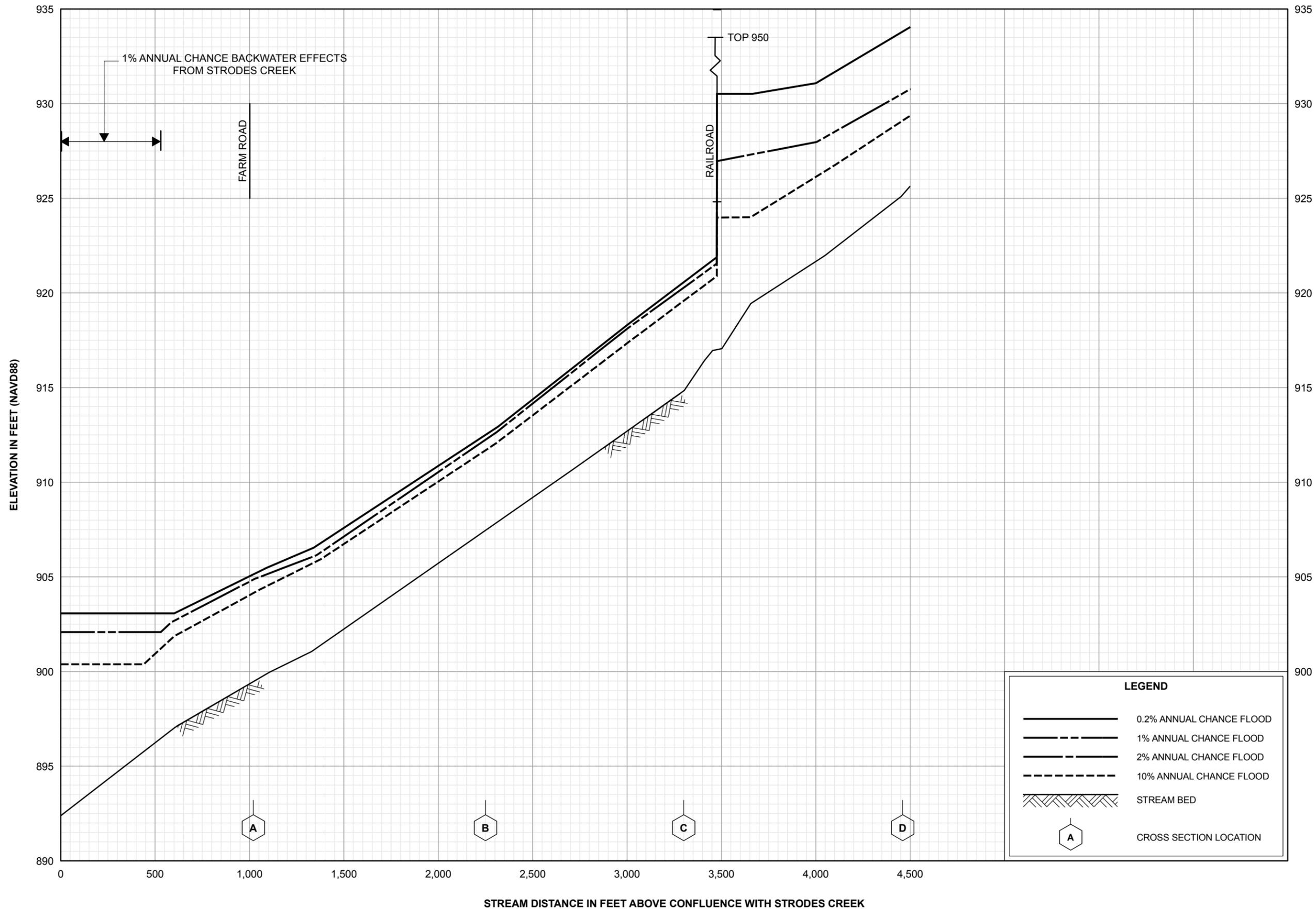


FLOOD PROFILES

STRODES CREEK TRIBUTARY S3

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



LEGEND

-  0.2% ANNUAL CHANCE FLOOD
-  1% ANNUAL CHANCE FLOOD
-  2% ANNUAL CHANCE FLOOD
-  10% ANNUAL CHANCE FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

FLOOD PROFILES

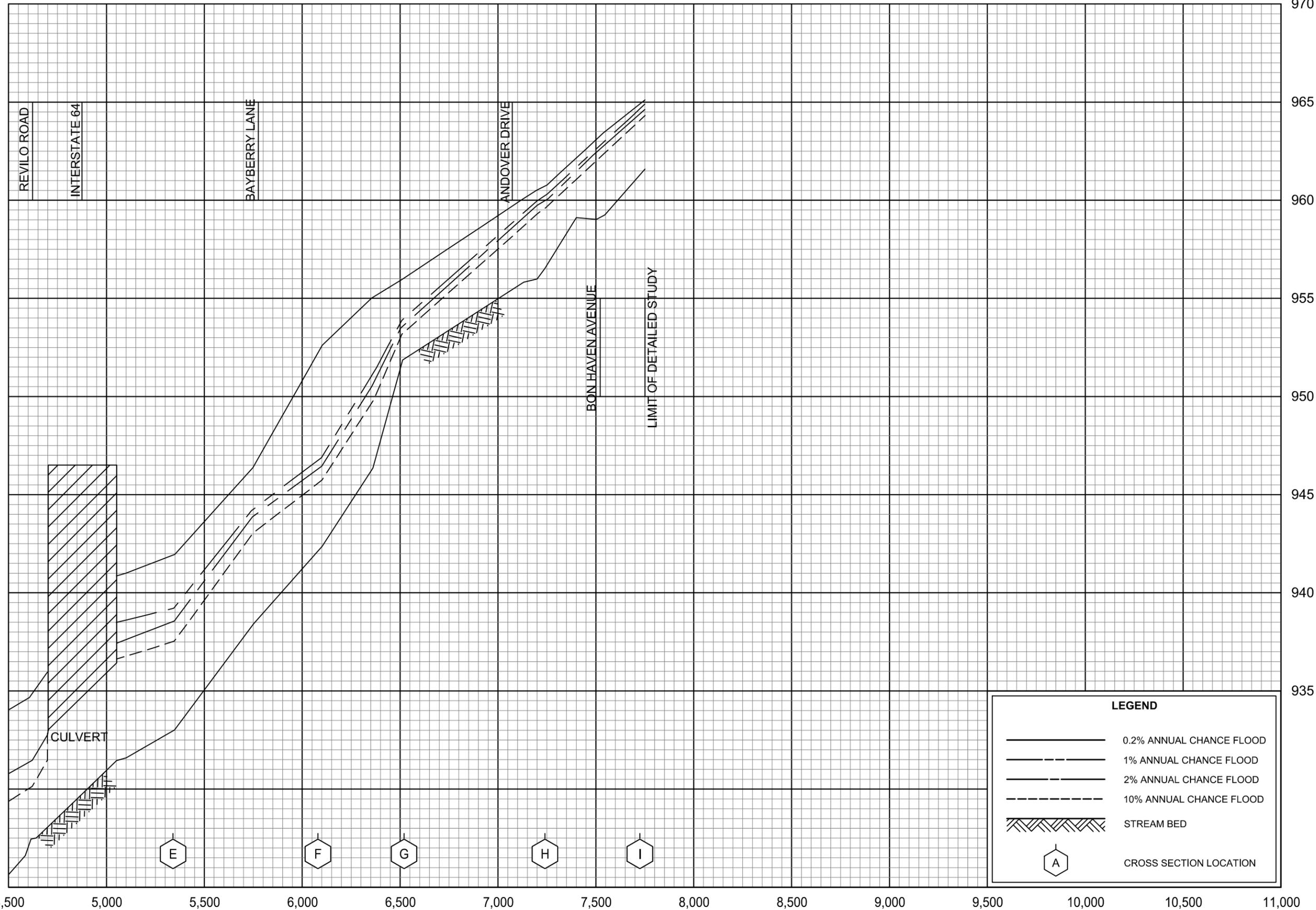
STRODES CREEK TRIBUTARY S4

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

ELEVATION IN FEET (NAVD88)

970
965
960
955
950
945
940
935
930
925



STREAM DISTANCE IN FEET FEET ABOVE CONFLUENCE WITH STRODES CREEK

LEGEND

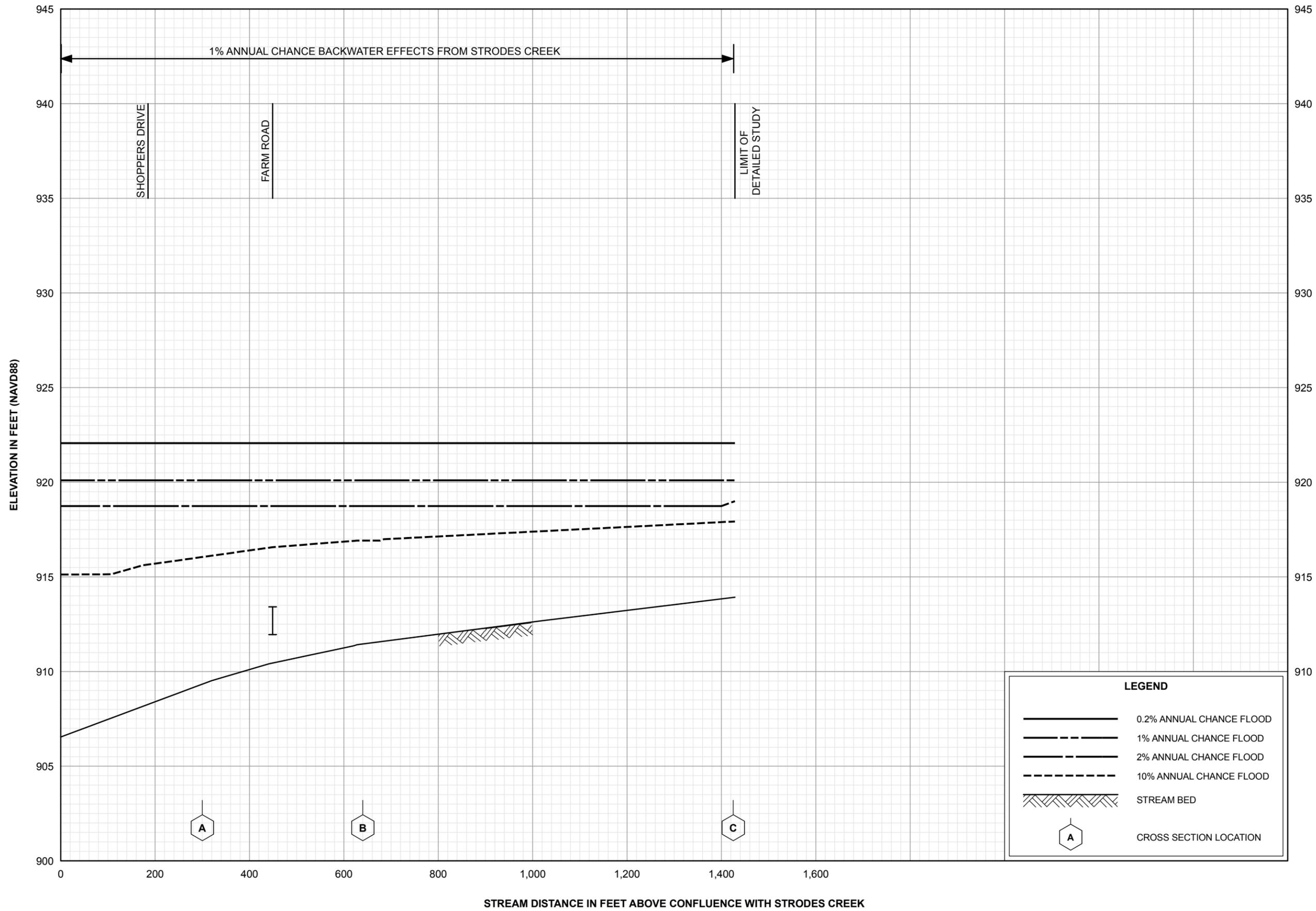
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

STRODES CREEK TRIBUTARY S4

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

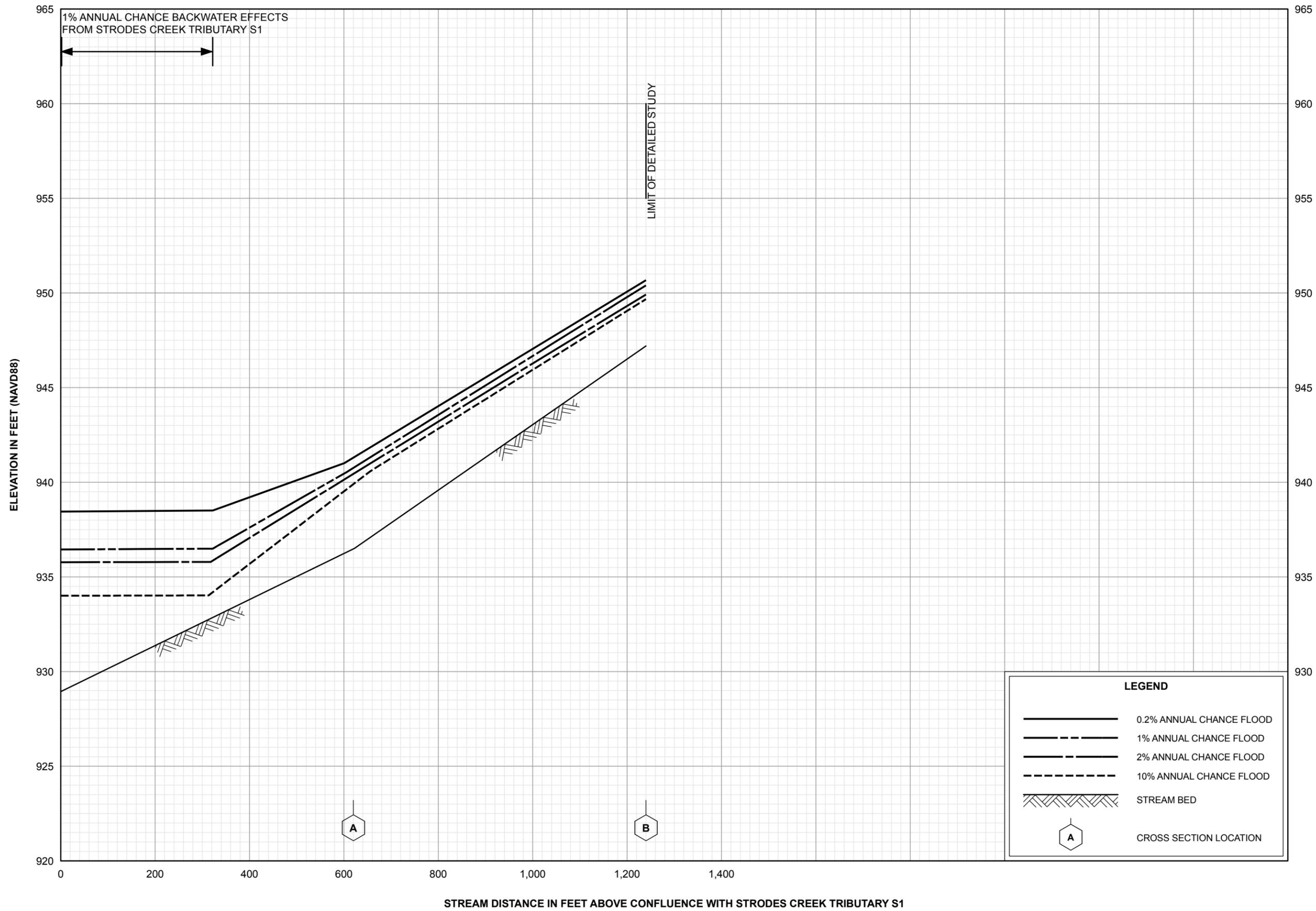


FLOOD PROFILES

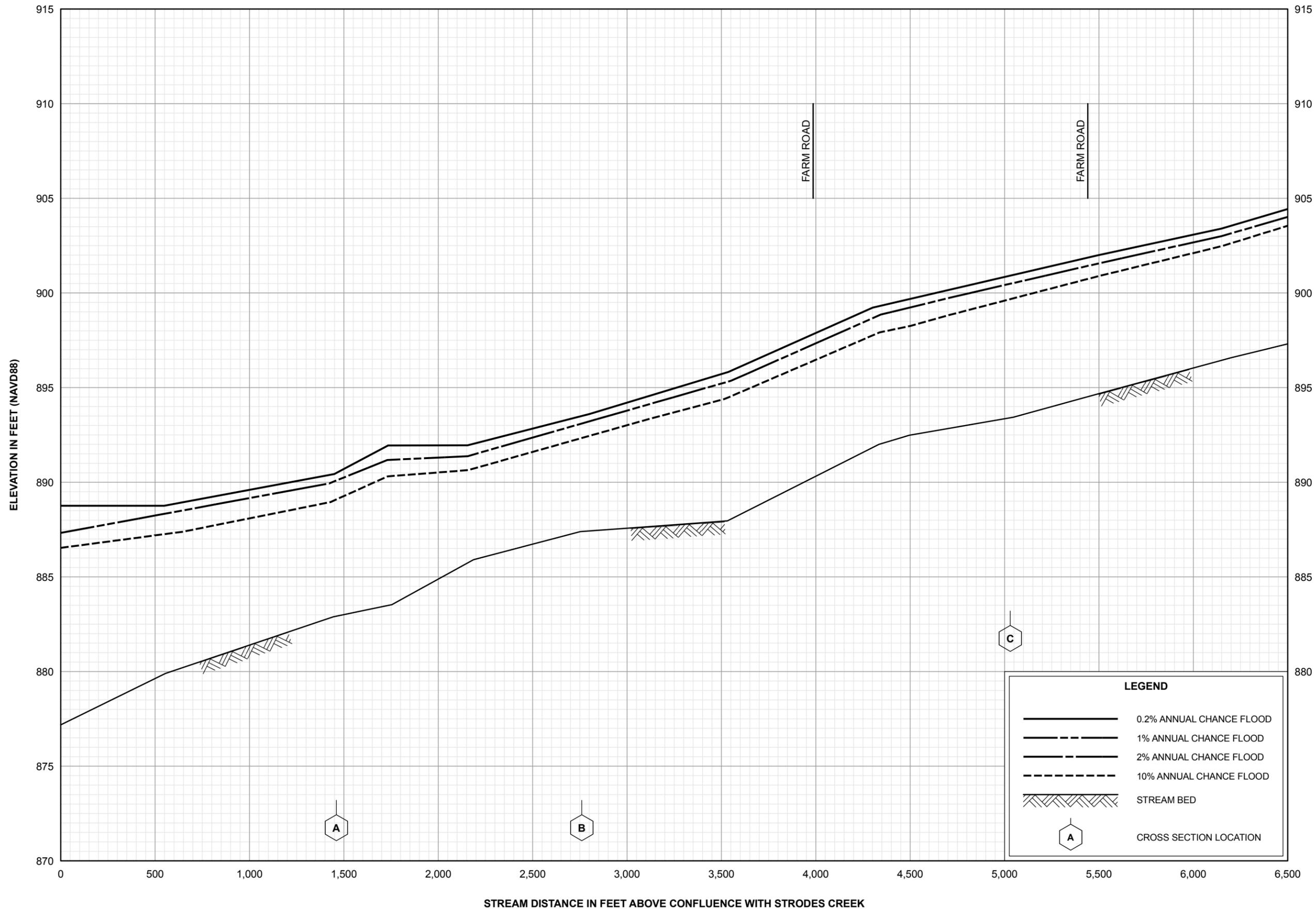
STRODES CREEK TRIBUTARY S5

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



LEGEND	
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	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

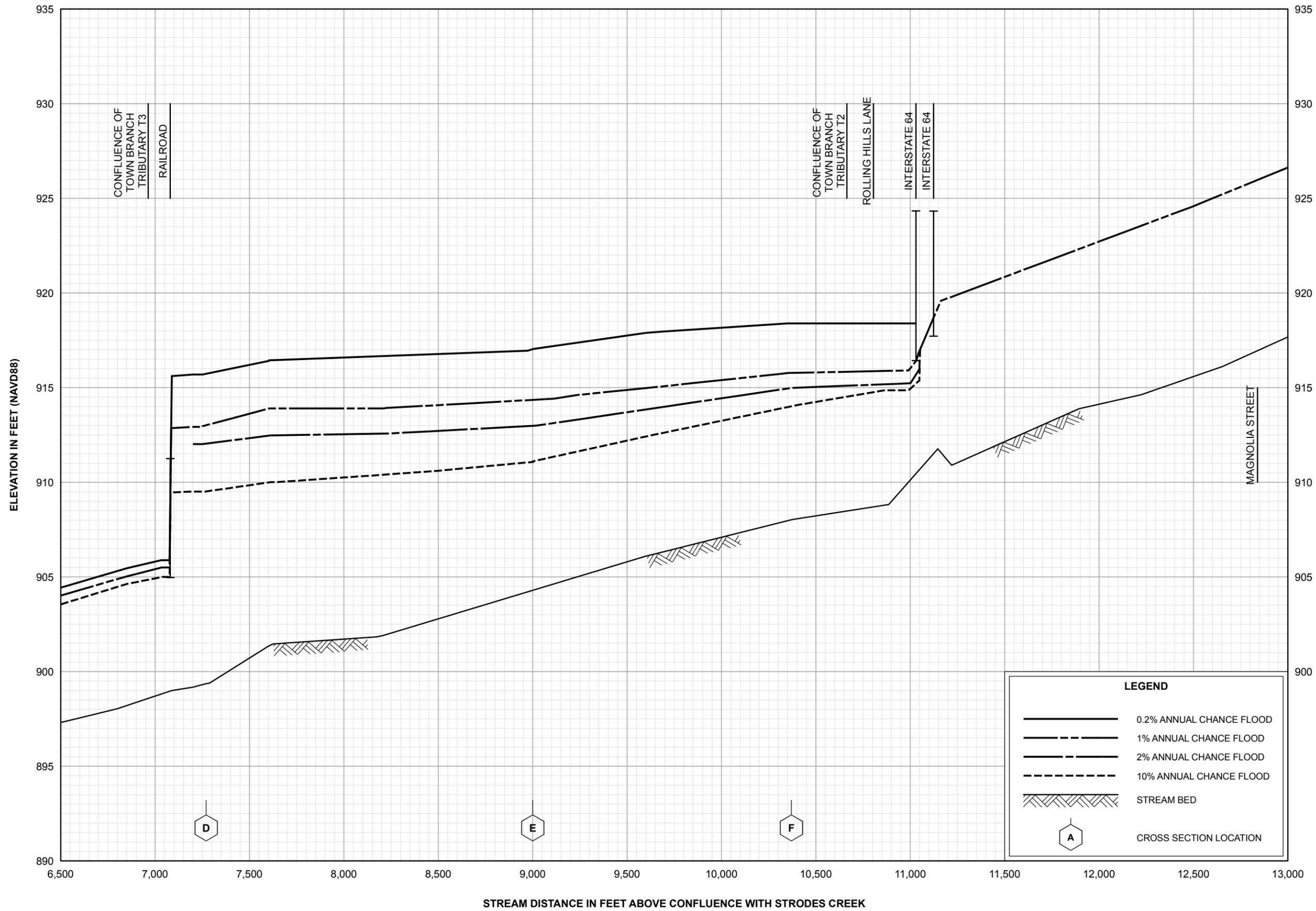


FLOOD PROFILES

TOWN BRANCH

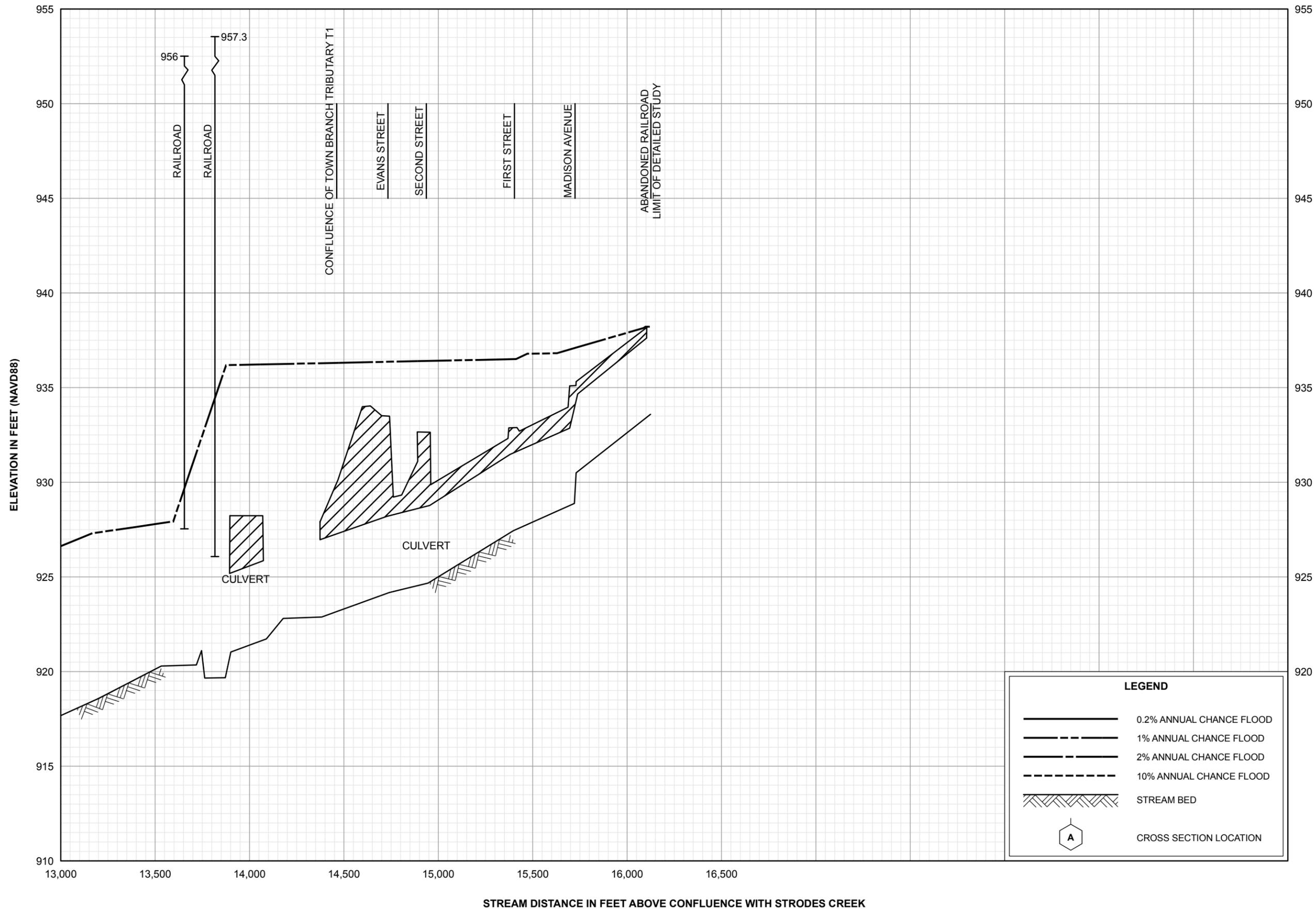
FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



FLOOD PROFILES
TOWN BRANCH

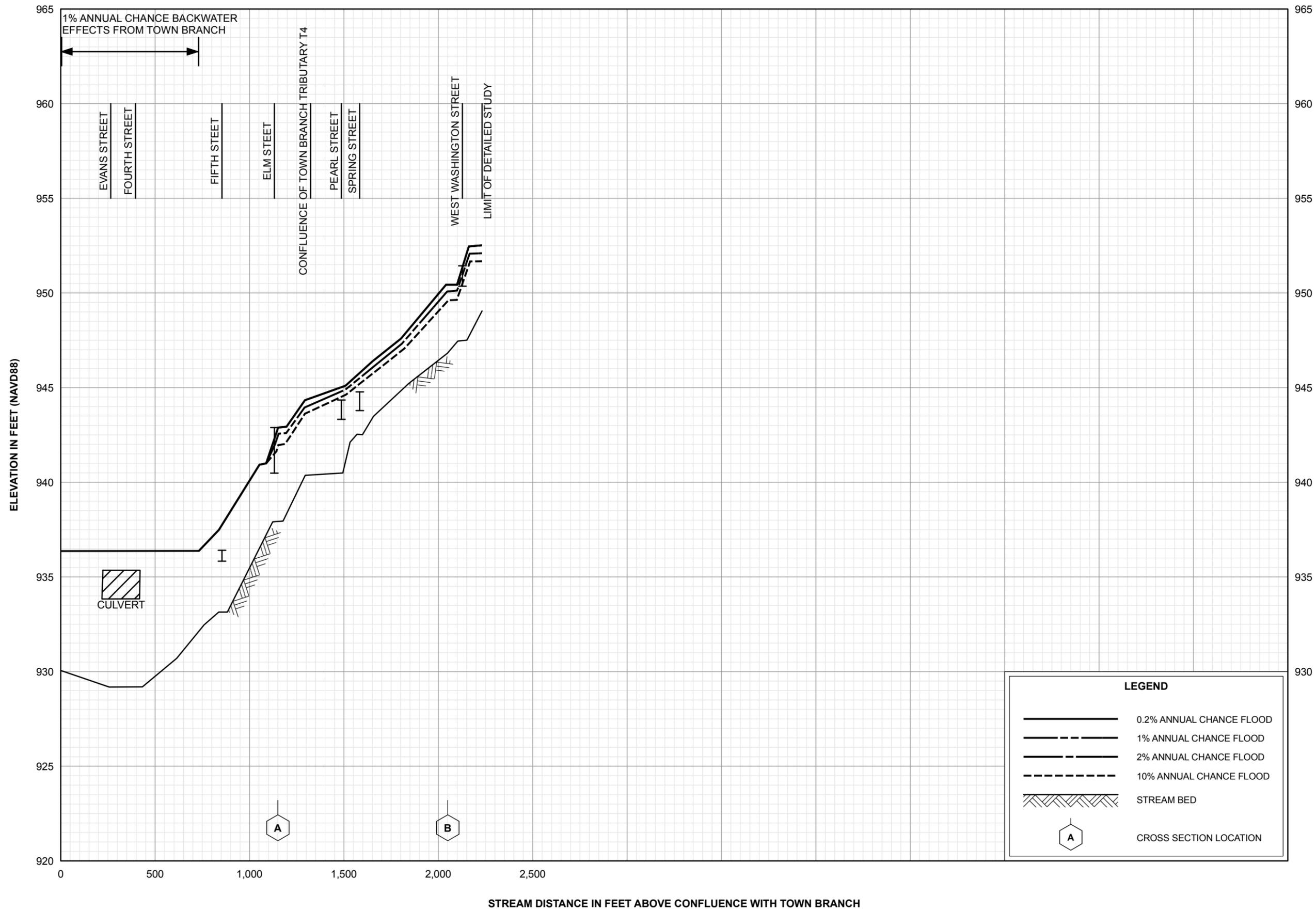
FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS



LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES
TOWN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS

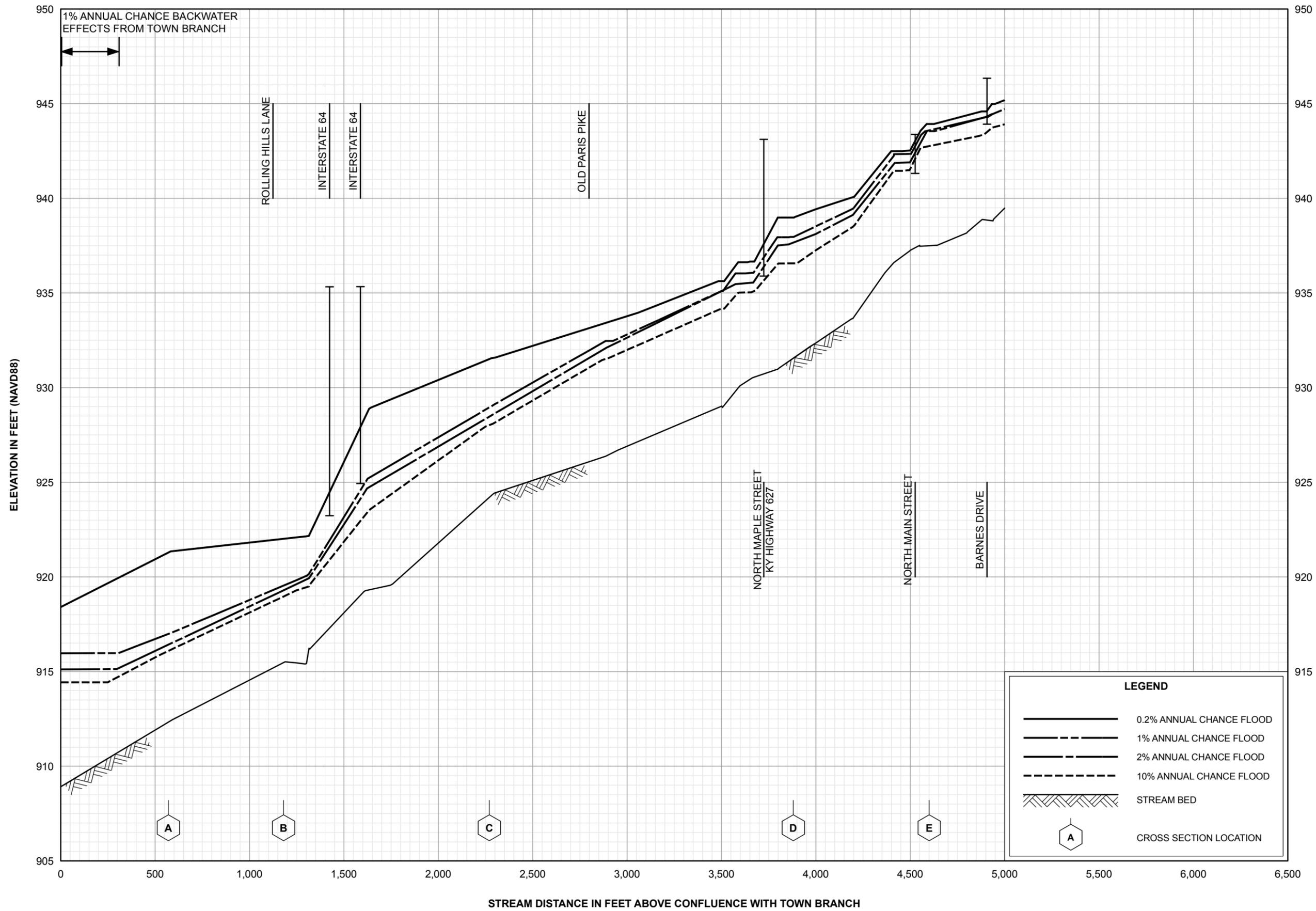


FLOOD PROFILES

TOWN BRANCH TRIBUTARY T1

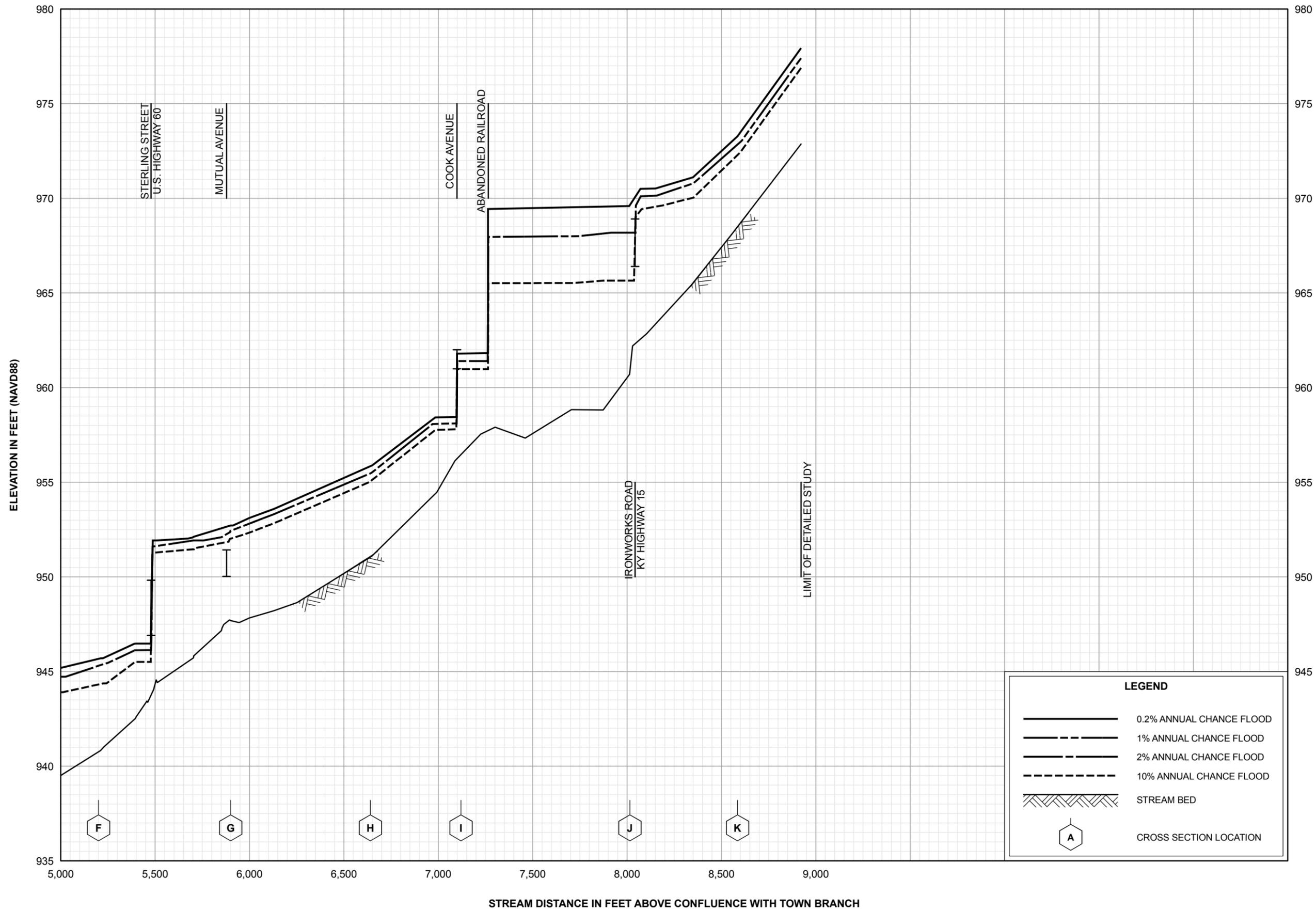
FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



FLOOD PROFILES
TOWN BRANCH TRIBUTARY T2

FEDERAL EMERGENCY MANAGEMENT AGENCY
CLARK COUNTY, KY
AND INCORPORATED AREAS

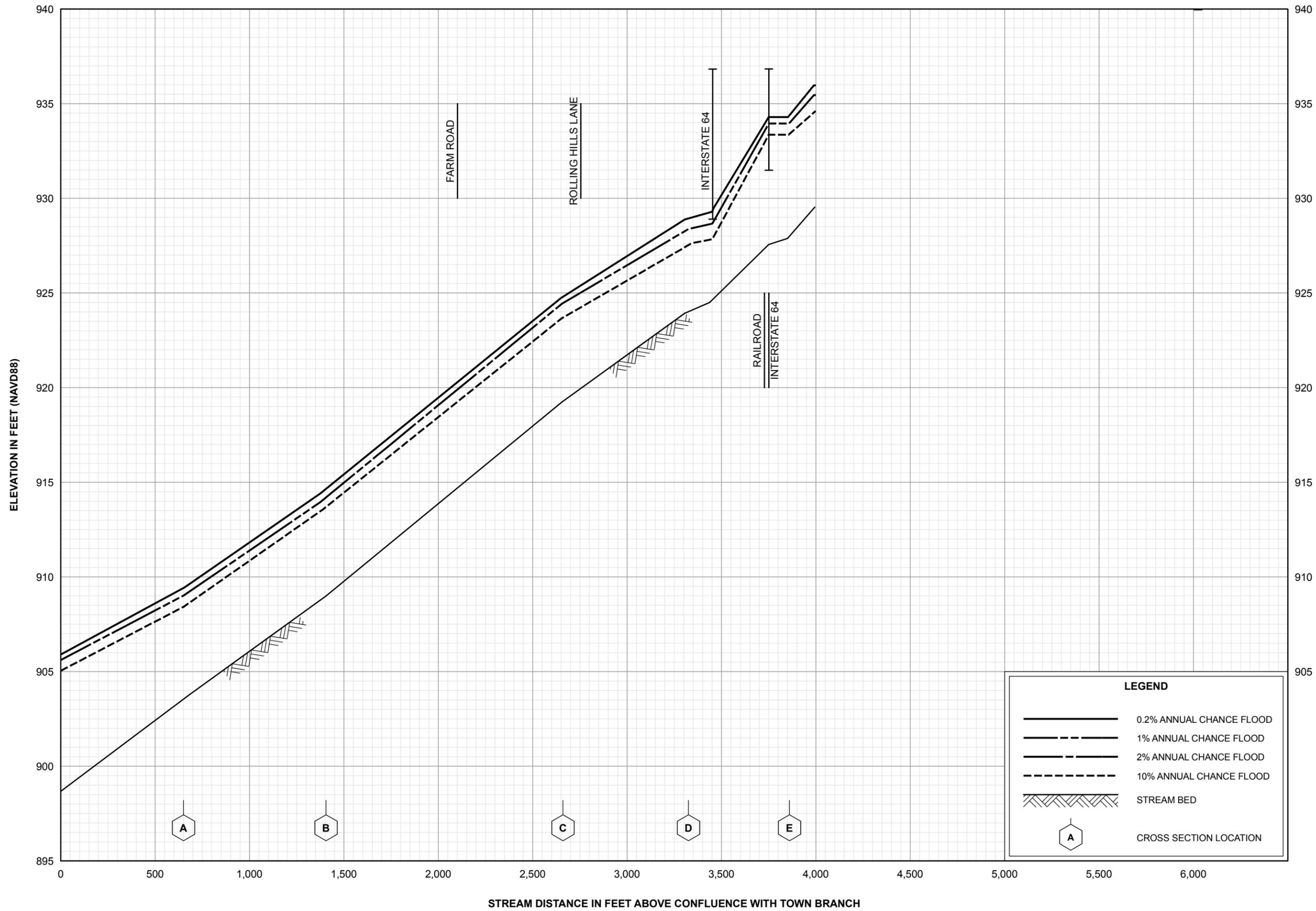


FLOOD PROFILES

TOWN BRANCH TRIBUTARY T2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

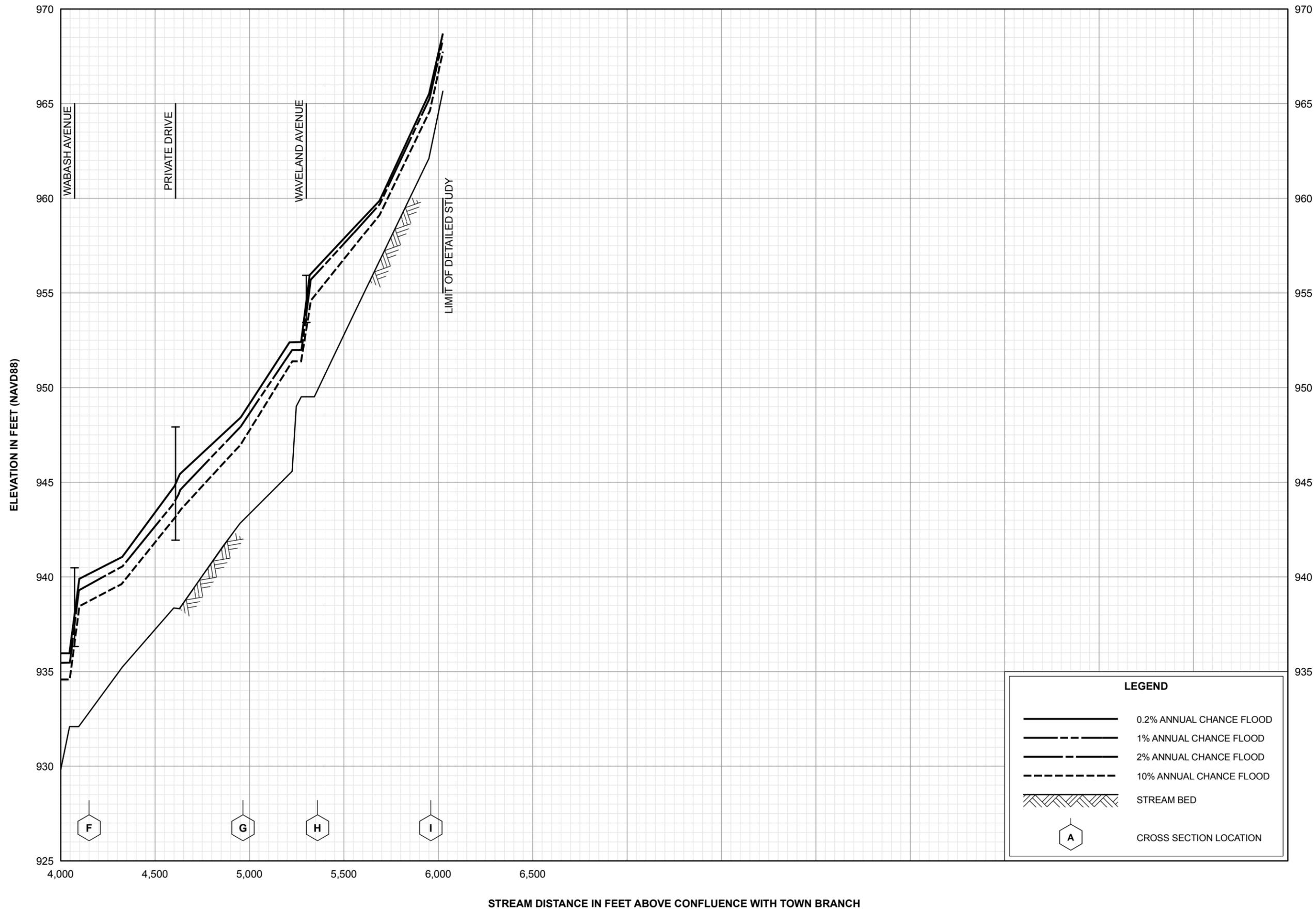


FLOOD PROFILES

TOWN BRANCH TRIBUTARY T3

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**

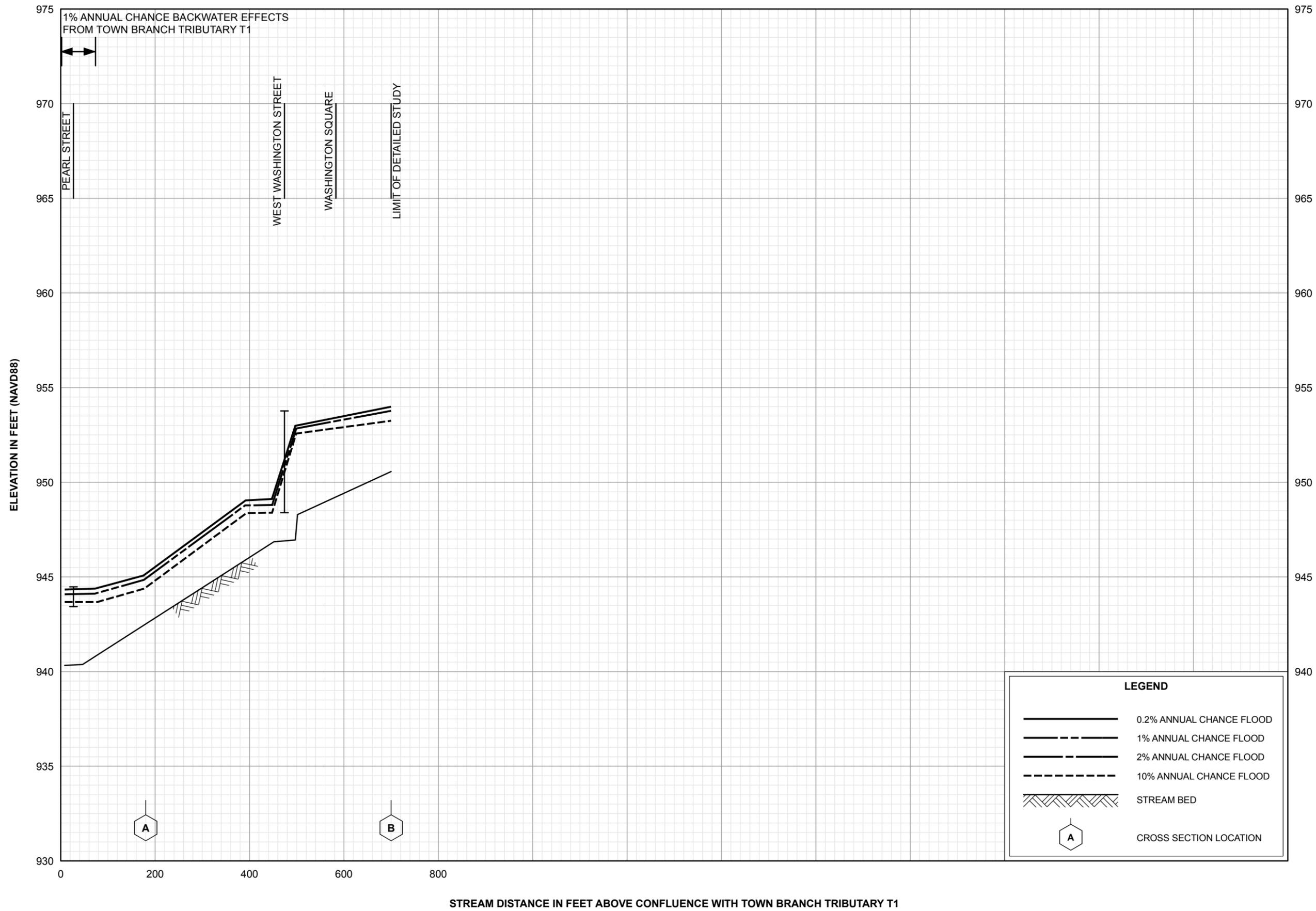


FLOOD PROFILES

TOWN BRANCH TRIBUTARY T3

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**



LEGEND

-  0.2% ANNUAL CHANCE FLOOD
-  1% ANNUAL CHANCE FLOOD
-  2% ANNUAL CHANCE FLOOD
-  10% ANNUAL CHANCE FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

FLOOD PROFILES

TOWN BRANCH TRIBUTARY T4

FEDERAL EMERGENCY MANAGEMENT AGENCY

**CLARK COUNTY, KY
AND INCORPORATED AREAS**