

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 2



MADISON COUNTY, KENTUCKY

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
MADISON COUNTY UNINCORPORATED AREAS	210342
BEREA, CITY OF	210156
RICHMOND, CITY OF	210157



FEMA

REVISED: PRELIMINARY 2/26/2016

FLOOD INSURANCE STUDY NUMBER
21151CV001B

Version Number 2.3.3.2

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Exhibits

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Kentucky River	09-13 P
Lower Tate Creek	14-15 P
Otter Creek	16-17 P
Otter Creek Tributary 1	18-22 P
Otter Creek Tributary 1.1	23-24 P
Otter Creek Tributary 2	25-29 P
Silver Creek	30-31 P
Taylor Fork	32-35 P
Taylor Fork Tributary 1	36-37 P
Taylor Fork Tributary 2	38-40 P
Taylor Fork Tributary 2A	41 P
Taylor Fork Tributary 3	42-43 P
Taylor Fork Tributary 4	44-45 P
Taylor Fork Tributary 5	46-47 P
Taylor Fork Tributary 6	48-50 P
Taylor Fork Tributary 7	51 P
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Upper Tate Creek	55-57 P
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Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT MADISON 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 Madison 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
Madison County (Unincorporated Areas)	210342	05100205, 05100204	21151C0020D, 21151C0040D, 21151C0045D, 21151C0065D, 21151C0070D, 21151C0105D, 21151C0110D, 21151C0115D, 21151C0120D, 21151C0130D, 21151C0135D, 21151C0139D, 21151C0140D, 21151C0143D, 21151C0144D, 21151C0145D, 21151C0155D, 21151C0160D, 21151C0165D, 21151C0170C, 21151C0180D, 21151C0190C, 21151C0210C, 21151C0250D, 21151C0252D, 21151C0254D, 21151C0255D, 21151C0256D, 21151C0257D, 21151C0258D, 21151C0259D, 21151C0265D, 21151C0270D, 21151C0280D, 21151C0300D, 21151C0305C, 21151C0315C, 21151C0335C, 21151C0352D, 21151C0354C, 21151C0355C, 21151C0356D, 21151C0357D, 21151C0358D, 21151C0359D, 21151C0365D, 21151C0366D, 21151C0370D, 21151C0400C, 21151C0425C	
City of Berea	210156	05100205	21151C0265D, 21151C0270D, 21151C0352D, 21151C0354C, 21151C0355C, 21151C0356D, 21151C0357D, 21151C0358D, 21151C0359D, 21151C0365D, 21151C0366D, 21151C0370D	
City of Richmond	210157	05100205	21151C0139D, 21151C0140D, 21151C0143D, 21151C0144D, 21151C0252D, 21151C0254D, 21151C0255D, 21151C0256D, 21151C0257D, 21151C0258D, 21151C0259D, 21151C0280D	

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 Madison County became effective on October 2, 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 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 Madison 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 Madison 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

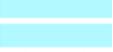
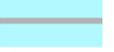
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate 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

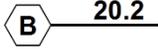
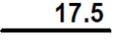
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): <i>CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas. See Notes to Users for important information.</i>	
 CBRS AREA 09/30/2009	Coastal Barrier Resources System Area: Labels are shown to 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 Madison 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 Madison 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.

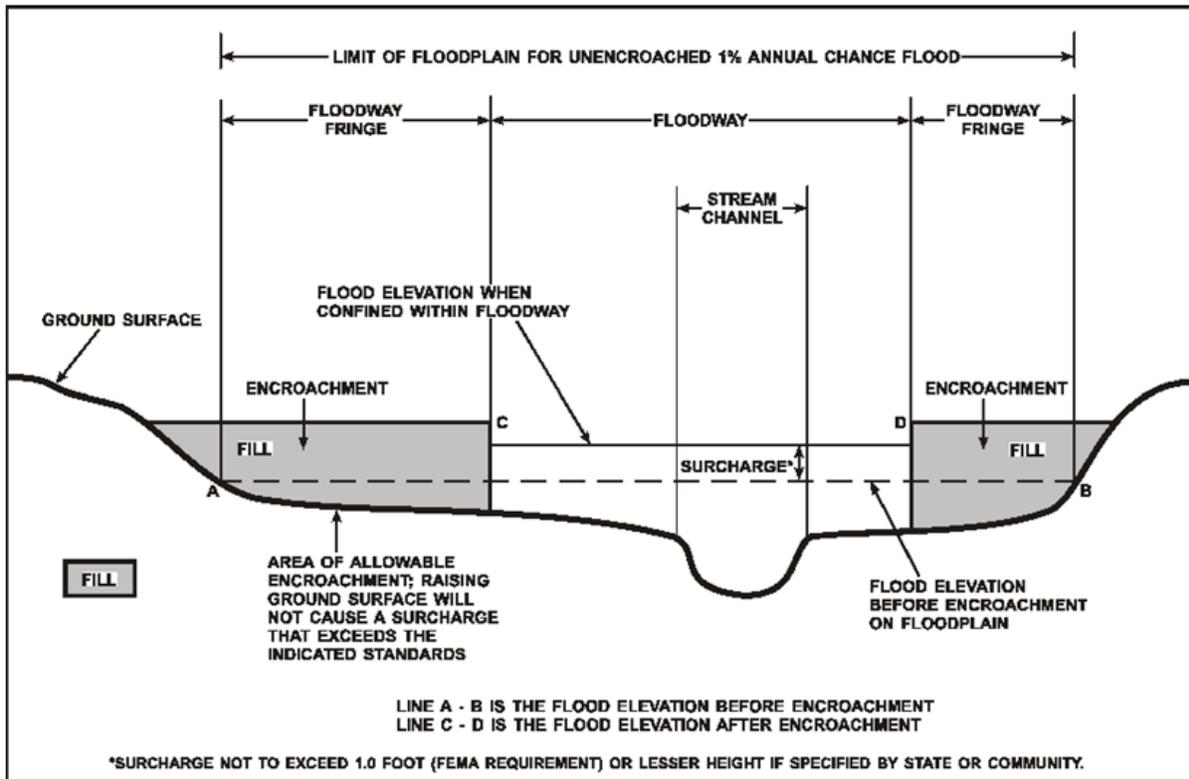
2.2 Floodways

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 Madison 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
Ball Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	0.93 miles upstream of intersection with Barnes Mill Road	05100205	1.38		N	A	June 2014
Ballard Branch	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	0.22 miles upstream of intersection with I-75	05100205	2.84		N	A	June 2014
Ballard Branch Tributary 1	Madison County (Unincorporated Areas)	Confluence with Ballard Branch	0.24 miles upstream of intersection with John Ballard Road	05100205	0.60		N	A	June 2014
Bogie Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.28 miles upstream of intersection with Mule Shed Lane	05100205	1.80		N	A	June 2014
Brown Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	2.21 miles upstream of intersection with Bogie Mill Road	05100205	2.32		N	A	June 2014
Brushy Fork	Madison County (Unincorporated Areas), City of Berea	0.06 miles upstream of intersection with Mt. Vernon Road (US-25)	0.92 miles upstream of confluence with Brushy Fork	05100205	0.92		N	A	June 2014
Brushy Fork	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	0.06 miles upstream of intersection with Mt. Vernon Road (US-25)	05100205	3.22		Y	AE	July 2009
Brushy Fork Tributary 1	Madison County (Unincorporated Areas)	Confluence with Brushy Fork	0.08 miles upstream of intersection with Railroad	05100205	1.32		N	A	June 2014
Buffalo Creek	Madison County (Unincorporated Areas)	Confluence with Tate Creek	1.84 miles upstream of Tates Creek Road	05100205	1.85		N	A	June 2014

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
Butler Branch	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	1.97 miles upstream from confluence with Drowning Creek	05100204	1.97		N	A	July 2009
Calloway Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	1.58 upstream of intersection with Simpson Lane	05100205	4.58		N	A	July 2009
Clear Creek I	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	1.72 miles upstream of intersection with Clear Creek Ln	05100205	2.83		N	A	July 2009
Copperas Branch	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	0.30 miles upstream of intersection with Red Lick Road	05100204	0.82		N	A	July 2009
Cowbell Creek	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	2.36 miles upstream of intersection with KY-21 State Highway	05100204	4.05		N	A	July 2009
Crutcher Fork	Madison County (Unincorporated Areas)	Confluence with Tate Creek	0.47 miles upstream of Crutcher Pike	05100205	1.74		N	A	June 2014
Dog Branch	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	1.69 miles upstream of Richmond Road	05100205	1.73		N	A	June 2014
Dreaming Creek	Madison County (Unincorporated Areas), City of Richmond	Confluence with Otter Creek	0.48 miles upstream of intersection with Red House Rd	05100205	2.82		N	A	June 2014
Dreaming Creek Tributary	Madison County (Unincorporated Areas), City of Richmond	Confluence with Dreaming Creek	0.73 miles upstream of intersection with Old Wilderness Trail	05100205	1.25		Y	AE	July 2009
Drowning Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	5.54 miles upstream of intersection with rail road	05100204	14.13		N	A	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
Drowning Creek Tributary 1	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	0.85 miles upstream of confluence with Drowning Creek	05100204	0.85		N	A	July 2009
Drowning Creek Tributary 2	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	1.80 miles upstream of confluence with Drowning Creek	05100204	1.80		N	A	July 2009
Drowning Creek Tributary 3	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	0.79 miles upstream of intersection with Irvine Road	05100204	0.93		N	A	July 2009
Drowning Creek Tributary 4	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	0.58 miles upstream from confluence with Drowning Creek	05100204	0.58		N	A	July 2009
Drowning Creek Tributary 5	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	1.07 miles upstream of confluence with Drowning Creek	05100204	1.07		N	A	July 2009
Dry Branch	Madison County (Unincorporated Areas)	Confluence with Paint Lick Creek	0.98 miles upstream from intersection with Dry Branch Road	05100205	1.03		N	A	July 2009
Dunbar Branch	Madison County (Unincorporated Areas)	Confluence with Rocky Lick Branch	0.17 miles upstream of intersection with Walker Parke Road	05100205	0.17		N	A	July 2009
East Fork Otter Creek	Madison County (Unincorporated Areas)	Confluence with Otter Creek	0.20 miles upstream of intersection with Union City Road	05100205	7.02		N	A	June 2014
East Fork Otter Creek Tributary 1	Madison County (Unincorporated Areas)	Confluence with East Fork Otter Creek	0.37 miles upstream of intersection with Union City Road	05100205	1.12		N	A	June 2014
East Fork Otter Creek Tributary 2	Madison County (Unincorporated Areas)	Confluence with East Fork Otter Creek	2.03 miles upstream of intersection with Brookstown Road	05100205	3.37		N	A	June 2014

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
East Fork Silver Creek	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	0.28 miles upstream of intersection with Gabbard Town Road	05100205	0.37		N	A	June 2014
East Fork Silver Creek	Madison County (Unincorporated Areas), City of Berea	0.28 miles upstream of intersection with Gabbard Town Road	1.83 miles upstream of intersection with Gabbard Town Road	05100205	1.55		N	A	July 2009
Elk Garden Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.78 miles upstream of confluence with Silver Creek	05100205	1.78		N	A	June 2014
Falling Branch	Madison County (Unincorporated Areas)	Confluence with Kentucky River	1.47 miles upstream of confluence with Kentucky River	05100204	1.47		N	A	July 2009
Finney Fork	Madison County (Unincorporated Areas)	Confluence with Tate Creek	1.26 miles upstream of confluence with Tate Creek	05100205	1.26		N	A	June 2014
Flint Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	1.06 miles upstream of confluence with Kentucky River	05100204	1.07		N	A	July 2009
Flint Creek Tributary 1	Madison County (Unincorporated Areas)	Confluence with Flint Creek	0.07 miles upstream of confluence with Flint Creek	05100204	0.07		N	A	July 2009
Floyd Branch	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	1.87 miles upstream of intersection with Floyd Branch Road	05100204	1.89		N	A	July 2009
Gilead Branch	Madison County (Unincorporated Areas)	Confluence with Paint Lick Creek	1.11 miles upstream of confluence with Paint Lick Creek	05100205	1.11		N	A	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
Gravel Lick Branch	Madison County (Unincorporated Areas)	Confluence with Joe Lick Fork	1.52 miles upstream of intersection with Gravel Lick Branch Road	05100204	2.31		N	A	July 2009
Gravel Lick Tributary 2	Madison County (Unincorporated Areas)	Confluence with Gravel Lick Branch	0.60 miles upstream from confluence with Gravel Lick Branch	05100204	0.60		N	A	July 2009
Greens Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.42 miles upstream of intersection with Bogie Mill Road	05100205	1.53		N	A	June 2014
Hams Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.24 miles upstream of intersection with Jigg Water Road	05100205	1.24		N	A	June 2014
Harts Fork	Madison County (Unincorporated Areas), City of Richmond	Confluence with Hays Fork	0.30 miles upstream of intersection with Railroad	05100205	3.37		N	A	June 2014
Hays Fork	Madison County (Unincorporated Areas), City of Richmond	Confluence with Silver Creek	1.83 miles upstream of intersection with Battlefield Memorial Highway	05100205	7.33		N	A	June 2014
Hays Fork Tributary 2 DS	Madison County (Unincorporated Areas)	Confluence with Hays Fork	Base of Lake Gem Dam	05100205	0.98		N	A	June 2014
Hays Fork Tributary 2 US	Madison County (Unincorporated Areas)	540 feet upstream of Lake Gem Dam	1.81 miles upstream of intersection with Battlefield Memorial Highway	05100205	1.00		N	A	June 2014
Hays Fork Tributary 4	Madison County (Unincorporated Areas)	Confluence with Hays Fork	0.10 miles upstream of intersection with Rose Lane	05100205	1.84		N	A	June 2014

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
Hickory Lick Creek	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.50 miles upstream of intersection with Hickory Lick Road	05100205	1.65		N	A	July 2009
Hickory Lick Creek Tributary 2	Madison County (Unincorporated Areas)	Confluence with Hickory Lick Creek	1.33 miles upstream of confluence with Hickory Lick Creek	05100205	1.50		N	A	July 2009
Hickory Lick Creek Tributary 2.1	Madison County (Unincorporated Areas)	Confluence with Hickory Lick Creek Tributary 2	0.60 miles upstream of confluence with Hickory Lick Creek Tributary 2	05100205	0.60		N	A	July 2009
Hicks Branch	Madison County (Unincorporated Areas)	Confluence with West Fork Otter Creek	2.28 miles upstream of intersection with Three Forks Road	05100205	3.22		N	A	June 2014
Hicks Branch Tributary 1	Madison County (Unincorporated Areas)	Confluence with Hicks Branch	1.06 miles upstream of intersection with Cedar Hill Drive	05100205	2.03		N	A	June 2014
Hines Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	2.25 miles upstream from confluence with Kentucky River	05100205	2.25		N	A	July 2009
Honest Branch	Madison County (Unincorporated Areas)	Confluence with Tate Creek	1.19 miles upstream of confluence with Tate Creek	05100205	1.19		N	A	June 2014
Irvine Lick Creek	Madison County (Unincorporated Areas)	Confluence with Tate Creek	0.23 miles upstream of intersection with Cardinal Drive	05100205	1.22		N	AE	June 2014
Jacks Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	1.43 miles upstream of confluence with Kentucky River	05100205	1.43		N	A	June 2014
Jackson Branch	Madison County (Unincorporated Areas)	Confluence with Silver Creek	0.30 miles upstream of intersection with Jackson Branch Road	05100205	2.93		N	A	June 2014

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
Joe Lick Fork	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	2.24 miles upstream of intersection with Gravel Lick Branch Road	05100205	3.10		N	A	July 2009
Jones Branch I	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.47 miles upstream of confluence with Jones Branch Tributary 1	05100205	1.55		N	A	June 2014
Jones Branch Tributary 1	Madison County (Unincorporated Areas)	Confluence with Jones Branch I	0.09 miles upstream of intersection with Walnut Meadow Road	05100205	0.90		N	A	June 2014
Judytown Branch	Madison County (Unincorporated Areas)	Confluence with Walnut Meadow Branch	1.81 miles upstream of intersection with Walnut Meadow Road	05100205	2.20		N	A	July 2009
Kentucky River	Madison County (Unincorporated Areas)	County boundary	County boundary	05100205	59.33		Y	AE	July 2009
Kentucky River Tributary 3	Madison County (Unincorporated Areas)	Confluence with Kentucky River	1.28 miles upstream of confluence with Kentucky River	05100204	1.28		N	A	July 2009
Kentucky River Tributary 77	Madison County (Unincorporated Areas)	Confluence with Kentucky River	0.96 miles upstream of confluence with Kentucky River	05100205	0.96		N	A	June 2014
Little Muddy Creek	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	1.16 miles upstream of intersection with Railroad	05100205	2.44		N	A	July 2009
Long Branch	Madison County (Unincorporated Areas)	County boundary	0.97 miles upstream of county boundary	05100204	0.97		N	A	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
Long Branch III	Madison County (Unincorporated Areas)	Confluence with Lower Tate Creek	1.11 miles upstream of intersection with Tates Creek Road	05100205	1.19		N	A	June 2014
Long Branch Tributary 1	Madison County (Unincorporated Areas)	Confluence with Long Branch	0.66 upstream of confluence with Long Branch	05100204	0.66		N	A	July 2009
Long Hollow	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.30 miles upstream of intersection with Scaffold Cane Road	05100205	1.37		N	A	June 2014
Lost Fork	Madison County (Unincorporated Areas)	Confluence with Otter Creek	0.12 miles upstream of intersection with Lost Fork Road	05100205	1.91		N	A	June 2014
Lower Tate Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	1.34 miles upstream of intersection with Tates Creek Road	05100205	3.08		Y	AE	September 1988
McCarter Branch	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	0.78 miles upstream of intersection with Casteel road	05100204	1.13		N	A	July 2009
Muddy Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	0.30 miles upstream of intersection with Gumbottom Road	05100205	30.19		N	A	July 2009
Muddy Creek Tributary 1	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	1.56 miles upstream of intersection with Railroad	05100205	1.68		N	A	July 2009
Muddy Creek Tributary 3	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.46 miles upstream of intersection with Tipton Road	05100205	1.0		N	A	July 2009
Muddy Creek Tributary 4	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.30 miles upstream of intersection with College Hill Road	05100205	0.98		N	A	July 2009
Muddy Creek Tributary 5	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.98 miles upstream of confluence with Muddy Creek	05100205	0.98		N	A	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
Muddy Creek Tributary 6	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	1.00 miles upstream of confluence with Muddy Creek	05100205	1.00		N	A	July 2009
Muddy Creek Tributary 6.1	Madison County (Unincorporated Areas)	Confluence with Muddy Creek Tributary 6	0.63 miles upstream of confluence with Muddy Creek Tributary 6	05100205	0.63		N	A	July 2009
Muddy Creek Tributary 7	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	1.46 miles upstream of confluence with Muddy Creek	05100205	1.46		N	A	July 2009
Muddy Creek Tributary 8	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.86 miles upstream of intersection with Oakley Wells Road	05100205	1.25		N	A	July 2009
Muddy Creek Tributary 8.1	Madison County (Unincorporated Areas)	Confluence with Muddy Creek Tributary 8	1.34 miles upstream of confluence with Muddy Creek Tributary 8	05100205	1.34		N	A	July 2009
Muddy Creek Tributary 9	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.35 miles upstream of confluence with Muddy Creek	05100205	0.35		N	A	July 2009
Muddy Creek Tributary 10	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.41 miles upstream of confluence with Muddy Creek	05100205	0.41		N	A	July 2009
Muddy Creek Tributary 17	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.54 miles upstream of confluence with Muddy Creek	05100205	0.54		N	A	July 2009
Old Town Branch	Madison County (Unincorporated Areas)	Confluence with Taylor Fork	0.39 miles upstream of intersection with I-75	05100205	2.83		N	A	June 2014
Old Town Branch Tributary 1	Madison County (Unincorporated Areas), City of Richmond	Confluence with Old Town Branch	0.26 miles upstream of intersection with Lancaster Road	05100205	1.27		N	A	June 2014

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
Oldham Branch	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	1.31 miles upstream of Walter Lakes Road	05100204	1.84		N	A	July 2009
Otter Creek	Madison County (Unincorporated Areas), City of Richmond	Confluence with Kentucky River	1.09 miles upstream of intersection with Union City Road	05100205	11.28		N	A	June 2014
Otter Creek	Madison County (Unincorporated Areas), City of Richmond	1.09 miles upstream of intersection with union City Road	0.01 miles upstream of intersection with Catalpa Loop	05100205	2.60		Y	AE	July 2009
Otter Creek	Madison County (Unincorporated Areas), City of Richmond	0.01 miles upstream of intersection with Catalpa Loop	1.28 miles upstream of intersection with Catalpa Loop	05100205	1.27		N	A	June 2014
Otter Creek Tributary 1	Madison County (Unincorporated Areas)	0.02 miles downstream of intersection with Big Hill Avenue	0.12 miles upstream of intersection with Eastern Bypass	05100205	0.42		N	AE	June 2014
Otter Creek Tributary 1	City of Richmond	Confluence with Otter Creek	0.02 miles downstream of intersection with Big Hill Avenue	05100205	1.65		Y	AE	July 2009
Otter Creek Tributary 1.1	City of Richmond	Confluence with Otter Creek Tributary 1	0.11 miles upstream of intersection with Steep Street	05100205	1.00		N	AE	June 2014
Otter Creek Tributary 2	City of Richmond	0.06 miles downstream of intersection with Evansdale Avenue	0.07 miles upstream of intersection with Irvine Street	05100205	0.20		N	AE	June 2014

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
Otter Creek Tributary 2	Madison County (Unincorporated Areas), City of Richmond	Confluence with Otter Creek	0.06 downstream of intersection with Evansdale Avenue	05100205	1.90		Y	AE	July 2009
Otter Creek Tributary 3	Madison County (Unincorporated Areas)	Confluence with Otter Creek	1.33 miles upstream of intersection with Concord Road	05100205	1.43		N	A	June 2014
Otter Creek Tributary 4	City of Richmond	Confluence with Otter Creek	0.21 miles upstream of intersection with Pumpkin Run Road	05100205	0.89		N	A	June 2014
Otter Creek Tributary 5	Madison County (Unincorporated Areas)	Confluence with Otter Creek	0.84 upstream of confluence with Otter Creek	05100205	0.84		N	A	June 2014
Owsley Fork	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	0.77 miles upstream of Owsley Fork Road	05100204	2.81		N	A	July 2009
Paint Lick Creek	Madison County (Unincorporated Areas)	Confluence with Kentucky River	7.12 miles upstream of intersection with KY-52 State Highway	05100205	30.49		N	A	July 2009
Paint Lick Creek Tributary 1	Madison County (Unincorporated Areas)	Confluence with Paint Lick Creek	1.22 miles upstream of intersection with KY-21 State Highway	05100205	1.27		N	A	July 2009
Paint Lick Tributary 4	Madison County (Unincorporated Areas)	Confluence with Paint Lick Creek	0.07 miles upstream of confluence with Paint Lick Creek	05100205	0.07		N	A	July 2009
Poplar Branch	Madison County (Unincorporated Areas)	Confluence with Drowning Creek	0.002 miles upstream of confluence with Drowning Creek	05100205	0.002		N	A	July 2009
Red Lick Branch	Madison County (Unincorporated Areas)	Confluence with Cowbell Creek	0.29 miles upstream of intersection with Jackson Lane	05100204	0.94		N	A	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
Red Lick Branch Tributary 1	Madison County (Unincorporated Areas)	Confluence with Red Lick Branch	0.56 miles upstream of intersection with Battlefield Memorial Highway	05100204	1.06		N	A	July 2009
Red Lick Creek	Madison County (Unincorporated Areas)	County boundary	0.90 miles upstream of intersection with Battlefield Memorial Highway	05100204	8.75		N	A	July 2009
Rocky Lick Branch	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	0.65 miles upstream of intersection with Walker Parke Road	05100205	1.34		N	A	July 2009
Shallow Ford Creek	Madison County (Unincorporated Areas)	Confluence with Tate Creek	0.67 miles upstream of intersection with Clay Lane	05100205	6.08		N	A	June 2014
Shirley Branch	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	1.75 miles upstream of intersection with Beach Grove Road	05100204	1.96		N	A	July 2009
Silver Creek DS	Madison County (Unincorporated Areas), City of Berea, City of Richmond	Confluence with Kentucky River	0.01 miles downstream of intersection with Richmond Road (US-25)	05100205	35.95		N	A	June 2014
Silver Creek	Madison County (Unincorporated Areas), City of Berea	0.01 miles downstream of intersection with Richmond Road (US-25)	0.10 miles upstream of intersection with State Highway 21 (KY-21)	05100205	4.07		Y	AE	July 2009
Silver Creek US	Madison County (Unincorporated Areas), City of Berea	0.10 miles upstream of intersection with State Highway 21 (KY-21)	0.33 miles upstream of intersection with Kindred Lane	05100205	3.19		N	A	June 2014

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
Silver Creek Tributary 1	Madison County (Unincorporated Areas)	Confluence with Silver Creek	1.41 miles upstream of intersection with Peytontown Road	05100205	2.33		N	A	June 2014
Silver Creek Tributary 2	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	1.33 miles upstream of intersection with Richmond Road	05100205	1.38		N	A	June 2014
Silver Creek Tributary 3	Madison County (Unincorporated Areas)	Confluence with Silver Creek	0.99 miles upstream of intersection with Arbuckle Road	05100205	1.44		N	A	June 2014
Silver Creek Tributary 11	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	0.64 miles upstream of confluence with Silver Creek	05100205	0.64		N	A	June 2014
Silver Creek Tributary 37	Madison County (Unincorporated Areas)	Confluence with Silver Creek	0.96 miles upstream of confluence with Silver Creek	05100205	0.96		N	A	June 2014
Sledd Branch	Madison County (Unincorporated Areas)	Confluence with Paint Lick Creek	1.69 miles upstream of confluence with Paint Lick Creek	05100205	1.69		N	A	July 2009
Smith Fork	Madison County (Unincorporated Areas)	Confluence with Calloway Creek	0.96 miles upstream of intersection with Simpson Lane	05100205	0.97		N	A	July 2009
Stillhouse Branch	Madison County (Unincorporated Areas)	Confluence with Red Lick Creek	0.08 miles upstream of Webb N Road	05100204	0.91		N	A	July 2009
Stony Fork	Madison County (Unincorporated Areas)	Confluence with Kentucky River	2.02 miles upstream of intersection with Whitlock Road	05100205	2.19		N	A	June 2014
Stony Run	Madison County (Unincorporated Areas)	Confluence with Otter Creek	0.35 miles upstream of intersection Stoney Run Road	05100205	2.17		N	A	June 2014

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
Tate Creek	Madison County (Unincorporated Areas)	1.34 miles upstream of intersection with Tates Creek Road	0.06 miles downstream of intersection with Finney Fork Road	05100205	6.63		N	A	June 2014
Taylor Fork	Madison County (Unincorporated Areas)	Confluence with Silver Creek	0.54 miles upstream of intersection with Curtis Pike	05100205	1.26		N	A	June 2014
Taylor Fork	Madison County (Unincorporated Areas), City of Richmond	0.54 miles upstream of intersection with Curtis Pike	0.70 miles upstream of confluence with Taylor Fork Tributary 1	05100205	5.98		Y	AE	July 2009
Taylor Fork Tributary 1	Madison County (Unincorporated Areas), City of Richmond	Confluence with Taylor Fork	0.48 miles upstream of confluence with Taylor Fork	05100205	0.48		Y	AE	July 2009
Taylor Fork Tributary 2	Madison County (Unincorporated Areas), City of Richmond	Confluence with Taylor Fork	1.03 miles upstream of confluence with Taylor Fork Tributary 2A	05100205	1.33		Y	AE	July 2009
Taylor Fork Tributary 2A	Madison County (Unincorporated Areas), City of Richmond	Confluence with Taylor Fork Tributary 1	0.34 miles upstream of confluence with Taylor Fork Tributary 2	05100205	0.34		Y	AE	July 2009
Taylor Fork Tributary 3	Madison County (Unincorporated Areas), City of Richmond	Confluence with Taylor Fork	0.53 miles upstream of confluence with Taylor Fork	05100205	0.53		Y	AE	July 2009
Taylor Fork Tributary 4	Madison County (Unincorporated Areas)	Confluence with Taylor Fork	0.46 miles upstream of confluence with Taylor Fork	05100205	0.46		Y	AE	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
Taylor Fork Tributary 5	Madison County (Unincorporated Areas), City of Richmond	Confluence with Taylor Fork	0.04 miles of intersection with Alycia Drive	05100205	0.93		Y	AE	July 2009
Taylor Fork Tributary 6	Madison County (Unincorporated Areas), City of Richmond	Confluence with Taylor Fork	0.16 miles upstream of intersection with Idylwild Court	05100205	1.10		Y	AE	July 2009
Taylor Fork Tributary 7	Madison County (Unincorporated Areas)	Confluence with Taylor Fork	0.35 miles upstream of confluence with Taylor Fork	05100205	0.35		Y	AE	July 2009
Taylor Fork Tributary 8	Madison County (Unincorporated Areas)	Confluence with Taylor Fork	0.68 miles upstream of intersection with Wilgreen Lake Road	05100205	0.7		N	A	June 2014
Terrill Branch	Madison County (Unincorporated Areas), City of Berea	Confluence with Silver Creek	0.70 miles upstream of intersection with Highway 1016	05100205	1.40		N	AE	June 2014
Terrill Branch	Madison County (Unincorporated Areas), City of Berea	0.70 miles upstream of intersection with Highway 1016	0.98 miles upstream of intersection with Highway 1016	05100205	0.28		N	A	July 2009
Tribble Branch	Madison County (Unincorporated Areas), City of Richmond	Confluence with West Fork Otter Creek	0.90 miles upstream of confluence of Tribble Branch Tributary 1	05100205	2.60		N	A	June 2014
Tribble Branch Tributary 1	Madison County (Unincorporated Areas)	Confluence with Tribble Branch	1.34 miles upstream of confluence with Tribble Branch	05100205	1.34		N	A	June 2014

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 Tate Creek	Madison County (Unincorporated Areas), City of Richmond	0.06 miles downstream of intersection with Finney Fork Road	0.19 miles upstream of intersection with Stocker Drive	05100205	3.72		Y	AE	July 2009
Viny Fork	Madison County (Unincorporated Areas)	Confluence with Muddy Creek	2.72 miles upstream of confluence with Muddy Creek	05100205	2.72		N	A	July 2009
Walnut Meadow Branch	Madison County (Unincorporated Areas)	Confluence with Paint Lick Creek	0.09 miles downstream of intersection with Guynn Road	05100205	3.17		N	A	July 2009
Walnut Meadow Branch	Madison County (Unincorporated Areas), City of Berea	0.09 miles downstream of intersection with Guynn Road	0.12 miles upstream of intersection with Ginger Drive	05100205	2.50		Y	AE	July 2009
West Fork Otter Creek	Madison County (Unincorporated Areas)	Confluence with Otter Creek	0.23 miles upstream of intersection with Old Wilderness Trail N	05100205	5.14		N	A	June 2014
West Fork Otter Creek Tributary 6	Madison County (Unincorporated Areas)	Confluence with West Fork Otter Creek	0.98 miles upstream of Bill Eades E	05100205	2.13		N	A	June 2014

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 Madison 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 Madison County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Madison County (Unincorporated Areas)	A, AE, X
City of Berea	A, AE, X
City of Richmond	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 entirety of Madison County.	3,242
Upper Kentucky	05100204	Kentucky River	Begins on Kentucky River at the Madison-Irvine County boundary and extends southeast to the confluence of North Fork and South Fork Kentucky River.	1,084

4.2 Principal Flood Problems

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

Table 6: Principal Flood Problems

Flooding Source	Description of Flood Problems
Brushy Fork	Subject to intermittent flash flooding. No historic flood information is available for Brushy Fork.
Kentucky River	Low-lying areas of Madison County flood periodically from the Kentucky River.
Silver Creek	Subject to intermittent flash flooding. The highest floods on record occurred in 1957 with a peak discharge of 10,500 cubic feet per second (cfs) and 1968 with a peak discharge of 6,410 cubic feet per second (cfs).
Walnut Meadow Branch	Subject to intermittent flash flooding. According to local residents, the highest flood on Walnut Meadow Branch since the 1930s, in the segment between Interstate 75 and Guynn Road, occurred in the 1980's.

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

Table 7: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)*	Source of Data
Silver Creek	State Route 1983 bridge about 2.5 miles southwest of Kingston, Kentucky	888.5	January, 1957	50	Flood Insurance Study (FEMA 2012)
Silver Creek	USGS Gage 03284300 at Kinston, Kentucky	884.9	April, 1968	10	Flood Insurance Study (FEMA 2012)

4.3 Non-Levee Flood Protection Measures

Table 8 contains information about non-levee flood protection measures within Madison 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
Brushy Fork	Bryant Lake Dam	Retention Structure	On a tributary to Brushy Fork, approximately 0.5 mile east of Berea.	Constructed in 1967 and breached in 1982.
East Fork Silver Creek	Lower Silver Creek Lake Dam (Pig Hollow Lake Dam)	Retention Structure	About 2.0 miles southeast of Berea.	Constructed in 1939. Modified in 1982 to raise the retention structure by about 8 feet.
East Fork Silver Creek	Upper Silver Creek Lake Dam (Kale's Lake Dam)	Retention Structure	About 2.0 miles southeast of Berea.	Constructed in 1920.
Kentucky River	Lock and Dam No. 9	Lock and Retention Structure	Just downstream of the confluence of Tate Creek.	One of a series designed for navigational purposes. The facility does not offer flood protection to Madison County from the 1-percent annual chance flood.

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. (Coastal Stillwater elevations are discussed in Section 5.3 and shown in Table 17.) 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
Brushy Fork	At approximately 380 feet downstream of Caffold Cane Road	5.9	1,813	*	2,869	3,389	4,887
Brushy Fork	At approximately 400 feet downstream of CSX Railroad	4.8	1,697	*	2,697	3,183	4,539
Brushy Fork	At approximately 340 feet upstream of Mount Vernon Road	3.8	754	*	1,256	1,508	2,170
Kentucky River	At River Mile Station 191.6	*	76,100	*	90,900	96,700	109,000
Dreaming Creek Tributary	At approximately 0.2 miles downstream of Third Street	*	620	*	850	910	1,100
Dreaming Creek Tributary	At approximately 500 feet upstream of Third Street	*	420	*	570	610	750
Dreaming Creek Tributary	At approximately 0.7 miles upstream of Third Street	*	174	*	238	255	310
Irvine Lick Creek	At approximately 1,200 feet upstream of Cardinal Drive	1.9	785	1,109	1,381	1,679	2,465

*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
Irvine Lick Creek	At crossing of Cardinal Drive	1.8	757	1,071	1,334	1,624	2,387
Irvine Lick Creek	At approximately 1,920 feet upstream of Old Farm Road	1.5	650	924	1,155	1,409	2,082
Irvine Lick Creek	At approximately 115 feet upstream from Sundae Drive	1.2	579	827	1,035	1,266	1,878
Irvine Lick Creek	At approximately 827 feet downstream from Sundae Drive	1.1	531	760	954	1,168	1,738
Otter Creek	At approximately 70 feet upstream of Four Mile Road	*	4,620	*	6,360	6,990	8,460
Otter Creek	At approximately 0.2 miles upstream of Four Mile Road	*	4,240	*	5,650	6,170	7,360
Otter Creek	At approximately 200 feet upstream of Irvine Road	*	3,070	*	4,100	4,400	5,100
Otter Creek	At approximately 50 feet upstream of Catalpa Loop	*	2,463	*	2,350	3,625	4,720

*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
Otter Creek Tributary 1	At approximately 485 feet upstream of Eastern Bypass	0.66	650	818	880	940	1,120
Otter Creek Tributary 1	At approximately 460 feet upstream of Big Hill Avenue	0.31	221	325	415	615	791
Otter Creek Tributary 1	At crossing of Big Hill Avenue	0.21	172	254	327	516	631
Otter Creek Tributary 1.1	At approximately 450 feet upstream of Steep Street	0.45	285	417	529	656	996
Otter Creek Tributary 1.1	At approximately 1,440 feet downstream of Steep Street	0.41	268	392	498	618	941
Otter Creek Tributary 1.1	At approximately 175 feet upstream of Justin Drive	0.27	199	294	376	469	722
Otter Creek Tributary 1.1	At approximately 30 feet upstream of Sylvia Drive	0.17	147	220	283	355	551
Otter Creek Tributary 1.1	At approximately 30 feet downstream of Sylvia Drive	0.09	95	143	186	236	371
Otter Creek Tributary 2	At approximately 210 feet upstream of Irvine Street	0.13	120	156	170	180	220

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
Otter Creek Tributary 2	At approximately 110 feet downstream of Evansdale Avenue	0.09	94	131	157	180	220
Otter Creek Tributary 2	At approximately 340 feet downstream of Evansdale Avenue	0.03	46	71	93	120	193
Silver Creek	At approximately 0.7 miles downstream of KY-1016	21.3	7,408	*	11,937	14,309	20,341
Silver Creek	At approximately 0.8 miles upstream of KY-1016	16.1	6,298	*	10,185	12,126	17,271
Silver Creek	At approximately 500 Feet upstream of KY-21	12	4,268	*	6,999	8,348	11,691
Taylor Fork	At approximately 600 feet downstream of the confluence with Old Town Branch	*	6,430	*	10,530	12,420	16,950
Taylor Fork	At approximately 200 feet downstream of the confluence with Taylor Fork Tributary 7	*	3,390	*	4,900	5,590	7,330
Taylor Fork	At approximately 300 feet upstream of Interstate-75	*	1,920	*	2,820	3,030	3,460

*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
Taylor Fork	At approximately 700 feet upstream of Interstate-75	*	2,270	*	3,360	3,730	4,650
Taylor Fork	At approximately 600 feet downstream of Lancaster Road	*	2,970	*	4,430	5,140	7,030
Taylor Fork	At approximately 200 feet downstream of the confluence with Taylor Fork Tributary 4	*	1,910	*	3,130	3,680	5,080
Taylor Fork	At approximately 150 feet downstream of the confluence with Taylor Fork Tributary 2	*	1,760	*	2,880	3,370	4,620
Taylor Fork	At approximately 0.6 miles downstream of the confluence with Taylor Fork Tributary 1	*	950	*	1,560	1,840	2,510
Taylor Fork	At approximately 150 feet downstream of the confluence with Taylor Fork Tributary 1	*	440	*	710	840	1,150
Taylor Fork	At approximately 0.7 miles upstream of the confluence with Taylor fork Tributary 1	*	150	*	250	300	410
Taylor Fork Tributary 1	At approximately 700 feet upstream of the confluence with Taylor Fork	*	190	*	290	320	420

*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
Taylor Fork Tributary 1	At approximately 0.3 miles upstream of the confluence with Taylor Fork	*	130	*	200	230	300
Taylor Fork Tributary 1	At approximately 0.5 miles upstream of the confluence with Taylor Fork	*	90	*	140	160	210
Taylor Fork Tributary 2	At approximately 0.3 miles upstream of the confluence with Taylor Fork	*	910	*	1,290	1,440	1,780
Taylor Fork Tributary 2	At approximately 0.4 miles upstream of the confluence with Taylor Fork	*	680	*	950	1,040	1,280
Taylor Fork Tributary 2	At approximately 75 feet downstream of Lower Loop Road	*	480	*	620	670	790
Taylor Fork Tributary 2	At approximately 700 feet upstream of Upper Loop Road	*	330	*	420	460	530
Taylor Fork Tributary 2A	At approximately 300 feet upstream of the confluence with Taylor Fork Tributary 2	*	150	*	230	260	330
Taylor Fork Tributary 2A	At approximately 0.3 miles upstream of the confluence with Taylor Fork Tributary 2	*	130	*	190	220	270

*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
Taylor Fork Tributary 3	At approximately 200 feet upstream of the confluence with Taylor Fork	*	150	*	220	250	320
Taylor Fork Tributary 3	At approximately 0.5 miles upstream of the confluence with Taylor Fork	*	80	*	120	140	180
Taylor Fork Tributary 4	At approximately 500 feet upstream of the confluence with Taylor Fork	*	170	*	240	260	320
Taylor Fork Tributary 4	At approximately 0.5 miles upstream of the confluence with Taylor Fork	*	100	*	140	150	190
Taylor Fork Tributary 4	At approximately 300 feet downstream of Armitage Drive	*	1,790	*	2,250	2,430	2,840
Taylor Fork Tributary 5	At approximately 50 feet upstream of Elizabeth Drive	*	1,330	*	1,700	1,870	2,190
Taylor Fork Tributary 5	At approximately 200 feet upstream of Alycia	*	780	*	980	1,060	1,240
Taylor Fork Tributary 5	At approximately 0.3 miles upstream of the confluence with Taylor Fork	*	550	*	730	810	970

*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
Taylor Fork Tributary 5	At approximately 800 feet upstream of Idylwild Court	*	310	*	410	450	540
Taylor Fork Tributary 6	At approximately 0.2 miles upstream of the confluence with Taylor Fork	*	910	*	1,290	1,450	1,790
Taylor Fork Tributary 6	At approximately 0.4 miles upstream of the confluence with Taylor Fork	*	830	*	1,170	1,320	1,630
Taylor Fork Tributary 7	At approximately 450 feet downstream of Guynn Road	5.7	2,760	*	4,390	5,170	7,530
Taylor Fork Tributary 7	At approximately 0.5 miles upstream of Interstate-75	3.6	2,390	*	3,630	4,200	5,690
Upper Tate Creek	At approximately 0.3 miles upstream of Finney Fork Road	*	3,730	*	5,640	6,130	7,670
Upper Tate Creek	At approximately 100 feet upstream of the confluence with Irvine Lick Creek	*	3,070	*	4,420	4,800	6,010
Upper Tate Creek	At approximately 0.4 miles upstream of Goggins Lane	*	1,510	*	2,160	2,310	2,780

*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
Upper Tate Creek	At approximately 200 feet upstream of Interstate-75	*	1,240	*	1,690	1,900	2,290
Upper Tate Creek	At approximately 700 feet downstream of Grey Oaks Drive	*	630	*	860	910	1,100
Upper Tate Creek	At approximately 300 feet downstream of Robert L. Telford Drive	*	520	*	700	750	910
Upper Tate Creek	At approximately 0.2 miles upstream of Stocker Drive	*	370	*	500	530	640
Walnut Meadow Branch	At approximately 0.8 miles downstream of Ginger Drive	2.4	2,310	*	3,440	3,980	5,330
Walnut Meadow Branch	At approximately 650 feet above Ginger Drive	1.3	1,040	*	1,630	1,920	2,650

*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

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Silver Creek	3284310	USGS	Silver Creek Near Berea	53.4	5/28/1959	4/29/1983
Silver Creek	3284300	USGS	Silver Creek Near Kingston	28.6	4/4/1968	5/16/1983
Old Town Branch Tributary	3284340	USGS	Old Town Branch Tributary	1.83	11/17/1975	11/19/1984

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. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data Tables in this FIS report. 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					
Ball Branch	Confluence with Silver Creek	0.93 miles upstream of intersection with Barnes Mill Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Ballard Branch	Confluence with Silver Creek	0.22 miles upstream of intersection with I-75	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Ballard Branch Tributary 1	Confluence with Ballard Branch	0.24 miles upstream of intersection with John Ballard Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Bogie Branch	Confluence with Silver Creek	1.28 miles upstream of intersection with Mule Shed Lane	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Brown Branch	Confluence with Silver Creek	2.21 miles upstream of intersection with Bogie Mill Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Brushy Fork	0.06 miles upstream of intersection with Mt. Vernon Road	0.92 miles upstream of confluence with Brushy Fork	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Brushy Fork	Confluence with Silver Creek	0.06 miles upstream of intersection with Mt. Vernon Road (US-25)	HEC-HMS 3.2	HEC-RAS v. 3.1.2	7/2009	AE	None
Brushy Fork Tributary 1	Confluence with Brushy Fork	0.08 miles upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Buffalo Creek	Confluence with Tate Creek	1.84 miles upstream of Tates Creek Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Butler Branch	Confluence with Drowning Creek	1.97 miles upstream from confluence with Drowning Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Calloway Creek	Confluence with Kentucky River	1.58 upstream of intersection with Simpson Lane	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Clear Creek I	Confluence with Muddy Creek	1.72 miles upstream of intersection with Clear Creek Ln	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Copperas Branch	Confluence with Red Lick Creek	0.30 miles upstream of intersection with Red Lick Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Cowbell Creek	Confluence with Red Lick Creek	2.36 miles upstream of intersection with KY-21 State Highway	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Crutcher Fork	Confluence with Tate Creek	0.47 miles upstream of Crutcher Pike	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Dog Branch	Confluence with Silver Creek	1.69 miles upstream of Richmond Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Dreaming Creek	Confluence with Otter Creek	0.48 miles upstream of intersection with Red House Rd	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Dreaming Creek Tributary	Confluence with Dreaming Creek	0.73 miles upstream of intersection with Old Wilderness Trail	*	*	9/30/2009	AE	None
Drowning Creek	Confluence with Kentucky River	0.66 miles upstream of confluence with Drowning Creek Tributary 4	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Drowning Creek Tributary 1	Confluence with Drowning Creek	0.85 miles upstream of confluence with Drowning Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Drowning Creek Tributary 2	Confluence with Drowning Creek	1.80 miles upstream of confluence with Drowning Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Drowning Creek Tributary 3	Confluence with Drowning Creek	0.79 miles upstream of intersection with Irvine Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Drowning Creek Tributary 4	Confluence with Drowning Creek	0.58 miles upstream from confluence with Drowning Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Drowning Creek Tributary 5	Confluence with Drowning Creek	1.07 miles upstream of confluence with Drowning Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Dry Branch	Confluence with Paint Lick Creek	0.98 miles upstream from intersection with Dry Branch Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Dunbar Branch	Confluence with Rocky Lick Branch	0.17 miles upstream of intersection with Walker Parke Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
East Fork Otter Creek	Confluence with Otter Creek	0.20 miles upstream of intersection with Union City Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
East Fork Otter Creek Tributary 1	Confluence with East Fork Otter Creek	0.37 miles upstream of intersection with Union City Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
East Fork Otter Creek Tributary 2	Confluence with East Fork Otter Creek	2.03 miles upstream of intersection with Brookstown Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
East Fork Silver Creek	Confluence with Silver Creek	0.28 miles upstream of intersection with Gabbard Town Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
East Fork Silver Creek	0.28 miles upstream of intersection with Gabbard Town Road	1.82 miles upstream of intersection with Gabbard Town Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Elk Garden Branch	Confluence with Silver Creek	1.78 miles upstream of confluence with Silver Creek	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Falling Branch	Confluence with Kentucky River	1.47 miles upstream of confluence with Kentucky River	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Finney Fork	Confluence with Tate Creek	1.26 miles upstream of confluence with Tate Creek	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Flint Creek	Confluence with Kentucky River	1.06 miles upstream of confluence with Kentucky River	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Flint Creek Tributary 1	Confluence with Flint Creek	0.07 miles upstream of confluence with Flint Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Floyd Branch	Confluence with Red Lick Creek	1.87 miles upstream of intersection with Floyd Branch Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Gilead Branch	Confluence with Paint Lick Creek	1.11 miles upstream of confluence with Paint Lick Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Gravel Lick Branch	Confluence with Joe Lick Fork	1.52 miles upstream of intersection with Gravel Lick Branch Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Gravel Lick Tributary 2	Confluence with Gravel Lick Branch	0.60 miles upstream from confluence with Gravel Lick Branch	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Greens Branch	Confluence with Silver Creek	1.42 miles upstream of intersection with Bogie Mill Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hams Branch	Confluence with Silver Creek	1.24 miles upstream of intersection with Jigg Water Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Harts Fork	Confluence with Hays Fork	0.30 miles upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hays Fork	Confluence with Silver Creek	1.83 miles upstream of intersection with Battlefield Memorial Highway	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hays Fork Tributary 2 DS	Confluence with Hays Fork	Base of Lake Gem Dam	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hays Fork Tributary 2 US	540 feet upstream of Lake Gem Dam	1.81 miles upstream of intersection with Battlefield Memorial Highway	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hays Fork Tributary 4	Confluence with Hays Fork	0.10 miles upstream of intersection with Rose Lane	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hickory Lick Creek	Confluence with Muddy Creek	0.50 miles upstream of intersection with Hickory Lick Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Hickory Lick Creek Tributary 2	Confluence with Hickory Lick Creek	1.33 miles upstream of confluence with Hickory Lick Creek Tributary 2.1	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Hickory Lick Creek Tributary 2.1	Confluence with Hickory Lick Creek Tributary 2	0.60 miles upstream of confluence with Hickory Lick Creek Tributary 2	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Hicks Branch	Confluence with West Fork Otter Creek	2.28 miles upstream of intersection with Three Forks Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hicks Branch Tributary 1	Confluence with Hicks Branch	1.06 miles upstream of intersection with Cedar Hill Drive	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Hines Creek	Confluence with Kentucky River	2.25 miles upstream from confluence with Kentucky River	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Honest Branch	Confluence with Tate Creek	1.19 miles upstream from confluence with Tate Creek	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Irvine Lick Creek	Confluence with Tate Creek	0.23 miles upstream of intersection with Cardinal Drive	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	AE	None
Jacks Creek	Confluence with Kentucky River	1.43 miles upstream of confluence with Kentucky River	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Jackson Branch	Confluence with Silver Creek	0.30 miles upstream of intersection with Jackson Branch Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Joe Lick Fork	Confluence with Red Lick Creek	2.24 miles upstream of intersection with Gravel Lick Branch Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Jones Branch I	Confluence with Silver Creek	1.47 miles upstream of confluence with Jones Branch Tributary 1	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Jones Branch Tributary 1	Confluence with Jones Branch I	0.09 miles upstream of intersection with Walnut Meadow Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Judytown Branch	Confluence with Walnut Meadow Branch	1.81 miles upstream of intersection with Walnut Meadow Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Kentucky River	County boundary (Confluence of Paint Lick Creek)	County boundary (Confluence of Red River)	Gage Analysis	HEC-RAS v. 3.1.2	05/2010	AE	None
Kentucky River Tributary 3	Confluence with Kentucky River	1.28 miles upstream of confluence with Kentucky River	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Kentucky River Tributary 77	Confluence with Kentucky River	0.96 miles upstream of confluence with Kentucky River	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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 Muddy Creek	Confluence with Muddy Creek	1.16 miles upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Long Branch	County boundary	0.97 miles upstream of county boundary	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Long Branch III	Confluence with Lower Tate Creek	1.11 miles upstream of intersection with Tate Creek Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Long Branch Tributary 1	Confluence with Long Branch	0.66 upstream of confluence with Long Branch	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Long Hollow	Confluence with Silver Creek	1.30 miles upstream of intersection with Scaffold Cane Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Lost Fork	Confluence with Otter Creek	0.12 miles upstream of intersection with Lost Fork Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Lower Tate Creek	Confluence with Kentucky River	1.34 miles upstream of intersection with Tates Creek Road	Regression Analysis	HEC-2	9/1988	AE	None
McCarter Branch	Confluence with Red Lick Creek	0.78 miles upstream of intersection with Casteel road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Muddy Creek	Confluence with Kentucky River	0.30 miles upstream of intersection with Gumbottom Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 1	Confluence with Muddy Creek	1.56 miles upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 3	Confluence with Muddy Creek	0.46 miles upstream of intersection with Tipton Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 4	Confluence with Muddy Creek	0.30 miles upstream of intersection with College Hill Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 5	Confluence with Muddy Creek	0.98 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 6	Confluence with Muddy Creek	1.00 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 6.1	Confluence with Muddy Creek Tributary 6	0.63 miles upstream of confluence with Muddy Creek Tributary 6	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 7	Confluence with Muddy Creek	1.46 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Muddy Creek Tributary 8	Confluence with Muddy Creek	0.86 miles upstream of intersection with Oakley Wells Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 8.1	Confluence with Muddy Creek Tributary 8	1.34 miles upstream of confluence with Muddy Creek Tributary 8	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 9	Confluence with Muddy Creek	0.35 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 10	Confluence with Muddy Creek	0.41 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Muddy Creek Tributary 17	Confluence with Muddy Creek	0.54 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Old Town Branch	Confluence with Taylor Fork	0.39 miles upstream of intersection with I-75	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Old Town Branch Tributary 1	Confluence with Old Town Branch	0.26 miles upstream of intersection with Lancaster Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Oldham Branch	Confluence with Drowning Creek	1.31 miles upstream of Walter Lakes Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Otter Creek	Confluence with Kentucky River	1.09 miles upstream of intersection with union City Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Otter Creek	1.09 miles upstream of intersection with Union City Road	0.01 miles upstream of intersection with Catalpa Loop	*	*	09/30/2009	AE	None
Otter Creek	0.01 miles upstream of intersection with Catalpa Loop	1.28 miles upstream of intersection with Catalpa Loop	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Otter Creek Tributary 1	0.02 miles downstream of intersection with Big Hill Avenue	0.12 miles upstream of intersection with Eastern Bypass	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	AE	None
Otter Creek Tributary 1	Confluence with Otter Creek	0.02 miles downstream of intersection with Big Hill Avenue	*	*	09/30/2009	AE	None
Otter Creek Tributary 1.1	Confluence with Otter Creek Tributary 1	0.11 miles upstream of intersection with Steep Street	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	AE	None
Otter Creek Tributary 2	0.06 miles downstream of intersection with Evansdale Avenue	0.07 miles upstream of intersection with Irvine Street	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	AE	None
Otter Creek Tributary 2	Confluence with Otter Creek	0.06 downstream of intersection with Evansdale Avenue	*	*	09/30/2009	AE	None
Otter Creek Tributary 3	Confluence with Otter Creek	1.33 miles upstream of intersection with Railroad	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Otter Creek Tributary 4	Confluence with Otter Creek	0.21 miles upstream of intersection with Pumpkin Run Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Otter Creek Tributary 5	Confluence with Otter Creek	0.84 upstream of confluence with Otter Creek	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Owsley Fork	Confluence with Red Lick Creek	0.77 miles upstream of Owsley Fork Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Paint Lick Creek	Confluence with Kentucky River	7.12 miles upstream of intersection with KY-52 State Highway	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Paint Lick Creek Tributary 1	Confluence with Paint Lick Creek	1.22 miles upstream of intersection with KY-21 State Highway	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Paint Lick Tributary 4	Confluence with Paint Lick Creek	0.07 miles upstream of confluence with Paint Lick Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Poplar Branch	Confluence with Drowning Creek	0.002 miles upstream of confluence with Drowning Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Red Lick Branch	Confluence with Cowbell Creek	0.29 miles upstream of intersection with Jackson Lane	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Red Lick Branch Tributary 1	Confluence with Red Lick Branch	0.56 miles upstream of intersection with Battlefield Memorial Highway	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Red Lick Creek	County boundary	1.21 miles upstream of intersection with Battlefield Memorial Highway	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Rocky Lick Branch	Confluence with Muddy Creek	0.65 miles upstream of intersection with Walker Parke Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Shallow Ford Creek	Confluence with Tate Creek	0.67 miles upstream of intersection with Clay Lane	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Shirley Branch	Confluence with Red Lick Creek	1.75 miles upstream of intersection with Beach Grove Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Silver Creek	Confluence with Kentucky River	0.01 miles downstream of intersection with Richmond Road (US-25)	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Silver Creek	0.01 miles downstream of intersection with Richmond Road (US-25)	0.10 miles upstream of intersection with State Highway 21 (KY-21)	HEC-HMS 3.2	HEC-RAS v. 3.1.2	07/2009	AE	None
Silver Creek	0.10 miles upstream of intersection with State Highway 21 (KY-21)	0.33 miles upstream of intersection with Kindred Lane	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	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					
Silver Creek Tributary 1	Confluence with Silver Creek	1.41 miles upstream of intersection with Peytontown Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Silver Creek Tributary 2	Confluence with Silver Creek	1.33 miles upstream of intersection with Richmond Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Silver Creek Tributary 3	Confluence with Silver Creek	0.99 miles upstream of intersection with Arbuckle Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Silver Creek Tributary 11	Confluence with Silver Creek	0.64 miles upstream of confluence with Silver Creek	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Silver Creek Tributary 37	Confluence with Silver Creek	0.96 miles upstream of confluence with Silver Creek	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Sledd Branch	Confluence with Paint Lick Creek	1.69 miles upstream of confluence with Paint Lick Creek	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Smith Fork	Confluence with Calloway Creek	0.96 miles upstream of intersection with Simpson Lane	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Stillhouse Branch	Confluence with Red Lick Creek	0.08 miles upstream of Webb N Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	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					
Stony Fork	Confluence with Kentucky River	2.02 miles upstream of intersection with Whitlock Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Stony Run	Confluence with Otter Creek	0.35 miles upstream of intersection Stoney Run Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Tate Creek	1.34 miles upstream of intersection with Tates Creek Road	0.06 miles downstream of intersection with Finney Fork Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Taylor Fork	Confluence with Silver Creek	0.54 miles upstream of intersection with Curtis Pike	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Taylor Fork	0.54 miles upstream of intersection with Curtis Pike	0.70 miles upstream of confluence with Taylor Fork Tributary 1	*	*	09/30/2009	AE	None
Taylor Fork Tributary 1	Confluence with Taylor Fork	0.48 miles upstream of confluence with Taylor Fork	*	*	09/30/2009	AE	None
Taylor Fork Tributary 2	Confluence with Taylor Fork	1.03 miles upstream of confluence with Taylor Fork Tributary 2A	*	*	09/30/2009	AE	None
Taylor Fork Tributary 2A	Confluence with Taylor Fork Tributary 2	0.34 miles upstream of confluence with Taylor Fork Tributary 2	*	*	09/30/2009	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					
Taylor Fork Tributary 3	Confluence with Taylor Fork	0.53 miles upstream of confluence with Taylor Fork	*	*	09/30/2009	AE	None
Taylor Fork Tributary 4	Confluence with Taylor Fork	0.46 miles upstream of confluence with Taylor Fork	*	*	09/30/2009	AE	None
Taylor Fork Tributary 5	Confluence with Taylor Fork	0.04 miles of intersection with Alycia Drive	*	*	09/30/2009	AE	None
Taylor Fork Tributary 6	Confluence with Taylor Fork	0.16 miles upstream of intersection with Idylwild Court	*	*	09/30/2009	AE	None
Taylor Fork Tributary 7	Confluence with Taylor Fork	0.35 miles upstream of confluence with Taylor Fork	*	*	09/30/2009	AE	None
Taylor Fork Tributary 8	Confluence with Taylor Fork	0.68 miles upstream of intersection with Wilgreen Lake Road	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Terrill Branch	Confluence with Silver Creek	0.70 miles upstream of intersection with Highway 1016	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	AE	None
Terrill Branch	0.70 miles upstream of intersection with Highway 1016	0.98 miles upstream of intersection with Highway 1016	Regression Equation	HEC-RAS v. 3.1.2	7/2009	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					
Tribble Branch	Confluence with West Fork Otter Creek	0.90 miles upstream of confluence of Tribble Branch Tributary 1	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Tribble Branch Tributary 1	Confluence with Tribble Branch	1.34 miles upstream of confluence with Tribble Branch	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
Upper Tate Creek	0.06 miles downstream of intersection with Finney Fork Road	0.19 miles upstream of intersection with Stocker Drive	*	*	09/30/2009	AE	None
Viny Fork	Confluence with Muddy Creek	2.72 miles upstream of confluence with Muddy Creek	Regression Equation	HEC-RAS v. 4.1.0	07/2009	A	None
Walnut Meadow Branch	Confluence with Paint Lick Creek	0.09 miles downstream of intersection with Guynn Road	Regression Equation	HEC-RAS v. 3.1.2	07/2009	A	None
Walnut Meadow Branch	0.09 miles downstream of intersection with Guynn Road	0.12 miles upstream of intersection with Ginger Drive	HEC-HMS 3.2	HEC-RAS v. 3.1.2	07/2009	AE	None
West Fork Otter Creek	Confluence with Otter Creek	0.23 miles upstream of intersection with Old Wilderness Trail N	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None
West Fork Otter Creek Tributary 6	Confluence with West Fork Otter Creek	0.98 miles upstream of Bill Eades E	Regression Equation	HEC-RAS v. 4.1.0	06/24/2014	A	None

Table 14: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
Brushy Fork	0.055	0.070 – 0.120
Dreaming Creek Tributary	0.035 – 0.055	0.055 – 0.085
Irvine Lick Creek	0.03 – 0.05	0.06 – 0.1
Kentucky River	0.038 – 0.045	0.070 – 0.120
Lower Tate Creek	0.040 – 0.055	0.050 – 0.090
Otter Creek	0.035 – 0.100	0.080 – 0.250
Otter Creek Tributary 1	0.013 – 0.100	0.080 – 0.200
Otter Creek Tributary 1 – Limited Detailed Study	0.025 – 0.9	0.02 – 0.07
Otter Creek Tributary 1.1	0.015 – 0.08	0.025 – 0.11
Otter Creek Tributary 2	0.035 – 0.048	0.065 – 0.085
Otter Creek Tributary 2 – Limited Detailed Study	0.035 – 0.05	0.075 – 0.09
Silver Creek	0.045 – 0.055	0.060 – 0.120
Taylor Fork	0.030 – 0.055	0.055 – 0.100
Taylor Fork Tributary 1	0.045	0.065
Taylor Fork Tributary 2	0.030 – 0.040	0.055 – 0.070
Taylor Fork Tributary 2A	0.035 – 0.045	0.060
Taylor Fork Tributary 3	0.035 – 0.045	0.055 – 0.080
Taylor Fork Tributary 4	0.040 – 0.045	0.065 – 0.070
Taylor Fork Tributary 5	0.025 – 0.045	0.055 – 0.100
Taylor Fork Tributary 6	0.028 – 0.045	0.065 – 0.085
Taylor Fork Tributary 7	0.028 – 0.045	0.065 – 0.085
Terrill Branch	0.02 – 0.055	0.075 – 0.095
Upper Tate Creek	0.045	0.085
Walnut Meadow Branch	0.045 – 0.055	0.030 – 0.120
Approximate Studies	0.037 – 0.060	0.060 – 0.100

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 Madison County FIS for the entire county was -0.5 feet.

Table 20: Countywide Vertical Datum Conversion

[Not Applicable to this FIS Project]

Table 21: Stream-by-Stream 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
Madison County	All within HUC 05100204	NED 1/3 Arc Second Digital Elevation Model	1:24,000	10 meter	USGS
Madison County	Calloway Creek, Clear Creek I, Dry Branch, Dunbar Branch, Gilead Branch, Hickory Lick Creek, Hickory Lick Creek Tributary 2, Hickory Lick Creek Tributary 2.1, Hines Creek, Judytown Branch, Little Muddy Creek, Muddy Creek and Tributaries, Paint Lick Creek, Paint Lick Creek Tributary 1, Rocky Lick Branch, Sledd Branch, Smith Fork, Viny Fork	NED 1/3 Arc Second Digital Elevation Model	1:24,000	10 meter	USGS
Madison County, City of Berea, City of Richmond	All others within HUC 05100205	LiDAR	1 meter GSD	2 ft.	KYGeonet

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 (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Brushy Fork								
A	611	94	456	7.4	921.4	920.8 ²	921.1	0.3
B	1,757	230	887	3.8	926.0	926.0	927.0	1.0
C	2,526	177	852	4.0	928.5	928.5	929.2	0.7
D	4,108	104	637	5.3	933.4	933.4	934.0	0.6
E	5,481	90	731	4.6	938.6	938.6	939.3	0.7
F	7,141	164	913	3.7	942.0	942.0	942.3	0.3
G	8,252	198	1,162	2.7	946.5	946.5	947.2	0.7
H	9,708	200	1,204	2.6	949.0	949.0	949.5	0.5
I	10,860	186	876	3.6	949.8	949.8	950.7	0.9
J	12,355	114	468	6.8	955.1	955.1	955.9	0.8
K	12,801	96	699	4.6	957.5	957.5	958.5	1.0
L	14,834	88	406	3.7	964.9	964.9	965.0	0.1
M	16,014	83	513	2.9	967.9	967.9	967.9	0.0
N	16,992	135	448	3.4	976.5	976.5	976.5	0.0

¹Stream distance in feet above confluence with Silver Creek

²Elevations computed without consideration of backwater effects from Silver Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

BRUSHY FORK

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
Dreaming Creek Tributary								
A	59	59	131	7.7	839.5	837.2 ²	837.2	0.0
B	506	101	407	2.3	845.0	845.0	845.8	0.8
C	1,088	83	167	5.4	847.9	847.9	847.9	0.0
D	1,756	73	204	4.5	855.0	855.0	855.0	0.0
E	2,618	78	118	7.0	862.1	862.1	862.1	0.0
F	3,403	74	139	4.2	867.9	867.9	868.0	0.1
G	4,614	68	77	6.0	883.4	883.4	883.7	0.3
H	5,995	87	158	2.1	900.8	900.8	900.8	0.0
I	6,657	43	66	3.9	917.1	917.1	917.1	0.0

¹Stream distance in feet above confluence with Dreaming Creek

²Elevations computed without consideration of backwater effects from Dreaming Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

DREAMING CREEK TRIBUTARY

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	146.61	939/183	27,938	4.0	573.1	573.1	573.4	0.3
B	147.27	553/388	21,982	5.1	573.5	573.5	573.8	0.3
C	149.29	481/250	19,999	5.7	575.0	575.0	575.4	0.4
D	150.44	428/253	18,859	6.0	576.1	576.1	576.4	0.3
E	151.40	338/218	18,227	6.2	576.8	576.8	577.1	0.3
F	151.77	458/339	20,688	5.5	577.2	577.2	577.6	0.4
G	152.40	432/303	20,679	5.5	577.7	577.7	578.0	0.3
H	153.50	501/325	24,766	4.6	578.5	578.5	578.8	0.3
I	154.02	406/181	19,693	5.7	578.7	578.7	579.1	0.4
J	155.42	275/177	15,873	7.1	579.4	579.4	579.8	0.4
K	155.94	373/185	19,571	5.8	580.1	580.1	580.5	0.4
L	156.38	409/146	18,757	6.0	580.3	580.3	580.7	0.4
M	157.09	448/150	20,566	5.5	581.0	581.0	581.4	0.4
N	157.89	373/157	19,871	5.7	581.8	581.8	582.1	0.3
O	159.08	484/272	21,635	4.5	582.8	582.8	583.3	0.5
P	160.21	426/324	20,491	4.7	583.3	583.3	583.8	0.5
Q	160.65	408/339	19,918	4.9	583.4	583.4	583.9	0.5
R	160.87	417/272	20,458	4.7	583.6	583.6	584.1	0.5
S	161.60	352/146	19,156	5.1	583.9	583.9	584.5	0.6
T	162.55	739/152	24,907	3.9	584.4	584.4	584.9	0.5
U	163.51	377/233	19,947	4.9	584.9	584.9	585.4	0.5
V	164.61	730/202	25,532	3.8	585.4	585.4	585.4	0.5

¹Stream distance in miles above confluence with Ohio River

²Width/Width within county

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

KENTUCKY RIVER

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 (continued)								
W	165.80	408/250	18,201	5.3	585.9	585.9	586.4	0.5
X	166.80	295/170	15,758	6.1	586.5	586.5	587.0	0.5
Y	167.83	329/241	17,795	5.4	587.3	587.3	587.8	0.5
Z	168.23	423/177	20,622	4.7	587.6	587.6	588.1	0.5
AA	169.12	324/165	17,682	5.5	588.0	588.0	588.6	0.6
AB	169.68	406/296	17,838	5.4	588.3	588.3	588.8	0.5
AC	170.67	525/229	21,709	4.5	589.3	589.3	589.8	0.5
AD	171.13	541/339	23,054	4.2	590.1	590.1	590.6	0.5
AE	172.83	443/212	22,381	4.3	590.9	590.9	591.4	0.5
AF	173.81	404/230	20,241	4.8	591.3	591.3	591.8	0.5
AG	174.10	347/249	18,251	5.3	591.5	591.5	592.0	0.5
AH	175.25	709/459	25,081	3.9	592.3	592.3	592.8	0.5
AI	175.88	360/147	17,483	5.5	592.5	592.5	593.1	0.6
AJ	176.55	415/241	20,172	4.8	593.2	593.2	593.7	0.5
AK	177.17	694/457	23,053	4.2	593.8	593.8	594.4	0.6
AL	177.65	688/439	20,951	4.6	594.0	594.0	594.7	0.7
AM	178.34	746/164	22,417	4.3	594.8	594.8	595.5	0.7
AN	179.81	753/526	23,268	4.2	595.7	595.7	596.5	0.8
AO	180.07	1,013/778	29,198	3.3	596.0	596.0	596.8	0.8
AP	180.60	643/466	21,377	4.5	596.3	596.3	597.0	0.7
AQ	181.38	489/127	19,468	5.0	596.9	596.9	597.6	0.7
AR	182.87	505/401	19,769	4.9	598.2	598.2	599.0	0.8

¹Stream distance in miles above confluence with Ohio River

²Width/Width within county

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

KENTUCKY RIVER

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 (continued)								
AS	183.91	607/410	22,255	4.4	599.2	599.2	599.9	0.7
AT	186.15	1,044/785	29,310	3.3	600.7	600.7	601.5	0.8
AU	186.67	816/609	25,127	3.9	600.9	600.9	601.7	0.8
AV	187.14	935/789	25,625	3.8	601.4	601.4	602.1	0.7
AW	188.10	800/364	24,895	3.9	601.9	601.9	602.7	0.8
AX	188.56	400/252	18,371	5.3	602.1	602.1	602.9	0.8
AY	189.59	412/288	19,198	5.0	603.4	603.4	603.9	0.5
AZ	191.13	664/452	23,303	4.2	604.4	604.4	605.2	0.8
BA	192.57	447/242	16,510	6.5	605.2	605.2	606.1	0.9
BB	193.06	956/340	30,257	3.5	606.4	606.4	607.2	0.8
BC	193.45	804/168	22,872	4.7	606.5	606.5	607.3	0.8
BD	194.47	1,074/910	32,007	3.3	607.7	607.7	608.4	0.7
BE	194.97	944/502	24,592	4.3	607.9	607.9	608.7	0.8
BF	196.05	382/153	15,841	6.7	608.8	608.8	609.4	0.6
BG	196.47	829/152	21,157	5.1	609.6	609.6	610.3	0.7
BH	197.50	369/219	17,885	6.0	610.7	610.7	611.3	0.6
BI	199.58	615/469	19,616	5.4	612.4	612.4	613.3	0.9
BJ	201.06	889/748	25,143	4.3	614.2	614.2	614.9	0.7
BK	201.78	1,244/179	29,355	3.6	614.7	614.7	615.6	0.9
BL	202.29	705/196	18,860	5.7	615.1	615.1	616.0	0.9
BM	203.68	368/210	14,340	7.5	616.8	616.8	617.6	0.8
BN	204.65	333/123	14,557	7.3	618.4	618.4	619.1	0.7
BO	205.67	713/143	25,753	4.2	620.0	620.0	620.6	0.6

¹Stream distance in miles above confluence with Ohio River

²Width/Width within county

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON 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 Tate Creek								
A	3,058	219	1,469	4.6	582.5	561.0 ²	561.5	0.5
B	3,793	139	1,143	5.9	582.5	562.0 ²	562.7	0.7
C	6,532	134	892	7.6	582.5	567.5 ²	567.8	0.3
D	7,604	410	1,605	4.2	582.5	571.3 ²	571.8	0.5
E	8,660	102	652	10.4	582.5	575.8 ²	575.9	0.1
F	9,062	104	1,111	6.1	582.5	579.0 ²	580.0	1.0
G	10,271	90	703	9.7	583.3	583.3	583.9	0.6
H	11,591	95	845	8.0	593.3	593.3	593.9	0.6
I	12,806	134	1,064	6.4	598.5	598.5	599.3	0.8
J	14,126	104	788	8.6	604.9	604.9	605.8	0.9
K	16,132	134	963	7.0	618.1	618.1	618.8	0.7

¹Stream distance in feet above confluence with Kentucky River

²Elevations computed without considering backwater effects from Kentucky River

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

LOWER TATE 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
Otter Creek								
A	6,353	280	1,823	3.8	800.1	800.1	801.1	1.0
B	6,989	294	1,882	3.7	801.7	801.7	802.6	0.9
C	7,312	309	1,950	3.6	802.9	802.9	803.6	0.7
D	8,001	333	3,658	1.9	803.6	803.6	804.5	0.9
E	9,982	257	2,425	2.9	805.2	805.2	806.1	0.9
F	10,970	360	2,676	2.3	806.0	806.0	807.0	1.0
G	12,082	143	1,035	5.9	807.1	807.1	807.9	0.8
H	12,595	124	745	8.1	808.2	808.2	809.1	0.9
I	12,877	186	1,108	5.5	809.2	809.2	810.2	1.0
J	13,495	126	894	6.8	810.7	810.7	811.7	1.0
K	14,327	243	1,350	4.5	812.9	812.9	813.7	0.8
L	15,001	71	543	9.9	814.2	814.2	815.2	1.0
M	16,242	93	743	7.3	818.9	818.9	819.5	0.6
N	16,905	107	529	8.3	820.6	820.6	821.3	0.7
O	17,668	179	909	4.8	825.2	825.2	825.4	0.2
P	18,463	146	638	6.9	828.0	828.0	828.8	0.8
Q	19,204	145	758	14.2	830.7	830.7	830.7	0.0
R	19,486	295	4,256	1.0	843.4	843.4	843.4	0.0
S	20,060	504	6,442	0.6	843.4	843.4	843.5	0.1

¹Stream distance in feet above confluence with Dreaming Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
AND INCORPORATED AREAS

FLOODWAY DATA

OTTER 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
Otter Creek Tributary 1								
A	572	68	430	4.1	843.4	838.9 ²	839.9	1.0
B	704	66	619	2.9	843.6	843.6	844.4	0.8
C	1,701	121	662	2.5	844.0	844.0	844.9	0.9
D	1,977	120	453	3.7	852.7	852.7	853.7	1.0
E	2,409	55	556	3.0	853.7	853.7	854.6	0.9
F	2,700	51	417	4.0	853.7	853.7	854.6	0.9
G	2,870	72	397	4.2	854.6	854.6	855.6	1.0
H	3,136	81	544	2.9	855.3	855.3	856.1	0.8
I	3,274	141	1,045	1.5	857.7	857.7	858.0	0.3
J	3,764	100	554	2.9	859.1	859.1	859.7	0.6
K	3,971	80	558	2.9	861.2	861.2	862.2	1.0
L	4,918	52	261	6.1	862.3	862.3	863.2	0.9
M	5,207	123	519	3.1	868.2	868.2	868.8	0.6
N	6,080	44	227	4.5	873.3	873.3	873.7	0.4
O	6,276	68	676	1.5	879.1	879.1	879.8	0.7
P	6,957	35	171	5.7	879.2	879.2	879.9	0.7
Q	7,159	60	504	1.9	886.3	886.3	887.1	0.8
R	8,251	65	202	4.7	888.2	888.2	888.4	0.2
S	8,673	92	201	4.7	889.9	889.9	889.9	0.0

¹Stream distance in feet above confluence with Otter Creek

²Elevations computed without consideration of backwater effects from Otter Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

OTTER CREEK TRIBUTARY 1

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
Otter Creek Tributary 2								
A	309	98	293	5.4	813.7	813.2 ²	813.9	0.7
B	963	147	419	3.8	817.3	817.3	817.5	0.2
C	1,687	109	334	3.1	821.3	821.3	821.4	0.1
D	2,088	76	176	5.9	824.2	824.2	824.4	0.1
E	2,379	56	199	5.2	828.1	828.1	828.4	0.3
F	2,656	55	167	6.2	830.2	830.2	830.3	0.1
G	2,895	61	138	7.2	833.5	833.5	833.6	0.1
H	3,217	68	245	4.0	836.2	836.2	836.3	0.2
I	3,637	88	144	6.9	837.7	837.7	837.7	0.0
J	4,119	89	314	3.2	841.6	841.6	841.6	0.1
K	4,433	100	230	4.1	843.9	843.9	844.0	0.0
L	4,624	121	272	3.5	845.2	845.2	845.2	0.0
M	5,030	165	290	3.3	847.7	847.7	847.8	0.0
N	5,251	80	190	5.0	849.3	849.3	849.3	0.0
O	5,722	120	78	8.5	853.6	853.6	853.6	0.0
P	6,178	95	399	1.7	861.1	861.1	861.2	0.1
Q	6,793	50	139	4.8	863.6	863.6	863.9	0.3
R	7,290	33	115	2.4	868.5	868.5	868.5	0.0
S	7,734	108	304	0.9	871.7	871.7	871.8	0.1
T	8,230	31	45	5.1	873.6	873.6	873.8	0.2
U	8,589	57	105	2.2	879.4	879.4	879.4	0.0
V	9,121	17	48	3.7	884.8	884.8	884.8	0.0

¹Stream distance in feet above confluence with Otter Creek

²Elevations computed without consideration of backwater effects from Otter Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

OTTER CREEK TRIBUTARY 2

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
Otter Creek Tributary 2 (Continued)								
W	9,225	35	154	1.3	890.3	890.3	890.7	0.4
X	9,547	24	42	4.2	890.7	890.7	891.2	0.5
Y	9,912	21	39	4.7	894.4	894.4	894.5	0.1

¹Stream distance in feet above confluence with Otter Creek

²Elevations computed without consideration of backwater effects from Otter Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

OTTER CREEK TRIBUTARY 2

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
Silver Creek								
A	15,385	264	3,381	4.2	903.9	903.9	904.3	0.4
B	16,822	450	5,199	2.8	905.9	905.9	906.6	0.7
C	20,477	230	3,459	4.1	909.7	909.7	910.7	1.0
D	22,776	462	4,784	2.5	911.8	911.8	912.6	0.8
E	25,335	668	5,217	2.3	914.2	914.2	915.1	0.9
F	27,425	565	3,557	3.4	917.0	917.0	918.0	1.0
G	30,263	346	2,306	3.6	925.7	925.7	926.7	1.0
H	32,336	664	3,570	2.3	931.7	931.7	932.3	0.6
I	35,362	669	2,457	3.4	937.3	937.3	937.6	0.3
J	36,867	196	1,020	8.2	944.4	944.4	944.9	0.5

¹Stream distance in feet above White Station Road

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

SILVER 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
Taylor Fork								
A	6,637	540	20,097	0.6	829.2	829.2	830.2	1.0
B	16,446	220	2,426	1.6	829.3	829.3	830.2	0.9
C	17,849	135	740	5.2	831.5	831.5	832.0	0.5
D	21,591	271	4,108	1.1	865.1	865.1	865.1	0.0
E	24,924	63	325	11.0	873.9	873.9	874.0	0.1
F	27,509	80	295	6.5	889.0	889.0	889.5	0.5
G	29,512	112	432	4.3	903.6	903.6	904.3	0.7
H	31,602	53	278	6.1	913.3	913.3	914.0	0.7
I	33,466	40	132	6.4	922.8	922.8	923.7	0.9
J	35,835	22	74	6.6	945.1	945.1	945.8	0.7
K	38,042	26	55	5.4	970.1	970.1	970.2	0.1

¹Stream distance in feet above confluence with Silver Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK

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
Taylor Fork Tributary 1								
A	323	25	66	5.9	933.4	933.4	933.7	0.3
B	1,608	16	29	7.8	952.2	952.2	952.3	0.1
C	2,521	22	26	6.2	978.0	978.0	978.0	0.0

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 1

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
Taylor Fork Tributary 2								
A	208	160	635	2.3	884.9	884.9	885.1	0.2
B	1,506	65	204	7.1	896.3	896.3	896.8	0.5
C	2,800	32	148	6.4	907.8	907.8	908.8	1.0
D	4,192	40	106	7.0	918.2	918.2	918.7	0.5
E	5,401	51	611	1.0	942.3	942.3	942.9	0.6
F	7,020	40	181	2.5	957.7	957.7	958.7	1.0

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 2

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
Taylor Fork Tributary 2A								
A	312	10	31	8.3	899.8	899.8	900.8	1.0
B	1,785	40	39	5.7	929.1	929.1	929.1	0.0

¹Stream distance in feet above confluence with Taylor Fork Tributary 2

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 2A

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
Taylor Fork Tributary 3								
A	91	258	519	0.5	878.8	878.8	879.8	1.0
B	1,379	30	45	4.4	901.7	901.7	902.0	0.3
C	2,813	25	25	5.7	930.8	930.8	930.9	0.1

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 3

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
Taylor Fork Tributary 4								
A	438	49	46	5.6	878.1	878.1	878.3	0.2
B	941	20	33	7.3	892.3	892.3	892.4	0.1
C	2,406	25	26	5.8	928.5	928.5	928.6	0.1

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 4

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
Taylor Fork Tributary 5								
A	163	112	1,163	2.2	865.2	865.2	865.2	0.0
B	1,247	92	850	2.9	875.9	875.9	876.9	1.0
C	2,038	104	1,035	2.3	885.1	885.1	885.7	0.6
D	3,062	110	1,235	1.9	894.5	894.5	895.3	0.8
E	4,896	43	130	8.1	915.8	915.8	916.7	0.9

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 5

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
Taylor Fork Tributary 6								
A	248	53	224	3.6	835.9	835.9	835.9	0.0
B	1,502	33	70	11.6	858.2	858.2	858.2	0.0
C	3,287	18	70	8.6	887.9	887.9	888.8	0.9
D	3,889	44	341	1.5	903.1	903.1	904.0	0.9
E	4,581	50	154	2.9	917.6	917.6	918.6	1.0
F	5,489	30	42	10.7	932.1	932.1	932.2	0.1
G	5,813	25	54	8.4	943.8	943.8	943.9	0.1

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 6

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
Taylor Fork Tributary 7								
A	622	70	485	3.0	829.2	829.2	830.2	1.0
B	1,340	35	202	6.8	836.0	836.0	837.0	1.0
C	1,856	25	111	11.9	842.8	842.8	843.6	0.8

¹Stream distance in feet above confluence with Taylor Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

TALYOR FORK TRIBUTARY 7

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
Upper Tate Creek								
A	7,209	155	883	6.9	784.2	784.2	785.2	1.0
B	7,492	207	1,383	4.4	785.9	785.9	786.5	0.6
C	7,869	109	503	12.2	789.1	789.1	789.1	0.0
D	8,549	143	975	6.3	796.1	796.1	796.2	0.1
E	9,260	93	478	12.8	802.2	802.2	802.3	0.1
F	10,016	209	1,053	5.3	808.3	808.3	808.6	0.3
G	10,482	182	872	6.4	811.8	811.8	811.9	0.1
H	11,488	143	836	6.3	820.7	820.7	820.9	0.2
I	11,896	220	884	6.0	824.8	824.8	825.0	0.2
J	12,529	170	551	9.1	830.5	830.5	830.6	0.1
K	13,343	272	1,278	3.9	837.1	837.1	837.9	0.8
L	14,474	184	725	6.6	841.3	841.3	841.6	0.3
M	15,012	199	865	2.7	843.6	843.6	844.1	0.5
N	15,555	180	700	3.3	846.1	846.1	846.4	0.3
O	16,369	117	451	5.1	849.2	849.2	849.3	0.1
P	17,172	88	324	6.5	853.0	853.0	853.1	0.1
Q	17,525	151	518	4.0	854.5	854.5	854.7	0.2
R	17,866	23	165	12.7	856.4	856.4	856.7	0.3
S	18,636	75	381	5.2	862.6	862.6	863.2	0.6
T	19,677	99	462	4.1	865.5	865.5	866.4	0.9
U	20,361	39	179	9.6	869.8	869.8	870.3	0.5
V	21,282	36	187	8.3	876.8	876.8	877.8	1.0

¹Stream distance in feet above Crutcher Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

UPPER TATE 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
Upper Tate Creek								
W	22,108	115	350	3.3	882.6	882.6	883.1	0.5
X	23,091	61	149	6.8	887.3	887.3	887.4	0.1
Y	23,966	65	253	3.6	897.0	897.0	897.4	0.4
Z	24,384	65	252	3.5	901.6	901.6	901.6	0.0
AA	24,609	104	607	1.4	905.3	905.3	905.4	0.1
AB	24,926	63	347	2.2	907.9	907.9	908.2	0.3
AC	25,404	58	162	4.4	909.9	909.9	910.1	0.2
AD	25,508	108	241	3.0	914.4	914.4	914.4	0.0
AE	25,831	106	265	2.6	914.7	914.7	914.7	0.0
AF	26,090	79	204	3.0	918.4	918.4	918.4	0.0
AG	26,592	56	82	6.4	923.0	923.0	923.3	0.3
AH	26,903	85	102	5.2	928.3	928.3	928.3	0.0

¹Stream distance in feet above Crutcher Fork

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

UPPER TATE 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
Walnut Meadow Branch								
A	16,838	162	759	4.4	890.4	890.4	890.5	0.1
B	18,125	242	1,038	3.2	892.9	892.9	893.2	0.3
C	19,007	339	946	3.5	897.8	897.8	898.0	0.2
D	19,883	351	1,828	1.8	899.0	899.0	899.4	0.4
E	21,456	181	1,000	3.3	903.8	903.8	904.2	0.4
F	23,059	290	1,399	2.4	905.6	905.6	906.3	0.7
G	24,473	182	758	4.3	909.0	909.0	909.6	0.6
H	25,939	83	510	4.9	914.2	914.2	914.8	0.6
I	27,167	88	452	5.6	919.4	919.4	920.0	0.6
J	28,391	88	285	4.6	924.1	924.1	924.5	0.4
K	29,220	60	244	5.4	928.7	928.7	929.3	0.6
L	30,027	105	349	3.7	934.3	934.3	934.9	0.6

¹Stream distance in feet above confluence with Paint Lick Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MADISON COUNTY, KY
 AND INCORPORATED AREAS

FLOODWAY DATA

WALNUT MEADOW BRANCH