

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**SCOTLAND COUNTY,
NORTH CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
CITY OF LAURINBURG	370222
SCOTLAND COUNTY	370316
TOWN OF EAST LAURINBURG	370359
TOWN OF GIBSON*	370566
TOWN OF MAXTON**	370587
TOWN OF WAGRAM	370360

*No Special Flood Hazard Areas Identified

**Area Not Included



PRELIMINARY: 3/28/2024

REVISED:

**Federal Emergency Management Agency
State of North Carolina
Flood Insurance Study Number
37165CV000F**

www.fema.gov and www.ncfloodmaps.com



FOREWORD

This countywide Flood Insurance Study (FIS) Report was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long-term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the state level. As a part of this effort, the State of North Carolina has joined with FEMA in a Cooperating Technical State (CTS) agreement to produce and maintain this FIS Report and the accompanying digital Flood Insurance Rate Map (FIRM) for North Carolina.

Flood Insurance Study (FIS) means an examination, evaluation, and determination of flood hazards, corresponding water surface elevations, flood hazard risk zones, and other flood data in a community issued by the North Carolina Floodplain Mapping Program (NCFMP). The Flood Insurance Study (FIS) is comprised of the following products used together: the Digital Flood Hazard Database, the Water Surface Elevation Rasters, the digitally derived, autogenerated Flood Insurance Rate Map and the Flood Insurance Survey Report. A Flood Insurance Survey is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. This report contains detailed flood elevation data, data tables and FIRM indices. When a flood study is complete for the National Flood Insurance Program (NFIP), the digital information, reports and maps are assembled into a FIS. Information shown on in the FIS is provided in digital format by the NCFMP.

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the North Carolina Floodplain Mapping Program. It is advisable to use www.fris.nc.gov/fris or contact the community repository for any additional data.

The following is a list of the publication dates of this Countywide FIS report starting with the initial Report accompanying the North Carolina Statewide FIRM:

Date	Reason
6/17/2003	Initial Statewide FIS Report Effective Date
12/16/2003	Corrections to cross sectioning stationing and numbering
7/7/2014	A Portion of the County Received New H&H Analysis
12/06/2019	A Portion of the County Received New H&H Analysis

This FIS has been produced as part of the North Carolina Floodplain Mapping Program. Scotland County, North Carolina, falls under the administrative jurisdiction of Region IV of the Federal Emergency Management Agency (FEMA). Questions concerning this FIS may be directed to the North Carolina Floodplain Mapping Program at www.ncfloodmaps.com, the FEMA Map Assistance Center by calling the toll-free information line at 1-877-FEMA MAP (1-877-336-2627), or by contacting the FEMA Regional Office at the following address:

FEMA, Federal Insurance and Mitigation Administration
Koger Center - Rutgers Building
3003 Chamblee Tucker Road
Atlanta, Georgia 30341
(770) 220-5402

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1.0 Introduction

1.1 The National Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available in communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. Federally backed flood insurance is available in more than 19,000 communities across the United States and its territories.

The NFIP is managed by the Federal Insurance and Mitigation Administration of the Federal Emergency Management Agency (FEMA). The Federal Insurance and Mitigation Administration manages the insurance component of the NFIP and oversees the flood hazard mapping and the floodplain management aspects of the program.

The NFIP, through involvement with communities, the insurance industry, and the lending industry, helps reduce flood damage by nearly \$800 million a year. Further, buildings constructed in compliance with NFIP building standards suffer approximately 80% less damage annually than those not built in compliance. In addition, every \$3 paid in flood insurance claims saves \$1 in disaster assistance payments. The NFIP is self-supporting for the average historical loss year, which means that operating expenses and flood insurance claims are not paid by the taxpayer, but through premiums collected for flood insurance policies.

Additional information of interest to homeowners, community officials, insurance companies, lenders, and study contractors is available in Section 9.0 of this FIS Report and on the NFIP Internet homepage at <http://www.fema.gov/business/nfip/>.

1.2 Purpose of this Flood Insurance Study

Flood Insurance Studies (FISs) are one of the primary means by which the NFIP administers the National Flood Insurance Act of 1968, the Flood Disaster Protection Act of 1973, and the National Flood Insurance Reform Act of 1994. FISs develop flood risk data that are used to establish actuarial flood insurance rates. The information in this FIS Report will also be used by Scotland County and the jurisdictions therein (hereinafter referred to collectively as Scotland County) to facilitate the adoption and maintenance of floodplain management ordinances, which form the basis of communities' continued participation in the NFIP. Minimum requirements for participation in the NFIP are set forth in Title 44, Part 60, Section 3 of the Code of Federal Regulations (44 CFR 60.3). In some States and/or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. In such cases, the more restrictive criteria will take precedence, and the State and/or community (or other jurisdictional agency) will be able to explain them.

This FIS investigates the existence and severity of flood hazards in, or revises and updates previous FISs for, the geographic area of Scotland County, North Carolina, including the jurisdictions listed in Table 1.

Table 1 - Jurisdictions in Scotland County

Community	Included in this FIS	If Not Included, Location of Flood Hazard/Flood Insurance Rate Data
CITY OF LAURINBURG	Yes	
SCOTLAND COUNTY	Yes	
TOWN OF EAST LAURINBURG	Yes	
TOWN OF GIBSON*	Yes	
TOWN OF MAXTON	No	Robeson County FIS Report, 2019
TOWN OF WAGRAM	Yes	

*No Special Flood Hazard Areas Identified

1.3 FIS Components

A Flood Insurance Study (FIS) is an analysis of flood hazards, typically presented as a set of Flood Insurance Rate Map (FIRM) panels and the FIS Report, which includes a set of Flood Profiles and/or Water-surface elevation rasters.

Flood Insurance Study Report

The FIS Report provides a context for the information shown on the FIRM, as well as a summary of the data upon which the analyses are based. It also includes an index of sources of additional information on the NFIP.

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).

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 27, "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 Scotland became Effective on 6/17/2003. Refer to Table XX for information about subsequent revisions to 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:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

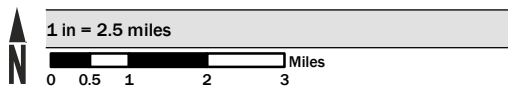
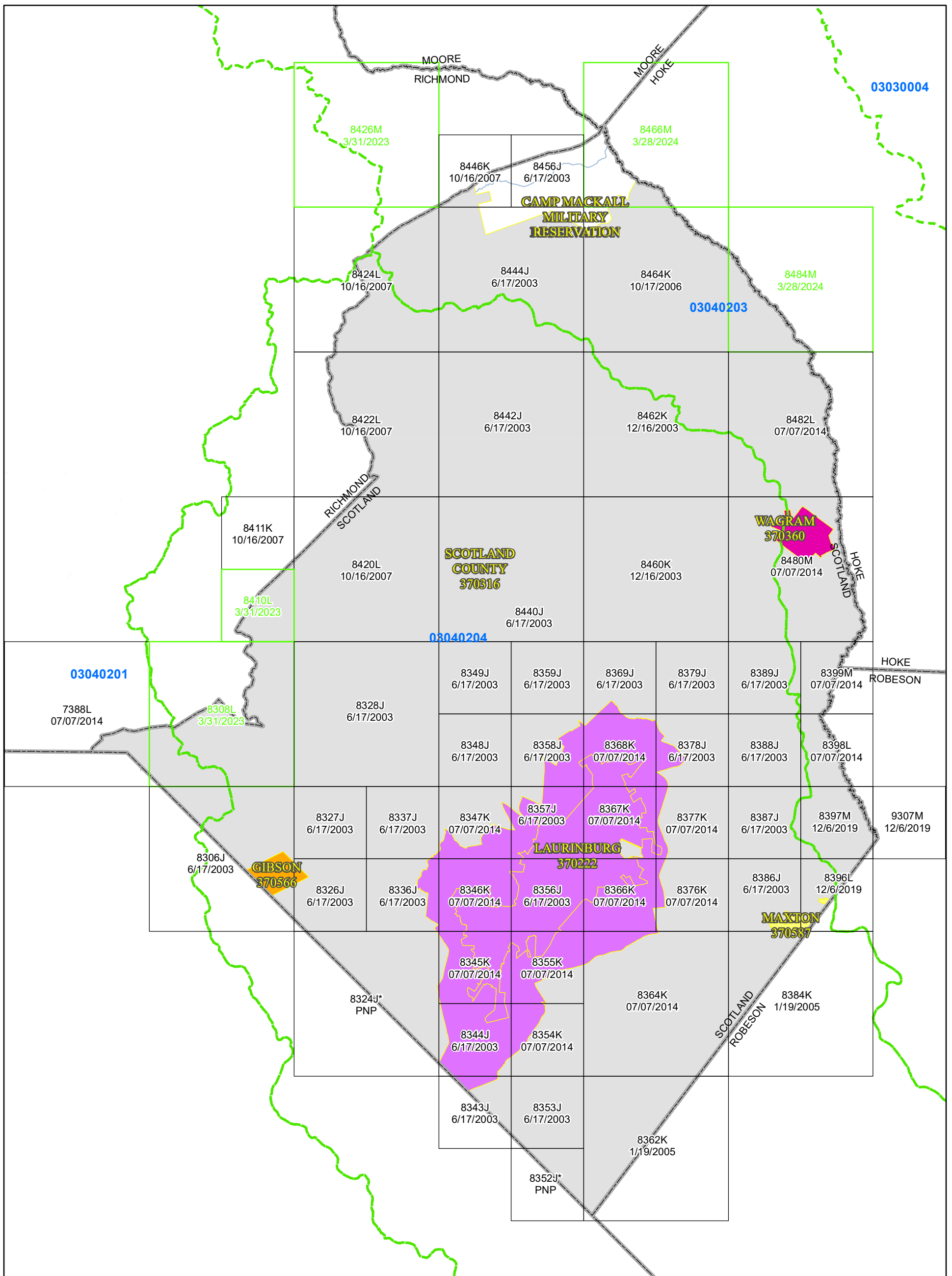
FEMA does not impose floodplain management requirements or special insurance ratings based on Limit of Moderate Wave Action (LiMWA) delineations at this time. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. If the LiMWA is shown on the FIRM, it is being provided by 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 reducing the risk associated with 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, 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>.



Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

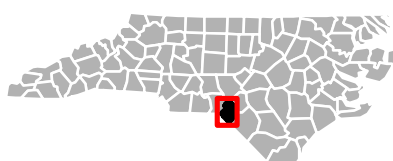
The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels previously issued under the North Carolina Seamless paneling scheme

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

[HTTPS://FRIS.NC.GOV/FRIS](https://FRIS.NC.GOV/FRIS)
[HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION
*PANEL NOT PRINTED

COUNTY LOCATOR



PRELIMINARY
3/28/2024

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP INDEX

SCOTLAND COUNTY, NORTH CAROLINA And Incorporated Areas

PANELS PRINTED:

7388, 8306, 8308, 8326, 8327, 8328, 8336, 8337, 8343, 8344, 8345, 8346, 8347, 8348, 8349, 8353, 8354, 8355, 8356, 8357, 8358, 8359, 8362, 8364, 8366, 8367, 8368, 8369, 8376, 8377, 8378, 8379, 8384, 8386, 8387, 8388, 8389, 8396, 8397, 8398, 8399, 8410, 8411, 8420, 8422, 8424, 8426, 8440, 8442, 8444, 8446, 8456, 8460, 8462, 8464, 8466, 8480, 8482, 8484, 9307



FEMA

MAP NUMBER
37165CIND0H

2.0 Floodplain Management Applications

Flood events of a magnitude expected to occur with a 10%, 2%, 1%, or 0.2% annual chance have been selected as having special significance for developing sound floodplain management programs. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10%, 2%, 1%, and 0.2% chance, respectively, of being equaled in any given year. Therefore, FIS Reports typically determine water-surface elevations for floods with these probabilities. The FIRM delineates 1% and 0.2% annual chance floodplains and 1% annual chance floodway boundaries, and depicts 1% annual chance flood elevations, rounded to the nearest foot, to assist in developing floodplain management measures.

2.1 Floodplains

To provide a national standard without regional discrimination, the 1% annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. A 1% annual chance flood, or base flood, is defined as that having a 1% chance of being equaled or exceeded in any given year. The 1% annual chance floodplains shown on the FIRM identify areas that are expected to be inundated by the 1% annual chance flood. This 1% annual chance floodplain is also called a Special Flood Hazard Area (SFHA), where the NFIP's floodplain management regulations must be enforced by the community as a condition of participation in the NFIP. The 0.2% annual chance floodplain is employed to indicate additional areas of flood risk associated with exceptionally severe floods.

2.2 Floodways

Encroachment on floodplains such as that caused by placement of 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, floodways are provided as a tool to assist local communities in this aspect of floodplain management. Under this concept, the 1% annual chance riverine floodplain is divided into a floodway and a floodway fringe. 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. Figure 2, "Floodway Schematic," illustrates this principle. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this FIS are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional encroachment studies.

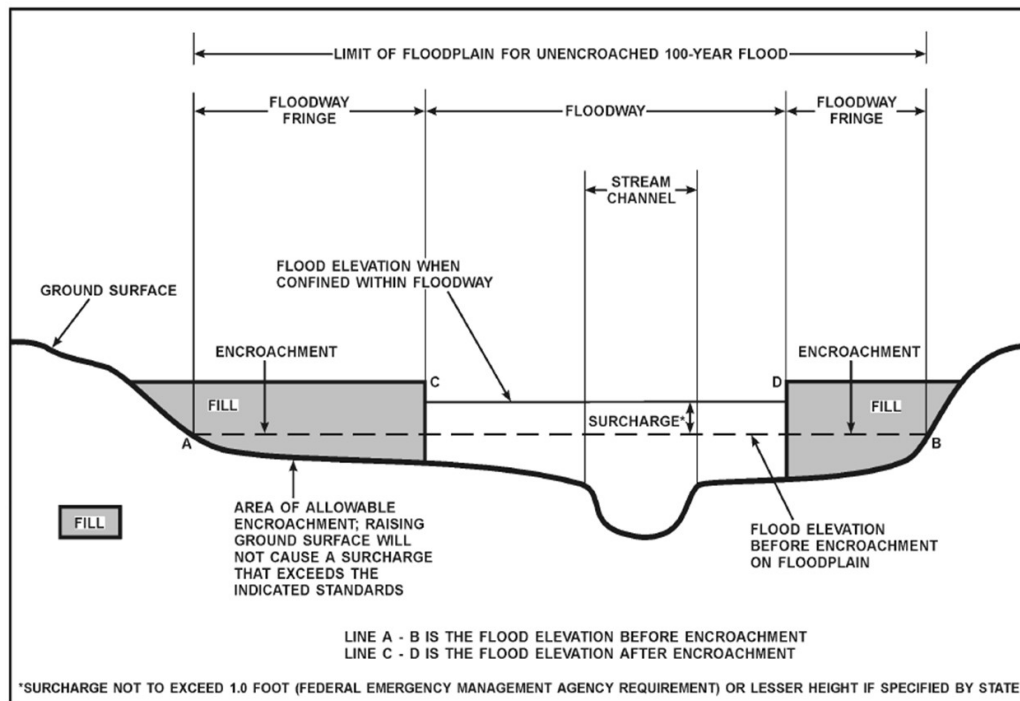


Figure 2- Floodway Schematic

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 Watershed Characteristics

Because a FIS is a probability analysis that may not account for some of the factors listed below, communities are strongly encouraged to consider adopting more restrictive or higher floodplain management criteria or ordinances than the minimum Federal requirements. Communities may also increase the validity of their flood hazard data by investing in continuous maintenance of river gages (see the Data Validity and Reliability paragraph below). If the U.S. Geological Survey (USGS) or other agencies do not maintain gages on the flooding sources of interest, partnerships with the USGS may be pursued, or local gages may be installed. For more information, see Section 9.0 of this report.

This flood hazard study represents an analysis of certain watershed characteristics, some of which are summarized as follows:

Drainage Area

In general, streams that drain larger areas have greater flood hazards. FISs, in North Carolina, do not typically analyze flood hazards in places with rural drainage areas of less than one square mile and within urban drainage areas of less than ½ square mile.

Soil Permeability and Infiltration

Differences in the types of soil and the amount of vegetation in a watershed have a significant effect on the amount of water that the soil can absorb; soils with a high sand content absorb much more water than soils with a high clay content. The presence of vegetation increases infiltration; the presence of pavement decreases infiltration and also speeds runoff to receiving waters. As soil permeability and infiltration decrease, the volume and rate of overland flow increases.

Soil Moisture Conditions

In addition to soil permeability and infiltration, the level of the water table helps determine the saturation point, beyond which no water is absorbed. As rainfall duration increases, the height of the water table increases.

Channel and Floodplain Geometry

The geometric contour of a streambed, termed channel geometry, and the geometric contour of a floodplain determine the volume of water that a channel can hold and partially determine the rate at which water flows through it.

Channel and Floodplain Roughness

The roughness of a surface affects the characteristics of runoff whether the water is on the surface of the watershed or in the channel.

FIS Reports include analyses of how these factors will combine to produce overland flow patterns during floods that have a certain probability of occurring in any given year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at shorter intervals or even within the same year. The risk of experiencing a rare flood increases when longer periods are considered. For example, the risk of having a flood which equals or exceeds the 1% annual chance flood (1% chance of annual exceedance) in any 50-year period is approximately 40% (4 in 10), but for any 90-year period, the risk increases to approximately 60% (6 in 10).

It is important to note that the 1% annual chance flood is used as the national standard to allow a consistent approach to floodplain management, flood hazard assessment, and flood hazard mapping. In any given community, a number of factors may result in flooding characteristics that do not conform to predicted conditions. Therefore, the determination that an area is not shown on the FIRM as being within a Special Flood Hazard Area is no guarantee that it will not flood during a 1% annual chance flood. Examples of these factors include Data Validity and Reliability; Developmental and Topographic Changes Over Time; Erosion, Deposition, and Debris Flow; and Meandering and Lateral Migration.

Data Validity and Reliability

Certain types of analysis methods yield more justifiable characterizations of flood hazards. For example, a gage analysis, to determine peak discharges, is based on actual measurements of watershed conditions over time and, therefore, is typically considered the most accurate method of hydrologic analysis. However, it is not feasible to install enough gages to gather data on every stream. In addition, for many of the gage sites that do exist, there are interruptions in the period of record. The usefulness of gage data for the purpose of predicting flooding behavior decreases with interruptions in the period of record; predicted flooding conditions over a 100-year period based on 20 years of measurements spread over a 35-year period are less valid than those based on 30 years of continuous measurements. A regression analysis is typically considered the best method in the absence of gage data, as it uses gage data from watersheds with similar characteristics to estimate flood frequency and magnitude in an ungaged watershed. Regression equations reflect average conditions for a region; therefore, the results will not exactly match the results of a gage analysis at a particular location. The standard errors of the North Carolina rural regression equations range from 44 to 51 percent for estimates of the 1% annual chance flood. That means the difference between the results of the regression equation and the gage analysis for approximately two-thirds of the locations that gage data exists are within 44 to 51 percent of the gage analysis results. A rainfall-runoff hydrologic analysis may be used for gaged or ungaged watersheds, and can estimate the effects of storage areas and flood control structures and measures. This method is most valid when calibrated against historical data.

Developmental and Topographic Changes Over Time

A FIRM is based on the best topographic and planimetric information available to FEMA and the State of North Carolina at the time the study is produced. In time, however, development and/or natural phenomena can alter the physical characteristics of a watershed and its drainage channels, resulting in changes in the flood hazards in those areas. For example, constructing a housing subdivision reduces the amount of soil that is available to absorb water; this in turn causes an increase in the volume of surface water that flows into the channel.

Erosion, Deposition, and Debris Flow

The flood hazards shown on a FIRM are based on the assumption of unobstructed flow. The FIRM does not reflect an analysis of areas that are subject to erosion caused by the increased water-surface elevations and velocities that occur during flooding. In addition to the risks of landslides or a weakening of the ground underneath roads or structures, any sediment that is removed from one location will be deposited in another; accumulated deposits may have a pronounced effect on flood hazards in those areas. Similarly, debris such as fallen trees or branches, litter, or other items may obstruct stream channels or hydraulic structures, increasing water-surface elevations, velocities, and floodplain width.

Meandering and Lateral Migration

FISs are based on the assumption that channel geometry will remain stable during normal drainage and during flood events. This assumption is valid for most streams, which flow over bedrock or between bedrock outcroppings that form non-alluvial channels. However, alluvial streams change the channel geometry with time, significantly so during flood events. Alluvial streams are subject to erosion and deposition, which may result in braided or meandering channels. Streams of this type may be characterized by lateral migration, or channel shifting, in which the stream may change course entirely during a flood. Whenever clear evidence is available, a FIRM will identify the alluvial nature of a studied flooding source and designate wider floodways to allow for potential migration. However, these floodways are based on qualitative assessments and not on quantitative geomorphic and engineering analyses.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this FIS project.

3.0 Insurance Applications

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones and, in 1% annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies. Table 2, “Flood Zone Designations,” includes a description of each type of flood hazard zone.

Table 2 - Flood Designations

Zone	Description
A	Zone A is the flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined in the FIS Report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone.
AE	Zone AE is the flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined in the FIS Report by detailed methods. In most instances, whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
AH	Zone AH is 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 Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
AO	Zone AO is 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 detailed hydraulic analyses are shown within this zone.
AR	Zone AR is 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.
A99	Zone A99 is 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 depths are shown within this zone.
V	Zone V is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no Base Flood Elevations are shown within this 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. Whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
X	Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2% annual chance floodplain, areas within the 0.2% annual chance floodplain, and to areas of 1% annual chance flooding where average depths are less than 1 foot, areas of 1% annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone.
X (Future)	Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent- annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.
D	Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

4.0 Area Studied

Scotland County is found in the Coastal Plain region of North Carolina. It is surrounded by Hoke County to the northeast, Robeson County to the southeast, and Richmond County to the west.

4.1 Basin Description

Table 3, "Basin Description" 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 area.

Table 3 - Basin Description

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description	HUC Area (square miles)
Little Pee Dee	03040204	Little Pee Dee River	The Little Pee Dee River Basin headwaters are in Richmond and Scotland Counties. The basin then flows south into South Carolina, draining portions of Robeson and Columbus Counties in North Carolina, ending at the Pee Dee River.	1,368
Lower Pee Dee	03040201	Pee Dee River	The Lower Pee Dee River Basin begins in Anson and Richmond Counties in North Carolina and drains southeast through South Carolina towards Winyah Bay and the Atlantic Ocean.	2,532
Lumber	03040203	Lumber River	The Lumber River Basin headwaters are in Montgomery and Moore County. The basin then drains significant portions of Bladen, Columbus, Hoke, and Robeson Counties before confluenting with the Little Pee Dee River in South Carolina.	1,753

4.2 Principal Flood Problems

Table 4, "Principal Flood Problems" contains a list of principal flooding problems in Scotland County.

Table 4 - Principal Flood Problems

Flooding Source	Problem
All Sources	Scotland County is drained by small tributaries of the Pee Dee River. Stream channels are poorly defined, have low gradients, and are bordered by low, swampy floodplains. Floods can occur at any time during the year, but major floods are more likely to occur during the hurricane season, July to November. The Leith Creek channel has been dredged from the Laurinburg and Southern Railroad bridge just upstream of Fertilizer Plant Road to the corporate limits of the City of Laurinburg. Most road and railroad crossings have undersized culverts and openings that restrict flood flow.

4.3 Historic Flood Elevations

Hurricane Floyd

(9/16/1999)

Hurricane Floyd made landfall near Wilmington with category two winds of 105 to 110 mph. Rainfall totals from Floyd were as high as 15 to 20 inches over portions of eastern North Carolina; with a record of 23.45 inches of rain falling in the month of September at Wilmington, NC. This breaks the previous record of 21.12 inches set in July 1886. These rains combined with saturated ground from previous rain events, including Hurricane Dennis, to produce an inland flood disaster. There were 74 deaths in the United States, including 52 in North Carolina, due to drowning from flood waters. This makes Floyd the deadliest U.S. hurricane since Agnes in 1972. Data from the USGS indicate that eleven of their stream gage monitoring sites in North Carolina (Ahoskie, Rocky Mount, Hilliardston, White Oak, Enfield, Tarboro, Lucama, Hookerton, Trenton, Chinquapin, and Freeland) exceeded 0.2% annual chance flood levels due to Floyd. Total losses in North Carolina approach \$5 billion with an estimated \$3.5 billion in damages to North Carolina homes, businesses, roads, and infrastructure. Floyd passed relatively close to the entire U.S. east coast, justifying hurricane warnings from Florida to Massachusetts and requiring an estimated two million people to evacuate. The last hurricane to require warnings for as large a stretch of coastline was Hurricane Donna in 1960.

Hurricane Bonnie

(8/26/1998)

The landfall location of Bonnie was in southern North Carolina near Cape Fear very close to landfall of both Hurricanes Bertha and Fran in 1996. Even though a powerful storm, damage from Bonnie was much less than Fran, which was also Category 3. Winds gusted up to 100 knots and storm tides of 5 to 8 feet above normal were reported mainly in eastern beaches of Brunswick County, while a storm surge of 6 feet was reported at Pasquotank and Camden Counties in the Albemarle Sound.

**Hurricane Fran
(9/5/1996)**

The landfall location of Fran near the city of Wilmington and its progression into the Raleigh-Durham area caused an estimated \$1.275 billion in damage in North Carolina alone. Fran hit with gusts up to 105 mph and a storm surge of approximately 16 feet. Over \$1 billion in damage was reported in North Topsail Beach and Surf City and 23 people were killed.

**Hurricane Bertha
(7/12/1996)**

1996 was a damaging year in the hurricane history of North Carolina. Tropical Storm Arthur, Hurricane Bertha, and Hurricane Fran all made direct landfall on the North Carolina coastline. It was the most active tropical cyclone season in the state since 1955, when Hurricanes Connie, Diane, and Ione all hit the coast. Bertha entered North Carolina in North Topsail Beach with 105 mph gust and a storm surge of approximately 5 feet.

**Hurricane Gloria
(9/26/1985)**

The landfall location of Gloria was Cape Hatteras, with 90 knot winds and a storm surge of approximately 6-8 feet.

**Hurricane Diana
(9/13/1984)**

The landfall location of Diana was 38 miles south of Wilmington with 90 mph winds at its closest approach to Wilmington. Diana had 115 mph sustained winds before landfall. Storm surge was approximately 5-6 feet.

Table 5, “Historic Flood Elevations”, lists selected flooding sources in Scotland County with records of past stages. The table shows the historic peak, a location description, approximate stream station, the date of the historic peak, and approximate recurrence interval of the flood elevation. The approximate recurrence interval for a flood is often estimated based on an analysis of rainfall amounts from a storm and /or stream gage data.

Table 5 - Historic Flood Elevations

Flooding Source/Tropical Storm	Location Description	Approx. Stream Station	Historic Peak (Feet NAVD 88)	Date	Approximate Recurrence Interval (in years)
Lumber River / Hurricane Floyd	Near River Bend Outfitters on NC HWY 904	118000	63.1	10/1/1999	25
Lumber River / Hurricane Floyd	Behind Scott Motor Company Hardware on NC HWY 904	118000	63.4	10/1/1999	25
Lumber River / Hurricane Floyd	Red Barn across from 8175 Williamson Cross Road	186000	79.4	10/1/1999	25

4.4 Flood Protection Measures

Flood protection measures may be structural (such as levees, dams, and reservoirs) or non-structural (such as land-use management ordinances, policies, or practices).

Table 6, “Non-Levee Flood Protection Measures”, lists the flood protection measures undertaken to mitigate flood damage in Scotland County.

Table 6 - Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Leith Creek	Channel improvement	BREAKWATER	Leith Creek channel – structural and nonstructural improvements	Leith Creek channel – structural and nonstructural improvements

Table 7, “Levees” is not applicable in Scotland County.

4.5 Scope of Study

For this map maintenance revision, a scoping meeting was held in Scotland County to present the results of initial research to the county and communities within the county and to discuss their floodplain mapping needs. The county and communities were asked to provide input on proposed study priorities and analysis methods. These meetings resulted in the identification of flooding sources having a floodplain mapping need. Map Maintenance Plans were developed based on the results of the scoping meetings and were both mailed to each jurisdiction within Scotland County and posted to the State's website at www.ncfloodmaps.com.

Draft basin plans were developed based on the results of the initial scoping meetings. Final scoping meetings were held by the State and FEMA to provide counties and communities an overview of the draft basin plans, including the proposed scope and schedule for the project, and to provide an opportunity for additional county and community input. After the final scoping meeting was held, the Final Basin Plans were produced.

This FIS covers the geographic area of Scotland County, North Carolina, and all jurisdictions therein. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. Limits of detailed study are indicated on the Flood Profiles and/or Water-surface elevation rasters and/or the FIRM.

Table 8, "Flooding Sources Studied by Detailed Methods", lists all flooding sources within the county that were studied by detailed methods for this FIS and previous FISs.

Table 8 - Flooding Sources Studied by Detailed Methods

Source	Riverine Sources		Affected Communities
	From	To	
Crooked Creek	The North Carolina / South Carolina State boundary	The Scotland / Richmond County boundary	Camp Mackall Military Reservation Scotland County
Gum Swamp Creek	Pea Bridge Road	3,700 feet downstream of Andrew Jackson Highway	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Leith Creek	2,000 feet downstream of CSX Transportation	400 feet downstream of Rea Magnet Road	Camp Mackall Military Reservation City Of Laurinburg Scotland County Town Of East Laurinburg
Little Creek	The confluence with Leith Creek	Approximately 600 feet upstream of Wagram Road	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Lumber River	Approximately 0.6 mile downstream of Red Springs Road / NC Highway 71	Approximately 1,800 feet downstream of North Turnpike Road (SR 1412) / Turnpike Road (SR 1203)	Camp Mackall Military Reservation Scotland County Town Of Wagram
Lumber River	Robeson/Columbus County line	Robeson/Scotland County line	Camp Mackall Military Reservation Scotland County Town Of Maxton

Table 9, "Flooding Sources Studied by Detailed Methods: Redelineated" is not applicable in Scotland County.

Table 10, "Flooding Sources Studied by Detailed Methods: Limited Detailed", lists all flooding sources within the county that were studied by limited detailed methods for either this FIS or previous FISs.

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Beaverdam Creek1	Confluence with Juniper Creek	1.5 miles upstream of Nashville Church Road	Camp Mackall Military Reservation Scotland County
Big Branch	Confluence with Bridge Creek	0.5 mile upstream of State Route 74	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Big Muddy Creek	Confluence with Big Muddy Creek	0.4 mile downstream of Hoffman Road	Camp Mackall Military Reservation Scotland County
Big Muddy Creek	Confluence with Lumber River	Approximately 1,500 feet upstream of Blues Bridge Road	Camp Mackall Military Reservation Scotland County
Bridge Creek	Confluence with Leith Creek	1,640 feet upstream of Andrew Jackson Highway	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Cabin Branch	The confluence with Big Branch	Approximately 1.4 miles upstream of Barnes Bridge Road	Camp Mackall Military Reservation City Of Laurinburg Scotland County

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Crawford Branch	Confluence with Gum Swamp Creek	Approximately 0.6 mile upstream of Old Peggy Mill Road	Camp Mackall Military Reservation Scotland County
Drowning Creek	Hoke County Boundary	The Moore/Montgomery County boundary	Camp Mackall Military Reservation Scotland County
Gum Swamp Creek	3,700 feet downstream of Andrew Jackson Highway	0.5 mile upstream of Sneads Grove Road	Camp Mackall Military Reservation Scotland County
Gum Swamp Creek	Approximately 0.5 mile downstream of the confluence of Camp Branch	Approximately 0.5 mile upstream of Marston Road	Camp Mackall Military Reservation Scotland County
Gum Swamp Creek Tributary	Confluence with Gum Swamp Creek	1.3 miles upstream of confluence with Gum Swamp Creek	Camp Mackall Military Reservation Scotland County
Joes Creek	Approximately 1.4 miles downstream of County Line Road	Approximately 500 feet upstream of Old Laurinburg Road	Camp Mackall Military Reservation Scotland County
Joes Creek	Confluence with Gum Swamp Creek	County Boundary	Camp Mackall Military Reservation Scotland County
Joes Creek Tributary	Confluence with Joes Creek	Approximately 1.0 mile upstream of County Line Road	Camp Mackall Military Reservation Scotland County
Jordan Creek	Confluence with Juniper Creek	950 feet downstream of Timmons Road	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Juniper Creek	Confluence with Shoe Heel Creek	1.9 miles upstream of Nashville Church Road	Camp Mackall Military Reservation Scotland County
Juniper Creek Tributary	Confluence with Juniper Creek	750 feet upstream of Lee Lane	Camp Mackall Military Reservation Scotland County
Leith Creek	State Boundary	3,400 feet upstream of Harry Malloy Road	Camp Mackall Military Reservation Scotland County
Leith Creek	Wagram Road	Aberdeen Road	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Leith Creek Tributary 1	Confluence with Leith Creek	1,600 feet upstream of confluence with Leith Creek	Camp Mackall Military Reservation Scotland County
Leith Creek Tributary 2	Confluence with Leith Creek	325 feet downstream of Andrew Jackson Highway	Camp Mackall Military Reservation Scotland County
Little Creek	Approximately 600 feet upstream of Wagram Road	Approximately 150 feet downstream of US Highway 15/501	City Of Laurinburg
Little Juniper Creek	Confluence with Juniper Creek	280 feet upstream of Aberdeen Road	Camp Mackall Military Reservation Scotland County
Little Juniper Creek Tributary	Confluence with Little Juniper Creek	0.7 mile upstream of Aberdeen Road	Camp Mackall Military Reservation Scotland County
Little Shoe Heel Creek	Confluence with Shoe Heel Creek	1.7 miles upstream of North Turnpike Road	Camp Mackall Military Reservation Scotland County
Little Shoe Heel Creek Tributary	Confluence with Little Shoe Heel Creek	150 feet downstream of Arch McLean Road	Camp Mackall Military Reservation Scotland County
Lower Beaverdam Creek	Confluence with Gum Swamp Creek	1,800 feet upstream of Old Wire Road	Camp Mackall Military Reservation Scotland County
Lumber River	Approximately 1,800 feet downstream of North Turnpike Road (SR 1412) / Turnpike Road (SR 1203)	Approximately 1,100 feet downstream of US Highway 15/501	Camp Mackall Military Reservation Scotland County
Lumber River	Approximately 700 feet upstream of downstream County boundary	Upstream County Boundary	Camp Mackall Military Reservation Scotland County Town Of Wagram
Shoe Heel Creek	700 feet downstream of Old Maxton Road	1.6 miles upstream of Jane Shaw Road	Camp Mackall Military Reservation Scotland County Town Of Maxton
Shoe Heel Creek	State Boundary	County Boundary	Camp Mackall Military Reservation Scotland County Town Of Maxton
Steer Branch	Confluence with Leith Creek	50 feet downstream of CSX Transportation	Camp Mackall Military Reservation Scotland County
Unnamed Tributary to Gum Swamp Creek	The confluence with Gum Swamp Creek	Approximately 175 feet upstream of Blue Woods Road (SR 1116) Approximately 175 feet upstream of Blue Woods Road (SR 1116)	City Of Laurinburg
Upper Beaverdam Creek	Confluence with Gum Swamp Creek	800 feet upstream of Marston Road	Camp Mackall Military Reservation Scotland County
Water Creek	Approximately 1.4 miles downstream of Barnes Bridge Road	Approximately 0.4 mile upstream of Hasty Road (SR 1615)	Camp Mackall Military Reservation City Of Laurinburg Scotland County
Water Creek	Confluence with Gum Swamp Creek	2 miles upstream of confluence with Gum Swamp Creek	Camp Mackall Military Reservation City Of Laurinburg Scotland County

Table 11, "Stream Name Changes" is not applicable in Scotland County.

Table 12, "Letters of Map Revision" is not applicable in Scotland County.

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-year, 25-year, 50-year, 100-year, or 500-year period (recurrence interval in years) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-year, 25-year, 50-year, 100-year, 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.

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. For details on the county's hydrologic analyses, the hydrologic report is available by request.

A summary of the drainage area-peak discharge relationships for the flooding sources studied by detailed methods is shown in Table 13, "Summary of Discharges".

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Beaverdam Creek¹					
Approximately 500 feet upstream of confluence with Juniper Creek	5.54	*	*	477	*
Approximately 1.1 miles upstream of confluence with Juniper Creek	4.55	*	*	417	*
Big Branch					
Confluence with Bridge Creek	6.91	*	*	1550	*
Approximately 250 feet downstream of US 501	6.66	*	*	1526	*
Approximately 0.9 miles upstream of US 501	5.72	*	*	1446	*
Approximately 1.0 mile downstream of SR 1614	3.05	*	*	1132	*
Approximately 220 feet downstream of SR 1614	2.68	*	*	1086	*
Approximately 670 feet downstream of US 501	2.01	*	*	993	*
Big Muddy Creek					
At mouth	18.90	*	*	1111	*
Just downstream of confluence of Towers Fork	10.41	*	*	737	*
Bridge Creek					
Confluence with Leith Creek	17.56	*	*	2592	*
Approximately 270 feet downstream of SR 1619	17.23	*	*	2574	*
Confluence of Big Branch	10.12	*	*	1751	*
Approximately 90 feet downstream of SR 1620	9.86	*	*	1733	*
Approximately 2.9 miles downstream of SR 1614	8.67	*	*	1648	*
Approximately 70 feet downstream of SR 1621	8.39	*	*	1628	*
Approximately 80 feet downstream of SR 1614	7.54	*	*	1563	*

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 750 feet downstream of Jones Lake Dam	6.72	*	*	1498	*
Bridge Creek					
Approximately 720 feet upstream of Jones Lake Dam	5.86	*	*	1261	*
Approximately 270 feet downstream of Berwick Drive	5.74	*	*	1251	*
Approximately 1,400 feet upstream of Berwick Drive	5.54	*	*	1222	*
Approximately 140 feet downstream of US 15-401	3.87	*	*	1044	*
Approximately 260 feet downstream of SR 1108	3.47	*	*	889	*
Approximately 140 feet downstream of US 74	3.05	*	*	750	*
Approximately 300 feet upstream of SR 1105	1.92	*	*	224	*
Camp Branch					
Confluence of Camp Branch	23.63	*	*	1295	*
Crawford Branch					
Confluence with Gum Swamp	5.35	*	*	453	*
Approximately 140 feet downstream of SR 1339	5.27	*	*	449	*
Approximately 2,800 feet upstream of SR 1339	4.62	*	*	410	*
Approximately 0.6 miles downstream of SR 1612	3.57	*	*	343	*
Approximately 1,400 feet downstream of SR 1612	2.71	*	*	284	*
Approximately 220 feet downstream of SR 1612	2.42	*	*	263	*
Approximately 600 feet upstream of SR 1612	2.12	*	*	240	*
Crooked Creek					
The North Carolina/South Carolina State boundary	4.40	200	330	400	580
Approximately 950 feet upstream of the North Carolina/South Carolina State boundary	4.30	200	330	390	570
Approximately 0.5 mile upstream of the North Carolina/South Carolina State boundary	3.30	170	270	330	480
Approximately 170 feet downstream of Ghio Road /County Line Road (SR1803)	2.50	140	230	270	390
Gum Swamp Creek					
Confluence of Water Creek	125.98	2140	3432	4096	5874
Approximately 500 feet upstream of SR 1614	119.29	2060	3305	3945	5659
Approximately 1,500 feet downstream of US 15-401	118.75	2053	3295	3933	5642
Approximately 0.9 mile downstream of SR 1108	110.55	1954	3136	3744	5372
Confluence of Joes Creek	109.18	1937	3109	3712	5327
Confluence of Lower Beaverdam Creek	73.15	1466	2359	2818	4052
Approximately 0.5 mile upstream of NC 79	59.96	1264	2031	2457	3454
Approximately 100 feet downstream of US 74	58.69	*	*	2420	*
Approximately 0.6 mile upstream of SR 1319	54.69	*	*	2310	*
Approximately 0.5 mile downstream of SR 1323	41.91	*	*	1920	*
Confluence of Crawford Branch	26.54	*	*	1403	*
Joes Creek					
Confluence with Gum Swamp Creek	35.20	*	*	1700	*
Approximately 200 feet upstream of NC 79	32.20	*	*	1600	*
Approximately 200 feet downstream of SR 1145	29.60	*	*	1510	*
Approximately 200 feet upstream of SR 1152	25.30	*	*	1360	*
Confluence of Joes Creek Tributary	19.25	*	*	1125	*

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 100 feet upstream of SR 1802	16.22	*	*	1000	*
Joes Creek					
Approximately 200 feet downstream of SR 1801	14.14	*	*	909	*
Approximately 400 feet downstream of CSX Transportation	4.29	*	*	400	*
Joes Creek Tributary					
Confluence with Joes Creek	3.64	*	*	358	*
Approximately 400 feet upstream of County boundary	1.92	*	*	230	*
Jordan Creek					
Approximately 1,900 feet upstream of confluence with Juniper Creek	19.03	*	*	1120	*
Approximately 950 feet upstream of US 401	18.89	*	*	1110	*
Approximately 1,350 feet upstream of SR 1321	14.07	*	*	910	*
Approximately 200 feet upstream of SR 1335	9.54	*	*	690	*
Approximately 0.9 miles downstream of SR 1335	7.02	*	*	560	*
Approximately 840 feet downstream of SR 1343	3.70	*	*	360	*
Juniper Creek					
Confluence with Shoe Heel Creek	49.75	*	*	2170	*
Just upstream of confluence of Jordan Creek	29.96	*	*	1525	*
Approximately 0.4 mile downstream of Old Wire Road	23.36	*	*	1285	*
Approximately 0.4 mile downstream of confluence of Beaverdam Creek	18.98	*	*	1114	*
Approximately 500 feet upstream of confluence of Beaverdam Creek	9.42	*	*	688	*
Approximately 1.1 miles upstream of confluence of Beaverdam Creek	7.85	*	*	607	*
Juniper Creek Tributary					
Confluence with Juniper Creek	2.32	*	*	260	*
Leith Creek					
County boundary	59.30	*	*	3660	*
Approximately 0.8 mile downstream of SR 1615	53.32	*	*	3467	*
Approximately 1,600 feet downstream of SR 1615	52.51	*	*	3441	*
Approximately 700 feet upstream of SR 1615	52.15	*	*	3429	*
Approximately 0.5 mile upstream of SR 1623	49.45	*	*	3339	*
Approximately 1.0 mile upstream of SR 1615	46.38	*	*	3236	*
Approximately 0.9 mile downstream of US 501	28.24	*	*	2631	*
Approximately 600 feet downstream of Johns Lake Dam	27.54	*	*	2608	*
Approximately 0.4 mile downstream of SR 1619	26.57	*	*	2575	*
Approximately 100 feet upstream of CSX Transportation	25.61	*	*	2544	*
Approximately 1.6 miles downstream of SR 1609	23.89	*	*	2486	*
Approximately 0.9 mile downstream of SR 1609	22.56	*	*	2442	*
Approximately 0.6 mile downstream of CSX Transportation	18.50	1218	1970	2306	3061
Approximately 1,100 feet downstream of Highland Drive	12.97	1116	1813	2122	2821
Approximately 1,300 feet upstream of Highland Drive	12.73	1078	1761	2065	2750
Approximately 60 feet upstream of US BUS 74	11.29	882	1488	1762	2372
Approximately 400 feet upstream of Carver Street	9.34	693	1209	1445	1965
Approximately 500 feet upstream of Gil Street	8.93	335	545	645	939
Approximately 500 feet upstream of Railroad	6.04	255	416	493	719
Approximately 60 feet upstream of SR 1302	5.28	*	*	449	*

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 0.5 mile downstream of SR 1321	4.39	*	*	396	*
Leith Creek					
Approximately 0.4 mile upstream of SR 1321	3.88	*	*	363	*
Approximately 0.6 miles downstream of NC 144	3.29	*	*	324	*
Approximately 100 feet upstream of NC 144	0.98	*	*	141	*
Leith Creek Tributary 1					
Confluence with Leith Creek	5.71	*	*	474	*
Approximately 1,500 feet downstream of SR 1624	4.35	*	*	393	*
Approximately 100 feet upstream of SR 1624	4.18	*	*	382	*
Approximately 1,400 feet downstream of SR 1623	3.38	*	*	331	*
Approximately 100 feet upstream of SR 1623	3.32	*	*	327	*
Leith Creek Tributary 2					
Confluence with Leith Creek	2.46	*	*	265	*
Little Creek					
Approximately 0.6 mile upstream of Old Lumberton Road (SR 1438)	2.86	150	250	300	440
Approximately 1,100 feet downstream of Railroad	0.50	*	*	94	*
Little Juniper Creek					
Approximately 0.4 mile upstream of confluence with Juniper Creek	4.16	*	*	392	*
Approximately 1,000 feet upstream of Old Wire road	3.11	*	*	321	*
Little Shoe Heel Creek					
Confluence with Shoe Heel Creek	8.85	*	*	658	*
Approximately 1,000 feet upstream of SR 1405	8.42	*	*	636	*
Confluence of Little Shoe Heel Creek Tributary	4.53	*	*	411	*
Approximately 1,000 feet upstream of SR 1411	3.07	*	*	318	*
Approximately 2.5 miles upstream of SR 1412	1.96	*	*	234	*
Approximately 12.1 miles upstream of SR 1412	1.42	*	*	187	*
Approximately 13.6 miles upstream of SR 1412	1.35	*	*	181	*
Little Shoe Heel Creek Tributary					
Between SR 1415 and CSX Transportation	1.96	*	*	233	*
Lower Beaverdam Creek					
Confluence with Gum Swamp Creek	11.40	*	*	790	*
Confluence of Beasley Branch	9.20	*	*	680	*
Approximately 100 feet upstream of SR 1148	5.80	*	*	490	*
Lumber River					
Approximately 0.9 mile upstream of NC Highway 71/Red Springs Road	354.30	4030	7100	8800	13900
Approximately 1.6 miles upstream of NC Highway 71/Red Springs Road	353.90	4030	7100	8800	13900
Approximately 1.1 miles downstream of McGirt Bridge Road (SR 1433)	353.00	4020	7100	8800	13890
Approximately 0.8 mile downstream of McGirt Bridge Road (SR 1433)	352.00	4020	7090	8790	13890
At McGirt Bridge Road (SR 1433)	351.10	4020	7090	8790	13890
Approximately 0.4 mile upstream of McGirt Bridge Road (SR 1433)	350.70	4020	7090	8790	13890
Approximately 1.1 miles upstream of McGirt Bridge Road (SR 1433)	349.70	4010	7080	8780	13880
Approximately 1.3 miles upstream of McGirt Bridge Road (SR 1433)	345.20	3990	7060	8760	13870
Approximately 2.3 miles upstream of McGirt Bridge Road (SR 1433)	344.20	3990	7060	8760	13860
Approximately 2.1 miles downstream of Red River Road (SR 1404)	343.30	3990	7060	8750	13860

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 1.3 miles downstream of Red River Road (SR 1404)	342.50	3980	7050	8750	13860
Lumber River					
Approximately 0.9 mile downstream of Red River Road (SR 1404)	342.00	3980	7050	8750	13860
Approximately 0.6 mile downstream of Red River Road (SR 1404)	341.00	3980	7050	8740	13850
Approximately 390 feet downstream of Red River Road (SR 1404)	340.70	3980	7040	8740	13850
Approximately 0.5 mile upstream of Red River Road (SR 1404)	339.90	3970	7040	8740	13850
Approximately 0.6 mile upstream of Red River Road (SR 1404)	338.60	3970	7040	8730	13850
Approximately 0.7 mile downstream of U.S. Highway 401/Raeford Road	338.30	3970	7030	8730	13850
Approximately 0.6 mile downstream of U.S. Highway 401/Raeford Road	337.40	3960	7030	8730	13840
Approximately 1,020 feet upstream of U.S. Highway 401/Raeford Road	336.90	3960	7030	8730	13840
Approximately 1,300 feet upstream of U.S. Highway 401/Raeford Road	336.10	3960	7020	8720	13840
Approximately 1.0 mile upstream of U.S. Highway 401/Raeford Road	335.60	3960	7020	8720	13840
Approximately 1.1 miles upstream of U.S. Highway 401/Raeford Road	331.50	3940	7000	8700	13830
Approximately 1.6 miles upstream of U.S. Highway 401/Raeford Road	330.80	3940	7000	8700	13820
Approximately 2.2 miles upstream of U.S. Highway 401/Raeford Road	330.30	3940	7000	8700	13820
Approximately 2.3 miles upstream of U.S. Highway 401/Raeford Road	329.40	3930	6990	8690	13820
Approximately 2.4 miles upstream of U.S. Highway 401/Raeford Road	329.20	3930	6990	8690	13820
Approximately 2.5 miles upstream of U.S. Highway 401/Raeford Road	328.20	3930	6990	8690	13810
Approximately 2.6 miles downstream of North Turnpike Road (SR 1412)	327.40	3930	6990	8680	13810
Approximately 1.9 miles downstream of North Turnpike Road (SR 1412)	326.50	3920	6980	8680	13810
Approximately 1.8 miles downstream of North Turnpike Road (SR 1412)	325.10	3920	6980	8670	13800
Approximately 1.1 miles downstream of North Turnpike Road (SR 1412)	324.40	3920	6970	8670	13800
Approximately 4,850 feet downstream of North Turnpike Road (SR 1412)	312.90	3870	6920	8620	13770
Approximately 4,620 feet downstream of North Turnpike Road (SR 1412)	309.60	3860	6910	8610	13760
Approximately 2,650 feet downstream of North Turnpike Road (SR 1412)	309.40	3860	6910	8610	13760
Upstream of confluence of Big Muddy Creek	221.92	*	*	8231	*
Quewhiffle Creek					
At mouth	22.51	*	*	1252	*
Shoe Heel Creek					
County boundary	83.22	*	*	3080	*
Approximately 1 mile upstream of BYP 74	79.44	*	*	2980	*
Confluence of Juniper Creek	22.74	*	*	1261	*
Approximately 500 feet upstream of SR 1433	21.94	*	*	1231	*
Approximately 1,000 feet upstream of SR 1427	20.91	*	*	1190	*
Lower limit of pond	19.79	*	*	1146	*
Upper limit of a pond	18.85	*	*	1108	*
Confluence with Little Shoe Heel Creek	7.49	*	*	587	*
Approximately 0.4 mile upstream of SR 1403	3.47	*	*	346	*
Steer Branch					
Confluence with Leith Creek	3.04	*	*	307	*
Approximately 600 feet downstream of SR 1619	2.65	*	*	280	*
Approximately 0.5 mile upstream of SR 1619	2.26	*	*	251	*
Towers Fork					
Just upstream of confluence with Big Muddy Creek	6.72	*	*	545	*

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Water Creek					
Confluence with Gum Swamp Creek	4.60	*	*	420	*
Approximately 0.7 mile upstream of mouth	4.40	*	*	410	*
Approximately 140 feet upstream of Barnes Bridge Road (SR 1614)	2.00	*	*	230	*
Approximately 1,550 feet downstream of Hasty Road (SR 1615)	0.90	*	*	140	*

Table 14, "Summary of Stillwater Elevations" is not applicable in Scotland County.

Table 15, "Gage Information", lists the stream gages located in Scotland County, including the drainage area of the flooding source at the gage and the period of record available at the time of the publication of this FIS Report.

Table 15 - Gage Information

Gage Number	Flooding Source	Site Name	Drainage Area (square miles)	Period of Record	
				From	To
02133500	Drowning Creek	DROWNING CREEK NEAR HOFFMAN, NC	183.00	1940	2008
02133624	Lumber River	LUMBER RIVER NEAR MAXTON, NC	365.00	1988	2009
02132320	Shoe Heel Creek	BIG SHOE HEEL CREEK NR LAURINBURG, NC	83.30	1987	2008

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the flood elevations for the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and/or Water-surface elevation rasters. For stream segments for which BFEs were computed, selected cross-section locations are also shown on the FIRM. Flood Profiles and/or Water-surface elevation rasters were developed showing computed water- surface elevations for floods of the selected recurrence intervals.

Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles and/or Water-surface elevation rasters or in the Floodway Data tables in the FIS Report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in the FIS 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 Flood Profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For details on the county's hydraulic analyses, the hydraulic report is available by request.

For the streams studied by detailed methods, water surface elevations of floods of the selected recurrence intervals were computed through use of the Army Corps of Engineers' HEC RAS step backwater computer program . The hydraulic analyses were based on unobstructed flow. The flood elevations shown on the Profiles and/or Water-surface elevation rasters are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail. The computer models were calibrated using historic high water data collected during field investigations.

The cross section geometries were obtained from a combination of digital elevation data obtained by Light Detection and Ranging (LIDAR) and field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. Natural floodplain cross sections were surveyed approximately every 4000 feet along the detail study reaches to obtain the channel geometry between bridges and culverts. Overbank cross section data for the backwater analyses were obtained from recently flown LIDAR data.

Channel roughness factors (Manning's "n") used in the hydraulic computations were made in the field by an engineer where stream access was possible, with orthophotos used to supplement areas that could not be accessed. The channel and overbank "n" values for all of the streams studied by detailed methods are shown in Table 16, "Roughness Coefficients".

Table 16 - Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Big Branch	0.050	0.110
Big Muddy Creek	0.038 to 0.055	0.135 to 0.140
Cabin Branch	0.050	0.032 to 0.110
Crawford Branch	0.055	0.012
Crooked Creek	0.050 to 0.060	0.032 to 0.150
Drowning Creek	0.050 to 0.060	0.100 to 0.120
Gum Swamp Creek	0.055 to 0.085	0.012
Joes Creek	0.055	0.012
Joes Creek Tributary	0.055	0.012
Juniper Creek	0.060 to 0.065	0.120 to 0.125
Little Creek	0.050	0.032 to 0.090
Lumber River	0.035 to 0.065	0.032 to 0.150
Unnamed Tributary to Gum Swamp Creek	0.045 to 0.050	0.032 to 0.090
Water Creek	0.050 to 0.060	0.032 to 0.090

For flooding sources studied by limited detailed methods in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this report and the FIRM panels. This method entails developing a HEC-RAS hydraulic model, resulting in the calculation of BFEs and the delineation of the 1% annual chance floodplain (designated as Zone AE). Cross sections for the flooding sources studied by limited detailed methods were obtained using digital elevation data obtained with LIDAR technology developed as part of the North Carolina Statewide Floodplain Mapping Program. The hydraulic model is prepared using this digital elevation data, without surveying bathymetric or structural data. Where bridge or culvert data are readily available, such as from the North Carolina Department of Transportation, these data have been reflected in the hydraulic model. If these structural data are not readily available, field measurements of these structures were made to approximate their geometry in the hydraulic models. In addition, this method does not include field surveys that determine specifics on channel and floodplain characteristics. A limited detailed study is a “buildable” product that can be upgraded to a fully detailed study at a later date by verifying stream channel characteristics, bridge and culvert opening geometry, and by analyzing multiple recurrence intervals.

The results of the HEC-RAS computations are tabulated for all cross sections (Table 17, “Limited Detailed Flood Hazard Data”). Flood Profiles have not been developed for streams studied by limited detailed methods. Water-surface elevation rasters were developed for streams studied by limited detailed methods. In addition, floodways for streams studied by limited detailed methods are not delineated on the FIRM. However, the 1% annual chance water-surface elevations, flood discharges, and non-encroachment widths from the limited detailed studies for every modeled cross section are given in Table 17. The non-encroachment widths given at modeled cross sections can be used by communities to enforce floodplain management ordinances that meet the requirement defined in 44 CFR 60.3(c)(10).

Between cross sections for streams studied by limited detailed methods, 1% annual chance water-surface elevations can be calculated by mathematical interpolation using the distance along the stream centerline. Non-encroachment widths and, therefore, the location of a non-encroachment area boundary between cross sections should be determined based on either 1) mathematical interpolation, or 2) the non-encroachment width at the upstream or downstream cross section, whichever is larger. If the width determined by this second method is wider than the Special Flood Hazard Area (SFHA) or the 1% annual chance floodplain delineated on the FIRM for this location along the stream, the non-encroachment area shall be considered to be coincident with the SFHA. A full detailed study incorporating field survey data in the HEC-RAS hydraulic model may be submitted for a Letter of Map Revision (LOMR) request to map a regulatory floodway along a section of a stream in lieu of applying the non-encroachment widths listed in Table 17.

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Beaverdam Creek1				
005	517.5	477.0	246.4 ¹	71.0 / 82.0
010	1024.5	477.0	246.4 ¹	6.0 / 6.0
012	1153.9	477.0	248.4	6.0 / 6.0
020	2023.8	477.0	249.3	151.0 / 156.0
024	2386.2	477.0	249.3	117.0 / 126.0
028	2793.8	477.0	249.5	15.0 / 132.0
033	3348.4	477.0	250.6	17.0 / 120.0
038	3839.9	477.0	251.0	128.0 / 110.0
048	4804.2	477.0	251.3	28.0 / 101.0
055	5511.9	477.0	251.5	205.0 / 176.0
070	6977.0	477.0	252.8	40.0 / 5.0
074	7432.6	477.0	255.9	8.0 / 115.0
077	7704.6	417.0	256.3	48.0 / 84.0
082	8229.1	417.0	257.3	66.0 / 5.0
087	8674.6	417.0	258.0	35.0 / 58.0
089	8920.4	417.0	260.6	7.0 / 23.0
094	9391.1	417.0	262.5	5.0 / 121.0
Big Branch				
008	790.0	1550.0	155.3	78.0 / 267.0
024	2402.0	1550.0	156.8	44.0 / 216.0
032	3165.0	1550.0	158.2	71.0 / 189.0
033	3345.0	1526.0	158.3	18.0 / 18.0
035	3493.0	1526.0	159.6	18.0 / 18.0
036	3637.0	1526.0	160.7	185.0 / 275.0
053	5286.0	1526.0	161.3	143.0 / 144.0
065	6466.0	1526.0	163.0	11.0 / 200.0
082	8220.0	1526.0	165.9	189.0 / 110.0
093	9348.0	1446.0	167.1	168.0 / 124.0
102	10239.0	1446.0	167.8	172.0 / 40.0
104	10413.0	1446.0	168.0	229.0 / 11.0
105	10527.0	1132.0	168.1	207.0 / 11.0
109	10901.0	1132.0	168.4	120.0 / 56.0
111	11090.0	1132.0	168.7	72.0 / 61.0
123	12309.0	1132.0	171.2	10.0 / 166.0
133	13326.0	1132.0	173.4	11.0 / 123.0
142	14175.0	1132.0	175.8	26.0 / 66.0
156	15606.0	1132.0	181.3	13.0 / 13.0
158	15761.0	1086.0	182.5	16.0 / 64.0
159	15881.0	1086.0	183.7	* 2
162	16237.0	1086.0	183.8	260.0 / 81.0
171	17131.0	1086.0	184.0	93.0 / 126.0
185	18479.0	1086.0	186.3	11.0 / 128.0
198	19782.0	1086.0	190.8	11.0 / 133.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
212	21248.0	1086.0	194.1	14.0 / 157.0
Big Branch				
227	22690.0	1086.0	197.9	12.0 / 84.0
232	23234.0	993.0	200.9	21.0 / 21.0
235	23498.0	993.0	203.8	21.0 / 21.0
240	24041.0	993.0	204.6	126.0 / 87.0
249	24872.0	993.0	204.9	124.0 / 50.0
254	25390.0	993.0	205.1	76.0 / 18.0
255	25523.0	993.0	208.1	76.0 / 18.0
260	25980.0	993.0	208.2	156.0 / 11.0
265	26482.0	993.0	208.4	178.0 / 11.0
268	26766.0	993.0	208.5	11.0 / 11.0
270	27041.0	993.0	211.6	11.0 / 11.0
273	27330.0	993.0	212.1	93.0 / 129.0
277	27739.0	993.0	212.2	89.0 / 145.0
278	27832.0	993.0	212.2	89.0 / 145.0
281	28075.0	993.0	212.2	115.0 / 103.0
285	28467.0	993.0	212.4	101.0 / 46.0
289	28922.0	993.0	212.7	11.0 / 55.0
294	29350.0	993.0	214.1	29.0 / 90.0
Big Muddy Creek				
033	3329.0	1111.0	267.4	213.0 / 252.0
035	3530.0	1111.0	274.0	144.0 / 148.0
050	4952.0	1111.0	274.2	102.0 / 29.0
061	6061.0	1110.5	274.4	95.0 / 39.0
079	7879.0	1110.5	276.0	26.0 / 26.0
081	8066.0	1110.5	277.4	26.0 / 26.0
091	9088.0	1110.5	281.1	42.0 / 37.0
093	9284.0	1110.5	282.0	40.0 / 40.0
110	11043.0	958.0	282.4	41.0 / 32.0
117	11683.0	958.0	282.8	29.0 / 39.0
121	12130.0	958.0	283.5	47.0 / 52.0
126	12565.0	958.0	283.8	78.0 / 67.0
130	12972.0	958.0	292.9	56.0 / 24.0
138	13753.0	958.0	292.9	82.0 / 58.0
146	14607.0	958.0	292.9	63.0 / 47.0
155	15482.0	958.0	293.0	77.0 / 83.0
164	16446.0	958.0	293.1	129.0 / 41.0
175	17498.0	958.0	293.2	95.0 / 76.0
182	18159.0	958.0	293.4	95.0 / 75.0
188	18827.0	958.0	293.6	107.0 / 63.0
197	19694.0	958.0	294.2	40.0 / 80.0
207	20733.0	958.0	295.5	70.0 / 80.0
216	21633.0	958.0	296.8	25.0 / 25.0
222	22217.0	910.0	300.6	40.0 / 16.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
225	22503.0	870.0	301.0	43.0 / 35.0
Big Muddy Creek				
236	23555.0	830.0	301.4	25.0 / 25.0
237	23719.0	830.0	302.3	25.0 / 25.0
244	24413.0	782.0	302.7	54.0 / 35.0
257	25671.0	360.9	302.9	30.0 / 30.0
264	26439.0	360.9	305.4	30.0 / 30.0
269	26880.0	360.9	306.9	30.0 / 30.0
273	27298.0	360.9	308.2	30.0 / 30.0
Bridge Creek				
022	2191.0	2592.0	148.8	555.0 / 382.0
041	4116.0	2592.0	151.7	197.0 / 233.0
043	4268.0	2574.0	152.0	169.0 / 226.0
045	4499.0	2574.0	153.4	169.0 / 226.0
051	5113.0	2574.0	154.0	140.0 / 413.0
060	6045.0	2574.0	154.6	636.0 / 425.0
062	6223.0	2574.0	154.9	623.0 / 356.0
079	7925.0	1751.0	156.0	67.0 / 244.0
090	9025.0	1751.0	157.6	156.0 / 299.0
092	9212.0	1733.0	157.7	156.0 / 299.0
096	9625.0	1733.0	158.1	260.0 / 290.0
112	11231.0	1733.0	159.7	155.0 / 179.0
123	12341.0	1733.0	161.5	235.0 / 54.0
141	14068.0	1733.0	163.8	151.0 / 200.0
155	15524.0	1648.0	166.4	9.0 / 218.0
157	15697.0	1628.0	170.2	* 2
164	16419.0	1628.0	170.3	276.0 / 183.0
175	17476.0	1628.0	170.6	157.0 / 230.0
187	18737.0	1628.0	171.6	217.0 / 94.0
189	18878.0	1563.0	172.9	217.0 / 94.0
203	20313.0	1563.0	173.4	89.0 / 246.0
211	21127.0	1563.0	174.2	20.0 / 226.0
215	21520.0	1563.0	174.8	196.0 / 70.0
224	22384.0	1563.0	176.3	179.0 / 92.0
233	23331.0	1563.0	177.9	93.0 / 155.0
240	24034.0	1563.0	179.5	69.0 / 180.0
246	24614.0	1498.0	181.0	9.0 / 291.0
248	24820.0	1498.0	185.0	* 2
255	25502.0	1498.0	185.1	* 2
269	26876.0	1251.0	195.7	* 2
285	28510.0	1222.0	195.8	* 2
298	29839.0	1222.0	195.8	* 2
299	29940.0	1222.0	195.8	* 2
311	31051.0	1222.0	195.9	* 2

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Bridge Creek				
313	31311.0	1044.0	195.9	* 2
320	32042.0	1044.0	195.9	77.0 / 391.0
330	32976.0	1044.0	196.1	78.0 / 114.0
345	34450.0	1044.0	200.4	101.0 / 91.0
362	36244.0	1044.0	205.5	74.0 / 117.0
364	36428.0	889.0	205.5	21.0 / 21.0
366	36562.0	889.0	210.9	21.0 / 21.0
367	36740.0	889.0	211.3	92.0 / 251.0
388	38765.0	750.0	213.5	8.0 / 8.0
392	39151.0	750.0	214.5	75.0 / 56.0
395	39519.0	750.0	214.8	50.0 / 95.0
399	39881.0	750.0	215.4	8.0 / 8.0
402	40239.0	750.0	218.4	122.0 / 9.0
414	41358.0	224.0	219.4	8.0 / 176.0
422	42231.0	224.0	219.6	8.0 / 8.0
429	42938.0	224.0	221.4	9.0 / 24.0
431	43100.0	224.0	223.0	9.0 / 24.0
437	43667.0	224.0	223.3	8.0 / 8.0
446	44576.0	224.0	224.5	79.0 / 9.0
447	44675.0	224.0	225.4	* 2
456	45628.0	224.0	227.5	8.0 / 8.0
459	45948.0	224.0	228.4	27.0 / 8.0
464	46447.0	224.0	229.0	17.0 / 8.0
Cabin Branch				
004	404.0	260.0	168.2 ¹	20.0 / 27.0
007	749.0	260.0	168.2 ¹	31.0 / 20.0
009	928.0	260.0	169.5	16.0 / 53.0
012	1244.0	260.0	172.3	18.0 / 18.0
014	1384.0	260.0	172.6	39.0 / 47.0
017	1658.0	260.0	172.6	20.0 / 20.0
021	2060.0	260.0	173.0	26.0 / 15.0
026	2582.0	260.0	178.4	20.0 / 19.0
030	3010.0	260.0	180.7	8.0 / 7.0
034	3425.0	260.0	181.8	19.0 / 19.0
039	3861.0	260.0	182.0	18.0 / 74.0
044	4392.0	260.0	182.1	19.0 / 19.0
048	4845.0	260.0	183.1	18.0 / 18.0
052	5200.0	260.0	184.3	20.0 / 20.0
057	5714.0	260.0	185.6	29.0 / 19.0
062	6243.0	260.0	186.7	22.0 / 21.0
065	6496.0	260.0	187.3	24.0 / 23.0
067	6668.0	260.0	188.6	5.0 / 6.0
068	6829.0	260.0	192.1	20.0 / 20.0
070	7048.0	260.0	192.1	48.0 / 56.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Cabin Branch				
074	7392.0	260.0	192.1	21.0 / 20.0
077	7702.0	190.0	192.5	21.0 / 21.0
080	8033.0	190.0	192.7	9.0 / 10.0
082	8172.0	190.0	194.8	12.0 / 12.0
084	8382.0	190.0	194.8	18.0 / 18.0
088	8811.0	190.0	196.0	20.0 / 19.0
092	9164.0	190.0	197.2	11.0 / 12.0
096	9606.0	190.0	199.9	19.0 / 20.0
099	9932.0	190.0	201.7	20.0 / 14.0
102	10248.0	190.0	203.1	9.0 / 9.0
105	10545.0	190.0	204.1	86.0 / 18.0
109	10868.0	190.0	204.4	31.0 / 21.0
113	11331.0	140.0	204.8	19.0 / 19.0
117	11721.0	140.0	204.9	67.0 / 53.0
118	11830.0	140.0	204.9	23.0 / 24.0
119	11920.0	140.0	204.9	24.0 / 23.0
120	12014.0	140.0	204.9	21.0 / 20.0
124	12394.0	140.0	205.5	24.0 / 24.0
129	12869.0	140.0	206.4	17.0 / 14.0
133	13310.0	140.0	207.9	21.0 / 19.0
136	13641.0	140.0	208.3	20.0 / 31.0
140	14026.0	140.0	208.5	17.0 / 24.0
Crawford Branch				
006	601.0	453.0	241.9 ¹	73.0 / 22.0
008	843.0	453.0	242.2	73.0 / 22.0
013	1258.0	453.0	244.4	43.0 / 18.0
019	1892.0	453.0	248.2	20.0 / 20.0
021	2076.0	453.0	249.0	126.0 / 126.0
023	2277.0	449.0	259.2	* 2
024	2426.0	449.0	259.2	* 2
026	2644.0	449.0	259.2	* 2
027	2717.0	449.0	259.2	* 2
028	2797.0	449.0	259.2	* 2
035	3471.0	449.0	259.2	* 2
035	3534.0	449.0	259.2	* 2
041	4112.0	449.0	259.2	* 2
042	4162.0	449.0	259.2	* 2
042	4218.0	449.0	259.2	* 2
043	4265.0	449.0	259.2	* 2
046	4592.0	449.0	259.2	* 2
050	5041.0	449.0	259.3	* 2
056	5625.0	410.0	259.3	* 2
058	5776.0	410.0	259.3	100.0 / 42.0
058	5845.0	410.0	259.3	100.0 / 42.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Crawford Branch				
060	5968.0	410.0	259.6	48.0 / 16.0
060	6026.0	410.0	259.9	28.0 / 28.0
061	6094.0	410.0	260.1	42.0 / 42.0
062	6174.0	410.0	260.2	18.0 / 18.0
065	6485.0	410.0	261.8	73.0 / 73.0
067	6679.0	410.0	262.3	27.0 / 27.0
068	6789.0	410.0	263.7	34.0 / 174.0
069	6904.0	410.0	263.7	* 2
072	7191.0	410.0	263.8	* 2
075	7488.0	410.0	263.8	45.0 / 135.0
078	7842.0	410.0	264.3	37.0 / 37.0
081	8105.0	410.0	266.9	26.0 / 26.0
084	8394.0	410.0	268.6	* 2
085	8519.0	410.0	269.4	* 2
086	8645.0	410.0	269.6	* 2
091	9140.0	410.0	270.8	* 2
095	9470.0	410.0	271.8	* 2
Gum Swamp Creek				
785	78543.0	2422.0	189.1	190.0 / 113.0
790	79042.0	2422.0	189.6	289.0 / 451.0
797	79672.0	2422.0	189.8	250.0 / 46.0
805	80501.0	2422.0	190.4	359.0 / 157.0
810	80973.0	2422.0	190.6	579.0 / 17.0
816	81636.0	2422.0	190.9	50.0 / 50.0
819	81918.0	2422.0	193.7	50.0 / 50.0
823	82301.0	2422.0	193.7	362.0 / 16.0
827	82657.0	2422.0	193.9	351.0 / 15.0
831	83137.0	2422.0	194.1	50.0 / 52.0
833	83282.0	2422.0	197.0	50.0 / 52.0
842	84225.0	2422.0	197.6	321.0 / 256.0
848	84800.0	2422.0	197.6	411.0 / 161.0
852	85154.0	2422.0	197.7	394.0 / 187.0
859	85948.0	2422.0	197.7	313.0 / 239.0
863	86250.0	2422.0	197.8	124.0 / 430.0
874	87384.0	2422.0	198.0	439.0 / 124.0
884	88376.0	2422.0	198.3	186.0 / 172.0
893	89273.0	2422.0	199.4	101.0 / 137.0
898	89765.0	2422.0	200.2	196.0 / 39.0
899	89917.0	2422.0	200.4	200.0 / 55.0
904	90387.0	2422.0	201.3	35.0 / 233.0
908	90828.0	2422.0	202.4	178.0 / 15.0
911	91128.0	2422.0	202.9	16.0 / 216.0
913	91286.0	2422.0	209.4	* 2

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Gum Swamp Creek				
921	92108.0	2422.0	209.5	* 2
925	92471.0	2422.0	209.7	* 2
929	92912.0	2422.0	209.9	* 2
936	93579.0	2422.0	210.2	* 2
953	95261.0	2307.0	210.5	433.0 / 220.0
967	96705.0	2307.0	210.7	423.0 / 210.0
974	97377.0	2307.0	210.8	407.0 / 228.0
985	98504.0	2307.0	210.8	590.0 / 44.0
991	99141.0	2307.0	210.9	590.0 / 17.0
1004	100436.0	2307.0	211.3	206.0 / 60.0
1020	101958.0	2307.0	212.1	23.0 / 251.0
1029	102938.0	2307.0	212.5	99.0 / 202.0
1036	103580.0	2307.0	212.9	145.0 / 138.0
1042	104230.0	2307.0	213.2	106.0 / 152.0
1053	105318.0	1921.0	213.7	207.0 / 147.0
1064	106430.0	1921.0	214.1	118.0 / 100.0
1071	107066.0	1921.0	214.5	299.0 / 81.0
1075	107472.0	1921.0	214.8	117.0 / 80.0
1076	107573.0	1921.0	215.1	117.0 / 80.0
1082	108222.0	1921.0	215.7	41.0 / 96.0
1088	108845.0	1921.0	216.2	28.0 / 273.0
1096	109622.0	1921.0	216.4	319.0 / 182.0
1103	110285.0	1921.0	216.6	164.0 / 129.0
1113	111302.0	1921.0	217.1	283.0 / 80.0
1122	112211.0	1921.0	217.5	368.0 / 83.0
1129	112895.0	1921.0	217.9	368.0 / 13.0
1135	113508.0	1921.0	218.2	306.0 / 163.0
1145	114542.0	1921.0	219.4	15.0 / 234.0
1152	115182.0	1921.0	220.5	189.0 / 41.0
1159	115866.0	1921.0	221.5	257.0 / 68.0
1163	116288.0	1921.0	221.8	255.0 / 77.0
1171	117107.0	1921.0	222.9	270.0 / 70.0
1181	118105.0	1921.0	223.7	658.0 / 44.0
1187	118735.0	1921.0	224.0	220.0 / 250.0
1197	119749.0	1921.0	224.9	216.0 / 89.0
1206	120563.0	1921.0	226.4	189.0 / 18.0
1212	121236.0	1921.0	227.6	122.0 / 144.0
1216	121649.0	1921.0	228.1	209.0 / 41.0
1221	122108.0	1921.0	228.6	283.0 / 17.0
1224	122355.0	1921.0	228.8	260.0 / 28.0
1233	123283.0	1921.0	229.3	396.0 / 20.0
1243	124289.0	1921.0	230.2	210.0 / 15.0
1245	124482.0	1931.0	230.5	156.0 / 48.0
1247	124713.0	1921.0	231.6	156.0 / 48.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Gum Swamp Creek				
1254	125415.0	1921.0	232.4	62.0 / 131.0
1262	126248.0	1921.0	233.4	293.0 / 17.0
1268	126779.0	1921.0	233.8	270.0 / 18.0
1273	127286.0	1921.0	234.1	268.0 / 157.0
1277	127719.0	1921.0	234.3	314.0 / 15.0
1286	128606.0	1921.0	235.4	323.0 / 15.0
1292	129151.0	1921.0	236.2	373.0 / 15.0
1295	129496.0	1921.0	236.7	64.0 / 39.0
1301	130069.0	1921.0	239.7	128.0 / 16.0
1308	130843.0	1921.0	240.1	231.0 / 140.0
1318	131794.0	1921.0	240.4	183.0 / 117.0
1327	132678.0	1921.0	240.9	201.0 / 98.0
1332	133178.0	1921.0	241.1	311.0 / 60.0
1340	133980.0	1921.0	241.5	206.0 / 98.0
1344	134410.6	1403.0	241.7	42.0 / 214.0
1348	134780.7	1403.0	242.0	29.0 / 253.0
1353	135269.6	1403.0	242.3	77.0 / 254.0
1362	136150.0	1403.0	243.2	141.0 / 60.0
1372	137244.4	1403.0	245.0	85.0 / 119.0
1388	138760.2	1403.0	246.4	472.0 / 34.0
1398	139767.9	1403.0	247.4	203.0 / 32.0
1410	141031.0	1403.0	250.3	132.0 / 52.0
1413	141287.5	1403.0	255.1	* 2
1427	142655.0	1403.0	255.2	* 2
1433	143326.0	1403.0	255.4	* 2
1444	144362.0	1295.0	256.0	* 2
1461	146063.0	1295.0	257.9	107.0 / 110.0
1471	147116.7	1295.0	259.8	46.0 / 226.0
1485	148487.2	1295.0	261.0	81.0 / 241.0
1497	149682.5	1295.0	262.4	82.0 / 369.0
1505	150528.3	1295.0	264.3	122.0 / 60.0
1507	150748.0	1295.0	265.8	122.0 / 60.0
1516	151608.9	1295.0	266.3	248.0 / 55.0
1526	152580.8	1295.0	267.4	10.0 / 173.0
1535	153482.9	999.6	271.1	62.0 / 63.0
1545	154531.9	999.6	273.7	11.0 / 220.0
1559	155854.5	999.6	275.9	70.0 / 56.0
1570	156988.6	999.6	277.3	145.0 / 105.0
1589	158873.0	999.6	279.9	106.0 / 43.0
1604	160406.7	999.6	283.2	109.0 / 68.0
1613	161262.5	999.6	285.0	109.0 / 11.0
1623	162272.8	659.0	287.4	103.0 / 25.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Gum Swamp Creek				
1632	163164.1	659.0	289.9	10.0 / 31.0
1641	164091.1	659.0	292.5	72.0 / 78.0
1647	164685.6	659.0	293.5	85.0 / 10.0
1658	165777.6	659.0	297.1	16.0 / 95.0
1671	167132.0	659.0	300.9	143.0 / 11.0
1679	167935.3	659.0	302.2	57.0 / 63.0
1688	168780.6	659.0	306.3	10.0 / 22.0
1689	168896.1	297.0	310.1	* 2
1697	169691.9	297.0	310.2	* 2
1708	170846.0	297.0	310.2	11.0 / 11.0
1715	171460.1	297.0	315.3	29.0 / 10.0
1717	171716.7	297.0	315.7	44.0 / 34.0
1719	171850.3	297.0	328.5	* 2
1726	172588.0	297.0	328.5	* 2
1730	172960.0	297.0	328.5	* 2
1735	173524.0	297.0	328.5	* 2
1740	174033.0	297.0	328.5	* 2
1744	174394.0	297.0	328.6	* 2
Gum Swamp Creek Tributary				
025	2474.0	252.0	210.4	464.0 / 108.0
030	2980.0	252.0	210.4	79.0 / 79.0
032	3179.0	252.0	212.4	79.0 / 79.0
036	3554.0	252.0	212.5	119.0 / 270.0
040	4012.0	252.0	212.6	11.0 / 111.0
048	4815.0	252.0	215.4	127.0 / 11.0
053	5331.0	252.0	216.6	26.0 / 81.0
057	5680.0	252.0	218.2	21.0 / 32.0
060	5970.0	252.0	219.3	75.0 / 111.0
062	6227.0	252.0	220.1	28.0 / 29.0
064	6428.0	252.0	221.3	31.0 / 12.0
068	6829.0	252.0	223.0	55.0 / 13.0
Joes Creek				
009	923.0	1702.0	178.2	442.0 / 13.0
013	1260.0	1702.0	178.2	380.0 / 17.0
016	1636.0	1702.0	178.2	49.0 / 49.0
020	1952.0	1702.0	178.2	* 2
024	2413.0	1702.0	178.5	* 2
039	3894.0	1702.0	180.6	* 2
051	5145.0	1702.0	181.3	* 2
062	6230.0	1702.0	181.8	* 2
073	7276.0	1702.0	182.2	* 2
090	9038.0	1702.0	182.9	155.0 / 260.0
101	10148.0	1702.0	183.5	320.0 / 13.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Joess Creek				
116	11647.0	1702.0	184.8	104.0 / 195.0
126	12583.0	1702.0	186.0	73.0 / 188.0
131	13138.0	1702.0	186.7	224.0 / 21.0
136	13624.0	1702.0	187.6	33.0 / 33.0
139	13883.0	1702.0	187.6	33.0 / 33.0
143	14296.0	1702.0	188.9	333.0 / 12.0
150	14963.0	1601.0	189.1	304.0 / 13.0
164	16392.0	1601.0	189.8	289.0 / 13.0
170	17033.0	1601.0	190.1	226.0 / 65.0
180	17995.0	1601.0	191.0	198.0 / 14.0
194	19434.0	1601.0	192.5	206.0 / 59.0
210	21027.0	1601.0	193.7	258.0 / 12.0
229	22885.0	1601.0	195.6	166.0 / 12.0
246	24640.0	1601.0	198.6	59.0 / 58.0
249	24942.0	1510.0	199.3	59.0 / 59.0
259	25884.0	1510.0	200.2	7.0 / 196.0
272	27170.0	1510.0	200.9	111.0 / 120.0
283	28266.0	1510.0	201.8	188.0 / 35.0
293	29315.0	1510.0	202.9	187.0 / 34.0
306	30591.0	1510.0	204.2	149.0 / 140.0
314	31449.0	1510.0	205.0	22.0 / 208.0
326	32590.0	1510.0	206.4	275.0 / 13.0
338	33810.0	1510.0	207.9	184.0 / 16.0
346	34550.0	1510.0	209.1	170.0 / 32.0
350	34984.0	1510.0	209.9	15.0 / 150.0
358	35789.0	1510.0	210.8	23.0 / 437.0
360	36004.0	1510.0	212.9	23.0 / 437.0
365	36520.0	1357.0	213.0	17.0 / 154.0
382	38190.0	1357.0	214.7	114.0 / 92.0
394	39376.0	1357.0	215.4	178.0 / 14.0
404	40379.0	1357.0	216.2	144.0 / 86.0
414	41357.2	1357.0	217.8	174.0 / 12.0
425	42453.4	1357.0	219.3	334.0 / 21.0
429	42877.6	1357.0	220.1	123.0 / 7.0
436	43625.8	1125.0	223.8	90.0 / 10.0
439	43855.3	1000.0	224.5	90.0 / 10.0
441	44059.8	1000.0	224.6	201.0 / 63.0
444	44442.7	1000.0	224.7	194.0 / 154.0
450	44983.9	1000.0	224.9	99.0 / 102.0
457	45694.1	1000.0	225.7	67.0 / 181.0
468	46751.6	1000.0	226.9	46.0 / 190.0
475	47478.1	1000.0	227.9	94.0 / 106.0
481	48056.4	1000.0	228.6	190.0 / 17.0
489	48859.8	1000.0	229.7	100.0 / 173.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Joese Creek				
502	50227.0	1000.0	232.9	104.0 / 7.0
511	51128.6	1000.0	235.6	204.0 / 45.0
513	51284.2	1000.0	238.5	204.0 / 45.0
521	52138.3	1000.0	238.6	386.0 / 173.0
528	52834.6	909.0	238.6	255.0 / 51.0
541	54121.5	909.0	239.1	222.0 / 6.0
554	55438.6	909.0	240.4	135.0 / 6.0
566	56630.6	909.0	242.7	42.0 / 75.0
574	57421.4	909.0	244.0	52.0 / 183.0
587	58678.9	909.0	245.7	81.0 / 89.0
594	59397.9	909.0	247.2	9.0 / 153.0
597	59696.5	909.0	248.5	8.0 / 127.0
601	60120.7	909.0	250.1	115.0 / 21.0
603	60260.0	400.0	250.7	115.0 / 21.0
609	60874.3	400.0	251.1	110.0 / 186.0
614	61380.7	400.0	251.2	19.0 / 75.0
622	62153.6	400.0	251.9	11.0 / 110.0
635	63495.6	400.0	254.6	88.0 / 8.0
643	64334.7	400.0	257.6	59.0 / 17.0
Joese Creek Tributary				
003	275.0	358.0	220.8	65.0 / 5.0
007	721.7	357.6	222.4	113.0 / 34.0
011	1095.7	357.6	223.5	90.0 / 4.0
013	1334.6	357.6	224.4	118.0 / 35.0
015	1542.5	357.6	227.2	118.0 / 35.0
018	1833.4	357.6	227.3	76.0 / 13.0
020	2035.0	357.6	227.6	83.0 / 5.0
023	2287.4	357.6	228.0	73.0 / 5.0
027	2672.4	357.6	228.6	94.0 / 19.0
031	3059.8	357.6	229.6	52.0 / 7.0
034	3442.3	357.6	231.4	39.0 / 37.0
036	3634.5	357.6	231.9	61.0 / 51.0
039	3853.9	357.6	232.8	16.0 / 53.0
044	4378.7	357.6	236.4	62.0 / 25.0
048	4808.2	357.6	237.8	69.0 / 29.0
053	5273.3	357.6	240.0	73.0 / 37.0
057	5707.8	357.6	240.9	141.0 / 5.0
061	6122.3	357.6	242.4	166.0 / 5.0
064	6438.4	357.6	243.6	7.0 / 74.0
069	6899.7	357.6	244.6	32.0 / 38.0
072	7242.1	357.6	246.1	79.0 / 6.0
079	7855.6	357.6	248.5	34.0 / 12.0
083	8295.9	357.6	251.1	17.0 / 64.0
089	8901.6	357.6	253.1	48.0 / 30.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Joese Creek Tributary				
091	9119.9	357.6	253.6	24.0 / 21.0
094	9416.0	357.6	254.7	21.0 / 68.0
098	9846.7	357.6	257.0	43.0 / 63.0
101	10067.8	357.6	258.0	28.0 / 16.0
102	10229.4	357.6	259.4	28.0 / 16.0
103	10347.4	357.6	260.5	85.0 / 6.0
105	10547.3	357.6	263.1	85.0 / 6.0
107	10745.7	357.6	263.1	174.0 / 62.0
109	10872.5	230.3	263.1	123.0 / 70.0
111	11138.2	230.3	263.1	65.0 / 37.0
113	11317.6	230.3	263.2	69.0 / 6.0
116	11553.4	230.3	263.7	18.0 / 66.0
121	12064.8	230.3	266.1	25.0 / 25.0
124	12434.3	230.3	267.6	25.0 / 35.0
129	12921.5	230.3	269.1	25.0 / 25.0
135	13539.7	230.3	271.1	23.0 / 28.0
140	13977.7	230.3	274.1	5.0 / 45.0
143	14324.6	230.3	276.1	35.0 / 38.0
145	14515.8	230.3	276.4	45.0 / 48.0
149	14947.4	230.3	277.7	21.0 / 30.0
151	15078.8	230.3	278.9	45.0 / 5.0
153	15314.6	230.3	280.9	5.0 / 46.0
154	15430.9	230.3	281.8	5.0 / 73.0
156	15612.5	230.3	282.2	5.0 / 92.0
Jordan Creek				
017	1686.8	1116.0	192.0 ¹	224.0 / 193.0
023	2294.4	1116.0	192.0 ¹	395.0 / 22.0
032	3210.2	1116.0	193.9	128.0 / 128.0
034	3391.6	1116.0	194.4	128.0 / 128.0
042	4172.6	1116.0	194.5	399.0 / 320.0
056	5644.3	1110.0	195.4	161.0 / 115.0
062	6219.1	1110.0	196.5	215.0 / 20.0
064	6402.5	1110.0	198.1	215.0 / 20.0
071	7128.7	1110.0	198.3	438.0 / 63.0
077	7739.4	1110.0	198.6	272.0 / 137.0
089	8927.4	1110.0	199.7	235.0 / 17.0
094	9367.4	1110.0	200.7	279.0 / 17.0
099	9916.4	1110.0	202.3	18.0 / 18.0
100	9990.4	1110.0	203.5	19.0 / 17.0
103	10301.8	1110.0	204.1	141.0 / 294.0
107	10680.3	1110.0	204.2	82.0 / 290.0
117	11737.4	1110.0	204.6	173.0 / 101.0
137	13662.9	1110.0	206.5	65.0 / 137.0
148	14777.6	1110.0	207.9	68.0 / 299.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Jordan Creek				
166	16596.6	1110.0	210.0	165.0 / 38.0
189	18901.6	1110.0	212.8	164.0 / 91.0
191	19107.9	1110.0	212.9	19.0 / 19.0
193	19266.6	1110.0	213.2	20.0 / 19.0
196	19596.9	1110.0	214.0	248.0 / 35.0
200	20035.7	1110.0	214.3	67.0 / 167.0
204	20422.8	1110.0	214.8	201.0 / 36.0
207	20688.8	906.0	215.2	17.0 / 17.0
209	20861.6	906.0	215.8	17.0 / 17.0
212	21216.3	906.0	216.8	169.0 / 97.0
216	21597.7	906.0	217.0	189.0 / 102.0
223	22318.8	906.0	217.3	165.0 / 62.0
230	22987.8	906.0	218.0	162.0 / 18.0
238	23754.7	906.0	218.8	17.0 / 129.0
263	26309.6	906.0	222.2	75.0 / 39.0
285	28539.3	906.0	224.9	19.0 / 155.0
303	30342.0	906.0	227.0	41.0 / 296.0
318	31817.0	906.0	230.4	17.0 / 408.0
330	33008.0	906.0	233.0	17.0 / 398.0
344	34436.6	906.0	234.8	207.0 / 17.0
366	36641.4	906.0	237.2	462.0 / 23.0
373	37309.0	906.0	237.8	21.0 / 215.0
380	38027.3	906.0	238.3	213.0 / 65.0
393	39323.9	906.0	239.8	152.0 / 19.0
405	40463.5	906.0	241.7	19.0 / 202.0
412	41218.6	906.0	242.8	20.0 / 177.0
415	41514.6	906.0	243.4	29.0 / 27.0
416	41619.5	906.0	244.4	29.0 / 27.0
419	41861.7	906.0	245.0	172.0 / 57.0
423	42275.4	906.0	245.6	67.0 / 21.0
426	42612.9	906.0	246.1	133.0 / 77.0
430	43009.2	906.0	246.5	24.0 / 24.0
445	44463.5	906.0	249.6	34.0 / 147.0
452	45232.0	906.0	250.8	19.0 / 135.0
459	45913.6	906.0	252.5	33.0 / 79.0
470	47047.9	906.0	254.6	85.0 / 64.0
475	47476.1	694.0	255.4	61.0 / 41.0
477	47689.6	694.0	262.2	* 2
481	48101.5	694.0	262.2	* 2
487	48737.0	694.0	262.3	* 2
492	49244.0	694.0	262.3	* 2
498	49751.4	694.0	262.3	* 2
504	50375.7	694.0	262.3	373.0 / 514.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Jordan Creek				
513	51258.8	694.0	262.3	164.0 / 290.0
521	52110.2	694.0	262.4	240.0 / 195.0
530	52996.5	694.0	262.5	130.0 / 17.0
540	54004.8	694.0	263.6	24.0 / 185.0
554	55440.7	694.0	265.5	72.0 / 18.0
571	57113.6	694.0	267.2	62.0 / 96.0
582	58150.0	694.0	268.3	18.0 / 73.0
590	58969.6	694.0	269.6	17.0 / 103.0
598	59772.0	694.0	271.0	22.0 / 43.0
602	60245.3	562.0	271.6	38.0 / 37.0
610	60995.8	562.0	272.5	22.0 / 62.0
614	61431.9	562.0	273.1	36.0 / 49.0
623	62282.4	562.0	275.5	17.0 / 17.0
631	63059.1	562.0	277.4	17.0 / 112.0
638	63765.8	562.0	278.3	52.0 / 19.0
639	63877.0	562.0	281.5	52.0 / 19.0
641	64112.8	562.0	281.5	45.0 / 119.0
651	65092.0	562.0	281.9	17.0 / 17.0
656	65562.8	562.0	283.4	17.0 / 78.0
662	66177.3	562.0	284.3	81.0 / 18.0
668	66804.3	562.0	285.9	23.0 / 18.0
680	67962.8	562.0	290.9	93.0 / 112.0
692	69156.5	562.0	291.8	31.0 / 143.0
698	69835.7	562.0	291.9	20.0 / 20.0
708	70760.1	562.0	297.0	17.0 / 159.0
719	71878.6	562.0	299.3	22.0 / 22.0
728	72842.7	562.0	300.1	131.0 / 64.0
Juniper Creek				
024	2389.2	2922.0	180.6	1017.0 / 425.0
041	4103.7	2162.0	181.3	178.0 / 847.0
050	4954.8	2162.0	181.7	332.0 / 639.0
059	5896.3	2162.0	182.3	266.0 / 572.0
064	6367.4	2162.0	182.6	34.0 / 592.0
066	6639.4	2162.0	185.8	34.0 / 592.0
072	7171.1	2162.0	185.8	260.0 / 840.0
078	7789.9	2162.0	185.8	573.0 / 570.0
092	9176.8	2162.0	186.0	523.0 / 694.0
104	10406.7	2162.0	186.6	240.0 / 560.0
113	11346.5	2162.0	187.3	297.0 / 397.0
119	11905.1	2162.0	187.6	419.0 / 383.0
124	12433.4	2162.0	187.9	563.0 / 311.0
127	12714.0	2162.0	188.0	373.0 / 604.0
130	13019.9	2162.0	189.9	373.0 / 604.0
133	13329.3	2162.0	189.9	593.0 / 744.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Juniper Creek				
138	13773.4	2162.0	190.0	633.0 / 475.0
145	14532.2	2162.0	190.1	593.0 / 358.0
153	15345.7	2162.0	190.4	267.0 / 270.0
162	16189.6	2162.0	191.1	260.0 / 383.0
167	16747.0	1525.0	191.7	368.0 / 380.0
167	16747.0	2162.0	191.7	368.0 / 380.0
188	18818.1	1525.0	192.7	43.0 / 721.0
194	19393.3	1525.0	193.3	136.0 / 650.0
200	20023.2	1525.0	194.2	69.0 / 402.0
203	20258.9	1525.0	196.6	69.0 / 402.0
211	21057.8	1525.0	196.7	643.0 / 34.0
221	22076.0	1525.0	196.9	509.0 / 75.0
245	24478.0	1525.0	198.4	161.0 / 201.0
251	25111.7	1525.0	198.9	451.0 / 110.0
256	25556.0	1525.0	199.3	16.0 / 547.0
268	26833.5	1525.0	200.0	126.0 / 411.0
281	28129.2	1525.0	201.6	160.0 / 103.0
304	30371.2	1525.0	204.8	134.0 / 298.0
315	31500.6	1525.0	205.6	278.0 / 227.0
331	33110.0	1285.0	206.7	158.0 / 233.0
341	34123.6	1285.0	207.6	227.0 / 85.0
346	34615.8	1285.0	208.4	50.0 / 50.0
348	34781.4	1285.0	209.1	50.0 / 50.0
354	35368.4	1285.0	209.7	405.0 / 15.0
360	35961.1	1285.0	209.9	267.0 / 29.0
366	36601.4	1285.0	210.3	52.0 / 284.0
368	36809.5	1285.0	211.9	472.0 / 35.0
373	37338.8	1285.0	212.0	408.0 / 144.0
390	39019.7	1285.0	212.4	347.0 / 74.0
397	39652.3	1285.0	213.1	25.0 / 22.0
399	39856.2	1285.0	215.3	246.0 / 22.0
405	40540.9	1285.0	215.5	247.0 / 21.0
418	41816.3	1285.0	216.5	586.0 / 27.0
428	42842.3	1285.0	218.2	182.0 / 16.0
444	44415.3	1285.0	221.0	17.0 / 401.0
465	46521.3	1285.0	222.5	351.0 / 14.0
489	48935.8	1285.0	224.7	182.0 / 155.0
501	50106.2	1285.0	226.5	104.0 / 100.0
505	50543.7	1285.0	227.9	44.0 / 44.0
507	50731.4	1285.0	229.3	44.0 / 44.0
514	51446.5	1285.0	229.4	376.0 / 86.0
523	52271.0	1285.0	230.4	214.0 / 47.0
529	52914.2	1285.0	231.0	48.0 / 234.0
541	54133.2	1285.0	232.2	239.0 / 20.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Juniper Creek				
551	55137.3	1114.0	233.2	72.0 / 173.0
559	55858.4	1114.0	233.7	406.0 / 117.0
572	57196.1	1114.0	234.8	30.0 / 198.0
580	58018.3	1114.0	236.2	109.0 / 94.0
584	58399.6	1114.0	236.9	15.0 / 285.0
593	59314.7	1114.0	238.8	14.0 / 187.0
596	59624.0	1114.0	239.5	50.0 / 201.0
601	60101.1	1114.0	240.3	223.0 / 14.0
604	60445.4	1114.0	240.8	272.0 / 14.0
608	60828.1	1114.0	241.3	202.0 / 144.0
610	61018.3	1114.0	241.7	16.0 / 124.0
611	61123.4	1114.0	246.4	16.0 / 124.0
614	61419.8	1114.0	246.4	438.0 / 350.0
624	62439.4	1114.0	246.5	151.0 / 95.0
634	63449.9	688.0	246.9	128.0 / 16.0
640	64007.5	688.0	247.9	119.0 / 17.0
647	64693.0	688.0	249.1	46.0 / 81.0
654	65387.1	688.0	249.5	17.0 / 224.0
660	66009.5	688.0	249.8	151.0 / 90.0
671	67132.2	688.0	251.4	165.0 / 36.0
676	67647.2	688.0	253.1	54.0 / 124.0
681	68108.2	688.0	253.9	108.0 / 28.0
685	68456.9	688.0	254.1	283.0 / 16.0
690	69045.3	688.0	254.7	267.0 / 14.0
698	69819.8	607.0	257.0	16.0 / 264.0
704	70385.0	607.0	257.8	19.0 / 134.0
710	70967.4	607.0	258.9	103.0 / 14.0
713	71255.2	607.0	259.1	234.0 / 172.0
Juniper Creek Tributary				
021	2101.8	263.0	180.6 ¹	133.0 / 21.0
023	2342.9	263.0	180.8	149.0 / 22.0
031	3124.3	263.0	182.0	25.0 / 25.0
034	3440.5	263.0	183.9	17.0 / 17.0
039	3881.5	263.0	184.5	39.0 / 23.0
042	4179.5	263.0	185.8	39.0 / 23.0
047	4741.5	263.0	186.0	19.0 / 19.0
051	5061.0	263.0	186.9	32.0 / 21.0
056	5555.1	263.0	187.7	23.0 / 82.0
064	6350.1	263.0	189.5	53.0 / 16.0
066	6628.9	263.0	190.2	116.0 / 20.0
071	7121.0	263.0	190.8	75.0 / 22.0
075	7485.6	263.0	191.6	59.0 / 32.0
079	7888.5	263.0	192.7	36.0 / 58.0
083	8344.2	263.0	195.0	46.0 / 19.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Juniper Creek Tributary				
092	9217.2	263.0	197.3	41.0 / 74.0
099	9888.2	263.0	199.3	19.0 / 19.0
104	10351.6	263.0	200.8	18.0 / 140.0
107	10686.2	263.0	201.2	88.0 / 19.0
109	10852.1	263.0	207.6	88.0 / 19.0
112	11152.5	263.0	207.6	119.0 / 192.0
126	12620.9	263.0	207.6	25.0 / 257.0
136	13635.9	263.0	207.7	16.0 / 47.0
143	14282.9	263.0	209.3	46.0 / 33.0
150	14988.9	263.0	211.7	33.0 / 24.0
158	15778.7	263.0	214.2	31.0 / 15.0
165	16510.0	263.0	217.5	16.0 / 16.0
171	17117.5	263.0	219.9	22.0 / 47.0
176	17570.0	263.0	220.7	76.0 / 13.0
Leith Creek				
156	15597.0	3660.0	135.8 ¹	543.0 / 255.0
174	17445.0	3660.0	137.0	737.0 / 215.0
201	20105.0	3660.0	139.8	500.0 / 278.0
212	21160.0	3467.0	141.1	529.0 / 341.0
219	21863.0	3441.0	142.0	171.0 / 193.0
225	22454.0	3441.0	142.2	160.0 / 914.0
243	24276.0	3429.0	143.0	539.0 / 350.0
269	26936.0	3339.0	144.0	397.0 / 856.0
304	30356.0	3236.0	145.6	108.0 / 942.0
333	33318.0	2631.0	149.6	106.0 / 460.0
349	34895.0	2631.0	152.1	418.0 / 90.0
350	35033.0	2631.0	152.2	51.0 / 49.0
353	35288.0	2631.0	155.4	51.0 / 49.0
354	35387.0	2631.0	155.5	397.0 / 115.0
358	35797.0	2631.0	160.0	275.0 / 18.0
386	38583.0	2608.0	160.2	478.0 / 238.0
403	40321.0	2608.0	160.6	504.0 / 353.0
419	41907.0	2608.0	160.9	246.0 / 723.0
438	43845.0	2575.0	161.3	68.0 / 38.0
441	44142.0	2575.0	162.8	68.0 / 38.0
451	45074.0	2544.0	163.5	322.0 / 481.0
453	45297.0	2544.0	163.7	498.0 / 354.0
474	47433.0	2544.0	164.1	147.0 / 394.0
496	49599.0	2544.0	165.2	144.0 / 231.0
516	51570.0	2544.0	166.1	431.0 / 142.0
554	55423.0	2486.0	168.2	320.0 / 410.0
587	58695.0	2442.0	171.3	302.0 / 205.0
600	60004.0	2442.0	172.4	171.0 / 307.0
603	60259.0	2442.0	173.3	171.0 / 307.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Leith Creek				
604	60361.0	2442.0	173.4	233.0 / 215.0
923	92324.0	493.0	216.4	9.0 / 105.0
932	93206.0	449.0	218.4	99.0 / 104.0
942	94161.0	449.0	218.7	142.0 / 13.0
947	94685.0	449.0	219.2	29.0 / 29.0
956	95611.0	449.0	221.7	62.0 / 8.0
962	96226.0	449.0	222.9	8.0 / 90.0
972	97181.0	396.0	225.6	49.0 / 8.0
977	97706.0	396.0	226.8	96.0 / 8.0
983	98262.0	396.0	228.0	21.0 / 8.0
987	98708.0	396.0	232.2	9.0 / 9.0
988	98819.0	396.0	234.9	9.0 / 9.0
996	99593.0	396.0	234.9	188.0 / 58.0
1008	100829.0	396.0	235.9	54.0 / 82.0
1016	101566.0	363.0	237.7	89.0 / 39.0
1024	102375.0	363.0	239.3	59.0 / 68.0
1035	103534.0	363.0	241.4	77.0 / 51.0
1045	104546.0	324.0	242.6	62.0 / 70.0
1054	105359.0	324.0	243.3	54.0 / 77.0
1061	106082.0	324.0	244.0	58.0 / 8.0
1066	106563.0	324.0	245.6	9.0 / 70.0
1068	106759.0	324.0	248.2	9.0 / 70.0
1075	107532.0	141.0	248.2	62.0 / 78.0
1082	108218.0	141.0	248.3	92.0 / 8.0
Leith Creek Tributary 1				
015	1484.0	474.0	138.5	26.0 / 240.0
039	3876.0	393.0	140.8	10.0 / 195.0
041	4092.0	393.0	145.2	10.0 / 195.0
054	5360.0	382.0	145.4	90.0 / 115.0
066	6615.0	382.0	145.9	43.0 / 112.0
081	8066.0	382.0	149.2	39.0 / 117.0
094	9374.0	331.0	152.7	72.0 / 7.0
096	9554.0	331.0	155.4	72.0 / 7.0
112	11222.0	327.0	157.0	17.0 / 7.0
Leith Creek Tributary 2				
010	987.0	265.0	175.4	44.0 / 9.0
023	2254.0	265.0	183.3	16.0 / 37.0
029	2933.0	265.0	185.3	7.0 / 7.0
033	3321.0	265.0	187.9	* 2
043	4255.0	265.0	188.7	79.0 / 15.0
Little Creek				
167	16711.0	250.0	217.7	27.0 / 13.0
171	17099.0	165.0	217.9	23.0 / 57.0
172	17155.0	165.0	218.9	26.0 / 16.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Little Creek				
174	17438.0	165.0	224.0	26.0 / 16.0
176	17569.0	165.0	224.0	110.0 / 86.0
182	18237.0	165.0	224.0	45.0 / 135.0
190	18984.0	165.0	224.0	61.0 / 80.0
200	19960.0	94.0	224.1	6.0 / 31.0
201	20114.0	94.0	224.3	4.0 / 4.0
203	20258.0	94.0	225.1	4.0 / 4.0
204	20402.0	94.0	225.3	28.0 / 44.0
210	21048.0	94.0	226.0	6.0 / 5.0
218	21790.0	94.0	228.4	13.0 / 45.0
227	22729.0	94.0	229.8	14.0 / 27.0
236	23575.0	94.0	232.1	23.0 / 9.0
241	24073.0	94.0	232.7	8.0 / 69.0
Little Juniper Creek				
004	428.3	392.0	197.4 ¹	331.0 / 14.0
018	1773.8	392.0	198.9	12.0 / 192.0
025	2457.0	392.0	200.1	11.0 / 192.0
033	3343.2	392.0	201.0	35.0 / 181.0
041	4050.0	392.0	202.2	11.0 / 157.0
046	4642.0	392.0	203.4	41.0 / 178.0
048	4818.6	392.0	207.7	41.0 / 178.0
074	7444.3	392.0	210.0	10.0 / 71.0
082	8167.7	392.0	213.4	83.0 / 36.0
094	9403.1	321.0	215.6	36.0 / 86.0
102	10220.9	321.0	218.4	12.0 / 113.0
104	10393.8	321.0	219.9	46.0 / 69.0
105	10515.4	321.0	223.2	46.0 / 69.0
106	10625.7	321.0	223.2	145.0 / 149.0
107	10714.2	321.0	223.1	11.0 / 11.0
108	10802.6	321.0	226.5	11.0 / 11.0
114	11388.0	321.0	226.7	187.0 / 137.0
129	12927.1	321.0	226.7	10.0 / 154.0
136	13564.4	321.0	228.2	12.0 / 152.0
142	14164.0	321.0	232.6	10.0 / 59.0
144	14413.8	154.0	233.6	11.0 / 63.0
152	15238.2	154.0	237.0	50.0 / 11.0
162	16243.4	154.0	241.3	36.0 / 35.0
166	16574.9	154.0	241.9	12.0 / 77.0
168	16780.8	154.0	245.2	11.0 / 11.0
169	16939.0	154.0	249.4	11.0 / 11.0
172	17165.8	154.0	249.6	77.0 / 236.0
177	17718.3	154.0	249.6	36.0 / 88.0
182	18210.7	154.0	249.7	18.0 / 24.0
185	18487.9	154.0	252.3	14.0 / 14.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Little Juniper Creek				
186	18643.8	154.0	255.4	14.0 / 14.0
189	18918.8	154.0	255.5	21.0 / 40.0
Little Juniper Creek Tributary				
003	336.8	196.0	227.8	8.0 / 92.0
007	686.3	196.0	229.1	61.0 / 48.0
010	1012.8	196.0	232.1	68.0 / 32.0
011	1131.5	196.0	236.3	68.0 / 32.0
014	1351.8	196.0	236.3	129.0 / 55.0
018	1821.9	196.0	236.4	67.0 / 41.0
021	2124.1	196.0	236.5	14.0 / 20.0
025	2513.0	196.0	237.7	21.0 / 24.0
035	3487.0	196.0	241.3	16.0 / 40.0
046	4567.9	196.0	245.2	6.0 / 38.0
052	5159.7	196.0	246.8	44.0 / 5.0
059	5857.2	196.0	249.0	12.0 / 38.0
065	6524.1	196.0	252.2	24.0 / 33.0
069	6937.9	196.0	253.6	11.0 / 38.0
073	7349.2	196.0	256.6	* 2
075	7466.0	196.0	259.3	10.0 / 10.0
079	7874.9	196.0	259.4	79.0 / 6.0
085	8471.1	196.0	259.5	36.0 / 5.0
091	9136.9	196.0	261.7	41.0 / 7.0
096	9584.7	196.0	262.3	6.0 / 80.0
100	10026.0	196.0	262.6	9.0 / 83.0
104	10385.2	196.0	262.8	5.0 / 53.0
110	11006.5	196.0	264.4	44.0 / 15.0
Little Shoe Heel Creek				
012	1174.0	658.0	214.5	65.0 / 177.0
018	1849.9	658.0	215.3	312.0 / 32.0
026	2638.5	658.0	216.3	265.0 / 14.0
033	3328.1	658.0	217.1	254.0 / 157.0
041	4069.1	658.0	217.9	194.0 / 70.0
043	4345.2	658.0	218.5	20.0 / 20.0
046	4561.3	636.0	221.2	20.0 / 20.0
055	5485.5	636.0	221.4	408.0 / 59.0
061	6098.2	636.0	221.7	218.0 / 19.0
075	7513.3	411.0	224.1	46.0 / 80.0
083	8250.0	411.0	225.8	28.0 / 18.0
089	8914.5	411.0	226.7	50.0 / 78.0
094	9433.2	411.0	227.4	16.0 / 16.0
102	10233.4	411.0	230.0	27.0 / 15.0
112	11151.2	411.0	232.5	17.0 / 17.0
115	11548.9	368.0	234.0	17.0 / 17.0
116	11619.8	368.0	237.3	17.0 / 17.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Little Shoe Heel Creek				
121	12116.3	368.0	237.6	181.0 / 15.0
129	12867.9	368.0	237.8	16.0 / 60.0
137	13677.7	368.0	239.1	17.0 / 210.0
140	13994.0	368.0	239.8	30.0 / 30.0
143	14342.3	368.0	242.5	16.0 / 16.0
153	15325.1	368.0	243.6	64.0 / 102.0
158	15819.0	368.0	244.0	114.0 / 24.0
163	16287.8	368.0	245.9	16.0 / 16.0
164	16380.2	368.0	248.3	16.0 / 16.0
168	16838.5	368.0	248.9	94.0 / 22.0
176	17559.0	368.0	249.7	32.0 / 206.0
181	18090.7	368.0	250.7	15.0 / 15.0
191	19057.5	368.0	253.5	15.0 / 123.0
199	19854.7	368.0	254.5	15.0 / 15.0
209	20937.2	368.0	258.5	15.0 / 15.0
216	21623.4	368.0	259.6	50.0 / 113.0
224	22397.0	368.0	260.8	17.0 / 17.0
231	23069.6	318.0	263.9	60.0 / 15.0
238	23843.8	318.0	264.6	15.0 / 93.0
251	25107.0	318.0	266.9	16.0 / 16.0
259	25881.8	318.0	269.8	76.0 / 15.0
265	26454.8	318.0	270.5	16.0 / 16.0
269	26904.6	318.0	271.2	28.0 / 15.0
278	27815.4	318.0	273.5	16.0 / 16.0
284	28404.9	318.0	276.6	17.0 / 17.0
289	28914.5	318.0	278.8	15.0 / 15.0
293	29258.7	318.0	280.3	15.0 / 15.0
294	29444.3	318.0	286.2	15.0 / 15.0
296	29645.0	318.0	286.2	57.0 / 66.0
301	30140.4	318.0	286.3	15.0 / 80.0
307	30666.4	252.0	286.5	16.0 / 16.0
315	31546.2	252.0	288.7	37.0 / 16.0
319	31928.7	252.0	292.8	15.0 / 15.0
327	32660.7	233.0	296.7	44.0 / 16.0
333	33258.3	233.0	299.6	15.0 / 16.0
338	33772.4	233.0	303.9	17.0 / 36.0
339	33881.4	233.0	308.5	* 2
341	34065.1	233.0	308.7	* 2
347	34667.4	233.0	309.6	* 2
354	35354.1	187.0	310.2	* 2
358	35841.1	187.0	310.6	16.0 / 16.0
359	35939.6	181.0	316.0	* 2
363	36270.2	181.0	316.0	* 2

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Little Shoe Heel Creek				
372	37158.7	181.0	316.0	44.0 / 140.0
376	37626.4	181.0	319.3	16.0 / 16.0
381	38069.0	181.0	325.9	15.0 / 15.0
385	38452.8	181.0	330.0	16.0 / 16.0
388	38778.7	181.0	331.3	15.0 / 19.0
Little Shoe Heel Creek Tributary				
014	1438.7	299.0	224.2	69.0 / 43.0
023	2276.7	299.0	226.6	10.0 / 41.0
031	3053.2	299.0	228.5	26.0 / 63.0
038	3774.6	299.0	230.2	44.0 / 10.0
045	4510.4	299.0	233.9	11.0 / 40.0
048	4805.2	299.0	234.7	24.0 / 90.0
050	4968.6	299.0	236.3	25.0 / 90.0
056	5567.0	299.0	236.7	41.0 / 10.0
059	5907.5	299.0	238.3	39.0 / 10.0
064	6393.7	233.0	239.6	30.0 / 58.0
067	6707.1	233.0	240.4	10.0 / 39.0
068	6799.8	233.0	242.3	10.0 / 39.0
072	7223.1	233.0	243.3	27.0 / 96.0
077	7660.3	233.0	243.7	22.0 / 82.0
083	8276.7	233.0	244.6	41.0 / 94.0
090	8989.8	233.0	245.8	12.0 / 17.0
096	9583.5	233.0	247.2	12.0 / 17.0
104	10351.4	233.0	250.4	12.0 / 17.0
109	10946.9	233.0	252.2	42.0 / 10.0
113	11306.4	233.0	252.9	10.0 / 13.0
118	11847.5	233.0	254.5	10.0 / 13.0
124	12369.9	233.0	256.3	11.0 / 11.0
127	12689.0	233.0	257.1	11.0 / 11.0
Lower Beaverdam Creek				
007	672.0	784.0	180.0	29.0 / 58.0
010	1027.0	784.0	180.0	17.0 / 129.0
014	1386.0	784.0	180.9	67.0 / 22.0
019	1900.0	784.0	182.2	37.0 / 142.0
024	2417.0	784.0	183.1	57.0 / 47.0
027	2654.0	784.0	183.5	163.0 / 10.0
032	3210.0	784.0	185.0	21.0 / 21.0
033	3328.0	784.0	185.3	21.0 / 21.0
036	3627.0	784.0	186.2	303.0 / 13.0
040	4018.0	784.0	186.3	268.0 / 18.0
045	4523.0	784.0	186.4	164.0 / 367.0
050	4951.0	784.0	186.4	259.0 / 370.0
053	5317.0	784.0	186.4	234.0 / 339.0
057	5712.0	784.0	186.5	36.0 / 429.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Lower Beaverdam Creek				
061	6073.0	784.0	186.6	270.0 / 178.0
063	6309.0	784.0	186.8	188.0 / 74.0
068	6755.0	784.0	187.2	211.0 / 74.0
072	7157.0	784.0	187.5	10.0 / 178.0
075	7468.0	784.0	187.9	72.0 / 122.0
080	7990.0	784.0	188.4	116.0 / 98.0
083	8298.0	784.0	188.7	136.0 / 39.0
087	8673.0	784.0	189.2	88.0 / 60.0
089	8888.0	784.0	189.7	103.0 / 15.0
093	9275.0	784.0	190.6	170.0 / 11.0
096	9612.0	784.0	191.3	113.0 / 10.0
100	10012.0	784.0	192.4	109.0 / 12.0
103	10305.0	677.0	193.1	13.0 / 13.0
104	10428.0	677.0	194.0	13.0 / 13.0
107	10748.0	677.0	194.5	203.0 / 12.0
109	10904.0	677.0	194.5	186.0 / 48.0
112	11207.0	677.0	194.6	51.0 / 141.0
114	11411.0	677.0	194.7	121.0 / 17.0
118	11803.0	677.0	194.9	140.0 / 42.0
128	12849.0	677.0	195.6	10.0 / 143.0
134	13418.0	677.0	197.1	46.0 / 130.0
141	14118.0	677.0	199.3	215.0 / 10.0
147	14659.0	677.0	201.3	192.0 / 10.0
152	15191.0	677.0	201.8	203.0 / 237.0
158	15758.0	677.0	202.0	191.0 / 156.0
161	16144.0	677.0	202.2	57.0 / 10.0
168	16783.0	677.0	203.6	59.0 / 114.0
176	17589.0	677.0	204.8	144.0 / 41.0
179	17937.0	677.0	205.3	53.0 / 158.0
185	18543.0	677.0	206.8	11.0 / 11.0
192	19192.0	677.0	208.7	19.0 / 209.0
199	19879.0	491.0	209.8	55.0 / 42.0
205	20530.0	491.0	213.8	17.0 / 17.0
211	21127.0	491.0	214.3	145.0 / 150.0
217	21710.0	491.0	214.6	121.0 / 86.0
224	22362.0	491.0	215.1	128.0 / 12.0
Lumber River				
6500	649950.0	8765.0	208.2	268.0 / 574.0
7205	720469.0	8610.0	238.3	258.0 / 257.0
7226	722602.0	8688.0	241.2	58.0 / 202.0
7227	722693.0	8688.0	242.9	57.0 / 200.0
7236	723560.0	8688.0	243.9	43.0 / 619.0
7265	726501.0	8688.0	244.2	677.0 / 653.0
7300	730033.0	8688.0	244.5	1035.0 / 743.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Lumber River				
7345	734487.0	8567.0	245.5	1014.0 / 116.0
7383	738330.0	8503.0	246.7	279.0 / 872.0
7409	740933.0	8503.0	247.6	808.0 / 332.0
7431	743103.0	8503.0	248.6	1089.0 / 157.0
7461	746129.0	8503.0	249.6	1089.0 / 274.0
7493	749271.0	8503.0	250.9	439.0 / 461.0
7529	752945.0	8503.0	253.6	252.0 / 556.0
7556	755635.0	8503.0	255.1	902.0 / 45.0
7584	758351.0	8460.0	256.7	36.0 / 881.0
7605	760535.0	8460.0	257.9	509.0 / 570.0
7632	763214.0	8460.0	259.0	753.0 / 293.0
7645	764459.0	8355.0	259.9	109.0 / 99.0
7647	764705.0	8355.0	261.3	127.0 / 115.0
7683	768266.0	8355.0	263.5	218.0 / 468.0
7754	775443.0	8320.0	265.6	474.0 / 96.0
Shoe Heel Creek				
870	87034.7	3079.0	164.7	711.0 / 718.0
875	87466.9	3079.0	165.1	106.0 / 109.0
876	87571.7	3079.0	165.9	107.0 / 108.0
878	87763.3	3079.0	166.0	635.0 / 727.0
879	87896.7	3079.0	166.0	107.0 / 108.0
881	88071.6	3079.0	166.3	108.0 / 108.0
884	88425.3	3079.0	166.9	672.0 / 756.0
897	89661.2	3079.0	167.0	248.0 / 1820.0
907	90699.0	3072.8	167.2	265.0 / 1377.0
920	91997.2	3072.8	167.3	384.0 / 1034.0
933	93312.8	3072.8	167.6	595.0 / 704.0
947	94684.5	3072.8	167.8	422.0 / 731.0
959	95934.2	3072.8	168.0	754.0 / 761.0
968	96798.7	3072.8	168.2	827.0 / 676.0
977	97716.1	3072.8	168.5	1048.0 / 240.0
984	98437.7	3072.8	169.1	89.0 / 89.0
986	98622.5	3072.8	170.7	89.0 / 89.0
988	98802.2	3072.8	171.3	89.0 / 89.0
994	99380.7	3072.8	171.7	350.0 / 819.0
1013	101284.0	3072.8	171.9	1077.0 / 253.0
1021	102080.0	3024.2	172.1	748.0 / 263.0
1024	102421.0	3024.2	172.2	547.0 / 291.0
1026	102588.3	3024.2	173.1	547.0 / 291.0
1029	102892.0	3024.2	173.2	678.0 / 464.0
1033	103298.2	3024.2	173.3	152.0 / 152.0
1036	103612.0	3024.2	173.8	152.0 / 152.0
1043	104274.0	3024.2	174.0	1002.0 / 449.0
1052	105211.7	3024.2	174.1	1161.0 / 162.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Shoe Heel Creek				
1065	106491.9	2982.3	174.3	1175.0 / 63.0
1074	107407.7	2982.3	174.5	1195.0 / 35.0
1083	108298.1	2982.3	174.8	741.0 / 35.0
1095	109541.0	2982.3	175.4	851.0 / 377.0
1105	110514.8	2982.3	175.6	883.0 / 492.0
1111	111068.2	2982.3	175.9	635.0 / 565.0
1121	112135.8	2982.3	176.3	651.0 / 414.0
1129	112924.3	2982.3	176.9	715.0 / 188.0
1150	114956.7	2982.3	178.1	1162.0 / 36.0
1157	115684.9	2982.3	178.3	944.0 / 256.0
1213	121334.2	2982.0	181.6	654.0 / 254.0
1229	122910.2	1261.0	183.1	23.0 / 456.0
1240	123960.0	1261.0	183.7	23.0 / 362.0
1252	125153.4	1261.0	185.7	24.0 / 23.0
1254	125379.1	1230.0	186.5	23.0 / 23.0
1260	125979.4	1230.0	187.0	816.0 / 25.0
1272	127208.6	1230.0	187.6	143.0 / 57.0
1278	127803.2	1230.0	188.2	712.0 / 27.0
1285	128531.9	1230.0	189.0	173.0 / 24.0
1293	129327.2	1230.0	190.1	401.0 / 24.0
1302	130155.9	1230.0	190.9	327.0 / 24.0
1310	131030.5	1190.0	191.8	144.0 / 60.0
1320	131956.5	1190.0	193.0	26.0 / 176.0
1322	132228.2	1190.0	193.6	23.0 / 23.0
1324	132378.2	1190.0	194.1	23.0 / 23.0
1324	132431.7	1190.0	194.3	117.0 / 25.0
1325	132540.5	1190.0	201.4	* 2
1328	132814.8	1190.0	201.4	* 2
1333	133332.5	1190.0	201.4	* 2
1340	134024.9	1190.0	201.4	* 2
1348	134761.7	1190.0	201.4	* 2
1354	135398.4	1190.0	201.4	* 2
1361	136092.1	1190.0	201.5	* 2
1366	136601.3	1146.0	201.5	* 2
1372	137223.0	1146.0	201.5	* 2
1380	138037.8	1146.0	201.6	354.0 / 23.0
1386	138612.1	1146.0	201.8	385.0 / 23.0
1392	139186.2	1146.0	202.0	191.0 / 166.0
1403	140253.4	1146.0	202.7	110.0 / 98.0
1410	140955.4	1146.0	203.5	65.0 / 107.0
1416	141600.7	1146.0	204.2	23.0 / 135.0
1422	142236.6	1146.0	205.0	185.0 / 121.0
1427	142677.7	1146.0	205.5	27.0 / 27.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Shoe Heel Creek				
1428	142827.8	1108.0	206.6	27.0 / 27.0
1433	143298.5	1108.0	207.2	81.0 / 265.0
1441	144097.7	1108.0	207.4	256.0 / 483.0
1455	145540.2	1108.0	207.6	342.0 / 168.0
1466	146622.0	1108.0	207.9	376.0 / 33.0
1472	147209.2	1108.0	208.2	140.0 / 175.0
1481	148134.7	1108.0	209.1	24.0 / 202.0
1490	148986.4	1108.0	209.7	199.0 / 234.0
1500	150026.4	1108.0	210.4	152.0 / 57.0
1508	150788.3	1108.0	211.5	23.0 / 464.0
1516	151558.6	1108.0	212.2	109.0 / 571.0
1518	151831.5	587.0	212.3	23.0 / 464.0
1520	151961.8	587.0	212.4	24.0 / 464.0
1523	152256.2	587.0	212.6	23.0 / 265.0
1525	152541.5	587.0	212.7	23.0 / 23.0
1530	153011.5	587.0	213.2	24.0 / 24.0
1533	153348.5	587.0	213.5	24.0 / 24.0
1540	154009.1	587.0	214.2	23.0 / 23.0
1545	154482.3	587.0	215.1	25.0 / 25.0
1551	155132.2	587.0	216.3	23.0 / 23.0
1556	155587.7	587.0	217.1	24.0 / 24.0
1562	156183.8	587.0	218.0	24.0 / 24.0
1568	156829.5	587.0	218.6	59.0 / 109.0
1573	157328.9	587.0	218.8	45.0 / 122.0
1581	158108.1	544.0	219.5	23.0 / 68.0
1586	158599.4	544.0	220.2	23.0 / 47.0
1589	158907.5	544.0	220.8	26.0 / 26.0
1590	159008.4	544.0	221.3	24.0 / 24.0
1592	159171.4	544.0	221.6	33.0 / 71.0
1594	159428.8	544.0	221.9	23.0 / 53.0
1598	159754.9	544.0	222.3	25.0 / 25.0
1598	159823.4	544.0	229.2	* 2
1603	160264.4	544.0	229.2	* 2
1606	160625.9	544.0	229.3	* 2
1610	161040.2	544.0	229.3	314.0 / 288.0
1617	161695.4	544.0	229.4	108.0 / 182.0
1623	162286.4	544.0	229.6	190.0 / 108.0
1629	162882.0	544.0	229.9	219.0 / 22.0
1635	163539.2	544.0	230.4	165.0 / 48.0
1636	163636.3	544.0	232.1	165.0 / 48.0
1640	163994.2	544.0	232.1	222.0 / 139.0
1646	164619.5	544.0	232.5	70.0 / 23.0
1653	165349.2	544.0	233.5	23.0 / 23.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Shoe Heel Creek				
1659	165939.1	544.0	234.3	97.0 / 111.0
1663	166349.2	544.0	235.1	25.0 / 25.0
1669	166859.0	544.0	236.6	77.0 / 91.0
1671	167112.0	544.0	237.0	24.0 / 24.0
1674	167390.9	345.0	241.5	* 2
1675	167513.0	345.0	241.6	* 2
1680	167999.0	345.0	241.8	* 2
1683	168277.4	345.0	242.0	* 2
1688	168824.7	345.0	242.3	* 2
1693	169252.4	345.0	242.7	24.0 / 24.0
1698	169791.7	345.0	243.4	24.0 / 24.0
1702	170178.5	345.0	244.0	24.0 / 35.0
1706	170590.4	345.0	244.4	23.0 / 23.0
1714	171365.3	345.0	246.0	153.0 / 24.0
1720	172035.4	345.0	248.6	24.0 / 155.0
1729	172863.0	345.0	250.5	85.0 / 110.0
1733	173311.5	345.0	251.5	51.0 / 152.0
1738	173829.2	345.0	253.2	23.0 / 23.0
1743	174274.1	345.0	255.4	23.0 / 209.0
1747	174723.4	345.0	256.5	24.0 / 450.0
1752	175171.7	345.0	258.0	195.0 / 25.0
1757	175688.0	345.0	259.0	233.0 / 25.0
Steer Branch				
015	1484.0	307.0	144.4	149.0 / 9.0
033	3251.0	307.0	150.4	128.0 / 7.0
041	4095.0	307.0	153.3	59.0 / 74.0
045	4549.0	280.0	155.6	8.0 / 8.0
048	4813.0	280.0	159.7	8.0 / 8.0
051	5076.0	280.0	159.8	8.0 / 119.0
058	5769.0	280.0	159.8	91.0 / 36.0
071	7139.0	280.0	162.3	10.0 / 16.0
084	8447.0	251.0	169.3	61.0 / 22.0
Towers Fork				
016	1580.0	700.0	306.9	25.0 / 25.0
018	1822.0	700.0	308.9	25.0 / 25.0
031	3139.0	640.0	310.0	41.0 / 37.0
038	3804.0	640.0	310.1	46.0 / 46.0
044	4402.0	545.0	310.3	23.0 / 23.0
048	4792.0	545.0	312.5	31.0 / 31.0
054	5398.0	545.0	314.1	46.0 / 26.0
058	5750.0	545.0	314.6	50.0 / 43.0
062	6221.0	545.0	315.4	23.0 / 23.0
065	6483.0	545.0	317.8	23.0 / 23.0
067	6704.0	545.0	318.4	38.0 / 38.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Unnamed Tributary to Gum Swamp Creek				
001	90.0	310.0	166.6'	15.0 / 32.0
004	372.0	310.0	166.6'	13.0 / 14.0
007	659.0	310.0	166.6'	15.0 / 15.0
008	840.0	310.0	166.6'	13.0 / 16.0
010	1049.0	310.0	166.6'	4.0 / 4.0
011	1092.0	310.0	174.1	244.0 / 244.0
014	1359.0	310.0	174.1	232.0 / 233.0
017	1700.0	310.0	174.1	281.0 / 286.0
021	2096.0	310.0	174.1	144.0 / 136.0
025	2474.0	310.0	174.1	149.0 / 149.0
028	2763.0	310.0	174.1	54.0 / 55.0
030	3032.0	310.0	174.1	51.0 / 51.0
032	3238.0	310.0	174.1	47.0 / 48.0
033	3342.0	310.0	178.3	29.0 / 69.0
034	3440.0	310.0	178.3	49.0 / 116.0
036	3644.0	310.0	178.3	128.0 / 109.0
038	3762.0	310.0	186.2	287.0 / 288.0
041	4066.0	310.0	186.2	255.0 / 255.0
044	4372.0	310.0	186.2	139.0 / 139.0
047	4681.0	310.0	186.2	130.0 / 130.0
049	4891.0	310.0	186.2	183.0 / 183.0
052	5173.0	310.0	186.2	157.0 / 157.0
053	5337.0	310.0	186.2	114.0 / 114.0
054	5407.0	310.0	186.5	114.0 / 114.0
056	5644.0	310.0	186.5	121.0 / 120.0
059	5861.0	310.0	186.5	156.0 / 156.0
061	6116.0	230.0	186.5	178.0 / 177.0
063	6340.0	230.0	186.5	112.0 / 112.0
066	6578.0	230.0	186.5	111.0 / 111.0
069	6861.0	230.0	186.5	52.0 / 8.0
070	7016.0	230.0	186.6	61.0 / 8.0
071	7143.0	230.0	186.6	85.0 / 21.0
073	7282.0	230.0	186.6	49.0 / 15.0
076	7587.0	230.0	186.8	15.0 / 15.0
079	7948.0	230.0	187.8	28.0 / 14.0
080	8027.0	230.0	187.8	28.0 / 14.0
084	8384.0	230.0	188.5	36.0 / 48.0
086	8554.0	230.0	190.1	16.0 / 38.0
088	8751.0	230.0	191.2	19.0 / 38.0
090	9002.0	230.0	191.5	15.0 / 16.0
093	9318.0	230.0	192.4	15.0 / 16.0
094	9428.0	230.0	192.8	16.0 / 16.0
097	9661.0	230.0	194.3	19.0 / 19.0
098	9820.0	230.0	195.1	17.0 / 16.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Unnamed Tributary to Gum Swamp Creek				
100	9998.0	230.0	197.1	15.0 / 15.0
102	10184.0	230.0	197.5	16.0 / 26.0
103	10334.0	230.0	197.5	30.0 / 42.0
106	10645.0	230.0	197.6	53.0 / 15.0
108	10829.0	230.0	197.6	15.0 / 25.0
111	11051.0	230.0	197.7	15.0 / 27.0
115	11452.0	230.0	197.8	59.0 / 59.0
117	11679.0	230.0	197.8	71.0 / 71.0
120	11975.0	230.0	199.9	11.0 / 10.0
122	12225.0	230.0	201.8	22.0 / 21.0
126	12565.0	230.0	202.1	33.0 / 17.0
129	12876.0	150.0	202.4	19.0 / 21.0
132	13198.0	150.0	203.8	15.0 / 15.0
133	13298.0	150.0	204.1	7.0 / 32.0
135	13459.0	150.0	205.1	19.0 / 15.0
135	13538.0	150.0	205.2	42.0 / 15.0
138	13756.0	150.0	205.5	16.0 / 15.0
140	14000.0	150.0	206.5	17.0 / 15.0
142	14238.0	150.0	207.4	22.0 / 15.0
145	14461.0	150.0	208.3	15.0 / 17.0
146	14568.0	150.0	209.3	5.0 / 6.0
147	14652.0	150.0	217.1	17.0 / 15.0
147	14687.0	150.0	217.2	58.0 / 87.0
148	14753.0	150.0	217.2	132.0 / 59.0
Upper Beaverdam Creek				
005	473.0	666.0	210.4	* 2
011	1056.0	666.0	210.4	* 2
016	1626.0	666.0	210.4	* 2
018	1843.0	666.0	210.4	* 2
023	2310.0	666.0	210.4	* 2
028	2758.0	666.0	210.5	208.0 / 84.0
034	3373.0	666.0	210.5	243.0 / 471.0
045	4504.0	666.0	210.8	394.0 / 9.0
053	5290.0	666.0	212.6	23.0 / 268.0
058	5756.0	666.0	213.5	10.0 / 106.0
063	6319.0	666.0	214.9	164.0 / 31.0
070	7014.0	666.0	215.7	349.0 / 10.0
087	8706.0	666.0	218.3	38.0 / 273.0
097	9705.0	666.0	220.7	243.0 / 36.0
103	10291.0	666.0	222.2	163.0 / 11.0
108	10796.0	666.0	223.0	294.0 / 137.0
114	11379.0	559.0	223.8	280.0 / 37.0
116	11574.0	559.0	224.7	280.0 / 37.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Upper Beaverdam Creek				
121	12095.0	559.0	225.0	68.0 / 92.0
124	12369.0	559.0	225.1	11.0 / 86.0
Water Creek				
023	2263.0	421.0	155.9	36.0 / 52.0
024	2360.0	421.0	160.8	36.0 / 52.0
026	2638.0	421.0	160.9	93.0 / 94.0
030	3031.0	421.0	161.0	103.0 / 106.0
032	3154.0	421.0	161.1	67.0 / 95.0
035	3461.0	421.0	161.3	51.0 / 146.0
038	3841.0	421.0	161.7	106.0 / 57.0
043	4324.0	406.0	162.5	119.0 / 40.0
048	4839.0	406.0	164.6	35.0 / 89.0
051	5111.0	406.0	165.8	10.0 / 81.0
054	5398.0	406.0	166.5	129.0 / 7.0
058	5773.0	406.0	168.4	8.0 / 86.0
061	6149.0	406.0	169.0	22.0 / 53.0
065	6463.0	406.0	169.2	109.0 / 62.0
070	7027.0	406.0	170.0	102.0 / 59.0
073	7347.0	406.0	170.6	185.0 / 36.0
077	7686.0	406.0	171.3	156.0 / 36.0
081	8056.0	406.0	171.9	110.0 / 21.0
084	8400.0	406.0	173.1	189.0 / 8.0
088	8803.0	406.0	175.4	7.0 / 39.0
093	9285.0	300.0	176.2	155.0 / 7.0
096	9608.0	300.0	176.8	104.0 / 19.0
100	9967.0	300.0	178.4	7.0 / 158.0
104	10399.0	300.0	179.2	102.0 / 100.0
110	10974.0	300.0	179.5	157.0 / 21.0
117	11710.0	280.0	181.0	31.0 / 24.0
118	11835.0	280.0	182.6	29.0 / 21.0
124	12433.0	280.0	183.8	41.0 / 46.0
128	12753.0	280.0	184.1	63.0 / 57.0
130	13030.0	280.0	184.5	46.0 / 53.0
136	13572.0	280.0	185.4	44.0 / 16.0
140	14038.0	280.0	186.9	35.0 / 25.0
143	14267.0	280.0	187.0	46.0 / 29.0
149	14907.0	280.0	187.3	43.0 / 37.0
153	15326.0	280.0	188.4	16.0 / 121.0
157	15743.0	280.0	189.6	55.0 / 35.0
161	16083.0	280.0	190.6	17.0 / 75.0
162	16203.0	280.0	192.6	17.0 / 75.0
167	16694.0	280.0	192.7	41.0 / 38.0
171	17109.0	230.0	193.0	27.0 / 25.0
173	17306.0	230.0	194.4	27.0 / 25.0
177	17714.0	230.0	194.5	21.0 / 48.0

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Water Creek				
183	18295.0	230.0	195.5	16.0 / 16.0
190	19032.0	230.0	198.4	61.0 / 44.0
196	19617.0	230.0	199.3	32.0 / 16.0
199	19911.0	230.0	199.9	34.0 / 36.0
205	20501.0	230.0	201.1	16.0 / 58.0
208	20761.0	230.0	201.3	36.0 / 25.0
211	21098.0	140.0	201.4	16.0 / 22.0
214	21422.0	140.0	201.7	24.0 / 16.0
217	21736.0	140.0	202.1	25.0 / 20.0
219	21939.0	140.0	202.3	16.0 / 16.0
223	22313.0	140.0	202.7	39.0 / 9.0
226	22584.0	140.0	203.9	40.0 / 9.0
229	22930.0	140.0	203.9	16.0 / 16.0
231	23069.0	140.0	204.3	13.0 / 17.0
235	23501.0	140.0	206.0	16.0 / 16.0
238	23828.0	140.0	206.3	13.0 / 22.0
244	24350.0	140.0	207.0	16.0 / 16.0

¹Elevation includes backwater effects

²Floodway not computed

5.3 Coastal Analyses

This section is not applicable to this FIS project. Table 18 “Summary of Coastal Analyses”, Table 19 “Tide Gage Analysis Specifics” and Table 20 “Coastal Transect Parameters” do not apply to Scotland County.

6.0 Mapping Methods

6.1 Vertical and Horizontal Control

Vertical Datum

All FISs 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. With the finalization of the North American Vertical Datum of 1988 (NAVD 88), all North Carolina FISs have been prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown on the FIRM for Scotland County are referenced to NAVD 88. Structure and ground elevations in the county must, therefore, be referenced to NAVD 88. It is important to note that FISs for adjacent communities in neighboring states may be referenced to NGVD 29. This may result in BFE differences across political boundaries between the communities.

As noted above, the elevations shown in this FIS are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor. The conversion factor for Scotland County is # feet. The locations used to establish the conversion factor were USGS quadrangle corners that fell within the county, as well as those that were within 2.5 miles outside the county. The benchmarks are referenced to NAVD 88. Table 21, "Datum Conversion Locations and Values," is shown below.

Table 21, "Datum Conversion Locations and Values."

Table 21 - Datum Conversion Locations and Values

Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
35.00	-79.50	-0.81
35.00	-79.50	-0.81
34.88	-79.50	-0.86
34.88	-79.50	-0.86
34.87	-79.38	-0.87
34.87	-79.38	-0.87
34.75	-79.63	-0.94
34.75	-79.50	-0.93
34.75	-79.50	-0.93
34.75	-79.37	-0.92
34.75	-79.37	-0.92
34.62	-79.50	-0.97
Average conversion in Scotland County from NGVD 29 to NAVD 88 = -0.89 feet		

The vertical datum conversion factor for all flooding sources which run along a county boundary are in accordance with the conversion factor used in those contiguous counties.

BFEs shown on the FIRM represent whole-foot rounded values. For example, a 1% annual chance water-surface elevation of 102.4 feet will appear as 102 on the FIRM and 102.6 feet will appear as 103. Therefore, users who wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and/or Water-surface elevation rasters and supporting data tables in the FIS Report, which are shown, at a minimum, to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (<http://www.ngs.noaa.gov>).

Vertical Control Monuments

Qualifying bench marks within Scotland County that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical, with a vertical stability classification of A, B, or C, are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier (PID).

The National Geodetic Survey establishes precisely located monuments on the North Carolina Grid System and Bench

Marks referenced to a vertical datum (NGVD 1929 and NAVD 1988).

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

Monuments with a Stability D classification may be used as Elevation Reference Marks (ERMs) when a Stability C or better monument is not an option. These ERMs must be approved by NCGS and can be set and used as elevation bench marks to establish vertical control and produce NC DFIRMs. Including such ERMs will greatly augment North Carolina's useable vertical control network.

In addition, when local jurisdictions have established their own vertical monument network, these monuments may also be shown on the FIRM with the appropriate designations. Local monuments will be placed on the FIRM if the community has requested that they be included and if the monuments meet the aforementioned criteria.

North Carolina Geodetic Survey (NCGS) and contractor surveyed vertical control monuments will be shown on the FIRM panels. Those cataloged by NCGS meet similar requirements to the NGS monuments as described above. Most monuments that have been cataloged by NCGS have been established to NGS standards, but have not been submitted to NGS for inclusion into the NSRS. The qualifying criteria for depicting bench marks established by the State's contractors on the new digital FIRM panels include:

- GPS surveying of permanent 3-D survey monuments to 5-centimeter or better local network accuracy guidelines, in accordance with NOAA Technical Memorandum NOS NGS-58 "Guidelines for Establishing GPS-Derived Ellipsoid Heights (Standards: 2 cm and 5 cm)," and conversion to NAVD 88 orthometric heights using NGS' latest geoid mode;
- Requiring a stability classification of "C" or better; and
- Submitting GPS files and station descriptions to NCGS.

To obtain current information for cataloging local bench marks in the NSRS, please visit the Data Sheet page of the NGS website at <http://www.ngs.noaa.gov/cgi-bin/datasheet.prl>, or contact the NGS Information Services Branch at:

**NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-32822
(301) 713-3242**

Information regarding the NCGS or State contractor bench marks can be obtained through the NCGS website at www.ncgs.state.nc.us, or by phone at (919) 733-3836.

It is important to note that temporary vertical monuments, sometimes called Elevation Reference Marks, 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, interested individuals may contact FEMA to access this information.

Horizontal Datum and Control

The digital files that comprise the FIRM are georeferenced to an established coordinate system. The coordinate system used for the production of this FIRM is North Carolina State Plane (FIPSZONE 3200) referenced to the North American Datum of 1983 (NAD83), GRS80 ellipsoid.

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.

The projection used in the preparation of this map was the North Carolina State Plane Coordinate System. The horizontal datum was NAD83, GRS80 spheroid. Differences in datum, spheroid, or projection used in the production of FIRMs for adjacent states may result in slight positional differences in map features across the state boundary. These differences do not affect the accuracy of this FIRM.

As part of the North Carolina CTS Initiative, North Carolina digital FIRM panel numbers are consistent with the North Carolina Land Records Management Program (LRMP).

The 11-digit digital FIRM panel numbering system for North Carolina is: SS MM LLLL PP X, where SS = State Federal Information Processing Code (37); MM = Easting-Northing (EN) 1,000,000-foot coordinates; LLLL = LRMP map numbers to include the EN 100,000-foot coordinates, and the EN 10,000-foot coordinates; PP = place holders for additional EN 1,000-foot coordinates; and X = suffix ("J" for the initial edition). North Carolina's State Plane Coordinate System origin is outside the State boundary to the southwest (in Georgia), the eastings range from approximately 0,404,000 (Tennessee border) to 3,040,000 (Atlantic Ocean); and the northings range from approximately 0,045,000 (South Carolina border) to 1,043,000 (Virginia border). Digital FIRM panels were compiled at either 1"=1,000', covering an area of 20,000 feet x 20,000 feet (20" x 20" panels); or at 1"=500', covering an area of 10,000 feet x 10,000 feet (20" x 20" panels). An additional 2 digits (both zeros) are held in reserve as a "place holder" in the event that future FIRMs are printed at a larger scale; e.g., 1"=250', covering an area of 5,000 feet x 5,000 feet for which the 1,000-foot coordinates would either be 0 or 5.

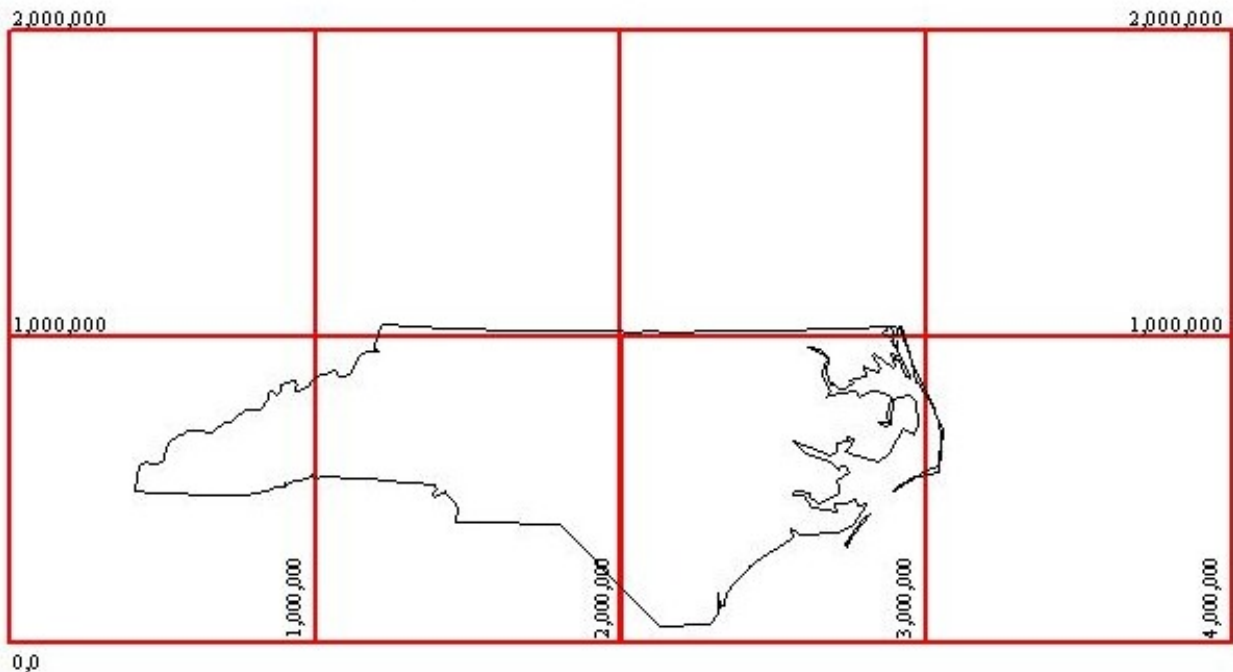


Figure 3 - North Carolina's State Plane Coordinate System

6.3 Floodplain and Floodway Delineation

Floodplain Boundaries

For streams restudied by detailed and limited detailed methods, the 1% and 0.2% annual chance floodplains were delineated using flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic data acquired using airborne Light Detection and Ranging (LIDAR).

The topographic data satisfies a vertical root-mean-square error (RMSE) accuracy standard of 20 cm (1.3 feet accuracy at the 95% confidence limit) for the Outer Banks and 25 cm (1.6 feet accuracy at the 95% confidence limit) for those portions of the basin lying west of the Outer Banks. These data could be contoured at roughly a 2-foot vertical contour interval. All elevations were referenced to the NAVD 88 and reflect orthometric heights. Variably spaced, bare-earth digital topographic data in ASCII point file format were combined with imagery (either flown concurrently with the LIDAR data or using existing digital orthophotos) to establish a Triangulated Irregular Network (TIN) of digital elevation points, which include selected breaklines to be used for hydraulic modeling. Furthermore, a uniformly spaced sampling of the TIN resulted in uniformly spaced Digital Elevation Models (DEMs), with 20 ft x 20 ft post spacing, which was generated in multiple file formats.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones VE, AO, AH, A99, AR, A, and AE), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundaries have been shown.

Floodway Delineation

The floodways presented in this FIS 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. The results of the floodway computations are tabulated for selected cross sections (Table 22, "Floodway Data"). The computed floodway is shown on the FIRM. In cases where the floodway and 1% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown. In areas where the top of the bridge or road is higher than the 1.0-percent annual chance (100-year) flood, the FIRM will show the flood discharge as contained within the structure for emergency management purposes. It is important to note that FEMA and community floodway regulations still apply in and around those areas.

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
Crooked Creek								
007	663	54.0	132.0	3.0	225.9	225.9	226.2	0.3
018	1,792	52.0	162.0	2.4	228.8	228.8	229.8	1.0
027	2,706	43.0	119.0	2.8	232.5	232.5	232.9	0.4
036	3,613	80.0	142.0	2.3	233.8	233.8	234.4	0.6
049	4,895	72.0	154.0	2.1	237.1	237.1	238.0	0.9
056	5,551	47.0	101.0	3.3	239.1	239.1	240.1	1.0
Gum Swamp Creek								
003	335	5842.0 ¹	4664.0	0.9	148.9	148.9	149.8	0.9
008	828	636.0	5047.0	0.8	149.0	149.0	149.9	0.9
017	1,738	725.0	5183.0	0.8	149.2	149.2	150.1	0.9
032	3,212	636.0	4259.0	1.0	149.5	149.5	150.5	1.0
056	5,609	428.0	3314.0	1.3	150.5	150.5	151.5	1.0
066	6,623	650.0	4795.0	0.9	150.9	150.9	151.9	1.0
083	8,286	499.0	3494.0	1.2	151.5	151.5	152.4	0.9
106	10,595	532.0	3813.0	1.1	152.4	152.4	153.3	0.9
107	10,727	559.0	3899.0	1.1	152.7	152.7	153.5	0.8

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
114	11,356	770.0	5538.0	0.8	152.9	152.9	153.8	0.9
Gum Swamp Creek								
124	12,438	743.0	4951.0	0.8	153.2	153.2	154.1	0.9
143	14,321	636.0	4340.0	0.9	153.8	153.8	154.8	1.0
163	16,312	511.0	2956.0	1.4	154.7	154.7	155.7	1.0
192	19,190	519.0	3162.0	1.3	156.3	156.3	157.1	0.8
223	22,285	561.0	4173.0	1.0	158.0	158.0	158.6	0.6
239	23,931	598.0	4283.0	1.0	158.6	158.6	159.3	0.7
254	25,382	781.0	4401.0	0.9	159.0	159.0	159.7	0.7
255	25,545	781.0	3906.0	1.1	159.9	159.9	160.3	0.4
264	26,409	618.0	4643.0	0.9	160.3	160.3	160.6	0.3
284	28,365	383.0	2985.0	1.3	160.7	160.7	161.2	0.5
298	29,808	499.0	3753.0	1.1	161.2	161.2	161.8	0.6
315	31,454	479.0	3057.0	1.3	161.6	161.6	162.5	0.9
317	31,728	479.0	3578.0	1.1	162.3	162.3	162.8	0.5
321	32,108	409.0	3097.0	1.3	162.5	162.5	163.0	0.5
330	32,960	714.0	4428.0	0.9	162.8	162.8	163.4	0.6
358	35,766	707.0	4590.0	0.9	163.5	163.5	164.3	0.8
383	38,305	583.0	3949.0	1.0	164.2	164.2	165.0	0.8
416	41,608	575.0	3710.0	1.1	165.4	165.4	166.3	0.9
439	43,914	595.0	3922.0	1.0	166.3	166.3	167.3	1.0
475	47,470	558.0	3762.0	1.1	167.7	167.7	168.7	1.0
492	49,156	592.0	3457.0	1.1	168.5	168.5	169.5	1.0
501	50,142	832.0	2931.0	1.3	169.5	169.5	170.3	0.8
503	50,322	900.0	10062.0	0.4	177.8	177.8	178.3	0.5
511	51,114	993.0	11406.0	0.3	177.8	177.8	178.3	0.5
525	52,474	1059.0	11009.0	0.3	177.9	177.9	178.3	0.4
547	54,742	750.0	7146.0	0.5	177.9	177.9	178.4	0.5
567	56,749	900.0	7589.0	0.5	178.0	178.0	178.6	0.6
584	58,393	601.0	4420.0	0.9	178.2	178.2	178.9	0.7
611	61,128	483.0	3697.0	1.0	179.1	179.1	179.9	0.8
627	62,653	625.0	4708.0	0.8	179.7	179.7	180.5	0.8
639	63,919	951.0	6611.0	0.6	180.0	180.0	180.9	0.9
660	66,036	475.0	2979.0	1.0	180.5	180.5	181.4	0.9
677	67,679	276.0	1838.0	1.5	181.5	181.5	182.4	0.9
693	69,325	521.0	2986.0	0.9	182.2	182.2	183.2	1.0
701	70,080	444.0	2682.0	1.1	182.5	182.5	183.5	1.0
711	71,086	270.0	1587.0	1.8	183.1	183.1	184.0	0.9
721	72,133	115.0	850.0	3.3	184.3	184.3	185.2	0.9
723	72,289	115.0	925.0	3.1	184.9	184.9	185.8	0.9
726	72,552	260.0	1535.0	1.8	185.5	185.5	186.3	0.8
733	73,281	542.0	2961.0	1.0	185.9	185.9	186.7	0.8
752	75,203	460.0	2284.0	1.2	186.7	186.7	187.6	0.9
774	77,364	559.0	2313.0	1.1	188.1	188.1	188.9	0.8

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
782	78,242	333.0	1662.0	1.5	188.8	188.8	189.6	0.8
Leith Creek								
637	63,676	722.0	2511.0	0.9	176.3	176.3	177.2	0.9
652	65,226	506.0	2042.0	1.1	178.6	178.6	178.8	0.2
656	65,621	411.0	1759.0	1.3	178.6	178.6	179.3	0.7
657	65,733	411.0	3754.0	0.6	186.0	186.0	186.0	0.0
661	66,060	277.0	2545.0	0.9	186.1	186.1	186.1	0.0
667	66,727	177.0	1810.0	2.0	186.2	186.2	186.3	0.1
668	66,823	164.0	1900.0	1.8	186.2	186.2	186.4	0.2
670	66,968	177.0	2088.0	1.8	186.2	186.2	186.5	0.3
685	68,520	383.0	3475.0	0.7	186.6	186.6	186.9	0.3
696	69,597	345.0	2517.0	0.8	186.8	186.8	187.2	0.4
706	70,561	378.0	1401.0	1.5	187.5	187.5	187.9	0.4
707	70,680	378.0	1771.0	1.2	187.6	187.6	188.0	0.4
719	71,936	430.0	2525.0	0.8	187.8	187.8	188.7	0.9
731	73,135	486.0	2134.0	1.0	188.2	188.2	189.2	1.0
732	73,217	486.0	2499.0	0.8	189.2	189.2	190.0	0.8
736	73,621	296.0	1488.0	1.4	189.5	189.5	190.3	0.8
738	73,813	306.0	1592.0	1.3	189.9	189.9	190.8	0.9
740	73,989	217.0	1538.0	1.3	191.5	191.5	192.4	0.9
744	74,442	241.0	1821.0	1.1	192.2	192.2	192.6	0.4
754	75,362	259.0	1858.0	1.1	192.3	192.3	193.0	0.7
767	76,715	159.0	1231.0	1.7	192.7	192.7	193.7	1.0
776	77,634	169.0	1185.0	1.7	193.5	193.5	194.3	0.8
779	77,940	61.0	500.0	4.1	193.7	193.7	194.5	0.8
781	78,066	61.0	567.0	3.6	194.7	194.7	195.6	0.9
784	78,351	306.0	1611.0	1.1	195.2	195.2	196.0	0.8
786	78,613	343.0	1652.0	1.1	195.3	195.3	196.1	0.8
789	78,870	343.0	2996.0	0.6	199.3	199.3	200.0	0.7
791	79,137	209.0	1841.0	1.0	199.3	199.3	200.1	0.8
795	79,526	210.0	1189.0	1.5	199.4	199.4	200.2	0.8
797	79,660	210.0	1892.0	1.8	199.8	199.8	200.6	0.8
800	80,014	210.0	1467.0	1.2	199.9	199.9	200.7	0.8
803	80,320	196.0	1394.0	1.3	200.0	200.0	200.8	0.8
804	80,430	196.0	1167.0	1.5	200.0	200.0	200.8	0.8
811	81,109	211.0	1695.0	1.0	200.2	200.2	201.1	0.9
817	81,700	211.0	1258.0	1.4	200.3	200.3	201.3	1.0
822	82,227	161.0	679.0	2.6	200.8	200.8	201.6	0.8
823	82,313	161.0	1186.0	1.5	201.9	201.9	202.7	0.8
827	82,672	139.0	1070.0	1.7	202.0	202.0	202.8	0.8
832	83,240	122.0	985.0	1.5	202.2	202.2	203.0	0.8
838	83,761	97.0	768.0	1.9	202.3	202.3	203.3	1.0
839	83,933	97.0	876.0	1.7	203.8	203.8	204.6	0.8
842	84,173	146.0	1134.0	1.3	203.9	203.9	204.7	0.8
844	84,428	180.0	1269.0	1.1	203.9	203.9	204.8	0.9

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
846	84,594	180.0	1366.0	1.1	204.4	204.4	205.3	0.9
Leith Creek								
850	85,000	180.0	1180.0	1.2	204.5	204.5	205.4	0.9
859	85,931	179.0	803.0	0.8	204.9	204.9	205.9	1.0
871	87,059	173.0	691.0	0.9	205.5	205.5	206.5	1.0
882	88,157	53.0	245.0	4.3	207.3	207.3	207.8	0.5
883	88,343	47.0	292.0	2.2	208.2	208.2	208.5	0.3
884	88,422	50.0	287.0	2.9	208.4	208.4	208.7	0.3
889	88,883	164.0	591.0	1.1	209.1	209.1	209.5	0.4
902	90,184	168.0	397.0	1.2	210.6	210.6	211.5	0.9
912	91,184	113.0	376.0	1.3	212.9	212.9	213.8	0.9
919	91,867	96.0	360.0	1.4	214.4	214.4	215.0	0.6
Little Creek								
010	969	50.0	115.0	3.6	186.6 ²	181.5	181.6	0.1
027	2,695	169.0	444.0	0.9	186.6 ²	183.9	184.5	0.6
035	3,481	201.0	613.0	0.7	186.6 ²	184.3	185.1	0.8
043	4,329	96.0	369.0	1.0	188.5	188.5	188.5	0.0
050	5,046	204.0	366.0	1.0	188.8	188.8	189.1	0.3
059	5,858	207.0	681.0	0.5	188.9	188.9	189.4	0.5
068	6,826	75.0	84.0	4.2	189.9	189.9	190.1	0.2
077	7,659	246.0	937.0	0.4	195.2	195.2	195.6	0.4
088	8,820	150.0	212.0	1.7	195.4	195.4	195.9	0.5
102	10,242	79.0	211.0	1.7	197.4	197.4	198.0	0.6
112	11,209	39.0	92.0	3.3	201.8	201.8	202.4	0.6
124	12,412	55.0	183.0	1.6	203.9	203.9	204.7	0.8
131	13,076	199.0	1537.0	0.2	209.9	209.9	210.4	0.5
135	13,490	200.0	1251.0	0.2	209.9	209.9	210.4	0.5
143	14,269	158.0	536.0	0.6	209.9	209.9	210.4	0.5
150	14,953	126.0	413.0	0.7	210.0	210.0	210.5	0.5
155	15,475	35.0	90.0	3.3	210.4	210.4	210.8	0.4
157	15,731	60.0	417.0	0.7	214.4	214.4	215.2	0.8
160	15,987	168.0	894.0	0.3	214.4	214.4	215.3	0.9
163	16,265	170.0	796.0	0.3	214.5	214.5	215.3	0.8
168	16,833	35.0	134.0	1.9	214.5	214.5	215.3	0.8
174	17,361	55.0	174.0	1.4	214.9	214.9	215.5	0.6
178	17,838	35.0	80.0	3.1	215.6	215.6	216.2	0.6
180	18,019	23.0	75.0	3.3	216.5	216.5	216.9	0.4
185	18,543	40.0	162.0	1.5	217.7	217.7	218.6	0.9
Lumber River								
5811	581,083	1165.0	8560.0	1.0	186.0	186.0	186.6	0.6
5833	583,310	1380.0	10252.0	0.8	186.5	186.5	187.2	0.7
5836	583,579	1292.0	4195.0	1.9	186.8	186.8	187.3	0.5
5856	585,611	840.0	5814.0	1.4	187.4	187.4	187.9	0.5
5881	588,108	820.0	4732.0	1.7	188.6	188.6	189.4	0.8
5913	591,299	790.0	6108.0	1.3	190.9	190.9	191.7	0.8

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
5924	592,382	820.0	5791.0	1.4	191.4	191.4	192.2	0.8
Lumber River								
5953	595,255	870.0	6009.0	1.3	193.1	193.1	193.9	0.8
5981	598,131	800.0	5420.0	1.5	194.7	194.7	195.4	0.7
5995	599,466	800.0	5669.0	1.4	195.5	195.5	196.2	0.7
6020	601,979	265.0	3241.0	2.5	197.5	197.5	198.1	0.6
6032	603,171	820.0	6522.0	1.2	197.9	197.9	198.5	0.6
6062	606,161	830.0	5468.0	1.5	199.0	199.0	199.9	0.9
6076	607,568	850.0	5634.0	1.4	200.0	200.0	200.8	0.8
6102	610,229	970.0	6017.0	1.3	201.3	201.3	202.2	0.9
6115	611,523	950.0	6207.0	1.4	202.2	202.2	203.1	0.9
6144	614,407	900.0	6083.0	1.4	203.7	203.7	204.6	0.9
6156	615,608	860.0	6762.0	1.3	204.3	204.3	205.2	0.9
6178	617,820	1050.0	5646.0	1.6	205.7	205.7	206.6	0.9
6208	620,758	700.0	4365.0	2.0	208.7	208.7	209.4	0.7
6241	624,063	760.0	6792.0	1.3	210.7	210.7	211.6	0.9
6280	628,015	250.0	2547.0	3.4	212.7	212.7	213.6	0.9
6298	629,797	880.0	7004.0	1.3	214.0	214.0	214.8	0.8
6318	631,799	300.0	3131.0	2.8	215.3	215.3	215.8	0.5
6345	634,470	1110.0	7606.0	1.2	216.4	216.4	217.1	0.7
6370	636,982	328.0	2938.0	3.0	218.6	218.6	219.2	0.6
6375	637,472	475.0	4012.0	2.2	220.1	220.1	220.5	0.4
6398	639,837	870.0	6982.0	1.3	221.1	221.1	221.6	0.5
6441	644,122	920.0	6825.0	1.3	222.4	222.4	223.3	0.9
6486	648,587	690.0	5199.0	1.7	225.2	225.2	226.0	0.8
6518	651,830	990.0	7040.0	1.2	227.1	227.1	228.0	0.9
6550	654,953	950.0	5742.0	1.5	228.8	228.8	229.8	1.0
6574	657,401	830.0	5494.0	1.6	230.9	230.9	231.7	0.8
6613	661,293	960.0	5574.0	1.6	233.3	233.3	234.2	0.9
6642	664,234	870.0	4288.0	2.0	235.8	235.8	236.8	1.0
6670	667,018	515.0	3903.0	2.2	238.3	238.3	239.3	1.0

¹Width extends beyond State boundary

²Elevation includes backwater effects

6.4 Coastal Flood Hazard Mapping

This section, including Table 23, "Summary of Coastal Transect Mapping Considerations", is not applicable to this FIS project.

7.0 Revising the FIS

7.1 Letters of Map Amendment and Letters of Map Revision - Based on Fill

LOMAs and LOMR-Fs are documents issued by FEMA that officially remove a property and/or a structure from a Special Flood Hazard Area (SFHA), if data supporting the removal are submitted. LOMAs and LOMR-Fs are generally determinations regarding areas that are too small to be shown on a FIRM panel; consequently, the changes they describe become official without revising the FIRM or the FIS Report.

NFIP regulations require that the lowest adjacent grade (the lowest ground touching the structure) be at or above the 1% annual chance flood elevation for a LOMA to be issued. Currently, there is no fee for FEMA's review of a LOMA request, but the requester of a LOMA is responsible for providing all the information needed for the review, which may include structure and/or property elevations certified by a licensed land surveyor or professional engineer. Therefore, LOMA requesters may need to retain the services of a land surveyor or engineer.

A LOMA cannot be used for property on which fill has been placed. For those situations, a LOMR-F must be used. As a participant in the NFIP, a local government must adopt ordinances that meet the minimum Federal floodplain management standards, which are outlined in Section 60.3 of the NFIP regulations. For a number of reasons, these ordinances generally vary from community to community. Nonetheless, because the placement of fill within the floodplain can affect flood hazards in the surrounding area, additional information is needed before FEMA can process a LOMR-F request. Among the data required for a LOMR-F is the community acknowledgment form. This form is FEMA's assurance that all appropriate Federal, State, and local floodplain management requirements have been met. Furthermore, NFIP regulations require that the lowest adjacent grade (the lowest ground touching the structure) be at or above the 1% annual chance flood elevation for a LOMR-F to be issued removing the structure from the floodplain. Because LOMR-F requests are the result of changed physical conditions rather than limitations of scale or topographic definition, FEMA charges a fee for the review of a LOMR-F request. As with the LOMA, the requester of a LOMR-F is responsible for providing all supporting information, including structure and/or property elevation data.

In cases where property owners plan to add fill in the SFHA, NFIP regulations require plans and technical information to be submitted for review by FEMA before construction takes place. FEMA will issue a conditional LOMR-F stating how flood hazards would change and what portions of the property, if any, would remain in the SFHA if the project were built according to the submitted plans.

The issuance of a LOMA or LOMR-F ends the property owner's obligation to purchase flood insurance as a condition of Federal or federally backed financing. However, the property owner's mortgage company maintains the prerogative to require flood insurance as a condition of providing financing. Before attempting to obtain a LOMA or LOMR-F, property owners are advised to consult their mortgage companies regarding this policy. Even if the mortgage company indicates that it will require flood insurance if a LOMA or LOMR-F is issued, it may be advantageous for property owners to request a LOMA or LOMR-F because flood insurance premiums are lower for properties removed from the SFHA than for properties that remain within the SFHA.

For additional information regarding LOMAs, LOMR-Fs, conditional LOMR-Fs, or current application fees, please call the FEMA Map Information eXchange (FMIX) toll-free information line at 1-877-FEMA MAP (1-877-336-2627).

7.2 Letters of Map Revision

A Letter of Map Revision (LOMR) is a document issued by FEMA and the NCFMP that revises an FIS Report and/or FIRM. A LOMR is used to change flood risk zones, floodplain and/or floodway delineations, flood elevations, or planimetric features such as road systems or corporate limits. A LOMR provides FEMA and the NCFMP with a cost-effective means of revising the FIS information without physically changing and reprinting the map or report itself. A portion of the FIRM panel or FIS Report showing the revised information is issued with the LOMR. The LOMR is sent to all affected communities and is archived in the communities' NFIP map repository for public reference.

In cases where a proposed project (such as construction in the 1% annual chance floodplain) would result in a significant rise in 1% annual chance water-surface elevations, NFIP regulations require the community to submit plans and technical information for review by FEMA and the NCFMP before construction takes place. This assures communities participating in the NFIP that proposed projects meet minimum NFIP requirements. The result of FEMA and the NCFMP reviews is documented in a conditional LOMR.

For additional information regarding LOMRs, conditional LOMRs, or current application fees, please call the FEMA Map Assistance Center toll-free information line at 1-877-FEMA MAP (1-877-336-2627) or the NCFMP at 919-715-5711.

7.3 Physical Map Revisions

Physical Map Revisions (PMRs) are processed to incorporate information concerning conditions present in the community that are not reflected in the FIS, and involve distributing republished FISs that supersede the most current NFIP data in the community repository. PMRs may be initiated by a request from a community resident or agency, or FEMA may initiate a PMR to incorporate one or more LOMRs, to reflect significant changes in corporate limits, to correct errors, or to update flood hazards to match new information from an adjacent community's FIS. Due to the costs associated with updating and distributing FISs, map revisions will be processed as LOMRs rather than PMRs whenever possible. For more information regarding PMRs, please contact the FEMA Map Information eXchange (FMIX) toll-free information line at 1-877-FEMA MAP (1-877-336-2627), the FEMA Regional Office at the address listed on the Notice to Flood Insurance Study Users page at the front of this report, or the NCFMP at 919-715-5711.

7.4 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards in a given community. FEMA accomplishes this through a national mapping needs assessment process that assigns priorities and allocates funds to sponsor or subsidize new flood hazard analyses used to update FIS Reports. For map maintenance restudies within the state of North Carolina, scoping will be performed by county approximately 2.5-3.5 years after the previous effective date. Scoping will focus on streams with restudy needs within those previously effective counties rather than on full countywide restudies. A restudy refers specifically to updating or reevaluating engineering analyses that were performed for a flood mapping project that directly impact BFEs and/or flood hazard boundary extents or analysis of previously unstudied flood prone areas. Restudy project evaluation triggers and prioritization values are an essential component of the map maintenance program. For more information regarding NCFMP-contracted restudies, please contact the NCFMP at 919-715-5711 or at www.ncfloodmaps.com. For more information regarding FEMA-contracted restudies, please contact the FEMA Map Information eXchange (FMIX) toll-free information line at 1-877-FEMA MAP(1-877-336-2627) or the FEMA Regional Office at the address listed on the Notice to Flood Insurance Study Users page at the front of this report.

7.5 Map Revision History

The current FIRM is a subset of the Statewide FIRM, showing flood hazard information for the entire geographic area of Scotland County. Previously, separate Flood Hazard Boundary Maps (FHBMs), Flood Boundary and Floodway Maps (FBFMs), and/or FIRMs were prepared for each identified flood prone jurisdiction within the county. Historical data relating to the NFIP maps prepared for each community prior to and including the 6/17/2003 North Carolina Statewide FIRM, which includes Scotland County, are presented in Table 24, "Map Revision History."

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Scotland County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FHBMs, FIRMs, and/or FBFMs for all of the incorporated and unincorporated jurisdictions within Scotland County.

Table 24 - Map Revision History

Community	Initial Identification Date	Initial FIRM Effective Date	FIRM Revision Date
CITY OF LAURINBURG	1/9/1974	1/3/1986	7/7/2014
CITY OF LAURINBURG	1/9/1974	1/3/1986	6/17/2003
SCOTLAND COUNTY	6/16/1978	12/16/1988	12/06/2019
SCOTLAND COUNTY	6/16/1978	12/16/1988	7/7/2014
SCOTLAND COUNTY	6/16/1978	12/16/1988	10/16/2007
SCOTLAND COUNTY	6/16/1978	12/16/1988	1/19/2005
SCOTLAND COUNTY	6/16/1978	12/16/1988	6/17/2003
TOWN OF EAST LAURINBURG	7/11/1975	12/16/1988	7/7/2014
TOWN OF EAST LAURINBURG	7/11/1975	12/16/1988	6/17/2003
TOWN OF GIBSON	6/17/2003	6/17/2003	
TOWN OF WAGRAM	8/8/1975	6/17/2003	07/07/2014
TOWN OF WAGRAM	8/8/1975	6/17/2003	10/17/2006
TOWN OF WAGRAM	8/8/1975	6/17/2003	12/16/2003

8.0 Study Contracting and Community Coordination

8.1 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS revises and updates the previous countywide FIS for the geographic area of Scotland County and Incorporated Areas. Table 25, "Authority and Acknowledgments," includes information for the previous countywide FIS and for this revision. This table also includes information for the single-jurisdiction FISs published for each community included in this countywide FIS (if available) as compiled from their previously printed FIS Reports.

Table 25 — Authority and Acknowledgments

Community	FIS Dated	Study Contracted By	Data Source	Contract or IAA Number	Work Completed In
SCOTLAND COUNTY	7/7/2014	NCFMP	NCFMP	N/A	8/2009

This FIS Report was produced through a unique cooperative partnership between the State of North Carolina and FEMA. The State of North Carolina, through FEMA's Cooperating Technical Partner (CTP) Initiative, has become the first Cooperating Technical State (CTS) and will assume primary ownership of the NFIP FIRM panels for all North Carolina communities. This role has traditionally been fulfilled by FEMA. The North Carolina Floodplain Mapping Program is conducting flood hazard analyses and producing updated, digital FIRM panels. The hydrologic and hydraulic analyses and the FIRM panels for the initial statewide mapping for Scotland County were produced by NCFMP under contract with the State of North Carolina and issued on effective 7/7/2014. For this revision, the hydrologic and hydraulic analyses and the FIRM panels were produced by NCFMP, under contract with the State of North Carolina.

8.2 Scoping/Consultations Coordination Officer's/Public Meetings

For each FIS produced during the initial phase of statewide, an Initial Scoping Meeting was held with representatives from FEMA, the county, the incorporated communities, and the State of North Carolina. A Final Scoping meeting was held to review the Draft Basin Plan and finalize the streams to be studied by detailed methods. This information was then used to create the Final Basin Plan.

For map maintenance revisions, only one scoping meeting was held to identify the streams to be newly studied by detailed methods, redelineated, or to be studied by limited detailed methods. This information was then used to create the Map Maintenance Plan.

The historical dates of the Initial and Final Scoping Meetings held during the first round of statewide mapping for Scotland County are shown in Table 26, "Scoping Meetings." Meetings held for the map maintenance revision are also included below for Scotland County.

Table 26 — Scoping Meetings

Community	River Basin	Initial Scoping Date	Attended By	Final Scoping Date	Attended By
SCOTLAND COUNTY	LUMBER/YADKIN	5/4/2006	Representatives of the State, FEMA, Dewberry and Scotland County	N/A	N/A

In general, for each FIS an initial Consultation Coordination Officer's (CCO) meeting is held with representatives from FEMA, the communities, and the study contractors to explain the nature and purpose of the FIS and to identify the streams to be studied by detailed methods. A final CCO meeting is held with representatives from FEMA, the communities, and the study contractors to review the results of the study. Public Participation Meetings are not required by FEMA, but provide an opportunity to review and discuss the FIS Report and FIRM panels for each jurisdiction in a public setting. The dates for the preliminary and public participation meetings are shown in Table 27, "CCO and Public Participation Meetings."

Table 27 — CCO and Public Participation Meetings

Community	For FIS Dated	Meeting Location	Final CCO Meeting Date	Attended By	Public Meeting Date	Attended By
SCOTLAND COUNTY	7/7/2014	City of Laurinburg	N/A	N/A	3/21/2012	The Public
SCOTLAND COUNTY	6/17/2003	City of Laurinburg	11/22/2002	Officials from Scotland County, NCDEM, FEMA, Dewberry and Greenhome & O'Mara	1/23/2003	The Public

9.0 Guide to Additional Information

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

The Map Repositories table below lists locations where FIRMs for Scotland County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 28 — Map Repositories

Community	Address	City	State	Zip Code
Town of East Laurinburg	East Laurinburg Municipal Building, 28 Fourth Street	Laurinburg	NC	28352
Town of Wagram	Wagram Town Offices, 24341 Riverton Road	Wagram	NC	28396
City of Laurinburg	Laurinburg City Hall, 305 West Church Street	Laurinburg	NC	28352
Scotland County	Scotland County Inspections Department, 517 Peden Street	Laurinburg	NC	28352

9.1 Additional Information

All FIRM panels created for the State of North Carolina are produced in a seamless statewide format; however, FIS Reports are produced for individual counties.

Copies of FIRM panels are available for a nominal fee. To obtain a copy of the current flood map for a specific community, contact the FEMA Map Service Center at 1-800-358-9616. To facilitate the processing of your request, please review the current flood map on file at your local community repository and obtain the panel number in which you are interested. If necessary, users may also order a FIRM Index from the Map Service Center to determine the appropriate panel numbers. The Map Service Center also accepts orders for the Community Status Book and the Flood Insurance Manual. The FIS Report, FIRM panels, and digital data used to produce the FIRM panels are available online at www.ncfloodmaps.com.

Information concerning the data used in the preparation of this FIS, contained in an Engineering Study Data Package, may be obtained by contacting the FEMA Regional Office at the address listed on the Notice to Flood Insurance Study Users page at the front of this report.

Table 29, "Additional Information" is not applicable in Scotland County.

10.0 Appendix

10.1 Bibliography

All bibliography and reference information associated within this Flood Insurance Study are maintained and accessible within the geodatabase structure and associated metadata. Users requiring more specific information should contact the North Carolina Floodplain Mapping Program (NCFMP) at:

NC Floodplain Mapping Program
4218 Mail Service Center
Raleigh, NC 27699-4218
Phone: 919-715-5711
Fax: 919-715-0408
Email: frishelp@ncdps.gov