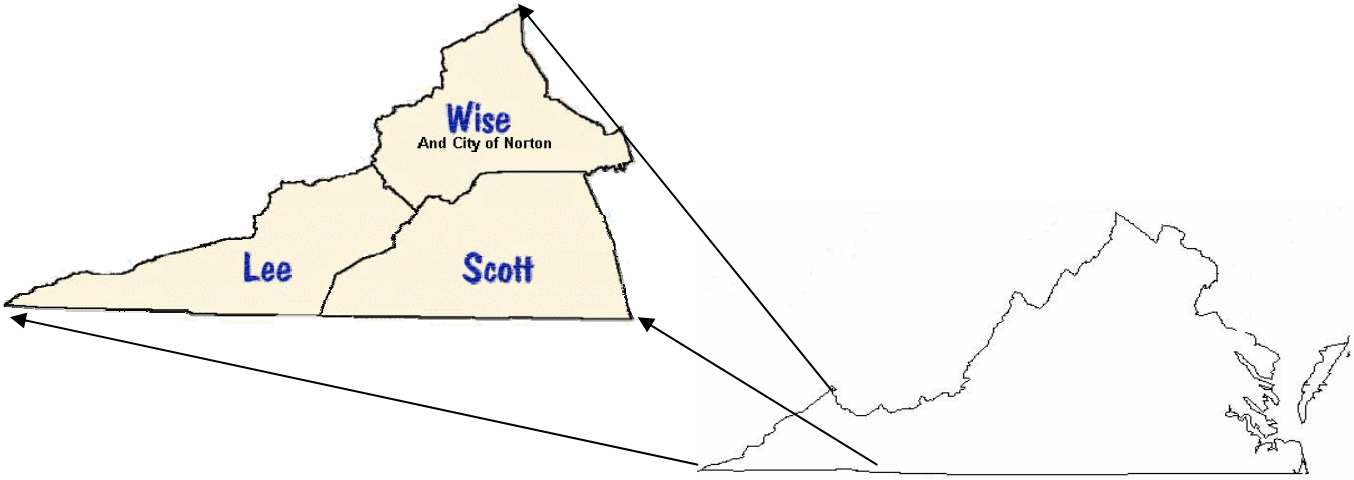
LENOWISCO
Planning District Commission



Hazard Mitigation Plan
(FINAL)

November 22, 2005

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SECTION I. EXECUTIVE SUMMARY

For the purposes of this Hazard Mitigation Plan, the LENOWISCO Planning District is comprised of the City of Norton, the Counties of Lee, Scott and Wise, and the towns of Jonesville, Pennington Gap, Saint Charles, Clinchport, Duffield, Dungannon, Gate City, Nickelsville, Weber City, Big Stone Gap, and Appalachia. Hereinafter and throughout the document, the area will be referred to as the LENOWISCO Planning District. The area is vulnerable to many types of natural hazards — including floods, tornadoes, winter storms, earthquakes and severe thunderstorms — and has experienced the effects of each of these at some point in its history.

The last few decades of growth within the LENOWISCO Planning District have placed more development than ever in harm's way, increasing the potential for severe economic and social consequences if a major disaster or other catastrophic event were to occur today. Such an event could have the potential to cost the local governments, residents, and businesses millions of dollars in damages to public buildings and infrastructure, lost tax revenues, unemployment, homelessness, and emotional and physical suffering for many years to come.

A multi-hazard mitigation plan has been prepared for the LENOWISCO Planning District in accordance with the requirements of the Disaster Mitigation Act of 2000. Having the mitigation plan in place will help the area to:

- Better understand local hazards and risks;
- Build support for mitigation activities;
- Develop more effective community hazard-reduction policies and integrate mitigation concepts into other community processes;
- Incorporate mitigation into post-disaster recovery activities; and
- Obtain disaster-related grants in the aftermath of a disaster.

Hazard Identification and Risk Assessment

Prioritizing the potential hazards that can impact the LENOWISCO Planning District was based on the probability that a potential hazard will affect the area and the potential impacts on it, given a disaster event. Values were assigned to each hazard type, based on the hazard's highest potential hazard level. These hazard level categories represent the likelihood of a hazard event, which could significantly affect the LENOWISCO Planning District. These categories are based on the classifications used in the Hazard Identification portion of this document and are ***High, Medium-High, Medium,*** and ***Low***. In order to focus on the most significant hazards, only those assigned a level of **High** or **Medium-High** have been included for analysis in the risk assessment. Table I-1 summarizes the results of this analysis, which is explained more fully in Section IV of this plan.

Table I-1 — Hazard Identification Results	
Hazard Type	**Hazard Level**
Flooding	High
Sever Winter Storms	Medium-High
Wildfire	Medium-High
Landslides	Medium-High
Severe Thunderstorms/Hail Storms	Medium
Severe Wind	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Tornado	Low
Extreme Heat	Low
Karst Topography	Low

The Mitigation Strategy

During the presentation of findings for the Hazard Identification and Risk Assessment workshop, the Mitigation Advisory Committee (MAC) was asked to provide comments and suggestions on actions and policies, which could lessen the area's vulnerability to the identified hazards. The MAC supported the following preliminary comments below:

- Top priorities for the area were public safety, public education, and reduction of potential economic impacts of disasters.
- Alternatives should consider the impacts on the LENOWISCO Planning District as a whole.
- Alternatives must not conflict with other local government programs.
- Outreach and other efforts should be attempted to FEMA-designated Repetitive Loss Properties.
- Past experiences from disasters should be built upon.
- The success of past mitigation projects should be considered in developing alternatives.
- Community Rating System and the floodplain ordinance update, policies and activities should be a priority.

The following overarching goal and six specific goals were developed by the MAC to guide the area's future hazard mitigation activities.

Overarching LENOWISCO Area Goal:
"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events."

- **GOAL 1:**
  Ensure public health and safety within the LENOWISCO planning region before, during, and following hazardous events.
- **GOAL 2:**
  Implement effective hazard mitigation measures that would minimize the impact of natural hazards on life and property for both existing and future development.
- **GOAL 3:**
  Increase the area's floodplain management activities and participation in the National Flood Insurance Program.
- **GOAL 4:**
  Incorporate hazard awareness and risk reduction principles into the daily activities, processes, functions, and policies of the community.
- **GOAL 5:**
  Continue to assess and enhance understanding of the extent of our vulnerability to natural hazards.
- **GOAL 6:**
  Publicize mitigation activities to reduce the area's vulnerability to the identified hazards.

The MAC reviewed the STAPLE/E Criteria (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) process to assist in selecting and prioritizing the most appropriate mitigation actions for the LENOWISCO Planning District. This methodology required that social, technical, administrative, political, legal, economic, and environmental considerations be taken into account when reviewing potential projects and policies. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on local jurisdiction's capabilities. These actions are laid out with an implementation strategy and timeframes in Section VII of this plan.

Conclusion

This plan symbolizes the LENOWISCO Planning District's continued commitment and dedication to enhance the safety of its residents and businesses by taking actions before a disaster strikes. While each jurisdiction cannot necessarily prevent natural hazard events from occurring, they can minimize the disruption and devastation that so often accompanies these disasters.

SECTION II. INTRODUCTION

Mitigation

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials and other community stakeholders.

A local mitigation plan is the physical representation of a jurisdiction's commitment to reduce risks from natural hazards. Local officials can refer to the plan in their day-to-day activities and decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives. Additionally, these local plans will serve as the basis for states to prioritize future grant funding as it becomes available.

It is hoped that the LENOWISCO Planning District's hazard mitigation plan will be a tool for all community stakeholders to use by increasing public awareness about local hazards and risks, while at the same time providing information about options and resources available to reduce those risks. Teaching the public about potential hazards will help each of the area's jurisdictions protect themselves against the effects of the hazards, and will enable informed decision making on where to live, purchase property, or locate businesses.

The Local Mitigation Planning Impetus

On October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000), which established a national disaster hazard mitigation grant program that would help to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act and has added a new section, §322 Mitigation Planning. Section 322 requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans for disasters declared after November 1, 2003, (subsequently revised to November 1, 2004) as a condition of receiving Hazard Mitigation Grant Program (HMGP) project grants and other forms of non-emergency disaster assistance. Local governments must review and if necessary, update the mitigation plan every five years from the original date of the plan to continue program eligibility.

Interim Final Rule Planning Criteria

As part of the process of implementing DMA 2000, The Federal Emergency Management Agency (FEMA) prepared an Interim Final Rule (the Rule) to define the mitigation planning criteria for States and communities. Published in the Federal Register on February 26, 2002, at 44 CFR Part 201, the Rule serves as the governing document for DMA 2000 planning implementation.

Organization of the Plan

This planning document has been organized in a format that follows the process enumerated in the Rule.

Section III – Planning Process describes the LENOWISCO Planning District's stakeholder involvement and defines the processes followed throughout the creation of this plan.

Section IV – Community Profile provides a physical and demographic profile of the LENOWISCO Planning District looking at such things as climate, population, business characteristics and land use and development trends within the planning area.

Section V – Hazard Identification and Risk Assessment evaluates the natural hazards likely to affect the LENOWISCO Planning District, and quantifies whom, what, where, and how local jurisdictions may be vulnerable to future hazard events.

Section VI – Capability Assessment analyzes each of the four local jurisdiction's policies, programs, plans, resources, and capability to reduce exposure to hazards in the community.

Section VII – Mitigation Strategy addresses the LENOWISCO Planning District's issues and concerns for hazards by establishing a framework for loss-reduction activities and policies. The strategy includes future vision statements, goals, objectives, and a range of actions to achieve the goals.

Section VIII – Plan Maintenance Procedures specifies how the plan will be monitored, evaluated, and updated, including a process for continuing stakeholder involvement once the plan is completed.

Section X – Appendices is the last section of the plan, and includes supplemental reference materials and more detailed calculations and methodologies used in the planning process.

SECTION III. PLANNING PROCESS

Beginning in 2003 , the City of Norton and the Counties of Lee, Scott and Wise, Virginia, and as members of the LENOWISCO Planning District, collaborated with the Virginia Department of Emergency Management to undertake a multi-jurisdictional natural hazards planning initiative. To facilitate the planning process, a Mitigation Advisory Committee (MAC) was established to 1) provide leadership and guidance for the planning initiative, and 2) develop a beginning set of goals to guide the development of a natural hazards mitigation plan.

These goals were based on the principles of hazard awareness and disaster prevention. These goals included:

- Ensure that the Planning District has sustainable communities and businesses resistant to the human and economic costs of disasters;
- Maintain and enhance the economic stability, public health, and safety to the communities of the area;
- Ensure that the Planning District's cultural richness and environmental quality are not jeopardized by the occurrence of a disaster; and
- Recognize the potential impact of natural or manmade hazards on public and private buildings and facilities, and the utility and transportation systems that serve them.

Beginning in 2003, the MAC held regular meetings and commenced work to more accurately identify the area's natural hazards. They coordinated and consulted with other entities and stakeholders to identify and delineate natural and manmade hazards within the four local jurisdictions and to assess the risks and vulnerability of public and private buildings, facilities, utilities, communications, transportation systems, and other vulnerable infrastructure. Neighboring counties adjacent to the planning district were contacted by the MAC as the planning process began. In addition, the MAC initially contacted all incorporated cities and towns within the Planning District to solicit interest and input concerning participation in the development of a multi-jurisdiction hazard mitigation plan. Towns were represented at committee meetings and were given the opportunity to review the draft plan.

At the behest of the Virginia Department of Emergency Management (VDEM), Planning District employees re-contacted the incorporated cities and towns, by letter, at the end of October 2004 to again solicit their input for the inclusion of mitigation actions from each community into the mitigation strategy portion of the plan and to request adoption of the plan upon completion, as well. The communities' responses are incorporated into the final plan.

TABLE III-1 — Mitigation Planning Workgroup Meetings
LENOWISCO PDC — Steering Committee Participation

Meeting Dates	Summary Discussions
3/11/03	Kick-off Meeting
8/18/03	Presentation of HIRA Findings
6/03/04	Mitigation Strategy Development
2/4/05	Second Mitigation Strategy Development Meeting

In January 2003, LENOWISCO Planning District Commission contracted with the engineering consulting firm, Dewberry, to build upon the hazard identification effort and to develop a Hazard Identification and Risk Assessment (HIRA) and subsequent natural hazard mitigation plan. The MAC worked with the consultants throughout the planning process to ensure that potential stakeholders participated in the process and would have opportunities for input in the draft and final phases of the plan.

The Mitigation Advisory Committee

A Mitigation Advisory Committee (MAC) is comprised of public representatives, private citizens, businesses, and organizations worked with the Dewberry team and to provide input at key stages of the process. Efforts to involve city or county and county departments and community organizations that might have a role in the implementation of the mitigation actions or policies included invitations to attend meetings and serve on the MAC, e-mails of minutes and updates, strategy development workshops, and outreach through public libraries, television and radio publicity, plus opportunities for input and comment on all draft deliverables.

The LENOWISCO Planning District Commission would like to thank and acknowledge the following persons who served on the MAC and their representative departments and organizations throughout the planning process:

TABLE III-2 — LENOWISCO PDC Mitigation Advisory Committee Members	
Glen Skinner	Wise County Administrator
Ed Stoots	VA Dept of Forestry
Robert Mullins	Wise County
Bob Adkins	Wise County
Bill Stokes	City of Norton
John Strutner	Scott County
Bobby Dorton	Town of Pound
Jeff Rose	Town of Pound
Vern Haefele	Town of Appalachia
Dane Poe	Lee County
Mark Smith	Town of Pennington Gap
Lewis Moore	Lee County
George Polly	Town of Big Stone Gap
JoRetta Smith	Town of Weber City
Roger Mustard	Town of Nickelsville
Danny Jordan	Town of Coeburn
Matthew Horton	Town of Gate City
Melissa Farmer	Scott County
Laura Mullins	Town of Wise
Frank Kibler	LENOWISCO PDC

Public Participation and Citizen Input

Several opportunities were provided to the public for input and participation throughout the planning process. Drafts of the Hazard Identification and Risk Assessment and Mitigation Strategies were made available via the project team website (http://projects.dewberry.com/LENOWISCO_Planning_District). The planning process was discussed on a regular basis at the LENOWISCO Planning District Commission board meetings, which includes representation of all counties and towns in the planning district. Additionally, the plan was discussed at Board of Supervisor meetings in the participating counties.

In April of 2005, a copy of the Draft Hazard Mitigation Plan was made available in the public libraries in Lee, Scott, Wise, Counties. Copies of the announcements notifying the public of the availability of the draft plan for review is included in Appendix C.

In addition, open public meeting were held on June 22, June 23rd, and June 27th in Lee, Wise, and Scott Counties respectively. to provide an overview to the public of the planning process and the results of the hazard identification and mitigation strategy.

Also, draft copies of the complete plan were also available on the project website listed above for review and comment by the public. Copies of the announcements notifying the public of the availability of the draft plan for review is included in Appendix C.

Adoption

Participating jurisdictions must formally adopt the hazard mitigation plan in order for it to be approved by the State of Virginia and the Federal Emergency Management Agency. This plan was adopted by the Counties of Lee, Scott, and Wise, the City of Norton, and the Towns of Pennington Gap, Big Stone Gap, Coeburn, St. Paul, Pound, and Wise. The additional towns within the planning district not adopting the plan did not participate in the planning process and provide or support future mitigation strategies. Copies of the adoption language for each community is included in Appendix D.

SECTION IV. COMMUNITY PROFILE

Introduction

The LENOWISCO Planning District is located in southwestern Virginia, and includes Lee, Scott and Wise Counties, as well as the City of Norton. Approximately 1,385 square miles and over 92,000 people are covered by the Planning District. The district is bound on the north and west by the State of Kentucky, on the south by the State of Tennessee, and on the east by Dickenson and Russell Counties.

LENOWISCO, organized in 1965, serves its citizens and their local governments as a development district by promoting regional cooperation, helping to coordinate the activities and policies of member local governments, and providing planning assistance to local governments in all their activities. The majority of the commission's work is focused in the areas of grantsmanship, management services and geographic information services, particularly on multi-jurisdictional issues that span more than one locality.

Topography and Climate

The LENOWISCO Planning District is located in the northeastern Appalachian region of the United States and enjoys a seasonal climate, with an average high temperature of 75 degrees Fahrenheit and an average low temperature of 36 degrees Fahrenheit. Virginia's climate results from global-scale weather patterns that are modified by the diverse landscape of the Commonwealth. The state's landscape provides local controls primarily in three ways. First, the Atlantic Ocean and its "river" of warm water, commonly called the Gulf Stream, play a dominant role in differentiating Virginia's precipitation climate. Winter storms generally move or "track" from west to east and, in the vicinity of the east coast, move northeastward paralleling the coast and the Gulf Stream. This shift to a northeast track results in part from the tendency of the storm to follow the boundary between the cold land and the warm Gulf Stream Waters. These storms grow rapidly as they cross the coast; and as they move northeastward, moisture-laden air from the storm crosses Virginia from the east and northeast. The eastern slopes and foothills of the Blue Ridge Mountains are the prime recipients of this moisture. The great coastal storms of 1962, which are remembered primarily because of the high surf and storm surges along Virginia's coast, also produced record snowfalls along the northern section of the Blue Ridge mountains.

The high relief of the Appalachian and Blue Ridge mountain systems also helps to control Virginia's climate. The influence here originates with the well-developed rainfall pattern that is evident along the great mountains of the western margin of North America. Great quantities of rain fall on these western slopes as moist air from the Pacific Ocean flows eastward, rises, condenses, and precipitates. As the air flows down over the eastern slopes, however, little rain falls and a "rain shadow" pattern results. Along the Appalachian and Blue Ridge Mountains of western Virginia, this airflow is

sometimes from the west and sometimes from the east. When the flow is from the west, the New River and Shenandoah River valleys are in the rain shadow of the Appalachian Mountains; when the airflow is from the east, they are in the shadow of the Blue Ridge Mountains. As a result, both the New River and the Shenandoah River valleys are the driest portions of the state. Regions of equally low rainfall are rare in the eastern United States (although common along the eastern margins of the great plains of the central United States).

The third important local control on climate is the state's complex pattern of rivers and streams, which drain the precipitation that falls and modify the pattern of moist airflow from which the precipitation falls. These river systems drain the Commonwealth's terrain in all four geographical directions. In far southwestern Virginia, the Clinch and Holston Rivers drain south into North Carolina and Tennessee. The New River drains westward into the Ohio River, while the Shenandoah River drains northward into the Potomac. Finally, the Roanoke, James, York, and Rappahannock rivers drain eastward through the Piedmont and into the Tidewater area. The air that flows across Virginia flows either up these river valleys or over the crests of the mountains and down into the valleys. With a southerly flow of air, for example, moist air would move up the Holston River drainage, and rainfall would increase up valley with increasing elevation. However, this same southerly airflow would be downhill into the New River drainage, and on toward the Ohio River basin. This downward flow of air is not conducive to rainfall.

Weather Systems

Much of Virginia's rainfall results from storms associated with warm and cold fronts. As already noted, these storms generally move from west to east and, in the vicinity of the east coast, move northeastward. While a very large number of specific storm histories and storm tracks can occur and a great diversity of precipitation patterns can result, not all are equally common. Storms are most frequently observed to move parallel to the Appalachian or the Blue Ridge Mountains, the coastal zone, and the Gulf Stream, all of which have a northeast trend, or to move parallel to the Great Lakes and the Ohio River Valley. When storms cross the east coast well to the south of Virginia and move offshore, the heaviest rain usually falls in southeastern Virginia. When these storms become very intense or when they closely skirt the coastline, the strong up-slope winds result in heavy rainfalls on the Blue Ridge. Frequently, frontal storms tracking along the Ohio Valley move across southern Pennsylvania and off the New Jersey coast; as such storms approach the coast, great quantities of moist air flow inland and then southward into Virginia.

When sufficient cold air invades Virginia from the west and northwest, frontal storms may cause heavy snowfalls. Two of the state's most dramatic frontal snowstorms of recent years occurred during the Christmas holidays of 1966 and 1969. In both cases, the Storm tracked along the Gulf and the east coasts and crossed over Tidewater Virginia; a strong east and northeast flow brought moist air across the state, overriding cold air from the west. While heavy snows are common in the Piedmont region, the average winter does not have a major coastal snowstorm, and heavy winter snows usually are confined to the mountainous areas of the state. As remarkable as it may

seem, some of the heaviest snowfalls in the eastern United States occur in the Appalachians of West Virginia, just a few miles west of Highland County, Virginia. More than 2,500 millimeters (100 inches) fall annually in this area; but Virginia, being in West Virginia's snow shadow, receives only a fraction of this amount.

While heavy snowfalls usually result from frontal storms, hurricanes are created by a different weather pattern. Hurricanes and tropical storms are intense cyclones formed within the deep, moist layers of air over warm, tropical waters. Unlike frontal storms, which derive much of their energy from the great temperature contrasts on either side of fronts, hurricanes and tropical storms derive most of their energy from the warm ocean surface. Tropical storms over the low-latitude oceans generally move from east to west. As they move westward, they are displaced farther and farther to the north. Eventually, they enter the westerly airstreams of the mid-latitudes, and then recurve north and eastward. In the vicinity of Virginia, these tropical storms move in a general northeasterly track, like frontal storms: and as they move along this route, they intensify. Those storms that reach an intensity indicated by sustained winds of at least seventy-four miles an hour are classified as hurricanes.

Hurricanes and tropical storms that cross Virginia, including those immediately offshore, occur most frequently in early August and September and rarely appear before June or after November. During the month of September, anywhere from 10 to 40 percent of Virginia's rainfall comes from hurricanes and tropical storms. When Hurricane Camille, Virginia's most notable hurricane of recent times, passed through the state in 1969, upwards of 840 millimeters (33 inches) of rain fell on the eastern slopes of the Blue Ridge in Nelson County and caused record floods along the James River.

Before the turn of the century, hurricane and tropical storm passages across Virginia were relatively common, averaging one per year. From 1905 to 1920, however, a hurricane struck, on the average, only one year in every five. The frequency then increased to about three hurricanes in a five-year period before decreasing again in the 1960s and 1970s. The reasons for these variations are as yet unknown.

Thunderstorms, which occur in all months of the year, are most common in the deep, moist, warm air of tropical origin that is typical of summer. In Virginia, days with thunderstorms are recorded at commercial and military airports. Over the last two decades the state has averaged one thunder-storm day a decade in January, compared with nine thunderstorm days a month in July. Thunderstorm days are most frequent in southern Virginia, particularly in the far southwestern section, while northern Virginia experiences the least number of such storms. Thunderstorms are also most likely to occur during the warmest part of the day, with 4:00 p.m. the most probable time of occurrence. In Roanoke, for example, thunderstorms occur ten times more frequently at 4:00 p.m. than at 10:00 a.m. and five times more frequently at 4:30 p.m. than at 7:00 p.m. At Norfolk, thunderstorms are also most frequent at 4:00 p.m., remaining common there until about midnight. Thunderstorms produce complex patterns of rainfall, such that areas of heavy rain may be next to areas with little or no rain.

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Watersheds

The Planning District is located within three major water basins, the Clinch River Basin, Powell River Basin, and Holston River Basin. A number of steams and tributaries are located within these water basins. The Pound River and other smaller tributaries are located in the northeast portion of the Planning District and drains into the Levisa Fork of the Big Sandy River. The watersheds are discussed in greater detail in the Hazard Identification and Risk Assessment portion of this plan.

Population

Over ninety-two thousand people live in the LENOWISCO planning area. Population density for the planning district as a whole is approximately 66 people per square mile. This number varies from jurisdiction to jurisdiction with a high of 518 per square mile for the City of Norton, as befits its more urban character, to a low of 44 persons per square mile for Scott County, in line with its rural nature. A breakdown of the population by race can be found in Table IV-1.

Table IV-1: LENOWISCO Planning District – Racial Composition*	
White persons, percent, 2000 (a)	97.46%
Black or African American persons, percent, 2000 (a)	1.32%
American Indian and Alaska Native persons, percent, 2000 (a)	0.17%
Asian persons, percent, 2000 (a)	0.25%
Native Hawaiian and Other Pacific Islander, percent, 2000 (a)	<0.1%
Persons reporting some other race, percent, 2000 (a)	0.19%
Persons reporting two or more races, percent, 2000	0.59%
Persons of Hispanic or Latino origin, percent, 2000 (b)	0.58%
White persons, not of Hispanic/Latino origin, percent, 2000	97.05%

**Census 2000*

The Census Bureau estimates population growth between 2000 and 2003 to be around 1%. Other figures suggest that the population is fairly stable. For instance, about 65% of residents lived in the same home between 1995 and 2000. This number was significantly different for the City of Norton, however, where only 49.5% lived in the same house. These numbers suggest that there might be a significant number of new residents who may not be familiar with the natural hazard risks present in the City of Norton.

2000 Census data also reveals insights into potential special needs populations such as minors and seniors. Within the planning district, more than 5% of the population is under 5 years, 22% is under 18 years, and 15% is over 65 years old. The 2000 Census data shows that language barrier issues may not be of concern for the LENOWISCO planning district. Less than 2% of the population speaks a language other than English at home (this percentage was slightly higher for the City of Norton, at 3.1%) and less than half a percent are foreign-born.

Over 62% of residents graduate from high school but only about 10% percent hold bachelor's degrees or higher. These numbers, coupled with the population characteristics described in the previous paragraph are important to keep in mind when developing public outreach programs. The content and delivery of public outreach programs should be consistent with the audiences' needs and ability to understand complex information.

The average per capita household income of $14,748 is about two-thirds of the state per capita income of $23,975. On average, 20% of residents within the LENOWISCO

planning area live below the poverty line. This rate is significantly higher than the national rate of 11.3% and the state rate of 9.6%. This number may indicate that a large portion of the population will not have the resources available to them to undertake mitigation projects that require self-funding.

Housing

There are over 42,000 housing units within the planning area. Approximately 7% are multi-family units. This number is significantly higher for the City of Norton where 28% of the housing units are multi-unit structures. On average, 75% of residents own their own homes. Only the City of Norton's homeownership rate of 56% is lower than the national average of 66.2% or the state average of 68.1%. The housing characteristics are broken down by jursidiction in Table IV-2.

Table IV-2 — Housing Characteristics*

	Lee County	Scott County	Wise County	City of Norton	Total/Average
Housing units, 2002	11,222	11,514	17,989	1,950	42,675
Median value of owner-occupied housing units, 2000	$56,900	$69,100	$65,700	$62,800	$63,625
Homeownership rate, 2000	74%	78%	75%	56%	75%
Housing units in multi-unit structures, percent, 2000	4%	4%	8%	28%	7%

**Census 2000*

Labor and Industry

The three main industries in the LENOWISCO planning area are the automotive, wood products and the customer contact (i.e., customer service telecenters) industries. The communities of LENOWISCO are investing in a broadband communications network to facilitate future growth in these industries. In addition, Scott and Wise Counties are home to state enterprise zones, which enables them to offer incentives to companies including permit fee waivers, worker training, and tax incentives.

Each county has at least one industrial park with public utilities and easy transportation access (e.g., rail and highway). The parks in Scott and Wise Counties, are geared towards technology-based and light to medium industries. In addition, the LENOWISCO planning area is home to three correctional facilities (one federal and two state). These facilities provide over 1,300 jobs to the area.

Tourism also provides strong support to the local economy. A number of economic development initiatives, including performance venues and renovation of historic buildings, are being planned for the LENOWISCO district.

Top employers, by jurisdiction, include:

❖ Lee County	Lee County School Board
	U.S. Department of Justice
	De Royal
	Lee Regional Medical Center
	VDOT
❖ City of Norton	Norton Community Hospital
	St. Mary's Hospital
	Wal Mart
	Norton City School Board
	Verizon
❖ Scott County	Scott County School Board
	Joy Technologies
	Tempur Production
	Food City
	Ridgecrest Manor
❖ Wise County	Wise County School Board
	Paramont Coal Company
	Sykes Enterprises
	Wallens Ridge Correctional Center
	A & G Coal Corporation

Transportation

Numerous highways transverse the planning area and include U.S.23, U.S.58, U.S. 421, VA. 65, VA.71, and VA.72, which are primarily four-lane arterial highways. The national interstate system is also easily accessible. For instance, from Scott County, four interstate highways (I-181, I-81, I-26 and I-75) are within 50 miles.

Rail transportation is available from CSX Transportation and Norfolk Southern Railway. The Tri-Cities Regional Airport in Blountville, Tennessee provides the nearest commercial air service. Lonesome Pine Airport in Lee County, with a 5,280 foot lighted runway, is the primary corporate air terminal for business and industry in southwest Virginia.

Utilities

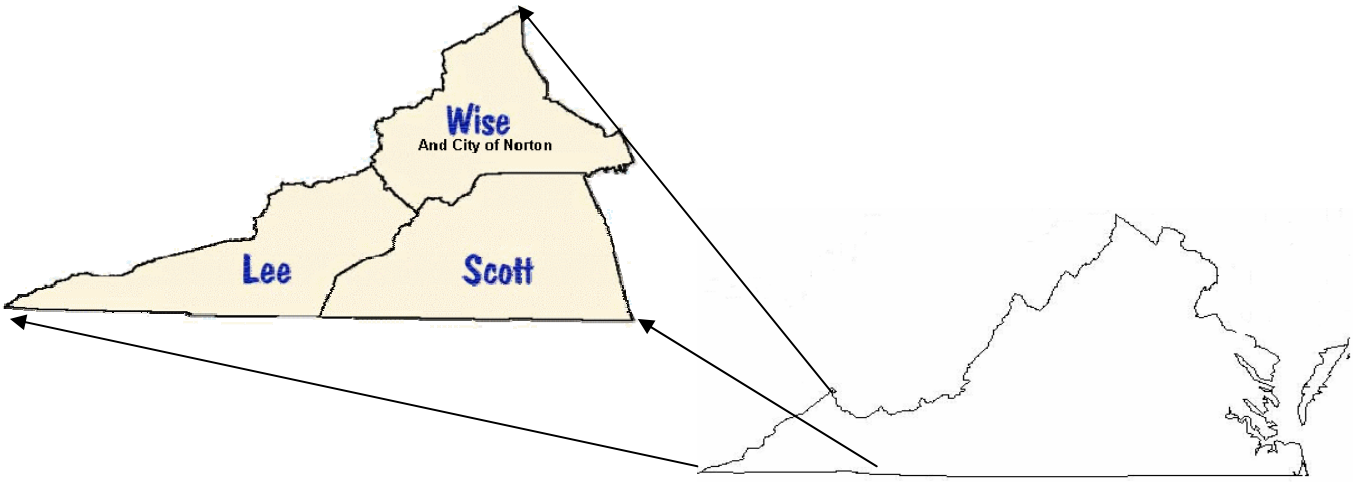
Public water and sewer is widely available throughout the planning area, through the municipal or county governments. American Electric Power and Old Dominion Power Company serve the electrical power needs throughout the planning district. Local telephone service is provided by Verizon and Bell Atlantic-Virginia.

Land Use

The LENOWISCO planning area is shown in Figure IV-1. For the purposes of the hazard mitigation planning initiative, it includes the City of Norton, Lee County, Scott County and Wise County. Development within the City of Norton is urban and suburban in nature and is, for the most part, moderately populated. Lee, Scott and Wise Counties development tends to be rural in nature although residential development is an important component in each county's long-range comprehensive plans. All three counties are moderately populated.

According to the Scott County Chamber of Commerce, "[m]ost of the people live on smooth land near streams and on the smoother ridge tops in the valley uplands. Very few live in the steep and rugged mountain country."

Figure IV – 1. LENOWISCO Planning Area



SECTION V. HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)

Introduction

The Hazard Identification and Risk Assessment (HIRA) serves as a guide to all communities in the LENOWISCO planning area when assessing potential vulnerabilities to natural hazards. When developing this plan, every effort was made to gather input from all aspects of the project area communities to assure that the results of this analysis will be as accurate as possible.

The planning area for this study includes Lee County, Scott County, Wise County, and the City of Norton. All jurisdictions located throughout these counties also have been included in this portion of the study, as this analysis has been completed on a regional basis. It should be noted, however that a local jurisdiction's inclusion in the full Mitigation Plan is dependent on the community's participation in the remainder of the planning process.

The purpose of this HIRA is to:

1) Identify all the natural hazards that could affect the Planning Area;
2) Assess the extent to which the area is vulnerable to the effects of these hazards; and
3) Prioritize the potential risks to the community.

The first step, identifying hazards, will assess and rank all the potential natural hazards, in terms of probability of occurrence and potential impacts. It will also identify those hazards with the highest likelihood of significantly impacting the community. This section will be completed based on a detailed review of the LENOWISCO planning area's hazard history. The hazards determined to be of the highest risk will be analyzed further to determine the magnitude of potential events, and to characterize the location, type, and extent of potential impacts. This will include an assessment of what types of development are at risk, including critical facilities and community infrastructure.

Hazard Identification

While there are many different natural hazards that could potentially affect the communities within the LENOWISCO Planning District, some hazards are more likely to cause significant impacts and damages than others. Although reducing the community's vulnerabilities to all hazards is ideal, the highest level of consideration must be given to those hazards which pose the greatest possible risk. This analysis will attempt to quantify these potential impacts for all possible hazard events, and identify those which could most significantly impact the communities involved. Once these hazards have

been identified, further analysis will be conducted to profile potential hazard events and to assess vulnerability to such events.

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards that could potentially affect the communities in the LENOWISCO Planning District generally include:

- Flooding
- Severe Winter Storms
- Wildfires
- Landslides
- Dam Failures
- Drought
- Earthquake
- Severe Wind
- Severe Thunderstorms
- Tornadoes

Depending on the severity, location, and timing of the specific events, each of these hazards could have devastating effects on homes, business, agricultural lands, infrastructure and ultimately citizens.

In order to gain a full understanding of the hazards, an extensive search of historic hazard data was completed. This data collection effort utilized meetings with local community officials, existing reports and studies, state and national data sets, and other sources. Some of the main resources used in this study include the Virginia Division of Emergency Management's Local Hazard Mitigation Planning Guide, 2002 Fire Management Plan, and the National Climatic Data Center (NCDC): Storm Event Database (2003 version). A comprehensive list of sources utilized for this plan can be found at the conclusion of this document.

Unfortunately, extensive local historical data is not currently available for many of the potential hazards. In some cases, the precise number of events that have affected the Planning District and the subsequent level of impact to the local communities are not known. In these cases, state and regional hazard information was collected and referenced whenever possible.

Probability of Hazards

The historical data collected includes accounts of all the hazard types listed above. However, some hazards have occurred much more frequently than others with a wide range of impacts. By analyzing the historical frequency of each hazard, along with the associated impacts, the hazards that pose the most significant risks to the LENOWISCO Planning District can be identified. This analysis will allow the local communities to focus the Mitigation Strategy of those hazards that are most likely to cause significant impacts.

Prioritizing the potential hazards that can threaten the Planning District will be based on two separate factors:

- the probability that a potential hazard will affect the community,
- the potential impacts on the community in the event such a hazard occurs.

The probability of a hazard event occurring is largely based on the historical recurrence interval of the hazard. For instance, if flood damage occurs every 5 years versus an earthquake event causing damage every 50 years, the flood probability would score much higher than the earthquake.

The hazard's impact on the community is made up of three separate factors: the extent of the potentially affected geographic area, the primary impacts of the hazard event, and any related secondary impacts. While primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood event may be road closures due to submerged pavement. A possible secondary impact in these circumstances would be restricted access of emergency vehicles to citizens in a portion of the community due to the road closure.

Level of Hazard

A formula has been developed to assign a value for probability and impact for each of the hazards considered. A *Hazard Analysis Worksheet*, as well as a detailed description of all the calculations and formulas utilized, is included as Appendix A of this document. As a result of this analysis, the hazards were broken down into four distinct categories which represent the level of consideration they will receive throughout the planning process. These categories are *High, Medium-High, Medium,* and *Low*.

In order to focus on the most critical hazards that may affect the Planning District communities, the hazards assigned a level of *High* or *Medium-High* will receive the most extensive attention in the remainder of this analysis, while those with a *Medium* planning level will be discussed in more general terms. Those hazards with a planning level of *Low* have not been addressed in this plan. The level of *Low* should be interpreted as not being critical enough to warrant further evaluation; however, these hazards should not be interpreted as having zero probability or impact. Table V-1 summarizes the results of the hazard level analysis.

Table V-1 — Hazard Identification Results	
Hazard Type	**Hazard Level**
Flooding	High
Sever Winter Storms	Medium-High
Wildfire	Medium-High
Landslides	Medium-High
Severe Thunderstorms/Hail Storms	Medium
Severe Wind	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Tornado	Low
Extreme Heat	Low

Because the types of the hazards discussed above are similar, some hazards will be discussed simultaneously later in this analysis. For instance, the analysis of severe wind encompasses severe thunderstorms, hurricanes, and tornadoes. In addition, the impacts of a dam/levee failure are covered by the flood analysis. A detailed discussion of the potential hazards that have been identified as high and medium-high level events will be addressed.

Extreme heat was identified in the hazard identification as a “low” level of concern for the Planning District. Generally, extreme heat is defined as temperatures that are 10 degrees or more above the average high temperature for the region during summer months, last for a prolonged period of time, and often are accompanied by high humidity levels. Given the probability and likely limited impacts of this hazard, it was ranked a “low” level for planning consideration. Detailed analysis was not considered needed.

In addition, Karst topography was also identified as a “low” level of concern for the planning district. Karst is a distinctive landscape topography largely formed by the dissolving of carbonate bedrocks such as limestone, dolomite, or marble by water. Karst topography causes unusual surface conditions such as sinkholes, caves, disappearing streams, springs, and vertical shafts. Although Karst topography is present throughout the Planning District, historic losses and damages have been low. Much of the Karst areas throughout the region have been identified, and its presence limits future development in some areas, it does not pose a significant threat for damages and loss of life.

Flooding

The most significant and frequent natural hazard to affect the LENOWISCO Planning District is flooding. The Planning District is a mountainous region with steep ridges and pronounced valleys, with three major water basins, the Clinch River Basin, Powell River Basin, and Holston River Basin. A number of steams and tributaries are located within these water basins. The Pound River and other smaller tributaries are located in the northeast portion of the Planning District and drains into the Levisa Fork of the Big Sandy River; however, minimal information as to flooding is available regarding this basin.

Because a majority of the flood history and flood data available for the area is organized by watershed, the discussion of some flood characteristics in this section have also been organized by watershed. As can be seen from the maps included in this section, all of the counties in the LENOWISCO planning district have portions in multiple watersheds. The area of each county contained in each watershed can be seen in the Figure V-1.

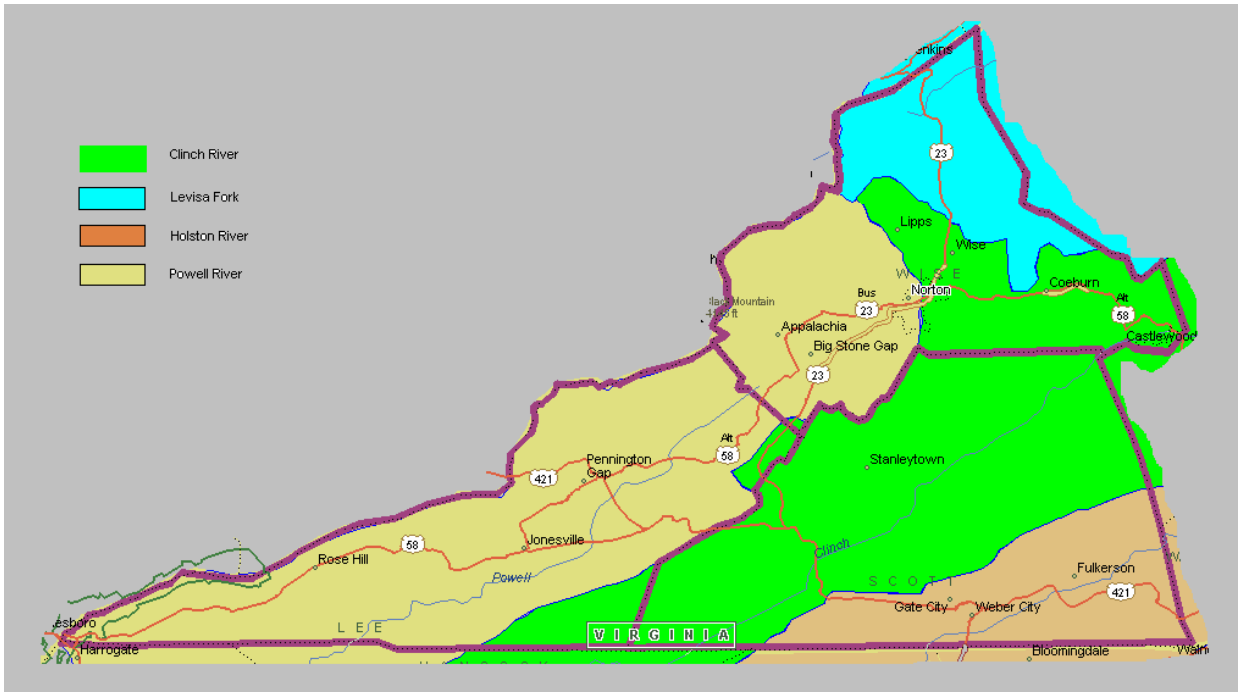


Figure V-1 — LENOWISCO Watersheds

Hazard History

The following sections include a description of the known flood history by major watershed.

Clinch River Basin

The Clinch River is one of the major rivers in the LENOWISCO planning district, with a drainage area of approximately 1,145 square miles. A majority of this area is located in Scott County, but portions are located in Lee and Wise counties. The Clinch is fed by numerous tributaries originating from the high mountain ridges throughout the drainage area. The primary tributaries to the Clinch are North Fork Clinch, flowing from the northern portion of the watershed; Stock Creek, flowing from the northwest portion of the watershed; Copper Creek, flowing from the eastern portion of the watershed; Stony Creek, flowing from the west; and Guest River, flowing from the northwestern (Wise County) portion of the watershed. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high.

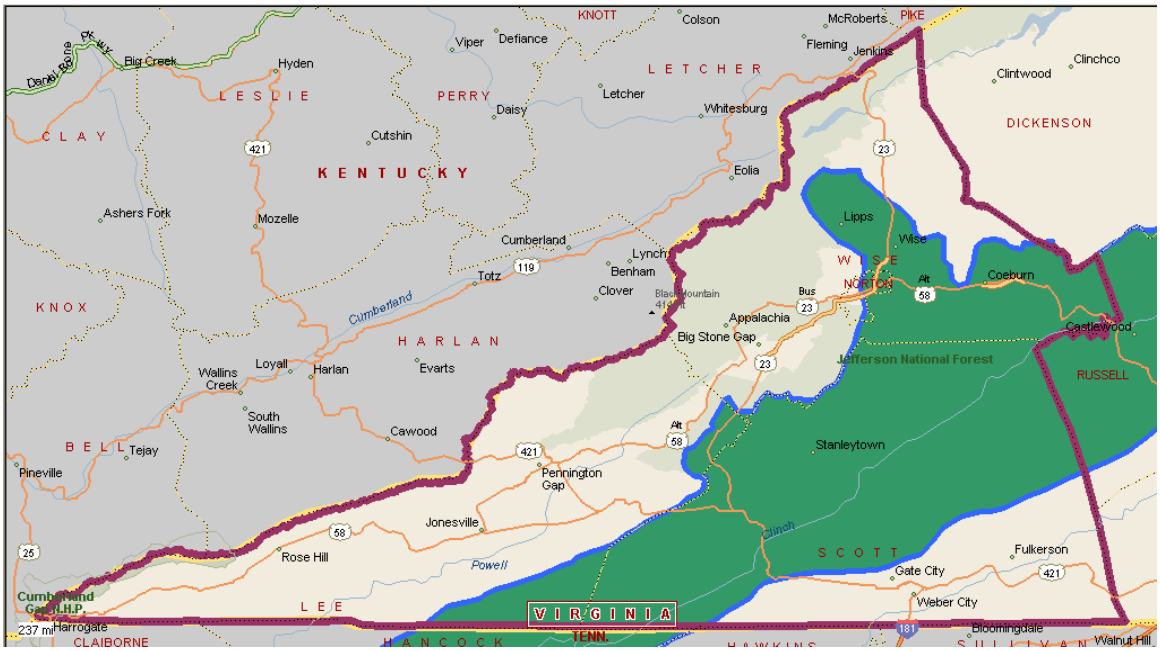


Figure V-2 — Clinch River Basin

Records of historic events in the Planning District are numerous, and floods on the Clinch River and its tributaries have been well documented.

The determined flood stage for the Clinch is 18 feet at Speers Ferry in Scott County. There have been approximately 69 recorded flood events since 1862 that have crested above this level on the Clinch. The two largest recorded floods occurred in April 1977 and February 1862 with the river cresting at approximately 37 feet at Speers Ferry in April 1977. As for most historic floods, a great deal of information is not available regarding damages due to these events. A Tennessee Valley Authority report produced in 1966 provides information of previous floods and compares all floods to the March 12, 1963 flood. The March 1963 flood level was nearly equal to those in 1862 and 1977. Records from this event indicate that several buildings were inundated with floodwaters, and roadways were blocked. Floodwater velocities in the 1963 flood

ranged from 8 feet per second in the river channel and up to 2 feet per second on the flood plain in the community of Clinchport. During a Maximum Probable Flood, the crest would be 17 to 19 feet higher than the 1963 flood, and velocities in the channel would range up to 11 feet per second and up to 4 feet per second in the flood plain.

The most recent flood event in the Planning District occurred on February 16, 2003. On the morning of February 13, 2003, a strong but slow-moving storm system developed in the lower Mississippi Valley and moved northeast toward the southern Appalachian region. Several inches of snow had fallen across region earlier in the week, with snow pack depths varying with terrain and location. It was estimated on February 13, that up to 10 inches of snow still lay on the ground on the higher ridges and mountains, especially across southwest Virginia in the Holston, Clinch, and Powell river headwater areas. By the morning of February 16, the ground across the southern Appalachian region was fully saturated with small streams everywhere flowing out of their banks, with larger streams and rivers starting to show either significant rises or flooding. While no rivers reached record levels, the widespread nature of the event, the number of people affected, and the dollar amount of damage combined to make this flood event memorable (NOAA).

Table V-2 includes flood heights for events on the Clinch River compiled from a study completed by the TVA reports of 1966 and 1977, and from USGS gauge data (TVA, USGS). The events shown are those with crest levels higher than 18 feet, the flood stage on the Clinch. Note that gauge readings prior to 1895, when the first gauge was installed at this location, have been estimated from personal accounts and high water marks.

Table V-2 — Historical Flooding on the Clinch River

TVA 1966 and 1977, USGS

OCCURANCE	LOCATION	Height (1196.52 FT) at Speers Ferry Gauge	DETAILS
March, 1826	Clinton, Tennessee		Greatest known flood on the Clinch River. No information obtained about flood. Probably a great flood occurred in upper reaches of the river in the Planning District.
February 22, 1862	Clinch River Area	1230.0 ft.	Highest known flood over most of the Clinch River area.
March, 1867	Dungannon	1229.0 ft.	No records, but residents say that flood was exceeded only by the flood of 1862
March 31, 1886	Clinton, Tennessee	1224.0 ft.	Only minor flooding in the Planning District
April 1, 1896	Speers Ferry	1221.3 ft.	First known flood reported in the records at Speers Ferry. Not a major flood upstream.
February 22, 1897	Clinch River Area	1220.3 ft	Minor flooding, no high water marks.
June 22, 1901	Entire river		Intense storms in the headwater area caused great damage and loss of life in the Richlands area.

Table V-2 — Historical Flooding on the Clinch River

TVA 1966 and 1977, USGS

OCCURANCE	LOCATION	Height (1196.52 FT) at Speers Ferry Gauge	DETAILS
March 1, 1902	Clinch River Area	1224.7 ft.	One of the largest known floods in the area. Washouts and slides occurred on the Clinch Valley Division of the Norfolk and Western Railway.
November 20, 1906	Clinch River Area	1218.1 ft.	Minor flooding reported. Railroad traffic delayed.
June 14, 1907	Clinch River Valley	1221.8 ft.	Extensive crop damage. Widely remembered flood.
April 3, 1912	Clinch River Area	1216.4 ft.	Minor flooding
April 1, 1913	Clinch River Area	1216.7 ft.	Minor flooding
March 5, 1917	Lower Clinch area	1224.0 ft.	Major flooding in the lower reaches of the Clinch River. Only minor flooding in the upper reaches.
January 29, 1918	Clinch River	1225.2 ft.	Known as the "ice tide", two to three inches of rain fell on snow covered frozen ground causing major flooding. Schools flooded at Dante
February 3 and June 13, 1923	Clinch River	1222.4 ft. 1214.9 ft.	Two floods caused some damage to the Clinch Valley Division of the Norfolk and Western Railway
December 22, 1926	Clinch River Area	1221.2 ft.	Prolonged period of rain in the lower Clinch Basin. Many washouts occurred on the smaller streams
August 14, 1940	Clinch River Basin	1217.5 ft.	Tropical storm produced two to four inches of rain caused heavy flow in the upper reaches of the river
1940 to 1957	Clinch River Area		Seven minor floods occurred that caused no particular damage
January 30, 1957	Clinch River	1225.4 ft.	Highest known flood of its time. $180,000 flood damages in St. Paul and $60,350 damages in Russell Co.
May 7, 1958	Clinch River	1220.5 ft.	Minor flood
March 12, 1963	Clinch River	1220.2 ft.	Over 100 families force to be evacuated in Richlands with two bridges in the Brooklyn area and one in the Hill Creek section were washed away or damages. Two houses in the Doran/Raven area were washed away.
March 17, 1973	Clinch River	1224.2 ft.	No record of flood damage
April , 1977	Clinch River Area	1233.2 ft.	Flood of record. $9.5 million in damages; heavy agricultural damages.
January 26, 1978	Clinch River	1223.8 ft.	No record of flood damage
February 16, 2003	Clinch River Area	1205.5 ft	Rain fall on up to 10" of snow with rising temperatures caused flooding

Recurrence intervals of floods can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gauge at Speers Ferry and the

1966 TVA Report, there have been 69 recorded events that have exceeded the flood stage on the Clinch in the past 141 years; for a flood recurrence interval of approximately once every 1.8 years. According to the flood profiles included in the FIS, the 100-year flood elevation at the USGS gauge is 1232.0 (NGVD 29), which corresponds to a flood crest of 35.48 feet, about 1.2 feet lower than the highest recorded flood level.

Powell River Basin

The Powell River is a major river in the area, with a drainage area of approximately 938 square miles. A majority of this area is located within Lee County, but portions of the watershed are also located in Wise County as well.

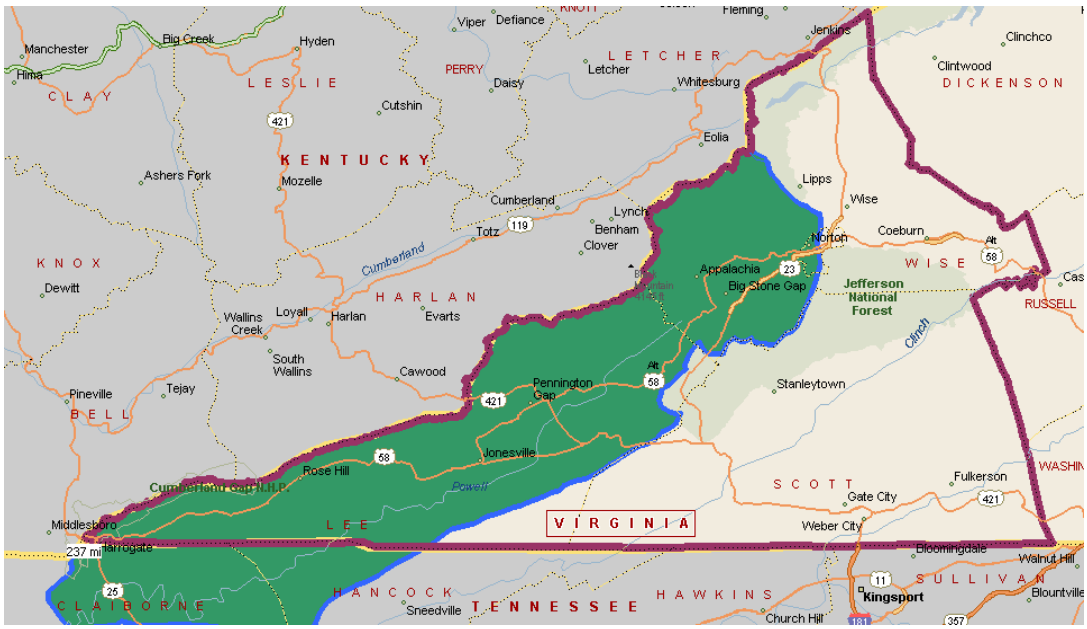


Figure V-3 — Powell River Basin

The Powell is fed by numerous tributaries originating from the high mountain ridges throughout the drainage area. The three major tributaries are North Fork Powell, South Fork Powell and Callahan Creek. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high.

Records of historic events in the Planning District are numerous, and floods on the Powell and its tributaries have been well documented. The determined flood stage for the Powell is 8 feet. There have been approximately 73 recorded flood events since 1918 that have crested above this level on the Powell. The two largest recorded floods occurred in April 1977 and March 1963, with the river cresting over 44 feet near Jonesville. As for most floods in this area, much information is not available regarding damages due to these events. A Virginia State Water Control Board report (1977) and a TVA report (1972) provide much information regarding previous floods. Records from

these events indicate that several buildings were inundated with floodwaters, and roadways were blocked.

Table V-3 includes flood heights for events on the Powell River compiled from a study completed by the TVA report of 1972 and 1977, and from USGS gauge data (TVA, USGS). The events shown are those with crest levels higher than 8 feet, the flood stage on the Powell. Note that gauge readings prior to 1918, when the first gauge was installed at this location, have been estimated from personal accounts and high water marks.

Table V-3 — 10 Highest Floods in Order of Magnitude
Powell River near Jonesville, Virginia

Date	Elevation
April 5,1977	1303.4 feet
March 12, 1963	1292.4 feet
January 1, 1918	1292.1 feet
March 18, 2002	1291.5 feet
December 31, 1969	1291.2 feet
January 8, 1946	1289.9 feet
March 7, 1967	1288.1 feet
January 30, 1957	1286.0 feet
March 17, 1973	1285.8 feet
February 11,1994	1285.7 feet

* USGS

Recurrence intervals can be estimated using the number of flood occurrences over a period of time. Based on the data from the USGS gage near Jonesville, there have been 73 recorded events that have exceeded the flood stage on the Powell in the past 85 years, for a recurrence interval of approximately once every 1.2 years. In the FEMA Flood Insurance Study, approximate methods were used to determine the extent of the floodplain of Powell River at Jonesville. Therefore, no 100-year water surface elevations were determined and no comparison could be made to the historic gauge data.

Holston River Basin

The North Fork Holston River is a major river in the Planning District. Most of the flood information available is for Big Moccasin Creek with a drainage area of approximately 94.7 square miles.

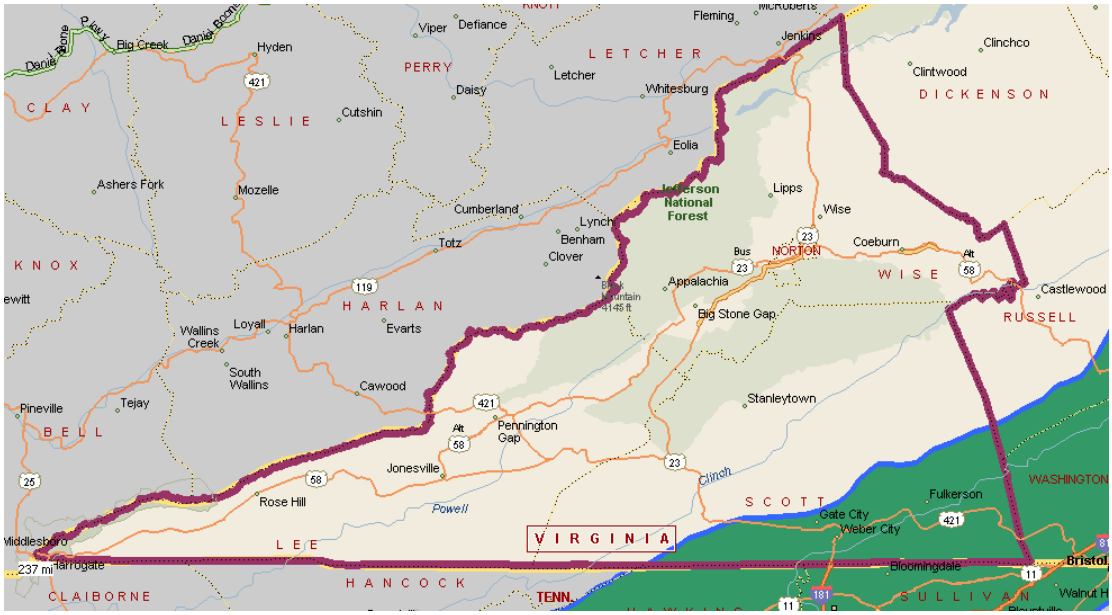


Figure V-4 — Holston River Basin

Big Moccasin Creek is fed by numerous tributaries originating from the high mountain ridges throughout the drainage area. The major tributary is Little Moccasin Creek. Due to steep mountainous terrain in the area, there is a high potential for rapid flooding following a moderate to significant rain event or spring snowmelt.

Although records of historic events in the Planning District are numerous, floods on the North Fork of the Holston are not very well documented. However, floods on Big Moccasin Creek and its tributaries have been well documented. The determined flood stage for Big Moccasin Creek is 6 feet. There have been approximately 53 recorded floods since 1862 that have crested above this level. The largest recorded flood occurred in March 1963, with the river cresting over 10 feet near Gate City. As for most floods in this area, much information is not available regarding damages due to these events. A TVA report produced in 1967 provides much information regarding previous floods. Records from these events indicate that several buildings were inundated with floodwaters, and roadways were blocked.

Table V-4 includes flood heights for events on the Big Moccasin Creek compiled from a study completed by the TVA report of 1967, and from USGS gauge data (TVA, USGS). The events shown are those with crest levels higher than 6 feet, the flood stage on the Big Moccasin Creek. Note that gauge readings prior to 1952, when the first gauge was installed at this location, have been estimated from personal accounts and high water marks.

Table V-4 — 10 Highest Floods in Order of Magnitude Big Moccasin Creek near Gate City, Virginia	
Date	**Elevation**
March 12, 1963	1277.8 feet
January 30, 1950	1276.8 feet
May 6, 1958	1276.5 feet
February 18, 1944	1276.1 feet
January 8, 1946	1276.1 feet
January 29, 1957	1276.0 feet
August 14, 1940	1275.6 feet
January 16, 1947	1275.6 feet
February 2, 1950	1275.6 feet
April 16, 1956	1275.6 feet

* USGS

Recurrence intervals can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gage near Gate City, there have been 53 recorded events that have exceeded the flood stage on the Big Moccasin Creek in the past 104 years, for a flood recurrence interval of approximately once every 1.8 years. According to the flood profiles included in the FIS, the 100-year flood elevation at the USGS gauge is 1279.3 (NGVD 29), which corresponds to a flood crest of 11.7 feet, over 1.55 feet higher than the highest recorded flood level.

Hazard Profile

The majority of the flooding in the LENOWISCO Planning District is flash flooding that occurs following a period of intense or sustained rainfall. The highly mountainous terrain and associated steep slopes cause rainwater to runoff rapidly, quickly filling streambeds following an event. Flood-producing storms can occur throughout the year; however, historically the most common months for significant flooding have been January, February, and March. These months, along with April and December, have the highest average precipitation and the highest frequency of intense rainfall events. In addition, flood events can be exacerbated by rapidly melting snow during the winter months.

Because of the mountainous terrain of the drainage area, flooding occurs rapidly, often occurring before the rain event has passed, and flow passes very quickly through the smaller tributaries of the area into the larger streams. The combined effects of these smaller tributaries can create extremely fast-moving floodwaters that greatly exceed the capacity of the larger streams. These fast-moving floodwaters allow little time for residents in the floodplain to evacuate themselves or protect their property, and the force of such rapidly flowing waters increase the potential of damage and loss of life. The duration of these flood events vary depending on the specific characteristics of the

rain event. Floodwaters generally recede rapidly once the rain event has ended, but can last from a few hours to a few days.

Warning System

Because flash floods occur rapidly and allow very little warning time, the only potential warning to an upcoming flood event comes through the ability to forecast a heavy rain event prior to its occurrence. The National Weather Service (NWS) issues flood watches and warnings when heavy rains or severe storms threaten the area. These warnings are carried to local residents through local media outlets such as television and radio stations. In addition, the NWS, in conjunction with the National Oceanic and Atmospheric Administration (NOAA), operates the NOAA Weather Radio System. This system is a nationwide network of radio transmitters that broadcasts severe weather data to relatively inexpensive special receivers that can be purchased by the public. When a severe weather alert is issued, the transmitter will switch to alert mode, notifying residents of the potential risk. Although not extensive, the measures provide residents and citizens located in a flood-prone area some warning time to prepare for a potential flood.

Secondary Effects

If a significant flood event occurs, there is a potential for a variety of secondary impacts. Some of the most common secondary effects of flooding are impacts to infrastructure and utilities such as roadways, water service, and wastewater treatment. Many of the roadways in the Planning District are vulnerable to damage due to floodwaters. The effect of flood damages to roadways can limit access to areas, cutting off some residents from emergency services as well as other essential services.

Since a major heating source in the area is propane gas, many of the properties in the floodplains have above-ground fuel storage tanks. Field observations revealed that the majority of the tanks in the floodplain are not secured or strapped down. If these tanks were to be damaged or dislodged during a flood event, the resulting gas leaks could present serious explosion risks. Tanks can also become floating projectiles in quickly moving floodwaters, causing serious damage to property and danger to individuals in their path.

Hazard Areas

The portions of the Planning District most susceptible to flooding are those directly adjacent to the areas major waterways; however, flooding can occur along the smaller tributaries throughout the area. Due to the mountainous terrain in the area and the associated steep slopes, the majority of development in the Planning District is located in the valleys along these rivers. Development generally consists of residential and agricultural uses, with commercial districts typically limited within the incorporated towns. A significant amount of the development in the Planning District is located in the floodplain.

FEMA, through the National Flood Insurance Program (NFIP), has developed Flood Insurance Rate Maps (FIRMs) that identify flood zones through detailed hydrologic and hydraulic studies. These flood zones represent the areas susceptible to the 1% annual chance flood, or 100-year flood. Whenever possible, FEMA will also determine a Base Flood Elevation (BFE) for the 100-year floodplain, which is the calculated elevation of flooding during this event. The BFE is a commonly used standard level for determining flood risk, and managing potential floodplain development. Although each specific flood event is different, these maps provide a more definitive representation of the highest flood risks in the communities. The specific flood hazard areas in each of the major watersheds are described below.

Clinch River Basin

The Clinch River, North Fork of the Clinch, Stock Creek, Copper Creek and Guest River have all been studied in detail as part of the FEMA Flood Insurance Study, and BFEs have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 100 feet wide in some locations to over 1,600 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Clinch River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFEs were determined.

As noted in the Hazard History section, the 100-year flood level has been exceeded on the Clinch River. This does not preclude the occurrence of another 100-year event in the future, as history has proven in many other places. The effective date for the FIRM is November 1, 1979. Watershed changes that have taken place since that date have not been accounted for, but their impact should be minimal due to the rural nature of the area.

Powell River Basin

The Powell River, North Fork of the Powell, South Fork of the Powell and Callahan Creek have all been studied in detail as part of the FEMA Flood Insurance Study, and BFEs have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 100 feet wide in some locations to over 1,600 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Powell River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFEs were determined.

As noted in the Hazard History section, large floods have occurred on the Powell River. This does not preclude the occurrence of a 100-year flood event in the future, as history has proven in many other places. The effective date for the FIRM is November 1, 1979. Watershed changes that have taken place since that date have not been accounted for, but their effect should be minimal due to the rural nature of the area.

Holston River Basin

The North Fork of the Holston River, Big Moccasin Creek and Little Moccasin Creek have all been studied in detail as part of the FEMA Flood Insurance Study, and BFEs have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 300 feet wide in some locations to over 1,000 feet wide in others, depending on local topography. For areas along other small streams throughout the Holston River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFEs were determined.

As noted in the Hazard History section, a 100-year flood has not been exceeded on the Holston River. This does not preclude the occurrence of 100-year event in the future, as history has proven in many other places. The effective date for the FIRM is November 1, 1979. Watershed changes that have taken place since that date have not been accounted for, but their impact should be minimal due to the rural nature of the area.

Flood Maps

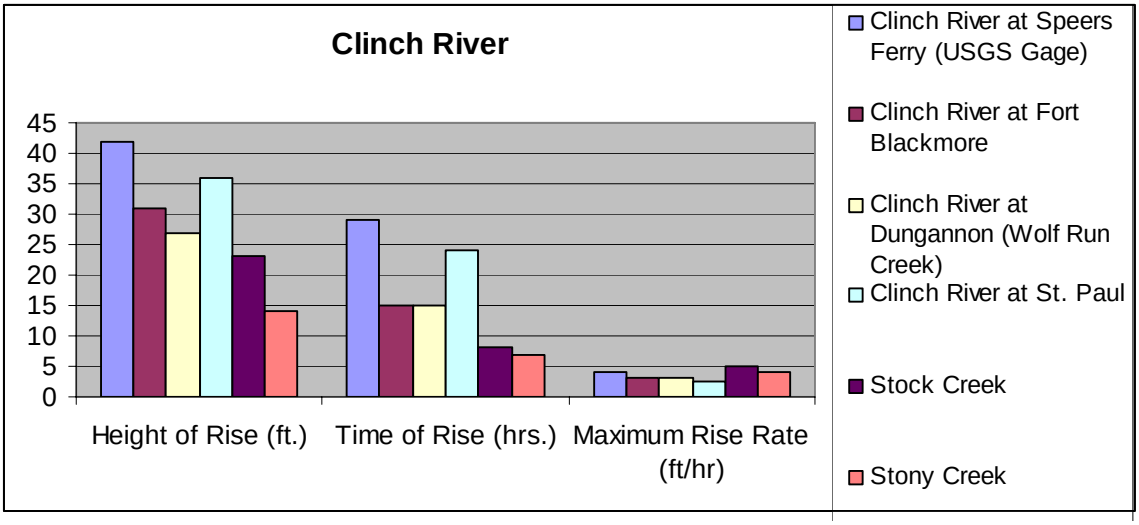
Historically, FEMA FIRMs have only been available as hard copy maps and not in digital format. However, in recent years FEMA has developed digital versions of the FIRMs called “Q3 flood maps”. These Q3 maps can be incorporated into a GIS. The only county in the LENOWISCO Planning District that currently has Q3 flood data available is Wise County. Therefore, based on input from the Planning District of the critical flood areas, portions of the 100-year floodplains of Scott and Lee Counties, as shown on the FIRMs, were geo-referenced and scanned for use with a GIS system. Although having digital versions of the floodplain for an entire county would be ideal, digitizing the floodplain for the entire county was not determined to be cost effective within the confines of this project. The areas of Lee and Scott County for which the floodplains have been digitized include the following communities: Coeburn (Wise County Unincorporated Areas), Appalachia, Big Stone Gap, Hill (Scott County Unincorporated Areas), Clinchport, Gate City, Pennington Gap, and south of St. Charles (Lee County Unincorporated Areas). Maps of these areas, including known locations of structures, can be found at the end of this section.

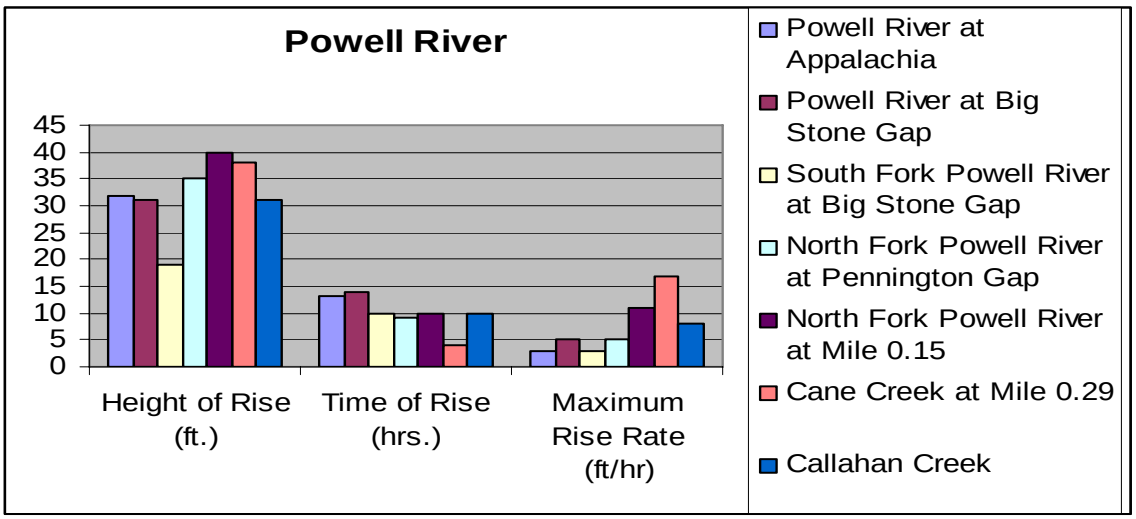
Vulnerability Analysis

In the previous sections of this analysis, specific areas susceptible to flooding in the Planning District were identified. The next step in a Hazard Identification and Risk Assessment is to identify what is vulnerable to the effects of potential flooding. Flooding impacts a community to the degree it affects the lives of its citizens and the community functions overall. Therefore, the most vulnerable areas of a community will be those most affected by floodwaters in terms of potential loss of life, damages to homes and businesses, and disruption of community services and utilities. For example, an area with a highly developed floodplain is significantly more vulnerable to the impacts of flooding than a rural or undeveloped floodplain where potential floodwaters would have little impact on the community.

A number of factors contribute to the relative vulnerabilities of certain areas in the floodplain. Development, or the presence of people and property in the hazardous areas, is a critical factor in determining vulnerability to flooding. Additional factors that contribute to flood vulnerability range from specific characteristics of the floodplain to characteristics of the structures located within the floodplain. The following is a brief discussion of some of these factors and how they may relate to the area.

- **Flood depth:** The greater the depth of flooding, the higher the potential for significant damages. Flood depths have been estimated for the maximum probable event for this area by various TVA and Corps of Engineers studies. Flood heights and rise rates in Figure V-5 are based on the Maximum Probable Flood.





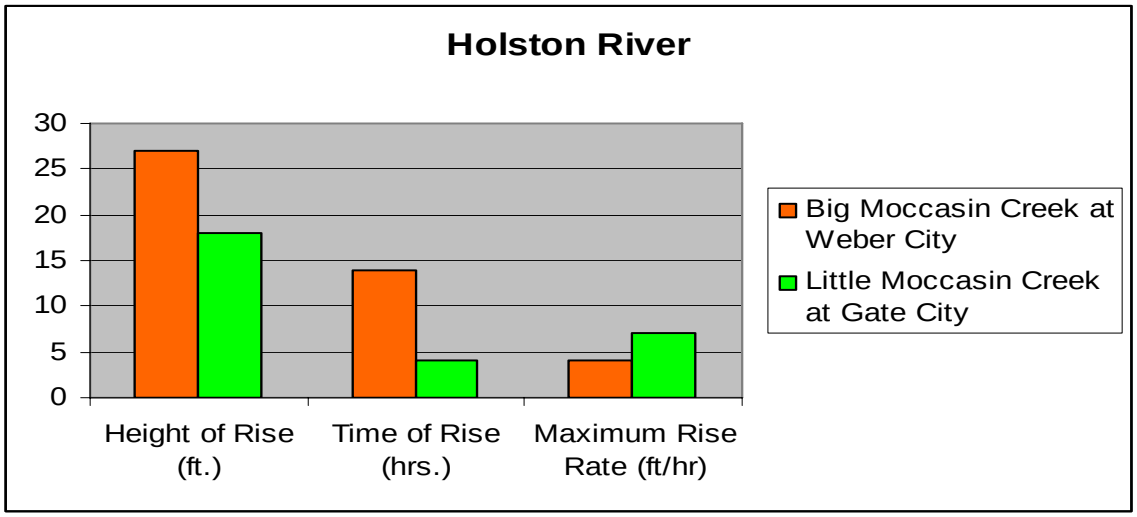
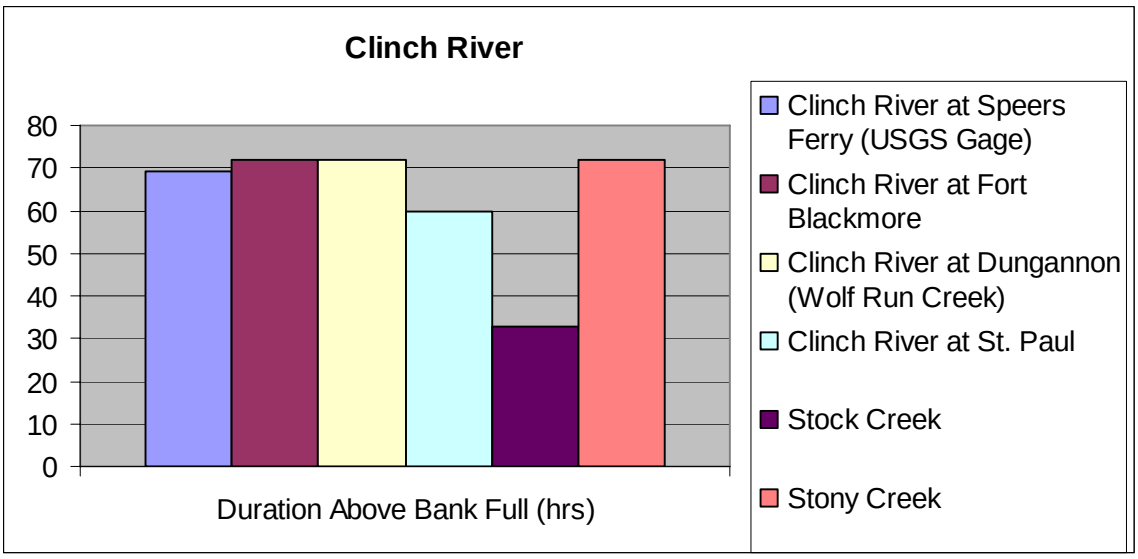
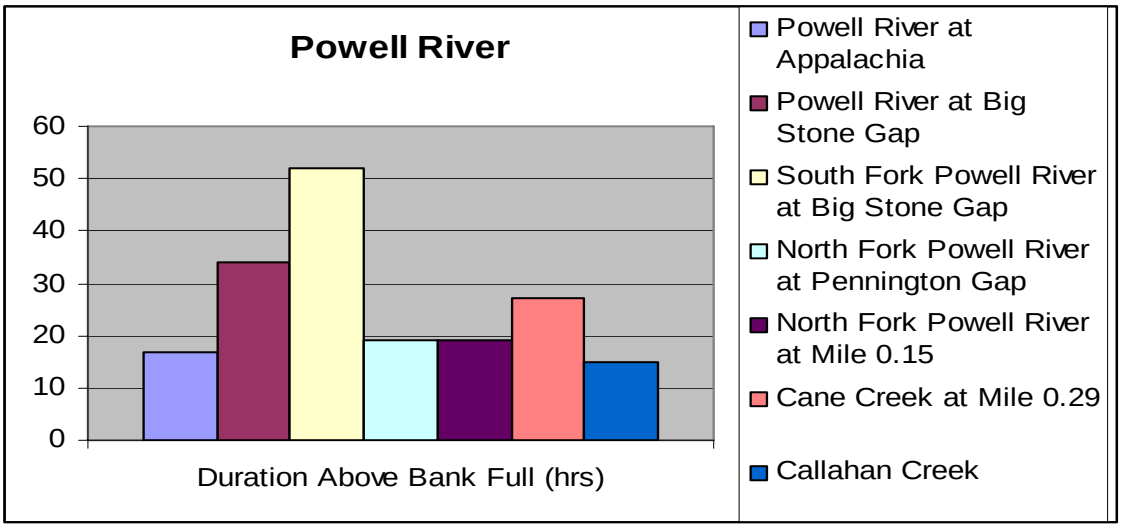


Figure V-5 — River Basin Flood Heights and Rise Rates

- **Flood duration:** The longer duration of time that floodwaters are in contact with building components such as structural members, interior finishes, and mechanical equipment, the greater the potential for damage. As stated previously, because of the steep topography of the area, floodwaters tend to recede quickly following and event, but may remain longer in localized areas. Flood durations in Figure V-6 are based on the Maximum Probable Flood.





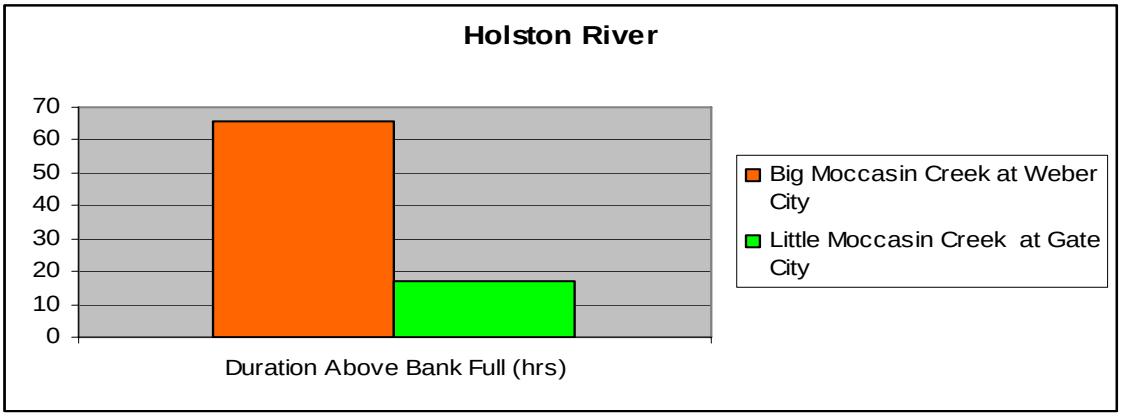
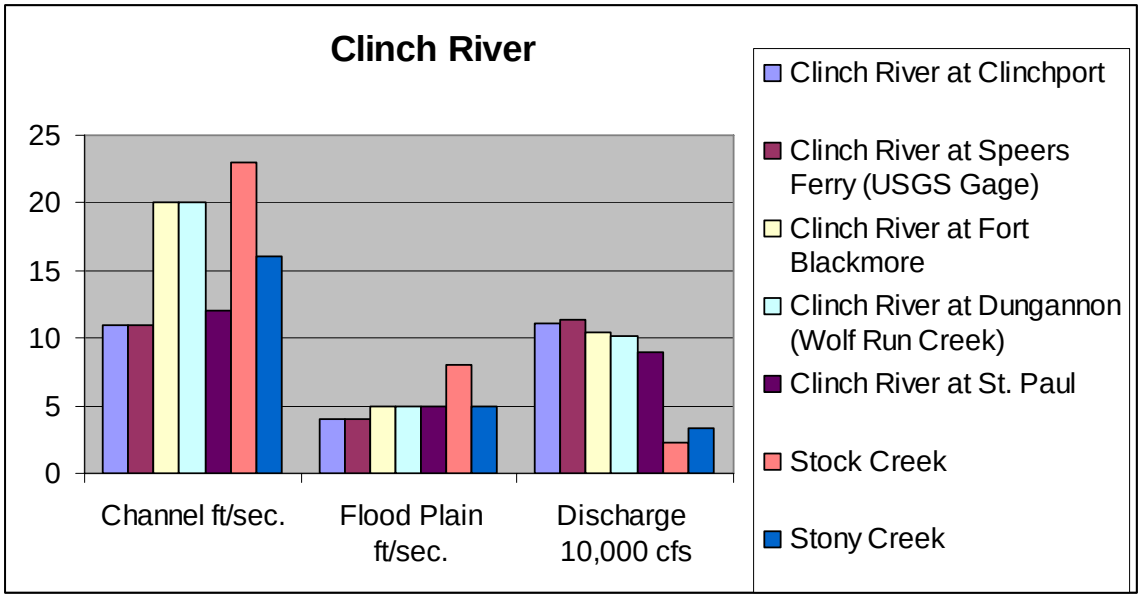
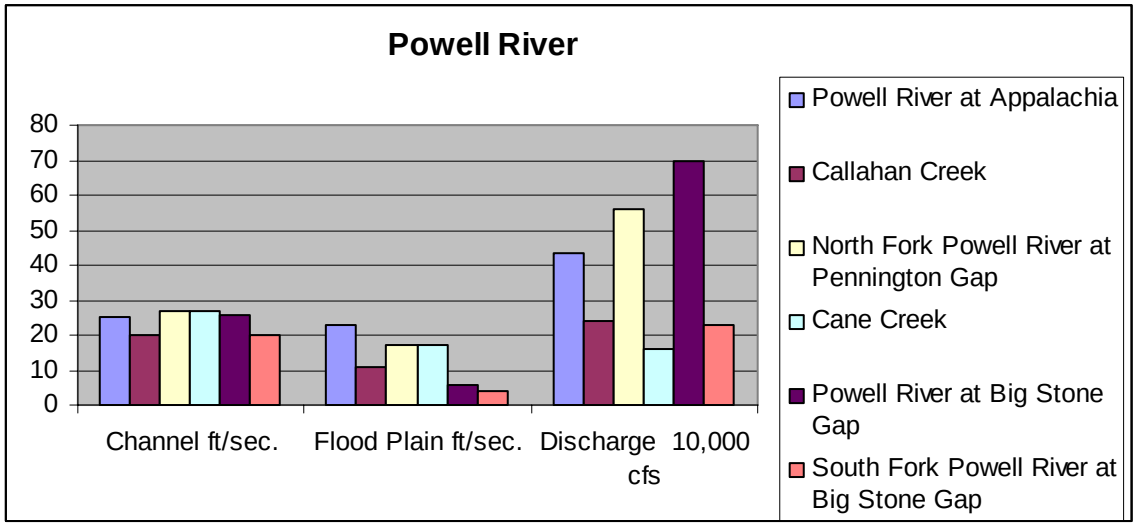


Figure V-6 — River Basin Flood Durations

- **Velocity:** Flowing water exerts forces on the structural members of a building, increasing the likelihood of significant damage. A one-foot depth of water, flowing at a velocity of 5 feet per second or greater, can knock an adult over and cause significant scour around structures and roadways (FEMA 259). The relatively high velocity of floodwaters in the area will increase damages throughout the Planning District. Flood velocities in Figure V-7 are based on the Maximum Probable Flood.





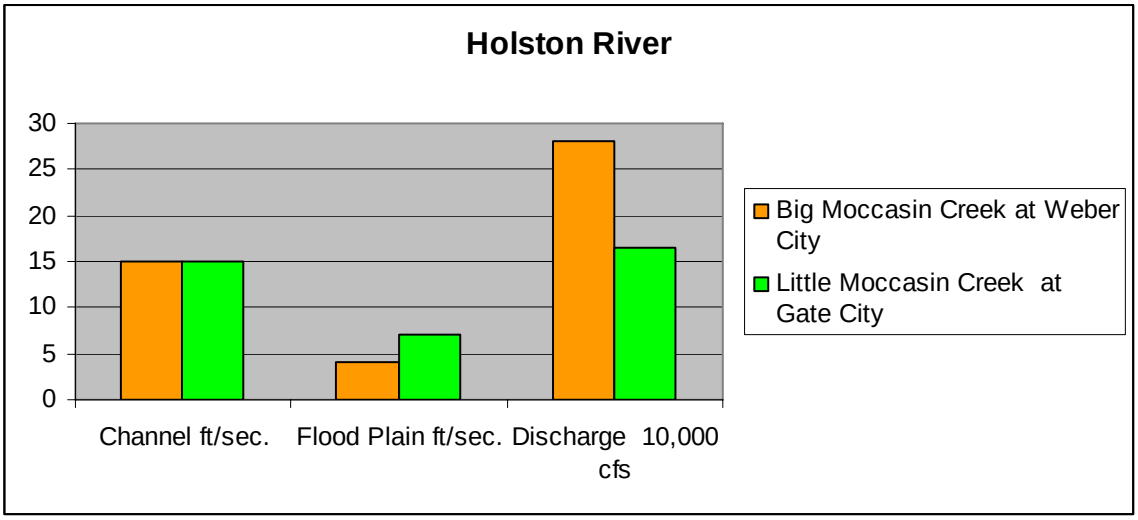


Figure V-7 — River Basin Flood Velocities

- **Elevation:** The lowest possible point where floodwaters may enter a structure is the most significant factor contributing to its vulnerability to damage due to flooding. Entry point elevations of structures throughout the Planning District area vary greatly relative to the BFE. Data on the specific elevations of these structures have not been compiled for use in this analysis.
- **Construction Type:** Certain types of construction are more resistant to the effects of floodwaters than others. Masonry buildings, constructed of brick or concrete blocks, are typically the most resistant to flood damages simply because masonry materials can be in contact with limited depths of flooding without sustaining significant damage. Wood frame structures are more susceptible to flood damage because the construction materials used are easily damaged when inundated with water. The type of construction throughout the Planning District varies from area to area. Specific building types will be discussed in the specific flood area descriptions below.

Structures at Risk

In order to assess the Planning District's potential vulnerability to flooding, specific data regarding structures located in the floodplain was collected as a part of this analysis. Structures potentially in the floodplain were identified by comparing the floodplain areas from the FEMA FIRMs with each County's existing building data. Specific data on these structures was collected during a 'windshield survey' and included the structures' occupancy type, building material type, number of stories, area, value per square foot, total value, and flooding source. Using the type, occupancy, and use of these structures, estimated building values were developed. For the purpose of this analysis, comparable buildings with the same uses, approximate age and general conditions were identified in the Planning District. Tax appraisal values for these buildings (minus land value) and R. S. Means Square Foot Costs were used to develop a square foot value for each building type, which was applied to the properties located in the flood plain to estimate a structure value. Typical per square foot costs for building construction were considered in analyzing the relative accuracy numbers developed for this analysis and some adjustments were made for certain properties in the field based on visual analysis (e.g. decreases in value for blighted or damaged buildings).

From the data collected, a total of 5,427 structures were located in the floodplain, with an estimated total value of nearly 200 million dollars. Of these structures, 3,611 are some form or residential property, 615 are commercial properties, and 1,201 are of public, church or unidentified use. The chart in Figure V-8 contains a more detailed break down of the use of all structures in the floodplain.

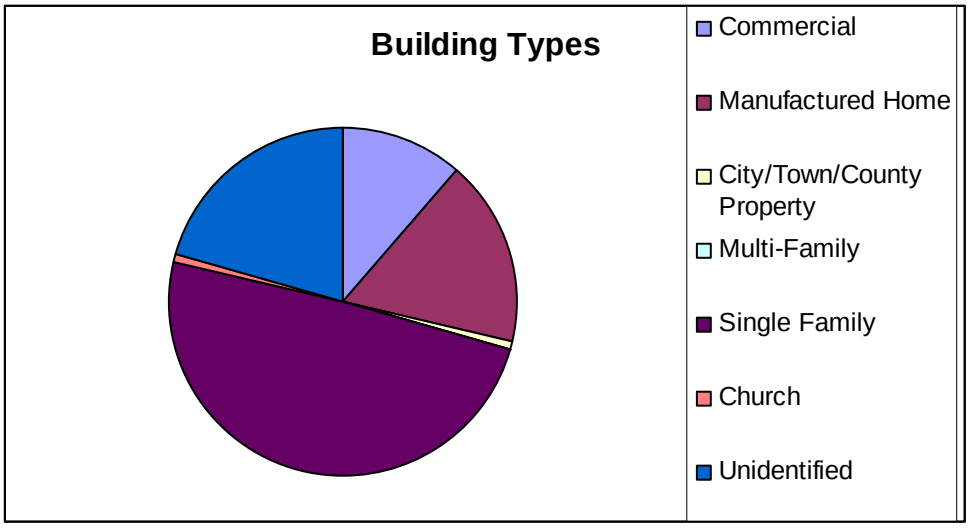


Figure V-8 — Breakdown of Building Types in the Floodplain

As demonstrated in Figure V-8, a wide variety of building types are present in the floodplains of the Planning District. A majority of the structures, approximately 67%, are residential properties. Many of the residential properties are either mobile homes or low-density residential properties.

The variances in the use and value of these structures in the floodplain are more evident when evaluated for each separate flood source. Tables V-5 through V-8 include a summary of the number, value, and predominant use of the structures located in the floodplain of all FEMA recognized flood sources. A more detailed discussion of the vulnerability of each flood source follows these tables.

Table V-5 — Structures at Risk by Flooding Source
Lee County

Flood Source	Number of Structures	Total Value	Most Prevalent Building Type	Second Most Prevalent Building Type
Clinch River	25	$1,171,238	Single Family Residential (64%)	Manufactured Home (20%)
Powell River	697	$32,953,009	Single Family Residential (63%)	Manufactured Home (21%)

Table V-6 — Structures at Risk by Flooding Source
Scott County

Flood Source	Number of Structures	Total Value	Most Prevalent Building Type	Second Most Prevalent Building Type
Clinch River	693	$34,380,986	Single Family Residential (62%)	Manufactured Home (21%)
Holston River	400	$19,621,821	Single Family Residential (63%)	Manufactured Home (21%)

Table V-7 — Structures at Risk by Flooding Source
Wise County

Flood Source	Number of Structures	Total Value	Most Prevalent Building Type	Second Most Prevalent Building Type
Clinch River	1,069	$34,791,990	Single Family Residential (39%)	Manufactured Home (23%)
Levisa Fork	908	$31,720,972	Single Family Residential (46%)	Manufactured Home (14%)
Powell River	1,381	$41,232,825	Single Family Residential (49%)	Manufactured Home (10%)

Table V-8 — Structures at Risk by Flooding Source City of Norton				
Flood Source	**Number of Structures**	**Total Value**	**Most Prevalent Building Type**	**Second Most Prevalent Building Type**
Guest River	142	$2,007,840	Single Family Residential (39%)	Manufactured Home (23%)
Powell River	112	$429,120	Single Family Residential (49%)	Manufactured Home (10%)

Clinch River

The vast majority of structures located in the floodplain of Clinch River are residential. As can be seen in Tables V-5 through V-7, the two highest uses are residential and manufactured home uses. A number of the homes in this area have estimated values between $46,072 and $52,047. In addition to the value of the actual structures, many of these structures have contents value, increasing the vulnerability to damages due to flooding.

Mobile homes are scattered throughout the area. The estimated average value of these structures along the Clinch River is approximately $25,000. These structures tend to be more vulnerable that other residential types due to their poor structural stability and flood-prone construction materials as well as the reduced means these residents have to protect themselves from potential flood damage.

Powell River

The vast majority of structures located in the floodplain of the Powell are residential. As can be seen in Tables V-5, V-7 and V-8, the two highest uses are residential and manufactured home uses. A number of the homes in this area have estimated values between $46,072 and $52,047. In addition to the value of the actual structures, many of these structures have contents value, increasing the vulnerability to damages due to flooding.

Mobile homes are scattered throughout the area. The estimated average value of these structures along the Powell River is approximately $25,000. These structures tend to be more vulnerable that other residential types due to the poor structural stability and flood-prone construction materials as well as the reduced means these residents have to protect themselves from potential flood damage.

Holston River

The vast majority of structures located in the floodplain of North Fork of the Holston are residential. As can be seen in Table V-6, the two highest uses are residential and

manufactured home uses. A number of the homes in this area have estimated values between $46,072 and $52,047. In addition to the value of the actual structures, many of these structures have contents value, increasing the vulnerability to damages due to flooding.

Mobile homes are scattered throughout the area. The estimated average value of these structures along the Holston River is approximately $25,000. These structures tend to be more vulnerable that other residential types due to the poor structural stability and flood-prone construction materials as well as the reduced means these residents have to protect themselves from potential flood damage.

Critical Facilities

The impacts of floodwaters on critical facilities, such as police and fire stations, hospitals, and water or wastewater treatment facilities, can greatly increase the overall effect of a flood event on a community. Some of these facilities located in the floodplains in the Planning District are located in areas with a high risk to flooding. Although data regarding the specific locations of these facilities in relation to the floodplain is limited, some sources of data do exist. FEMA, through the development of the Hazards US (HAZUS) software, has collected data on the location of these types of facilities nationwide. Using this data, a list of these facilities located in the floodplain has been generated, and is included in Table V-9. It should be noted that these facilities have been determined to be in the floodplain using a planning level analysis, and should be used only as a planning tool. In order to accurately determine if a structure is actually located in the floodplain, site-specific information must be available. In addition, this data set is limited by the data available from HAZUS. Other critical facilities may be located in or near the floodplain, in addition to those listed below.

Table V-9 — HAZUS – Critical Facilities in the Floodplain

Jurisdiction	Facility
Wise County	Appalachia Fire Department
	Coeburn Hospital Clinic
	Coeburn Police Department
	Pound Rescue Squad
	Pound Police Department
	Powell Valley Fire Department
	Tru-Care (medical facility)
Lee County	St Charles Elementary School
	Pennington Gap Fire Department

There are four wastewater treatment plants located near the rivers or their tributaries, but they are not located in the floodplain. If one of these facilities were to be damaged during a flood event, service could be interrupted and untreated sewage could be released into adjacent waterways.

Special needs populations are those that require additional attention during a flood event, are not as able to protect themselves prior to an event, or are not able to

understand potential risks. These can include non-English populations, elderly populations, or those in a lower socioeconomic group. Special needs populations in the Planning District area are primarily lower income and elderly individuals, living in a flood prone area, without the resources to take actions to protect themselves.

Future Land Use Trends

Due to existing development and very steep topography outside of the river valleys, developable land in the Planning District is scarce. For that reason, one of the dominant development trends in the area is redevelopment. Older, lower value structures are being destroyed and replaced by newer construction with significantly higher dollar values. This is especially true with older mobile homes that are being replaced by new pre-fabricated modular homes. Many of these structures are located in the floodplain, where this redevelopment trend is increasing the value of structures at risk to damages due to flooding in the Planning District.

Winter Storms

Severe winter storms and blizzards are extratropical cyclones that originate as mid-latitude depressions (FEMA, 1997). Snowstorms, blizzards, and ice storms are the most common examples. These storms can bring heavy snowfall, high winds, ice, and extreme cold with them. Historically, winter storms in southwestern Virginia have produced significant snowfall, sleet, and freezing rain.

Hazard History

On January 20-22, 1985, an arctic cold front swept across the state, ushering in extreme cold and high winds. Wind chill temperatures plunged well below zero. Winds knocked out power compounding the effects of the cold. Pipes froze and burst. Fresh snowfall of 4 inches helped temperatures across the entire state fall below zero. New records were set at several locations in the state.

During the winter of 1993-1994, Virginia was struck by a series of ice storms. Although ice storms are not an uncommon event in the valleys and foothills of the Appalachian Mountains, and the region had been overdue for an ice storm, it was unprecedented to have several occur in succession.

The most significant winter storm to affect the LENOWISCO Planning District was the "Super Storm of March '93", also known as "The Storm of the Century". Occurring between March 12th and 15th, 1993, this storm affected 26 states throughout the central and eastern portions of the United States. The storm resulted in a federal disaster declaration. Throughout the region, the snowfall amounts ranged from 12 inches to over 48 inches depending on elevation. Extreme southwest Virginia saw 30 to 42 inches of snow from the storm (the most snow in more than 25 years). Some roofs collapsed under the weight of the snow. Winds produced blizzard conditions over portions of the west with snow drifts up to 12 feet. Interstates were shut down. Shelters were opened for nearly 4,000 stranded travelers, and those that left were without heat and electricity. Virginia called out its National Guard to help with emergency transports and critical snow removal.

During the February 10–11, 1994 ice storm, some areas of southern Virginia received a devastating 3 inches of ice, causing tremendous tree damage and power outages for up to a week. The "Blizzard of '96" or the "Great Furlough Storm" began late on Saturday, January 6. As much as 30 to 36 inches of snow fell over the western mountains.

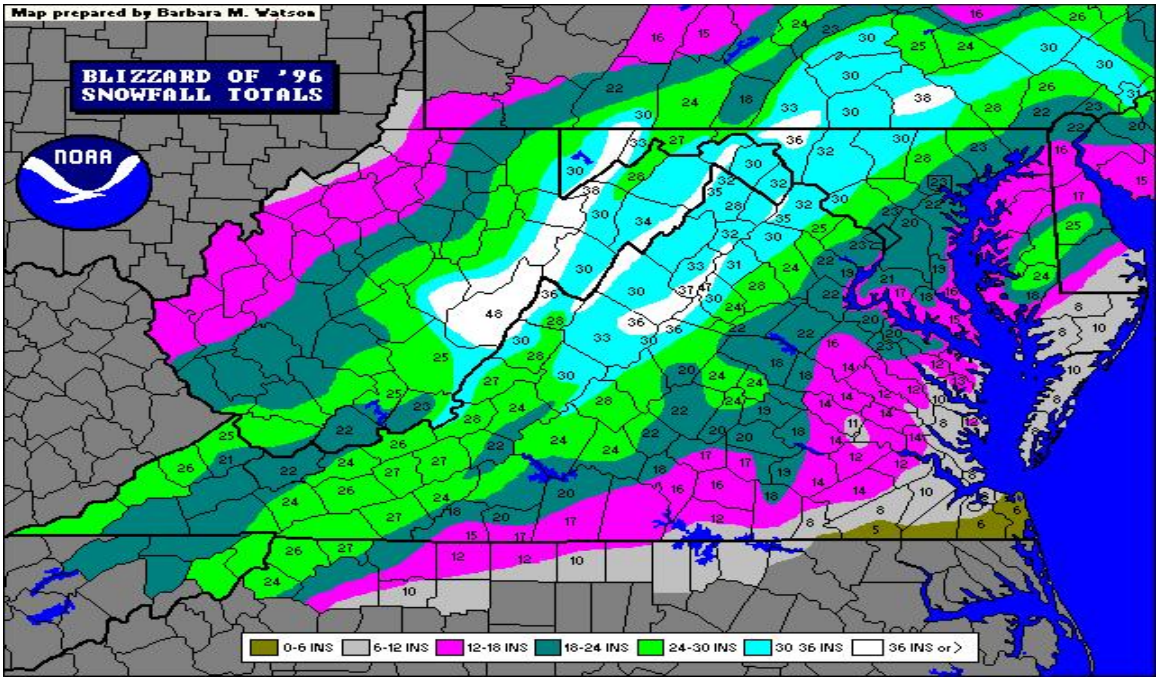


Figure V-9 — Snowfall Totals for Blizzard of 1996

Table V-10 includes ranges of snowfall for select historic events in southwest Virginia. This table is not inclusive of all historic snowfall events.

Table V-10 — Historic Snow Fall Amounts	
Date	**Amount**
February 12 –March 10, 1960	65 inches
December 10 – 12, 1960	4 - 13 inches
January 20 – 22, 1985	4 inches
March 13-14, 1993	30 - 42 inches
January 6-13, 1996	30 - 36 inches
January 27-28, 1998	12 - 24 inches

Hazard Profile

Although the Commonwealth of Virginia is not generally associated with severe winter storms, the mountainous area in the southwestern portion of the state regularly experiences several snow storms each year. These storms can produce between 4 and 12 inches of snow from each event. Total average annual snowfall within the Planning District varies from county to county. Wise County has an average annual snowfall of 37" per year, the City of Norton 15" per year, Scott County 9" per year, and Lee county 14" per year. However, as Table V-10 illustrates, storms producing higher snowfall amounts are possible.

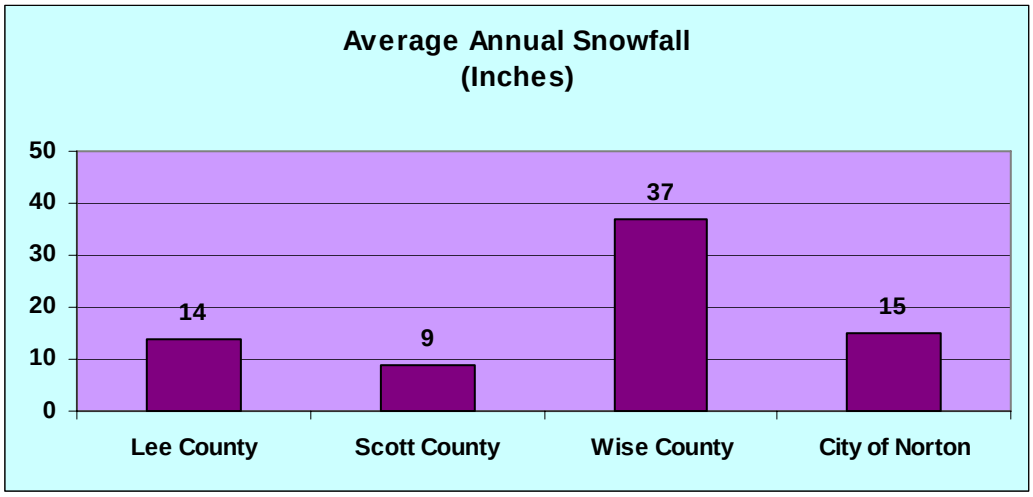


Figure V-10 — Average Annual Snowfall for LENOWISCO

In addition to snow, winter storms can also bring sleet and freezing rain to the area. Sleet is generally described as frozen water particles that fall in the form of ice, while freezing rain falls as super cooled water which can freeze on impact with the ground, trees, or roadways. In its most severe form, freezing rain can fall as part of an ice storm that can coat the area with a layer of ice up to 3" thick. Ice storms can cause significant damage by snapping tree limbs and bending trees to the ground. These fallen limbs and trees can completely block roadways, cut access to certain areas of the Planning District for days, and interfere with and destroy overhead utility lines.

Predictability and Frequency

The National Weather Service tracks winter storms by radar. Based on this radar information as well as models, the National Weather Service provides up-to-date weather information and issues winter storm watches to indicate when conditions are favorable for a winter storm, and winter storm warnings if a storm is actually occurring or detected by radar. On average, southwestern Virginia will experience between one and two severe winter storms in a given year. Snowfalls amounts for these storms can vary from a few inches to up to a foot of snow in extreme cases. The higher elevations of the Planning District (i.e. High Knob in the Jefferson National Forest) can experience as much as 48" of snow in a severe winter storm.

Secondary Effects

Secondary effects of winter storms are broad. Treacherous driving conditions can result in automobile accidents in which passengers may be injured and property damages may occur. Deliveries of heating fuel can be delayed by impassible roads. Impassable roads can also result in schools being closed because buses are not able to access their routes and bring children to school. The costs of salting and sanding roads and of snow removal can be staggering to communities both large and small. The costs to repair roads after spring thaws can also be significant.

After a significant snowfall, the resulting thaw that occurs when the temperature rises above freezing can cause flooding in some areas. As noted in the flood section of this HIRA, January through March are the months with the highest occurrences of flooding. The rainy season coincides with snowfall and subsequent melting. Because of the mountainous terrain in this area, flood events tend to occur rapidly and with little warning.

The local economy also can suffer if businesses close due to inclement winter weather. The impact could be significant in a larger event. In addition, disabled transportation systems may mean that shipments of goods and services are delayed, which may result in decreased inventory for retailers and increased inventory for industrial and commercial suppliers.

Vulnerability Analysis

Winter storms can disrupt lives for periods of a few hours or up to several days, depending upon the severity of the storm. Transportation systems are usually among the first and hardest hit sectors of a community. Snow and ice can block primary and secondary roads, and treacherous conditions make driving difficult; some motorists may be stranded during a storm, and emergency vehicles may not be able to access all areas. The steep slopes found throughout the Planning District exacerbate the situation, making some of the secondary roads impassible during even a minor winter weather event.

Utility infrastructure can also be adversely affected by winter storms. Heavy snow and ice can cause power lines to snap, leaving citizens without power and, in some cases, heat for hours or even days. Likewise, telephone lines can also snap, disabling communication within portions of a community. Frozen water pipes can rupture in people's homes, and water and sewer mains can also freeze and leak or rupture if not properly maintained. These ruptures can lead to flooding and property damage.

People's health can also be adversely affected by severe winter weather. People who lose heat in their homes and do not seek alternate shelter, people who get stuck in snowdrifts while driving, or people working and playing outdoors can suffer from hypothermia and frostbite. Since winter weather hazards generally affect the entire Planning District and vary in intensity and form, it is not possible to quantify primary effects or specific damages.

Wildfire

"A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures" (FEMA 386-2, 2001) and may originate from a variety of ignition sources. The risk of wildfires, though not as high as it is in the western U.S., is a genuine concern for the Commonwealth of Virginia. Each year, about 1,600 wildfires consume a total of 8,000 to 10,000 acres of forest and grassland in the Commonwealth.

During the fall drought of 2001, Virginia lost more than 13,000 acres to wildfires (Virginia Department of Forestry website)

In 2003, prior to the completion of this study, the Virginia Department of Forestry (VDOF) completed a statewide *Wildfire Risk Assessment (WRA)* in an attempt to quantify the varying levels of risk throughout the state. The data gathered in this risk assessment were grouped by the various Virginia Planning District Commissions (PDCs) for the years of 1995 through 2001. This assessment utilized GIS-based data for the LENOWISCO Planning District, regarding a number of wildfire related factors including hazard incidents, land cover, topography, and population density, among others. Based on this data, and utilizing a detailed risk assessment methodology, VDOF identified all areas as having a wildfire risk level of *High, Medium, Low, or None.* Because the data utilized in this statewide risk assessment is current, and the overall analysis is extremely comprehensive, the VDOF risk assessment served as the basis for this study.

Hazard History

Most of Virginia's wildfires were caused either intentionally or unintentionally by humans. Due to the growth of the population of the Commonwealth, there has been an increase in people living in the urban-wildland interface, as well as an increase in use of the forest for recreational purposes. Historical records of wildfire events specific to the LENOWISCO Planning District are limited, and not all wildfires are reported. Based on the data obtained from the VDOF WRA, between 1995 and 2001 there have been over of 620 wildfire incidents in the LENOWISCO Planning District. These incidents are shown graphically on a map prepared by VDOF, *"LENOWISCO, Wildfire Incidents From 1995 to 2001"*, included at the end of this section. Of particular note is the high number of wildfire incidences that occurred in the area straddling the Lee and Scott County border, just above the state line. The numbers of incidents, per county per year, are listed in Table V-11.

Table V-11 — Wildfire Incidents per year per County

Fire Year	County			Total
	Lee	Scott	Wise	
1995	51	40	25	116
1996	15	16	10	41
1997	15	24	25	64
1998	30	41	21	92
1999	23	49	30	102
2000	27	36	20	83
2001	51	61	12	122
Total	212	267	143	622

Lee County

Based on the 1995 to 2001 recorded data in Table 5.1, there have been 212 wildfire incidents, which have burned more than 4,980 acres and caused an estimated amount of $1,961,643 worth of damage. Of these incidents, only two (2) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (45 fires) and other incendiary causes (132 fires).

Scott County

Between 1995 and 2001, there have been 267 recorded incidences of wildfire, which have burned more than 1,890 acres and caused an estimated amount of $1,756,900 worth of damage. Of these incidents, only eight (8) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (77 fires) and other incendiary causes (130 fires).

Wise County

Between 1995 and 2001, there have been 143 recorded incidences of wildfire, which have burned more than 4,360 acres and caused an estimated amount of $158,472 worth of damage. Of these incidents, only three (3) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (41 fires) and other incendiary causes (57 fires).

Hazard Profile

Wildfires can be classified as either a wildland fire or an urban-wildland interface (UWI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. An urban-wildland interface fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In UWI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the urban-wildland interface is defined as "…the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildlands or vegetative fuels."

A wildfire hazard profile is necessary to assess the probability of risk for specific areas. Certain conditions must be present for a wildfire hazard to occur. A large source of fuel must be present; the weather must be conducive (generally hot, dry, and windy); and fire suppression sources must not be able to easily suppress and control the fire. Once a fire starts, topography, fuel, and weather are the principal factors that influence wildfire behavior. There are several factors that influence an area's risk to the occurrence of wildfires. These include, but are not limited to:

- Historical Wildfire Data

- Land Cover
- Percent Slope of Topography
- Slope Orientation
- Population Density
- Distance to Roads
- Railroad Buffer
- Road Density and Developed Areas

Historical Wildfire Data – It is generally accepted that areas where wildfires have historically been relatively prevalent (or absent) will remain similar in the future. As stated above, there are numerous portions of the LENOWISCO planning district that have high numbers of historic wildfires. Therefore, it can be assumed that the conditions that contribute to a wildfire occurrence are present in these areas, increasing the likelihood that additional fires will occur in these areas.

Land Cover – Wildfire fuels (e.g. grasses, crops, forest, urban development, etc.) determine the ease of ignition, as well as the burn intensity and advancement opportunities. Because of the rural nature of the LENOWISCO planning area, a large portion of the area is forested. These forested areas serve as a readily available fuel source, which also increases the risk of wildfire incidents and of widespread and larger events.

Percent Slope of Topography – Through convective pre-heating, wildfires generally advance uphill. In general, the steeper the slope, the greater the ease of wildfire ignition. The mountainous terrain (i.e. steep slopes) of the planning area is conducive to the ignition and advancement of wildfires. In addition, the steep slopes are a detriment to fire fighting efforts because of the difficulty in accessing and transporting firefighting equipment to wildfire sites.

Slope Orientation – Slopes that generally face south receive more direct sunlight, thereby drying fuels and creating conditions more conducive to wildfire ignition. There are numerous south-facing slopes in the planning district, creating a greater potential for wildfire occurrence.

Population Density – An overwhelming majority of wildfires in the Commonwealth are intentionally or unintentionally ignited by humans. As population increases, the more opportunities for wildfire ignition exist. Therefore, although large portions of the LENOWISCO planning area posses many of the other factors that contribute to the occurrence of wildfires, the rural characteristic of these areas decreases the risk of potential wildfires.

Distance to Roads – Travel corridors increase the probability of human presence, which in turn can result in increased potential for wildfire ignition. Hence, areas of the

LENOWISCO planning area that are in close proximity to roadways have a higher probability of wildfire.

Railroad Buffer – Railroad operations can produce sparks that may ignite a wildfire. Numerous railroads run through the LENOWISCO planning area; however, this risk is low, with only about 2% of wildfires occurring in the Commonwealth were reported to have been ignited from railroad use.

Road Density and Developed Areas – Areas that contain a large percentage of developed land and roadway networks generally feature low amounts of wildland fuels, which are typically fragmented to such a degree to minimize the risk of a wildfire. This is the case in many of the towns and villages throughout the LENOWISCO planning area, thereby lowering the overall risk to the most densely populated portions of the Planning District.

Fire Seasons

The Virginia wildfire season is normally in the spring (March and April) and then again in the fall (October and November). During these months, the relative humidity is usually lower and the winds tend to be higher. In addition, the hardwood leaves are on the ground, providing more fuel and allowing the sunlight to directly reach the forest floor, warming and drying the surface fuels.

As fire activity fluctuates during the year from month to month, it also varies from year to year. Historically extended periods of drought and hot weather can increase the risk of wildfire. Some years with adequate rain and snowfall amounts keep fire occurrences low; while other years with extended periods of warm, dry, windy, days exhibit increased fire activity.

Long-term climate trends as well as short term weather patterns play a major role in the risk of wildfires occurring (as shown in Table 5.1 for the year 2001.) For instance, short term heat waves along with periods of low humidity can also increase the risk of fire, while high winds directed at a fire can cause it to spread rapidly.

Secondary Effects

There are numerous secondary effects that could impact the LENOWISCO Planning District due to wildfires. These include an impact on tourism, and thus the local economy, through activities such as camping, hiking, hunting, and fishing. Additional secondary impacts due to wildfire include a degradation of air and water quality, as well as a threat to wildlife habitat including endangered species. Also, areas that have been burned due to wildfire have an increased risk of flooding and landslides in the event of heavy rains.

Hazard Areas

VDOF used GIS to develop a statewide spatial Wildfire Risk Assessment model to identify areas where conditions are more conducive and favorable to wildfire occurrence

and advancement. This model incorporated the factors listed in the Hazard Profile section and weighted them on the scale of 0 to 10, with 10 representing the characteristic of each factor that have the highest wildfire risk. With this model VDOF identified areas of the LENOWISCO Planning District as having a wildfire risk level of High, Medium, or Low. The results are shown on the map prepared by VDOF, *"LENOWISCO, Virginia Fire Risk Zones"*, included at the end of this section. As indicated on the map, only a very small area of each County has a low fire risk zone. The entire LENOWISCO Planning District is mostly equally divided between medium and high risk areas. The areas along the County boundaries, particularly the area between Lee and Scott Counties at the state border are the areas of high risk. This high risk is most likely due to the topography (steep slopes) and the inaccessibility of the area. The western half of Lee County is the area with the lowest number of historical incidences, and the area of low to medium risk.

Vulnerability Analysis

As stated in the section above, according the VDOF WRA large portions of the LENOWISCO planning area are at high risk for wildfire occurrence. Although these high risk areas tend to be located in the more rural and mountainous portions of the planning district, higher density areas have also been classified as having a high risk. Because these high risk areas are so vast, many of the residents of the planning area live or work in or near a high risk area. Therefore, the most significant threat to the LENOWISCO Planning District is that to human life and safety. Many residents in the area live within the urban-wildlife interface and are at the greatest risk from potential wildfires. A commonly found scenario in the LENOWISCO planning district is the 'stacking' of structures up a ridge with one-way access and flammable fuels in between the structures. These circumstances can greatly increase the risk of loss from wildfire and is hazardous to firefighters trying to protect the structures.

Structures at Risk

As stated in the previous section, large portions of the LENOWISCO planning district have been designated as having a high risk to wildfires as determined by VDOF. In an attempt to quantify the potential vulnerability in the areas, the approximate number and value of the structures located in these areas have been estimated. Because the available data regarding structures located in the three counties varies, two separate methods of determining the number and value of the structures at risk have been utilized. It should be noted what because the data used as a basis for these analyses differ, the results may vary from county to county.

Wise County

As mentioned in earlier sections of this report, Wise County has a comprehensive GIS system which includes an inventory of building locations and building type. With this data available, and because the VDOF Risk Assessment is also readily available in GIS format, determining the number of structures located in the High Risk Wildfire zone was relatively simple. The values of these structures were then estimated as described in

Section 3 of this report. Representative structures were chosen throughout the county and values were obtained using tax assessors data and by using building costs using RS Means building data. Table V-12 below includes the results of this analysis.

Table V-12— Wise County – Structures with High Wildfire Risk

Structure Type	Number of Structures	Average Value	Total Value
Residential Structures	15,557	$25,571	$397,808,047
Commercial/Public Buildings	163	$91,000	$14,833,000
Total	15,863		$412,641,047

Lee and Scott County

As stated in previous sections, current data regarding building locations and types is not available in digital GIS format. Therefore, determining the number and type of structures at risk is more difficult than in other locations. The only building data available for Lee and Scott County is the planimetric data compiled in 1981. Because this data is the best available data, it was utilized in completing an estimate of the number of structures at risk in these areas. Using this data, and the VDOF GIS data, the number of structures located in the high risk areas was determined. The number of these structures was then adjusted to account for development in these areas using growth rates obtained by comparing CENSUS data from 1980 to 2000. As described above, the structure values were estimated by identifying representative structures in the community and determining their value using local tax data and RS Means national building cost data. Table V-13 includes the estimated number of structures located in the High Risk areas in both Lee and Scott County.

Table V-13 — Lee and Scott County – Structures with High Wildfire Risk

County	Building Type	Number of Structures	Average Value	Total Value
Lee County	Residential	4507	$26,981	$121,612,075
	Commercial	501	$90,752	$45,449,839
Total		5,008		**$167,061,914**
Scott County	Residential	6057	$26,981	$163,418,605
	Commercial	673	$90,752	$61,074,111
Total		6,730		**$224,492,716**

Landslides

A landslide is an occurrence of ground movement in which soil, rock or debris move outward and downward along a slope. Types of landslides can include rock falls, deep-seated failures of slopes, shallow debris slides, and mudslides. The difference in these types of slides depends on the type of movement, as well as the type of material. Landslides can occur suddenly and dramatically or can occur slowly over a period of time. The exact location and timing of a landslide cannot be predicted. Landslides are common throughout the Appalachian Mountains because of the extremely steep slopes present.

Hazard History

Historically, numerous landslides have occurred throughout the LENOWISCO Planning District. In some cases, slide locations are still visibly apparent; unfortunately, detailed historic records of the location and extent of landslides have not been kept. Because a majority of landslide occurrences have occurred adjacent to existing roadways, or around a roadway under construction, the best resource for obtaining landslide data are the local offices of the Virginia Department of Transportation (VDOT). Therefore, VDOT representatives were specifically contacted in an attempt to gather as much information on historic landslides as possible. The following section includes a description of the landslide data by county.

Lee County

VDOT reported seven individual locations throughout Lee County where historic landslide activity has been documented. All of the reported landslides documented by VDOT are included in the northern and eastern portions of the county. These locations include:

- Route 421 west of Pennington Gap and just east of the Kentucky border
- Multiple locations along Route 606 north of Pennington Gap both east and west of Route 721
- Route 611 approximately 2.25 miles west of Route 23
- Multiple locations along Route 58 & 421 east of Route 612
- Route 621 approximately 1.0 mile west of Route 622

These location can also be found on the *"Lee County, Virginia Landslide Locations"* map, included at the end of this section.

Scott County

In Scott County, VDOT has documented historic landslide locations in 4 major areas, primarily in the southern portion of the county, which include:

- Multiple locations along Route 58 & 421, east of Route 726 and west of Route 638
- Multiple locations along Route 23, west of Gate City both east and west of Route 643
- Along Route 72 north of Gate City and approximately 1.2 miles north of Route 627
- Along Route 604 approximately 3 miles west of Route 622

These locations can also be found on the *"Scott County, Virginia Landslide Locations"* map included at the end of this section.

Wise County

VDOT has identified seven primary landslide locations throughout Wise County, a majority of which are located along major roadways throughout the county. In addition to the location of the slides VDOT also provided additional data regarding the characteristics of some of the historic slides.

- The Black Mountain section of Route 160 has had several slides in the past several years.
- The Norton Bypass section of Route 23 has had several slides.
- Indian Creek Mountain north of Wise. There is an active slide requires recurring maintenance by VDOT.
- Along Route 23 on the Pound Bypass just north of J. W. Adams School.
- The section of Route 23 between the north intersection of Route 610 and the bottom of the mountain in Powell Valley has hade major slides in the past.
- Along Route 23 in the town of Appalachia there is an active slide location that is scheduled for repairs by VDOT.
- Route Alt. 58 in the vicinity of Route 657.

These locations can also be found on the *"Wise County, Virginia Landslide Locations"* map included at the end of this section.

It should be noted that this locations do not represent all of the historic slide locations in the LENOWISCO planning district. Many small landslides that do not directly impact the public are not reported or recorded. These landslides have typically been located along smaller roadways throughout the area, and numbers of slides and potential damage amounts are unknown.

Hazard Profile

Where and when landslides occur is based on number of natural factors, and can be exacerbated by conditions created by man. The most prominent natural factors affecting

susceptibility to landslides are topography, geology, and precipitation. No single factor alone will cause a landslide to occur, but a combination of factors will. Topography plays an obvious role in the occurrence of landslides. The steeper a slope, the greater the forces of gravity that act on the rocks or soils on that slope, increasing the potential for failure. Geology is an important factor as well, as the strength of the rock, soil, or debris to resist the forces of gravity greatly affects the likelihood of a landslide. Therefore, the type and sequence of rock and soil types and layers greatly affect slope stability. The potential for landslides on slopes with the combination of steep terrain and loose or weak soil can be exacerbated by high levels of precipitation. Precipitation is a key catalyst for the occurrence of a landslide. Water can seep into the voids between soil and rock particles, decreasing the strength of the slope, and increasing the potential for landslides. As a result landslides are most common during or following heavy periods or rain.

Other factors that increase the potential of a landslide include erosion, undercutting, and slope loading. When the base of a slope is eroded or undercut, the strength of the entire slope can be compromised. In mountainous regions such as the LENOWISCO Planning District, this commonly occurs along existing roadways, or during the construction of new roadways. Slope loading can also increase the potential for landslides. The construction of structures or roadways on a steep slope can increase the strain on the material, thus increasing the potential of a slide. The amount of ground cover and vegetation on a slope also can play a role in a slopes susceptibility to landslides, as dense cover can secure an otherwise unstable slope.

Landslides can be triggered by other natural hazards. The effect of extreme precipitation including flooding has been discussed above. In addition, ground shaking associated with an earthquake can trigger landslides on un-stable slopes. Thin surface soils and steep topography throughout the LENOWISCO Planning District create conditions favorable to erosion and landslides. Widespread construction of roads, clearing of lands, and preparation of development sites on very steep slopes exacerbate the problem.

Predictability

The exact time or location that a landslide will occur cannot be predicted. As previously discussed, landslides can be caused by a combination of many different factors. In some instances, the potential for a landslide to occur at a particular location can be identified based not only on topographical and geologic factors, but also on other physical indicators. The United States Geological Survey (USGS) has developed a landslide overview map for the United States that combines susceptibility to landslides as well as the history of past landslide incidences in the area. The map ranks the susceptibility of and area and the past incidence on a level of high, moderate, and low. A level of high incidence was given to areas where more than 15% of the land had been involved in land sliding, and a level of high susceptibility was given to areas where more than 15% of the land area was determined to be susceptible to landslides based on geologic and topographic factors. Virtually the entire LENOWISCO Planning District is

located within an area of both high susceptibility and high incidence, indicating the highest possible national risk level.

Hazard Areas

Because of the physical characteristics of the area, virtually the entire LENOWISCO Planning District is located in a high risk area to the effects of landslides. As stated previously, due to the many factors that contribute to when and where a landslide will occur, it is extremely difficult to indicate precise locations that are at a greater risk of being affected by a landslide than other areas. However, one of the best indicators of where a landslide may occur are locations of past landslide activity. These areas have demonstrated susceptibility to landslide occurrence, making additional landslides at these locations likely.

Historic landslide problem areas are indicated in the landslide location maps included at the end of this section. As noted previously, these maps do not depict all areas within the LENOWISCO Planning District where historic landslides have occurred, or where they may be a problem in the future. Historically, detailed records have not been maintained by local or county governments, therefore the data required to identify all known high landslide risk areas located within the planning district is not available.

Vulnerability Assessment

Because the conditions that cause a landslide are extremely site specific, the impacts of an individual landslide can vary greatly. Landslides can damage or potentially destroy anything in the path of the slide including homses, businesses, roads, and utilities. Landslide debris can also partially or fully block rivers, in which case the potential for significant flooding exists. The precise impacts of a landslide will depend on the specific characteristics of the slide, as well as the level of development in the slide area.

Due to the extreme steep slopes throughout the LENOWISCO Planning District, virtually all of the development in the area is at high risk to the effects of landslides. The vulnerability of specific structures and assets can only be determined by a detailed investigation of the site characteristics, primarily the proximity to at-risk slopes. A majority of the more densely developed areas of the LENOWISCO Planning District are located in areas with more gradual slopes. Therefore, the risk of widespread damages due to landslides in the densely developed areas is limited. However, a majority of the unincorporated areas throughout the planning district have extremely steep slopes. The potential for landslide damage to structures in these areas could be high.

Based on past occurrences, the most vulnerable assets located within the LENOWISCO Planning District are its roadways. Many of the roads in the area traverse steep slopes increasing the vulnerability to damage. The damage to a roadway affected by a landslide can vary from partial blockage to total destruction. In addition to the damage to the road itself, more significant economic and safety impacts may be felt by the community due the loss of function of the roadway. Many of the roadways throughout the planning district provide the only direct access from one community to another, or

potentially the only access certain remote areas. This reduction in access can increase the response time of emergency vehicles, creating a potentially serious threat to public safety in these areas.

Wind Events

Wind can be one of the most destructive forces of nature. Strong winds can erode mountains and shorelines, topple trees and buildings, and destroy a community's critical utilities and infrastructure. Primarily, damaging winds that affect the LENOWISCO Planning District are associated with severe thunderstorms, or the remnants of a tropical storm or hurricane. Winds from a severe thunderstorm can reach over 60 mph in the southwest Virginia region. These storms generally develop along a cold front and can extend for hundreds of miles.

Although rare, tornadoes can occur in the Planning District. If a tornado were to impact the Planning District, the level of damages sustained would depend most on the strength of the tornado, measured by the Fujita Scale, along with the type and number of facilities and resources impacted. Table V-14 includes the corresponding wind speeds for the Fujita Scale, and typical damage descriptions for each level.

Table V-14 — The Fujita Scale

Scale Value	Wind Speed (mph)	Description of Typical Damage
F0	40-72	Light damage. Tree branches snapped; antennas and signs damaged.
F1	73-112	Moderate damage. Roofs off; trees snapped; trailers moved and/or overturned.
F2	113-157	Considerable damage. Weak structures and trailers demolished; cars moved.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed buildings; trains overturned; trees uprooted; cars lifted up and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures blown off weak foundations; cars thrown; large missiles generated.
F5	261-318	Incredible damage. Houses lifted off foundations and carried some distance; large missiles thrown over 100 yards; trees debarked.

Hazard History

Records of the impacts of high wind events in the Planning District are limited. The relatively large distance between the Planning District and the Atlantic Coast limit the impacts of the winds associated with hurricanes and tropical storms. Because the highest winds speeds associated with a hurricane or tropical storm are typically located to the east of the storm's eye, and the path of most of these storms are to the east of the Planning District, extremely high winds from these events are rare. Damaging winds

from severe thunderstorms have occurred throughout Southwest Virginia on a regular basis. Wind damages have typically been localized throughout the region and have included broken tree limbs, blown down trees, damage to power lines, and moderate building damage. The following article contains an account of a high wind event in the LENOWISCO planning district.

> **May 2, 1929, "Virginia's Deadliest Tornado Outbreak":** It has been said that tornadoes do not occur in mountainous areas. This is false. It was a warm May day with a cold front moving in from the west. The first tornado hit Rye Cove in Scott County in extreme southwest Virginia. The elevation of Rye Cove is about 1500 feet and it sits between two ridges that rise another 500 feet above. The tornado struck the school house and the principal described what he saw:
>
> *"It was raining at the time, 11:55 a.m., and classes were recessed for noon. About 25 children were in the building, the remainder being on the playground. I was walking down the hall when I saw what looked like a whirlwind coming up the hollow. Trees were swaying and as the whirlwind neared the building, it became a black cloud. It struck the building and I believe I yelled. The next thing I remember, I was standing knee-deep in a pond 75 feet from where the building stood. I was badly shaken up and frightened and surprised that I was able to wade out of the water. Bodies of children were scattered over a wide radius."*
>
> Twelve children and a teacher were killed and 42 more were injured. The school was an oak-framed, well-constructed, two-story building. It contained 10 classrooms and an assembly room. An eyewitness from a nearby hillside saw two clouds rush together about a mile down the valley. They formed the tornado that struck the school just moments later. The school collapsed and pieces were scattered up to 2 miles. The tornado continued on for a few miles, but fortunately, no other communities were in its path. Several buildings in Rye Cove were destroyed. A total of 100 people were injured.
>
> (Virginia Tornados: Written by: Barbara McNaught Watson, Warning Coordination Meteorologist, Sterling, Virginia)

Due to the mountainous terrain, tornado occurrences in the area have been rare, although they are possible. Table V-15 includes historical tornado occurrences in the counties within the Planning District.

Table V-15 — Tornadoes from 1776-2001

County	# of Tornadoes
Lee	2
Scott	3
Wise	1
City of Norton	0

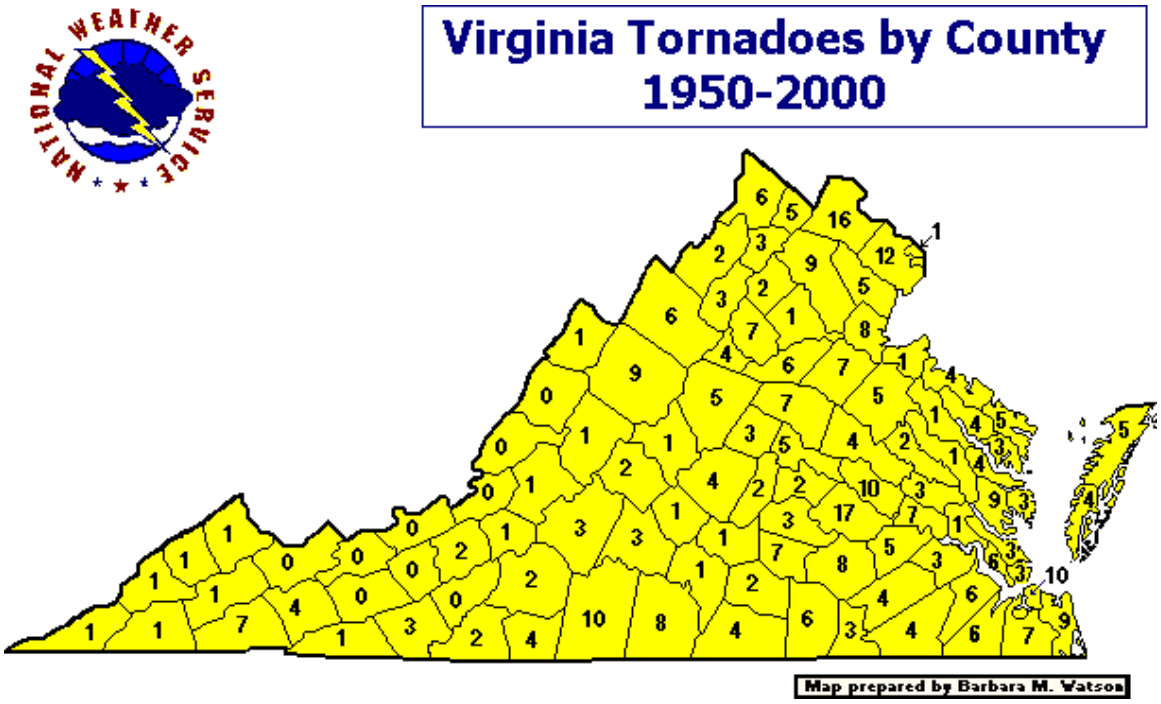


Figure V-11 — Virginia Tornado Totals by County

Hazard Areas

The Planning District is not classified as an area with a higher than average base wind speed nationally. According to the Virginia Uniform Statewide Building Code (BOCA, 1996), the minimum design wind speed for the Planning District area is 70 mph.

High wind events, primarily severe thunderstorms, have occurred in every portion of the Planning District. There are no proven indicators to predict specifically where high winds may occur, and these events can be expansive enough to affect the entire area. Although localized geography, such as mountain ranges and gorges, can contribute to potential damages caused by these events, no specific locations within the Planning District have been identified due to these conditions. Therefore, the entire Planning District is considered to have an equal risk of being impacted by a high wind event.

Vulnerability Analysis

Depending on the type of wind event, the damage sustained can range from extremely localized to widespread, and from moderate to devastating. The potential impacts of a severe wind event to the Planning District depend on the specific characteristics of the event but can include broken tree branches and uprooted trees; snapped power, cable, and telephone lines; damaged radio, television, and communication towers; damaged and torn off roofs; blown out walls and garage doors; overturned vehicles; totally destroyed homes and businesses; and serious injury and loss of life. Downed trees and

power lines can fall across roadways and block key access routes, as well as cause extended power outages to portions of the Planning District.

The extent and degree of damages from a high wind event are primarily related to the intensity of the event, measured in terms of wind speed. Sustained high winds can be the most damaging, although a concentrated gust can also cause significant damage. As wind speeds increase, the extent of damage varies depending on a number of site-specific characteristics that will be discussed later in this section.

Although no specific areas of the Planning District can be designated as having a higher risk of being affected by a severe wind event, there are a number of factors that contribute to a particular area's vulnerability to damages if a high wind event should occur. Certain characteristics of an area or of a structure increase its resistance to damages then others. Many of these factors are extremely specific to the particular location, or the particular structure in question. However, each factor's affects on vulnerability can be discussed in general. The following is a list of these factors and a description of how they relate to vulnerability, particularly in the Planning District.

Design Wind Pressures

Buildings must be designed to withstand both external and internal wind pressures on the structural framing and exterior elements. The level to which these structures are designed, as expected, directly correlates with their ability to resist damages due to high winds. The State's building code dictates to what design wind speed a structure must be designed to. When stipulating the design wind load of residential and commercial structures, the Virginia Uniform Statewide Building Code refers to the standards developed in BOCA, 1996. As described in the previous section, the design wind speed for the Planning District is determined to be 70 mph. For some building types, those structures constructed subsequent to the adoption of the building code are the most likely to be the most resistant to damages from wind. However, the resistance to wind damage based on these code requirements is only effective to the level the requirements are enforced, and no comprehensive data on the date built for these structures exists for the Planning District.

Building Type

The type of building construction will have a significant impact on potential damages from high wind events. A summary of basic building types – listed in order of decreasing vulnerability (from most to least vulnerable) – is provided below.

- **Manufactured:** This building type includes manufactured buildings that are produced in large numbers of identical or smaller units. These structures typically include light metal structures or mobile homes.
- **Non–Engineered Wood:** Wood buildings that have not been specifically engineered during design. These structures may include single and multi-family

residences, some one or two story apartment units, and small commercial buildings.

- **Non-Engineered Masonry:** Masonry buildings that have not been specifically engineered during design. These structures may include single and multi-family residences, some one or two story apartment units, and some small commercial buildings.
- **Lightly Engineered:** Structures of this type may combine masonry, light steel framing, open-web steel joists, wood framing, and wood rafters. Some portions of these buildings have been engineered attention while others have not. Examples of these structures include motels, commercial, and light industrial buildings.
- **Fully Engineered:** These buildings typically have been designed for a specific location, and have been fully engineered during design. Examples include high-rise office buildings, hotels, hospitals, and most public buildings.

The Planning District includes a variety of building types. Residential construction is primarily wood framed, varying from single story to multiple stories, although some masonry residential properties are present as well. As mentioned in the list above, non-engineered wood framed structures are among the most susceptible to potential damage. With this type of construction being the most prevalent for residential properties in the Planning District, a majority of residential structures in the area could be classified to have a high level of vulnerability to damages should a high wind event occur.

Other types of structures found throughout the Planning District that are vulnerable to damages during high wind events are metal framed buildings, primarily associated with light industrial buildings, as well as some agricultural buildings.

According to the Virginia Uniform Statewide Building Code, agricultural buildings, such as barns and silos, are required to meet minimum requirements and be constructed in accordance with the state building code. Although the potential for human losses in these structures may be lower, the potential for high amounts of damages are significant.

Other building related factors that impact the potential for damage include height, shape, and the integrity of the building envelope. Taller buildings and those with complex shapes and complicated roofs are subject to higher wind pressures than those with simple configurations. The building envelope is composed of exterior building components and cladding elements including doors and windows, exterior siding, roof coverings, and roof sheathing. Any failure or breach of the building envelope can lead to increased pressures on the interior of the structure, further damage to contents and framing, and possible collapse.

Critical Facilities

The vulnerability of critical facilities such as police and fire stations, hospitals, shelters, and utility services varies greatly depending on the factors described in the sections above. In order to accurately assess the relative vulnerability of these structures, data regarding the vulnerability factors would be required. Generalizations based on the vulnerability factors can be made in certain instances. Due to the high level of importance to the community, the ability of these structures to resist the forces of high wind events greatly affects the community's overall vulnerability to these hazards.

Estimating Losses

Due to the varying characteristics of the potential wind events that can affect the Planning District, preparing loss estimation for a particular event is not a simple task. Severe thunderstorms or straight line wind events could bring severe winds to the entire Planning District, although damages may only occur in localized areas. However, potential wind damages can be estimated on various structure types based on the potential wind speeds and building types described in the sections above.

The FEMA Benefit Cost module, used for estimating the benefits of potential wind mitigation projects, contains a wind damage function based on building type and potential wind speed. This wind damage function expresses the potential damage to a building as a percentage of the building's replacement value, and potential damages to a building's contents as a percentage of the value of its contents. For use in this module, FEMA separates structures according to the building types described in the Vulnerability Analysis section.

Using these building types, and the potential wind speeds for the LENOWISCO planning district, potential damages can be expressed in terms of a percentage of the building and contents values. ASCE 7 categorizes the southwest Virginia area as a 90-mph wind zone, based on a 50-year recurrence interval. Based on ASCE 7, the potential wind speed for an event with a 100-year recurrence interval was estimated to be 107% of the 50-year wind speed, or 96.3 mph. Table V-16 includes estimates of potential damage of the specific building types in the LENOWISCO area for the 50- and 100-year interval wind event. It should be noted that the 100-year wind speed assumed corresponds with an F1 category tornado on the Fujita scale. Damages from the impact of a tornado stronger than an F1 could greatly exceed these estimates.

Table V-16 — Potential Wind Damage by Building Type				
	50-Year Event (90 mph)		100-Year Event (96.3 mph)	
Building Type	**Building Damage**	**Contents Damage**	**Building Damage**	**Contents Damage**
Manufactured	25%	40%	50%	100%
Light Engineered	5%	2.5%	15%	15%
Non-Engineered Wood	7.5%	5%	20%	20%
Non-Engineered Masonry	5%	2.5%	15%	15%
Fully Engineered	2.5%	2.5%	5%	15%

Earthquake

The earth's surface is composed of a series of tectonic plates, which are constantly moving and shifting against one another. The movement of these plates causes stress to develop along plate boundaries and along fault lines. When the stress along one of these boundaries or fault lines exceeds the strength of the adjacent rock and earth, a slip or fracture occurs, releasing the built up energy as waves. These energy waves travel through the earth's crust up to the ground surface, causing the shaking that is associated with an earthquake.

Earthquakes in the United States occur most frequently along the West Coast, due to the close proximity to the North American plate boundary. Earthquakes can also occur along the East Coast of the United States, but the mechanisms causing these earthquakes are as not well understood, as these earthquakes occur within the plate rather than at plate boundaries (USGS, 2003).

The Commonwealth of Virginia is subject to earthquakes occurring in two primary areas of seismic activity. The Eastern Tennessee Seismic Zone extends from Charleston, South Carolina through western North Carolina and eastern Tennessee into central Virginia. The New Madrid Seismic Zone is located in southern Missouri. Both zones have the potential to affect the LENOWISCO Planning District. Although these faults have not produced a significant earthquake in recent years, both have a history and the potential to produce severely damaging earthquakes in the future.

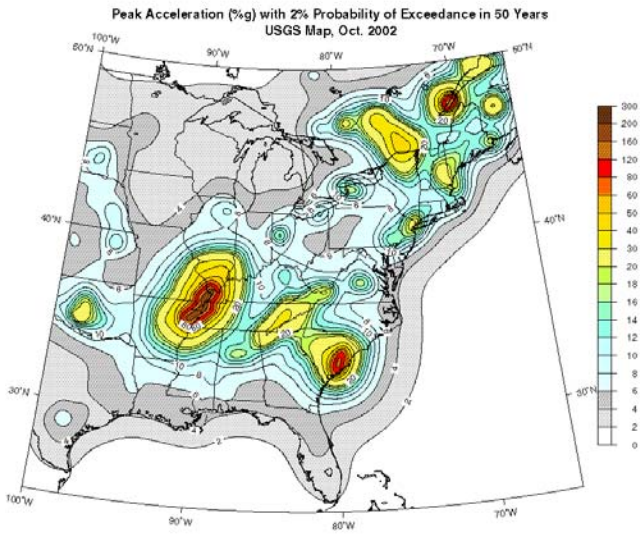


Figure V-12 — Earthquake Probability Map

When earthquakes occur, the shaking motion is measured on an instrument called a seismograph. The wave peaks on a seismograph indicate the strength of the shaking motion of the earthquake. The magnitude of an earthquake depends on how much energy is released and is used to measure the size of an earthquake's source (USGS, 2003). The magnitude is expressed in terms of the Richter scale, which is a logarithmic mathematical formula based on the amplitude of the waves measured by the seismograph. The Richter scale uses whole numbers and decimals to measure earthquake magnitudes.

In addition to magnitude, an earthquake can also be measured in terms of intensity. The intensity of an earthquake is the effect of the earthquake on the earth's surface. In the United States, the intensity is commonly measured with the Modified Mercalli Intensity Scale (MMI). This scale assigns an intensity level to an earthquake depending on the effects of an earthquake felt at a particular location, such as chimneys damaged, people awakened, and levels of building damage. Because this scale is based on the actual effects of an event, the intensity of a particular earthquake will vary by location, generally decreasing in intensity the farther the location is from the source, or epicenter of the earthquake.

Table V-17 includes the levels for both the MMI scale and the Richter scale, as well as the associated levels of damages.

Table V-17 — Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	<10	

Table V-17 — Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale Magnitude
II	Feeble	Some people feel it	<25	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	<50	
IV	Moderate	Felt by people walking	<100	
V	Slightly Strong	Sleepers awake; church bells ring	<250	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<500	<5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls	<1000	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	<2500	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<5000	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7500	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<9800	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>9800	>8.1

Hazard History

The largest recorded earthquake to occur along the East Coast of the United States occurred in Charleston, South Carolina on September 1, 1886. This earthquake is estimated to have been magnitude 7.3 on the Richter scale and was felt as far away as Boston, Massachusetts and Milwaukee, Wisconsin. Overall, this earthquake resulted in 60 lives lost and an estimated $5 – $6 million in damages.

The largest historic earthquake to occur within the Commonwealth of Virginia occurred in Giles County on May 31, 1897. There were other seismic events preceding the earthquake, as tremors on May 3, 1897 caused damage in the areas around Pulaski, Radford, and Roanoke. In addition, loud rumblings were reported near the epicenter

between May 3 and May 31. The event of May 31 was felt from Georgia to Pennsylvania and as far west as Indiana and Kentucky, encompassing a 280,000-square mile area. In Pearisburg, Virginia, walls of old brick houses cracked, bricks were thrown from chimney tops, springs were muddied, and some earth fissures appeared. Minor aftershocks continued through June 6, 1897, and other shocks were observed on June 28, September 3, and October 21. On February 5, 1898, Pulaski reported additional chimney damage and people rushed into the street during a tremor.

The LENOWISCO Planning District also was impacted by the 1811-1812 earthquakes that occurred along the New Madrid fault in Missouri. This earthquake had an approximate magnitude of 7.2 at its epicenter and had an intensity of VI throughout the Planning District. Although powerful, damages associated with this earthquake were limited due to the relatively low population density throughout the region at the time of the event.

Table V-18 includes a list of recorded earthquakes that have either occurred in the Commonwealth of Virginia, or have occurred in neighboring states that have affected Virginia, based on the most complete data available. The intensity and magnitude of all these events are not known, and in some cases damages may have occurred but were not recorded. This table is not intended to represent earthquakes affecting the Planning District, but to provide an overview of the seismic history of Virginia.

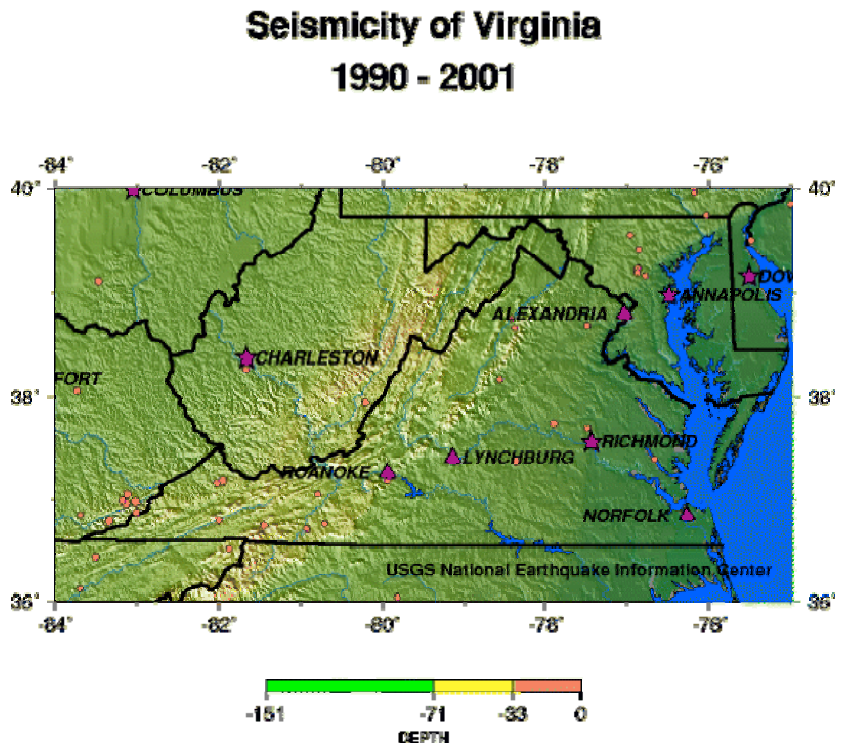
Table V-18 — Historic Earthquakes affecting Virginia

Date	Location	Magnitude Intensity	Description
February 21, 1774	Virginia/North Carolina	Unknown	Shock felt throughout area
December 1811 February 1812	New Madrid, MO	Intensity: VI Magnitude: 7.1-7.2	Small amount of damage due to low population density
March 9, 1828	Southwestern Virginia	Intensity: V	Shaking felt throughout State
August 27, 1833	Richmond, VA	Intensity: V	Two miners killed in Dover Mills near Richmond
April 29, 1852	Wytheville, VA	Intensity: VI	Chimney damage, windows rattled
August 31, 1861	Southwestern Virginia	Intensity: VI	Chimney damage (*note: occurred during Civil War so details sketchy*)
December 22, 1875	Manakin, VA	Intensity: VII	Chimneys broken, shingles shaken off, glass broken
May 3, 1897	Pulaski, VA	Intensity: VI	Loud rumblings
May 31, 1897	Giles County, VA	Intensity: VII	Brick walls cracked, bricks thrown from chimney tops, springs muddied, earth fissures appeared
June 28, 1897	Giles County, VA	Intensity: I	Aftershock
September 3,	Giles County, VA	Intensity: I	Aftershock

1897			
October 21, 1897	Giles County, VA	Intensity: I	Aftershock
February 5, 1898	Pulaski	Intensity: VI	Chimney damage, people rushed into streets
February 11, 1907	Arvonia, VA	Intensity: VI	Minor damage, small area affected
August 23, 1908	Arvonia, VA	Intensity: II	Aftershock
May 8, 1910	Arvonia, VA	Intensity: II	Aftershock
April 9, 1918	Luray, VA	Intensity: VI	Broken windows in Washington DC
September 5, 1919	Front Royal, VA	Intensity: VI	Chimney damage, springs & streams muddied
December 26, 1929	Charlottesville, VA	Intensity: VI	Bricks thrown from chimneys
April 23, 1959	Giles County	Intensity: VI	Chimney damage, plaster cracked, pictures fell
May 5, 2003	Goochland County, VA	Magnitude: 3.9	Rumblings, no damage, last reported earthquake in Virginia as of June

*TVA 1957, USGS

The map included in Figure V-13, prepared by the National Earthquake Information Center, displays the locations of historic earthquakes in the Commonwealth of Virginia, along with the different topographic regions of the state. The greatest concentrations of earthquakes have occurred in the western portion of the state, throughout the Blue Ridge mountains, and several in the Commonwealth of Kentucky. No earthquakes have originated within the limits of the LENOWISCO Planning District.



NOAA: (http://neic.usgs.gov/neis/states/virginia/virginia_seismicity.html)

Figure V-13 — Past Earthquakes in Virginia

Hazard Profile

Depending on the location, magnitude, and intensity of an earthquake, the damages and associated impacts to the community can vary greatly. As described in Table 8.1, the impacts can range from a light shaking barely noticeable to citizens to large ground upheavals that can totally destroy buildings and infrastructure.

In an attempt to quantify the risk of damages due to an earthquake throughout the United States, the United Stated Geological Survey (USGS), through the Earthquake Hazard Program, has developed maps displaying likely levels of ground motion due to future earthquakes. When developing these maps, USGS considered the potential magnitude and locations of future earthquakes based on historical data and geological information on the recurrence intervals of fault ruptures. Using this data, the extent of potential ground shaking with a 10 percent, 5 percent, and 2 percent chance of being exceeded in a 50-year period has been calculated, and contour lines have been interpolated are delineated on earthquake hazard maps.

The most commonly used method to quantify potential ground motion is in terms of peak ground acceleration (pga). During an earthquake, particles on the earth move in response to the energy waves released at the epicenter. How quickly these particles accelerate is directly proportional to the anticipated level of damages due to an earthquake, with the higher levels of acceleration causing the most significant damage. Peak ground acceleration is expressed as a percentage of a known acceleration, the acceleration of gravity (32.2 ft/s^2), and is commonly referred to as “%g”.

Figure V-14 displays the peak acceleration for the Commonwealth of Virginia with a 2 percent chance of being exceeded in a 50-year period. As can be seen in the figure, the majority of the LENOWISCO Planning District is located between the 20% of g contour and the 30% of g contour. The remainder of the area is less than 20%.

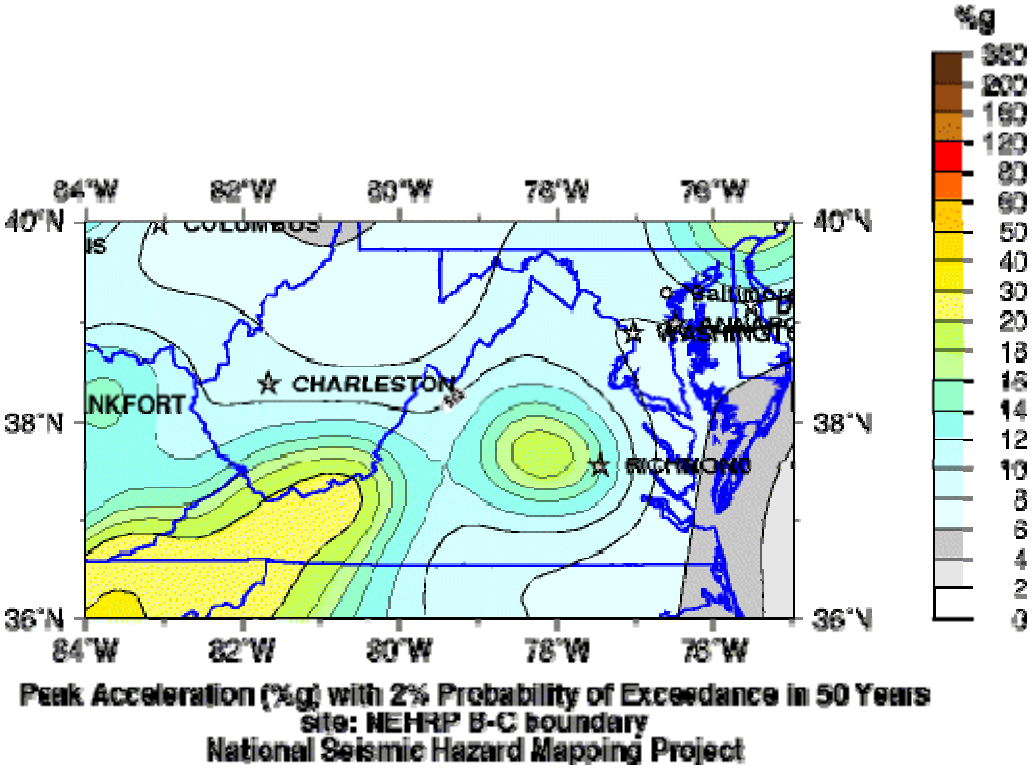


Figure V-14 — Virginia Earthquake Probability Map

Using the scale provided in Table V-18, this level of ground shaking is slightly greater to that associated with a level VII (MMI) intensity earthquake or between 6.1 and 6.9 on the Richter scale. Typical damages associated with this earthquake include loss of control in moving cars, fractures in masonry walls and buildings, and damage to poorly constructed buildings. Note that this peak acceleration is not the highest intensity earthquake that could affect the Planning District. Earthquakes of greater and lesser intensities can occur, and have lower and higher probability levels, respectively.

Hazard Areas

Because of the large area affected by most earthquakes, as well as the vast diversity of the locations and intensities of historic earthquakes that have and can affect southwestern Virginia, there are no specific areas of the LENOWISCO Planning District can be identified as a higher risk of being affected by an earthquake. However, this same distinction also indicates that the entire Planning District is at a similar risk to earthquake.

Some slightly elevated hazards may be experienced in those areas subjected to deep mining. The presence of mine portals and shafts in the subterrain provide the rock

strata with a void in which to settle following a seismic event. The settlement of earth into these voids can cause fissures or sinkholes on the surface, which could cause significant damage to buildings and other infrastructure on the surface, even following a minor seismic event.

Vulnerability Analysis

The effects of earthquakes are wide-ranging, from little or no effect to major structural damage. The degree of damage largely depends on the location of the epicenter relative to the community and the magnitude of the event. As stated previously, these factors can not be controlled or predicted. Other factors such as the level of seismic design, the type of construction, and other site-specific characteristics also play a role in the level of damages sustained during an earth quake.

The municipalities within the LENOWISCO Planning District currently utilize the Virginia Uniform Building Code. The Code, which references the seismic design level from BOCA 96, requires varying levels of seismic design, which depend on an importance factor determined by the structures use and nature of occupancy. The higher levels of seismic design are assigned to those structures where the risk of injury or loss of life is highest, or those whose function is most critical to the community should an event occur. Examples of these structures include schools, health care facilities, power generating facilities, water and wastewater treatment facilities, police stations, and fire stations. Although these structures are required to be designed to resist higher levels of seismic activity, they also represent the highest vulnerability to earthquake losses within the Planning District.

When assessing vulnerability, a discussion of the probability of earthquake activity is necessary. As noted in earlier sections, there are two distinct seismic zones affecting the Planning District – the New Madrid Seismic Zone and the East Tennessee Seismic Zone.

Table V-19 —
Periodicity of Earthquakes for the New Madrid Seismic Zone

Magnitude	Recurrence	$PROB_{15}$	$PROB_{50}$
>8.0	550-1200	0.3-1	2.7-4.0
7.0	255-500	5-9	19-29
6.0	70-90	40-63	86-97
5.0	10-12	~100	~100
4.0	14 months	~100	~100

http://www.uky.edu/ArtsSciences/Geology/webdogs/virtky/

From Table V-19, it is apparent that there is a significant chance that a magnitude 6.0 earthquake will strike the New Madrid Seismic Zone before the year 2040. This translates into the potential for property destruction when the event occurs. It has been

estimated that if an earthquake similar to that of December 16, 1811, were to strike today, thousands of deaths would result at the epicenter, as well as billions of dollars in damage. Within the LENOWISCO Planning District, an Intensity Level of VI could be anticipated, with the potential for scattered chimney damage, plaster walls cracking, and some glass breakage.

Primary and Secondary Impacts

As listed in Table V-19, the primary impact of an earthquake can range from toppled chimneys and broken windows, to cracked walls and roadways, to complete collapse of structures and bridges. Depending on the magnitude and location of the earthquake, the overall effects on the community can range from minimal to catastrophic. In larger events, loss of life and injuries can be extensive and the cost of damages can be massive. As stated previously, although historically moderate earthquakes have affected the Planning District, the potential for a higher magnitude earthquake event does exist, due mainly to the proximity of the two key seismic zones.

In some cases, the secondary impacts from an earthquake can be as damaging and disruptive to a community and its citizens. The most significant potential secondary effect of an earthquake in the Planning District is the potential for landslides. Ground shaking during an earthquake can cause failure in previously weakened steep slopes as well as otherwise stable slopes. The specific impacts of landslides are discussed further in that section of the HIRA.

In addition to landslides, other secondary effects can include disruption of critical services such as water, electrical, and telephone services. Damage to police stations, fire stations, and other emergency service facilities can weaken a community's ability to respond in the crucial hours and days following an event.

Drought

"Drought is a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area" (USGS, 2000). Three significant types of drought can affect the LENOWISCO Planning District, which are meteorological, agricultural, or hydrologic drought. Meteorological drought is simply a departure from a normal precipitation amount, and is reliant on no other factors. Agricultural drought describes a soil moisture deficiency to the extent it effects the needs of plant life, primarily crops. Hydrologic drought is defined in terms of shortfall of water levels of lakes and reservoirs, and stream flow in rivers, streams, and soils (Multi Hazard Risk Assessment, 2000). Drought is a natural part of most climatic areas, but the severity of droughts differs based on duration, geographic extent, and intensity.

Hazard History

There have been a number of significant droughts recorded in Virginia since 1900. The most recent drought extended over a period of four years, from 1998 to 2002. This

period saw rainfall levels well below normal and caused many communities throughout the region to institute water restrictions.

Although meteorologists have attempted to predict long term changes and trends in weather patterns, the onset of a significant drought can not be predicted. As indicated in Figure V-15, extended periods of dry weather have occurred many times from over the past 100 years.

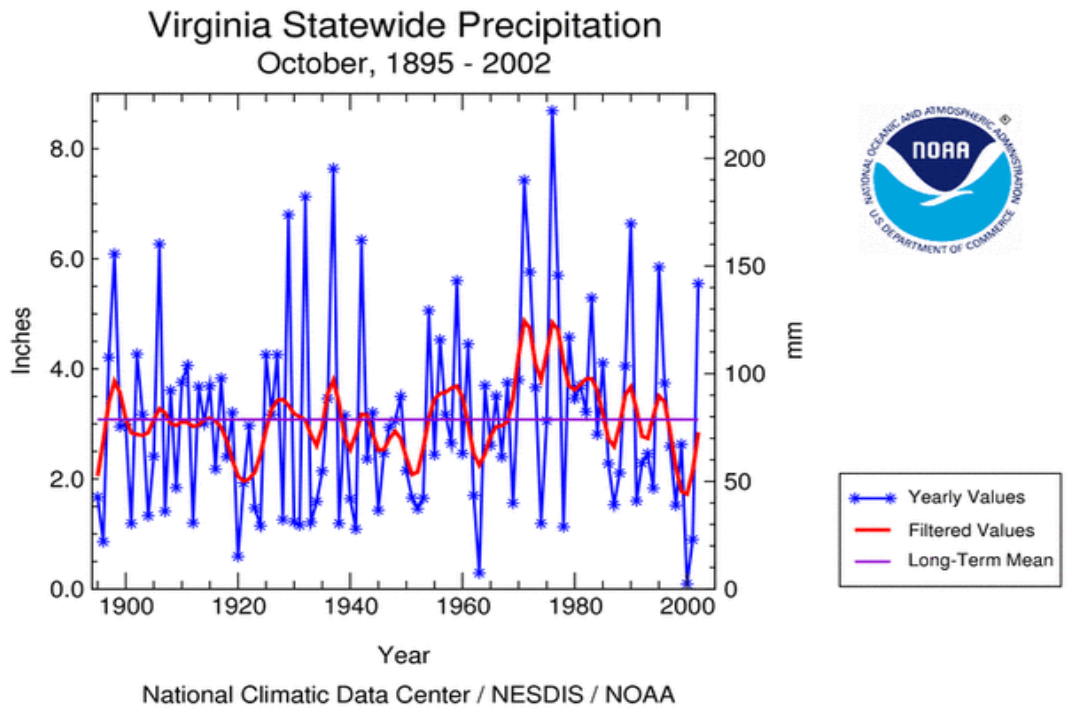


Figure V-15 — Virginia Statewide Precipitation

Hazard Profile

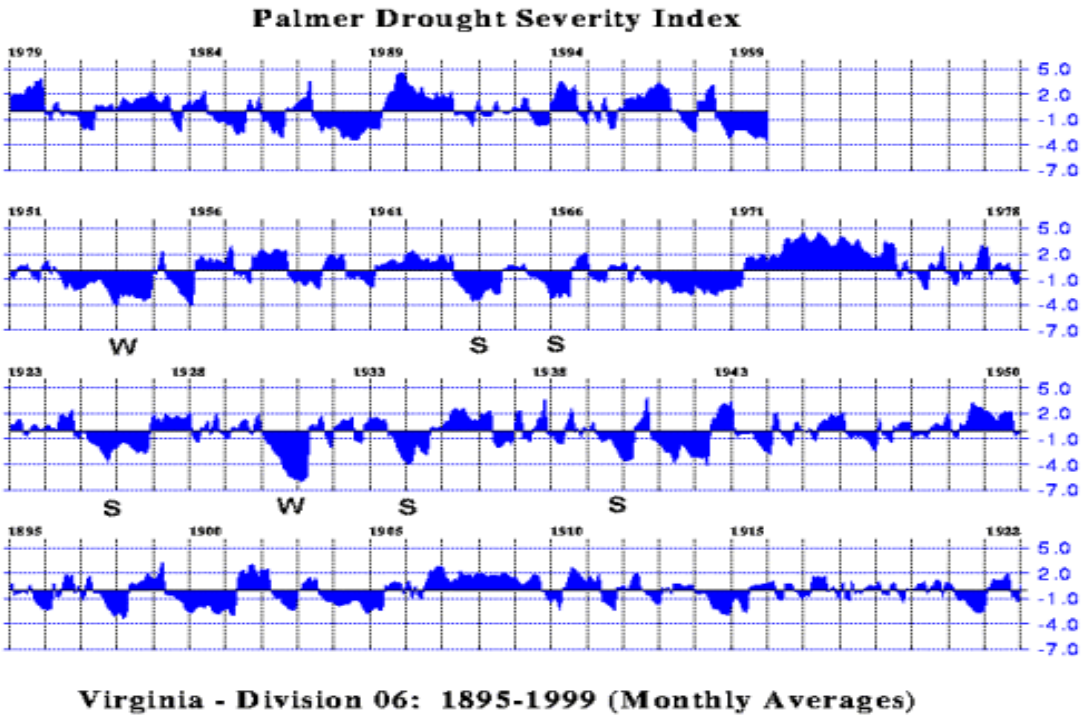
Just as there are multiple types of drought, there are multiple methods to indicate when a drought is occurring, as well as the severity of the drought. The multiple indices are based on a variety of data including precipitation amounts, stream flows, soil moisture, snow pack, as well as other water storage data. Commonly, the drought indices used depends on the type of drought being measured. It is important to note that not all types of drought must be occurring simultaneously. In some cases, an area can be affected by one form of drought, while levels measuring another form of drought are normal.

The most commonly used drought indicator is the Palmer Drought Index. This index was developed in the 1960s by the National Oceanic and Atmospheric Administration (NOAA), and uses temperature and rainfall data to determine dryness. Negative numbers indicate drought, while positive numbers indicate surplus rainfall. Minus two is considered a moderate drought, minus three is severe drought, and minus four is extreme drought. Likewise, positive two is considered a moderate rainfall, positive three

a severe rainfall, and positive four, an extreme rainfall. In addition to the Palmer Index, the Standard Precipitation Index (SPI) and the Crop Moisture Index (CMI) are also used to measure drought. The SPI relates the deficit in precipitation compared to normal levels to varying degrees of time. Because the duration of lower than average precipitation levels has varying effects on stream flows, water storage levels, and soil moisture content, the SPI attempts to measure drought based on the long term deficit in precipitation. The CMI measures short term moisture conditions across predominate crop producing regions. It is based on the temperature and precipitation levels for a given week as well as the CMI value for the previous week (http://www.drought.unl.edu/whatis/indices.htm).

The Virginia State Climatology Office uses the Palmer Drought Severity Index (PDSI) to measure long-term moisture status. A reading of -3.0 is considered to be a "severe drought". The drought index for the week ending January 1, 2000 was -2.68.

Figure V-16 shows the PDSI history for Southwest Virginia from 1895 through January 1, 2000. Each period in which the value averaged around -3.0 for a half year or longer is underscored and marked with an "S" for similar to the existing conditions on January 1, 2000 and "W" for worse. Figure V-17 shows the PDSI history for the Commonwealth of Virginia.



*Virginia State Climatology Office

Figure V-16 — Historical Palmer Drought Severity Index for Southwest Virginia

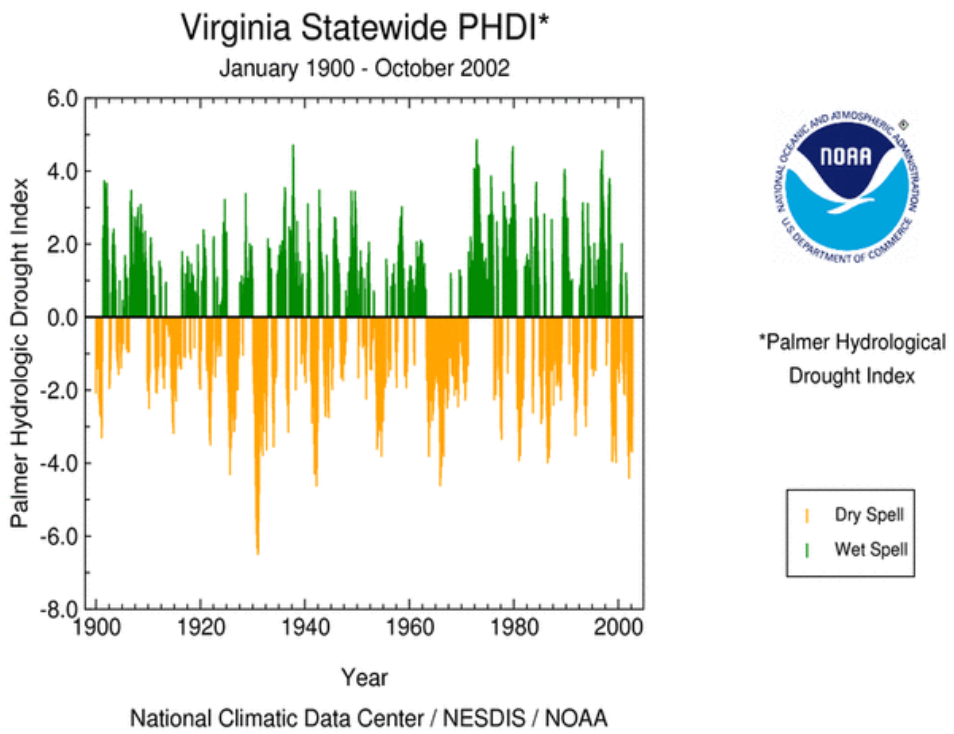


Figure V-17 — Virginia Statewide Palmer Hydrological Drought Index

Vulnerability Analysis

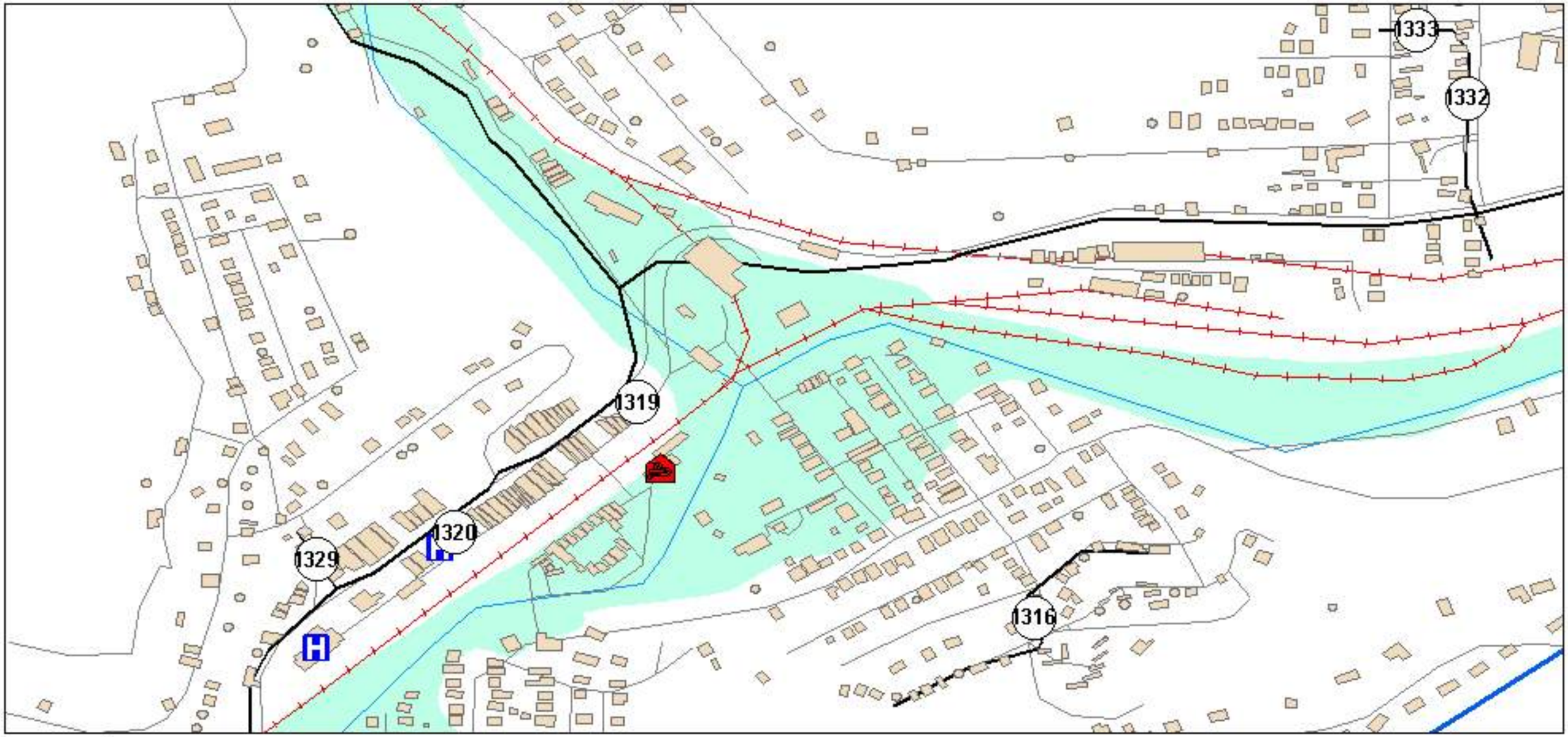
If a significant drought event were to occur, it could bring extensive economic, social, and environmental impacts to the Planning District. Typically, one of the most significant economic effects to a community is the agricultural impacts. Other economic effects could be felt by businesses that rely on adequate water levels for their day to day business such as carwashes and laundromats.

Drought also can create conditions that promote the occurrence of other natural hazards such as wildfires and wind erosion. The likelihood of flash flooding is increased if a period of severe drought is followed by a period of extreme precipitation. Low-flow conditions also decrease the quantity and pressure of water available to firefighters to fight fires, while the dry conditions increase the likelihood fires will occur.

Environmental drought impacts include those on both human and animal habitats and hydrologic units. During periods of drought, the amount of available water decreases in lakes, streams, aquifers, soil, wetlands, springs, and other surface and subsurface water sources. This decrease in water availability can affect water quality such as salinity, bacteria, turbidity, and temperature increase and pH changes. Changes in any of these levels can have a significant effect on the aquatic habitat of a numerous plants and animals found throughout the Planning District. Low water flow can result in decreased sewage flows and subsequent increases in contaminants in the water supply. Decrease in the availability of water also decreases drinking water supply and the food supply as food sources become scarcer. This disruption can work its way up

the food chain within a habitat. Loss of biodiversity and increases in mortality can lead to increases in disease and endangered species.

Appalachia, Virginia 100-Year Floodplain



Legend

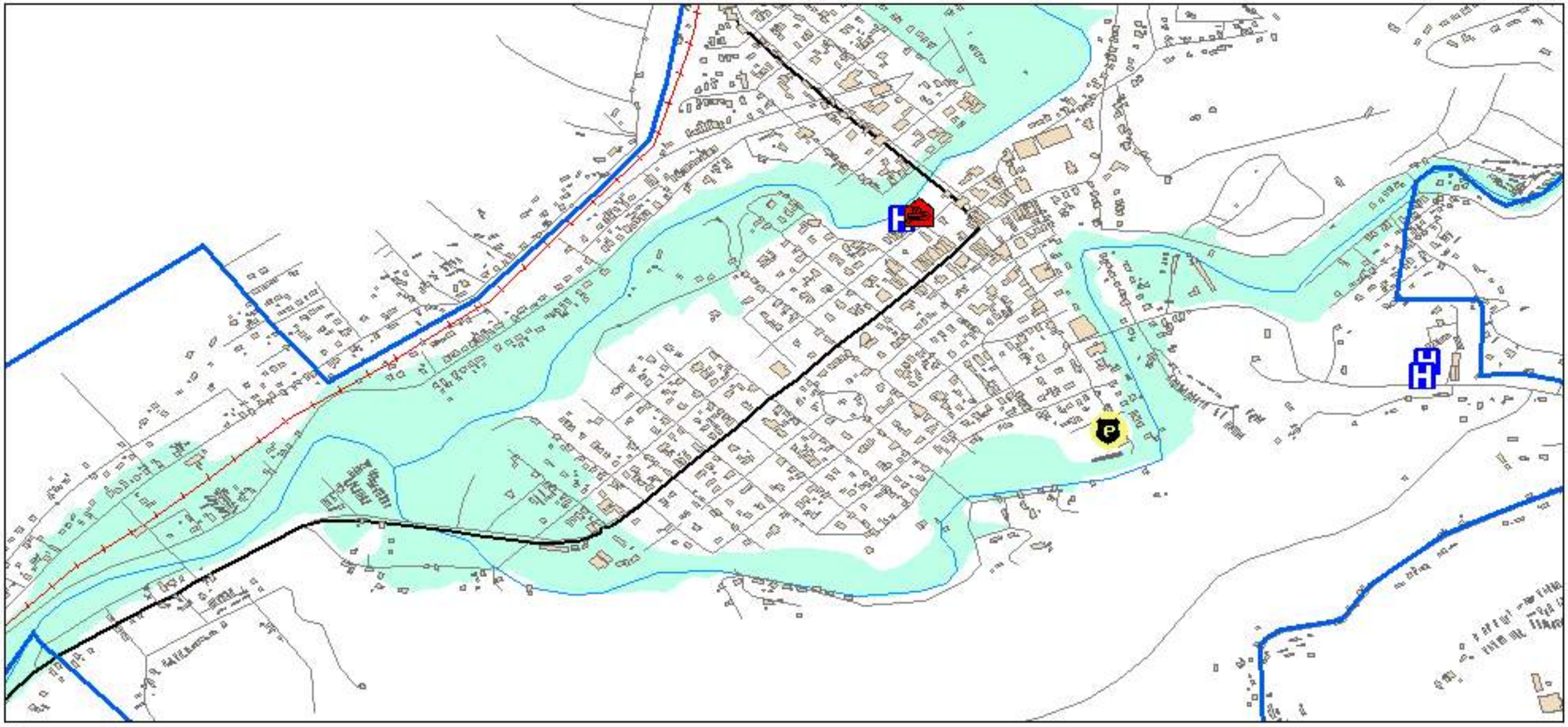
- Schools
- Fire
- Police
- Medical Facilities
- Railroad
- Major Roads
- Local Roads
- Water
- Building Footprints
- 100-Year Floodplain
- County Boundary
- Corporate Limits

N

0.1 0 0.1 0.2

Miles

Big Stone Gap, Virginia 100-Year Floodplain



Legend

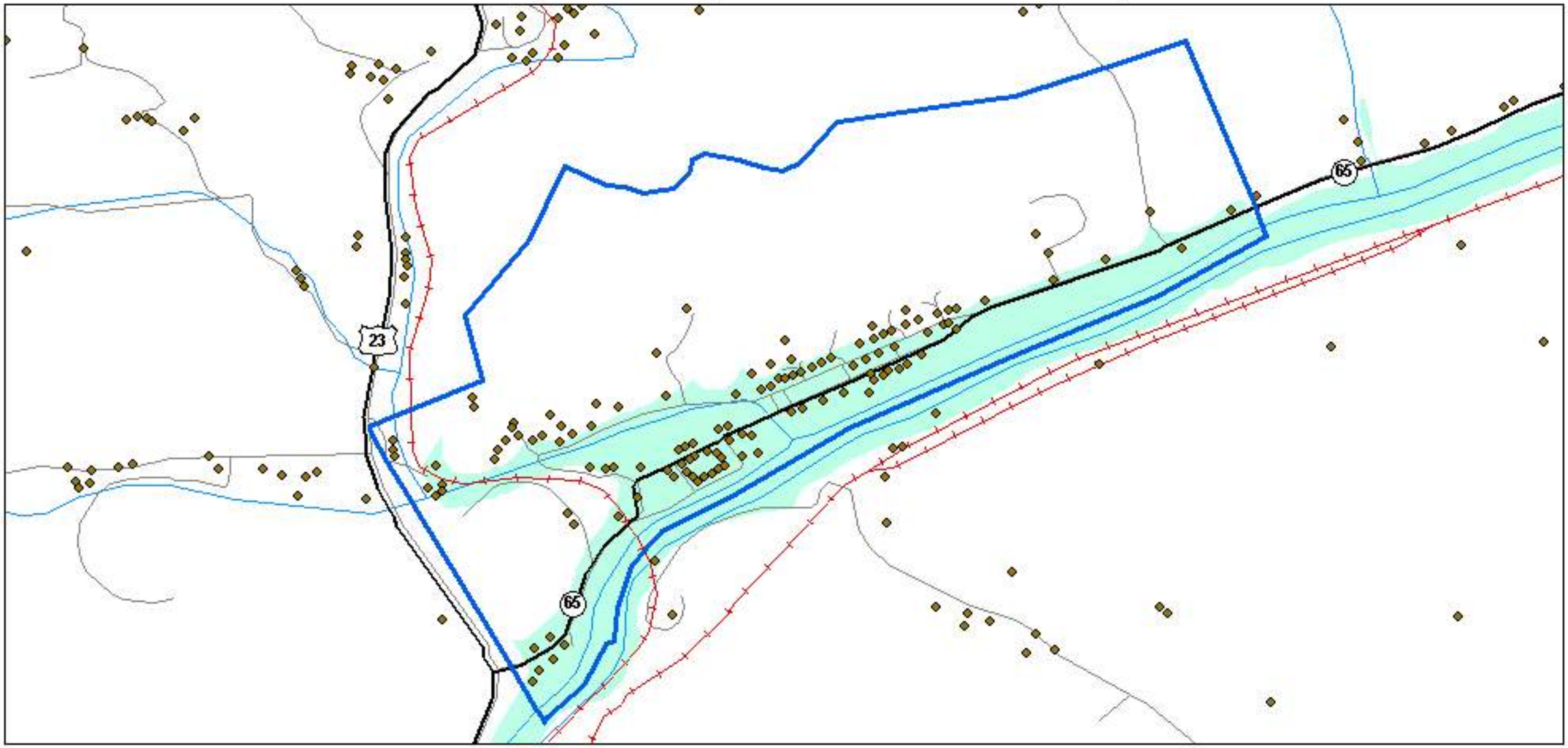
- Schools
- Fire
- Police
- Medical Facilities
- Railroad
- Major Roads
- Local Roads
- Water
- Building Footprints
- 100-Year Floodplain
- County Boundary
- Corporate Limits

N

0.25 0 0.25 0.5

Miles

Clinchport, Virginia 100-Year Floodplain



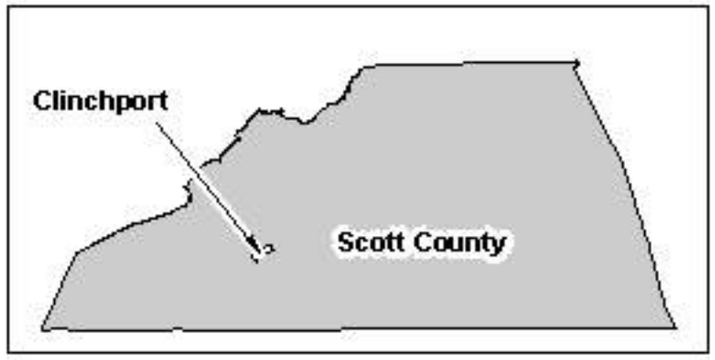
Legend

- Structures
- Schools
- Fire
- Police
- Medical Facilities
- Railroads
- Major Roads
- Local Roads
- Water
- 100-Year Flooding
- County Boundary
- Corporate Limits

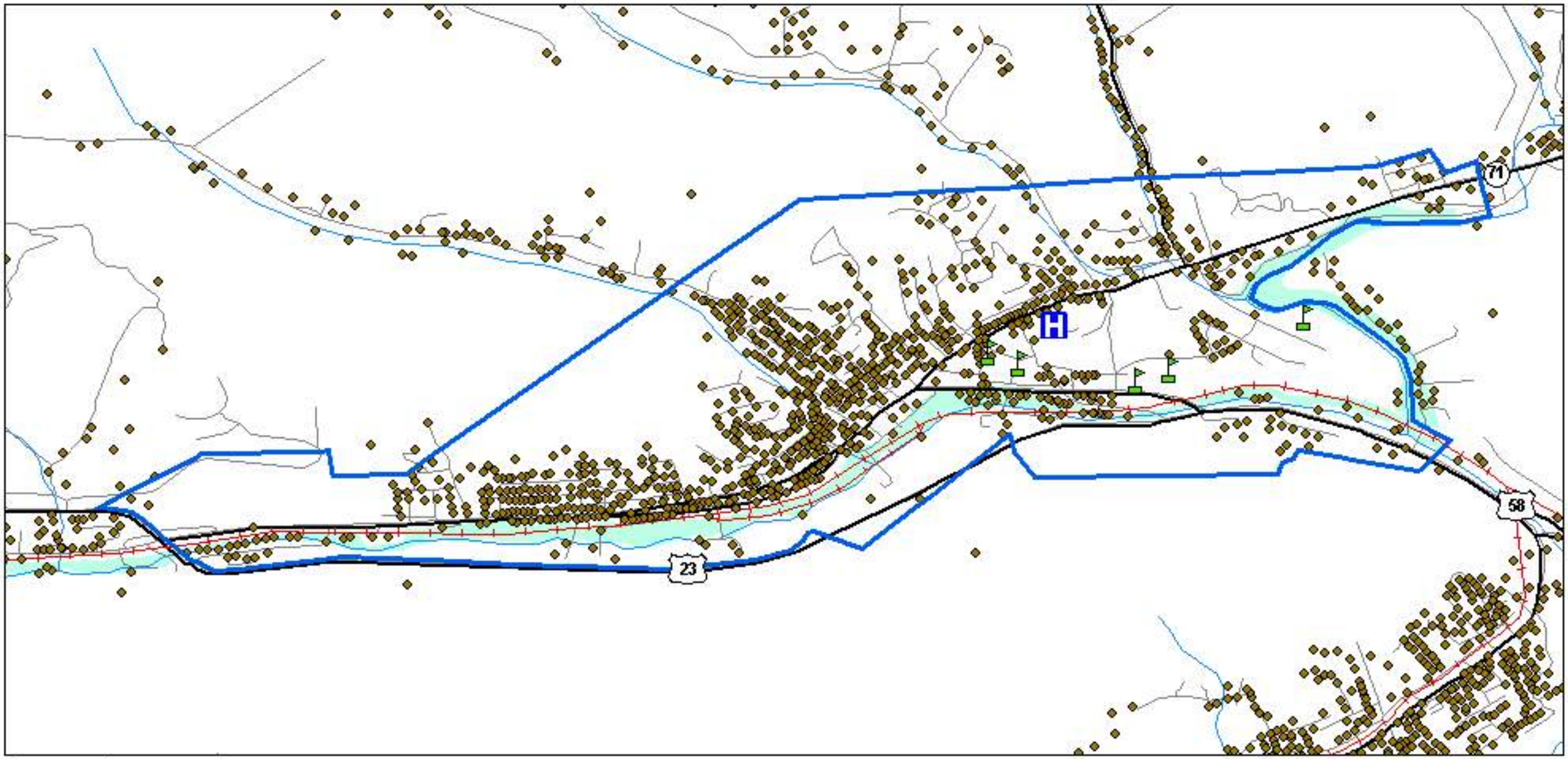
N

0.25 0 0.25 0.5

Miles



Gate City, Virginia 100-Year Floodplain



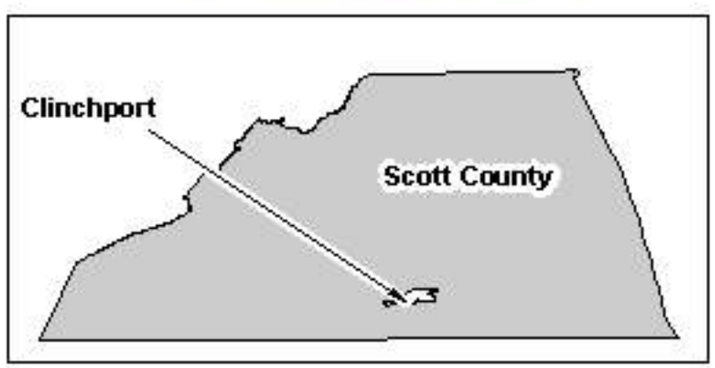
Legend

- Structures
- Schools
- Fire
- Police
- Medical Facilities
- Railroads
- Major Roads
- Local Roads
- Water
- 100-Year Flooding
- County Boundary
- Corporate Limits

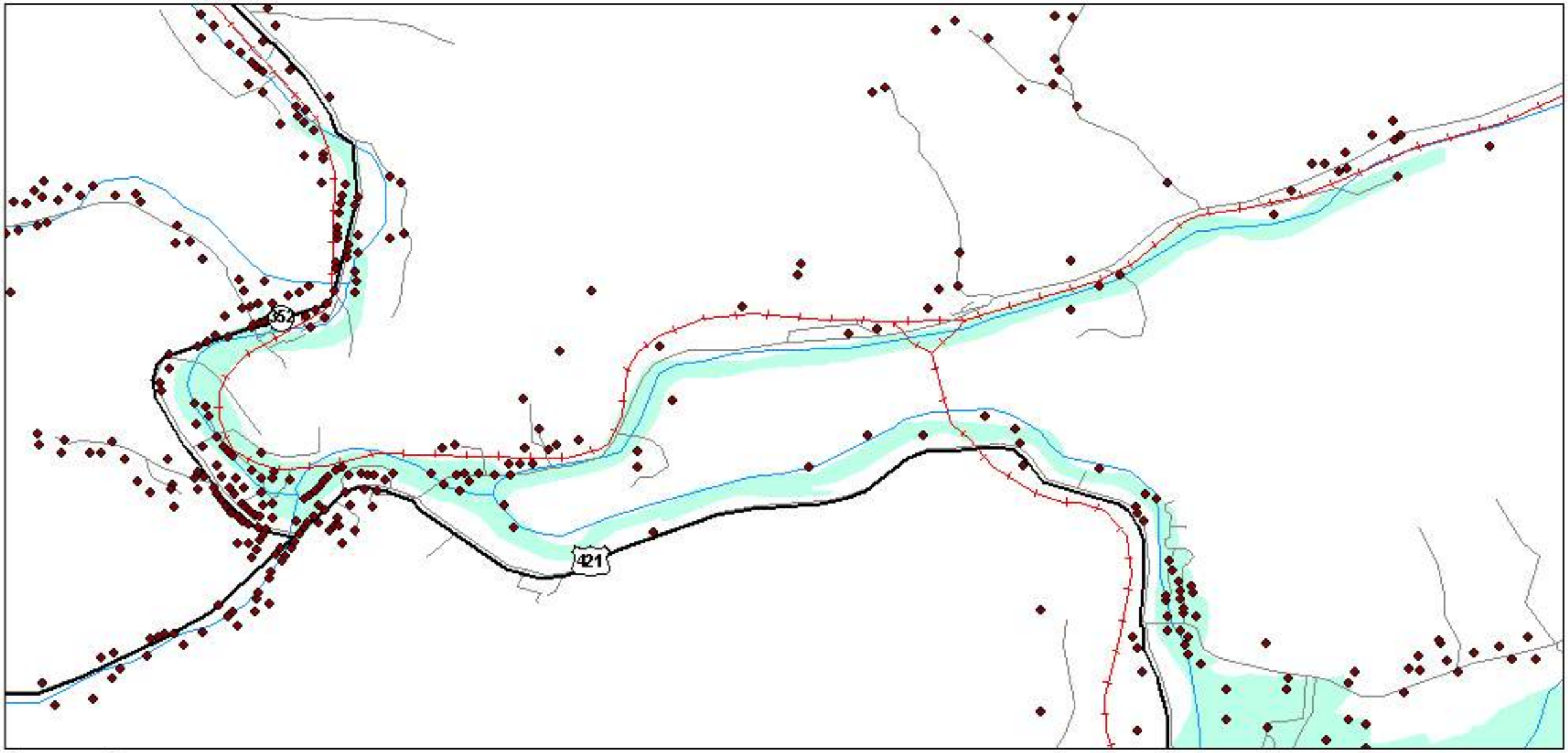
N

0.4 0 0.4 0.8

Miles



Lee County (Unincorporated Areas), Virginia 100-Year Floodplain



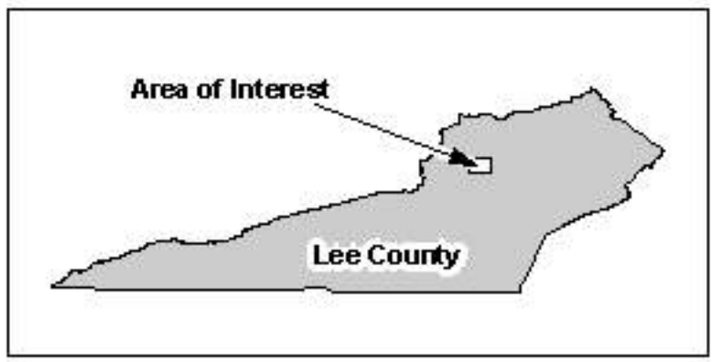
Legend

- Structures
- Schools
- Fire
- Police
- Medical Facilities
- Railroads
- Major Roads
- Local Roads
- Water
- 100-Year Floodplain
- County Boundary
- Corporate Limits

N

0.2 0 0.2 0.4

Miles



Lee County, Virginia Landslide Locations

Wise County

Kentucky

Scott County

Tennessee

38

352

421

421

58

58

Legend

Landslide Location

Railroads

Major Roads

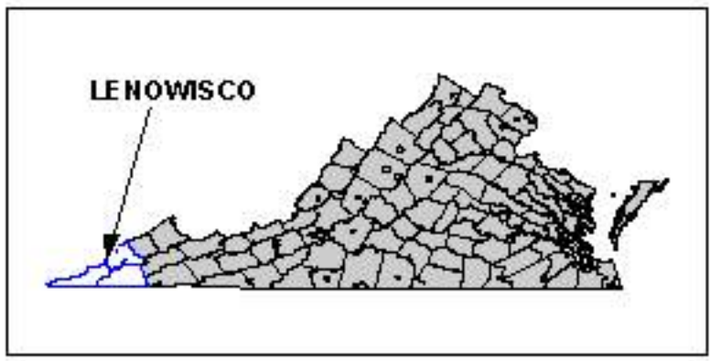
Water

County Boundary

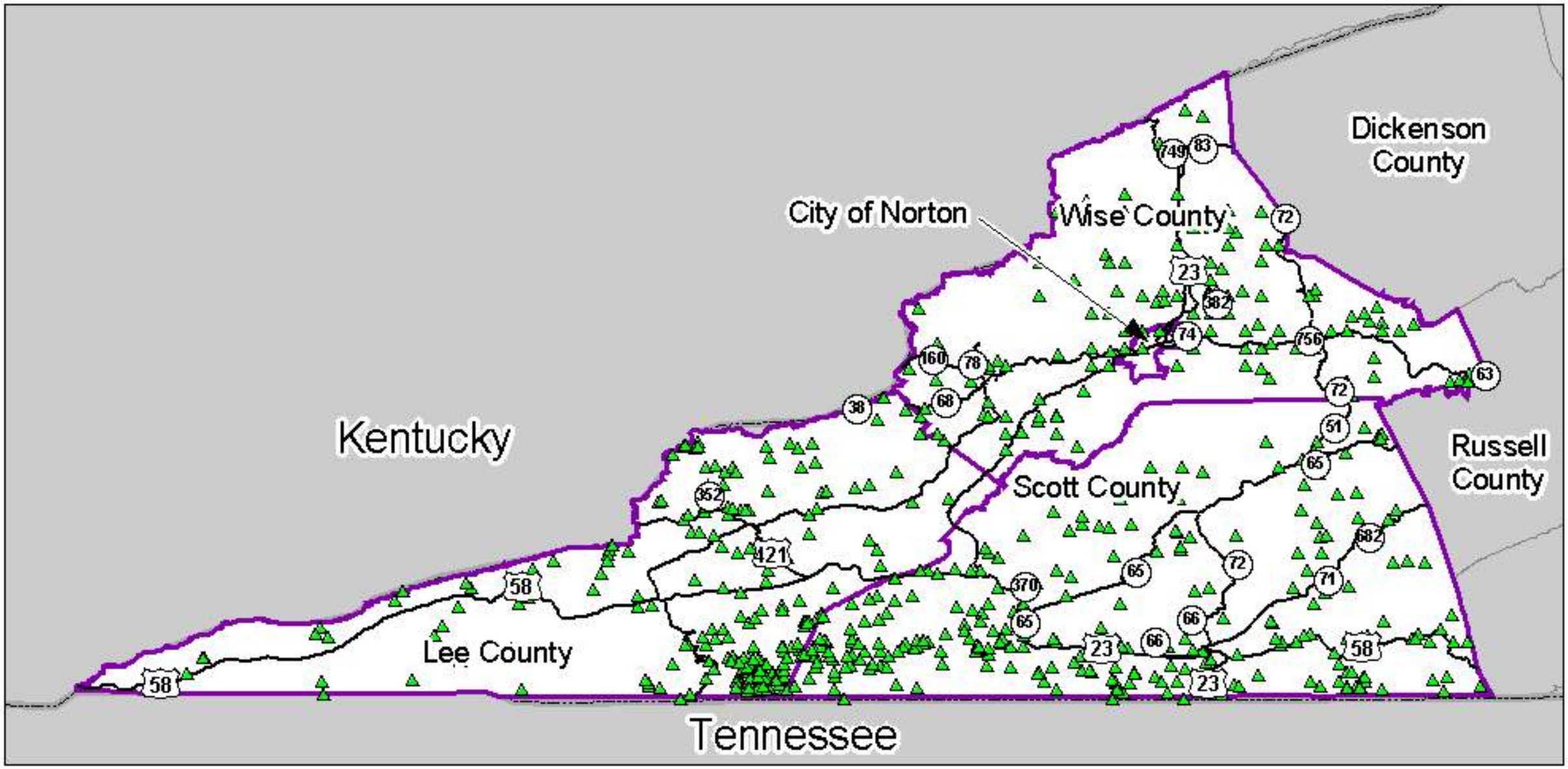
N

6 0 6 12

Miles



LENOWISCO, Wildfire Incidents From 1995 to 2001



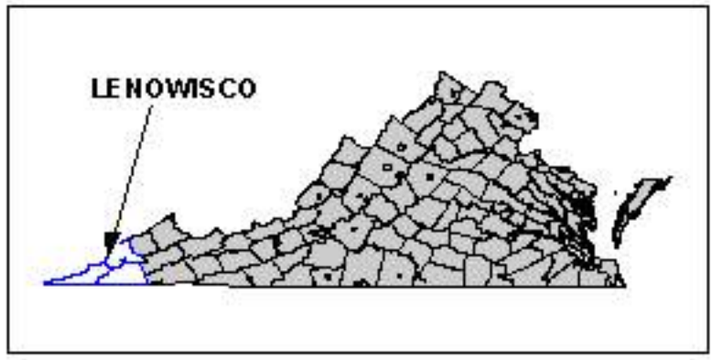
Legend

- Wildfire Incidents
- Major Roads
- County Boundary

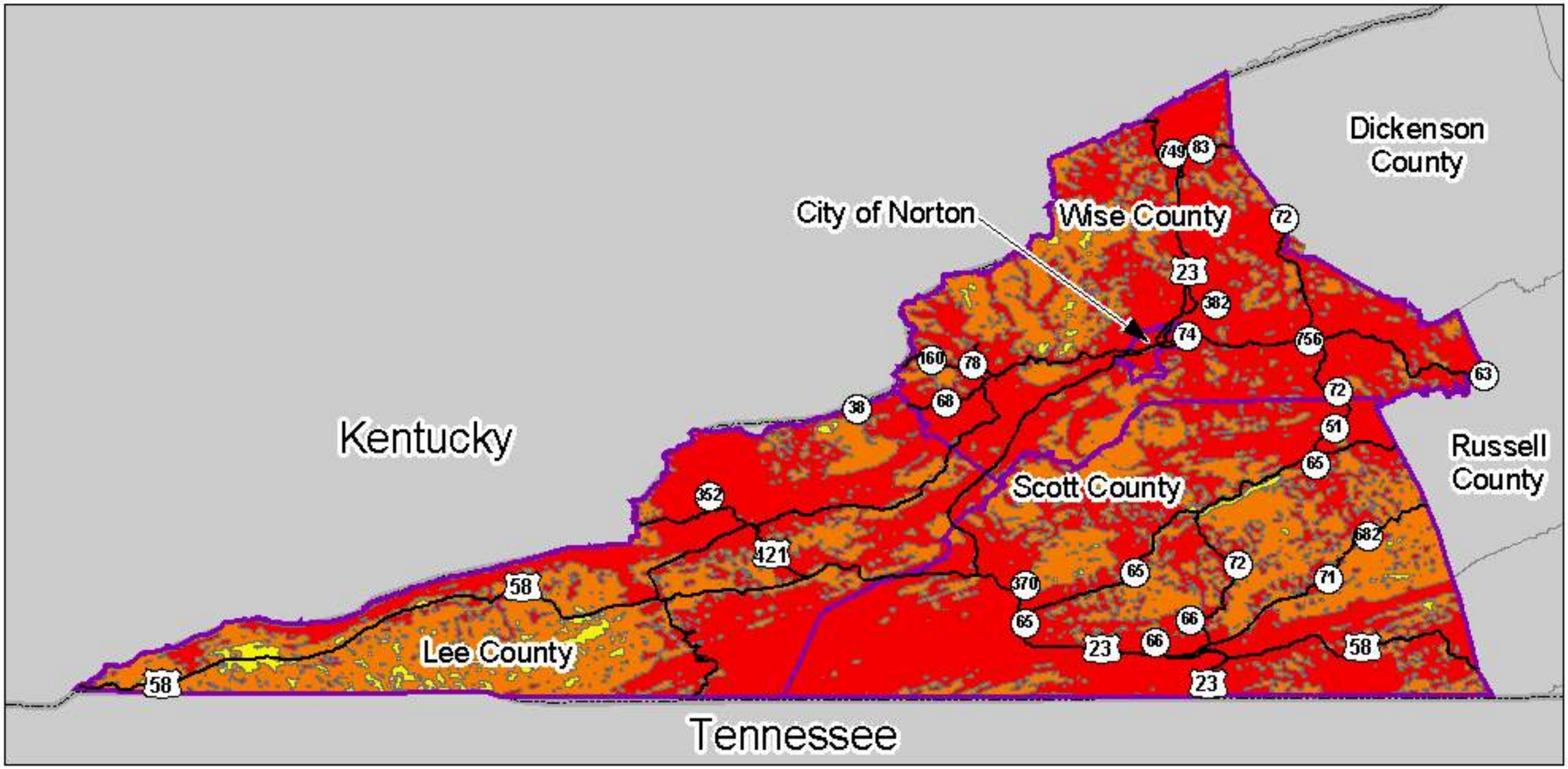
N

10 0 10 20

Miles



LENOWISCO, Virginia Fire Risk Zones



Legend

Fire Risk Zones

- Low
- Medium
- High

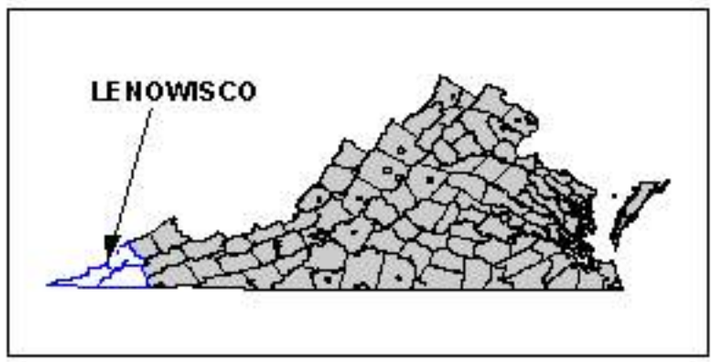
Major Roads

County Boundary

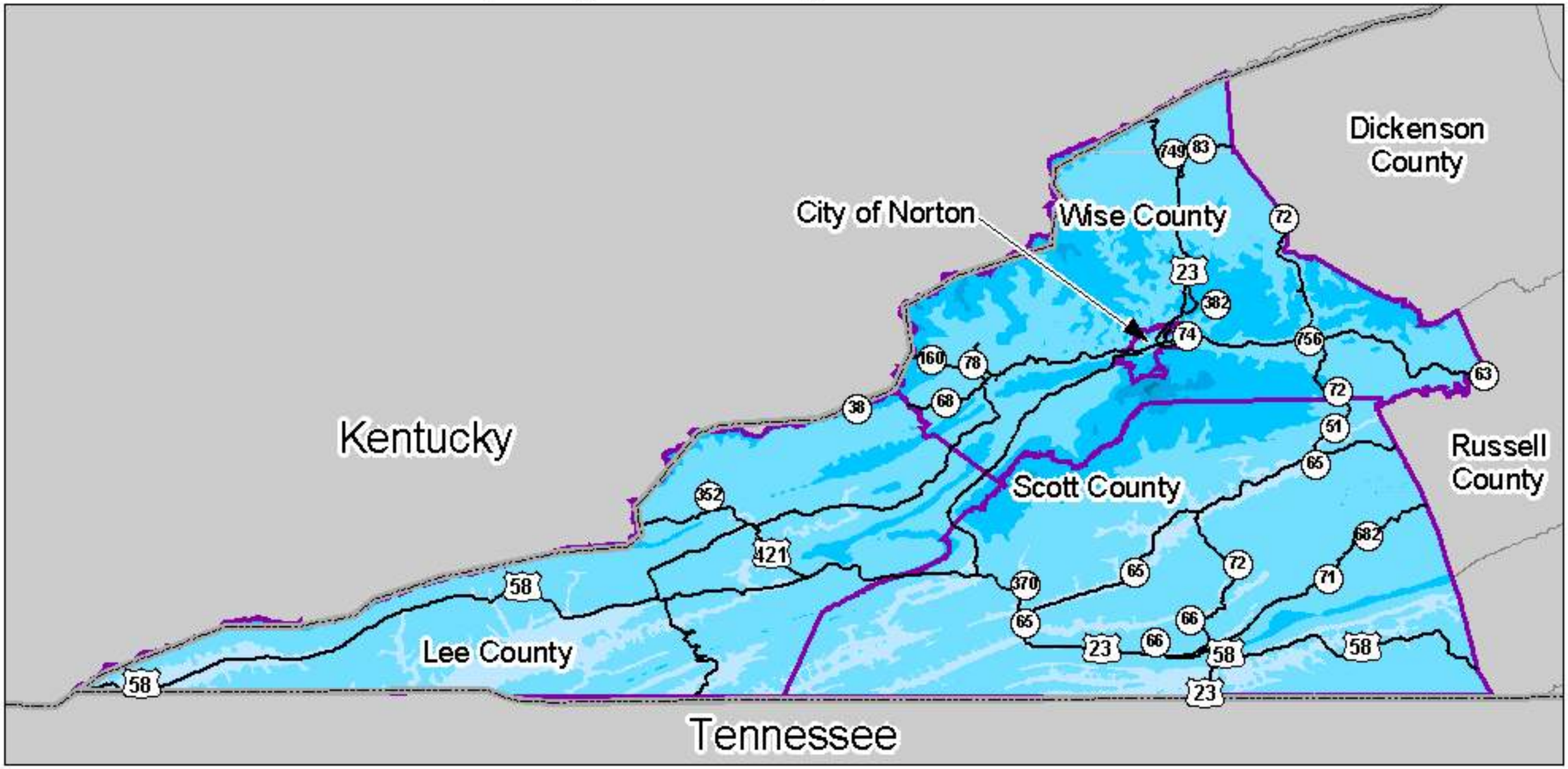
N

10 0 10 20

Miles



LENOWISCO, Virginia Average Annual Total Snowfall



Legend

Average Snow Depth

- 48
- 44
- 37
- 9
- < 9

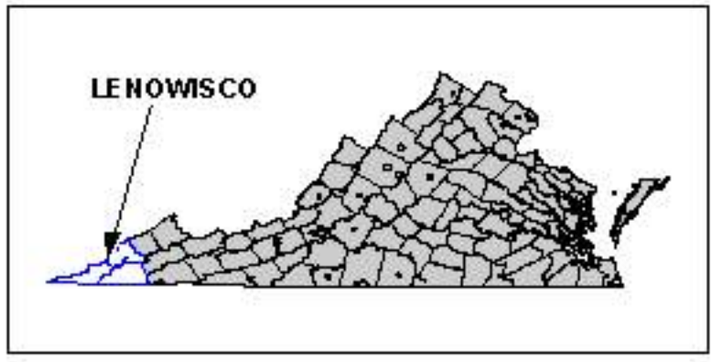
Major Roads

County Boundary

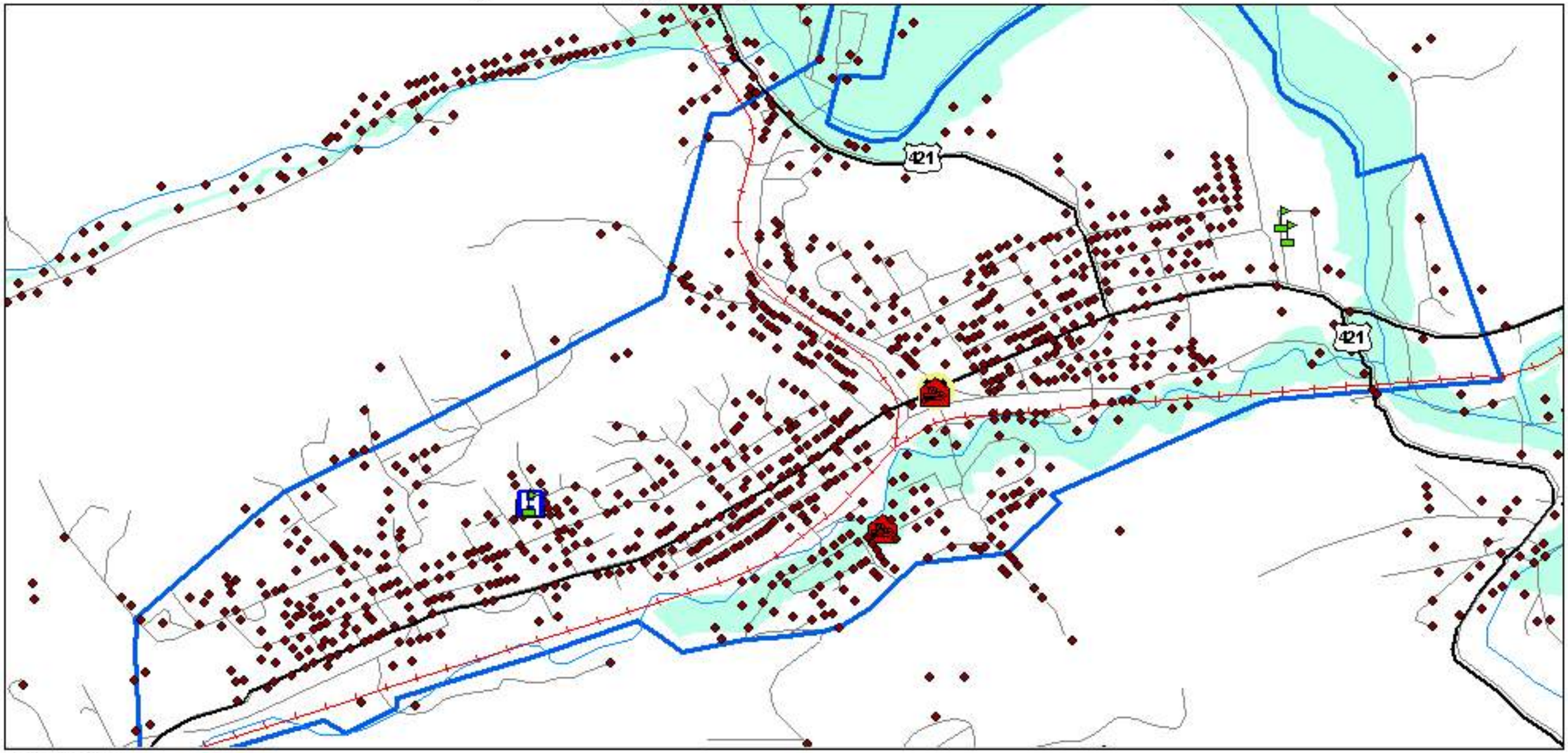
N

10 0 10 20

Miles



Pennington Gap, Virginia 100-Year Floodplain



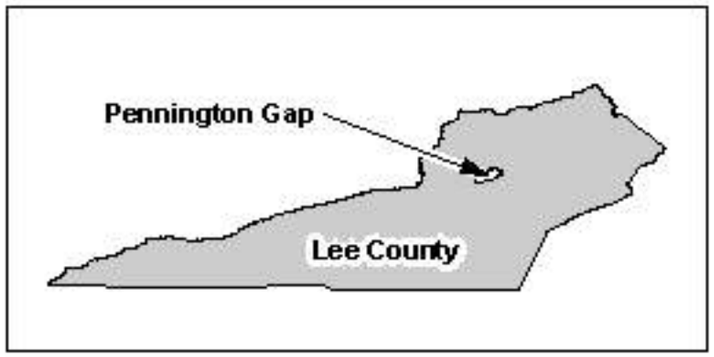
Legend

- Structures
- Schools
- Fire
- Police
- Medical Facilities
- Railroads
- Local Roads
- Major Roads
- Water
- 100-Year Floodplain
- County Boundary
- Corporate Limits

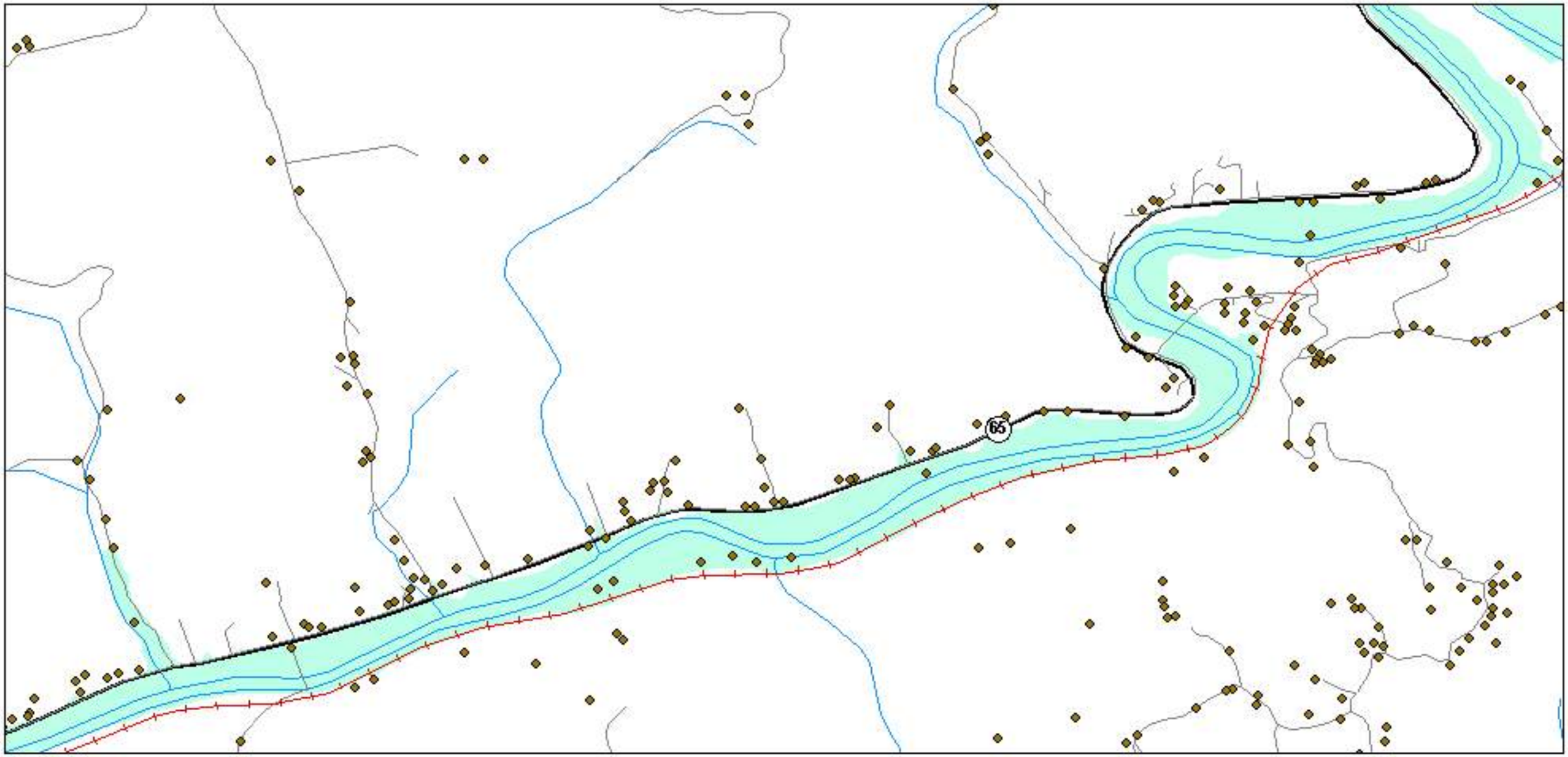
N

0.25 0 0.25 0.5

Miles



Scott County (Unincorporated Areas), Virginia 100-Year Floodplain



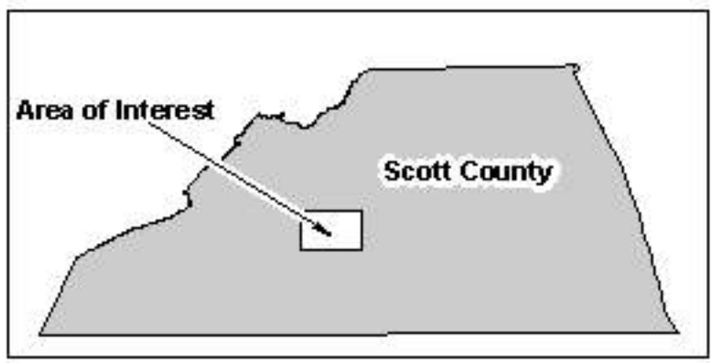
Legend

- Structures
- Schools
- Fire
- Police
- Medical Facilities
- Railroads
- Major Roads
- Local Roads
- Water
- 100-Year Flooding
- County Boundary
- Corporate Limits

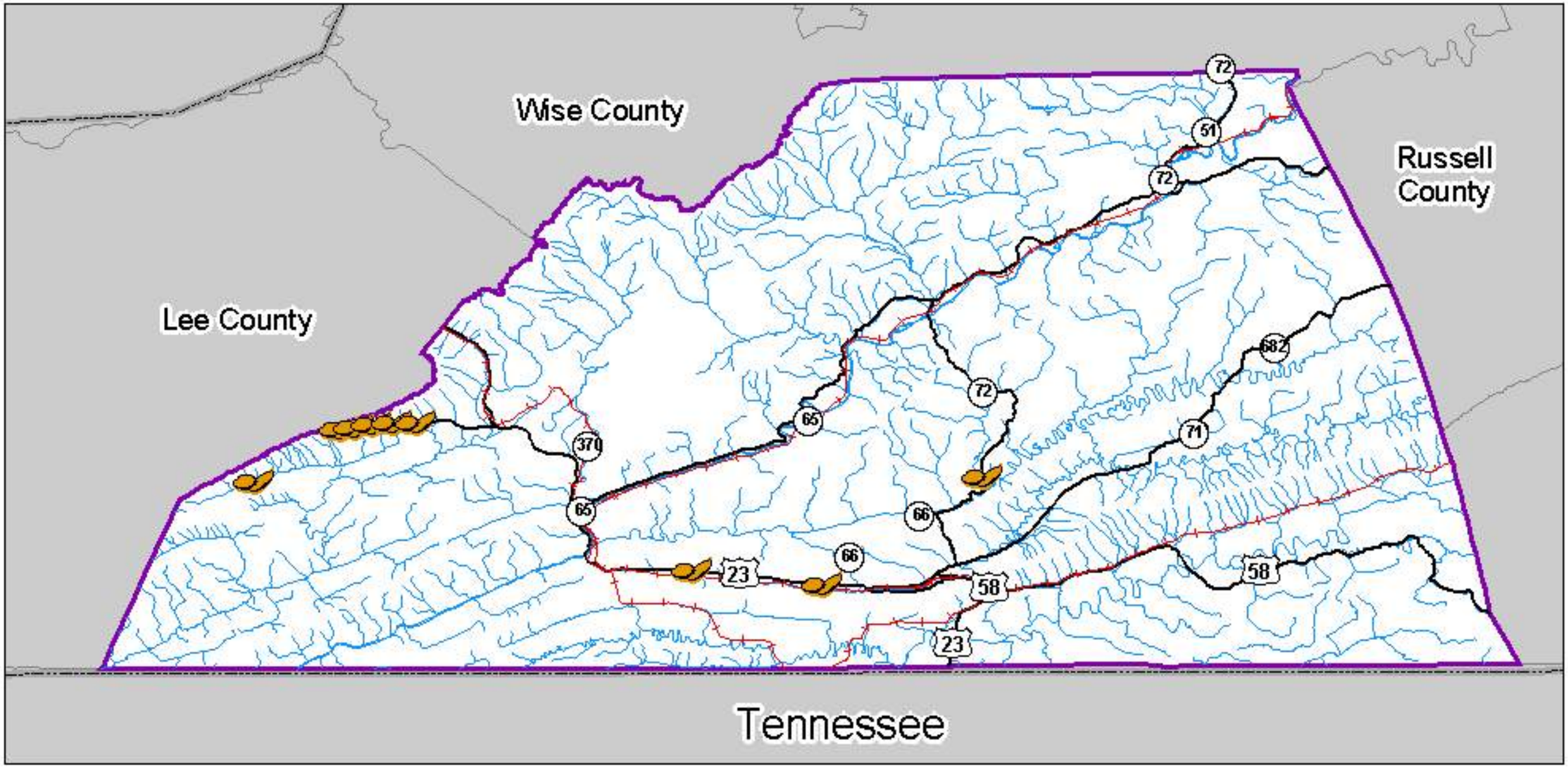
N

0.4 0 0.4 0.8

Miles



Scott County, Virginia Landslide Locations



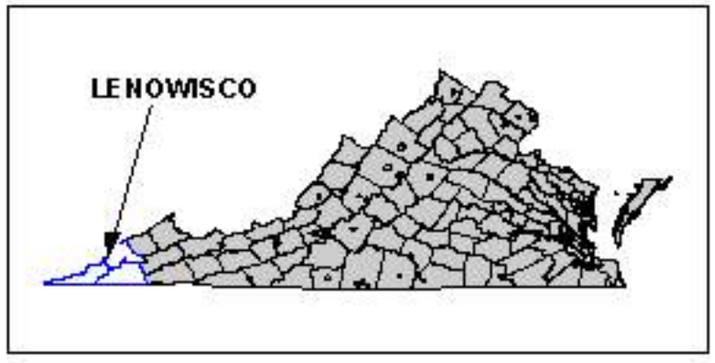
Legend

- Landslide Locations
- Railroads
- Major Roads
- Water
- County Boundary

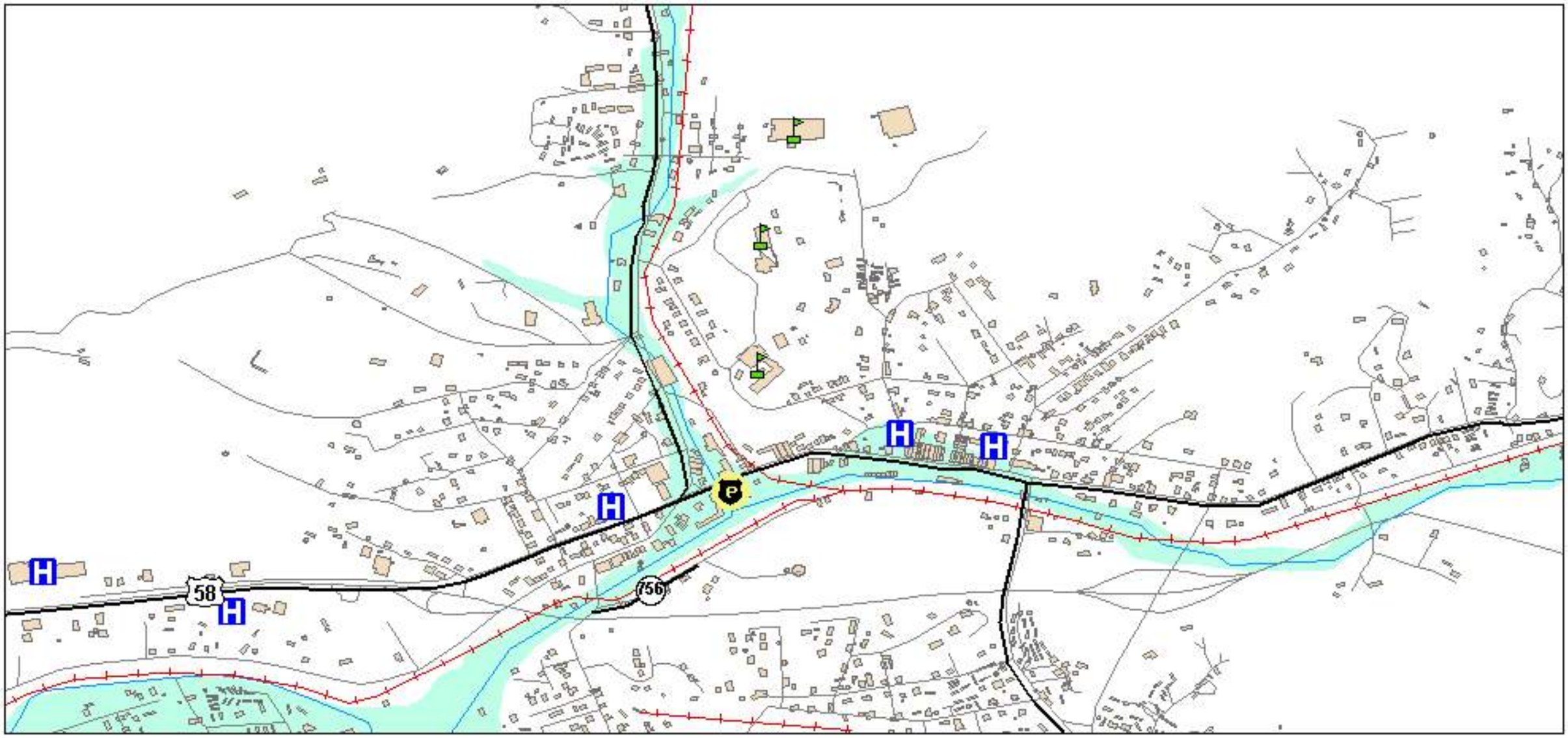
N

5 0 5 10

Miles



Wise County (Unincorporated Areas), Virginia 100-Year Floodplain



Legend

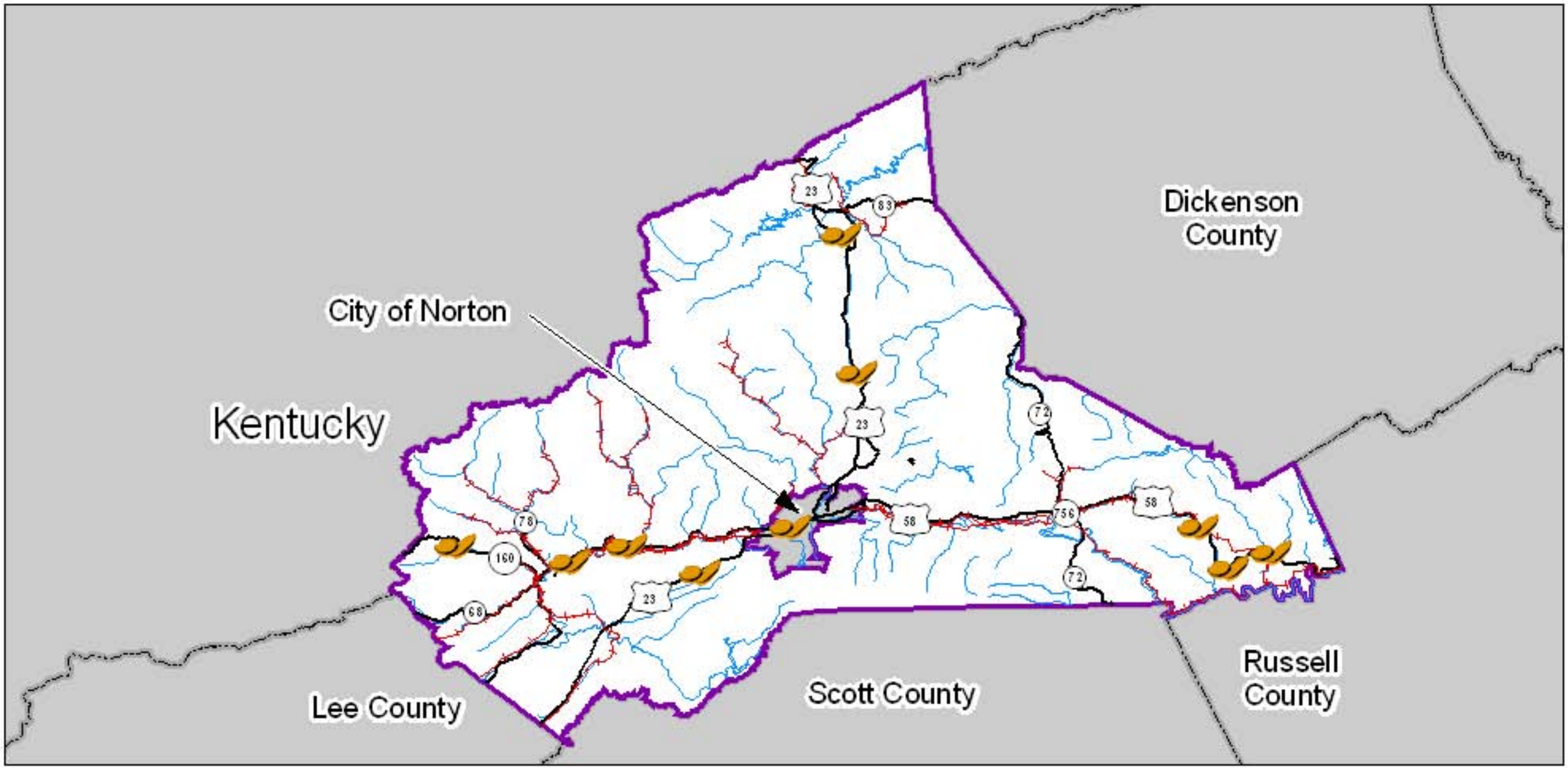
- Schools
- Fire
- Police
- Medical Facilities
- Railroad
- Major Roads
- Local Roads
- Water
- Building Footprints
- 100-Year Floodplain
- County Boundary
- Corporate Limits

N

0.2 0 0.2 0.4

Miles

Wise County, Virginia Landslide Locations

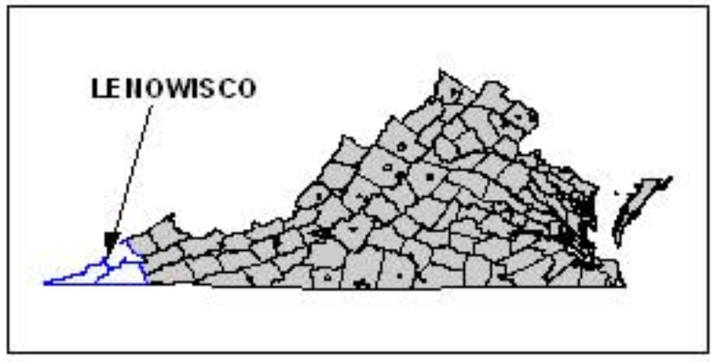


Legend

- Landslide Locations
- Railroads
- Major Roads
- Water
- County Boundary

N

6 0 6 12
Miles



SECTION VI. CAPABILITY ASSESSMENT

Introduction

This portion of the Plan assesses the LENOWISCO area's current capacity to mitigate the effects of the natural hazards identified in Section IV of Plan – Hazard Identification and Risk Assessment. This assessment includes a comprehensive examination of the following local government capabilities:

1. *Staff and Organizational Capability*
2. *Technical Capability*
3. *Fiscal Capability*
4. *Policy and Program Capability*
5. *Legal Authority*
6. *Political Willpower*

The purpose of conducting the capabilities assessment is to identify potential hazard mitigation opportunities available to the LENOWISCO area local governments including the City of Norton and the Counties of Lee, Scott and Wise. Careful analysis should detect any existing gaps, shortfalls or weaknesses within existing governmental activities that could exacerbate a community's vulnerability. The assessment will also highlight the positive measures already in place or being done at the City or County level, which should continue to be supported and enhanced, if possible, through future mitigation efforts. This examination ensures that existing plans, studies, and reports are incorporated into this mitigation plan.

The capability assessment serves as the foundation for designing an effective hazard mitigation strategy. It not only helps establish the goals and objectives for the LENOWISCO area to pursue under this Plan, but assures that those goals and objectives are realistically achievable under given local conditions.

This section of the plan is divided into four parts, each of which is a brief profile of the capabilities of the participating jurisdictions. The following table summarizes the plans and ordinances of each jurisdiction that can support hazard mitigation goals and strategies.

Table VI-1 — Capability Matrix - Plans and Ordinances				
Plan or Ordinance	**Lee County**	**City of Norton**	**Scott County**	**Wise County**
Building Code	X	X	X	X
Comprehensive Land Use Plan		X		X
Emergency Operations Plan			X	X
Floodplain Ordinance			X	X
Floodplain Management Plan				
Local Hazard Mitigation Plan				
Open Space Plan				
Stormwater Management Plan				
Stormwater Ordinance				
Subdivision Ordinance	X	X	X	X
Watershed Protection Plan				
Zoning Ordinance	X	X		X

City Of Norton

1. Staff and Organizational Capability

The City of Norton has a very limited staff and organizational capability to implement hazard mitigation strategies. The City is administered by council-manager form of government with a five person **City Council**. The **Council** is elected to staggered four-year terms. The **City Manager** oversees the day-to-day operations of city government.

The **City Manager**, who is hired by the **Council**, acts on their behalf and manages the various City departments. More specifically, the **City Manager** directs and supervises the administration of all city offices, boards, commissions and agencies under the general direction and control of the Board. Responsibilities include:

- Development of the annual budget,
- Coordination of public relations programs,
- Provision of administrative services to the City,
- Administration of equal employment opportunity and affirmative action policies and programs,

- Human Resource Management and Payroll,
- Risk Management,
- Facilities Management, and
- A number of delegated programs.

The City has a number of professional staff departments to serve the residents of the community and to carry out day-to-day administrative activities. These include the following:

- General Government and Administration
- Health and Human Services
- Parks and Recreation
- Planning and Community Development
- Public Safety
- Public Works
- Public Utilities

There are also fourteen (14) Local Boards and Commissions which provide administrative support to the city departments and **City Council**.

The **Public Works Department** is responsible for the engineering, mapping drainage issues and natural hazard.

The **Planning and Community Development Department** enforces the National Flood Insurance Program requirements and other applicable local codes. It also houses the county's geographic information systems (GIS). The department is also responsible for addressing land use planning, as well as, developing mitigation strategies.

2. Technical Capability

The City of Norton has very limited technical capability to implement hazard mitigation strategies.

2 A. Technical Expertise

The City of Norton has a full-time planner on staff to administer the City's hazard mitigation programs. The City has no licensed engineers. The City does have a building department.

The City also has a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. The City has GIS capability to further hazard mitigation goals.

2.C. Internet Access

The City of Norton does provide its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for City officials and residents - far less important than it used to be. It is believed that Internet access will help further the City's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

The City of Norton has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the City's budgeted expenditures were $ 6,534,803. The majority of these funds are obligated to education, although "public safety" did cost the city $1,506,594 for this period according to the most recent financial statements. The City of Norton receives most of its revenues through local taxes and through restricted intergovernmental contributions (federal and state pass through dollars). It is highly unlikely that the City could afford to provide the local match for the existing hazard mitigation grant programs. Considering the current budget deficits at both the State and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for the community.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% Federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, the City of Norton will not qualify as a small and impoverished community. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community."

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative

activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for the City of Norton.

4.A. Recent Hazard Mitigation Efforts

The City of Norton has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

The City of Norton does not participate in the CRS.

4.C. Emergency Operations Plan

The City of Norton has developed and adopted a Emergency Operations Plan which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. The Plan describes the City's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the City to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between **this** Hazard Mitigation Plan and the City of Norton's Emergency Operations Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the City Council as having the lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Operations Plan.

4.D. Floodplain Management Plan

The City of Norton does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program. This Hazard Mitigation Plan is intended to fulfill the CRS planning requirement should the community decide to enter the program.

4.E. Stormwater Management Plan

The City of Norton does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. According to the City's Subdivision Ordinance, lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for

residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

The City has developed and adopted a Comprehensive Plan on April 15, 2003. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

The City of Norton has adopted several ordinances that are relevant to hazard mitigation. Table VI-2 provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy.

Table VI-2 — City of Norton Ordinances Related to Hazard Mitigation			
Ordinance	**Adoption Date**	**Description/Purpose**	**Mitigation Effectiveness**
Flood Damage Prevention Ordinance	**May 1979**	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the City prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The City's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be redelineated with updated topography, and that base flood elevations will be recalculated.	**HIGH**
Subdivision Ordinance	**Dec. 20, 1983**	Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	**MODERATE**
City of Norton State of Emergency Ordinance	**Prior to 1975**	The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	**LOW**

4.H. Open Space Plans

The City of Norton does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

The City of Norton does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan, dated 2000, contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia' political subdivisions must not act without proper delegation from the State. All power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia' enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. *The City of Norton has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry.*

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. The City of Norton does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. *The City of Norton has adopted a building code and established a Building/ Inspections Department to carry out its building inspections.*

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. *The City of Norton has not adopted a land use regulation.*

5.B.1. Planning

According to State Statute, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted “in accordance with a plan”, the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. *The City of Norton has established a Planning and Community Development Department.*

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land “uses” controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications that control height and bulk such as lot size, building height and set backs, and density of population. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or

conditional use districts. Zoning ordinances consist of maps and written text. *The City of Norton enforces a city wide zoning ordinance dated 1998.*

5.B.3. Subdivision Regulations

Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved. Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations only indirectly affect the type of use made of land or minimum specifications for structures. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. *The City of Norton has adopted a Subdivision Ordinance.*

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. *The City of Norton has not adopted stormwater regulations.*

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodplain control are empowered through §15.2-2223 and §15.2-2280 of the Code of Virginia. The City of Norton has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely “hazardproofing” a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. *The City of Norton proposes to use acquisition as a local mitigation tool.*

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the

collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. *The City of Norton does levy property taxes. The City also uses (preferential tax districts and special assessments) for purposes of guiding growth and development.*

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. *The City of Norton has a Five-Year Capital Improvement Plan adopted in June 2002 and that plan undergoes an annual review.*

6. Political Willpower

Most City residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with the City of Norton's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

LEE COUNTY

1. Staff and Organizational Capability

Lee County has limited staff and organizational capability to implement hazard mitigation strategies. Lee County is governed by a (5) member **Board of Supervisors**. The members represent the (5) districts into which the county is divided. There is also a County Administrator. The **Board** bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system. There are (19) county departments and (5) boards and commissions.

Those professional staff departments and boards are as follows:

- County Administration
- Central Accounting
- Central Purchasing
- County Attorney
- Community Development Department
- Building Inspections
- Animal Control
- Litter Control
- Parks and Recreation
- Emergency Services Department
- Solid Waste Management Department
- Electoral Board
- General Registrar
- Commissioner of the Revenue
- Treasurer
- Commonwealth's Attorney
- Clerk of Circuit Court
- Sheriff's Department
- Juvenile and Domestic Relations Court
- Planning Commission
- Industrial Development Authority
- Board of Zoning Appeals
- Public Service Authority
- Airport Commission

The **(Emergency Services) Department** is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The (**Building Inspection**) **Department** enforces the National Flood Insurance Program requirements and other applicable local codes.

The **Public Service Authority** oversees the maintenance of infrastructure including sewer and water treatment facilities.

Of the above-listed County departments, agencies and offices, the **(Emergency Services) Department, and the (County Administration) Department** have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of

this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

The Lee County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does not have a full-time planner on staff to administer the community's hazard mitigation programs. The County does have an inspections office which enforces a building code.

The County does have a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. The Lee County does not currently have GIS capability to further hazard mitigation goals.

2.C. Internet Access

The Lee County does provide its employees with Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

The Lee County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the County's budgeted expenditures were ($15,987,218). The majority of these funds are obligated to operations although "public safety" did cost the county ($2,611,274) for this period according to the most recent financial statements. The County receives most of its revenues through Property Taxes, Local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). It is highly unlikely that the County could afford to provide the local match for the existing hazard mitigation grant programs. Considering the current budget deficits at both the State and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for Lee County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% Federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, the Lee County will not qualify as a small and impoverished community. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community."

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Lee County.

4.A. Recent Hazard Mitigation Efforts

The Lee County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-

backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

The Lee County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

The Lee County has developed and adopted a Comprehensive Emergency Management Plan dated (December, 1990 with periodic updates) which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between **this** Hazard Mitigation Plan and Lee County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

The Lee County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the County decide to enter the CRS.

4.E. Stormwater Management Plan

The Lee County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be

platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

The Lee County does have a Comprehensive Plan.

4.G. Ordinances

The Lee County has adopted several ordinances that are relevant to hazard mitigation. The following worksheet provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy. For each ordinance, the following should be identified:

- Title(s)
- Adoption Date(s)
- Purpose(s)
- Description(s)
- Mitigation Effectiveness
- Notes

Flood Damage Prevention and Control Ordinance (12/14/90)

The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation.

The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.

Subdivision Ordinance (1997)

The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required.

Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.

Lee County State of Emergency Ordinance Authority to declare local emergency is granted by State Code 44-146.21, therefore no local ordinance is needed. Local emergencies are declared by the ES Director and confirmed by the local governing body by resolution.

The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency.

The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.

4.H. Open Space Plans

Lee County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Lee County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated, 2000, contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) Regulation; (b) Acquisition; (c) Taxation; and (d) Spending. The scope of this local authority is subject to constraints, however, as all of Virginia' political subdivisions must not act without proper delegation from the State. All power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia' enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

A. Regulation

1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or

condition making people or property more vulnerable to any hazard. *Lee County has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry.*

2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Lee County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. *Lee County has adopted a building code and established a Building Inspections Office to carry out its building inspections.*

B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. *Lee County has not adopted a land use regulation.*

1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other

related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. *Lee County has established a Planning Commission.*

2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications for use such as lot size, building height and set backs, density of population, etc. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. *Lee County enforces a county wide zoning ordinance which was adopted in (1993).*

3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved. *Lee County has adopted a Subdivision Ordinance.*

4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. *Lee County has not adopted stormwater regulations.*

5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through (state statute citation). Lee County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. *Lee County proposes to consider acquisition as a local mitigation tool.*

D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece

of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. *Lee County does levy property taxes.*

E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. *Lee County has not adopted and implemented a capital improvement program.*

6. Political Willpower

Most County residents are quite knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with the Lee County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Scott County

1. Staff and Organizational Capability

Scott County has limited staff and organizational capability to implement hazard mitigation strategies. Scott County is governed by a seven member Board of

Supervisors. The members represent the six election districts into which the county is divided; there is one Supervisor elected at-large. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted under the County Board Form as authorized under Va Code Section 15.2-400 et. seq. Scott County is one of three counties using this form.

The county's professional staff departments, boards, authorities, and commissions are as follows:

- Animal Control
- Board of Elections
- Central Accounting
- Central Purchasing
- Clerk of the Court
- Commissioner of Revenue
- Commonwealth's Attorney
- County Administrator
- County Attorney
- Department of Social Services
- E-911 Department
- Economic Development Authority
- Emergency Management
- Health Department
- Housing & Redevelopment Authority
- Inspections
- Parks/Golf Course Department
- Public Service Authority
- Public Works Department
- Recreation Department
- School Board
- Sheriff's Department
- Treasurer

The Emergency Management Department is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Inspections Department enforces the National Flood Insurance Program requirements and other applicable local codes.

The Public Works Department oversees the maintenance of the county's buildings and grounds. Stormwater facilities fall under the purview of either the individual towns or VDOT. Sanitary sewer and water treatment facilities and the transmission lines for both fall under the control of either the towns or the Public Service Authority.

Of the above-listed County departments, agencies and offices, the Emergency Management Department, and the Inspections Department have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Scott County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does not have a full-time planner on staff to administer the community's hazard mitigation programs. The County does have an inspections office which enforces a building code. All other technical, professional and engineering services are obtained via procurement of services from private companies and organizations.

The County does not have a staff person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program. Again, as stated above the county procures and contracts for such services. There is a Service Agreement in place now for such services.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Scott County is currently developing its GIS capability and in the near future will be capable of utilizing same to further hazard mitigation goals.

2.C. Internet Access

Scott County does provide its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Scott County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the County's total budgeted expenditures were about $38 million; of this total $26 million was for Education. The majority of these funds are obligated to operations although "Public Safety" cost the county approximately $3 million for this period according to the most recent financial statements. The County receives most of

its revenues through Local Property Taxes, State and Local Sales Tax, and other local services and through restricted intergovernmental contributions (federal and state pass through dollars Considering the current budget deficits at both the State and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for Scott County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% Federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, the Scott County will not qualify as a small and impoverished community. The definition is restricted to “communities of 3,000 or fewer individuals that is identified by the State as a rural community.”

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community’s vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Scott County.

4.A. Recent Hazard Mitigation Efforts

Scott County has undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Scott County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Scott County developed and adopted a Comprehensive Emergency Management Plan dated January 2002, which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County’s capabilities to respond to emergencies and

establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Scott County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Scott County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS. It should be noted that the incorporated towns of the county are responsible for administering the National Flood Insurance Program within their corporate limits.

4.E. Stormwater Management Plan

Scott County does not currently have an adopted stormwater management plan. The County Subdivision Ordinance does require the subdivider to supply all necessary information needed to determine what improvements are necessary to properly develop the subject property, including contour intervals, drainage plans and flood control devices. If any portion of the land being subdivided is subject to flood, the area is to be shown on the plat.

4.F. Comprehensive Plan

Scott County developed and adopted a Comprehensive Plan in June 2000. The plan provides the future vision for the county regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Scott County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy.

Table VI-3 — Scott County Ordinances Related to Hazard Mitigation

Ordinance	Adoption Date	Description/Purpose(s)	Mitigation Effectiveness
Flood Damage Prevention and Control Ordinance	**June 1991**	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the City prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The county's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be redelineated with updated topography, and that base flood elevations will be recalculated.	**HIGH**
Subdivision Ordinance	**1988**	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving the Planning Commission, County Attorney's Office, and Inspections Office (for flood zone clearance). Subdivision plats are required for review and must include the location of areas subject to flooding Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements	**MODERATE**

		and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	
Scott County State of Emergency Ordinance	**October 1974**	The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency. The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	**LOW**

4.H. Open Space Plans

Scott County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Scott County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan, dated 2000, contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia' political subdivisions must not act without proper delegation from the State. All power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia' enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Scott County has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings

more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Scott County has building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Scott County has adopted a building code and established an Inspections Office to carry out its building inspections functions.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Scott County has not yet adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Scott County has established a Planning Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications that control

height and bulk such as lot size, building height and set backs, and density of population. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Scott County has not adopted a county-wide zoning ordinance. However, the County's Planning Commission has devoted time in 2003-2004 to studying zoning and working on a proposed zoning ordinance which may be presented to the Board of Supervisors for its consideration in 2005.

5.B.3. Subdivision Regulations

The definition of "subdivision" in Scott County's Subdivision Ordinance is the division of a parcel of land into three or more lots or parcels of less than two acres each for the purpose of transfer of ownership or building development, or, if a new street is involved in any such division, any division of parcel of land. Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations only indirectly affect the type of use made of land or minimum specifications for structures. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Scott County has adopted a Subdivision Ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Scott County has not adopted stormwater regulations. However, it should be noted that Scott County has adopted and enforces its Soil and Erosion Control Ordinance (last amended in 2001). This ordinance is administered under an agreement with the Scott County Soil and Conservation District.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodplain control are empowered through §15.2-2223 and §15.2-2280 of the Code of Virginia. Scott County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program. Scott County's

Floodplain Ordinance was adopted in June 1991 and is administered by the Inspections Department.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Scott County proposes to continue using acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. While Scott County does levy property taxes, it does not use preferential tax districts and special assessments for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control

growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Scott County has not adopted and implemented a formal, capital improvement program. It plans and programs needed capital items and projects as part of the annual budget and appropriations process.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Scott County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Wise County

1. Staff and Organizational Capability

Wise County has limited staff and organizational capability to implement hazard mitigation strategies. Wise County is governed by an eight member Board of Supervisors. The members represent the four districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- Board of Election Commissioners
- Economic Development Department
- Emergency Services Department
- Equal Opportunity Office
- Finance Department
- Human Resources
- Information Systems
- Inspections
- Legal Department
- Animal Welfare Shelter
- Fire Department
- Planning and Growth Management
- Sheriff's Department
- Public Works Department
- Public Services Authority

The Emergency Services Department is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Zoning Department maintains a part-time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The department also enforces the National Flood Insurance Program requirements and other applicable local codes.

The Public Works Department oversees the maintenance of city infrastructure including roadways. The Public Services Authority oversees sewer and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Emergency Services Department and the Zoning Department have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Wise County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County has a part-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County does have an inspections office which enforces a building code.

The County has a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Wise County currently has GIS capability to further hazard mitigation goals.

2.C. Internet Access

Wise County provides its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more

meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Wise County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the County's budgeted expenditures were approximately $36 million. The majority of these funds are obligated to operations although "public safety" cost the county a little over $4 million for this period according to the most recent financial statements. The County receives most of its revenues through State and Local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the State and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for Wise County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% Federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, the Wise County will not qualify as a small and impoverished community. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community."

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Wise County.

4.A. Recent Hazard Mitigation Efforts

Wise County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum

NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Wise County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Wise County has developed and adopted a Comprehensive Emergency Management Plan dated 1988 which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. The Plan was adopted in September 1988. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between **this** Hazard Mitigation Plan and Wise County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Wise County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Wise County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Wise County has developed and adopted a Comprehensive Plan in October 1998. The plan provides the future vision for the county regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Wise County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy.

Table VI-5 — Wise County Ordinances Related to Hazard Mitigation			
Ordinance	**Adoption Date**	**Description/Purpose**	**Mitigation Effectiveness**
Flood Damage Prevention Ordinance	**1980; August 1994 (revised)**	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the City prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The City's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be redelineated with updated topography, and that base flood elevations will be recalculated.	**HIGH**
Subdivision Ordinance	**1976**	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before	**MODERATE**

		final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by engineers hired by the developer and the Virginia Department of Transportation to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, the Subdivision Ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	
Wise County State of Emergency Ordinance	**September 1988**	The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency. The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	**LOW**

4.H. Open Space Plans

Wise County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Wise County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia' political subdivisions must not act without proper delegation from the State. All power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia' enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Wise County has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Wise County has building codes. Municipalities and counties

may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Wise County has adopted a building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Wise County has adopted land use regulation including zoning.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Wise County has established a Planning Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications that control height and bulk such as lot size, building height and set backs, and density of population. Local governments are authorized to divide their territorial jurisdiction into

districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Wise County enforces a county wide zoning ordinance which was adopted in April 1991.

5.B.3. Subdivision Regulations

Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 3 acres where no street right-of-way dedication is involved. Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations only indirectly affect the type of use made of land or minimum specifications for structures. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Wise County has adopted a Subdivision Ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Wise County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodplain control are empowered through §15.2-2223 and §15.2-2280 of the Code of Virginia. Wise County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely “hazardproofing” a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by

gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Wise County proposes to continue using acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Wise County does levy property taxes, and uses preferential tax districts and special assessments for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Wise County has adopted and implemented a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Wise County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

SECTION VII. MITIGATION STRATEGY

The Mitigation Advisory Committee attended workshops on August 18, 2003, June 3, 2004, and February 4, 2005 to discuss the results of the hazard identification and risk assessments, review mitigation goals and objectives based on the priority areas and hazard types, discuss community strengths and weaknesses, and begin developing the mitigation strategy.

This section of the Hazard Mitigation Plan describes the most challenging part of any such planning effort – the development of a ***Mitigation Strategy***. It is a process of:

1. **Setting mitigation goals,**
2. **Considering mitigation alternatives,**
3. **Developing objectives and implementation approaches, and**
4. **Deriving a mitigation action plan.**

Essentially these four elements comprise this mitigation strategy.

Setting Mitigation Goals

The hazard mitigation planning process followed by the Mitigation Advisory Committee (MAC) is a typical problem-solving methodology:

- Describe the problem (Hazard Identification),
- Estimate the impacts the problem could cause (Vulnerability Assessment),
- Assess what safeguards already exist that could/should lessen those impacts (Capability Assessment), and
- Using this information, determine if you should do something (Determine Acceptable Risk), and if so, what that something should be (Develop an Action Plan).

When a community decides that certain risks are unacceptable and that certain mitigation actions may be achievable, the development of *goals* and *actions* takes place. Goals and actions help to describe what should occur, using increasingly more narrow descriptors. Initially, broad-based goals are developed, which are long-term and general statements. Goals are accomplished by implementing actions, which are very detailed and achievable in a finite time period.

The MAC discussed goals for this plan at two points in the planning process. First, early in the planning process, the MAC established general goals to set the initial tone and direction for the overall plan. Then, after the problem-solving process as described above took place, the goals were revisited to confirm that the data collection process supported them. Lastly, actions were developed as a logical extension of the plan's

objectives. Most of these actions are dynamic and can change. These actions have been utilized to develop a Mitigation Action Plan for the Planning District.
Representatives from Lee, Scott, and Wise Counties, the City or Norton, and the Towns of Jonesville, Pennington Gap, Saint Charles, Clinchport, Duffield, Dungannon, Gate City, Nickelsville, Weber City, and Appalachia. used the results of the data collection efforts to develop goals and prioritize their actions. The priorities differ somewhat from jurisdiction to jurisdiction. Overall, for the entire planning area, protecting new and existing development from the effects of hazards is the top priority because it is can be achieved on an individual community-by-community basis but at the same time be integrated into an overarching plan goal. Each jurisdiction's additional priorities were developed based on past damages, existing exposure to risk, other community goals, and weaknesses identified by the local government capability assessments.

Following the ***final*** public meeting on June 28, 2005, the following goals for the Planning District were accepted by the Mitigation Advisory Committee. The goals and their associated actions form the basis for the development of a mitigation action plan for implementation to be considered for the Planning District. The Mitigation Action Plan, located at the end of this section, contains recommended mitigation projects including timelines.

- **GOAL 1:**
  Ensure public health and safety within the LENOWISCO planning region before, during, and following hazardous events.
- **GOAL 2:**
  Implement effective hazard mitigation measures that would minimize the impact of natural hazards on life and property for both existing and future development.
- **GOAL 3:**
  Increase the area's floodplain management activities and participation in the National Flood Insurance Program.
- **GOAL 4:**
  Incorporate hazard awareness and risk reduction principles into the daily activities, processes, functions, and policies of the community.
- **GOAL 5:**
  Continue to assess and enhance understanding of the extent of our vulnerability to natural hazards.
- **GOAL 6:**
  Publicize mitigation activities to reduce the area's vulnerability to the identified hazards.

General Observations — Strengths

- The LENOWISCO area has several policies that have hazard mitigation elements or effects such as development and building code regulations, floodplain ordinances, zoning ordinances and stormwater management programs. Building code regulations, such as the freeboard and local enforcement, have helped to ensure that new development is built to accepted safety standards for development overall.
- Much of the language used for flood hazard mitigation is already present in some of the LENOWISCO area communities' existing comprehensive plans. These concepts involve floodplain management and the preservation of open space and natural areas.
- Over the next few years, the LENOWISCO area communities will continue to have opportunities to experience new development within its jurisdictions and those structures which are built will be constructed built to newer codes and standards that help to reduce damage from natural hazards.

General Observations — Weaknesses

- While the LENOWISCO area jurisdictions enforce their floodplain ordinances, many current ordinances are out-of-date and need to be revised. The area's jurisdictions could offer an even greater degree of protection if they adopted cumulative substantial damage and substantial improvement determinations.
- Citizens within the Planning District have a historic acceptance of the cycle of damage in the community. Repairing damaged buildings and infrastructure to pre-damaged condition, only to be damaged again during the next event is common in even the most frequently and severely damaged portions of the planning district.
- Limited amounts of developable land within the Planning District, and historic lack of public buy-in to mitigation has restricted the number mitigations options available for some of the most frequently and severely damaged portions of the Planning District.

During the presentation of findings for the hazard identification and risk assessment workshop, the Mitigation Advisory Committee was asked to provide their preliminary input and ideas. Ranges of alternatives were then considered by the Mitigation Advisory Committee based on their comments and suggestions.

The Mitigation Advisory Committee was asked to review the STAPLE/E criteria to rank the mitigation alternatives. The MAC utilized the STAPLE/E process, whenever possible, tempered by the preliminary comments below:

1. *Top priorities for the area were public safety, public education, and reducing potential economic impacts of disasters.*

2. *Alternatives should consider the impacts on the jurisdictions as a whole.*
3. *Alternatives must not conflict with other community programs.*
4. *Community Rating System (CRS) and floodplain management policies and activities should be a priority.*
5. *Experiences from disasters should be built upon.*
6. *The success of past mitigation projects should be used as a base for alternatives.*
7. *Outreach and other efforts should be focused on FEMA's Repetitive Loss Properties.*

Prioritizing Alternatives

The Mitigation Advisory Committee used the STAPLE/E Criteria (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) to select and prioritize the most appropriate mitigation alternatives for the LENOWISCO area communities. This methodology requires that the social, technical, administrative, political, legal, economic, and environmental considerations be taken into account when reviewing potential actions for the area's jurisdictions to undertake. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on a jurisdictions capabilities.

Table VII-1, below, provides information regarding the review and selection criteria for alternatives.

TABLE VII-1 — STAPLE/E REVIEW AND SELECTION CRITERIA FOR ALTERNATIVES
SOCIAL
• Is the proposed action socially acceptable to the community(s)? • Are there equity issues involved that would mean that one segment of a community is treated unfairly? • Will the action cause social disruption?
TECHNICAL
• Will the proposed action work? • Will it create more problems than it solves? • Does it solve a problem or only a symptom? • Is it the most useful action in light of other community(s) goals?
ADMINISTRATIVE
• Can the community(s) implement the action? • Is there someone to coordinate and lead the effort? • Is there sufficient funding, staff, and technical support available?

- Are there ongoing administrative requirements that need to be met?

POLITICAL

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

LEGAL

- Is the community(s) authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by a comprehensive plan, or must a comprehensive plan be amended to allow the proposed action?
- Will the community(s) be liable for action or lack of action?
- Will the activity be challenged?

ECONOMIC

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
- How will this action affect the fiscal capability of the community(s)?
- What burden will this action place on the tax base or local economy?
- What are the budget and revenue effects of this activity?
- Does the action contribute to other community goals, such as capital improvements or economic development?
- What benefits will the action provide?

ENVIRONMENTAL

- How will the action affect the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

The master grouping of alternatives the MAC chose from is included in the next section. These actions were then compiled into a master list for the MAC to rank. The MAC ranked the goals on a scale of 1 to 6 and the actions on a scale of 1 to 10. Ranking was done in order of relative priority based on the STAPLE/E criteria and the potential goal/action's ability to reduce vulnerability to natural hazards.

Considering Mitigation Alternatives

A wide range of potential mitigation alternatives were considered by the Mitigation Advisory Committee. The actions considered are presented in Appendix B. These actions include those for all hazards identified in the HIRA and include specific structural measures, policy and procedure revisions, and data collection measures. In many cases, actions specific to the community were developed based on the capacity of the communities and the level of data available when making decisions.

Mitigation Actions

In formulating a mitigation strategy, a wide range of activities were considered in order to help achieve the goals and to lessen the vulnerability of the LENOWISCO Planning District area to the effects of natural hazards. The Mitigation Action Plan is comprised of proactive mitigation actions designed to reduce or eliminate future losses from natural hazards in the participating jurisdictions.

In addition, the anticipated level of cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural measures, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. Although detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For those measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

LENOWISCO Planning District Commission Mitigation Actions

The mitigation actions proposed for the Planning District to undertake are listed on the pages that follow. Each has been designed to achieve the goals and objectives identified in this multi-jurisdictional all-hazards mitigation plan. Each proposed action includes:

(1) the appropriate category for the mitigation technique,
(2) the hazard it is designed to mitigate,
(3) the objective(s) it is intended to help achieve,
(4) some general background information,
(5) the priority level for its implementation (high, moderate, or low),
(6) potential funding sources, if applicable,
(7) the agency/person assigned responsibility for carrying out the strategy, and
(8) a target completion date.

When formulating a Mitigation Action Plan, a wide range of activities should be considered to help achieve the goals of communities and lessen the vulnerability of the participating jurisdictions to the effects of natural hazards. In general, all of these activities fall into one of the following broad categories of mitigation techniques. Tables VII-8 and VII-9 shows which jurisdictions have chosen to participate in the proposed actions. Appendix B includes the range of alternatives that were considered in by the Mitigation Advisory Committee.

Mitigation Advisory Committee.

ACTION #1

Obtain official recognition of the Mitigation Advisory Committee by the Planning District's communities in order to help institutionalize and develop an ongoing mitigation program.

Category: Public Information & Awareness
Hazard: All
Objective(s) Addressed: 4.3
Background: After the passage of the Disaster Mitigation Act of 2000 (DMA2K), local governments are required to develop and to adopt all hazards mitigation plans to be eligible for certain types of future disaster assistance including funds for mitigation activities. Nationwide, many communities have formed committees, councils or citizen groups to assist in developing and implementing plans. In the case of multi-jurisdictional plans, "mitigation advisory committees" are often formed and are comprised of local officials and residents from the participating jurisdictions. One way to assure the effectiveness of such committees is to bestow official status to them. An officially recognized Mitigation Action Committee will aid each community by sharing the workload on regionally beneficial actions and present a unified voice in dealing with state and FEMA officials.
Priority: High
Funding Sources: N/A
Responsibility Assigned to: MAC and PDC
Target Completion Date: December 31, 2005

ACTION #2

Target FEMA's Repetitive Loss Properties, and other known repetitively flooded properties, throughout the Planning District for potential mitigation projects.

Category: Property Protection

Hazard: Flood
Objective(s) Addressed: 1.2, 3.4
Background: Currently, over 40,000 of the four million properties insured under the National Flood Insurance Program have been identified by FEMA as repetitive loss properties. The known repetitive loss properties are those that have sustained flood damage and received flood insurance claim payments on multiple occasions. Wise County and Scott County have participated in an acquisition program in the past to remove these properties from vulnerable areas. However, funding for additional acquisition activities is not always available.
Priority: High
Funding Sources: FEMA's Pre-Disaster Mitigation (PDM) program, Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) program
Responsibility Assigned to: Mitigation Advisory Committee and Planning District Commission
Target Completion Date: June 1, 2008

ACTION #3

Undertake educational outreach activities by developing and distributing brochures and education materials for FEMA's Repetitive Loss Properties with specific mitigation measures emphasizing acquisition, relocation and elevation.

Category: Public Education and Awareness
Hazard: Flood
Objective(s) Addressed: 3.3
Background: The Planning District has several repetitive loss properties that have been identified by FEMA. Although an acquisition program for flood-prone properties has been undertaken in the state previously, local citizens are reluctant to relocate from an area where they have strong family and community ties. Citizens should be educated about the flood loss cycle associated with flood-prone areas and encouraged to work with local government officials to develop mutually agreeable strategies to address repetitive losses in the Planning District.
Priority: High
Funding Sources: FEMA, VDEM
Responsibility Assigned to: MAC, PDC and local emergency management agencies
Target Completion Date: April 1, 2006

ACTION #4

Evaluate the Planning District's community floodplain ordinances and enforcement procedures that may be outdated for possible upgrades.

Category: Prevention

Hazard: Flood
Objective(s) Addressed: 3.1
Background: Each county and community in the planning district has adopted and enforces the NFIP floodplain management regulations. By utilizing the working relationship established by the formalization of the Mitigation Action Committee communities can share information on the state of current regulations as well as enforcement procedures. By sharing this information communities can learn from one another on ways to best implement, monitor, and enforce NFIP regulations and over all floodplain management.
Priority: Moderate
Funding Sources: N/A
Responsibility Assigned to: Planning District communities' floodplain managers
Target Completion Date: January 1, 2007

ACTION #5

Initiate discussion concerning which individuals shall be designated as the Floodplain Manager in each of the four Planning District's jurisdictions. MAC and PDC will make recommendations to the appropriate decision-makers in each jurisdiction.

Category: Prevention
Hazard: All
Objective(s) Addressed: 3.2
Background: Over nineteen thousand communities participate in the National Flood Insurance Program (NFIP) and have adopted floodplain ordinances that specify the designation of a local floodplain official or administrator. In many cases, the local floodplain administrator is either 1) an individual with little or no experience about flooding and the NFIP, or 2) an individual with many responsibilities. Lee, Scott, and Wise Counties and the City of Norton have adopted floodplain ordinances and designated a local floodplain administrator. A review of these individuals' responsibilities, not just floodplain administration, can assist local decision-makers in the effective allocation of personnel resources and funding.
Priority: Moderate
Funding Sources: N/A
Responsibility Assigned to: MAC, PDC and local government decision-makers including county commissions.
Target Completion Date: January 1, 2006

ACTION #6

Publicize the Virginia Department of Forestry's *Money for Mitigation Program*. Utilize existing wildfire maps to prioritize project areas in the Planning District.

Assist local residents, in priority areas, to reduce wildfire hazards through the use of funding from the *Money for Mitigation Program*.

Category: Public Education and Awareness
Hazard: Fire
Objective(s) Addressed: 1.3
Background: Financial assistance to reduce fire hazards has been established at the Virginia Department of Forestry. The program provides 50%-50% cost share funds to reduce wildfire fuels, particularly in wildland urban interface areas. Citizen's groups and homeowner's associations are eligible applicants. A program description including eligibility criteria can be accessed at the agency's website www.vdof.org.
Priority: Moderate
Funding Sources: Virginia Department of Forestry
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: March 1, 2006

ACTION #7

Develop a comprehensive compilation of landslide activity in the Planning District to be used as a planning tool for future infrastructure projects.

Category: Prevention
Hazard: Landslide
Objective(s) Addressed: 2.9
Background: Landslide activity is prevalent in the mountainous regions of the Planning District. Most often, roadways are impacted by landslide events. The Virginia Department of Transportation and local government road and bridge departments usually respond to events on an as-needed basis. A compilation of landslide activity, both past and present, can assist decision-makers as a planning tool when determining where to cite new and upgraded infrastructure.
Priority: Moderate
Funding Sources: VDOT and local public works departments/agencies
Responsibility Assigned to: MAC, PDC and local public works departments/agencies
Target Completion Date: June 1, 2006

ACTION #8

Initiate discussions with public utility companies about incorporating mitigation as infrastructure is laid, maintained, or repaired. Invite utilities to make a presentation to the MAC to begin dialogue.

Category: Prevention
Hazard: All

Objective(s) Addressed: 2.5, 2.6
Background: Mitigation initiatives that protect utility infrastructure can most often be installed at the beginning of a project for much less money than installation as retrofitting after the fact. Many utility companies have the financial capacity and desire to protect their facilities from the impacts of natural hazards but are often unaware of the risk until an event occurs. Local governments can serve to educate the companies about the risk of natural hazards and provide technical guidance and references about hazard proofing their facilities.
Priority: Moderate
Funding Sources: FEMA; VDEM, VDC
Responsibility Assigned to: MAC, PDC, local public works departments/agencies, emergency management agencies and area Chambers of Commerce
Target Completion Date: Continuous

ACTION #9

Develop "hazard information centers" on the Planning District's community's websites and in public libraries where individuals can find hazard and mitigation information.

Category: Public Information and Awareness
Hazard: All
Objective(s) Addressed: 6.3
Background: As the Internet continues to become "the information super highway," more local governments are using it as a primary means of official communication with community residents through the development and administration of websites. Today, many residents pay their water and power bills online, register to vote and even obtain driver's licenses over the Internet. Use of local government websites to educate community residents about natural hazards and mitigation opportunities is growing nationwide.
Priority: Moderate
Funding Sources: Local government annual budgets for information technology
Responsibility Assigned to: Planning District community's local government communications departments/offices, the MAC and PDC.
Target Completion Date: December 31, 2005

ACTION #10

Investigate the benefits of submitting Community Rating System Applications for non-participating jurisdictions.

Category: Prevention
Hazard: All

Objective(s) Addressed: 3.8
Background: Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: Class 1 requires the most credit points and gives the largest premium reduction (45%); class 10 receives no premium reduction. Each class, starting with Class 9, receives a 5% premium reduction. MAC members should be educated on the benefits of participation of CRS, so that each community may potentially submit a CRS application.
Priority: Low
Funding Sources: Local government department budgets
Responsibility Assigned to: MAC, PDC, local government planning departments work with the State NFIP Coordinator at the VDC
Target Completion Date: June 1, 2006

ACTION #11

Investigate all critical facilities to evaluate their resistance to wind, fire, landslide and flood hazards. This study will examine all critical facilities within the Planning District communities and make recommendations as to ways in which the facilities can be strengthened or hardened.

Category: Public Information and Awareness
Hazard: All
Objective(s) Addressed: 2.3
Background: The ability to recover quickly after a disaster rests, in part, on the community's ability to maintain critical functions during response and recovery. Efforts should be undertaken to ensure that community critical facilities (e.g., fire departments, hospitals, schools) can withstand the impact of various hazards. Local facilities management offices/agencies and local emergency management agencies will work with the MAC and PDC to undertake a future study with recommendations for improvements. In order to finance this initiative, the MAC and PDC will submit a Pre-Disaster Mitigation (PDM) program grant application to the Virginia Department of Emergency Management.
Priority: Moderate
Funding Sources: FEMA, VDEM
Responsibility Assigned to: MAC, PDC, local facilities management agencies and local emergency management agencies
Target Completion Date: December 31, 2005

ACTION #12

Support Public Works initiatives to improve stormwater infrastructure throughout the area.

Category: Structural Projects
Hazard: Flood
Objective(s) Addressed: 2.10**,** 2.11, 2.12, 4.2, 4.6
Background: Many times, local stormwater channels are not identified on FEMA Flood Insurance Rates Maps (FIRM's). Consequently, stormwater hazards are often overlooked as natural hazards although they can cause significant problems during times of high water. Many jurisdictions do not regulate stormwater runoff, thereby, increasing flood damage potential during an event.
Priority: Moderate
Funding Sources: EPA, USACE, FEMA
Responsibility Assigned to: MAC, PDC and local public works departments
Target Completion Date: Continuous

ACTION #13

Develop and distribute a brochure targeting the District jurisdictions' community staff, which details mitigation principles and options.

Category: Public Information and Awareness
Hazard: All
Objective(s) Addressed: 4.4, 6.1
Background: Local governmental staff should be educated about the benefits of natural hazard mitigation and encouraged to incorporate the principles into the decision-making processes related to their jobs. Information on potential mitigation measures, as well as potential funding sources and partnering opportunities should be shared with all appropriate local staff.
Priority: Low
Funding Sources: FEMA, NWS, VDEM, VDC
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: Continuous

ACTION #14

Perform an analysis of emergency communication systems in all jurisdictions to ensure compatibility during an event.

Category: Public Information and Awareness
Hazard: All

Objective(s) Addressed: Goal 1
Background: Many natural disasters and other types of emergencies affect multiple jurisdictions simultaneously. The ability to communicate from jurisdiction to jurisdiction and between local jurisdictions and state and regional agencies is essential to a timely and appropriate response to an emergency or hazard event.
Priority: Moderate
Funding Sources: FEMA, DHS, Local funding
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: Continuous

Table VII-8 — Mitigation Action Item - Participation by County				
Action Item	Lee County	City of Norton	Scott County	Wise County
1	✓	✓	✓	✓
2	✓	✓	✓	✓
3	✓	✓	✓	✓
4	✓	✓	✓	✓
5	✓	✓	✓	✓
6	✓	✓	✓	✓
7	✓	✓	✓	✓
8	✓	✓	✓	✓
9	✓	✓	✓	✓
10	✓	✓	✓	✓
11	✓	✓	✓	✓
12		✓		
13	✓	✓	✓	✓
14	✓	✓	✓	✓

Table VII-9-1 — Mitigation Action Item - Participation by Town

Action Item	Jonesville	Pennington Gap	St. Charles	Clinchport	Duffield	Dungannon	Gate City	Nickelsville	Weber City
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
Additional		✓							

Table VII-9-1 — Mitigation Action Item - Participation by Town

Action Item	Appalachia	Big Stone Gap	Coeburn	Pound	St. Paul	Wise
1		✓	✓	✓	✓	✓
2						
3						
4						
5						
6						
7						
8						
9		✓		✓	✓	✓
10						
11						
12						
13				✓		
14						
Additional						

Additional Actions

Town of Pennington Gap

ACTION 1

Obtain funding to construct a greenway trail along the North Fork Powell River from River Bend Shopping Center to Leeman Field Park. One of the main purposes of this project is to create/improve the storm water infrastructure throughout this area by implementation of a storm water BMP.

Category: Structural Projects
Hazard: Flood
Objective(s) Addressed: 2.7, 2.10, 2.11, 3.3, 4.5, 4.6, 5.4, 6.3
Background: The Town of Pennington Gap has enlisted the services of the Community Design Assistance Center (CDAC), which is a division of the Virginia Polytechnic Institute and State University, College of Architecture and Urban Studies. CDAC has assisted in designing a greenway trail that runs along the North Fork of the Powell River from Route 58, where it enters the Town limits from the East, to Leeman Field, the Town managed recreation area. The greenway will provide a pedestrian access corridor from Leeman Field into the Pennington Gap downtown area. The section where the trailhead is located, adjacent to Route 58, is a privately owned commercial site that currently has storm water issues. At present, there are no Best Management Practices (BMPs) that treat the stormwater sheet flow coming off the parking lot and entering the river. Through initiatives of the Tennessee Valley Authority (TVA), an effort has been begun to gain an easement along 700 foot of river frontage in order to implement a stormwater BMP, as well as, provide enough land "canvas" in which to set the greenway trail. Funding sources are needed in order to bring this project to reality. A report that describes and documents the design process and the final conceptual design for the North Fork Powell River Greenway and information regarding stormwater management and Low Impact Development has been developed and can be provided if needed.

Priority: Medium
Funding Sources: VDOT, DCR, DOF, TVA, VEMA
Responsibility Assigned to: Mark J. Smith - Town Manager; Bobby Lane, Lane Engineering - Town Contracted Engineer
Target Completion Date: December 31, 2008

SECTION VIII. PLAN MAINTENANCE PROCEDURES

The long-term success of the LENOWISCO Planning District's mitigation plan depends in large part on routine monitoring, evaluating, and updating of the plan so that it will remain a valid tool for the communities to use. The first step in ensuring that the plan's activities will be implemented is obtain official recognition of the Mitigation Advisory Committee (MAC) as proposed in Mitigation Objective 4.3 and assign the responsibility to the MAC.

Plan Adoption, Implementation And Maintenance

Formal Plan Adoption

Nine local governments in southwestern Virginia have participated in this planning process and formally adopted this plan by resolution of their governing Board. Those local governments are the City of Norton and the counties of Lee, Scott, and Wise (LENOWISCO Planning District).

The adoption necessitated that the MAC 1) get the plan review and adoption on the appropriate meeting agendas in each jurisdiction, 2) produce and provide copies in official meeting packets, 3) facilitate the actual adoption, 4) collect the adoption resolutions, and 5) incorporate the adopted resolutions into the final Hazard Mitigation Plan.

The LENOWISCO Planning District appreciates the willingness that both Virginia Department of Emergency Management and FEMA Region III demonstrated by reviewing this plan concurrently and providing comments for revision *prior* to the adoption process. Not having done so would clearly have added more months to the adoption process.

Implementation

Upon adoption, the plan faces the biggest test: *implementation*. Implementation implies two concepts: action and priority.

While this plan puts forth many worthwhile and "High" priority recommendations, there may be competition among the participating communities in the LENOWISCO Planning District for limited mitigation funds. The decision of which action to undertake first will be the primary issue that the district's communities face. Fortunately, there are two factors that will help make that decision workable. First, there are high priority items for each participating community, so each can pursue an action independently. Therefore, the Plan's specific recommendations will begin to be addressed. Second, funding is always an important and critical issue. Consequently, whenever possible, the Planning District communities will pursue low or no-cost recommendations.

An example of a low-cost, high priority recommendation would be to pursue the education efforts necessary for elected officials and the general public as they relate to

participation in the National Flood Insurance Program (NFIP). In other cases, some communities need to strengthen their commitment to the NFIP by amending local floodplain ordinances.

Another example would be to pursue the regional goal of increasing education opportunities for the Planning District communities' employees, MAC representatives, and public officials regarding natural hazard mitigation, floodplain management, floodplain regulations, and enforcement. These initial efforts will lead to long-standing changes in vulnerability and can be initiated at very little cost, while promoting public education through their relative "visibility" in the community.

Another important implementation approach that is highly effective, but low-cost, is to take steps to incorporate the recommendations, and equally important, the underlying principles of this Hazard Mitigation Plan into other community plans and mechanisms, such as:

- Comprehensive Planning
- Capital Improvement Budgeting
- Economic Development Goals and Incentives

Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of government and development. This integration is accomplished by a constant effort to network and to identify and highlight the multi-objective, "win-win" benefits to each program, the communities and their constituents. Just as importantly, the mitigation plan and its recommendations should be presented as a *"framework for mitigation"* in all future planning efforts undertaken by the district's communities such as the development or revision of local comprehensive plans. This effort is achieved through the often tedious actions of monitoring agendas, attending meetings, sending memos, and promoting safe, sustainable communities.

Simultaneous to these efforts, it will be important to constantly monitor funding opportunities that can be utilized to implement some of the higher cost recommended actions. This will include creating and maintaining a repository of ideas on how any required local match or participation requirement can be met. Then, when funding does become available, the LENOWISCO Planning District communities will be in a position to take advantage of an opportunity. Funding opportunities that can be monitored include special pre- and post-disaster funds, special district budgeted funds, state or federal ear-marked funds, and grant programs, including those that can serve or support multi-objective applications.

With adoption of this plan, the LENOWISCO Planning District communities commit to:

- Pursuing the implementation of the high priority, low/no-cost Recommended Actions.

- Keeping the concept of mitigation in the forefront of community decision-making by identifying and stressing the recommendations of the Hazard Mitigation Plan when other community goals, plans and activities are discussed and decided upon.
- Maintaining a constant monitoring of multi-objective, cost-share opportunities to assist the participating communities in implementing the recommended actions of this plan for which no current funding or support exists.

Maintenance

Plan maintenance requires an ongoing effort to monitor and evaluate the implementation of the plan, and to update the plan as progress, roadblocks, or changing circumstances are recognized.

This monitoring and updating will take place through:

1. An annual review by each LENOWISCO Planning District community,
2. An annual review through the Mitigation Advisory Committee, and
3. A 5-year written update to be submitted to the state and FEMA Region III, unless disaster or other circumstances (e.g., changing regulations) lead to a different time frame.

When each community convenes for a review, they will coordinate with each of the other jurisdictions that participated in the planning process – or that has joined the planning group since the inception of the planning process -- to update and revise the plan. Public notice will be given and public participation will be invited, at a minimum, through available web-postings and press releases to the local media outlets, primarily newspapers and radio stations.

The evaluation of the progress can be achieved by monitoring changes in the vulnerability identified in the plan. Changes in vulnerability can be identified by noting:

- Lessened vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or,
- Increased vulnerability as a result of new development (and/or annexation).

The updating of the plan will be by written changes and submissions, as the LENOWISCO Planning District communities and Mitigation Advisory Committee deem appropriate and necessary.

SECTION IX. REFERENCES

In addition to the general body of literature on hazard vulnerability and hazard mitigation, the following reports and data were reviewed and used during this study:

City of Chesapeake, Virginia, Natural Hazards Mitigation Plan, 2003-2008, by City of Chesapeake, VA and Dewberry & Davis LLC, September 2003.

City of Conway, South Carolina Flood Hazard Mitigation Plan, February 16, 2000, by French & Associates, Ltd. Park Forest, Illinois

Flood Mitigation Plan for Lewes, Delaware, September 1999, by Greenhorne & O'Mara, Inc.,9001 Edmonston Road, Greenbelt, MD 20770

Heart of Illinois Project Impact Natural Hazards Mitigation Plan, April 12, 2004 by Dewberry, 8401 Arlington Blvd., Fairfax, VA 220311-4666.

Hyde County, North Carolina, Multi-Hazard Mitigation Plan, 2003, by Hyde County, NC.

Northeast Colorado All Hazards Mitigation Plan, December 2003 by Northeast Colorado Emergency Management Association and Mitigation Assistance Corporation.

Virginia Southwest Promise Profile, 2004*,* by Virginia Economic Development Partnership.

United States Census 2000, by U.S. Census Bureau.

HIRA References

Federal Emergency Management Agency, Multihazard Identification and Risk Assessment (1997)

Federal Emergency Management Agency, *Understanding Your Risks: Identifying hazards and estimating losses (*FEMA 386-2, 2001)

National Climatic Data Center, National Oceanic and Atmospheric Administration

National Drought Mitigation Center*, Drought Indices*, retrieved from http://www.drought.unl.edu/whatis/indices.htm

National Weather Service, *Virginia Tornados*

Tennessee Valley Authority reports (1966, 1967, 1972, 1977)

United States Geological Survey, Flood gauge data

University of Kentucky, *The Kentucky Earthquake Page*, retrieved from http://www.uky.edu/ArtsSciences/Geology/webdogs/virtky

Virginia Department of Forestry, *Wildfire Risk Assessment (WRA) – 2003*

Virginia Department of Transportation, Personal communication

Virginia State Water Control Board report (1977)

Virginia Uniform Statewide Building Code

APPENDIX A. DETAILED HAZARD IDENTIFICATION PARAMETERS AND METHODOLOGY

Based on all local and regional hazard data collected, an analysis of the potential hazards that can affect the LENOWISCO area was performed based on the four parameters that are described below. These four parameters were based on two separate factors — *the probabilities that a potential hazard will affect the planning area and the potential impacts on the planning area should a hazard event occur*. Hazard identification parameters and computations used to prioritize the potential hazards that can threaten the LENOWISCO area are listed in tabular form at the end of this appendix.

- **Probability** — This parameter addresses the probability that a potential hazard will affect the city. The probability for each hazard was determined based on the history of events in the LENOWISCO area, as well as any other relevant available data related to the probability for the Tidewater area. Hazard probabilities were classified into one of four distinct categories by estimating the hazard's average annual frequency, which is the probability of a specific hazard event occurring in the LENOWISCO area in a given year. Some average annual frequencies were relatively simple to estimate. For example, a review of LENOWISCO's tornado hazard history (Section V) indicated the city has experienced 6 tornadoes over the past 225 years. Therefore, the average annual frequency of a tornado event occurring in any given year was (6/225 x 100) = 2.7%. However, the frequencies of other hazards in the LENOWISCO area were more difficult to determine due to limited historical data. In such cases, frequency estimates relied on experience with similar events that have occurred near the planning area.

- **Affected Area** — This parameter is the first of three impact parameters, and addresses the potentially affected geographic area within the city should a hazard event occur. The extent of the affected area for each hazard was determined based on the specific characteristics of each hazard, the history of such events in the LENOWISCO area, and experience with similar events that have occurred near the planning area. The affected areas were classified into one of four distinct categories based on the extent of the city directly impacted by the hazard, ranging from a single building or facility to a widespread portion of the LENOWISCO area.

- **Primary Impact** — This second impact parameter addresses the potential direct damages to city buildings, facilities, and individuals should a hazard event occur. The primary impact was determined based on the specific characteristics of each hazard, the history of such events in the LENOWISCO area, and experience with similar events that have occurred near the planning area. Primary impacts were classified into one of four distinct categories by estimating the typical damage to a city building or facility from a given hazard, ranging from negligible (less than 10% damage) to catastrophic (greater than 50% damage).

- **Secondary Impacts** — This third impact parameter addresses the potential secondary impacts on the city should a hazard event occur. Note that while primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood event may be road closures due to submerged pavement; while a secondary impact could be restricted access of emergency vehicles to citizens in a portion of the community due to the road closure. Other examples of secondary impacts include loss of building or facility services (functional downtime), power outages, and mass evacuation of city residents. The secondary impacts were determined based on the specific characteristics of each hazard, the history of such events in the LENOWISCO area, and experience with similar events that have occurred near the planning area. Secondary impacts were classified into one of four distinct categories by estimating the typical impacts to the city at large from a given hazard, ranging from negligible (no loss of function, downtime, and/or evacuations) to high (major loss of function, downtime, and/or evacuations).

Once these parameters were determined, a preference scale was utilized to arrive at a hazard level for each of the hazard types considered for the LENOWISCO area. The preference scale method has been used as a means of quantifying hazard assessment results in other communities, and similar scales were developed to rank alternatives in other FEMA documents such as FEMA Publication 259. The preference scale used for this hazard analysis first assigned a numerical value between 1 and 4 to each parameter, with 1 representing the lowest hazard potential and 4 being the highest.

These numerical values were then modified by weighing each parameter by a factor to reflect the overall importance of that parameter, with 0.5 representing parameters of lowest importance and 2.0 representing parameters of highest importance. Importance factors may also be adjusted to reflect the level of confidence with the information supplied for a given parameter. For this reason, probability parameters were assigned a factor of 2.0 to reflect their high importance and the generally high confidence in the available information. However, the affected area, primary impact and secondary impacts parameter were assigned factors of 0.8, 0.7 and 0.5 to reflect their lower importance and the low confidence in the available information. Finally, the factored values assigned to the various parameters for each hazard were totaled, and the hazard types with the highest totals were considered the highest potential hazard level.

In order to quantify these hazard parameters, the following formula was developed to assign a value for probability and impact for each of the hazards considered.

Hazard Level = **Probability** x **Impacts**

Where: **Probability** = (Probability score x Importance factor)

Impacts = (*Affected Area* + *Primary Impact* + *Secondary Impacts*)

Affected Area = Affected Area score x Importance factor

Primary Impact = Primary Impact score x Importance factor

Secondary Impact = Secondary Impact score x Importance factor

The preference scale computations used to determine the hazard level for each of the potential hazards impacting the LENOWISCO area are summarized in tabular form at the end of this appendix. The hazard levels are broken down into four distinct categories that represent the likelihood of a hazard event of that type significantly impacting the LENOWISCO area: High, Medium-High, Medium, and Low. Note that the assigning of numerical values and importance factors for parameters is qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, a margin or error of +10 percent was assumed for the total scores used to arrive at the hazard level values.

HAZARD ANALYSIS WORKSHEET - LENOWISCO PLANNING DISTRICT

Hazard Type	Probability	Impact			Total Score	Hazard Planning Consideration
		Affected Area	Primary Impact	Secondary Impacts		
SEVERE WINTER STORM	6	3.2	1.4	1.5	37	Moderate
DROUGHT	4	3.2	0.7	1	20	Limited
EARTHQUAKE	4	3.2	1.4	1	22	Limited
WILDFIRE	8	2.4	2.1	0.5	40	Moderate
FLOODING	8	2.4	2.1	2	52	Significant
EXTREME HEAT	2	3.2	0.7	0.5	9	None
LANDSLIDES, LAND SUBSIDENCE, SOIL EROSION	8	1.6	2.1	1	38	Moderate
SEVERE WIND, TORNADO	4	2.4	1.4	1	19	Limited
SEVERE THUNDERSTORM / HAIL STORM	8	1.6	0.7	0.5	22	Limited
DAM/LEVEE FAILURE	2	2.4	2.8	2	14	Limited
TORNADO	2	1.6	2.1	1	9	None

The probability of each hazard is determined by assigning a level, from 1 to 4, based on the likelihood of occurrence from historical data. The total impact value includes the affected area, primary impact and secondary impact levels of each hazard. These levels are then multiplied by an importance factor to obtain a score for each category. The probability score is multiplied by the sum of the three impact categories to determine the total score for the hazard. Based on this total score, the hazards will be separated into four categories based on the hazard level they pose to the communities: unlikely, possible, critical and highly likely.

Probability Importance 2.0

Based on estimated likelihood of occurrence from historical data

Level	Probability	Score
1	Unlikely	2
2	Somewhat Likely	4
3	Likely	6
4	Highly Likely	8

Affected Area Importance 0.8

Based on size of geographical area of community affected by hazard

Level	Affected Area	Score
1	Isolated	0.8
2	Small	1.6
3	Medium	2.4
4	Large	3.2

Primary Impact Importance 0.7

Based on percentage of damage to typical facility in community

Level	Impact	Score
1	Negligible - less than 10% damage	0.7
2	Limited - between 10% and 25% damage	1.4
3	Critical - between 25% and 50% damage	2.1
4	Catastrophic - more than 50% damage	2.8

Secondary Impacts Importance 0.5

Based on estimated secondary impacts to community at large

Level	Impact	Score
1	Negligible - no loss of function, downtime, and/or evacuations	0.5
2	Limited - minimal loss of function, downtime, and/or evacuations	1
3	Moderate - some loss of function, downtime, and/or evacuations	1.5
4	High - major loss of function, downtime, and/or evacuations	2

Total Score = Probability x Impact, where:
Probability = (Probability Score x Importance)
Impact = (Affected Area + Primary Impact + Secondary Impacts), where:
Affected Area = Affected Area Score x Importance
Primary Impact = Primary Impact Score x Importance
Secondary Impacts = Secondary Impacts Score x Importance

Hazard Level

Total Score	(Range)	Distribution	Hazard Level
0.0	12.0	2	None
12.1	28.0	5	Limited
28.1	48.0	3	Moderate
48.1	64.0	1	Significant

APPENDIX B. MITIGATION ALTERNATIVES

General Multi-Hazard Mitigation Alternatives

The mitigation alternatives selected should be linked to the LENOWISCO area's goals and objectives, and must address each jurisdiction's hazard risks and vulnerability outlined in the plan's Hazard Identification and Risk Assessment. The following is a list of potential mitigation measures not specific to one hazard, which can benefit a community's overall hazard reduction efforts.

A.1. Comprehensive Plans

Comprehensive plans address how and where a community should grow by guiding the rate, intensity, form, and quality of physical development. These plans address land use, economic development, transportation, recreation, environmental protection, the provision of infrastructure, and other municipal functions. Comprehensive plans help to guide other local measures such as capital improvement programs, zoning ordinances, subdivision ordinances and other community policies and programs. By integrating hazard considerations into the plan, mitigation would become integrated with community functions and could therefore be an institutionalized part of a jurisdiction's planning efforts.

Density and development patterns should reflect the LENOWISCO area communities' ability to protect their jurisdictions, the environment, and the ability to evacuate the area. Development management tools should be incorporated into the local policies that address the location, density, and use of land, with a particular emphasis on development within high-risk areas. Efforts should be made to keep people and property out of high-hazard areas whenever possible. Particularly hazardous areas could be used for recreational uses, open space, or wildlife refuges.

A.2. Capital Budget Plans

Capital budget plans typically provide for the future and ongoing provision of public facilities and infrastructure. These plans can be vital tools in keeping new development out of high-hazard areas by limiting the availability of public infrastructure. Public facilities can often be relocated to less hazardous areas in the aftermath of a disaster. Public utilities can also be relocated, or they can be upgraded or floodproofed. Power and telephone lines can be buried underground. In order to maximize the gravity flow area of wastewater treatment plants, the facilities are often located at the lowest elevation in the community. If this point lies within a floodplain for example, consideration may be given to relocating or floodproofing such facilities. New locations for critical facilities should not be in hazard-prone areas, or in areas where their function may be impaired by a given hazard event (i.e., where water can flood the access roads). Critical facilities should be designed and/or retrofitted in order to remain functional and safe before, during, and after a hazard event.

A.3. Zoning

Zoning is by far the most common land-use control technique used by local governments. While a useful tool for regulating and restricting undesirable land uses, zoning has a somewhat more limited benefit when it comes to mitigation. Zoning is most effective on new development rather than existing development, which does little to address the pre-existing development in hazardous areas. Communities with a large amount of undeveloped land will benefit much more than older, more established communities. Even for new development, the issuance of variances, special use permits, rezoning, and the failure to enforce existing codes, however, will weaken zoning's ability to prevent certain types of building practices.

A.4. Building Codes

Building codes regulate the design, construction, and maintenance of construction within most communities. These regulations prescribe standards and requirements for occupancy, maintenance, operation, construction, use, and appearance of buildings. Building codes are an effective way to ensure than new and extensive re-development projects are built to resist natural hazards. In Virginia, communities are required by law to adopt and enforce the Uniform Statewide Building Code, which has provisions for wind, water, and seismicity.

A.5. Public Outreach and Education Programs

Educating the public about what actions they can take to protect themselves and their property from the effects of natural hazards can be an effective means for reducing losses. These types of programs could target public officials, citizens, businesses, or the local construction trade. The program could cover preparedness, recovery, mitigation, and general hazard awareness information. The information could be presented in a variety of ways, from workshops, brochures, advertisements, or local media. Potential outreach and education topics include:

- Code Awareness Training
- Sheltering and Evacuation
- Flood Insurance
- School Information (Primary, Secondary, Colleges, and Universities)
- New Homeowner/Resident Information
- Emergency Preparedness for Families, Businesses, and Tourists
- Driver Safety in Disasters
- Special Needs Outreach
- Hazard Mitigation for Homeowners (Including Manufactured Homes and Trailers), Renters, and Businesses

A.6. Vegetative Maintenance

Vegetative maintenance is the pruning and maintenance of trees, bushes, and other vegetation that could increases threats to power lines during storms, or could act as fuels during wildfires. This could be applied in limited areas that have a significant vulnerability to these hazards, such as an easement or along the urban-wildland interface.

A.7. Vegetative Planting and Treatment

Vegetative planting and treatments can help to capture and filter runoff and can reduce landslides. Perennial vegetation includes grass, trees, and shrubs, which cover the soil, reduce water pollution, slow the rate of runoff, increase filtration, and prevent erosion. This type of land treatment includes maintaining trees, shrubberies, and the vegetative cover, terracing (a raised bank of earth with vertical sloping sides and a flat top to reduce surface runoff) , stabilizing slopes, grass filter strips, contour plowing, and strip farming (the growing of crops in rows along a contour). Other potential options include vegetated swales, infiltration ditches, and permeable paving blocks.

B. Hazard-Specific Alternatives

The following is a list of potential mitigation measures that tend to work better when applied to a specific hazard.

B.1. Flood

Flood mitigation measures can be classified as structural or non-structural. In simple terms, structural mitigation attempts to eliminate the possibility of flooding at a particular location. Non-structural mitigation removes the potentially effected people or property from the potentially flooded area. The following is a list of potential mitigation measures.

B.1.a. Floodplain Management Ordinances

Floodplain management ordinances are weakened by development pressures, a lack of suitable sites outside of the floodplain, community desires to be near the water, inability to effectively monitor floodplain management activities, or by land-use planning policies that are encouraging development into floodplain areas. Plans or policies that place more properties at risk are also reducing the storage capacity and functions of the natural floodplains. Degradation of the floodplain in this way increases flood depths and affects the reliability of Flood Insurance Rate Maps. Structures built in floodplains, particularly those that do not utilize a freeboard (that exceeds the minimum Base Flood Elevation), are consequently even more vulnerable to damage by floods.

B.1.b Acquisition

Acquisition involves the purchasing of a property that is cleared and permanently held as open space. Acquisition permanently moves people and property out of harm's way, increases floodplain capacities, recreation areas and open space, and can help to preserve wetlands, forests, estuaries and other natural habitats. Participation in federally funded grant programs requires voluntary participation by the owner.

Acquisition programs can be expensive to undertake, and the property will no longer accrue taxes for the community and must be maintained, but it is by far the most effective and permanent mitigation technique. Acquisition is most effective when targeting repetitive loss structures, extremely vulnerable structures, or other high-hazard areas.

B.1.c. Elevation

Elevation is the raising of a structure above the Base Flood Elevation. Elevation is often the best alternative for structures that must be built or remain in flood prone areas, and is less costly than acquisition or relocation. However, elevating a structure can increase its vulnerability to high winds and earthquakes. Some building types are either unsuitable or cost-prohibitive to elevate.

B.1.d. Relocation

Relocation involves the moving of a building or facility to a less hazardous area, on either the same parcel or another parcel. This measure also moves people and property out of harm's way, and is a very effective measure overall. Some building types are either unsuitable or cost-prohibitive to relocate.

B.1.e. Stormwater Management Plans

New development that increases the amount of impervious surfaces affects the land's ability to absorb the water and can intensify the volume of peak flow runoff. Without efficient stormwater management, runoff could cause flooding, erosion, and water quality problems. Stormwater management plans should incorporate both structural and nonstructural measures in order to be most effective. Structural measures include retention and detention facilities that minimize the increase of runoff due to impervious surfaces and new development. Retention facilities allow stormwater to seep into the groundwater. Detention systems accumulate water during peak runoff periods that will be released at off-peak times. Nonstructural measures include establishing impervious surface limit policies and maintenance programs for existing drainage systems.

B.1.f. Dry Floodproofing

Dry floodproofing involves making all areas below the flood protection level watertight by strengthening walls, sealing openings, using waterproof compounds, or applying plastic sheeting on the walls. This method is not recommended for residential structures, but may work well for new construction, retrofitting, or repairing a non-residential structure. Due to pressure exerted on walls and floors by floodwater, dry floodproofing is effective on depths less than 2 to 3 feet. Floodproofing of basements is not recommended.

B.1.g. Wet Floodproofing

Opposite of dry floodproofing, wet floodproofing lets the floodwater actually enter a structure. This technique is effective on deeper flood depths, as it does not have the same potential to build up exterior pressure. Again, this method is not recommended

for residential structures and may not be used for basements under new construction, substantial improvements, or substantially damaged structures.

B.1.h. Storm Drainage Systems

Mitigation efforts include the installation, re-routing, or increasing the capacity of storm drainage systems. Examples include the separation of storm and sanitary sewers, addition or increase in size of drainage or retention ponds, drainage easements, or creeks and streams.

B.1.i. Drainage Easements

Easements can be granted that enable regulated public use of privately owned land for temporary water retention and drainage areas.

B.1.j. Structural Flood Control Measures

Water can be channeled away from people and property with structural control measures such as levees, dams, or floodwalls. These measures may also increase drainage and absorption capacities. These structural control measures may also increase Base Flood Elevations and could create a false sense of security.

B.1.k. Basement Backflow Prevention

LENOWISCO area communities should encourage the use of check valves, sump pumps, and backflow prevention devices in homes and buildings, if the infrastructure allows.

2. Wind

Proper engineering and design of a structure can increase a structure's ability to withstand the lateral and uplift forces of wind. Building techniques that provide a continuous load path from the roof of the structure to the foundation are generally recommended.

2.A. Windproofing

Windproofing is the modification of the design and construction of a building to resist damages from wind events, and can help to protect the building's occupants from broken glass and debris. Windproofing involves the consideration of aerodynamics, materials, and the use of external features such as storm shutters. These modifications could be integrated into the design and construction of a new structure or applied to reinforce an existing structure. Manufactured homes, which tend to be vulnerable to the effects of extreme wind events, can be protected by anchoring the structures to their foundations. Mobile homes could be tied down to their pads in order to prevent them from being destroyed. Public facilities, critical infrastructure, and public infrastructure (such as signage and traffic signals) should all be windproofed in vulnerable areas. However, windproofing is not a viable mitigation technique to protect against tornadoes.

2.B. Community Shelters/Safe Rooms

Community shelters and concrete safe rooms can offer protection and reduce the risk to life. Locations for these shelters or safe rooms are usually in concrete buildings such as shopping malls or schools. Communities lacking basements and other protection nearby should consider developing tornado shelters.

2.C. Burying Power Lines

Buried power lines can offer uninterrupted power during and after severe wind events and storms. Burying power lines can significantly enhance a community's ability to recover in the aftermath of a disaster. Buried power lines are typically more expensive to maintain and are more vulnerable to flooding. Encouraging back-up power resources in areas where burial is not feasible will enable the continuity of basic operations (e.g., security, refrigeration, heat, etc.) for businesses and facilities when there is a loss of power.

Available Mitigation Techniques

1. Prevention

Preventative activities are intended to keep hazard problems from getting worse. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning
- Open space preservation
- Floodplain regulations
- Storm water management
- Drainage system maintenance
- Capital improvements programming
- Shoreline / riverine / fault zone setbacks

2. Property Protection

Property protection measures protect existing structures by modifying the building to withstand hazardous events, or removing structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection

- Retrofitting (i.e., windproofing, floodproofing, seismic design standards, etc.)
- Insurance
- Safe rooms

3. Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their mitigation functions. Such areas include floodplains, wetlands, and dunes. Parks, recreation or conservation agencies, and organizations often implement these measures. Examples include:

- Floodplain protection
- Riparian buffers
- Fire resistant landscaping
- Fuel Breaks
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

4. Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Levees / dikes / floodwalls / seawalls
- Diversions / Detention / Retention
- Channel modification
- Storm sewers
- Wind retrofitting
- Utility protection/upgrades

5. Emergency Services

Although not typically considered a “mitigation technique,” emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems

- Evacuation planning and management
- Sandbagging for flood protection
- Installing shutters for wind protection

6. Public Information and Awareness

Public information and awareness activities are used to advise residents, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children education
- Hazard expositions
- Website

APPENDIX C. PUBLIC PARTICIPATION NOTICES

LENOWISCO Comprehensive Hazard Mitigation Plan
Notice of Draft Plan Available for Public Review/Comment

LENOWISCO Comprehensive Hazard Mitigation Plan

Draft Plan available for public review/comment

A draft copy of the LENOWISCO Comprehensive Hazard Mitigation Plan will remain available for public review and comment through Friday, May 6, 2005.

The Draft Plan can be reviewed at the following locations:

Lee County Public Library
406 Joslyn Avenue, Pennington Gap

Scott County Public Library
131 West Jackson Street, Gate City

Wise County Public Library
124 Library Road, SW, Wise

Any public comments or questions should be directed to Mr. Frank Kibler, Senior Planner, at:
LENOWISCO P.D.C., Duffield, Virginia
Phone: (276) 431-2206
Fax: (276) 431-2208
Email: fkibler@lenowisco.org

Powell Valley News (Lee County)
Published April 20, 2005

LENOWISCO Comprehensive Hazard Mitigation Plan

Draft Plan available for public review/comment

A draft copy of the **LENOWISCO Comprehensive Hazard Mitigation Plan** will remain available for public review and comment through Friday, May 6, 2005.

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131 West Jackson Street, Gate City

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LENOWISCO P.D.C., Duffield, Virginia
Phone:(276)431-2206
Fax: (276) 431-2208
Email: fkibler@lenowisco.org

Scott County Star
Published April 20, 2005

LENOWISCO Comprehensive Hazard Mitigation Plan

Draft Plan available for public review/comment

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124 Library Road, SW, Wise

Any public comments or questions should be directed to Mr. Frank Kibler, Senior Planner, at:

LENOWISCO P.D.C., Duffield, Virginia
Phone: (276) 431-2206
Fax: (276) 431-2208
Email: fkibler@lenowisco.org

Coalfield Progress (Wise County)
Published April 21, 2005

(Advertisements shown smaller than actual published size)

LENOWISCO Comprehensive Hazard Mitigation Plan
Notice of Public Meetings to Solicit Public Review/Comment

LENOWISCO Comprehensive Hazard Mitigation Plan

Notice of public meetings to solicit public review/comment

The LENOWISCO Planning District Commission will hold three public meetings to provide an opportunity for public review and comment on the LENOWISCO Comprehensive Hazard Mitigation Plan.

These meetings will be held at the following locations and times:

Conference Room, Lee County Courthouse
Wednesday, June 22, 2005, 5:30 p.m.

Supervisors Chambers, Wise County Courthouse
Thursday, June 23, 2005, 5:00 p.m.

Supervisors Chambers, Scott County Courthouse
Monday, June 27, 2005, 5:00 p.m.

Any questions sould be directed to
Mr. Frank Kibler, Senior Planner, at:
LENOWISCO P.D.C., Duffield, Virginia
Phone: (276) 431-2206
Email: fkibler@lenowisco.org

Powell Valley News (Lee County)
Published June 15, 2005

LENOWISCO Comprehensive Hazard Mitigation Plan

Notice Of Public Meeting To Solicit Public Review/Comment

The LENOWISCO Planning District Commission will hold three public hearings to provide an opportunity for public review and comment on the LENOWISCO Comprehensive Hazard Mitigation Plan.

These meetings will be held at the following locations and times:

Conference Room,
Lee County Courthouse
Wednesday, June 22, 2005, 5:30 p.m.

Supervisors Chambers,
Wise County Courthouse
Thursday, June 23, 2005, 5:00 p.m.

Supervisors Chambers,
Scott County Chambers
Monday, June 27, 200, 5:00 p.m.

Any questions should be directed to
Mr. Frank Kibler, Senior Planner, at:
LENOWISCO P.D.C., Duffield, Virginia
Phone: (276) 431-2206
Email: fkibler@lenowisco.org

Scott County Star
Published June 15, 2005

LENOWISCO Comprehensive Hazard Mitigation Plan

Notice of public meetings to solicit public review/comment

The LENOWISCO Planning District Commission will hold three public meetings to provide an opportunity for public review and comment on the LENOWISCO Comprehensive Hazard Mitigation Plan.

These meetings will be held at the following locations and times:

Conference Room, Lee County Courthouse
Wednesday, June 22, 2005, 5:30 p.m.

Supervisors Chambers. Wise County Courthouse
Thursday, June 23, 2005, 5:00 p.m..

Supervisors Chambers, Scoff County Courthouse
Monday, June 27, 2005, 5:00 p.m.

Any questions should be directed to Mr. Frank Kibler, Senior Planner, at: LENOWISCO P.D.C. Duffield, Virginia
Phone: (276) 431-2206 Email: fkibler@lenowisco.org

Coalfield Progress (Wise County)
Published June 16, 2005

(Advertisements shown smaller than actual published size)

APPENDIX D. NOTICES OF FORMAL ADOPTION

RESOLUTION NO. 16 - 2005

RESOLUTION ADOPTING THE LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Wise County and the Town of Big Stone Gap; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Big Stone Gap Town Council does hereby acknowledge the Town's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Big Stone Gap Town Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Big Stone Gap Town Council this 13 day of September, 2005.

Mayor, Town of Big Stone Gap

September 13, 2005
Date

ATTEST:

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including the City of Norton; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Norton City Council does hereby acknowledge the City's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Norton City Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Norton City Council this 6th day of September, 2005.

Vice-Mayor, Norton City Council

9-6-05
Date

ATTEST:

Mary A. Brown

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Wise County and the Town of Coeburn; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Coeburn Town Council does hereby acknowledge the Town's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Coeburn Town Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Coeburn Town Council this 17 day of October, 2005.

W. H. Dougherty Jr. 10/17/2005

Mayor, Town of Coeburn Date

ATTEST:

Sherry B Bise

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN
05-040

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Lee County; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW, THEREFORE BE IT RESOLVED, that the Lee County Board of Supervisors does hereby acknowledge the County's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Lee County Board of Supervisors, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

Adopted this 20th day of September, 2005.

CHAIRMAN

ATTEST:

CLERK

BOARD OF SUPERVISORS OF LEE COUNTY VIRGINIA

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Lee County and the Town of Pennington Gap; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Pennington Gap Town Council does hereby acknowledge the Town's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Pennington Gap Town Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Pennington Gap Town Council this 19th day of September, 2005.

Mayor, Town of Pennington

9-29-05
Date

ATTEST:

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Wise County and the Town of Pound; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Pound Town Council does hereby acknowledge the Town's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Pound Town Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Pound Town Council this 15th day of September, 2005.

Sarah J. Gilliam — 9-20-05

Mayor, Town of Pound — Date

ATTEST:

Joan E. Fleming

BOARD OF SUPERVISORS
PAUL S. FIELDS
JOE HORTON
DANNY S. PARKS
JOE W. HERRON
RANDALL S. "Buck" KINKEAD
CHAD E. HOOD
DAVID S. REDWINE, DVM

We're a Natural

SCOTT COUNTY
BOARD OF SUPERVISORS

COUNTY ADMINISTRATOR
JOHN STRUTNER
112 WATER STREET, SUITE 1
GATE CITY, VIRGINIA 24251
PHONE: (276) 386-6521
FAX: (276) 386-9198
e-mail: strutner@mounet.com
www.scottcountyva.com

SCOTT

VIRGINIA

At a meeting of the Scott County Board of Supervisors begun and held in the Supervisors' Meeting Room of the County Office Building in Gate City on Wednesday, the seventh day of September 2005, at 8:30 a.m.

PRESENT: David S. Redwine, Chairman
Paul S. Fields, Vice Chairman
D. Joe Horton
Danny S. Parks
Joe W. Herron
Chad E. Hood
Randall S. "Buck" Kinkead

ABSENT: None

On a motion by D. Joe Horton, duly seconded by Randall S. "Buck" Kinkead, this Board hereby adopts a resolution approving the LENOWISCO Comprehensive Hazard Mitigation Plan and orders it spread on the minutes of this meeting.

Resolution 2005-25
RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Scott County; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Scott County Board of Supervisors does hereby acknowledge the County's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Scott County Board of Supervisors, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Scott County Board of Supervisors this seventh day of September, 2005.

Original signed by Chairman David S. Redwine.

Voting aye: Paul S. Fields, D. Joe Horton, Danny S. Parks, Joe W. Herron, Chad E. Hood, Randall S. "Buck" Kinkead, and David S. Redwine.

Voting nay: None.

A TESTE: _____
CLERK

C: Mr. Ron Flanary, Executive Director, LENOWISCO
Mr. Frank Kibler, LENOWISCO

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

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WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Wise County and the Town of St. Paul; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the St. Paul Town Council does hereby acknowledge the Town's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the St. Paul Town Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the St. Paul Town Council this 12th day of September, 2005.

William J. Hess
Mayor, Town of St. Paul

Sept. 12, 2005
Date

ATTEST:

Kathy L. Chafin, Clerk

Wise County Board of Supervisors

Office of County Administrator

TELEPHONE 276-328-2321
FAX 276-328-9760

COURTHOUSE

P.O. BOX 570
206 E. MAIN STREET

WISE, VIRGINIA 24293

RESOLUTION ADOPTING THE
LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Wise County; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Wise County Board of Supervisors does hereby acknowledge the County's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that the Wise County Board of Supervisors, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED by the Wise County Board of Supervisors this 8th day of September 2005.

ATTEST: **WISE COUNTY BOARD OF SUPERVISORS**

Glen A. Skinner Fred Luntsford

Glen A. Skinner, Clerk **Fred A. Luntsford, Chairman**

RESOLUTION NO. 24, 2005

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWNOF WISE, VIRGINIA ADOPTING THE LENOWISCO COMPREHENSIVE HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the localities of the LENOWISCO Planning District agreed to jointly develop a district-wide plan for adoption by participating localities; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of citizens, business community members, non-profit organizations, public agencies, and representatives of the district's counties, city and towns, was formed to study the district's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the district and its localities; and

WHEREAS, a professional consulting firm was secured to assist the MAC in the development of a comprehensive natural hazard mitigation plan for the LENOWISCO Planning District, including Wise County and the Town of Wise; and

WHEREAS, the efforts of the MAC members and consulting firm have resulted in the development of a Comprehensive Hazard Mitigation Plan for the LENOWISCO Planning District.

NOW BE IT THEREFORE RESOLVED, that the Town Council of the Town of Wise, Virginia does hereby acknowledge the Town's participation in the development of the LENOWISCO Comprehensive Hazard Mitigation Plan; and

BE IT FURTHER RESOLVED, that said Town Council, to meet local requirements under the Disaster Mitigation Act of 2000, as amended, does hereby approve and adopt the LENOWISCO Comprehensive Hazard Mitigation Plan.

ADOPTED AND EFFECTIVE this 27th day of September, 2005.

VOTING "AYE": Clifton Carson, Caynor Smith, Jr., Luther Adkins, Erra Sutherland

VOTING "NAY": - None -

ABSENT: Jarrad Addison **ABSTENTIONS:** - None -

Clifton Carson
MAYOR

ATTEST:

Robin M. Bryant
CLERK OF COUNCIL