

2637 - Town of Wise Flood Resilience Plan and Staff Training

Application Details

Funding Opportunity:	2335-Virginia Community Flood Preparedness Fund - Capacity Building/Planning Grants - CY24 Round 5
Funding Opportunity Due Date:	Mar 28, 2025 11:59 PM
Program Area:	Virginia Community Flood Preparedness Fund
Status:	Under Review
Stage:	Final Application
Initial Submit Date:	Jan 24, 2025 10:43 AM
Initially Submitted By:	Reagan Walsh
Last Submit Date:	
Last Submitted By:	

Contact Information

Primary Contact Information

Active User*:	Yes
Type:	External User
Name*:	Mrs. Reagan Walsh Salutation First Name Middle Name Last Name
Title:	Town Planner
Email*:	rwalsh@townofwise.org
Address*:	501 West Main Street P.O. Box 1100 Wise Virginia 24293 City State/Province Postal Code/Zip
Phone*:	276-328-6013 204 Phone Ext. ###-###-####
Fax:	###-###-####
Comments:	

Organization Information

Status*:	Approved
Name*:	Town of Wise
Organization Type*:	Local Government
Tax ID*:	54-6001686
Unique Entity Identifier (UEI)*:	FC3RW6WA5H15
Organization Website:	https://www.townofwise.net

Address*: 501 West Main Street
P.O. Box 1100

Wise Virginia 24293-
City State/Province Postal Code/Zip

Phone*: 276-328-6013 204
###-###-#### Ext.

Fax: ###-###-####

Benefactor:

Vendor ID:

Comments:

VCFPF Applicant Information

Project Description

Name of Local Government*: Town of Wise
Your locality's CID number can be found at the following link: [Community Status Book Report](#)

NFIP/DCR Community Identification Number (CID)*: 510179

If a state or federally recognized Indian tribe,

Name of Tribe:

Authorized Individual*: Laura Roberts
First Name Last Name

Mailing Address*: 501 West Main Street
Address Line 1

P.O. Box 1100
Address Line 2

Wise Virginia 24293
City State Zip Code

Telephone Number*: 276-238-6013

Cell Phone Number*: 276-275-6856

Email*: mgr@townofwise.org

Is the contact person different than the authorized individual?

Contact Person*: Yes

Contact: Reagan Walsh
First Name Last Name

501 West Main Street
Address Line 1

P.O. Box 1100
Address Line 2

Wise Virginia 24293
City State Zip Code

Telephone Number: 276-328-6013

Cell Phone Number: 276-870-4101

Email Address: rwalsh@townofwise.org

Enter a description of the project for which you are applying to this funding opportunity

Project Description*:

The Town of Wise seeks funding from the Virginia Community Flood Preparedness Fund to enhance its flood risk management capacity through

the certification of a town staff member as a Certified Floodplain Manager (CFM) and the development of a comprehensive Flood Resiliency Plan. Low-income geographic area means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

Is the proposal in this application intended to benefit a low-income geographic area as defined above?

Benefit a low-income geographic area*: Yes

Information regarding your census block(s) can be found at census.gov

Census Block(s) Where Project will Occur*: CT 9309, BG1, BG2; CT 9314, BG1, BG2

Is Project Located in an NFIP Participating Community?* Yes

Is Project Located in a Special Flood Hazard Area?* No

**Flood Zone(s)
(if applicable):**

**Flood Insurance Rate Map Number(s)
(if applicable):**

Eligibility - Round 4

Eligibility

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

Local Government*: Yes
Yes - Eligible for consideration
No - Not eligible for consideration

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

Letters of Support*: N/A
Yes - Eligible for consideration
No - Not eligible for consideration

Has this or any portion of this project been included in any application or program previously funded by the Department?

Previously Funded*: No
Yes - Not eligible for consideration
No - Eligible for consideration

Has the applicant provided evidence of an ability to provide the required matching funds?

Evidence of Match Funds*: Yes
Yes - Eligible for consideration
No - Not eligible for consideration
N/A - Match not required

Scoring Criteria for Capacity Building & Planning - Round 4

Scoring

Eligible Capacity Building and Planning Activities (Select all that apply) ? Maximum 100 points. To make multiple selections, Hold CTRL and click the desired items.

Capacity Building and Planning*: Floodplain Staff Capacity, Resilience Plan Development

Is the project area socially vulnerable? (based on [ADAPT Virginia's Social Vulnerability Index Score](#))

Social Vulnerability Scoring:
Very High Social Vulnerability (More than 1.5)
High Social Vulnerability (1.0 to 1.5)
Moderate Social Vulnerability (0.0 to 1.0)
Low Social Vulnerability (-1.0 to 0.0)
Very Low Social Vulnerability (Less than -1.0)

Socially Vulnerable*: Moderate Social Vulnerability (0.0 to 1.0)

Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NRP?

NFIP*: No

Is the proposed project in a low-income geographic area as defined below?

"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

Low-Income Geographic Area*: Yes

Does this project provide ?community scale? benefits?

Community Scale Benefits*: Less than 25% of census block

Comments:

This project will provide benefits to the entirety of the Town of Wise, VA, however, the Town of Wise is split between two census tracts and four block groups, technically making up less than 25% of each representative block group.

Scope of Work and Budget Narrative - Capacity Building and Planning - Round 4

Scope of Work - General Information

Upload your Scope of Work

Please refer to Part IV, Section B. of the grant manual for guidance on how to create your scope of work

Scope of Work Attachment*: [Town of Wise CFPF Scope of Work Narrative.pdf](#)

Comments:

Town of Wise CFPF Scope of Work Narrative

Budget Narrative

Budget Narrative Attachment*: [CFPF Budget Narrative.pdf](#)

Comments:

Town of Wise CFPF Budget Narrative

Scope of Work Supporting Information - Capacity Building and Planning

Scope of Work Supporting Information

Describe identified resource needs including financial, human, technical assistance, and training needs

Resource need identification*:

The Town of Wise does not have the financial capacity to hire additional staff, so training an existing staff member to become a Certified Floodplain Manager is needed to oversee an effective floodplain management program. In addition to training a staff member to become a CFM, funding is needed in order to work with a consultant to create the Town of Wise Flood Resiliency Plan.

Describe the plan for developing, increasing, or strengthening knowledge, skills and abilities of existing or new staff. This may include training of existing staff, hiring personnel, contracting consultants or advisors

Development of Existing or New Staff*:

Train a town staff member to become a Certified Floodplain Manager (CFM), which will provide the Town of Wise with internal expertise to oversee floodplain management. The staff member, who is also the Town Planner/Zoning Administrator for the Town of Wise, will aim to complete the CFM certification process within 12 months of award. This staff member will also join the Association of State Floodplain Managers (ASFPM) and the Virginia Floodplain Management Association (VFMA) which will help this staff member develop and strengthen their skills through research, training, and networking opportunities. The Town of Wise will also contract with a consultant for the development of the Flood Resiliency Plan.

Where capacity is limited by funding, what strategies will be developed to increase resources in the local government? (This may include work with non-governmental organization, or applying for grants, loans, or other funding sources)

Resource Development Strategies*:

After the Town of Wise Flood Resiliency Plan has been adopted, town staff will work on identifying and applying to available grant programs for funding to implement projects identified in the plan. Town staff will also continue to work with local groups and organizations that have a focus on resiliency. Town staff also intend to continue to build up the internship program where students from the University of Virginia's College at Wise can work directly with the Town of Wise Floodplain Administrator in creating educational programming on floodplain management for residents of the community, conducting research, and participating in floodplain management training.

Describe policy management and/or development plans

Policy management and/or development*:

Town staff will incorporate goals, objectives, data, and statistics from the Town of Wise Flood Resiliency Plan into the Town of Wise

Comprehensive Plan. Town staff will also review the existing floodplain ordinance and suggest the adoption of an updated ordinance. Town staff will also utilize the Flood Resiliency plan to implement projects.

Describe plans for stakeholder identification, outreach, and education strategies

Stakeholder identification, outreach, and education strategies*:

Town staff will work with the consultant on identifying local stakeholders which will include members from town council, municipal department heads, other local government agencies, residents and property owners, members of the business community, faculty from UVA Wise, and local environmental groups. Town staff will create a Stakeholder Advisory Committee that will work with staff and the consultant on the creation of the Town of Wise Flood Resiliency Plan. In addition to the Stakeholder Advisory Committee, the Town of Wise will create a page on its website dedicated to the development of the Town of Wise Flood Resiliency Plan and will also conduct public input sessions to solicit feedback from the community.

Budget

Budget Summary

Grant Matching Requirement*:

LOW INCOME - Planning and Capacity Building - Fund 90%/Match 10%
*Match requirements for Planning and Capacity Building in low-income geographic areas will not require match for applications requesting less than \$3,000.
Is a match waiver being requested?

Match Waiver Request Yes

Note: only low-income communities are eligible for a match waiver.

*:

I certify that my project is in a low-income geographic area: Yes

Total Project Amount (Request + Match)*: \$30,000.00
**This amount should equal the sum of your request and match figures

REQUIRED Match Percentage Amount: \$3,000.00

BUDGET TOTALS

Before submitting your application be sure that you meet the match requirements for your project type.

Match Percentage: 10.00%
Verify that your match percentage matches your required match percentage amount above.
Total Requested Fund Amount: \$27,000.00
Total Match Amount: \$3,000.00
TOTAL: \$30,000.00

Personnel

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Fringe Benefits

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Travel

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Equipment

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Supplies

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Construction

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Contracts

Description	Requested Fund Amount	Match Amount	Match Source
Consultant	\$26,199.00	\$2,911.00	Town of Wise - General Fund
	\$26,199.00	\$2,911.00	

Pre-Award and Startup Costs

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

Other Direct Costs

Description	Requested Fun Amount	Match Amount	Match Source
ASFPMDues (3 years)	\$486.00	\$54.00	Town of Wise - General Fund
VFMA Dues (3 years)	\$148.50	\$16.50	Town of Wise - General Fund
CFMExam	\$166.50	\$18.50	Town of Wise - General Fund
	\$801.00	\$89.00	

Supporting Documentation - General

Supporting Documentation

Named Attachment	Required	Description	File Name	Type	Size	Upload Date
Detailed map of the project area(s) (Projects/Studies)						
FIRMette of the project area(s) (Projects/Studies)						
Historic flood damage data and/or images (Projects/Studies)						
A link to or a copy of the current floodplain ordinance		Town of Wise Floodplain Ordinance	2011 Floodplain Ordinance.pdf	pdf	20 MB	01/23/2025 03:16 PM
Maintenance and management plan for project						
A link to or a copy of the current hazard mitigation plan		LENOWISCO Hazard Mtigation Plan	LENOWISCO_Hazard_Mtigation_Plan.pdf	pdf	54 MB	01/23/2025 03:19 PM

A link to or a copy of the current comprehensive plan	Town of Wise Comprehensive Plan	Comprehensive Plan 2022_OCT_Final.pdf	pdf	669 KB	01/23/2025 03:20 PM
Social vulnerability index score(s) for the project area	Town of Wise Social Vulnerability Index Score (Moderate)	Town of Wise Social Vulnerability Index Score Moderate.pdf	pdf	172 KB	01/23/2025 03:38 PM
Authorization to request funding from the Fund from governing body or chief executive of the local government	Wise Town Council Resolution	20241022 TC CFPF Resolution Signed.pdf	pdf	59 KB	01/23/2025 03:39 PM
Signed pledge agreement from each contributing organization					
Maintenance Plan					
<i>Benefit-cost analysis must be submitted with project applications over \$2,000,000. in lieu of using the FEMA benefit-cost analysis tool, applicants may submit a narrative to describe in detail the cost benefits and value. The narrative must explicitly indicate the risk reduction benefits of a flood mitigation project and compares those benefits to its cost-effectiveness.</i>					
Benefit Cost Analysis					
Other Relevant Attachments	Town of Wise CFPF Application	CID510179_WiseTown_CFPF.pdf	pdf	17 MB	01/24/2025 10:37 AM

Letters of Support

Description	File Name	Type	Size	Upload Date
No files attached.				

SCOPE OF WORK NARRATIVE

NEED

The Town of Wise, located in the heart of Wise County, Virginia, is highly vulnerable to frequent flooding due to its mountainous geography and outdated stormwater infrastructure. The town's development occurred before modern floodplain management practices were in place, leading to buildings and infrastructure being situated directly along flood-prone areas. The town's proximity to steep mountainous terrain causes stormwater runoff to accumulate rapidly in two major creeks, Glade Creek and Yellow Creek, which traverse the town. These creeks, along with the Tributary to Yellow Creek, are the primary sources of flooding, especially during significant rainfall events. Past mining activities have also contributed to drainage issues, increasing runoff and further overwhelming the creeks.



Map 1: Town of Wise Municipal Boundaries

The current drainage structures and culverts are inadequate, unable to manage the runoff from heavy rain events. This has resulted in repeated flooding throughout residential areas and the central business district. An example of flooding



Photo 1: L.F. Addington School Bus Bridge Damage (2019)

impacts can be seen at the intersection of Railroad Avenue, School Avenue, Yellow Creek Road, and Varner Street, where a bridge located nearby on school property used by school buses collapsed during a flood event. In the case of an extreme flooding event, if this intersection were to become impassable, there would be no means of evacuation via motor vehicle for approximately 85 households. Property owned by the Town of Wise Public Works Department, traffic circulation, and bus routes for Wise Primary School and L.F. Addington Middle School would also be severely impacted.

Sediment buildup and bank erosion along the creeks further contribute to the issue, causing water to frequently overflow the banks and flood surrounding areas. Recent weather patterns, including more frequent and intense precipitation, combined with over 52 inches of annual snowfall, contribute to regular flooding. The Town of Wise receives the highest amount of annual snowfall of any locality in Virginia, which poses a significant risk to flooding, especially when combined with unseasonably warm weather or additional rainfall after a major snow event.

Despite previous efforts to acquire and demolish properties in the floodplain through Hazard Mitigation Grant Program projects, most properties along Glade Creek and Yellow Creek remain privately owned, limiting the town's ability to perform critical maintenance. The Town of Wise has faced approximately 15 federally declared disaster events since 1977 due to precipitation, most recently in October 2024 resulting from the impact of Hurricane Helene in late September 2024. The town is in urgent need of enhanced floodplain management capabilities to effectively mitigate these recurring risks. Without this project, the town's ability to address flooding will remain limited, leading to ongoing threats to public safety, property, and critical infrastructure.



Photo 2: Yellow Creek Road Pavement Buckling (2011)



Photo 3: Flood Waters Between L.F. Addington Middle School and Wise Primary School (2022)

This project seeks to enhance the Town of Wise's capacity to manage flood risks by certifying a staff member as a Certified Floodplain Manager (CFM) and developing a Flood Resiliency Plan. These efforts will align with existing planning documents, such as the LENOWISCO Hazard Mitigation Plan, the Town of Wise Comprehensive Plan, and the Wise County Comprehensive Plan, all of which emphasize sustainable development, flood mitigation, and resilience against climate impacts.

DEMOGRAPHIC INFORMATION



Photo 4: Town of Wise Census Profile (2024)

OVERVIEW

DEMOGRAPHICS AND ECONOMIC CHANGES

The Town of Wise has experienced significant shifts tied to the decline of the coal industry, which historically shaped the local economy and demographics. This decline has led to outmigration, population loss, and an aging demographic. The town's current population stands at around 2,971, with a broader trade area encompassing over 50,000 residents. Despite the economic challenges, the presence of the University of Virginia's College at Wise (UVA Wise) remains a major stabilizing force, significantly influencing the town's youthful demographic composition and offering opportunities for growth through educational services.

HOUSING AND ECONOMIC CHALLENGES

Housing remains a critical issue in Wise. The existing stock consists primarily of single-family homes, many of which are older. There is minimal new construction, and the town lacks adequate rental and affordable housing options. Approximately 31% of renters and 11% of homeowners in Wise are cost-burdened, meaning they spend a significant portion of their income on housing. The scarcity of affordable housing impacts economic development, as both local businesses and UVA Wise face challenges in recruiting employees and students due to limited suitable housing options.

ECONOMIC DRIVERS AND OPPORTUNITIES

UVA Wise is identified as the town's primary economic engine, along with government services and local businesses, including retail and tourism. The town's strategic location as the county seat and a regional commerce hub positions it to serve a larger population from surrounding areas. Despite economic difficulties, there is growing interest in entrepreneurship, tourism, and outdoor recreation. Wise has the potential to leverage these assets, particularly with improvements in infrastructure and downtown revitalization projects.

FLOODING IMPACTS ON POPULATION

Flooding issues in the Town of Wise significantly impacts the population, especially vulnerable groups, such as low-income residents, the elderly, and renters, who may have limited resources to adapt or recover from flood events. The town's demographic profile, which includes an aging population and a high proportion of cost-burdened renters and homeowners, highlights the urgency of addressing these flooding challenges.

SOCIAL EQUITY ANALYSIS

Flooding disproportionately affects marginalized populations, amplifying pre-existing social and economic vulnerabilities. In Wise, lower-income households and those living in older housing stock are at greater risk, as these homes are less likely to have been built with modern flood-resistant features. This creates a cycle where economically disadvantaged

residents experience more severe impacts from flooding, such as property damage, displacement, and higher costs for repairs—burdens that they are often unable to bear. C&C Mobile Home Park in the Town of Wise, for example, is partially located in the floodplain and floodway. There is only one entrance to C&C MHP, which includes a privately-owned bridge crossing Glade Creek.

By targeting these vulnerable groups through a Flood Resilience Plan, Wise can directly address social equity issues. Including proactive measures in the plan, such as pursuing Community Rating System (CRS) designation and providing community education on flood risks, can reduce the disproportionate impact on these populations, creating a safer and more equitable environment for all residents.



Photo 5: Flooding in C&C Mobile Home Park (2011)

DEVELOPING A FLOOD RESILIENCE PLAN

Implementing a comprehensive Flood Resilience Plan is a crucial step toward reducing flood risks and enhancing overall community well-being. This plan will include recommendations for updating infrastructure, such as stormwater management systems, mitigating flood risks, and updating the existing floodplain ordinance. The plan will also consider the benefits of pursuing CRS designation, and the staff capacity required to administer the CRS program. The plan will also prioritize accessible communication and emergency planning tailored to reach and assist vulnerable residents who may not have the resources or mobility to react swiftly during a flood.

TRAINING A CERTIFIED FLOODPLAIN MANAGER (CFM)

The Town of Wise does not have the financial capacity to hire additional staff dedicated to floodplain management. Considering this, training an existing staff member to become a Certified Floodplain Manager (CFM) is an important strategy for Wise. A CFM would possess the expertise to manage the town's floodplain more effectively, ensuring that development aligns with best practices for flood risk reduction. This role is pivotal in securing grants and resources from federal and state agencies, providing the town with additional funds to implement flood mitigation measures.

OVERALL IMPACT

By developing a Flood Resilience Plan and training a CFM, Wise can take a proactive approach to reduce flooding impacts, address social inequities, and enhance overall quality of life. These measures will protect not only the town's infrastructure and economy but also support its most vulnerable populations, creating a safer and more resilient community.

GOALS AND OBJECTIVES

The goals of this project focus on capacity building and planning for long-term flood mitigation.

- **Goal 1:** Train a town staff member to become a Certified Floodplain Manager (CFM), providing the Town of Wise with internal expertise to oversee floodplain management.
 - o Objective: Complete the CFM certification within 12 months, enabling the staff member to effectively implement zoning and floodplain regulations, enforce floodplain regulations and ordinances, and recommend implementation of mitigation projects outlined in the Town of Wise Flood Resiliency Plan.
- **Goal 2:** Develop a Flood Resiliency Plan.
 - o Objective: Work with a consultant to draft the plan, which will evaluate historical data, existing conditions, and future conditions, and incorporates flood resilience goals and objectives. The plan will prioritize areas for stormwater infrastructure improvements and property acquisitions, while addressing vulnerable populations and underserved areas.

This project directly aligns with both the Town of Wise Comprehensive Plan, which emphasizes flood control and sustainable land use, and the Wise County Comprehensive Plan, which seeks to protect natural resources and support development that avoids flood-prone areas.

WORK PLAN

Major Activities:

1. **Floodplain Manager Certification:** The Department of Planning and Zoning will oversee the certification of one employee, Town Planner/Zoning Administrator Reagan Walsh, as a CFM. This staff member will then be responsible for administering the Town of Wise Floodplain Management Program to regulate development in flood-prone areas. She will also be responsible for identifying flood mitigation projects, creating educational programming for the public on flood resiliency, and utilizing the flood resiliency plan to update the Town of Wise Comprehensive plan.
2. **Flood Resiliency Plan Development:**
 - a. *Phase 1: Assessment and Data Collection:* The Planning and Zoning Department will work with the consultant to evaluate historical and existing conditions, assess existing stormwater infrastructure, and identify areas most at risk of flooding, including areas outside the Special Flood Hazard Areas.
 - b. *Phase 2: Plan Development:* The Flood Resiliency Plan will be created according to DCR's Resilience Plan Requirements.
 - c. *Stakeholder Engagement:* Engage residents, business owners, and neighboring jurisdictions to gather input on proposed solutions and to hear their first-hand experience with flooding in the Town of Wise. Stakeholder engagement will occur throughout both phases of plan development.

Responsible Parties:

- **Town of Wise Department of Planning and Zoning:** The department will lead the project, working closely with the consultant to develop the Flood Resiliency Plan.
- **Consultant:** A hired expert will guide the creation of the Flood Resiliency Plan, ensuring that it aligns with both local and regional planning documents. The Lane Group has been procured by the Town of Wise to assist with the development of the Flood Resiliency Plan.
- **Stakeholder Advisory Committee:** A committee will be established that consists of local stakeholders and experts in environmental science. This committee will meet regularly during plan development and aid town staff and the consultant in conducting research, reviewing plan drafts, and promoting educational opportunities to their respective groups/organizations and to the community in general.

Timeframe:

- Floodplain Manager Certification: 12 months.
- Flood Resiliency Plan Development: 18 months, with phases for assessment/data collection and plan development. Due to the impacts of Hurricane Helene, it is anticipated that the development of the Flood Resiliency Plan will take more time than is usual. Ideally, the plan would be developed within a year of the award announcement, but planning for 18 months will provide a buffer if delays are encountered.

MAINTENANCE PLAN

The Town of Wise will establish a long-term maintenance plan for the adopted Flood Resiliency Plan, including regular inspections and maintenance of stormwater systems, creek beds, and flood-prone infrastructure to inform Flood Resiliency Plan updates. The Town of Wise Floodplain Administrator will ensure that future developments meet resilience standards and standards required by the Town of Wise floodplain ordinance, minimizing additional flood risks.

By aligning with the Town of Wise Comprehensive Plan and the Wise County Comprehensive Plan, the Town of Wise Flood Resiliency Plan will provide a framework for planning policies that promote sustainable land use and minimize or prevent development in high-risk flood areas.

Evaluation and Indicators of Success:

- Indicator 1: Successful certification of the Floodplain Manager within the project timeline.
- Indicator 2: Completion and adoption of the Town of Wise Flood Resiliency Plan.
- Indicator 3: Measurable reduction in flood-related damage through infrastructure improvements and enforcement of updated policies and ordinances.
- Indicator 4: Increased awareness in the community on flood resilience, available resources, and general knowledge on floodplain management.

The effectiveness of the Town of Wise Flood Resiliency Plan will be evaluated through annual reviews, comparing flood event data pre- and post-implementation. The project will also be benchmarked against the flood mitigation goals set forth in the LENOWISCO Hazard Mitigation Plan and the Wise County Comprehensive Plan, ensuring regional alignment. Changes to the plan, if needed, will be recommended to the Wise Town Council by the Planning Commission for adoption.

Appendix B: Budget Narrative Template

Applicant: <u>Town of Wise, VA</u> Name: <u>Community Flood Preparedness Fund & Resilient Virginia Revolving Loan Fund</u> Detailed Budget Narrative Period of Performance: <u>Date of Award</u> through <u>18 months</u> Submission Date: <u>1/24/2025</u>									
Grand Total State Funding Request									\$ 27,000
Grand Total Local Share of Project									\$ 3,000
Federal Funding (if applicable)									\$
Project Grand Total									\$ 30,000
Locality Cost Match									% 10
Financed By Cost Type	Personnel	Admin	Travel	Equipment	Supplies	Contracts	Indirect Costs	Other Costs	Total
Federal Share (if applicable)									
Local Share						2,911.00		89.00	3,000.00
State Share - CFFP Grant						26,199.00		801.00	27,000.00
State Share - 0% Match Loan									
Pre-Award/Startup									
Maintenance									
Total	\$	\$	\$	\$	\$	\$ 29,110.00	\$	\$ 890.00	\$ 30,000.00

BUDGET NARRATIVE

Estimated Total Project Cost: \$30,000.00

Budget Breakdown:

1. Consultant Services for Flood Resiliency Plan Development

- a. **Cost:** \$29,110.00
- b. **Amount Requested from CFPF:** \$26,199.00
- c. **10% Local Match:** \$2,911.00
- d. **Description:** The Town of Wise will contract with an external consultant (The Lane Group) to develop a comprehensive Flood Resiliency Plan. The consultant brings necessary expertise in flood resilience, which is crucial for the development of a plan that meets local and state requirements and aligns with regional goals.

2. Certified Floodplain Manager (CFM) Certification and Dues

- a. **Cost:** \$890.00
- b. **Amount Requested from CFPF:** \$801.00
- c. **10% Local Match:** \$89.00
- d. **Description:** This funding will cover the costs associated with the certification of a Town of Wise staff member as a Certified Floodplain Manager (CFM). This includes examination fees and three years of dues to both the Association of State Floodplain Managers and the Virginia Floodplain Managers Association. The CFM certification and membership to both organizations will build local capacity, allowing the Town of Wise to manage flood risks more effectively. Upskilling existing staff ensures that the Town of Wise can sustainably manage its floodplains and implement informed policies that mitigate flood risks.

Item	Total Cost	CFPF Request	Local Match	Notes
Consultant	\$29,110.00	\$26,199.00	\$2,911.00	The Lane Group
CFM Exam Fee	\$185.00	\$166.50	\$18.50	
ASFPM Dues	\$540.00	\$486.00	\$54.00	3 years
VFMA Dues	\$165.00	\$148.50	\$16.50	3 years

Match Waiver Request:

The Town of Wise respectfully requests a waiver of the 10% match requirement for the following reasons:

1. **Project Cost Under \$50,000.00:** As outlined in the guidelines, projects with total costs under \$50,000.00 may request a match waiver. This project, with a total cost of \$30,000.00, qualifies for this waiver consideration.
2. **Low Median Household Income:** The Town of Wise has a median household income of \$42,944.00, which is 49% of the median for Virginia, of \$87,249.00 (2022 U.S. Census). This substantial income gap highlights the economic challenges faced by the town's residents and further justifies the need for financial support without requiring a local match.

3. **Opportunity Zone Designation:** The Town of Wise is located within a designated Opportunity Zone. Opportunity Zones are designed to spur economic development in low-income communities by providing tax incentives to encourage long-term investment. This designation further supports the town's case for a match waiver, as the project will directly contribute to the town's resilience and sustainability by improving local planning capacity in an economically disadvantaged area.
4. **Distressed Counties in Appalachia:** The Appalachian Regional Commission (ARC) classifies each county within its footprint based on an analysis of how counties perform compared to national averages. This index-based classification system considers three-year average unemployment rates, per capita market income, and poverty rates. Wise County, within which the Town of Wise is located, is one of four counties in Virginia considered to be Distressed. Distressed counties are the most economically depressed counties as they rank in the worst 10 percent of the nation's counties.

Additional Notes:

While the Town of Wise is requesting a waiver, it is understood that this waiver may not be granted, therefore the Town of Wise is committed to providing the 10% match in order to see this plan come to fruition.

When the budget was initially being calculated, estimates for sending a Town of Wise staff member to the Emergency Management Institute for the "E0273 Managing Floodplain Development through the NFIP" had been included in the budget. After Hurricane Helene, DCR, in partnership with the University of Virginia's College at Wise, were able to host a local "G-273 Managing Floodplain Development through the NFIP" in Abingdon, VA from January 13-16, 2025. The staff member from the Town of Wise that will be taking the CFM exam participated in this training. The budget narrative and breakdown have been changed to reallocate the training and travel expenses for the E0273 course to the estimated cost of hiring a consultant. This was done because the training in Abingdon removed the need to attend E0273 as well as there being no time to get a revised resolution from Wise Town Council for a lower grant request.



LENOWISCO Planning District 2021 Hazard Mitigation Plan Update





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Section 1.1 Executive Summary

For the purposes of this Hazard Mitigation Plan (HMP), the LENOWISCO Planning District is comprised of Lee, Scott, and Wise Counties, and the City of Norton. Additionally, the Towns of Big Stone Gap, Coeburn, Gate City, Pennington Gap, Pound, St. Paul, and Wise participated in the HMP update. Hereinafter in this document, the area will generally be referred to as the LENOWISCO Planning District.

Recent decades have seen increased development in areas of potential harm, increasing the potential for severe economic and social consequences if a major disaster or other catastrophic event were to occur. Such an event could have the potential to cost 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 several years to come.

The Planning Team selected to focus on eleven (11) natural hazards that impact the LENOWISCO Planning District. Through an in-depth Risk Assessment, the Planning Team determined the following hazard risk ranking for the District:

TABLE: Hazard Risk Ranking for LENOWISCO Planning District <i>Complete Hazard Ranking Table is included here</i>					
Hazard	2021 Hazard Rankings				2013 Risk Ranking
	Frequency & Probability	Frequency & Probability	Risk Ranking	Risk Ranking	
Flooding	75	Very Probable/ Very Frequent	69	High	High
Non-Rotational Wind	75	Very Probable/ Very Frequent	68	High	Medium-High (combined with Tornado)
Winter Storm	75	Very Probable/ Very Frequent	67	High	Medium-High
Wildfire	50	Probable/Frequent	53	High	Medium
Communicable Disease	38	Somewhat Probable/ Somewhat Frequent	47	Medium	N/A
Landslide	44	Somewhat Probable/ Somewhat Frequent	47	Medium	Medium (combined with Land Subsidence, Soil Erosion)
Karst/ Subsidence	31	Somewhat Probable/ Somewhat Frequent	41	Medium	Low (Karst topography only)
Tornado	25	Somewhat Probable/ Somewhat Frequent	39	Medium	Medium-High (combined with Non-Rotational Wind)
Drought	19	Not Probable at All/ Not Frequent at All	28	Medium	Medium-High
Earthquake	13	Not Probable at All/ Not Frequent at All	25	Medium	Medium
Dam Failure	6	Not Probable at All/ Not Frequent at All	19	Low	Low



Given the varied geography, infrastructure, and social composition of each jurisdiction, the Planning Team also conducted a Risk Assessment for each jurisdiction. The Risk Assessments informed priority mitigation actions.

The update and adoption of the HMP by the District and all participating jurisdictions helps:

- Identify areas of risk and assess the potential cost and magnitude;
- Establish strategies and priorities to mitigate risk from natural and technological hazards
- Identify specific mitigation projects for each identified hazard;
- Guide the participating jurisdictions in their risk management activities and minimizes conflicts among agencies;
- Establish eligibility for future non-emergency disaster assistance.

The Mitigation Goals for the 2021 HMP include:

1. Protect the lives, health, and safety of LENOWISCO residents and visitors, maintain critical societal functions before, during, and after a disaster.
2. Identify and implement mitigation projects that will minimize a hazard's impact on existing and future developments, including reducing risk to NFIP repetitive loss and severe repetitive loss properties.
3. Incorporate mitigation into existing and future policies, plans, regulations, and laws in LENOWISCO.
4. Promote and support a whole community approach to mitigation that encourages residents, businesses, and public entities to become more disaster resilient.

The HMP includes 19 district-wide mitigation actions advancing each mitigation goal and across a variety of hazards and agencies. Each mitigation action was prioritized based on a series of parameters, including estimated cost, available funding sources, expected benefits, and timeline. The top priority new mitigation actions for the District include:

- Develop and deliver a Community Emergency Response Team (CERT) program for the LENOWISCO District and recruit members from all participating jurisdictions.
- Certify and/or maintain participation in StormReady Certification Program for all LENOWISCO District communities.
- Ensure each jurisdiction has a Continuity of Operations Plan that includes both natural hazards and epidemic/pandemic considerations.
- Update the LENOWISCO Health District Pandemic and Communicable Disease Plan using lessons learned from the COVID-19 pandemic.
- Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances and take steps to participate in the Community Rating System (CRS).
- Develop a LENOWISCO Community Wildfire Protection Plan with specific regional and local actions for wildfire mitigation.



The new planning team and updated planning process are described and documented in the HMP. The 2021 HMP includes the following key updates:

- **District and Jurisdiction Profiles:** Demographics, social, and economic data, as well as existing and future land use descriptions, are updated to reflect the current status of the District and the jurisdictions.
- **Capability Analysis:** Primary considerations for implementing any mitigation action is hazard potential, project funding, and capability to enact the mitigation action. The HMP update includes a Capability Analysis for the District and each participating jurisdiction.
- **Public Outreach:** Given the update occurred during the historic COVID-19 pandemic, the planning team worked to include the public's input through multiple safe avenues, including a preparedness survey, a virtual meeting with a phone line option, and public posting of the draft plan.
- **Hazard Profiles:** Each hazard section in the plan documents hazards reported in the last five years through National Centers for Environmental Information (NCEI), which merges three former National Oceanic and Atmospheric Administration (NOAA) databases, and additional reputable sources. Additionally, climactic variations and future conditions are factored into all hazard profiles.
- **Risk Assessment:** The updated risk assessment includes HAZUS-MH advanced level analysis using LENOWISCO Planning District Geographic Information Systems (GIS) data when possible. Each participating jurisdiction provided its own hazard analysis, which describes the hazards and their impacts as they pertain specifically to the community. Several hazards were changed or re-organized from the 2013 HMP in order to better align with the 2018 Commonwealth of Virginia HMP. These changes include:
 - Severe Wind and Severe Thunderstorm/Hail were re-organized into Non-Rotational Wind and Tornado;
 - Landslides, Land Subsidence, and Soil Erosion and Karst Topography were reorganized into Landslide and Karst/Subsidence;
 - Extreme Heat was removed as a hazard;
 - Communicable Disease was added; and
 - Solar Storm was initially included in the 2021 hazard assessment; however, given the limited data, Solar Storm is included as a special interest hazard and not in the overall risk assessment.
- **Mitigation:** The mitigation section addresses the status of the previous plan's strategies in addition to new mitigation goals, objectives, and strategies. The plan includes district-wide actions and actions for the participating counties and jurisdictions.
- **Yearly Updates:** The 2021 HMP outlines the District's plan for yearly updates that include all participating jurisdictions and public involvement.



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Section 1.2 Introduction

Emergency Management Background

Over the past fifty years, the meaning and scope of emergency management has evolved in response to changes in political, military, and natural environments. Emergency management has grown from a narrow civil defense focus to its present position of providing a wide array of services in response to natural, technological, and human-caused hazards.

Emergency management began after World War II. The federal government created a nationwide shelter program under the Civil Defense Act, and the first federal assistance to state and local governments was provided under civil defense programs. Response and recovery from natural, technological, and human-caused disasters were to be managed within the jurisdictions of state and local governments.

In 1979, the Federal Emergency Management Agency (FEMA) was established to assist in responding to war-caused emergencies, nuclear incidents, and natural, technological, and human-caused disasters. In the 1980s, response and recovery efforts from other than war became eligible for federal funding. Emergency management also experienced a key policy shift. Focus shifted from one of nuclear war preparedness to a more balanced focus on natural, technological, and human-caused hazards and disasters. An “all-hazards” approach was emphasized. Federal assistance became available for preparedness, response, and recovery efforts. In the 1990s, increasing demand on federal funds for disaster recovery assistance prompted changes in federal policy to emphasize mitigation and provide technical assistance to build state and local government capabilities to deal more independently with emergencies and disasters.

This evolution resulted in a shift from federal initiatives to fostering local and state developed and delivered programs. Within this framework, local emergency management organizations work to implement local, state, and federal emergency management and homeland security policy. By working collaboratively with governmental agencies, private industry, and citizens, and by providing technical assistance and support, local emergency management organizations are expanding capabilities to provide a broad spectrum of professional services.

In the 1990s, federal, state, and local governments recognized the increasing threat of terrorism based on domestic and foreign incidents, including the bombing of the New York World Trade Center in 1993, the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma, the bombing of the Khobar Towers in Saudi Arabia in 1996, and the bombing of the U.S.S. Cole in Yemen in 2000. These incidents demonstrated terrorists’ willingness to use weapons of mass destruction and resulted in the federal government examining the causes and effects of these incidents in order to shape U.S. policy and fund domestic anti-terrorism preparedness activities.

The September 11, 2001, terrorist attacks on the New York World Trade Center and the Pentagon was a defining moment in terrorism and resulted in the restructuring of domestic and foreign policy and the development of nationwide initiatives to detect and prevent terrorist attacks and protect critical infrastructure. The Department of Homeland Security was created, and the view of emergency management was expanded to a comprehensive set of services encompassing seven phases - detection, prevention, preparedness, protection, mitigation, response, and recovery.



Since this implementation of Homeland Security and Emergency Management, several attempts of terrorist attacks on the homeland have occurred. Three attempts on airliners (the shoe bomber, the underwear bomber, and the 2010 cargo package attack) were thwarted. Other serious attempts to bomb or attack military bases, subways, and Times Square were also shut down without loss of life or property. The Fort Hood shooting was the only successful terrorist attack, resulting in 13 seriously wounded or killed military personnel.

Hazard Mitigation Background

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals. Hazard mitigation planning and the subsequent implementation of the projects, measures, and policies developed as part of this Plan, is a primary mechanism in achieving FEMA's goal.

The federal Disaster Mitigation Act of 2000 requires jurisdictions to develop and maintain a Multi-Hazard Mitigation Plan (HMP) to remain eligible for certain federal disaster assistance and hazard mitigation funding programs. Renewal of the plan every five years is required to encourage the continual awareness of mitigation strategies. For the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt the HMP.

The following disasters were declared in the LENOWISCO Planning District during the HMP Planning Period (2015-2020).

FEMA Disaster Declarations <i>Source: FEMA</i>			
Year	Disaster Number	Event	Applicable Jurisdictions
2018	3403	Hurricane Florence	Lee, Scott, and Wise Counties
2020	3448, 4512	COVID-19 Pandemic	Lee, Scott, and Wise Counties

Plan Description

Natural, technological, and human-caused hazards pose a threat to every citizen and community within the LENOWISCO Planning District on some level and frequency. The process of hazard mitigation planning is a critical part of any community's planning program. Because most hazards occur infrequently, mitigation programs for hazards are usually initiated as a reaction to recovery from the most recent disaster. This form of hazard mitigation response is more costly, both in property and human loss, than is pre-disaster planning and mitigation.

Local Mitigation Plans must be updated and resubmitted to FEMA for approval every five (5) years to continue eligibility for FEMA hazard mitigation assistance programs. The mitigation planning regulation at 44 CFR §201.6(d)(3) states:

"A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years to continue to be eligible for mitigation project grant funding. Plan updates must demonstrate that progress has been made in the past 5 years for Local Mitigation Plans to fulfill commitments outlined in the previously approved plan. This involves a comprehensive review and update of each section of the Local Mitigation Plan and a discussion of the results of



evaluation and monitoring activities detailed in the Plan Maintenance section of the previously approved plan. Plan updates may validate the information in the previously approved plan or may involve a major plan rewrite."

The process of all-hazard mitigation planning is the first step toward protecting a community from losses associated with hazards and resulting disasters. Regarding hazard mitigation, the Federal Emergency Management Agency (FEMA) provides the following definitions:

- **Hazard mitigation:** Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.
- **Planning:** The act or process of making or carrying out plans, specifically, the establishment of goals, policies, and procedures for a social or economic unit.

Plan Purpose

This Plan was developed to demonstrate a commitment to reducing or eliminating the impact of natural, technological, and human-caused hazards, and to support efficient and effective response and recovery. The Plan addresses myriad risks and degrees of vulnerability, mitigation goals, objectives, and strategies.

The LENOWISCO Planning District Hazard Mitigation Plan was developed to ensure the Planning District's future eligibility for federal disaster mitigation funds through the Hazard Mitigation Grant Program as provided through the Robert T. Stafford Disaster Relief and Emergency Assistance Act, amended by the Disaster Mitigation Act of 2000. The Plan also ensures access to other federal programs, i.e., Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA). Although the LENOWISCO Planning District and local communities would remain eligible for certain emergency assistance and Human Services programs, the District understands that without an approved hazard mitigation plan, it and all participating jurisdictions would be ineligible for other disaster recovery programs, such as Fire Management and Public Assistance.

This Plan is structured through the planning requirements detailed in 44 Code of Federal Regulation (CFR) Part 201. The key purposes of this 2013 Plan are:

- To involve members of the counties, cities, towns, other agencies, and the public to draft and adopt a mitigation action plan that serves as the blueprint for future development and preparedness activities across the LENOWISCO Planning District;
- To prioritize loss reduction and emergency preparedness activities for disasters;
- To determine areas within the LENOWISCO Planning District that may be vulnerable to various hazards;
- To develop strategies and best practices to avoid and mitigate the impact of hazards.



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Section 1.3 Prerequisites

The 2021 LENOWISCO Hazard Mitigation Plan meets the requirements of the Disaster Mitigation Act of 2000, which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act to require state, local, and tribal entities to closely coordinate mitigation planning and implementation efforts.

1.3.1 Plan Adoption

This Plan represents a comprehensive description of LENOWISCO's commitment to significantly reduce or eliminate the potential impacts of disasters through planning and mitigation. Adoption by the local governing bodies within the District legitimizes the Plan and authorizes responsible agencies to implement mitigation responsibilities and activities.

To be eligible for federal mitigation funding, each participating jurisdiction must adopt the plan.

After a thorough review, the participating jurisdictions adopted the plan on the dates highlighted in the table below. The table also notes the jurisdictions that did not participate in the plan. Under the Planning Process section (1.4), documentation of communication with the non-participating jurisdictions is noted.

TABLE: Plan Adoption by Jurisdictions		
Participating Jurisdiction	Adopting Body (Signatory)	Date of Adoption
Lee County		
Scott County		
Wise County		
City of Norton		
Town of Jonesville	Did not participate in plan update	
Town of Pennington Gap		
Town of St. Charles	Did not participate in plan update	
Town of Clinchport	Did not participate in plan update	
Town of Duffield	Did not participate in plan update	
Town of Dungannon	Did not participate in plan update	
Town of Gate City		
Town of Nickelsville	Did not participate in plan update	
Town of Weber City	Did not participate in plan update	
Town of Appalachia	Did not participate in plan update	
Town of Big Stone Gap		
Town of Coeburn		
Town of Pound		
Town of St. Paul		
Town of Wise		



[Insert Adoption Letter Upon FEMA Approval Pending Adoption]

Following Federal review and approval, the participating jurisdictions in this plan intend to formally adopt the plan by Resolution or Ordinance.

[Insert FEMA Approval Letter Upon Receipt]

1.3.2 Planning Team & Jurisdiction Participation

Nineteen jurisdictions were invited to participate in the planning process. Representatives not only attended the meetings, but also participated by gathering appropriate data and historical information, completed the community preparedness survey, participated in their community hazard analysis, identified new mitigation strategies, updated past mitigation strategies, and participated in other efforts (i.e. webinars, phone interviews, and reviewing drafts). Local mitigation planning team representatives and their contact information and the documentation of participation in the Plan update are available below and sign-in sheets from meetings are in the Public Meetings section (1.4.2).

TABLE: Planning Team Participants					
Name	Organization	Title	Role in HMP	2013 Plan Participant	2021 Plan Participant
Frank Kibler	LENOWISCO Planning District	Senior Planner	Manager	X	X
Todd Lagow	City of Norton	Fire Chief/Emergency Management Coordinator	Jurisdiction Stakeholder		X
Stephen McElroy	City of Norton	City Engineer	Jurisdiction Stakeholder		X
Dane Poe	Lee County	County Administrator	Jurisdiction Stakeholder	X	X
Jeff Brickey	Scott County	Emergency Management Coordinator	Jurisdiction Stakeholder		X
Jessica Swinney	Wise County	Emergency Management Coordinator	Jurisdiction Stakeholder	X	X
Matthew Bright	Town of Big Stone Gap	Building & Zoning Official	Jurisdiction Stakeholder		X
Stephen Lawson	Town of Big Stone Gap	Town Manager	Jurisdiction Stakeholder		X
Jimmy Williams	Town of Coeburn	Town Manager	Jurisdiction Stakeholder		X
Greg Jones	Town of Gate City	Town Manager	Jurisdiction Stakeholder		X
Brian Skidmore	Town of Pennington Gap	Fire Chief	Jurisdiction Stakeholder		X



TABLE: Planning Team Participants

Jane Bennett	Town of Pound	Interim Town Manager	Jurisdiction Stakeholder		X
Earl Carter	Town of St. Paul	Public Works Director	Jurisdiction Stakeholder		X
Laura Roberts	Town of Wise	Town Planner	Jurisdiction Stakeholder	X	X

Participating Jurisdictions

The participating jurisdictions seeking approval under this plan are:

- Lee County
- Scott County
- Wise County
- City of Norton
- Town of Big Stone Gap
- Town of Coeburn
- Town of Gate City
- Town of Pennington Gap
- Town of Pound
- Town of St. Paul
- Town of Wise

Additional Stakeholders

In addition to participating jurisdictions, neighboring counties were invited to comment on the draft plan and participate in stakeholder review meetings. The table below outlines the representatives that were contacted by the planning team, as well as a description of their participation.

TABLE: Neighboring County Reviewers

County	2021 Representative	Email	2021 Description of Participation
Sullivan County, TN	Richard S. Venable, County Mayor	mayor@sullivancountyttn.gov	Did not participate; invited to final stakeholder meeting and review the public draft
Hancock County, TN	Thomas J. Harrison, County Mayor	officemanager@hancockmayortn.com	Did not participate; invited to final stakeholder meeting and review the public draft
Hawkins County, TN	Jim Lee, County Mayor	jim.lee@hawkinscountyttn.gov	Did not participate; invited to final stakeholder meeting and review the public draft
Dickenson County, VA	Larry Barton, County Administrator	lbarton@dickensonva.org	Did not participate; invited to final stakeholder meeting and review the public draft



TABLE: Neighboring County Reviewers

Russell County, VA	Lonzo Lester, County Administrator	lonzo.lester@russellcountyva.us	Did not participate; invited to final stakeholder meeting and review the public draft
Washcova County, VA	Jason Berry, County Administrator	jberry@washcova.com	Invited to final stakeholder meeting and review the public draft

1.3.3 Plan Authority

This 2021 Plan update was developed in accordance with federal, state, and local rules and regulations governing local hazard mitigation plans. The Plan authority will be routinely monitored and revised to maintain compliance with the below provisions, rules, and legislation:

TABLE: Plan Authority

Authority	Authority Description	Date
Federal	The National Flood Insurance Program (NFIP) was established with the passage of the National Flood Insurance Act	1968
Federal	Flood Mitigation Assistance Program (FMA) was created as part of the National Flood Insurance Reform Act (NFIRA)	1994
Federal	Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390)	10/30/2000
Federal	Pre-Disaster Mitigation (PDM) Program was authorized by section 203 of the 2000 Stafford Act, 42 USC (Public Law 106-390) and replaced by the Building Resilient Infrastructure and Communities (BRIC) Program. When the with Disaster Recovery Reform Act of 2018 (DRRA) was signed into law, FEMA worked to develop the BRIC program. The BRIC program development started in the summer of 2019 and first grant application period started September 2020.	10/30/2000
Federal	FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201 and 206	02/26/2002
State	§ 44-146.18. Department of Emergency Management; administration and operational control; coordinator and other personnel; powers and duties. Section B3 Notates that The Department shall promulgate plans and programs that are conducive to adequate disaster mitigation preparedness, response, and recovery programs.	--

Hazard Mitigation Legislation

Disaster Mitigation Act of 2000

To support the expanded role of emergency management, the Disaster Mitigation Act of 2000, (DMA2K), commonly known as the Stafford Act. Section 322 was passed. An amendment to the



Act, dealing with the development of local hazard mitigation plans. DMA2K was signed into law on October 30, 2000 (Public Law 106-390) and amended the Stafford Act to establish a national program for pre-disaster mitigation, streamline the administration of disaster relief, and control federal disaster assistance costs. The Interim Final Rule for planning provisions (44 CFR Part 201) is published in the Federal Register. Local hazard mitigation planning requirements are described in 44 CFR Part 201.6. Congress envisioned that implementation of these new requirements would result in the following benefits:

- Reduction of loss of life and property, human suffering, economic disruption, and disaster costs.
- Prioritization of hazard mitigation planning at the local level, with an increased emphasis on planning and public involvement, assessing risks, implementing loss reduction measures, and ensuring critical services/facilities survive a disaster.
- Establishment of economic incentives, awareness, and education to state, tribal, and local governments that result in forming community-based partnerships, implementing effective hazard mitigation measures, leveraging additional non-federal resources, and establishing commitments to long-term hazard mitigation efforts.

Regulation 44 CFR Part 201

44 CFR Part 201 regulations reflect the need for state, tribal, and local governments to closely coordinate mitigation planning and implementation efforts. State, tribal, and local governments must have a state- and FEMA-approved Local Mitigation Plan to receive FEMA hazard mitigation assistance and to apply for and/or receive the following project grants:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)
- Community Rating System (CRS)

Each hazard mitigation plan must, at minimum, address or include the following items:

- Plan adoption by all participating jurisdictions
- A description of the planning process including public involvement
- Hazard identification and risk assessment
- Mitigation strategy
- Plan implementation and maintenance procedures
- Any specific state requirements

The mitigation plan requirements in 44 CFR Part 201 emphasize greater interaction between state and local mitigation activities, and highlights the need for improved linkage between state and local mitigation plans. Under 44 CFR §201.4(c)(4), states are required to coordinate mitigation planning with tribal and local jurisdictions and document the funding and technical assistance they will provide. States should refer to local mitigation plans to improve the level of detail and comprehensiveness of statewide risk assessments and coordinate mitigation goals and objectives with local goals and objectives. Similarly, local governments may refer to the state mitigation plan where information may be useful for local mitigation strategy development.



Hazard Mitigation Grant Program

In 1988, Congress established the Hazard Mitigation Grant Program (HMGP) in Section 404 of the Stafford Act. In 2002, regulations pertaining to the HMGP were changed by 44 CFR Part 206. An Interim Final Rule was issued wherein the final compliance date was set to November 1, 2004 for all governments to have a FEMA-approved mitigation plan. The HMGP assists states and local communities to implement long-term hazard mitigation measures by providing federal funding after a major disaster declaration. Eligible applicants include state and local agencies, tribal organizations, and certain non-profit organizations. Examples of HMGP projects include:

- Property acquisition and relocation projects
- Structural retrofitting to minimize damages from high winds, earthquake, flood, wildfire, or other hazards
- Elevation of flood-prone structures
- Vegetative management programs

Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) Program is authorized by section 203 of the 2000 Stafford Act. Funding for the program is provided to assist state, tribal, and local governments in implementing cost-effective hazard mitigation activities. Two types of grants are offered under the PDM Program.

- Planning Grants - Allocated funds to be used for hazard mitigation plan development.
- Competitive Grants - Distributed funds using a competitive application process.

The minimum eligibility requirements for jurisdictions receiving PDM funds include:

- Participation in the National Flood Insurance Program (NFIP)
- Must not be suspended or on probation from the
- Must have a FEMA-approved hazard mitigation plan

Building Resilient Infrastructure and Communities (BRIC)

With the Disaster Recovery Reform Act (DRRA) of 2018, Congress authorized the creation of a new pre-disaster mitigation program. The Building Resilient Infrastructure and Communities (BRIC) program replaced the PDM program. The Disaster Recovery Reform Act, Section 1234, amended Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) and authorized BRIC. The BRIC grant program is available to states, local communities, tribes, and territories (SLTTs) for pre-disaster mitigation activities. The BRIC priorities are to:

- incentivize public infrastructure projects;
- incentivize projects that mitigate risk to one or more lifelines;
- incentivize projects that incorporate nature-based solutions; and,
- incentivize adoption and enforcement of modern building codes.



Section 1.4 Planning Process

All areas within the LENOWISCO Planning District are vulnerable to natural, technological, and human-caused hazards that have the possibility of causing severe threats to the health, welfare, and security of its residents. The cost of the response to and recovery from the potential disasters, regarding the potential loss of life or property, can be lessened when attention is turned to mitigating their impacts and effects before they occur or reoccur.

This Multi-Jurisdiction All-Hazard Mitigation Plan (HMP) seeks to identify LENOWISCO's hazards and understand their impact on vulnerable populations and infrastructure. With that understanding, the Plan sets forth solutions that if implemented, have the potential to significantly reduce the threat to life and property. The HMP is based on the premise that hazard mitigation works. With increased attention to managing natural hazards and land use, communities can reduce the threats to citizens and infrastructure. Many mitigation strategies can be implemented at minimal cost and social impact.

This is not an emergency response plan; however, the HMP can be used to identify gaps and enhance coordination of other plans, including comprehensive emergency management plans, continuity of operations, and emergency response plans. The primary focus of the HMP is to support better decision making directed toward lessening hazard impact and the implementation of activities or projects that will eliminate or reduce the risk for those that may already have exposure to a natural hazard threat.

Purpose

The purposes of the HMP are:

- Fulfill federal and local mitigation planning responsibilities;
- Promote pre-and post-disaster mitigation measures with short/long-range strategies to minimize suffering, loss of life, impact on traditional culture, and damage to property and the environment;
- Eliminate or minimize conditions that would have an undesirable impact on the people, culture, economy, environment, and well-being of the Planning District at large; and,
- Enhance elected officials', departments', and the public's awareness of the threats to the community's way of life, and of what can be done to prevent or reduce the vulnerability and risk.

Scope

This Multi-Jurisdiction All-Hazard Mitigation Plan covers all the areas within the eleven participating jurisdictions.

Mission Statement

The LENOWISCO Planning District Hazard Mitigation Plan (HMP) sets forth public policy designed to protect citizens, critical facilities, infrastructure, private and public property, the local economy, and the environment from risks associated with natural and human-caused hazards.



Federal and State Plan Compliance and Integration

This HMP is designed to comply with the requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, and Related Authorities and 44 CFR Part 201, which states that local governments, to be eligible for pre-disaster and/or post-disaster mitigation funds, must have an approved Hazard Mitigation Plan in place. The Plan is also designed to comply with the Federal Emergency Management Agency (FEMA) and Virginia Department of Emergency Management (VDEM), guidance documents (particularly the Local Multi-Hazard Mitigation Planning Guidebook dated 2018), and other applicable federal, state, and local regulations.

Plan Use

The Plan should be used to help officials within LENOWISCO plan, design, and implement programs and projects that will help reduce the jurisdiction's vulnerability to natural, technological, and human-caused hazards. The Plan should also be used to facilitate inter-jurisdiction coordination and collaboration related to all-hazard mitigation planning and implementation within the planning district. Lastly, the Plan should be used to develop or provide guidance for local emergency response planning. If adopted, this Plan will achieve compliance with the Disaster Mitigation Act of 2000.

Hazard Mitigation

Hazard mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, culture, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures which can be used to eliminate or minimize the risk to life, culture, and property, fall into three categories:

1. Keep the hazard away from people, property, and structures.
2. Keep people, property, or structures away from the hazard.
3. Reduce the impact of the hazard on victims, i.e., insurance.

Hazard mitigation measures must be practical, cost-effective, and culturally, environmentally, and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the anticipated damages.

Hazard mitigation planning should focus on capital investment and land use decision-making and be based on vulnerability. Capital investments, whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Once a capital facility is in place, very few opportunities will present themselves over the useful life of the facility to correct any errors in location or construction concerning to the hazard vulnerability. It is for this reason that zoning and other ordinances, which manage development in high vulnerability areas, and building codes, which ensure that new buildings are built to withstand the damaging forces of the hazards, are often the most useful tool in mitigation that a jurisdiction can implement.

Since the priority to implement mitigation activities is usually very low in comparison to the perceived threat, some important mitigation measures take time to implement. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, followed by effective mitigation management.



1.4.1 Existing Plans and Technical and Fiscal Resource Review & Plan Integration

The LENOWISCO Planning District completed its first HMP in 2005. An update was conducted in 2013. The current update was completed in 2021. The table below lists the plans, studies, and reports reviewed prior to the update of this Plan. The Capability Assessment includes additional information utilized in this plan. Plan integration strategies are further explained in 1.7.3 Plan Integration Strategy.

TABLE: Primary Documents Reviewed for this Plan Update				
Year	Title	Author(s)	Link/Location of Plan	Integration into HMP
2021	Reducing Risk in the Floodplain	FEMA Region III	http://nhma.info/wp-content/uploads/2021/02/R3_Reducing_Risk_in_the_Floodplain_Guide.pdf	Used to inform flood hazard mitigation actions and strategies to build jurisdiction capability.
2020	Featured Guide: Nature-Based Solutions Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities	FEMA	https://www.fema.gov/sites/default/files/2020-08/fema_riskmap_nature-based-solutions-guide_2020.pdf	Identify nature-based mitigation actions.
2020	LENOWISCO PDC Community Profile	Virginia Employment Commission	www.virginiaworks.com/Portals/200/Local%20Area%20Profiles/5109000301.pdf	Used to develop the District Community Profile and District Vulnerability Analysis. The data collected for the HMP can inform PDC Community Profile updates.
2020	Wise County Comprehensive Plan	Wise County Planning Commission	www.wisecounty.org/planupdate/2020_comp_plan.pdf	Used to develop the County Community Profile, Hazard Vulnerability Analysis, and design applicable mitigation actions The HMP can inform future Comprehensive Plan updates, particularly the land use, planning, natural resource, and sustainability sections



TABLE: Primary Documents Reviewed for this Plan Update

2020	Lee County Comprehensive Plan	Lee County Planning Commission	http://www.leecova.org/pdf/Lee%20County%20Comprehensive%20Plan-Adopted%202020.pdf	Used to develop the County Community Profile, Hazard Vulnerability Analysis, and design applicable mitigation actions The HMP can inform future Comprehensive Plan updates, particularly the land use, planning, natural resource, and sustainability sections
2020	Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2020	Scott County	http://www.scottcountyva.com/FY20-Audit.pdf	Used to create Fiscal Capability section for Jurisdiction Annex. Proposed mitigation actions should be considered in future budgets.
2020	2020-21 Approved Budget	City of Norton	http://www.nortonva.org/ArchiveCenter/ViewFile/Item/2791	Used to create Fiscal Capability section for Jurisdiction Annex. Proposed mitigation actions should be considered in future budgets.
2019	Comprehensive Economic Development Strategy	LENOWISCO Planning District Commission	www.lenowisco.org/reports-and-media.html	Used to develop the economic profile, support mitigation cost-benefit analysis, and analyzed current and future land use. Proposed District-wide mitigation actions should be considered in future Comprehensive Economic Development Strategy updates.
2019	County of Lee, Virginia Financial Statements for the Year Ended June 30, 2019	Lee County	http://www.leecova.org/Audit/Audit%20Report%20FY2019.pdf	Used to create Fiscal Capability section for Jurisdiction Annex. Proposed mitigation actions should be considered in future budgets.
2019	Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2019	Wise County	https://www.wisecounty.org/finance/audit/wiseco_va_audit_rpt_fy1819.pdf	Used to create Fiscal Capability section for Jurisdiction Annex. Proposed mitigation actions should be considered in future budgets.
2018	Commonwealth of Virginia Hazard Mitigation Plan	Virginia Department of Emergency Management	www.vaemergency.gov/agency/planning/	Used to ensure compliance with State requirements, enhance hazard profiles, align mitigation goals, and develop relevant mitigation actions.
2018	American Community Survey	U.S. Census Bureau	www.census.gov/programs-surveys/acs	Used to develop the demographic profiles and statistically support vulnerability analysis.



TABLE: Primary Documents Reviewed for this Plan Update

2017	LENOWISCO Agricultural Strategic Plan	LENOWISCO Planning District Commission	www.lenowisco.org/reports-and-media.html	Used to analyze hazard impact to crops and the economy. The HMP included crop impact data and land use impacts in hazard profiles and updates to the Strategic Plan can include data from the HMP.
2017	Scott County Comprehensive Plan	Scott County Planning Commission	www.scottcountyva.com/2017-CompPlanFinal.pdf	Used to develop the County Community Profile, Hazard Vulnerability Analysis, and design applicable mitigation actions. The HMP can inform future Comprehensive Plan updates, particularly the land use, planning, natural resource, and sustainability sections.
2013	Local Mitigation Planning Handbook	Federal Emergency Management Agency	www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/create-hazard-plan	Used to develop and crosswalk the mitigation plan structure and components.
2003	City of Norton 2020 Comprehensive Plan	City of Norton Planning Commission	www.nortonva.org/DocumentCenter/View/738/Comprehensive-Plan?bidId=	Used to develop the City Community Profile, Hazard Vulnerability Analysis, and design applicable mitigation actions. The HMP can inform future Comprehensive Plan updates, particularly the land use, planning, natural resource, and sustainability sections.

The LENOWISCO Planning District Board of Directors discusses and votes on several issues related to hazard mitigation, including:

- Water/ wastewater funding requests
- Allocation of construction funds
- Community Development Block Grant (CDBG) applications
- Updates on current improvement projects

A Hazard Mitigation Plan is only a part of the emergency planning, mitigation, preparedness, response, and recovery process. Therefore a second objective of the planning process was to coordinate Plan preparation with existing LENOWISCO Planning District emergency plans, programs, procedures, and organizations. For purposes of this Plan, existing hazard mitigation goals and objectives within the LENOWISCO Planning District were reviewed. It should be noted that this Plan does not replace any existing plans or programs but is intended to provide a reference on hazard mitigation to be used in planning and program development.



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1.4.2 Plan Participation

The following section details the planning process, planning team meetings and participation, non-participating jurisdictions, public outreach including a community preparedness survey and public forum, and the public plan review and feedback process.

Planning Process Detailed

In summary, the planning process consisted of the following steps:

Organize Resources

The LENOWISCO Planning District created a planning committee for the HMP update, representing the Planning District and participating jurisdictions. Members of the planning committee completed hazard profile worksheets and mitigation action worksheets, participated in individual mitigation action brainstorm meetings, facilitated public involvement, and reviewed the HMP draft to provide feedback for improvement. Four virtual planning meetings occurred during the process, which are detailed in the Planning Team Meetings section.

Identify Hazards

The planning committee identified hazards for the LENOWISCO Planning District based on their frequency and other relevant resources, including:

- Hazard planning documents developed by state, federal and private agencies
- NOAA (National Oceanic and Atmospheric Administration) National Centers for Environmental Information (formerly National Climatic Data Center-NCDC) data dating back to 1950
- Data from the United States Geological Survey (USGS), Virginia Department of Conservation and Recreation, and Virginia Department of Mines, Minerals, and Energy
- Data from the 2018 Commonwealth of Virginia Hazard Mitigation Plan
- Other sources highlighted in Section 1.4.1 Existing Plans and Technical Resources

Identify Vulnerabilities

The planning committee examined the potential effects to the LENOWISCO Planning District of the listed hazards by identifying vulnerable populations, infrastructure, critical services, facilities, and the environment in the first meeting. Team members geographically identified vulnerabilities using HAZUS-MH and Geographical Information System (GIS).

Develop Mitigation Goals

As required by FEMA, the planning effort was centered on community-supported hazard reduction goals to be implemented and evaluated based on measurable objectives. Mitigation projects are to be assessed against the established mitigation goals to ensure that the selected projects reduce risk as desired.



Risk Assessment

For each identified hazard, the planning committee created a profile addressing the hazard's probability, severity, extent, and potential impacts associated with each hazard. The team then used local resources to inventory the jurisdiction assets and estimate losses. The committee provided input and subject-matter expertise throughout this process. A standardized risk ranking methodology was developed, enabling stakeholders to compare risk from one jurisdiction to the other. The methodology created measured and weighed the following variables: probability, population exposure, property exposure, property damages, economic impact, and catastrophic potential. A quantitative assessment was first conducted, followed by input from key stakeholders from that community. Minor adjustments were made if needed. The assessment provides a holistic risk ranking of the LENOWISCO Planning District, whereas the individual jurisdiction assessments provide a very specific and unique view of risk as it pertains to that community.

Develop Mitigation Strategies

The planning team met with representatives of each participating jurisdiction to develop and prioritize mitigation strategies and action items that would reduce the costs of disaster response and recovery, protect people and infrastructure, and minimize overall disruption to each jurisdiction in the event of a disaster.

Write Plan

The HMP meets the requirements set forth by FEMA in the FEMA Criteria Crosswalk. Plan drafts were presented in electronic form to committee members and the public. The HMP was also shared with neighboring jurisdictions for review.

Public Involvement

A comprehensive public survey was distributed through several channels including social media, newspaper, and web outlets. A total of 166 residents completed the survey. In addition, one virtual public meeting occurred during the draft review phase. The draft of the plan was made public for review and details for the public announcements are included under the Public Forums and Outreach section (1.4.2.4).

Plan Review

The planning committee reviewed both the draft HMP as well as their respective jurisdiction annexes during the drafting phase. The planning committee assessed the HMP using the most current FEMA HMP Review Crosswalks. Once the HMP was completed, it was submitted as a draft to the committee and the public to review. Following the public comment time period and after changes were made, the plan was submitted to the Virginia Department of Emergency Management Hazard Mitigation Officer, and then to FEMA Region III Hazard Mitigation Officer for review. The LENOWISCO Planning District Commission reviewed the HMP in a parallel time frame.



Plan Adoption

The LENOWISCO Planning District coordinated the effort to ensure the HMP was formally adopted by each participating jurisdiction (see Plan Adoption section 1.3.1). A letter of Promulgation is provided in the Plan. Additionally, each participating jurisdiction will be requested to adopt the Plan by resolution with the respective mayors signing the appropriate multi-jurisdiction participation document.

Planning Team Meetings

The planning committee conducted three virtual meetings through GoToMeeting, as this HMP was completed during the COVID-19 pandemic, restricting any in-person engagement. The three meetings are summarized below, in alignment with the stage of the planning process detailed in the previous section.

Meeting One: Identify Hazards

The first planning committee virtual meeting took place on October 8, 2020. The objectives of this meeting were to outline the planning process, establish the project timeline, and outline data collection and plan review methods. The committee discussed the natural hazards to be included in the plan, and each jurisdiction was asked to complete a hazard worksheet outlining specific vulnerabilities and concerns for their community for each hazard.

Using an online polling tool, the planning committee members noted which hazards were of greatest concern to their communities. As shown in the figure below, Flooding and Winter Storm Events have posed the greatest risk across the LENOWISCO Planning District. Other questions posed to the planning committee included whether additional hazards should be added to the HMP, and where they saw the greatest opportunity for mitigation.

FIGURE: Polling Results from Planning Team Meeting

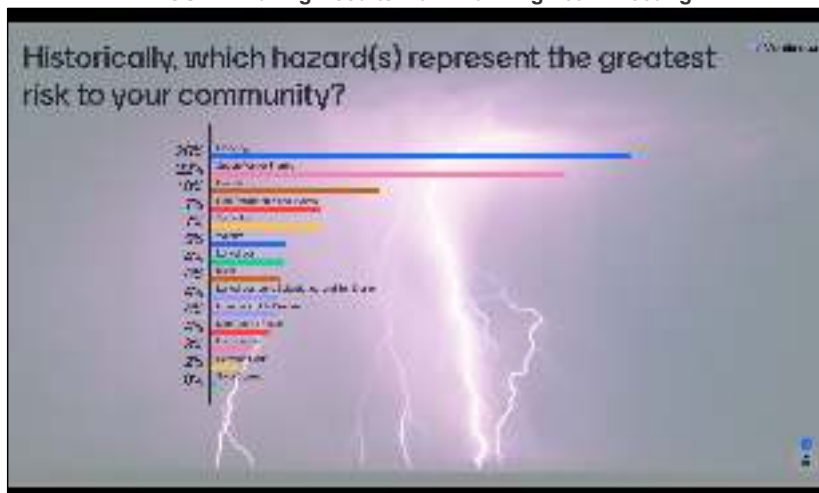




FIGURE: Polling Results from Planning Team Meeting



Eight of the eleven participating jurisdictions attended the first meeting. The LENOWISCO Planning District followed-up directly with all jurisdictions after the meeting to encourage and facilitate engagement. A complete list of participants is available in the table below.

TABLE: Attendance for Stakeholder Meeting October 8, 2020	
Name	Organization
Todd Lagow	City of Norton
Stephen McElroy	City of Norton
Fred Ramey	City of Norton
Alan Bailey	Lee County
Dane Poe	Lee County
Frank Kibler	LENOWISCO Planning District
Freda Starnes	Scott County
Greg Jones	Town of Gate City
Jane Bennet	Town of Pound
Earl Carter	Town of St. Paul
Laura Craft	Town of Wise
Karen Mullins	Wise County
Jessica Swinney	Wise County
Sara Harrington	VDEM All-Hazards Planner, Plan Approver
Betsy Lopez	Integrated Solutions Consulting – Project Lead
Leah Rausch	Integrated Solutions Consulting – Planner
Matt Stanley	Integrated Solutions Consulting – Principal Manager
Cassandra Wolff	Integrated Solutions Consulting – GIS Analyst / Planner
Ed Wolff	Integrated Solutions Consulting – Project Manager



Meeting Two: Develop Mitigation Goals

The second planning committee meeting focused on developing mitigation goals and actions for each participating jurisdiction. The team provided feedback on the draft goal statements for the 2021 HMP, and how they guide the development of actions. The planning team reviewed the benefits of mitigation, shared examples, outlined what information will need to be included for each mitigation action, and how the actions may leverage future funding opportunities. The committee shared any initial mitigation action ideas, including the need for generators for emergency shelters, acquisition and demolition projects, and more.

Participating jurisdictions were asked to consult with local stakeholders and subject matter experts to begin drafting mitigation action ideas using a provided worksheet (see figures on the following pages), which would then be refined through one-on-one calls.

Ten of the eleven participating jurisdictions attended the second meeting. The LENOWISCO Planning District followed-up directly with all jurisdictions after the meeting to encourage and facilitate engagement. A complete list of participants is available in the table below.

TABLE: Attendance for Stakeholder Meeting #2 December 16, 2020	
Name	Organization
Todd Lagow	City of Norton
Stephen McElroy	City of Norton
Dane Poe	Lee County
Frank Kibler	LENOWISCO Planning District
Jeff Brickey	Scott County
Matthew Bright	Town of Big Stone Gap
Stephen Lawson	Town of Big Stone Gap
Greg Jones	Town of Gate City
Brian Skidmore	Town of Pennington Gap
Jane Bennet	Town of Pound
Earl Carter	Town of St. Paul
Laura Roberts	Town of Wise
Jessica Swinney	Wise County
Betsy Lopez	Integrated Solutions Consulting – Project Lead
Leah Rausch	Integrated Solutions Consulting – Planner
Matt Stanley	Integrated Solutions Consulting – Principal Manager
Cassandra Wolff	Integrated Solutions Consulting – GIS Analyst / Planner
Ed Wolff	Integrated Solutions Consulting – Project Manager



FIGURE: New Mitigation Action Worksheet (Page 1)

Worksheet: New Mitigation Action (LENOWISCO)

Submitter Information:

Name	
Jurisdiction	
Organization/Department	
E-mail	
Phone Number	

Please describe the new mitigation action:

Mitigation Action Title Please outline action write and exact location when possible Description (including purpose, benefit, and loss avoided)	

New Action/Check tracking parameters noted at the end of the document:

Year Initiated	2021 (New Mitigation Action)
Applicable Jurisdiction	
Lead Agency/Organization	
Supporting Agencies/Organizations	
Potential Funding Source	
Cost	
Estimated Cost (High, Medium, Low)	
Benefits (High, Medium, Low)	
Priority (High, Medium, Low)	
Project Length (Short-term, Long-term, or Ongoing)	
Projected Completion Year or Ongoing	

Please indicate which goals apply to the new mitigation action. Select all that apply.

☒	Please set "X" by the applicable goals
☐	Goal 1: Protect the lives, health, and safety of LENOWISCO residents and visitors, maintain critical societal functions before, during, and after a disaster.
☐	Goal 2: Identify and implement mitigation projects that will minimize a hazard's impact on existing and future developments, including reducing risk to NFIP repetitive loss and severe repetitive loss properties.
☐	Goal 3: Incorporate mitigation into existing and future policies, plans, regulations, and laws in LENOWISCO.
☐	Goal 4: Promote and support a whole community approach to mitigation that encourages residents, businesses, and public entities to become more disaster resilient.

Page 1 of 5



FIGURE: New Mitigation Action Worksheet (Page 2)

Worksheet: New Mitigation Action (LENOWISCO)

STAFF/LEE Assessment: Please circle or highlight the best option and how the 7 scores

	Strongly Disagree (1)	Disagree (2)	Neither Agree or Disagree (3)	Agree (4)	Strongly Agree (5)
Social: Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.	1	2	3	4	5
Technical: Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.	1	2	3	4	5
Administrative: Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.	1	2	3	4	5
Political: Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.	1	2	3	4	5
Legal: It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.	1	2	3	4	5
Economic: Budget constraints can significantly deter the implementation of mitigation actions. It is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.	1	2	3	4	5
Environmental: Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.	1	2	3	4	5
Score Total of All 7 Categories:					

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FIGURE: New Mitigation Action Worksheet (Page 3)

Worksheet: New Mitigation Action (LENOWISCO)

Place an "X" by the hazard(s) this action will mitigate:

Mitigated Hazard	
X	Place an "X" by the applicable hazard
	Communicable Disease
	Drought
	Earthquake
	Flooding
	Dam Failure
	Railroad Subsidence
	Landslide
	Non-Relational Winds
	Solar Storm
	Tornado
	Volcano
	Winter Storm

Mitigation Action Timeline Parameters

While the preference is to provide definitive project completion dates, this is impossible for every mitigation action. Therefore, the parameters for the timeline (Projected Completion Date) are as follows:

- Short Term = to be completed in 1 to 5 years
- Long Term = to be completed in greater than 5 years
- Ongoing = currently being funded and implemented under existing programs and is seeking funding and necessary approvals

Mitigation Action Estimated Cost

While the preference is to provide definitive costs (dollar figures) for each mitigation action, this is not possible for every mitigation strategy/action. Therefore, the estimated costs for the mitigation initiatives identified in this Plan were identified as high, medium, or low, using the following ranges:

- Low – less than \$10,000
- Medium – from \$10,000 to \$100,000
- High – greater than \$100,000

Mitigation Strategy/Action Prioritization Process

The mitigation strategy must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.5(c)(3)(ii)). The mitigation strategies can be prioritized and evaluated, as shown on the individual mitigation action worksheets (using the STAPLEE method) for each recommended mitigation initiative.

County and municipal stakeholders evaluated each mitigation strategy/action with the following categories and questions:

Social:

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FIGURE: New Mitigation Action Worksheet (Page 4)

Worksheet: New Mitigation Action (HMP/WMSCO)

- + Will the proposed action adversely affect one segment of the population?
- + Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of over-income people?

Technical:

- + How effective is the action in avoiding or reducing future losses?
- + Will it create more problems than it solves?
- + Does it solve the problem or only a symptom?
- + Does the mitigation strategy address continued compliance with the NFIP?

Administrative:

- + Does the jurisdiction have the capability (staff, technical experts, and funding) to implement the action, or can it be readily obtained?
- + Can the community provide the necessary maintenance?
- + Can it be accomplished promptly?

Political:

- + Is there political support to implement and maintain this action?
- + Is there a local champion willing to help see the action to completion?
- + Is there enough public support to ensure the success of the action?
- + How can the mitigation objectives be accomplished at the lowest cost to the public?

Legal:

- + Does the community have the authority to implement the proposed action?
- + Are the proper laws, ordinances, and resolutions in place to implement the action?
- + Are there any potential legal consequences?
- + Is there any potential community liability?
- + Is the action likely to be challenged by those who may be negatively affected?
- + Does the mitigation strategy address continued compliance with the NFIP?

Economic:

- + Are there currently sources of funds that can be used to implement the action?
- + What benefits will the action provide?
- + Does the cost seem reasonable for the size of the problem and likely benefits?
- + What burden will be placed on the tax base or local economy to implement this action?
- + Does the action contribute to other community economic goals such as capital improvements or economic development?
- + What proposed actions should be considered but be "funded" for implementation until outside funding sources are available?

Environmental:

- + How will this action affect the environment (land, water, endangered species)?
- + Will this action comply with local, state, and federal environmental laws and regulations?

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Meeting Three: Draft Plan Review

The final stakeholder meeting covered the planning timeline, highlights of the draft plan, plan adoption process, and jurisdiction profile review. The committee invited six (6) neighboring counties to attend the stakeholder meeting and review the final plan draft. During the meeting, the committee presented the district-wide hazard ranking. Previous jurisdiction meeting discussions resulted in removing Solar Storms from the 2021 Hazard Risk Ranking, given the limited impact and data available. Additionally, the committee determined not to develop mitigation actions for Solar Storm. Solar Storm remained in the plan as a “hazard of interest.” In this meeting, the stakeholders agreed with the overall hazard ranking for the District; however, the stakeholders did not agree with the hazard ranking, particularly earthquake, for Wise County. The discussion also yielded further discussion on the different hazard rankings for each jurisdiction. Before the meeting, the committee provided the jurisdictions their plan annex, including mitigation actions and hazard ranking, to review. During the meeting, the committee reminded the jurisdictions to submit changes by February 25, 2021.

The stakeholders also provided valuable feedback on the mitigation priorities given to the district-wide mitigation actions. Overall, the stakeholders agreed with the mitigation actions' priority level except for the sheltering plan action. Stakeholders suggested moving the priority level from medium to high, which is reflected in the final version of the plan.

The committee explained the importance of adopting the plan following FEMA approval and adoption by the LENOWISCO Planning District Council. The stakeholders asked for the best way to adopt the plan. A representative from the Virginia Department of Emergency Management (VDEM) let the stakeholders know that the jurisdiction can adopt the plan by resolution.

At the end of the meeting, the committee encouraged the stakeholders to share the public draft and comment form with their community and attend the public meeting. Additionally, the committee encouraged the stakeholders to share their annex draft with others in their office for feedback.



All eleven participating jurisdictions and a representative from the Virginia Department of Emergency Management (VDEM) attended the meeting. A complete list of participants is available in the table below.

TABLE: Attendance for Stakeholder Meeting #2 December 16, 2020	
Name	Organization
Todd Lagow	City of Norton
Dane Poe	Lee County
Frank Kibler	LENOWISCO Planning District
Jeff Brickey	Scott County
Matthew Bright	Town of Big Stone Gap
Greg Jones	Town of Gate City
Brian Skidmore	Town of Pennington Gap
Jane Bennet	Town of Pound
Earl Carter	Town of St. Paul
Laura Roberts	Town of Wise
Jessica Swinney	Wise County
Sara Harrington	Virginia Department of Emergency Management (VDEM)
Betsy Lopez	Integrated Solutions Consulting – Project Lead
Leah Rausch	Integrated Solutions Consulting – Planner
Matt Stanley	Integrated Solutions Consulting – Principal Manager
Cassandra Wolff	Integrated Solutions Consulting – GIS Analyst / Planner



Non-Participating Jurisdictions

All jurisdictions in the LENOWISCO Planning District were invited multiple times through phone calls and e-mails to participate in the plan update. The jurisdictions that did not participate are listed below. All the non-participating jurisdictions fall within counties that did participate in the plan update. The counties have a larger staffing capacity to support mitigation projects.

TABLE: Non-Participating Jurisdictions			
Jurisdiction	Planning Meeting Invitations Sent via E-mail or Mail	Phone Call Dates Contacted	Responses & Reasons
Town of Jonesville	9/29/20, 10/7/20, 12/15/20	12/1/20, 12/8/20, 12/15/20, 1/13/21, 1/22/21	Non-responsive; County incorporated hazards impacting the jurisdiction into their plan
Town of St. Charles	9/29/20, 10/7/20, 12/15/20	---	No Government; Relies on County; County incorporated hazards impacting the jurisdiction into their plan
Town of Clinchport	9/29/20, 10/7/20, 12/15/20	---	No Staff; Relies on County; County incorporated hazards impacting the jurisdiction into their plan
Town of Duffield	9/29/20, 10/7/20, 12/15/20	---	No Staff; Relies on County; County incorporated hazards impacting the jurisdiction into their plan
Town of Dungannon	9/29/20, 10/7/20, 12/15/20	12/1/20, 12/8/20, 12/15/20, 1/13/21, 1/22/21, 1/28/21	Non-responsive; County incorporated hazards impacting the jurisdiction into their plan
Town of Nickelsville	9/29/20, 10/7/20, 12/15/20	12/1/20, 12/8/20, 12/15/20, 1/13/21, 1/22/21	No Full-time Staff; Relies on County
Town of Weber City	9/29/20, 10/7/20, 12/15/20	12/1/20, 12/8/20, 12/15/20, 1/13/21, 1/22/21	Non-responsive; County incorporated hazards impacting the jurisdiction into their plan
Town of Appalachia	9/29/20, 10/7/20, 12/15/20	12/1/20, 12/8/20, 12/15/20, 1/13/21, 1/22/21	Non-responsive; County incorporated hazards impacting the jurisdiction into their plan



Community Preparedness Survey

The LENOWISCO Planning District distributed an online, public survey to residents from December 17, 2020, to February 1, 2021. There were 166 complete responses, representing all of the participating jurisdictions. The survey included 35 questions (detailed in Appendix A: Survey Questions) and concluded with mitigation and preparation resources available in the District. A complete report of survey results is available in Appendix A: Survey Results.

The survey was shared by members of the planning committee across multiple platforms in the District, including:

- Nextdoor
- LENOWISCO Planning District website
- LENOWISCO Planning District social media (Twitter)
- Jurisdiction websites
- Jurisdiction social media platforms (Facebook, Twitter)
- Virginia Star newspaper

The press release and samples of survey distribution methods are available in Appendix A.

Regional Representation

Residents from each of the participating jurisdictions in the LENOWISCO Planning District responded to the survey, with 22.8% indicating they lived or worked in Lee County, 24.7% in Scott County, 53.3% in Wise County, and 7.3% in Norton. The Town of Wise (Wise County), Town of Gate City (Scott County), and Town of Big Stone Gap (Wise County) had the most survey respondents outside of unincorporated county areas. Survey responses by participating jurisdiction are detailed below:

- Town of Wise (40 responses)
- Unincorporated Wise County (37 responses)
- Unincorporated Lee County (29 responses)
- Town of Gate City (27 responses)
- Unincorporated Scott County (19 responses)
- Town of Big Stone Gap (18 responses)
- City of Norton (15 responses)
- Town of Pennington Gap (13 responses)
- Town of Coeburn (11 responses)
- Town of St. Paul (8 responses)
- Town of Pound (4 responses)

Demographics and Household Characteristics

The breakdown of survey participants mirrored the regional population, as described in the demographics section (1.5.3).

- 96.4% of survey respondents identify as Non-Hispanic White and 98.8% speak English in their household.
- 85% of respondents own their homes and 12% are renters.



- 24% of survey respondents live in a mobile or manufactured home, and 70% live in a single-detached home.
- 71% of respondents have lived in the LENOWISCO Planning District for 21 years or more, with only 14% having lived in the region for 10 years or less.

Natural Hazard Rankings

Survey respondents indicated the risk level for each hazard affecting the LENOWISCO Planning District. The hazards are organized by the number of respondents who indicated "high risk" below. Respondents indicated that Winter Storm and Communicable Disease were by far the highest-ranked hazards. This is understandable given this plan update took place during the COVID-19 global pandemic. Overall, 44.7% of survey respondents believed that the risks associated with the LENOWISCO Planning District's most prevalent hazards were increasing.

- Winter Storm (52.0%)
- Communicable Disease (41.5%)
- Flooding (18.1%)
- Wildfire (15.1%)
- Landslide (6.4%)
- Drought (5.3%)
- Tornado (5.3%)
- Subsidence (4.8%)
- Earthquake (4.7%)
- Karst (3.0%)
- Dam Failure (2.3%)
- Solar Storm (1.8%)

Survey respondents ranked the priority for mitigation of each hazard, based on their own risk perception. Ranking of priorities closely mirrored risk rankings, but more survey respondents believed their jurisdiction should more heavily prioritize flood mitigation than believed it was a high risk. Similarly, more respondents indicated a high priority to mitigate communicable disease, taking the top position of the surveyed hazards.

- Communicable Disease (54.5%)
- Winter Storm (51.5%)
- Flooding (35.5%)
- Wildfire (21.6%)
- Tornado (14.5%)
- Landslide (13.3%)
- Dam Failure (7.8%)
- Subsidence (7.4%)
- Non-Rotational Winds (7.2%)
- Drought (5.4%)
- Earthquake (5.4%)
- Solar Storm (3.0%)
- Karst (2.4%)



Preparation, Response, and Recovery

The survey asked respondents to describe their personal preparedness, how they access information about emergencies, their ability and willingness to evacuate in case of a natural hazard event, and their ability to successfully recover from a disaster.

Communication and Information

- 93% of survey respondents use a cellphone to access the internet, followed by 85% who use a computer or laptop at home. One respondent noted they do not have access to the internet, but this is likely an underestimate as the survey was only distributed online.
- Survey respondents noted their top sources for emergency and disaster preparedness information were web searches (42.4%), social media (37.6%), and Virginia government websites (37.1%).
- When asked how they would expect to receive alerts and information during an emergency, respondents indicated local television media (59.3%), private weather apps like the Weather Channel (54.1%), and social media (45.5%) as their top sources.
- 58% of respondents agreed or strongly agreed that they can easily obtain emergency information in times of crisis, while 14% disagreed or strongly disagreed.

Preparedness

- The top activities individuals have done to prepare for emergencies and disasters are to sign-up for emergency alerts (38.5%), secure a weather radio (29.1%), and prepare a 72-hour kit or disaster supply kit (27.7%). More than a quarter of respondents noted they had "done nothing" to prepare for an emergency.
- In selecting the reasons they have not pursued additional preparedness activities, 26.7% of survey respondents noted they didn't know what to do, followed by 15% of respondents who said it cost too much.
- If a disaster (e.g., snowstorm) impacted their community, knocking out electricity and running water, 68% of survey respondents thought their household could manage on its own for at least 3 days.
- 39.7% of respondents agreed or strongly agreed that their jurisdiction is providing the services necessary to prepare them for a disaster, while 20.5% disagreed or strongly disagreed.

Evacuation

- 80.2% of survey respondents indicated they were very likely or somewhat likely to immediately evacuate as instructed. 5% of respondents indicated they were at least somewhat likely to refuse to evacuate at all.
- When asked what would prevent them from evacuating, survey respondents indicated that a pet (35.3%), needing to stay to protect property (26.3%), and not having a place to go (21.6%) were the top reasons. An additional 27.5% of respondents indicated that no obstacles would prevent their evacuation.
- 6% of respondents indicated that someone in their household would require special assistance in an evacuation, and an additional 11% indicated that someone might need assistance. Out of the individuals that indicated yes or maybe, 11% didn't know who would provide the assistance, and 19% of respondents would rely on an outside agency.



Recovery

The top reasons for possibly not being able to recover from a disaster were no alternative power supply (46.3%), lack of financial savings (39.3%), or disruption in employment (26.9%).

Personal Disaster Experience

When asked if they had experienced any damage(s) from a previous disaster, 48.5% of survey respondents had experienced minor property damage and loss, while 11.2% had experienced major or catastrophic property damage. When asked what hazard caused the damages or losses, the most common answers included windstorms, winter storms, and flooding events, as illustrated in the word cloud below.

FIGURE: Word Cloud based on Survey Response Answers





Public Forums and Outreach

Traditionally, the public meeting would be offered as an in-person event. For the safety of the public during the pandemic, the committee offered the public meeting virtually. The committee advertised the public meeting in local newspapers and through social media platforms.

The public meeting covered the purpose of the Hazard Mitigation Plan update, the mitigation planning process, hazard rankings for the district, the feedback from the public survey, and mitigation strategies. At the end of the meeting, the committee encouraged the public to submit comments on the publicly available draft.

Public Plan Review and Feedback

At the conclusion of the planning process, the public was offered an opportunity to provide feedback to the draft plan. Efforts to make this opportunity known to residents included the following:

- Posting to the LENOWISCO Planning District website, as well as participating jurisdiction websites
- Sharing the link to the draft plan via social media platforms, including posting to Nextdoor and Facebook
- Announcements in the local newspaper

Members of the public provided critical feedback throughout the entire planning process. Members of the public attended public meetings and followed up with feedback particularly regarding mitigation actions, environmental concerns, and future development ideas.



Section 1.5 Community Profile

This profile will describe the LENOWISCO Planning District as a whole. For community profiles specific to each jurisdiction, please see the community annexes.

1.5.1 Topography, Geography, and Geology

There are 23 Planning District Commissions (PDC) in Virginia. The LENOWISCO Planning District Commission is the westernmost of all PDCs within the Commonwealth of Virginia. The District stretches roughly 1,385 square miles, bound on the north and west by the State of Kentucky, on the south by the State of Tennessee, and on the east by the Virginia counties of Dickenson, Russell, and Washington.

FIGURE: Virginia Planning District Commissions
Source: [Virginia Department of Housing and Community Development](#)



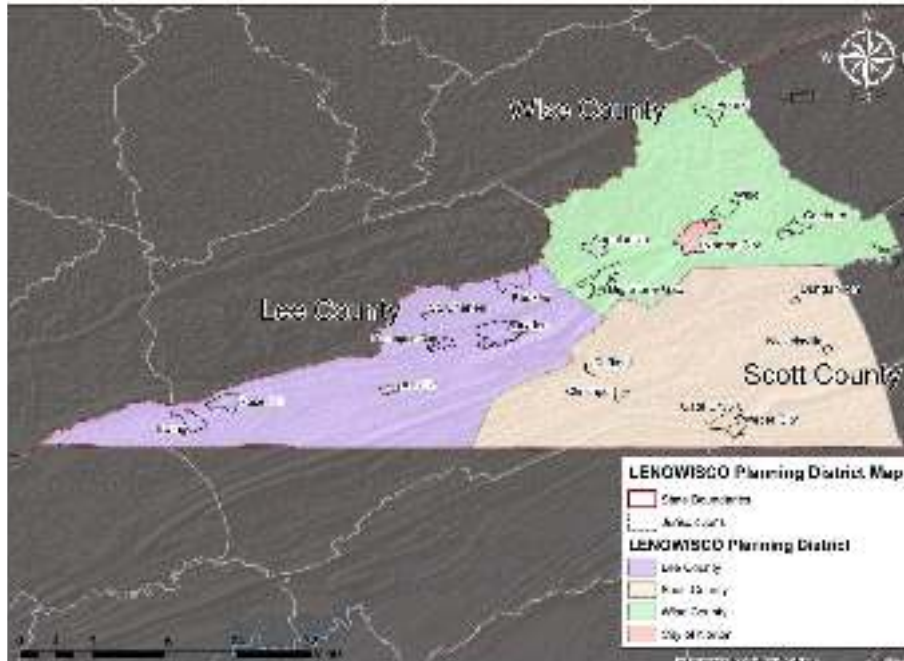
The LENOWISCO Planning District includes the four major jurisdictions of Lee County, Scott County, Wise County, the City of Norton, as well as 15 additional jurisdictions.

- **Lee County** is the westernmost county in the U.S. Commonwealth of Virginia and had an estimated population of 34,134 in 2018 according to American Community Survey (ACS) estimates. The county seat of Lee County is Jonesville. Additional incorporated communities include Pennington Gap and St. Charles.
- **Scott County** is directly east of Lee County and according to 2018 ACS estimates has a population of 22,009. The county seat is Gate City, and additional communities include Clinchport, Duffield, Dungannon, Nickelsville, and Weber City.
- **Wise County** is directly northeast of Lee County and according to 2018 ACS estimates has a population of 39,025. The county seat is Wise, and additional communities include Appalachia, Big Stone Gap, Coeburn, Pound, St. Paul, and the independent City of Norton.
- **Norton** is an independent city in the Commonwealth of Virginia. According to 2018 ACS estimates, the City's population is 3,990, making it the least populous city in Virginia,



along with the westernmost. Please note that the Bureau of Economic Analysis combines the City of Norton with surrounding Wise County for statistical purposes.

FIGURE: LENOWISCO Planning District Jurisdictions

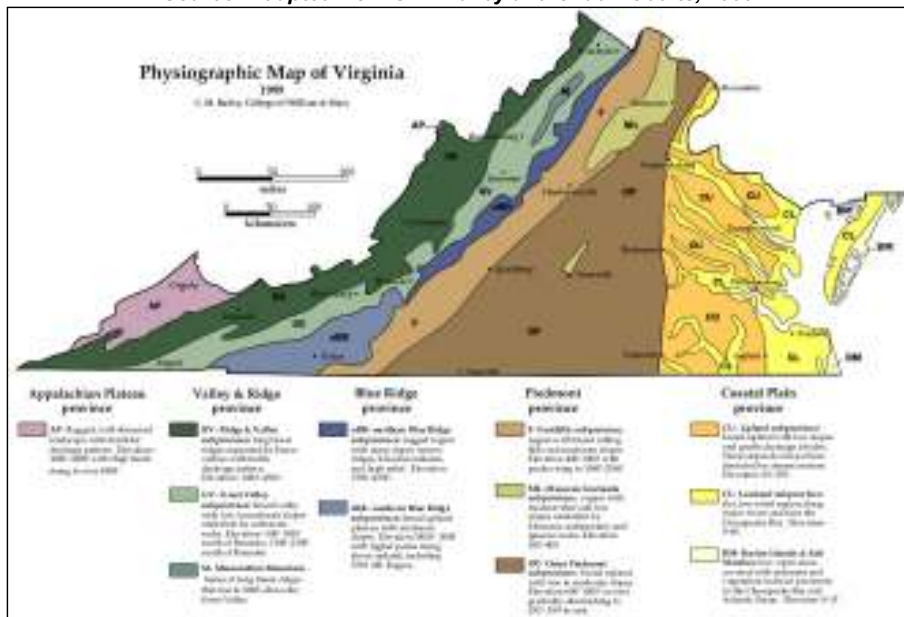


District Topography

Terrain and climate have determined the nature of the state's agriculture and industries. To help understand this setting that has been critical to life in Virginia for thousands of years, geographers have identified five physical regions in the state: the Coastal Plain (Tidewater), Piedmont, Blue Ridge Mountains, Valley and Ridge, and Appalachian Plateau. The LENOWISCO Planning District stretches both the Appalachian Plateau and Valley & Ridge regions. Lee and Scott Counties are primarily located in Valley & Ridge, while Wise County is primarily located within the Appalachian Plateau.



FIGURE: Physiographic Provinces of Virginia
Source: Adapted from C.M. Bailey and Chad Roberts, 1999



- **Appalachian Valley & Ridge Province:** Extending southwest to northeast along Virginia's western border is the Appalachian Ridge and Valley Region. Sometimes called the Great Valley, the region is a series of valleys divided by mountains. The region ranges from 1,000 ft. valleys to 4,000 ft. peaks. The region is characterized by its lush and gentle valleys and limestone caverns, caves, and hot springs.
- **Appalachian Plateau:** In the far southwestern portion of Virginia lies the Appalachia Plateau. This plateau extends into Kentucky as the Cumberland Plateau. Covered with rivers, streams, and forests, the Appalachian Plateau averages about 2,000 feet above sea level. Only three counties sit within the plateau, including Wise County. It is not a mountain range, but rather an eroded plain of sedimentary rock. The region is characterized by hilly and rugged terrain, stream erosion, and many valleys. The region is covered in forests and is home to many coal, natural gas, and petroleum resources.

District Geology

- **Appalachian Valley & Ridge Province:** Most of Scott County and Lee County fall within the Appalachian Valley & Ridge province, made up of limestone, shale, and sandstone. The presence of limestone bedrock leads to sinkholes across the region due to underground drainage and unstable rock formations. Additionally, the area has shallow soil underlain by these large rock formations, limiting many types of development at the surface.



- **Appalachian Plateau:** Much of Wise County, as well as the northern portion of Lee County (St. Charles area), fall within the Appalachian Plateau region. This area features sedimentary rocks in alternating beds of including sandstone, shale, coal, dolomite, and limestone. Much of the region features mineral deposits beneath the surface, often leading to divergent mineral and surface land ownership and rights. Underground mining operations can lead to unstable and subsiding surface conditions. This portion of the region has some of the most severe physical constraints to development.

There are no superfund sites in the LENOWISCO Planning District. There are areas in the District that were heavily utilized for coal mining; however, the Environmental Protection Agency has not declared any site in the planning distracted to be contaminated to a Superfund level ([EPA](#)).

1.5.2 Climate

The Commonwealth of Virginia is home to five, diverse climate regions: the Tidewater, Piedmont, Northern Virginia, Western Mountain, and Southwestern Mountain regions. The climate is the result of global weather patterns and the diverse landscape of the state, including the warm waters of the Atlantic Ocean Gulf Stream, the Blue Ridge Mountains, and the state's extensive and complex network of rivers and streams. The rivers drain in all four geographical directions. In the Southwestern Mountain region, where the LENOWISCO Planning District is located, the Clinch and Holston rivers drain into North Carolina and Tennessee. Air flows up these river valleys or down into the valleys from the mountains, impacting rainfall and air moisture. The concentration of different climate regions within a relatively small area leads to inconsistency in regional climate from year to year due to the lack of fixed boundaries between regions.

Frontal weather systems in Virginia tend to move from west to east. When cold air from the west or northwest enters Virginia, it often causes heavy snowfall as a frontal storm. Thunderstorms can occur at any time of year in Virginia but are more common in the summer with moist, warm air. Thunderstorms are most frequent in the southern part of the state, especially in the Southwestern Mountain region. Hurricanes and tropical storms form over warm ocean waters in lower latitudes. Once they reach the mid-latitudes, they tend to curve northerly and intensify. These storms mostly affect the Virginia Region between early August and September ([University of Virginia Climatology Office](#)).

Southwestern Mountain region experiences some of the most extreme weather in the Commonwealth, including frequent thunderstorm days, high snowfall, and high annual rainfall. While the far inland location of the District protects itself from the worst of tropical systems, the region still experiences a great deal of potentially hazardous weather. The following data are annual averages for the Southwestern Mountain Climate Region ([Virginia](#)):

- January Average Temperature: 24-44 (F)
- July Average Temperature: 60-85 (F)
- January Average Precipitation 4.04 inches
- July Average Precipitation 4.73 inches
- Annual Precipitation 47.33 inches
- Average Annual Snowfall: 16.7 to 23.2 inches



The climate between communities in the LENOWISCO Planning District can vary greatly depending on geographic location. For example, the Town of Wise in Wise County sees an average annual snowfall of 52 inches, while nearby Big Stone Gap sees only an average of eight inches of snow each year. The charts below illustrate the average annual rainfall and temperature for three locations in the District.

TABLE: Average Rainfall and Temperature in Wise, Virginia

Source: [US Climate Data](#)

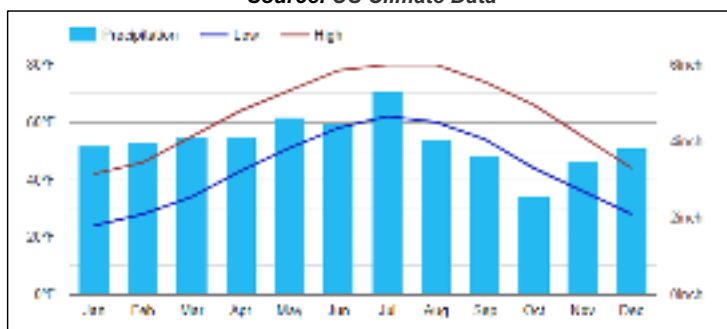


TABLE: Average Rainfall and Temperature in Big Stone Gap, Virginia

Source: [US Climate Data](#)

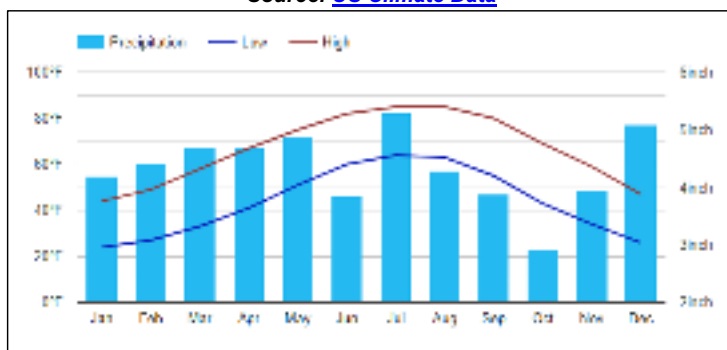
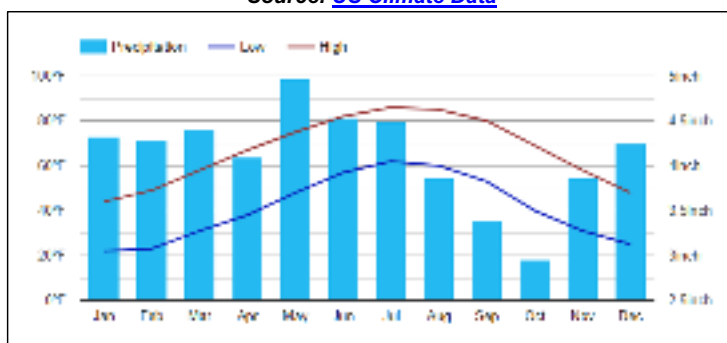




TABLE: Average Rainfall and Temperature in Pennington Gap, Virginia

Source: [US Climate Data](#)



1.5.3 Demographics

The following section provides a summary of the demographics of residents in the LENOWISCO Planning District, including population estimates, age, educational attainment, race and ethnicity, community patterns, poverty levels, and additional data relevant to community resilience.

Population

The following demographic data is based on the 2018 American Community Survey 5-Year Estimates for the four jurisdictions included in the LENOWISCO Planning District. The total population of the District was estimated to be 89,158 people as of 2018, with 3,990 people in the City of Norton, 24,134 people in Lee County, 22,009 people in Scott County, and 39,025 people in Wise County.

The Demographics Research Group at the University of Virginia Weldon Cooper Center is responsible for providing official statewide population projections for each biennial. According to these projections, included in the table below, the District's population will remain relatively constant through 2040, with some reduction in population projected.

TABLE: Population Projections			
Source: <i>Demographics Research Group, UVA Weldon Cooper Center</i>			
Jurisdiction	2020 Projection	2030 Projection	2040 Projection
City of Norton	3,906	3,857	3,762
Lee County	23,718	23,632	23,258
Scott County	21,949	20,961	19,740
Wise County	37,844	36,400	34,545



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Age

The following table shows the distribution of ages throughout the LENOWISCO Planning District compared to the U.S. and Virginia as a whole. Each county in the district has a slightly higher median age, with Scott County as the oldest jurisdiction with a median age of 46.9 years. The age distribution is similar to the makeup of both Virginia and the United States, with a similar proportion of both children and older adults.

TABLE: Community Profile – Age Source: 2018 American Community Survey 5-Year Estimates										
Age	United States	Virginia	City of Norton		Lee County		Scott County		Wise County	
			Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Median Age	37.9 years	38.5 years	37.3 years		44.4 years		46.9 years		40.7 years	
Under 5 Years	6.1%	6.1%	316	7.9%	1,123	4.7%	885	4.0%	2,013	5.2%
5 to 9 years	6.3%	6.2%	234	5.9%	1,272	5.3%	1,018	4.6%	2,331	6.0%
10 to 14 years	6.4%	6.2%	238	7.0%	1,340	5.6%	1,386	6.3%	2,042	5.2%
15 to 19 years	6.6%	6.5%	128	3.2%	1,254	5.2%	1,209	5.5%	2,344	6.0%
20 to 24 years	6.9%	6.9%	205	5.1%	1,171	4.9%	1,070	4.9%	2,702	6.9%
25 to 34 years	13.8%	13.9%	608	15.2%	3,112	12.9%	2,362	10.7%	5,348	13.7%
35 to 44 years	12.6%	13.0%	509	12.8%	3,045	12.6%	2,573	11.7%	4,882	12.5%
45 to 54 years	13.1%	13.8%	378	9.5%	3,384	14.0%	3,147	14.3%	5,200	13.3%
55 to 59 years	6.7%	6.7%	351	8.8%	2,047	8.5%	2,498	6.8%	2,670	6.8%
60 to 64 years	6.1%	6.0%	291	7.3%	1,672	6.7%	1,862	8.5%	2,910	7.5%
65 to 74 years	8.9%	8.7%	401	10.1%	2,844	11.8%	2,814	12.8%	3,959	10.1%
75 to 84 years	4.4%	4.2%	241	6.0%	1,576	6.5%	1,699	7.7%	1,776	4.6%
85 years and over	1.9%	1.7%	47	1.2%	339	1.4%	486	2.2%	848	2.2%



Educational Attainment

The following table shows the educational attainment for individuals 25 and over in the LENOWISCO Planning District when compared to the U.S. and Virginia. Overall, educational attainment in the district is lower than in Virginia and the U.S. All jurisdictions in the district have a lower percentage of high school graduates or higher, ranging from 74.8% in Wise County to 81.2% in Scott County. As of 2018, 10% of people over 25 in Lee County and Wise County had not completed at least 9th grade. Similarly, a smaller percentage of people in the district have completed a bachelor's degree or higher, with rates at less than half of the national and state totals.

TABLE: Community Profile - Educational Attainment Source: 2018 American Community Survey 5-Year Estimates										
Educational Attainment	United States	Virginia	City of Norton		Lee County		Scott County		Wise County	
			Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Less than 9th grade	4.8%	3.8%	139	4.9%	1,836	10.2%	1,302	7.9%	2,760	10.0%
9th to 12th grade, no diploma	6.6%	6.2%	405	14.3%	2,534	14.1%	1,796	10.9%	4,186	15.2%
High school graduate	26.9%	23.6%	690	24.4%	6,086	33.9%	6,115	37.2%	8,459	30.7%
Some college, no degree	20.0%	18.9%	848	30.0%	4,196	23.3%	3,560	21.7%	5,862	21.2%
Associate degree	8.6%	8.0%	266	9.4%	1,281	7.1%	1,305	7.9%	2,319	8.4%
Bachelor's degree	20.3%	22.4%	320	11.3%	1,477	8.2%	1,574	9.6%	2,451	8.9%
Graduate or professional degree	12.8%	17.2%	158	5.6%	564	3.1%	789	4.8%	1,556	5.6%
High school graduate or higher	88.6%	90.0%	2,282	80.8%	13,604	75.7%	13,343	81.2%	20,647	74.8%
Bachelor's degree or higher	33.1%	39.6%	478	16.9%	2,041	11.4%	2,363	14.4%	4,007	14.5%



Race/Ethnicity

The following table shows the distribution of the population that is White alone and Black or African American alone within the LENOWISCO Planning District when compared with Virginia and the U.S. Other race/ethnicity data is excluded as the groups are well under 1% when included by jurisdiction. As the largest racial minority group in the district, the Black/African American population is small, making up between 0-5.7% across the jurisdictions. The proportion of Black/African Americans in the district remains quite low compared to both Virginia as a whole (19.4%) and the United States (12.8%).

TABLE: Community Profile - Race/Ethnicity Source: 2018 American Community Survey 5-Year Estimates												
Race/Ethnicity	United States		Virginia		City of Norton		Lee County		Scott County		Wise County	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
White alone	236,475,401	72%	5,714,646	67.0%	3,597	90.2%	22,551	93.4%	21,566	98.0%	35,998	92%
Black or African American alone	41,989,671	12.8%	1,659,908	19.4%	185	4.6%	1,033	4.3%	162	<1%	2,227	5.7%

Commuting Patterns

The following tables show the commuting patterns of residents of the LENOWISCO Planning District by both means of transportation and place of work. Due to the District's location at the southwest corner of Virginia, bordering Tennessee and Kentucky, a disproportionate number of residents commute out of the state for work, when compared with Virginia and the United States as a whole. This is especially true for residents of Scott County, where more than 50% of working residents are estimated to commute out of state. Many workers also commute outside of their county, but within Virginia, for work. Additionally, LENOWISCO Planning District workers overwhelmingly rely on personal transportation, specifically personal cars, for commuting.

TABLE: Community Profile - Commuting Pattern Source: 2018 American Community Survey 5-Year Estimates						
Means of Transportation	United States	Virginia	City of Norton	Lee County	Scott County	Wise County
Drove alone	76.4%	77.2%	96.1%	84.2%	87.1%	83.7%
Carpooled	9.1%	9.2%	3.0%	10.5%	8.6%	11.2%
Other (public transit, walk, bike, work from home, etc.)	14.5%	13.6%	0.9%	5.2%	4.2%	5.1%



TABLE: Community Profile - Commuting Patterns
Source: 2018 American Community Survey 5-Year Estimates

Place of Work	United States	Virginia	City of Norton	Lee County	Scott County	Wise County
Worked in county of residence	72.3%	48.4%	21.4%	53.0%	38.7%	78.2%
Worked outside of county of residence	24.0%	42.8%	70.5%	26.4%	10.6%	16.8%
Worked outside of state of residence	3.7%	8.8%	8.1%	20.7%	50.7%	4.9%

Poverty

The following table shows the 2019 data produced by the [Small Area Income and Poverty Estimates Program](#), which produces single-year estimates of income and poverty by county. The data for 2019 demonstrates a slight decrease in individuals residing in poverty in the LENOWISCO Planning District (compared to the ACS 5-Year Estimates from 2018 presented in the next table); however, the 2020 COVID-19 pandemic prompted an increase in the poverty rate across the US. The [CDC](#) further studies the association between social vulnerability and a county's risk of becoming a hotspot. The data, to the extent available, will be further analyzed in the hazard profiles.

TABLE: Community Profile - Poverty
Source: 2019 Small Area Income and Poverty Estimates (SAIPE) Program

Poverty	United States		Virginia		City of Norton		Lee County		Scott County		Wise County	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Living in poverty	39,490,096	12.3%	822,944	9.9%	756	19.3%	5,939	27.1%	3,069	14.8%	7,039	20.4%



Additional Data

The following table outlines several other important indicators of community resilience. Across several indicators, residents of the District may be more vulnerable to natural hazard events. In addition to higher poverty levels than the U.S. and Virginia as a whole, the population of the District also tends to be older and more likely to have a disability. Additionally, many LENOWISCO Planning District residents live in vulnerable housing - with four times as many households living in mobile homes as the national average. It is important to note that the American Community Survey (ACS) estimates have a significant margin of error for smaller jurisdictions due to survey sample size limitations. This is especially true for very narrow community groups. ACS data was confirmed with local stakeholders to reach the best possible population estimates.

TABLE: Community Resilience Profile Source: 2018 American Community Survey 5-Year Estimates												
Community Resilience Indicator	United States		Virginia		City of Norton		Lee County		Scott County		Wise County	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
People with disabilities	40,071,666	12.6%	954,220	11.6%	929	23.6%	5,859	25.9%	5,286	24.8%	9,886	26.9%
People who are unemployed	9,508,312	3.7%	217,670	3.2%	247	7.9%	861	4.3%	491	2.7%	1,327	4.1%
People living below the poverty level	44,257,979	14.1%	893,580	10.9%	1,155	29.4%	5,414	24.0%	3,923	18.6%	7,890	22.0%
Households that receive SNAP Benefits	14,635,287	12.2%	371,719	8.7%	629	34.6%	2,248	24.6%	1,467	16.7%	3,394	22.4%
People without health insurance	29,752,767	9.4%	755,739	9.2%	397	35.6%	2,981	13.2%	2,320	10.9%	4,082	11.1%
People 65 years and older	50,783,796	15.6%	1,271,946	15%	689	14.2%	4,759	19.7%	4,999	22.7%	6,583	16.9%
People under 18 years old	73,429,392	22.6%	1,865,699	22.1%	923	25.6%	4,580	19%	4,062	18.5%	7,755	19.9%
Number of mobile homes in the community	8,512,218	6.2%	180,297	5.2%	309	15.1%	2,583	21.9%	2,991	25.9%	4,976	27.7%
Number of homes built in 1939 or earlier	17,407,947	12.8%	261,767	7.5%	233	11.4%	1,339	11.4%	1,606	13.5%	2,096	11.7%
Number of housing units without access to a vehicle	10,424,934	8.7%	194,930	6.2%	224	12.3%	989	10.8%	680	7.8%	1,521	10.1%



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1.5.4 Economy

The following section provides data relevant to the economic conditions of the LENOWISCO Planning District, including unemployment rates, local industry, and income and wage trends.

Unemployment Rates

The LENOWISCO Planning District, as with much of the United States, had a low unemployment rate for several years prior to the onset of the 2020 COVID-19 pandemic. As shown in the table below, unemployment rates steadily decreased in the District after 2013, reaching a low of 3.6% in November 2019. In 2020, unemployment rates across the country rose, with a peak in April. As of September 2020, the LENOWISCO economy seems to be returning to a more stable unemployment rate, but as the pandemic is ongoing, it is unclear if this trend will continue into 2021.

FIGURE: Unemployment Rates for LENOWISCO Planning District
Source: Virginia Employment Commission, 2nd Quarter, 2020

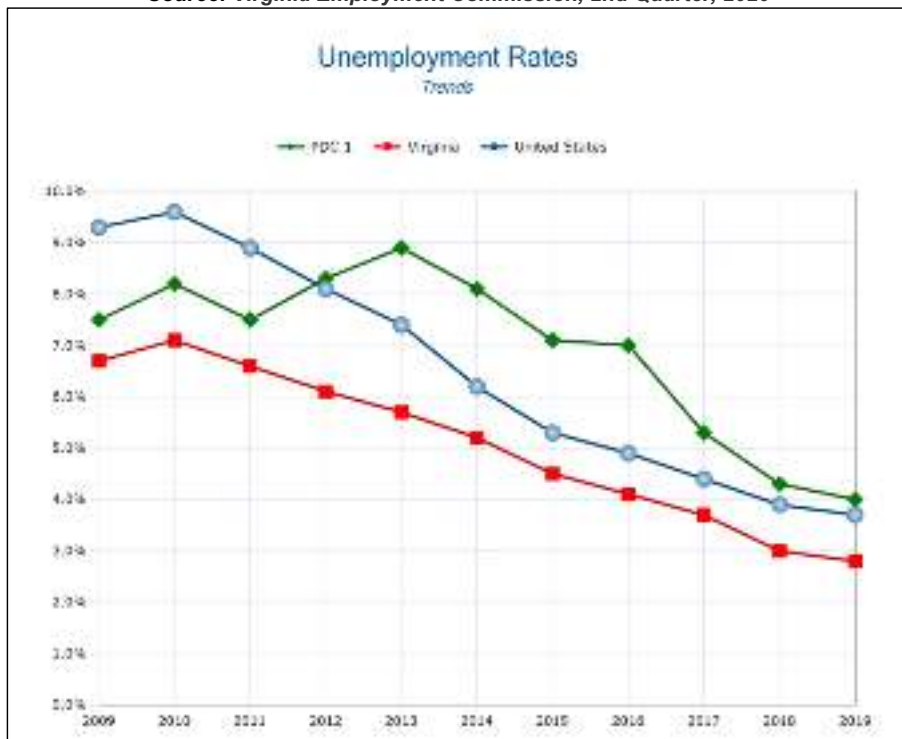




TABLE: Unemployment Rates (2009-2019)			
Source: Virginia Employment Commission, 2nd Quarter, 2020			
Year	LENOWISCO	Virginia	United States
2009	7.5%	6.7%	9.3%
2010	8.2%	7.1%	9.6%
2011	7.5%	6.6%	8.9%
2012	8.3%	6.1%	8.1%
2013	8.9%	5.7%	7.4%
2014	8.1%	5.2%	6.2%
2015	7.1%	4.5%	5.3%
2016	7.0%	4.1%	4.9%
2017	5.3%	3.7%	4.4%
2018	4.3%	3.0%	3.9%
2019	4.0%	2.8%	3.7%

TABLE: Unemployment Rates (Past 12 Months)			
Source: Source: Virginia Employment Commission, 2nd Quarter, 2020			
Month	LENOWISCO	Virginia	United States
October 2019	3.7%	2.5%	3.3%
November 2019	3.6%	2.5%	3.3%
December 2019	3.7%	2.4%	3.4%
January 2020	4.7%	3.0%	4.0%
February 2020	4.4%	2.8%	3.8%
April 2020	11.3%	10.8%	14.4%
May 2020	8.3%	8.9%	13.0%
June 2020	7.9%	8.2%	11.2%
July 2020	8.0%	8.0%	10.5%
August 2020	6.0%	6.3%	8.5%
September 2020	5.9%	6.1%	7.7%



Local Employers and Industry

Government agencies, at the local, state, and federal levels, serve as the largest industry by employment for the LENOWISCO Planning District. The top three industries by employment include healthcare and social assistance, local government, and retail trade. The largest employers and top industries by employment are listed in the tables below.

TABLE: Largest Employers in the LENOWISCO Planning District	
Source: <i>Virginia Employment Commission, 2nd Quarter, 2020</i>	
1	Wise County School Board
2	Food City
3	Sykes Enterprises
4	Lee County School Board
5	Scott County School Board
6	Walmart
7	Red Onion Correctional Center
8	Wallens Ridge Correction Center
9	University of Virginia, Blue Ridge Hospital
10	Norton Community Hospital
11	U.S. Department of Justice
12	Heritage Hall
13	Ballad Health
14	Mountain Empire Community College
15	Mountain Empire Older Citizens
16	Tempur Production
17	County of Wise
18	Frontier Health
19	Itec Healthcare Solutions
20	Telemed



Income and Wages

There is a wide range of weekly wages from the top industry types in the LENOWISCO Planning District. Retail trade and accommodation and food services are both lower-wage sectors, as shown in the table below, and rank in the top five industries in the District. Government and healthcare industries tend to have higher wages.

TABLE: Weekly Wages and Employment by Industry <i>Source: Virginia Employment Commission, 2nd Quarter, 2020</i>			
Rank	Industry	Number Employed	Average Weekly Wage
	Government Total	6,701	\$962
1	Healthcare and Social Assistance	3,775	\$737
2	Local Government	3,731	\$702
3	Retail Trade	3,598	\$477
4	State Government	2,210	\$832
5	Accommodation and Food Services	1,570	\$279
6	Administrative and Support and Waste Management	1,481	\$453
7	Manufacturing	1,299	\$834
8	Federal Government	760	\$1,352
9	Construction	551	\$676
10	Professional, Scientific, and Technical Services	542	\$826

According to 2018 American Community Survey estimates, the median household income in the LENOWISCO Planning District is significantly lower than the national and state averages. Jurisdictions in the District have median annual incomes ranging between approximately \$28,000 and \$39,000, as shown in the table below. As discussed in the previous section on poverty rates, residents with lower incomes may be less resilient to natural hazard events and more vulnerable to significant impacts.

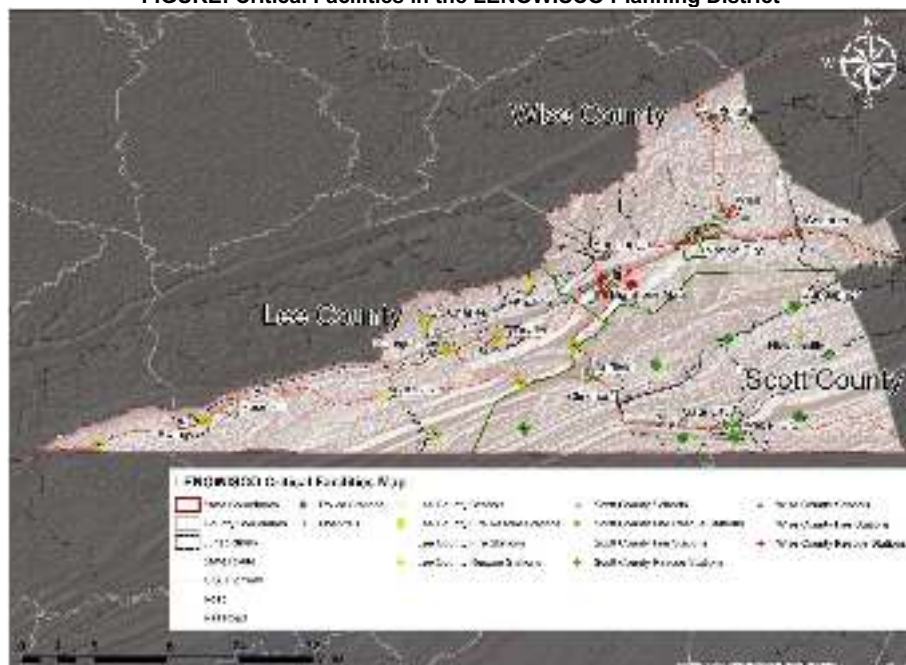
TABLE: Median Household Income <i>Source: 2018 American Community Survey 5-Year Estimates</i>						
	United States	Virginia	City of Norton	Lee County	Scott County	Wise County
Median Household Income	\$60,293	\$71,564	\$28,071	\$32,718	\$39,144	\$38,345



1.5.5 Critical Facilities

The following section outlines the critical facilities located in the LENOWISCO Planning District and each participating county. Critical facilities include major roadways, fire and rescue stations, and schools. These facilities are categorized by the Planning District as critical facilities for the purposes of this analysis, and do not include other important structures such as community centers or critical infrastructure systems. These facilities will be critical in the immediate response to a disaster or emergency event. For mitigation activities, it is important to consider the continued operations of these facilities which serve as the hub of emergency operations, rescue, and shelter activities. The map below shows all the critical facilities in the District.

FIGURE: Critical Facilities in the LENOWISCO Planning District





Lee County

The map below shows the critical facilities in Lee County and its local jurisdictions. The following table provides a list of these facilities by type and location.

FIGURE: Critical Facilities in Lee County

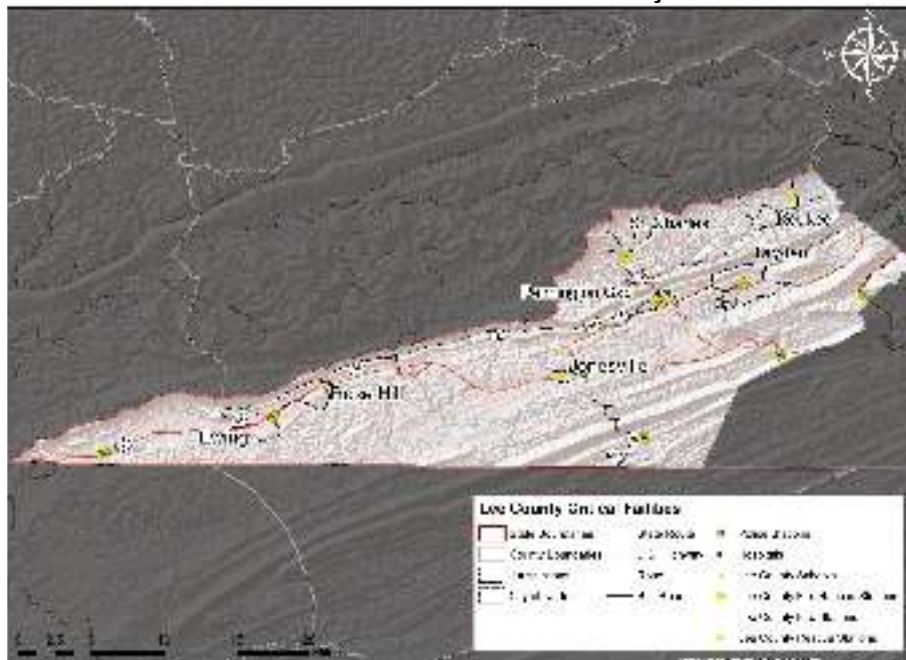




TABLE: Critical Facilities in Lee County

Type	Name	Address
School	St. Charles Elementary School	2434 Saint Charles Rd, St. Charles, VA 24282
School	Rose Hill Elementary School	150 Rose Hill Dr, Rose Hill, VA 24281
School	Jonesville Middle School	160 Bulldog Cir, Jonesville, VA 24263
School	Pennington Middle School	121 Bobcat Circle, Pennington Gap, VA 24277
School	Elk Knob Elementary School	148 Hornet Loop Pennington Gap, VA 24277
School	Dryden Elementary School	176 School House Ridge Rd, Dryden, VA 24243
School	Elydale Middle School	128 Elydale Rd, Ewing, VA 24248
School	Thomas Walker High School	126 Bluegrass Dr, Ewing, VA 24248
School	Lee High School	200 General Ln, Jonesville, VA 24263
School	Flatwoods Elementary School	205 Flatwoods School Rd, Jonesville, VA 24263
School	Lee County Career - Technical Center	181 Vo-Tech Dr., Ben Hur, VA 24218
Fire Rescue	Keokee Volunteer Fire Department and Rescue Squad	153 Fire Hall Rd, Keokee, VA
Fire Station	Blackwater Volunteer Fire Department	1001 A J Osborne HWY, Blackwater, VA
Fire Station	Thomas Walker Volunteer Fire Department Station #2	598 Neighborhood Ln, Ewing, VA 24248
Fire Station	Jonesville Volunteer Fire Department	33831 Wilderness Rd., Jonesville, VA
Fire Station	Pennington Gap Volunteer Fire Department	343 Doris Ave. Pennington Gap, VA
Fire Station	Dryden Volunteer Fire Department	961 Dryden Loop, Dryden, VA
Fire Station	St. Charles Volunteer Fire Department	2441 St. Charles Rd., St. Charles, VA
Fire Station	Thomas Walker Volunteer Fire Department	170 Pioneer Rd, Ewing, VA 24248
Rescue Squad	Thomas Walker Rescue Squad	St. Rt. 879 Ewing, VA 24248
Rescue Squad	Pennington Gap Rescue Squad	316 KY Ave, Pennington Gap, VA 24277
Rescue Squad	Jonesville Rescue Squad	32254 Wilderness Rd. Jonesville, VA
Rescue Squad	St. Charles Rescue Squad	VA Route 352 St. Charles, VA 24282
Police Department	Pennington Gap Police Department	528 Industrial Dr. Pennington Gap, VA 24277
Police Department	Jonesville Police Department	842 Park St. Jonesville, VA 24263
Sheriff's Department	Lee County Sheriff's Department	33640 Main St. U 101 Jonesville, VA 24263

The map below shows the critical facilities in Scott County and its local jurisdictions. The following table provides a list of these facilities by type and location.

FIGURE: Critical Facilities in Scott County





TABLE: Critical Facilities in Scott County

Type	Name	Address
School	Scott County Career-Technical Center	387 Broadwater Ave, Gate City, VA 24251
School	Weber City Elementary School	322 Jennings St, Weber City, VA 24290
School	Fort Blackmore Elementary School	214 Big Stoney Creek Rd, Fort Blackmore, VA 24250
School	Dungannon Intermediate School	113 Fifth Ave, Dungannon, VA 24245
School	Duffield-Pattonsville Primary School	663 Duffield-Pattonsville High, Duffield, VA 24244
School	Rye Cove Intermediate School	158 Memorial School Ln, Duffield, VA 24244
School	Rye Cove High School	164 Eagles Nest Ln, Duffield, VA 24244
School	Yuma Elementary School	130 Grover Cleveland Ln, Gate City, VA 24251
School	Shoemaker Elementary School	218 Shoemaker Dr, Gate City, VA 24251
School	Gate City Middle School	170 Harry Fry Dr, Gate City, VA 24251
School	Gate City High School	178 Harry Fry Dr, Gate City, VA 24251
School	Hilton Elementary School	303 Academy Rd, Hiltons, VA 24258
School	Nickelsville Elementary School	11415 Nickelsville Hwy, Nickelsville, VA 24271
School	Twin Springs High School	273 Titan Ln, Nickelsville, VA 24271
Fire Rescue	Duffield Volunteer Fire Department & Rescue Station #1	1326 Industrial Park Rd. Duffield, VA 24244
Fire Rescue	Nickelsville Volunteer Fire Department & Rescue Squad	11826 Nickelsville Hwy
Fire Station	Weber City Volunteer Fire Department Station #1	149 Roland St. Weber City, VA 24290
Fire Station	Duffield Volunteer Fire Department Substation #3	110 Eagles Nest Rd Duffield, VA 24244
Fire Station	Ft. Blackmore Volunteer Fire Department	11181 Veterans Memorial Hwy Blackmore, VA 2
Fire Station	Weber City Volunteer Fire Department Substation. #2	5032 Yuma Rd. Weber City, VA 24290
Fire Station	Duffield Volunteer Fire Department Substation #2	9473 Fairview Rd. Duffield, VA 24244
Fire Station	Hilton Volunteer Fire Department	St. RT. 709 Hilton, VA 24258
Fire Station	Gate City Volunteer Fire Department	140 Bishop St. Gate City, VA 24251
Fire Station	Dungannon Volunteer Fire Department	18759 Veterans Memorial Hwy
Rescue Squad	Gate City Rescue Squad	100 Park St. Gate City, VA 24251
Rescue Squad	Dungannon Rescue Squad	522 4th Ave. Dungannon, VA 24245
Police Department	Gate City Police Department	176 E. Jackson St. Gate City, VA



TABLE: Critical Facilities in Scott County		
Police Department	Weber City Police Department	2758 US 23 N. Weber City, VA
Sheriff's Department	Scott Co. Sheriff's Department	267 Willow St. Gate City, VA
Jail	Southwest VA Regional Jail	1037 Boone Trail Rd. Duffield, VA

Wise County

The map below shows the critical facilities in Wise County and its local jurisdictions. The following table provides a list of these facilities by type and location.

FIGURE: Critical Facilities in Wise County

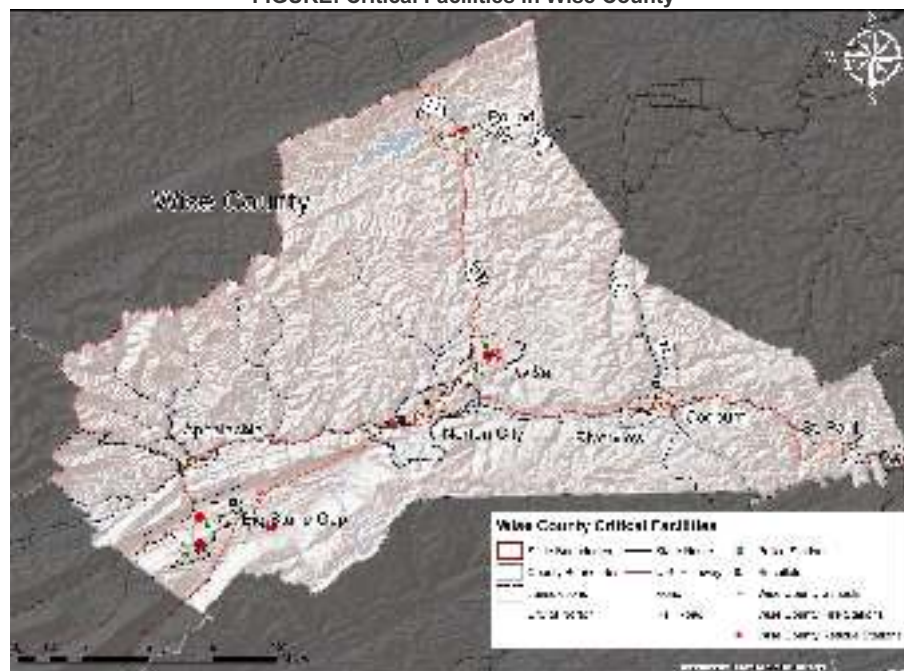




TABLE: Critical Facilities in Wise County

Type	Name	Address
School	Union High School	2 Champions Ave, Big Stone Gap, VA 24219
School	Coeburn Primary School	332 Schoolhouse Hill Dr. NE, Coeburn, VA 24230
School	St. Paul Elementary School	3200 Deacon Dr, Saint Paul, VA 24283
School	Wise Co. Career-Technical Center	621 Lake St NE, Wise, VA 24293
School	L.F. Addington Middle School	324 School St, Wise, VA 24293
School	Wise Primary School	323 Railroad Ave SE, Wise, VA 24293
School	James Woodrow Adams Combined	10824 Orby Cantrell Hwy, Pound, VA 24279
School	Union Primary School	2945 2nd Ave E, Big Stone Gap, VA 24219
School	Union Middle School	30 Champions Ave, Big Stone Gap, VA 24219
School	Coeburn Middle School	518 Centre Ave NE, Coeburn, VA 24230
School	J.I. Burton High School	109 11Th St, Norton, VA 24273
School	Norton Elementary School	205 Park Avenue Northeast, Norton, VA, 24273
School	Central High School	5000 Warrior Dr, Norton, VA 24273
Fire Station	Pound Volunteer Fire District	8422 N River Rd. Pound, VA 24279
Fire Station	Big Stone Gap Volunteer Fire District	363 Shawnee Ave. E. Big Stone Gap, VA 24219
Fire Station	Wise Volunteer Fire District	307 Norton Rd. Wise, VA 24293
Fire Station	Norton Fire District	618 Virginia Avenue NW, Norton, VA 24273
Fire Station	St. Paul Volunteer Fire District	16636 Russell St., St. Paul, VA 24283
Fire Station	Powell Valley Volunteer Fire District	1946 Tate Springs. Rd. Big Stone Gap, VA 24219
Fire Station	Coeburn Volunteer Fire District	114 Front St. E. Coeburn, VA 24230
Fire Station	Big Stone Gap Volunteer Fire District Station 2	1364 Dogwood Dr. Big Stone Gap, VA 24219
Rescue Squad	Big Stone Gap Rescue Squad	361 Shawnee Ave. E. Big Stone Gap, VA 24219
Rescue Squad	CTRAN – Ambulance Service	119 W. Main St. Wise, VA 24293
Rescue Squad	CTRAN – Big Stone Gap Ambulance Service	6 E. 19th St. N. Big Stone Gap, VA 24219
Rescue Squad	Lifecare Ambulance Service	1728 Norton Rd. SW, Wise, VA 24293
Rescue Squad	Lifecare Coeburn Ambulance Service	118 Grand Ave. NE, Coeburn, VA 24230
Rescue Squad	Norton Rescue Squad	1710 Main Ave. SW Norton, VA 24273
Rescue Squad	Pound Rescue Squad	8316 Main St. Pound, VA 24279



TABLE: Critical Facilities in Wise County

Rescue Squad	Wise Rescue Squad	302 Railroad Ave. Wise, VA 24293
Police Department	Appalachia Police Department	508 Main St. Appalachia, VA 24216
Police Department	St. Paul Police Department	16531 Russell St., St. Paul, VA 24283
Police Department	Wise Police Department	501 W. Main St. Wise, VA 24293
Police Department	Norton City Police Department	618 Virginia Ave. NW Norton, VA 24273
Police Department	Coeburn Police Department	114 Front St. E. Coeburn, VA 24230
Police Department	Big Stone Gap Police Department	505 E. 5th St. Big Stone Gap, VA 24219
Police Department	Pound Police Department	8422 N. River Rd Pound, VA 24279
Police Department	VA State Police Headquarters	1207 Norton, Rd. Wise, VA 24293
Sheriff's Department	Wise Co. Sheriff's Department	5605 Patriot Dr. Wise, VA 24293
Prison	Wallens Ridge State Prison	1052 Dogwood Dr. Big Stone Gap, VA 24219
Prison	Red Onion State Prison	1080 Jack Rose Hwy Pound, VA 24279
Healthcare	Lonesome Pine Hospital	1990 Holton Ave. Big Stone Gap, VA 24219
Healthcare	Norton Community Hospital	100 15th St. NW Norton, VA 24273
Healthcare	Mountain View Regional Hospital	310 3rd St. NE Norton, VA 24273
Healthcare	Fresenius Kidney Care Dialysis Center	340 Anderson Hollow Road, Suite 100, Norton, VA 24273
Healthcare	Southwest Virginia Regional Cancer Treatment Center	671 US-58 Alt., Norton, VA 24273



1.5.6 Capability Assessment

This section provides a capability assessment for the LENOWISCO Planning District. This is a summary of capability across the District. An assessment is available by jurisdiction in the plan annexes for Lee County (2.5), Scott County (3.5), and Wise County (4.5), City of Norton (5.5), as well as for each participating locality. This assessment includes the following capabilities:

- Legal and Regulatory Capability
- Fiscal Capability
- Administrative and Technical Capability (of the LENOWISCO Planning District staff only)

The LENOWISCO Planning District provides its member jurisdictions with:

- A forum for state and local governments on various issues including local infrastructure planning and development. Emphasis has been placed on Community Development, Economic Development, Transportation, and Public Utility Infrastructure.
- Grant writing and grant management services utilizing several community development programs. Emphasis is also being placed on both traditional economic development and new sector economic development.
- Geographic Information Services (GIS) to assist the member localities and the local community.

TABLE: Legal and Regulatory Capability

	Local Authority	County Run	Other Jurisdictional Authority	Comments
Codes, Ordinances & Requirements				
Building Code	Yes	Yes	-	Both jurisdictions and counties in the District enforce building ordinances.
Zonings	Yes	Yes	-	Both jurisdictions and counties in the District enforce zoning ordinances.
Subdivisions	Yes	Yes	-	Most jurisdictions in the District have a subdivision ordinance.
Stormwater Management	Yes	Yes	-	Most jurisdictions in the District have stormwater management included in their zoning ordinance.
Post Disaster Recovery	-	Some	-	Wise County is the only jurisdiction to recently complete a post-disaster recovery process.



TABLE: Legal and Regulatory Capability

Growth Management	Some	Yes	Yes	LENOWISCO Planning District develops regional planning documents that influence growth management and economic development. LENOWISCO is a designated Economic Development District. Some counties and jurisdictions support Economic Development Committees.
Public Health and Safety	-	Yes	Yes	The LENOWISCO Health District is the regional health authority. It is supported by the local Lee County, Scott County, and Wise County Health Departments.
Planning Documents				
General or Comprehensive Plan	Some	Yes	-	LENOWISCO Planning District can assist jurisdictions in creating comprehensive plans. Each county has an updated comprehensive plan, as well as some jurisdictions. Plans are developed by advisory Planning Commissions in each community and adopted by the Board of Supervisors or Town Council.
Environmental Protection	-	-	-	
Transportation Plan	-	No	Yes	LENOWISCO PDC has a transportation planner on staff. In 2011, the District developed the LENOWISCO Long-Range Transportation Plan for rural transportation routes. Jurisdictions rely on VDOT for most major transportation planning efforts.
Response/Recovery Planning				



TABLE: Legal and Regulatory Capability

Comprehensive Emergency Management Plan	-	Yes	No	Counties reported having either a Comprehensive Emergency Management Plan or Emergency Operations Plan (EOP) that is used by the local jurisdictions. Each county EOP has been updated within the last four years, and is monitored by a local Emergency Management Coordinator. In This role is typically part-time and combined with another public safety position. Wise County is the only jurisdiction with full-time EM staffing.
Community Wildfire Protection Plan	-	-	Some	Some parts of the District are included in National Forest wildfire plans, but not incorporated areas.
Post-Disaster Recovery Plan	-	Some	-	Wise County is the only jurisdiction to recently complete a post-disaster recovery process.
Continuity of Operations Plan	Some	Some	-	Some communities noted they had a Continuity of Operations Plan, or at least a limited version specific to a single hazard.

TABLE: Administrative and Technical Capability

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	No	
Engineers or professionals trained in building or infrastructure construction practices	No	
Planners or engineers with an understanding of natural hazards	No	
Surveyors	No	
Personnel skilled or trained in GIS applications	Yes	Director of Geographic Information Services (GIS); available for contract to jurisdictions
Emergency manager	No	
Grant writers	Yes	Various Planning Department staff



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1.5.7 Land Use and Development

Each jurisdiction within the LENOWISCO Planning District is responsible for land use planning and zoning. Additionally, LENOWISCO Planning District contracts with municipalities to provide capacity for plan and ordinance updates, as well as regional planning efforts. Relevant policies and regulatory documents for land use and development include:

- [City of Norton Comprehensive Plan, 2003](#)
- [City of Norton City Code, Zoning Ordinance Chapter](#)
- [Lee County Comprehensive Plan, 2020](#)
- [Lee County Zoning Ordinance](#)
- [Scott County Comprehensive Plan, 2017](#)
- [Scott County Zoning Ordinance](#)
- [Wise County Comprehensive Plan, 2020](#)
- [Wise County Zoning Ordinance](#)

The jurisdictions within the LENOWISCO Planning District have collectively experienced a declining population over several decades, which is projected to continue through 2040. With a shrinking and aging population base, the communities are preparing for future land use and development patterns to meet changing needs. A historic reliance on the coal mining industry has also contributed to a declining tax revenue base, restricting the resources available for adequate public services and facilities. These conditions point to the need for increased public services, economic development, and affordable and attainable housing solutions, which are all rooted in development and land-use patterns.

Each of the jurisdictions emphasizes the importance of efficient infrastructure provision and the maintenance and resilience of sewer and water infrastructure. Developable land in the District is concentrated along transportation corridors and in areas with existing access to critical infrastructure. Several of the communities' future land use maps explicitly note that primary development areas are those served by existing infrastructure to streamline service provision. Future development in the region is limited due to the significant amount of land on steep slopes (those over 20% grade), poor soil conditions, existing forest lands (both public and private), mining and mineral operations and land ownership, and an excess of flood-prone land. The jurisdictions each treat development in the flood plain differently, with some explicitly prohibiting development in the 100-year floodplain, with others only limiting development types.

Changes in Development

Participating jurisdictions reported minimal development during the HMP planning period (2015-2020). The land use and development trends described above restrict the amount of new development, and the declining population limits the need for new residential development. Some jurisdictions advanced acquisition and demolition projects in flood-prone areas in recent years, as well as the redevelopment and reuse of facilities for public, critical services. As outlined in local economic development and housing needs studies, jurisdictions in the LENOWISCO Planning District are focused on the improvement of existing structures and the more efficient provision of public services, rather than significant new development.

Other key land use and development trends are detailed by jurisdiction in the following sections.



Lee County Land Use and Development

The population of Lee County has remained somewhat stable over the past several decades, with population increases at the 1980 and 2010 Census standing out from an otherwise steady period of decline. Population projections indicate a minimal but continued decline through 2040. Lee County updated its Comprehensive Plan in October 2020, serving as a policy guide to development and land use decision-making within the county given trends in the local population, economy, and public service provision.

As discussed in the topography, geography, and geology section of this plan (1.5.1), Lee County and its neighbors face many development constraints, including steep slopes, poor soil conditions, flood-prone areas, mineral land under development, land subject to subsidence from underground mining, and the presence of National Forest and other public lands. Of 278,910 acres in Lee County, about 82% have slopes over 20% and another 6.4% between 10-20%. When combined with flood-prone land, poor access, or limited public facilities, Lee County faces a "critical lack of land suitable for future urban-type development" ([Lee County Comprehensive Plan, p. 8](#)).

Due to these restrictive factors, much of the historical development in Lee County is concentrated along main transportation corridors (Highways 23 and 58) and within the floodplain, as the roadways tend to follow the paths of rivers and creeks. Land along plateaus or ridge tops may be more suitable for development but does not have adequate transportation or utility access. These patterns, combined with economic decline, have led to the "physical deterioration of many of the County's urban and built-up areas, the continuation of only marginally functional land uses, and the unavailability of certain public services" ([Lee County Comprehensive Plan, p. 33](#)). The deteriorating conditions are exasperated by increasing climatic variability.

The 2020 Comprehensive Plan outlines several considerations for future land use and development, including recommending policies to improve the quality of timber in the county's forest lands, continuing mine reclamation activities, maintaining fertile lands for agricultural uses, restricting development in flood-prone areas, leveraging existing public sewage and water service facilities, and discouraging incompatible uses, among others. The plan includes two objectives regarding land use policies:

1. Maximize the current land use patterns that have been established while looking at possible land use changes that could better the development of the County
 - o Encourage development along transportation corridors
2. Minimize disturbance to existing land use when new land use takes place
 - o Practice responsible regrowth and planting
 - o Follow a sediment control plan
 - o Follow floodplain management practices



Scott County Land Use and Development

Like its neighboring counties, the population of Scott County has decreased since 1950, and is projected to continue its decline over the next twenty years. There have been some small population booms associated with the coal industry. The population that remains is steadily aging, driving the need for public services and facilities, as well as different housing types. Roughly 18% of residents live in the 8.5% of the county lands that make up six incorporated towns.

Scott County stretches 538 square miles (344,320 acres) and is blanketed with a network of rivers and streams. These water resources have determined historical development patterns and economic drivers, including agriculture. Most of the residential water supply relies on groundwater, including underground springs and wells, as well as some creeks. Forest land currently makes up about 62% of Scott County, but that amount ranged between 54% and 74% in just the second half of the 20th century. Poor management practices have degraded the quality of forest lands in many parts of the county, yielding increased vulnerability to climatic variations.

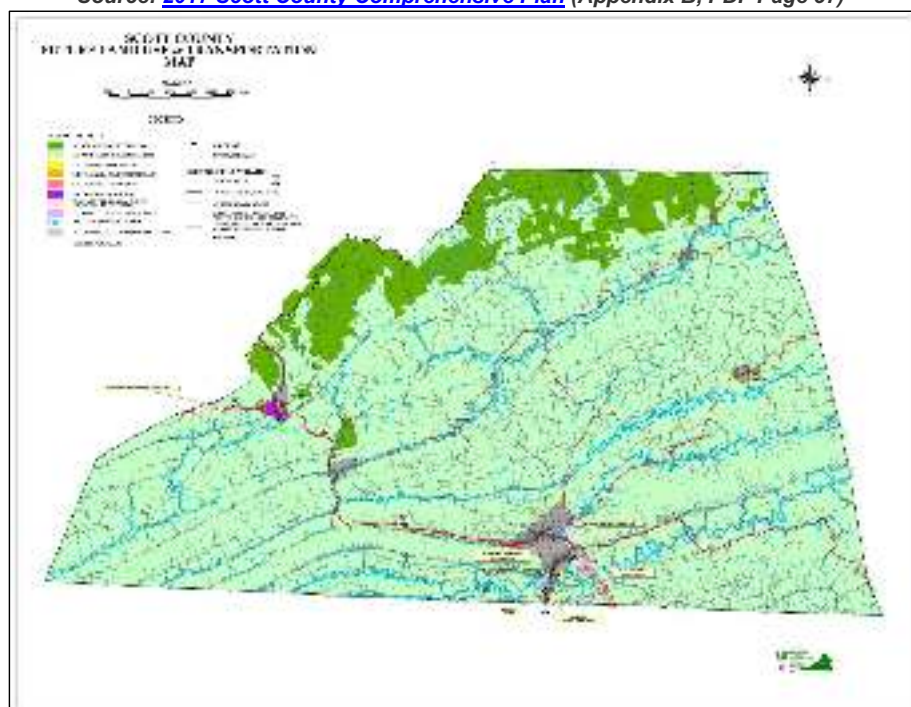
According to the [2017 Scott County Comprehensive Plan](#), most developable land in the county has been developed with no major changes expected. Future development will be concentrated on transportation corridors and through the expansion of existing developable areas. Past and future development in the county has been restricted due to flood-prone areas, steep slopes (88% of acres have a slope of 20% or greater), poor soil conditions, lack of utilities in certain areas, and incompatible land use mixes. The Scott County floodplain development regulations do not currently prohibit development in the floodplain but attempt to strongly discourage certain types.

The 2017 Comprehensive Plan provides policy guidance for future land use and transportation through the map below. The map designates areas for future development using the following criteria:

- Areas subject to flooding should not be developed
- Development should be directed toward areas that have access to public sewer or are suitable for septic system drain fields
- Areas with public water supply service should be developed prior to areas without such service
- Areas with adequate road access should be developed prior to areas without such access



FIGURE: Scott County Future Land Use and Transportation Map
Source: [2017 Scott County Comprehensive Plan](#) (Appendix B, PDF Page 57)





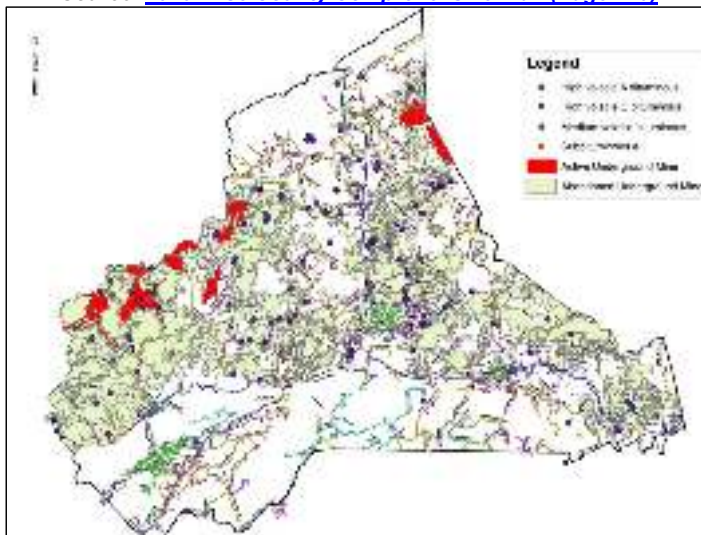
Wise County Land Use and Development

As discussed in the demographics section (1.5.3), projections show Wise County will lose population over the next twenty years. The population will also get older, shifting the demand for public services and facilities, such as different housing types, medical services, and transportation options. Wise County also faces declining wages and a growing unemployment rate, economic factors often associated with the rapidly declining coal industry. These conditions point to the need for increased public services, economic development, and affordable and attainable housing solutions, which are all rooted in development and land use patterns ([2020 Wise County Comprehensive Plan](#)).

Wise County makes up 249,312 acres, of which 67% (or 167,444 acres) is forestland. The vast majority (86.5%) of forest lands in the county are privately owned, while about 11% are part of the National Forest System and 2.6% are state forest. Wise County also has an extensive reservoir system, providing municipal drinking water to its residents through six reservoirs. This watershed is vulnerable to land use and development patterns, as well as the ongoing health of the forest land across the county. Land use and development are also constrained by steep slopes - over 92% of the county's land area has slopes greater than 20%, poor soil conditions, and flood-prone areas.

Development is also restricted by the vast network of active and abandoned underground mines across Wise County, as illustrated in the map below. Over 50% of the county's surface property is not available for development because of the sub-surface mining and mineral rights owned by private coal and resource companies, as well as the U.S. Forest Service. This patchwork of land ownership limits development and creates a risk of land subsidence.

FIGURE: Active and Underground Mines in Wise County
Source: [2020 Wise County Comprehensive Plan \(Page 140\)](#)

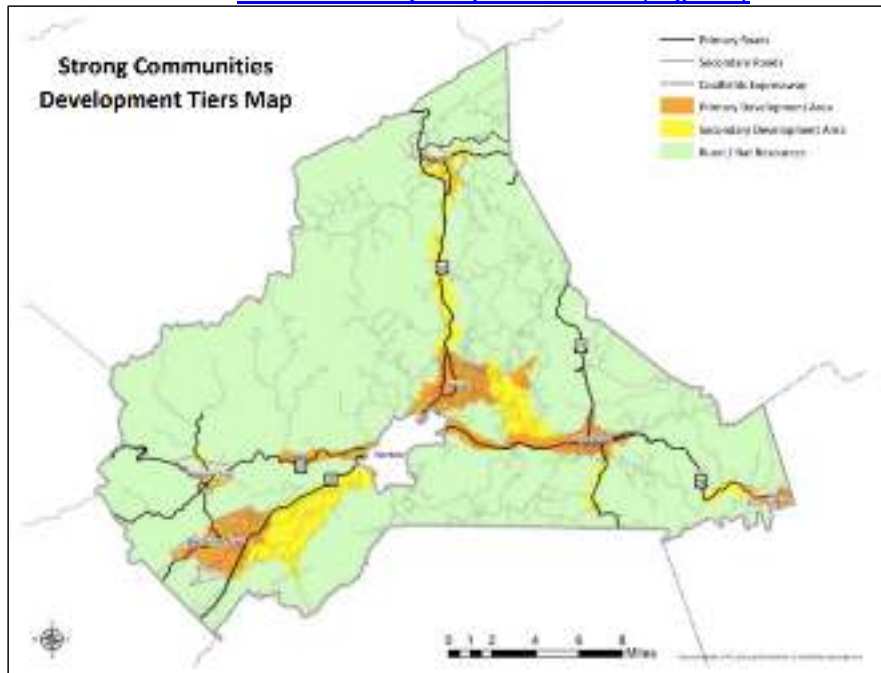




Wise County has been historically reliant on tax revenues from a thriving mining industry. As noted in the [2020 Wise County Comprehensive Plan](#), "the County didn't plan on a time when coal would not be part of our economy, because times were good, and money was flowing." The rapid drop in coal revenues was significant - from \$13 million in 2011 to just \$3 million in 2015. This reduction in tax revenue significantly limited the resources available for essential community services and critical infrastructure. The new comprehensive plan outlines "development tiers" to create a more functional land use plan and more reliable development patterns. This system provides a framework for growth management across the county, recognizing the need to provide efficient public services and protect rural and agricultural lands, as well as environmental resources and open spaces. The resulting Strong Community Development Plan seeks to "provide the County with an effective strategy to establish planning policies and manage spending to optimize investments in services and infrastructure, protects the natural environment, reduces potential loss of life and property from natural hazards, provides a clear direction to achieve an efficient development pattern and support and coordinate with its communities."

The Development Plan includes three tiers: primary development areas, secondary development areas, and rural/natural resources areas. These areas are illustrated in the map below.

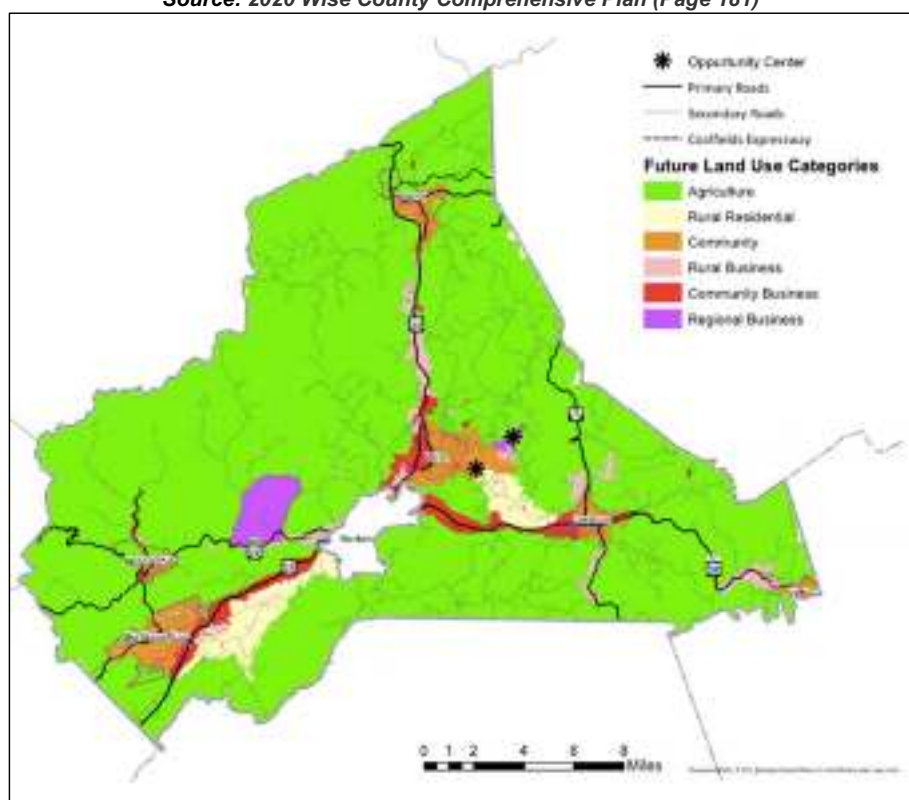
FIGURE: Development Areas in Wise County
Source: [2020 Wise County Comprehensive Plan \(Page 179\)](#)





Even with a tradition of rural land use and development patterns, Wise County prioritizes future development that is more compact, served by adequate facilities, introduces fewer costs, and reduces impacts to agricultural and natural resource lands. This is a departure from a large lot, rural development, and is a response to shifting climatic patterns. This policy directive, as outlined in the comprehensive plan, will guide future land use patterns and infrastructure planning, as illustrated in the map below.

FIGURE: Wise County Future Land Use Map
Source: 2020 Wise County Comprehensive Plan (Page 181)



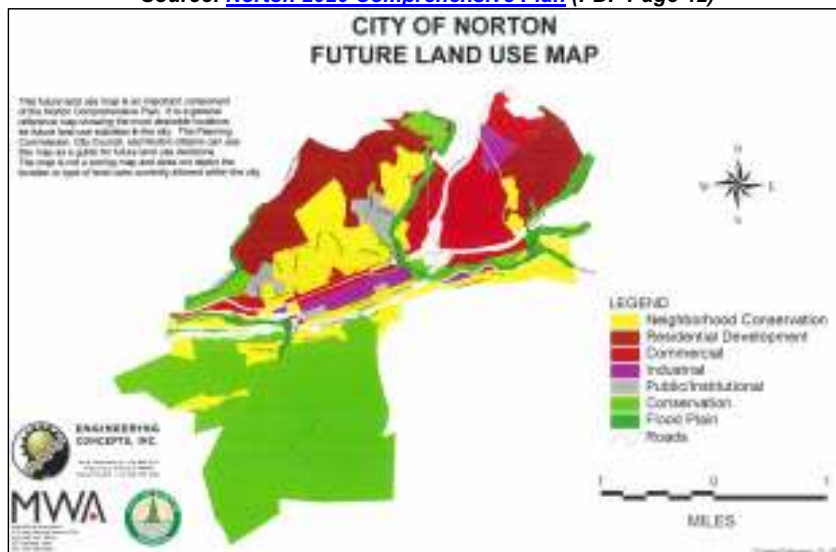


City of Norton Land Use and Development

The City of Norton last updated its [Comprehensive Plan](#) in 2003, covering a planning period through 2020. An update to the Norton Comprehensive Plan was underway during the development of the Hazard Mitigation Plan. The plan serves as a policy guide for long-term land-use decision-making and future development strategies within the City. As outlined in the Demographics section (1.5.3), the City of Norton is projected to lose population over the next twenty years. Norton's population has steadily declined since 1980, similar to its neighboring communities and Wise County as a whole. As with Wise County, Norton has historically been reliant on coal industry employment and tax revenues to support the local economy. Even in 2003 when the comprehensive plan was developed, the decline of the coal mining industry was apparent.

The comprehensive plan outlines several strategies related to future development in adopting the future land use map below. These strategies include designating sufficient land for future housing to accommodate growth, promoting infill housing, redeveloping key downtown commercial areas, and evaluating effective strategies for public service provision. The future land use map also indicates areas reserved for conservation and land in the 100-year flood plain. Restricting development in areas can assist the City in strategically developing with current and future climatic variations considered.

FIGURE: City of Norton Future Land Use Map, 2003
Source: [Norton 2020 Comprehensive Plan](#) (PDF Page 42)



The City of Norton enforces the Virginia Uniform Statewide Building Code and the Norton City Code. The City Code includes a chapter on Zoning Ordinances, [available here](#). The most recent zoning map for the City of Norton is [available here](#).



Section 1.6 Risk Assessment Overview

The following section provides a detailed risk assessment for the LENOWISCO Planning District. The assessment includes profiles of eleven natural hazards facing the District, the methodology used to rank each hazard by risk and vulnerability, and the results of the assessment.

1.6.1 Communicable Disease

A communicable disease spreads between people through contact with blood and bodily fluids, an airborne virus, or insect bites. A widespread communicable disease can cause a public health emergency as either a more localized epidemic or a global pandemic. A pandemic is a communicable disease that has spread around the world, causing illness on nearly every continent. Pandemics typically contribute to widespread economic and social impacts through long response and recovery periods. Historically, there is a pandemic every 30 years, although there have been two pandemics as declared by the World Health Organization in the 21st century, including H1N1 in June 2009 and COVID-19 in March 2020. Pandemic influenza represents one of the greatest threats within this hazard category and historically has had significant impacts globally ([CDC](#)).

Pandemics typically occur in waves lasting anywhere from six to eight weeks. As immunity is developed within a population, the virus will recede for a period of 8-12 weeks. The virus will then reemerge slightly mutated for another wave lasting six to eight weeks. The process then repeats during a pandemic two to three times.

Symptoms of pandemic influenza vary depending on the virulence of the strain but mirror typical seasonal symptoms including, fever, coughing, sore throat, congestion headaches, soreness in the muscles and joints, chills, and fatigue. During a pandemic, these symptoms can be severe resulting in hospitalizations and death. The infection rate and mortality rate, two indicators of severity, can vary between influenza strains. The mortality rate of the 1918 influenza was about 3%, with an infection rate of 30-40%. The mortality rate and the emergence of severe complications are higher for certain populations, including infants, the elderly, and people with pre-existing health conditions or compromised immune systems. That said, healthy young adults can also be affected by certain strains, including COVID-19.

The most effective strategy for combating pandemic influenza is vaccination. However, since a pandemic is caused by a novel strain, it is likely vaccine will not be available for the first wave and sometimes not until the middle of the second wave. Alternate strategies for mitigation include the use of antiviral medication, antibiotics for bacterial pneumonia often associated with influenza, social distancing, and public health hygienic practices.

COVID-19

Coronavirus disease 2019, commonly called COVID-19, is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in December 2019 in Wuhan, Hubei, China, and has since been traced back to an open animal market ([CDC](#)). COVID-19 is an ongoing pandemic at the time of this plan update. In 2020, there were nearly 80 million cases reported, with more than 1.5 million deaths globally. In the United States alone, there were nearly 20 million cases and 344,000 deaths. The United



States has the most cases of any country in the world, followed by India and Brazil ([World Health Organization](#)).

Common symptoms include fever, cough, fatigue, shortness of breath, and loss of smell and taste. While the majority of cases result in mild symptoms, some progress to acute respiratory distress syndrome (ARDS) possibly precipitated by cytokine storm, multi-organ failure, septic shock, and blood clots. The time from exposure to onset of symptoms is typically around five days but may range from two to fourteen days.

COVID-19 is spread through close contact, typically through respiratory droplets produced through coughing, sneezing, talking, or breathing. Transmission occurs through droplets that remain in the air for some amount of time. People infected with COVID-19 are most contagious during the early stages of the disease, including before symptom onset through the first three days after symptoms appear. Many people appear to be asymptomatic carriers of the disease, complicating efforts to reduce transmission and track cases ([CDC](#)).

Public health professionals have recommended safe behaviors to reduce spread, including wearing a mask when in close contact with people outside your household, frequent handwashing, and quarantine after potential or confirmed exposure to someone carrying the virus.

The United States has experienced an ongoing increase in COVID-19 cases, with several waves that vary between regions of the country. In early November 2020, the United States topped 100,000 new cases daily. By the end of 2020, Virginia had a seven-day average of 42 new daily cases per 100,000 people, resulting in nearly 4,000 new cases daily. The CDC threshold for low incidence is less than 1.5 cases per 100,000 people. Virginia alone reported about 350,000 cases of COVID-19 in 2020 ([CDC](#)).

COVID-19 in the LENOWISCO Planning District

Two federal disaster declarations (#3448 of March 13, 2020, and #4512 on June 11, 2020) were declared for the COVID-19 pandemic, inclusive of the LENOWISCO Planning District.

The following table shows cases of COVID-19 in LENOWISCO as of the end of 2020. As with many more rural communities, the jurisdictions in the LENOWISCO Planning District saw a later onset of COVID-19 community spread, with a small wave in the summer of 2020, with a significant increase beginning in October of 2020.

TABLE: COVID-19 Case Counts in the LENOWISCO District (01/01/20 – 12/31/20)
Source: Virginia Department of Health

Jurisdiction	Confirmed Cases	Deaths
City of Norton	179	1
Lee County	1,492	29
Scott County	1,214	34
Wise County	2023	59

Deleted: Planning

The impacts of the COVID-19 crisis will continue to unfold as this HMP is being written. In the Economy section (1.5.4), recent shifts in unemployment and other local impacts are discussed in more detail.



Hazard Extent

Pandemic Influenza generally occurs in multiple waves (2 to 3) that last a period of six to eight weeks each. Generally, each wave will occur approximately 12 weeks apart. Once a novel strain of influenza can achieve human-to-human transmission, the pandemic is expected to spread rapidly and across geographic barriers.

Although the likelihood of a pandemic is a certainty, its frequency is difficult to predict. In the 20th century, there were three influenza pandemics. In the 21st century, there have already been two - the ongoing COVID-19 pandemic, and the 2009 H1N1 pandemic. Pandemic influenza is characterized based on its ability to spread, not its virulence. Pandemics in the past have ranged from severe to mild.

History/Previous Occurrences

The Commonwealth of Virginia has a long and documented history of illness and disease, dating to the pre-colonial era. Later settlers experienced a variety of infectious and communicable diseases, often caused by famine, vitamin deficiencies, and exposure to new pathogens. In addition to the global COVID-19 pandemic in 2020 described in detail above, Virginia experienced three significant communicable disease outbreaks during the HMP planning period (2015-2020), described in the table below.

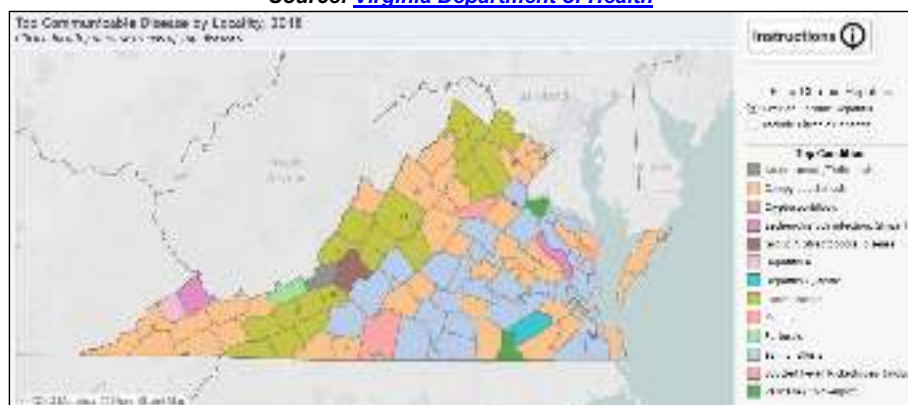
TABLE: Recent Disease Occurrences in Virginia, 2015-2020 Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan	
2015	In 2015, three EEE-infected horses were reported in the eastern region and one West Nile Virus (WNV) infected horse was reported in the northern region. Testing of sentinel chickens revealed 21 WNV-positive chickens in the Chesapeake, Norfolk, Suffolk, and Virginia Beach area, and 19 EEE-positive chickens in the Chesapeake, Norfolk, Suffolk, and Virginia Beach area.
2016	In 2016, the Virginia Department of Health investigated a statewide outbreak of hepatitis A caused by the widespread distribution of a commercial food product that was contaminated with the hepatitis A virus (HAV). A total of 110 Virginia residents infected with HAV were linked to the outbreak, with illness onsets occurring from May to October 2016. Approximately 35% of patients were hospitalized and no deaths were reported. Adults were more commonly affected, with patients ranging in age from 14-70 years (median 36); only 20% of persons affected were 19 years or younger. The most reported symptoms were nausea (90%), fatigue (89%), dark urine (84%), and anorexia (83%). The product that was contaminated was imported frozen strawberries, which were used in smoothies. Of patients who could recall the type of smoothie consumed (n=96), 100% reported drinking a smoothie containing frozen strawberries. FDA testing identified a virus in the strawberries, which had been imported from Egypt.
2016	Prior to December 2015, there were no documented cases of Zika virus disease in Virginia. As of February 2017, there were 114 confirmed cases of Zika virus disease in Virginia. Half of these cases were in the Northern Health Planning Region; 17% were in the Northwest Region, 15% were in the Central Region, 10% were in the Southwest Region, and the remaining 9% were in the Eastern Region.



The Virginia Department of Health (VDH) tracks reportable diseases throughout the Commonwealth, including the most common communicable disease by county. As illustrated below, all three counties in the LENOWISCO Planning District see the highest incidence of Campylobacteriosis. [According to the CDC](#), there are about 1.5 million cases of Campylobacteriosis annually in the United States. It is often caused by eating raw or undercook poultry or other meats, contact with animals, or drinking untreated or contaminated water.

FIGURE: Top Communicable Disease by County, 2018

Source: [Virginia Department of Health](#)



Additionally, the Virginia Department of Health tracks the ten most common communicable diseases in each county each year, as illustrated in the figures below.

FIGURE: Top 10 Communicable Diseases in Lee County, 2009-2017

Source: [Virginia Department of Health](#)

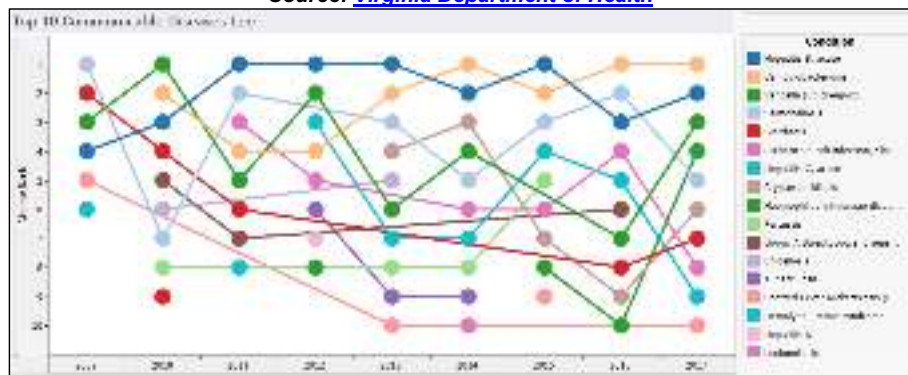




FIGURE: Top 10 Communicable Diseases in Scott County, 2009-2017

Source: [Virginia Department of Health](#)

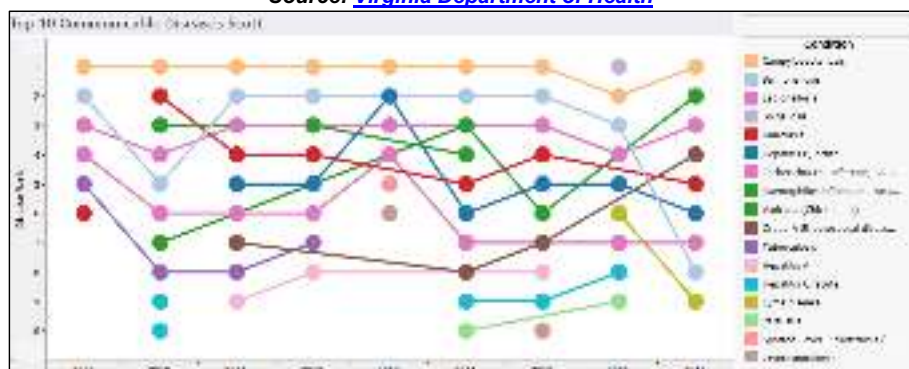
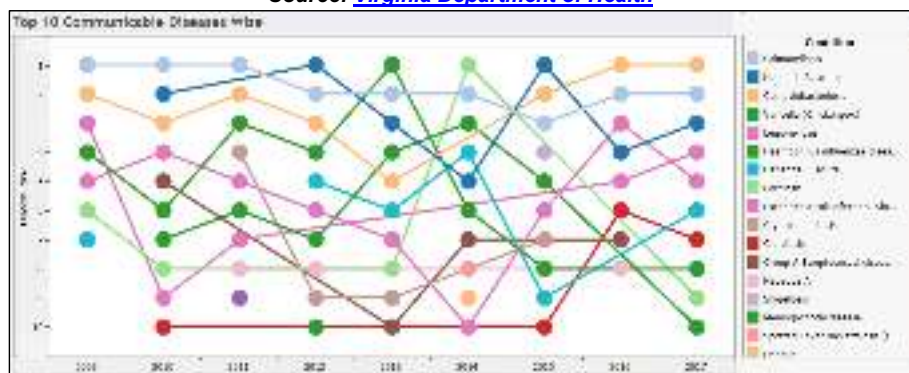


FIGURE: Top 10 Communicable Diseases in Wise County, 2009-2017

Source: [Virginia Department of Health](#)



In addition to local communicable diseases, there have been five pandemics during the 20th and 21st centuries: 1918, 1957, 1968, 2009, and 2020.

- **1918 (Spanish Flu):** The 1918-1919 influenza pandemic was the most severe and deadliest in history. An estimated 500 million people, or 30% of the world's population, were infected with the virus. Approximately 675,000 Americans and at least 50 million people worldwide died from the virus. The virus was first identified in military personnel returning from World War I in the spring of 1918. There is no agreed-upon origin point for the virus, as mass troop movements likely contributed to its rapid spread. The pandemic was characterized by three distinct waves, peaking in the U.S. during the second wave in the fall of 1918 ([CDC](#)).
- **1957 (Asian Pandemic Flu-H2N2):** This new influenza virus first emerged in Singapore in February 1957, followed by Hong Kong, and U.S. coastal cities by the summer of that



year. An estimated 116,000 Americans and 1.1 million people worldwide died from the virus ([CDC](#)).

- **1968 (Hong Kong Flu-H3N2):** The strain of influenza leading to the 1968 pandemic led to more significant deaths in people 65 and older. First reaching the U.S. in September 1968 from returning soldiers in Vietnam, the virus led to 1 million deaths worldwide and about 100,000 in the U.S. ([CDC](#)).
- **2009 (Swine Flu-H1N1):** H1N1 was first detected in the United States in April 2009. Nearly one-third of older people in the U.S. were found to have antibodies to this strain of H1N1, likely due to exposure to similar strains. The CDC estimates there were over 60 million cases and nearly a quarter-million hospitalizations in the U.S. Approximately 12,000 people died from the virus in the U.S., and between 151,000-575,000 worldwide, of which an estimated 80% were under the age of 65 ([CDC](#)).
- **2020 (COVID-19):** As an ongoing pandemic at the time of this plan update, COVID-19 is described in-depth at the beginning of this profile.



Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Somewhat Probable/Somewhat Frequent** because significant occurrences of this hazard have happened on occasion (even though isolated or low impact events may occur with more regularity). The overall risk ranking for this hazard is **Medium**.

The 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP) outlines a ranking of each jurisdiction in the LENOWISCO Planning District based on various risk factors. Due to the unpredictability and localized impact of a public health emergency, the HMP ranking parameters rely mostly on population size and density to determine risk. All jurisdictions in the District have a "Medium-Low" ranking.

TABLE: Communicable Disease Hazard Ranking Parameters Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Medium	Low	Low	Medium	Low	Medium-Low
Lee County	Medium	Low	Medium	Low	Low	Medium	Low	Medium-Low
Scott County	Medium	Low	Medium	Low	Low	Medium	Low	Medium-Low
Wise County	Medium	Medium	Medium	Low	Low	Medium	Low	Medium-Low



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Geographic Location

There is no geographic location for this hazard, beyond that outbreaks typically begin in areas with high populations. In contrast to seasonal influenza when it occurs during the late fall and early winter months, pandemic influenza can occur during any month or season. In the case of COVID-19, higher density coastal cities experienced the earliest waves of the pandemic, but the following months included rising case counts in rural areas and smaller cities.

Loss Estimates

Global pandemic events can contribute to significant economic losses across all sectors and communities. Other communicable diseases can have an extensive impact on livestock operations which may be subject to disease outbreaks. Livestock and animal products account for more than 66% of agricultural sales in Virginia ([USDA](#)). The state regularly sees small outbreaks of vector-borne diseases, including Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV). As recently as 2002, Virginia had an outbreak of avian influenza that caused significant impacts on poultry producers.

According to the 2017 Census of Agriculture, livestock, poultry, and products make up 74% of agricultural sales in [Lee County](#), 75% in [Scott County](#), and 66% in [Wise County](#). Given the importance of livestock to the local economy, a vector-borne illness leading to widespread animal losses could have significant economic impacts.

Vulnerability and Community Development Analysis

As the world experienced in 2020, public health emergencies (like a pandemic of influenza) will have a major impact on society. Public health emergencies, especially those of longer duration, introduce stress to the healthcare system and can have rippling impacts on the local and national economy. Influenza and other communicable diseases can also lead to increases in health complications and pose a greater risk to older individuals and those with underlying health conditions. The actual impacts of an event will be highly dependent on the duration, scale, and location of the incident.

COVID-19 also exposed challenges in the United States with successfully introducing interventions to slow the spread of the virus. Inconsistent messaging at the local, state, and federal levels can leave residents confused or distrustful of public health recommendations. As of November 2020, various vaccines are under development for COVID-19. It is unclear how receptive people will be to a mass-vaccination effort, and there is growing concern among public health professionals given the growing movement of anti-vaccination, coupled with the rapid pace of development for COVID-19 in particular. According to EIPH, "The two public health interventions that have had the greatest impact on the world's health are clean water and vaccines. Vaccines have prevented serious illnesses and death for millions of children and adults every year. But there is still a long way to go. Immunizations, the most cost-effective public health intervention, continue to be under-used" ([EIPH](#)).

It is anticipated that this hazard will become more likely to occur in the future as the population increases. Additionally, any decline in immunization rates in the District and Commonwealth will increase the probability of an epidemic/pandemic. Currently, schools in the LENOWISCO Planning District [report](#) high immunization rates.



Impact on LENOWISCO Residents

In the public survey completed in the Hazard Mitigation Plan update, over 40% of the public survey participants selected communicable disease as a high risk-hazard in the District, and over 30% of the survey participants indicated that communicable disease is a medium risk hazard for the District. Public health emergencies tend to have widespread impacts on many populations, but some residents are more at risk of complications than others. At-risk populations may include:

- Adults 65 years and older
- Pregnant women and women up to 2 weeks from the end of pregnancy
- People with chronic medical conditions (i.e. asthma, heart failure, chronic lung disease, obesity, etc.)
- People with compromised immune systems (i.e. diabetes, HIV, cancer, etc.)

Some communicable diseases may also pose a greater risk to children under 2 years old or people receiving certain medications or therapies. It is important to note that there are significant racial and ethnic disparities in the potential impact of a public health emergency. Inequities in the [social determinants of health](#) put some groups at increased risk of getting sick or dying, as was the case during the global COVID-19 pandemic ([CDC](#)). Some factors influencing this risk include:

- **Healthcare access and utilization:** those without access to adequate insurance, or those with limited access due to a lack of transportation, child care, the ability to take time off work, or language and cultural barriers.
- **Occupation:** people in "essential work settings" such as healthcare facilities, emergency operations, farms, factories, grocery stores, and public transportation will be in close contact with the public during a public health emergency. Additionally, individuals with limited paid sick days may feel pressured to come to work even if they are symptomatic or live with some showing symptoms.
- **Education, income, and wealth gaps:** people with limited job options, due to lower school completion rates or barriers to college, have less flexibility to leave jobs that put them at greater risk of exposure. Individuals with lower incomes cannot afford to miss work and/or don't have adequate savings.
- **Housing:** people living in more crowded housing may find it more difficult to avoid close contact or exposure. Additionally, people with lower incomes are at risk of eviction, shared housing, or homelessness.

Even if a public health emergency originates outside of the LENOWISCO Planning District, the community may still experience impacts. Short-term or contained outbreaks will have limited impacts on the larger population or economy, although they can be devastating for those who become sick. A prolonged outbreak like COVID-19 can have significant impacts on both the local and national economy. As of [September 2020](#), the unemployment rate was 6.2% in Virginia and 7.9% nationwide. People are unable to work for extended periods of time, either because they are sick, caring for someone who was exposed, or quarantining due to potential exposure. Businesses may need to lay off or furlough parts of their workforce due to decreased visitation, tourism, or other economic factors.



An additional factor during a prolonged public health emergency is the impact on schools and school-age children. Families and the workforce depend on regular school schedules, but most schools across the country closed during the initial outbreak of COVID-19 in the spring of 2020, and some returned in the fall with hybrid or online learning, limited hours, or other scheduling changes. Children can serve as ready carriers of a virus or pathogen and may infect family members, teachers, or other school staff. As of October 2020, the Virginia Department of Health had recorded [five school outbreaks](#) in the LENOWISCO Planning District. Outbreaks may lead to short-term closures, widespread quarantines, or other measures that impact the ability of parents and staff to go to work or access other reliable childcare options.

Vaccination compliance is relatively high in school districts in the LENOWISCO Planning District. In the fall of 2019, reporting school districts had vaccination coverage of 100% of kindergartners in Norton, 86.7% in Lee County, 96.9% in Scott County, and 95.2% in Wise County ([Virginia Department of Health](#)).

Based on these factors, there are several at-risk groups in the LENOWISCO Planning District, including the elderly, people with disabilities, socio-economically disadvantaged individuals, and people without health insurance.

TABLE: Data Profile Source: American Community Survey, 2014-2018					
Area	Total Population	Disabled	Individuals in Poverty	Individuals Over 65 years old	Uninsured
City of Norton	3,990	23.6% (929)	29.4%	14.2% (689)	10.1%
Lee County	24,134	25.9% (5,859)	24%	19.7 % (4,759)	13.2% (2,981)
Scott County	22,009	24.8% (5,286)	18.6%	22.7% (4,999)	10.9% (2,320)
Wise County	39,025	26.9% (9886)	22%	16.9% (6,583)	11.1% (4,082)



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Additionally, certain industries are more at risk from the impacts of a prolonged public health emergency, including retail trade; educational services, and health care and social assistance; and arts, entertainment, and recreation, and accommodation and food services. Collectively, these three sectors make up 49.3% of the workforce in Lee County, 42% in Scott County, 46.2% in Wise County, and 52.8% in the City of Norton.

TABLE: Data Profile								
Source: <i>American Community Survey, 2014-2018</i>								
Industry	Lee County		Scott County		Wise County		City of Norton	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Civilian employed population 16 years and over	7474		8340		13075		1539	
Agriculture, forestry, fishing and hunting, and mining	362	4.8%	235	2.8%	916	7%	93	6%
Construction	576	7.7%	832	10%	591	4.5%	33	2.1%
Manufacturing	905	12.1%	1467	17.6%	715	5.5%	141	9.2%
Wholesale trade	108	1.4%	65	0.8%	259	2%	0	0%
Retail trade	1209	16.2%	1032	12.4%	1840	14.1%	319	20.7%
Transportation and warehousing, and utilities	326	4.4%	236	2.8%	653	5%	20	1.3%
Information	27	0.4%	183	2.2%	122	0.9%	19	1.2%
Finance and insurance, and real estate and rental and leasing	257	3.4%	194	2.3%	512	3.9%	0	0%
Professional, scientific, and management, and administrative and waste management services	388	5.2%	975	11.7%	1368	10.5%	212	13.8%
Educational services, and health care and social assistance	2039	27.3%	2044	24.5%	3092	23.6%	383	24.9%
Arts, entertainment, and recreation, and accommodation and food services	434	5.8%	429	5.1%	1105	8.5%	111	7.2%
Other services, except public administration	363	4.9%	281	3.4%	683	5.2%	104	6.8%
Public administration	480	6.4%	367	4.4%	1219	9.3%	104	6.8%



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Impact on Essential Facilities, Critical Infrastructure, and Future Assets

Essential facilities will not be physically impacted by this hazard. They may be impacted by the loss of workers who are ill or need to care for others who are ill. The LENOWISCO Health District includes three health departments, Lee County Health Department, Wise County and City of Norton Health Department, and the Scott County Health Department. There are four hospitals in the district, including Lonesome Pine Hospital (Big Stone Gap), Norton Community Hospital (Norton), Mountain View Regional Hospital (Norton), and Lee County Hospital (Pennington Gap).

The greatest risk to critical infrastructure is the availability of personnel to properly maintain and operate infrastructure. The staff themselves may become ill, or need to attend to family members or others who are ill. Additionally, jurisdictions and companies responsible for managing critical infrastructure will need to have adequate protocols in place to protect workers from exposure while at work.

No future assets/infrastructure are exposed to damage due to a public health emergency; however, absenteeism and resource shortages can impact the maintenance of assets.

Future Conditions

The Virginia HMP (2018) notes that climate changes may have both short-term and long-term effects on both vector-borne disease transmissions and infection patterns, meaning changes in seasonal risk and possible broad geographic changes in disease patterns may occur over time.

Additionally, the EPA publication (2016) notes that climate changes may allow the emergence of new or significantly altered illnesses.

Impact on the Environment

The Virginia Department of Wildlife Resources manages a list of wildlife diseases. It is important to note is that many diseases impacting wildlife do not impact humans or impact in the same way. See the full list on the [Virginia Department of Wildlife Resources website](#).

While a public health emergency does not have immediate effects on the environment, a prolonged event like that of COVID-19 can lead to more limited resources and staffing for important environmental management activities. Public agencies responsible for water quality testing, parks and open space management, and other essential services may face resource limitations or budget cuts that restrict these activities.

Impact on Operations

A public health emergency can have significant impacts on the availability of first responders, healthcare personnel, and other emergency operations staff. These professionals can be easily exposed to pathogens or individuals carrying a virus, especially if there is not sufficient personal protective equipment (PPE) available or there are not adequate PPE protocols in place. Local hospitals and care facilities may experience a rapid increase in patients seeking care, potentially overwhelming capabilities, and requiring state or federal aid.



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Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Communicable Disease hazard.

Frequency & Probability ¹			Somewhat Probable / Somewhat Frequent	
Potential Magnitude and Scale ²			Somewhat Vulnerable	
Physical Vulnerability Hazard Impact ²			Somewhat Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Somewhat Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			Medium	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.2 Dam Failure

A dam failure is defined as an uncontrolled release of a reservoir. The causes of dam failures can be divided into three groups: dam overtopping, excessive seepage, and structural failure of a component. Despite efforts to provide sufficient structural integrity and to perform inspection and maintenance, problems can develop that can lead to failure. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage amounts can cause significant flooding downstream. Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures.
- Inadequate spillway capacity, resulting in excess overtopping flows.
- Internal erosion caused by embankment or foundation leakage or piping.
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components.
- Improper design, including the use of improper construction materials and construction practices.
- Negligent operations, including the failure to remove or open gates or valves during high flow periods.
- Failure of upstream dams in the same waterway.
- Landslides into reservoirs, which cause surges that result in overtopping
- High winds, which can cause significant wave action and result in substantial erosion; and
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments, can weaken entire structures.

Dams are complicated structures, and it can be difficult to predict how a structure will respond to distress. As stated in the *Safety of Existing Dams*, "... the modes and causes of failure are varied, multiple, and often complex and interrelated, i.e., often the triggering cause may not truly have resulted in failure had the dam not had a secondary weakness. These causes illustrate the need for careful, critical review of all facets of a dam" (*Safety of Existing Dams*, 1983).

More than a third of the nation's dams are already 50 years old. About 14,000 of those dams pose a "high" or "significant" hazard to life and property if a failure occurs. There are also about 2,000 "unsafe" dams in the United States and in almost every state.

- Communities downstream of a dam
- Communities reliant on levee systems for protection

Dams can fail with little warning. Intense storms may produce flooding in a few hours or even minutes for upstream locations. Flash floods can occur within six hours of the beginning of heavy rainfall, and dam failure may occur within hours of the first signs of breaching. Other failures and breaches can take much longer to occur, from days to weeks, as a result of debris jams, the accumulation of melting snow, the build-up of water pressure on a dam with (unknown) deficiencies after days of heavy rain, etc. Flooding can also occur when a dam operator releases excess water downstream to relieve pressure from the dam.



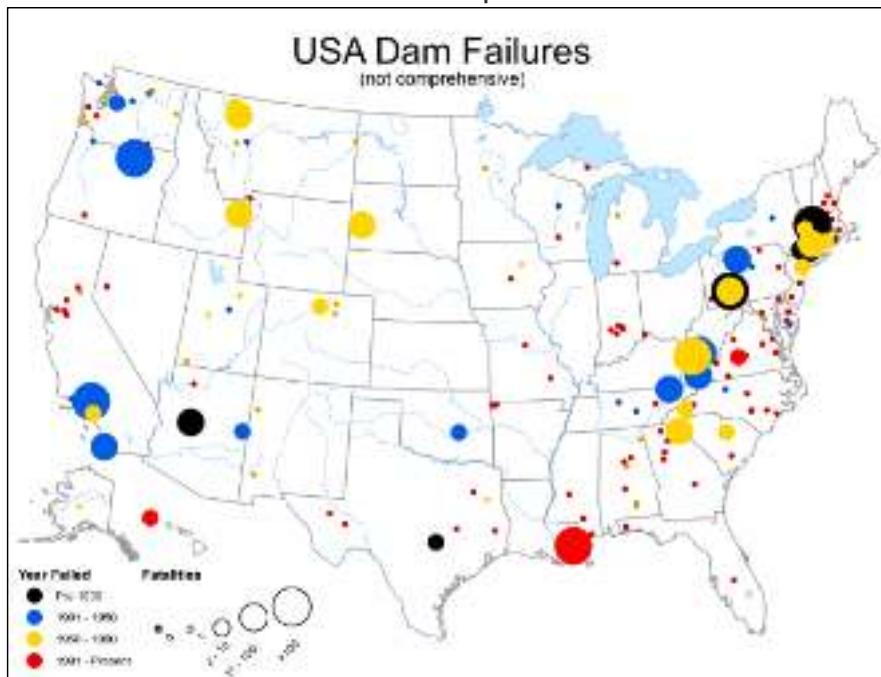
There is no official number of how many dam failures have occurred in the United States. Between 2005 and 2013, state-run dam safety programs reported 173 dam failures and 587 incidents at dams which, without intervention, may have led to a dam failure.

Overtopping a dam is often a precursor to dam failure. National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways or settlement of the dam crest account for approximately 34% of all U.S. dam failures.

Another 20% of U.S. dam failures have been caused by piping (internal erosion caused by seepage). Seepage often occurs around hydraulic structures, such as pipes and spillways; through animal burrows; around roots of woody vegetation; and through cracks in dams, dam appurtenances, and dam foundations ([Association of State Dam Safety Officials](#)).

FIGURE: Dam Failures in the United States

Source: James S. Halgren, Office of Hydrologic Development, National Weather Service, National Oceanic and Atmospheric Administration





Hazard Extent

The Virginia Department of Conservation and Recreation (DCR) Division of Dam Safety and Floodplain Management administers the Virginia Dam Safety Program. The Division regulates impounding structures and conducts ongoing dam inspections to prevent dam failures. Dam classification is based on potential downstream losses in the event of a failure and dictates regulatory requirements such as frequency of inspection and design standards. Hazard potential is not related to structural integrity.

TABLE: Virginia Dam Classification Systems Source: <i>Virginia Department of Conservation and Recreation</i>		
Hazard Potential	Description	Inspection
High (Class I)	Failure will cause probable loss of life or serious economic damage (to buildings, facilities, major roadways, etc.)	Annual, with inspection by a professional engineer every 2 years.
Significant (Class II)	Failure may cause loss of human life or appreciable economic damage (to buildings, secondary roadways, etc.)	Annual, with inspection by a professional engineer every 3 years.
Low (Class III)	Failure would result in no expected loss of human life, and cause no more than minimal economic damage	Annual, with inspection by a professional engineer every 6 years.

The Commonwealth of Virginia HMP identifies 53 High Hazard (Class I) dams across the state, including three in the LENOWISCO Planning District, as detailed in the table below. The 3 dams were also reported in the Army Corps of Engineer's National Inventory of Dams (NID), which lists a total of 23 dams in LENOWISCO. The NID table is located in the Geographic Location section.

TABLE: Virginia High Hazard Dam Inventory Source: <i>2018 Commonwealth of Virginia Hazard Mitigation Plan</i>				
Jurisdiction	Dam Name	Dam Operator	Water Reservoir Name	Water Reservoir Location
City of Norton	Lower Norton Reservoir Dam	City of Norton	Lower Norton Reservoir	City of Norton
City of Norton	Upper Norton Reservoir Dam	City of Norton	Upper Norton Reservoir	City of Norton
Wise County	Bear Creek Dam	Town of Wise	Wise Reservoir	Wise County

History/Previous Occurrences

There are no recorded dam failures in the LENOWISCO Planning District. The Commonwealth of Virginia does not manage a database of historic dam failures or flooding due to a dam failure. Most failures in the state occur due to a lack of maintenance combined with significant precipitation events.



Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Minimally Probably/Minimally Frequent**, because this hazard was determined to be extremely rare with little to no documented history of significant occurrences or events. While it is possible that low impact events may occur on occasion, the hazard's overall impact on the District and participating jurisdictions would be very minor. The overall risk ranking for this hazard is **Low**.

Digital mapping of flood inundation areas due to impoundment/dam failure is not currently available in digital form. Risk assessment and future probability are based on dam location and classification. As noted in the 2018 Commonwealth of Virginia HMP, assessing the probability of flooding due to dam failure is a site-specific endeavor and relates to detailed regulatory requirements based on design performance standards.

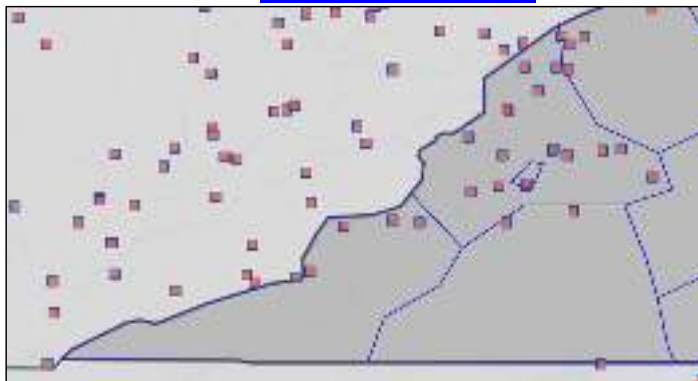
While no flooding events due to impoundment failure have been recorded in the LENOWISCO Planning District, understanding the location and risk for the county associated with dams and levees is vital. In the broader U.S., the average age of a dam is 57 years and 74% of these dams are considered "High Hazard Potential Dams" as defined by the National Inventory of Dams and require an Emergency Action Plan (EAP).

Geographic Location

According to the National Inventory of Dams, there are 23 dams in the LENOWISCO Planning District, as illustrated in the figure below.

FIGURE: Dams in the LENOWISCO Planning District

Source: [National Inventory of Dams](#)





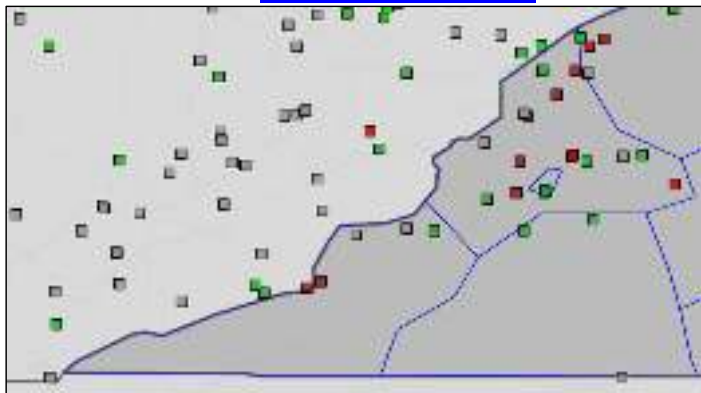
Hazard ratings are set for all large dams. The "hazard" rating is not based on the physical attributes, quality, or strength of the dam itself, but rather the potential for loss of life or property damage should the dam fail.

High Hazard Dam Potential

A dam is assigned a rating of High Hazard when its failure would probably put lives at risk. Dams with a "High" Hazard Potential Rating are required to have an EAP. Of the 11 dams with a "High" Hazard Potential Rating, eight have an EAP, and three do not have an EAP, as depicted in the maps below.

FIGURE: Dams in the LENOWISCO Planning District with an EAP

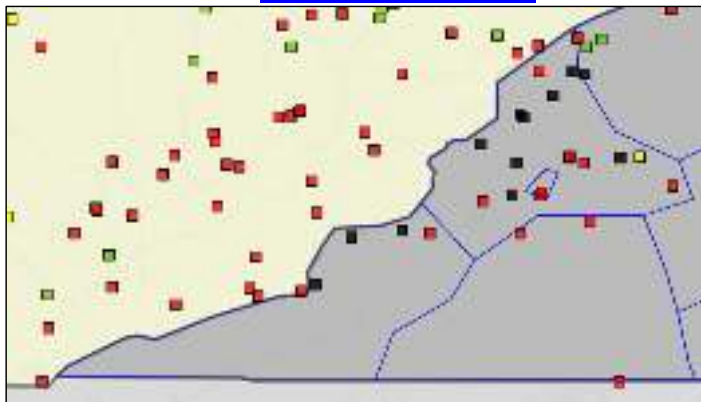
Source: [National Inventory of Dams](#)



(Green = completed EAP, Red = no completed EAP, Grey = EAP not required)

FIGURE: Dams in the LENOWISCO Planning District by Hazard Potential

Source: [National Inventory of Dams](#)



(Red = High Hazard Potential, Yellow = Significant Hazard Potential, Black = Undetermined)



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National Inventory of Dams

In addition to hazard potential and EAP, the National Inventory of Dams captures dam ownership and regulatory bodies, dam type, structural details, and reported inspection dates. A summary of dams in the LENOWISCO Planning District is included in the table below, followed by a more detailed table including all characteristics for the 23 dams.

TABLE: Summary of Dams in the LENOWISCO Planning District

Source: National Inventory of Dams

Jurisdiction	Total Dams	Average Age of Dam	% of High Hazard Potential Dams with an Emergency Action Plan	Percent of Dams Regulated by State Agency	Percent of Dams Regulated by a Federal Agency	Percent of Dams with Hydropower
City of Norton	2	N/A	100%	100%	0%	0%
Lee County	4	N/A	100%	50%	0%	50%
Scott County	1	N/A	100%	100%	0%	0%
Wise County	16	41	57%	69%	19%	6%

TABLE: Dams in the LENOWISCO Planning District

Source: National Inventory of Dams

Name	National ID#	Water Course	County/City	Owner	Year Completed	Hazard Potential	EAP	State Regulated	Last Inspection	Purpose
MIDDLETON DAM (10500DD045)	VA105001	STONE CREEK	LEE	STEVE MIDDLETON (Private)	Not Reported	Undetermined	No	Yes	Not Reported	Recreation
MILLER COVE SLURRY IMPOUNDMENT DAM	VA105004	Not Reported	LEE	Not Reported	Not Reported	Undetermined	Not Required	No	Not Reported	Not Reported
CALVIN PROJECT SLURRY DAM	VA105005	Not Reported	LEE	Not Reported	Not Reported	Undetermined	Not Required	No	Not Reported	Not Reported
KEOKEE DAM	VA105002	NORTH FORK POWELL RIVER	LEE	VIRGINIA DEPARTMENT OF GAME AND INLAND FISHERIES (State)	Not Reported	High	Yes	Yes	Not Reported	Recreation
UPPER NORTON RESERVOIR DAM	VA720002	BENGES BRANCH - POWELL RIVER	NORTON CITY	CITY OF NORTON (Local Government)	Not Reported	High	Yes	Yes	Not Reported	Recreation



TABLE: Dams in the LENOWISCO Planning District
Source: National Inventory of Dams

LOWER NORTON RESERVOIR DAM	VA720001	BENGES BRANCH - POWELL RIVER	NORTON CITY	CITY OF NORTON (Local Government)	Not Reported	High	Yes	Yes	Not Reported	Water Supply
BARK CAMP DAM (CORDER BOTTOM LAKE)	VA169001	LITTLE STONY CREEK	SCOTT	VIRGINIA DEPARTMENT OF GAME AND INLAND FISHERIES (State)	Not Reported	High	Yes	Yes	Not Reported	Recreation
BENS BRANCH DAM	VA195009	BENS BRANCH	WISE	TOWN OF APPALACHIA (Local Government)	Not Reported	High	Yes	Yes	Not Reported	Water Supply
RIMROCK LAKE DAM	VA195012	POWELL RIVER	WISE	G. W. BARNETTE (Private)	1962	Undetermined	No	Yes	Not Reported	Recreation
BAND MILL HOLLW FACILITY DAM	VA195007	-	WISE	Not Reported	Not Reported	Undetermined	Not Required	No	Not Reported	Not Reported
BLACK CREEK DAM (19500DD083)	VA195013	-	WISE	GREATER WISE, INC. (Private)	Not Reported	Undetermined	No	Yes	Not Reported	Recreation
DIXIANA MINE DAM	VA195005	GUEST RIVER	WISE	Not Reported	Not Reported	Undetermined	Not Required	No	Not Reported	Water Supply
STEER BRANCH DAM	VA195003	-	WISE	RED RIVER COAL COMPANY, INC. (Private)	Not Reported	Undetermined	Not Required	No	Not Reported	Other
N. FORK OF POUND DAM	VA195001	NORTH FORK OF POUND RIVER	WISE	CELRH (Federal)	1966	High	Yes	No	8/24/2016	Flood Control
INDIAN RIDGE POND DAM	VA195019	TR- POUND RIVER	WISE	Not Reported	Not Reported	Undetermined	No	Yes	Not Reported	Recreation
MCFALL FORK DAM	VA195020	TR- POUND RIVER	WISE	Not Reported	Not Reported	Undetermined	No	Yes	Not Reported	Recreation
UVA WISE #1 DAM	VA195017	YELLOW CREEK	WISE	UVA - COLLEGE AT WISE (State)	Not Reported	High	No	Yes	Not Reported	Recreation
UVA WISE #2 DAM	VA195018	YELLOW CREEK	WISE	UVA - COLLEGE AT WISE (State)	Not Reported	High	No	Yes	Not Reported	Recreation



TABLE: Dams in the LENOWISCO Planning District
Source: *National Inventory of Dams*

BEAR CREEK DAM (WISE RESERVOIR)	VA195011	TR-BEAR CREEK	WISE	TOWN OF WISE (Local Government)	Not Reported	High	Yes	Yes	Not Reported	Recreation
SALIES BRANCH SLURRY IMPOUNDMENT DAM	VA195027	-	WISE	PARAMONT CONTURA, LLC (Private)	Not Reported	Undetermined	No	No	Not Reported	Tailings
TOMS CREEK DAM	VA195010	TOMS CREEK	WISE	TOWN OF COEBURN (Local Government)	Not Reported	Significant	Yes	Yes	Not Reported	Water Supply
DOMINION GENERATION VA CITY DAM #2	VA195025	MEADE CREEK	WISE	VIRGINIA ELECTRIC AND POWER COMPANY (Public Utility)	Not Reported	High	No	Yes	Not Reported	Flood Control
BIG CHERRY RCC DAM	VA195016	SOUTH FORK POWELL RIVER	WISE	TOWN OF BIG STONE GAP (Local Government)	2002	High	Yes	Yes	Not Reported	Water Supply



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Loss Estimates

There is not currently a reliable method to calculate annualized losses due to dam failure in Virginia. Vulnerability, and thus potential losses, is based on the nature of downstream development and the operations and design of the dam itself. Losses due to dam failure could include loss of life, property damage, infrastructure disruption, and environmental impacts.

Vulnerability and Community Development Analysis

Most of the previously described causes for dam failure can be controlled through good design, proper construction, regular inspection by qualified personnel, and a commitment to strong enforcement to correct identified deficiencies. Dam failure vulnerability is dependent on the nature of downstream development and operations planning.

To reduce hazard potential, land downstream of new dams, or in the vicinity of existing canals, can be zoned or otherwise regulated to limit new construction and exposure. Public awareness measures, such as public education on dam safety, are proactive mitigation measures that should be implemented by local communities. Emergency Action Plans (EAPs) must be completed for the three dams located in Wise County that have a "High" Hazard Potential Ranking and no EAP. These dams include UVA-Wise #1 Dam, UVA-Wise #2 Dam, and Dominion Generation VA City Dam #2. Requests should be made to have Hazard Potential Rankings given to all the dams that currently do not have one. The EAP establishes potential dam failure inundation limits, notification procedures, and thresholds.

The risk to downstream assets and infrastructure can be reduced substantially with efforts to limit some types of development adjacent to streams and rivers. Additionally, none of the dams have an inspection date listed and only two have a completion year provided on the National Dam Inventory website. As with all infrastructure, deterioration with no maintenance will occur and makes failure more likely. An inspection will track maintenance.

Impact on LENOWISCO Residents

Public health risks are associated with dam failures. Particular for the LENOWISCO Planning District is the concern of pesticides utilized in crop control and the potential impact of drinking water supply. Additionally, the risks associated with flooding would apply if a dam failure occurred.

Impact on Essential Facilities, Critical Infrastructure, and Future Assets

The National Dam Safety Program was started in response to the catastrophic dam failures in the 1970s. Any structures located in the inundation area for a particular dam are at risk of catastrophic damages. Data is not currently available to identify essential facilities or critical infrastructure located in a dam inundation area in Virginia.

Future Conditions

Dams are constructed with safety features known as "spillways," which are put in place as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often



referred to as “design failures,” result in increased discharges downstream and increased flooding potential. Spillway operation is designed partly based on assumptions about a river’s flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. Increasing precipitation, especially heavy rain events, has increased the overall risk of floods. In turn, floods cause damage to infrastructure, such as dams.

The Virginia HMP (2018) highlights that the majority of dams in Virginia are privately owned and maintained. To lessen potential climate impacts on dams, coordination along with the use of green infrastructure and better engineering practices should be explored as mitigation tactics.

Impact on the Environment

Hundreds of dam failures have occurred throughout U.S. history. These failures have caused immense property and environmental damages and have taken thousands of lives. As the nation’s dams age and population increases, the potential for deadly dam failures can grow without proper and routine maintenance.

Impact on Operations

Dam failures have the potential to highly impact operations and to prevent failures, more coordination and communication are needed across agencies that regulate waterways, dams, and land use.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Dam Failure hazard.

Frequency & Probability ¹			Not Probable At All / Not Frequent At All	
Potential Magnitude and Scale ²			Somewhat Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Somewhat Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			Low	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.3 Drought

Droughts are characterized by either a short-term (seasonal) or long-term (several years) deficiency of precipitation. The resulting water shortages can impact important activities and environments, depending on the duration of the event. The water shortage is influenced not only by precipitation (amount, frequency, and intensity), but also by other factors including evaporation (which is increased by higher than normal heat and winds), transpiration, and human use. Human activities such as over farming, excessive irrigation, deforestation, and poor erosion controls can exacerbate a drought's effects. It can take weeks or months before the effects of below-average precipitation on bodies of water are observed. Depending on the region droughts can happen quicker, noticed sooner, or have their effects naturally mitigated. The more humid and wet an area is, the quicker the effects will be realized.

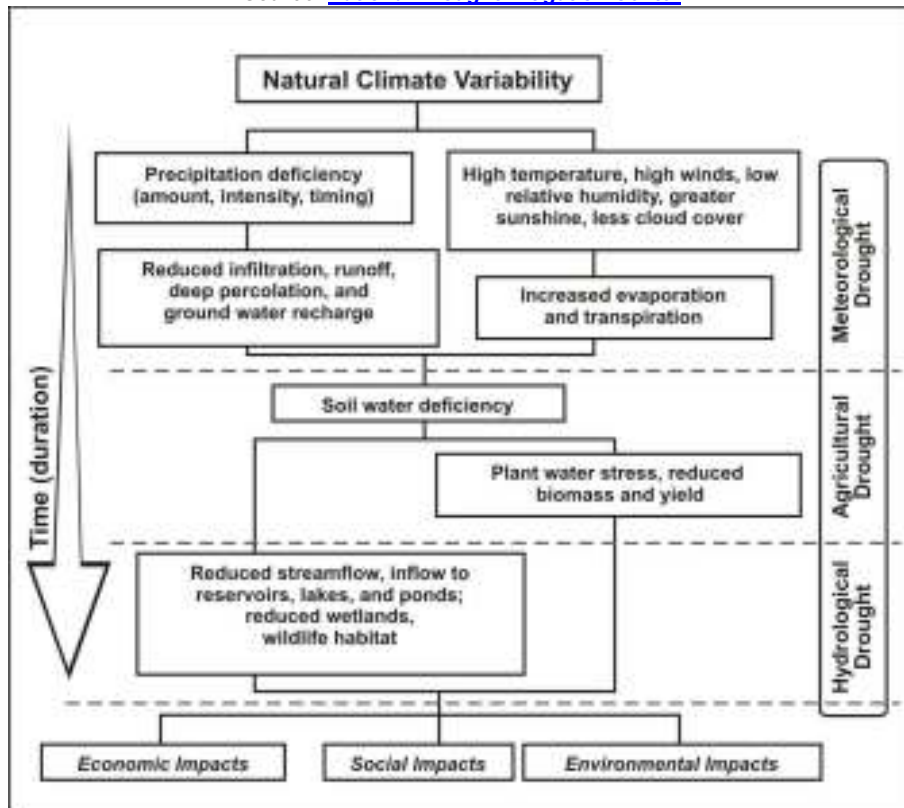
Drought is a part of an expected cycle between more wet and more dry periods in any given region. There are several common types of droughts, including:

- **Meteorological:** Defined by the degree of dryness (as compared to an average) and the duration of the dry period. These are region-specific and only appropriate for regions characterized by year-round precipitation.
- **Hydrological:** Associated with the effects of periods of precipitation shortfalls (including snow) on the surface or subsurface water supply, e.g. streamflow, reservoir, and lake levels, and groundwater. Impacts of hydrological droughts do not emerge as quickly as meteorological and agricultural droughts. For example, a deficiency of reservoir levels may not affect hydroelectric power production or recreational uses for many months.
- **Agricultural:** Links characteristics of meteorological or hydrological drought to agricultural impacts. An agricultural drought accounts for the variable susceptibility of crops during different stages of crop development from emergence to maturity.
- **Socioeconomic:** Links the supply and demand of some economic good, e.g. water, forage, food grains, and fish, with elements of meteorological, hydrological, or agricultural droughts. This type of drought occurs when demand for an economic good exceeds supply as a result of a weather-related shortfall in the water supply.

Droughts can occur in any part of Virginia, with the most common type being agricultural droughts. The following figure illustrates the sequence of three drought types (meteorological, agricultural, and hydrological) and their impacts.



FIGURE: Sequence and Impact of Common Drought Types
Source: [National Drought Mitigation Center](#)



Hazard Extent

Droughts can last weeks, months, or years and they occur frequently in the United States, however, they are a “slow-onset” event and require long periods of below-average rainfall. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

Droughts in the U.S. are classified based on the Palmer Drought Index, which uses several possible factors to determine the true severity of a drought. The range of the index is D1 to D4, where D4 represents the most damaging and severe drought. The index value of D0 is occasionally used to denote when a region is at risk from a drought in the near future. The table below from the United States Drought Monitor (USDM) shows the details behind these ratings:



TABLE: Drought Classification
Source: U.S. Drought Monitor

Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Short and Long-term Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30%	21-30%	-0.5 to -0.7	21-30%
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20%	11-20%	-0.8 to -1.2	11-20%
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10%	6-10%	-1.3 to -1.5	6-10%
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5%	3-5%	-1.6 to -1.9	3-5%
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2%	0-2%	-2.0 or less	0-2%



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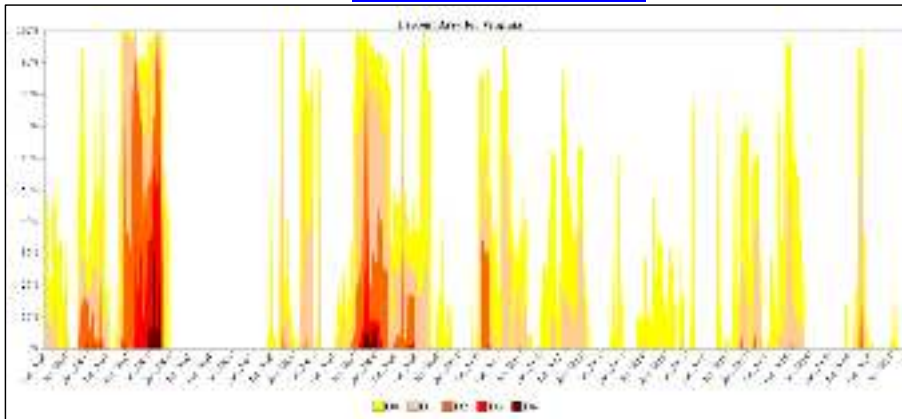
History/Previous Occurrences

According to the [National Centers for Environmental Information \(NCEI\) Storm Events Database](#), there were no drought events in the LENOWISCO Planning District between 1950-2020.

The U.S. Drought Monitor has monitored national drought conditions since 2000. Since 2000, the longest drought in Virginia took place between 2007-2009. Additionally, an intense period of drought occurred in the summer and fall of 2002, as illustrated in the figure below.

FIGURE: Drought Area for Virginia, 2000-2020

Source: [U.S. Drought Portal - Virginia](#)



In the LENOWISCO Planning District, drought periods have been similar to the state with less severity and duration. In recent years, the most significant drought event in the district was in late 2007 and early 2008. Short periods of "abnormally dry" conditions have occurred on an annual basis through the HMP planning period, with one short period of moderate-severe drought at the end of 2016.

FIGURE: Historical Drought Conditions in the LENOWISCO Planning District, 2000-2020

Source: [U.S. Drought Portal](#)

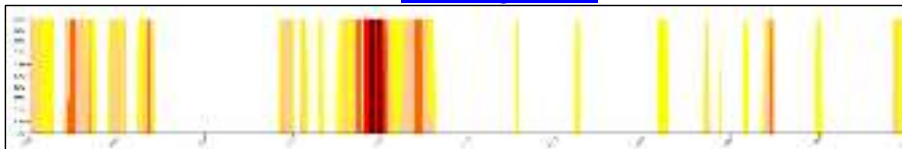




FIGURE: Drought Conditions in Virginia, December 2016

Source: [U.S. Drought Portal](#)



Other historic drought events impacting the LENOWISCO Planning District include:

- **1985-1988:** Severe drought in the entire southeastern US.
- **Early 2000s:** Throughout most of the early and mid-2000s the entire southeastern U.S. has been in varying levels of drought, including Virginia. In November 2002, 45 counties were approved for primary disaster designation by the US Secretary of Agriculture, while 36 requests were still pending. This dry period led to water conservation restrictions throughout the state and exacerbated water supply infrastructure problems, especially in rural communities.
- **October 2005:** A state of emergency was declared for the Town of Big Stone Gap when a combination of drought conditions and the construction of the Big Cherry Reservoir Dam resulted in a water shortage. The Commonwealth distributed \$1.3 million in funding to offset local emergency water supply operations.
- **2012-2013:** La Nina conditions produced extreme and exceptional drought conditions throughout much of the US, Canada, and Mexico. Peak drought conditions in July resulted in more than 80% of the country with at least abnormally dry conditions. For this event, much of Virginia was classified as either abnormally dry or as experiencing moderate to severe drought conditions.



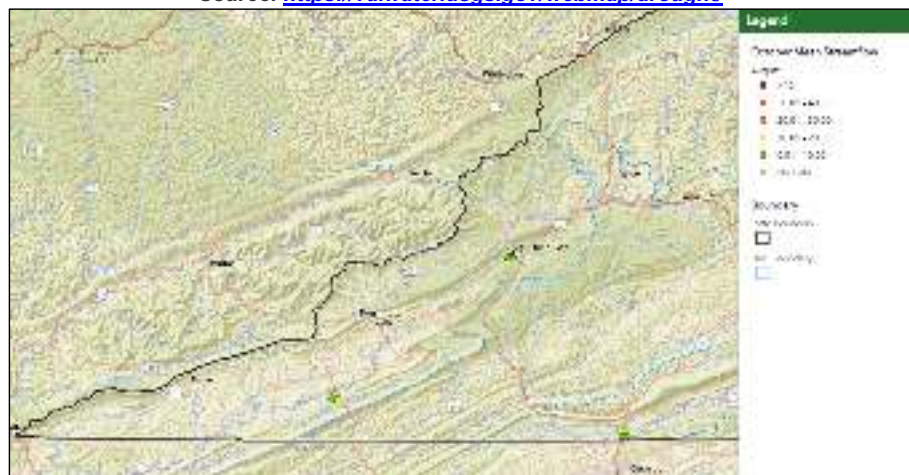
Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Minimally Probably/Minimally Frequent**, because this hazard was determined to be extremely rare with little to no documented history of significant occurrences or events. While low impact events may occur on occasion, the hazard's overall impact on the District and participating jurisdictions would be very minor. The overall risk ranking for this hazard is **Medium**.

Drought events are not predictable, making it difficult to assess probability. Due to the historic presence of drought in the LENOWISCO Planning District, some type of drought will likely occur in the future, but the duration, severity, and extent are more difficult to predict. USGS provides Drought Streamflow Probabilities for select rivers and streams in Virginia, including the Holston River near Gate City, the Powell River near Jonesville, and the Powell River at Big Stone Gap. Drought streamflow probabilities are projected for the summer months (July-September) based on the measured streamflow during the previous winter months (October-February). The drought probability for July-September 2020, as shown in the figure below, was below 20% at all three monitoring locations within the LENOWISCO Planning District.

FIGURE: Drought Streamflow Probabilities (July-September 2020)

Source: <https://va.water.usgs.gov/webmap/drought/>





Geographic Location

Communities rely on storms in the winter, and in some cases tropical systems in the summer, for adequate rainfall. If rainfall levels are lacking, a drought can be called in any season. Droughts are typically regional events and would impact all areas in the LENOWISCO Planning District. Two observable signs of the water situation are streamflow and groundwater status. The USGS monitors both through a network of river gauging stations and monitoring wells.

The USGS WaterWatch database offers monthly streamflow maps to compare streamflow over time. During the HMP analysis period (2015-2020), streamflows have increased from "normal" in 2015 to "above normal" in 2020 in both winter and summer seasons. Below are comparative maps from January and August. WaterWatch also manages two well monitoring stations in the LENOWISCO Planning District that offer information on current groundwater status.

FIGURE: Comparison Streamflow Map (January 2015 to January 2020)
Source: USGS WaterWatch

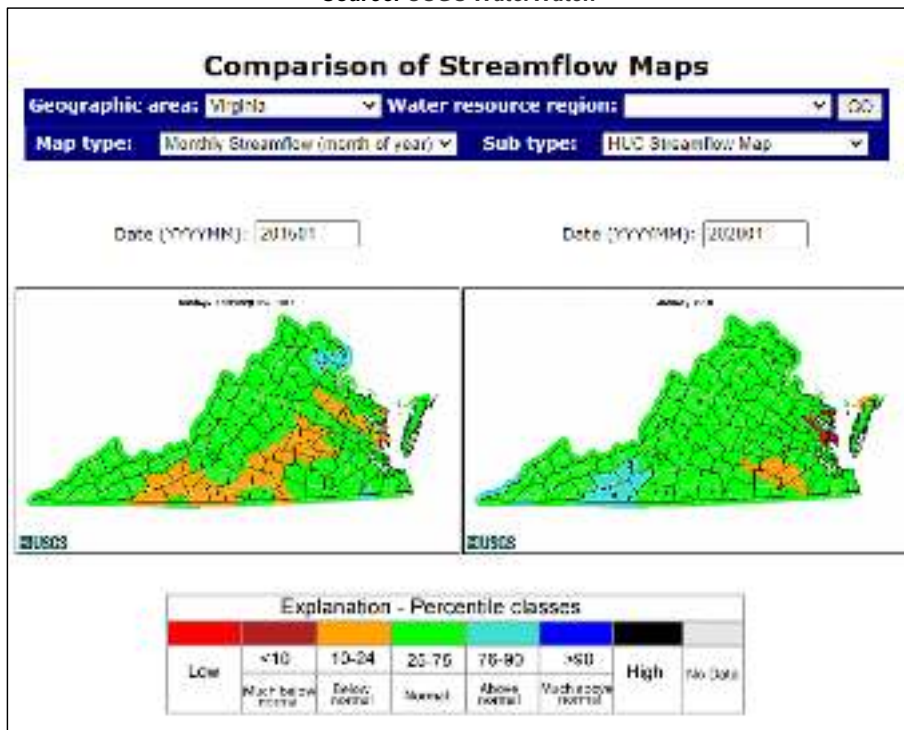
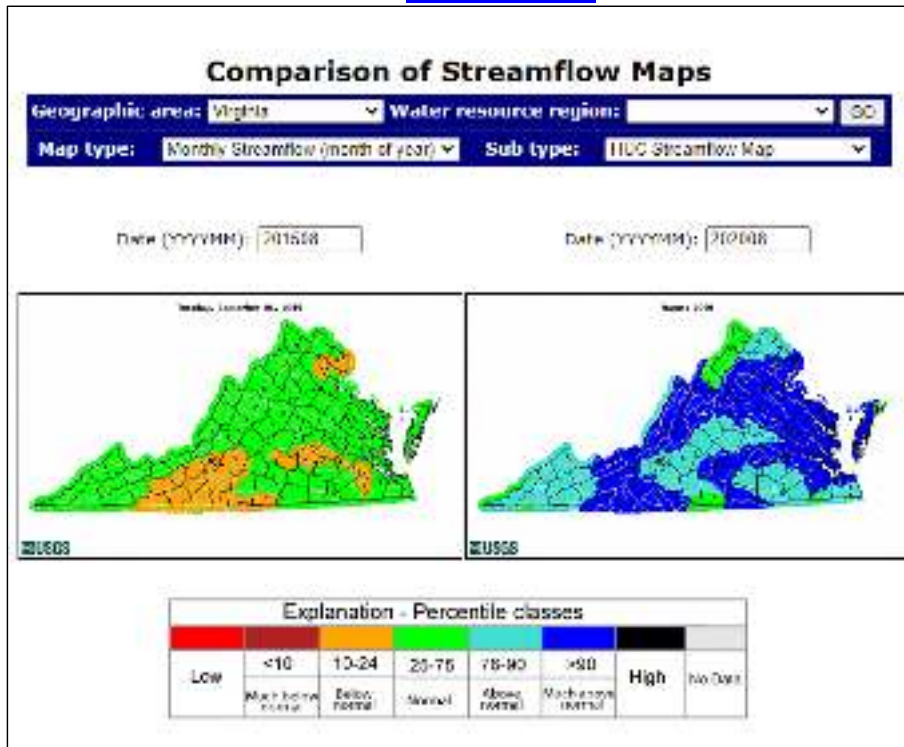




FIGURE: Comparison Streamflow Map (August 2015 to August 2020)
Source: [USGS WaterWatch](https://waterwatch.usgs.gov/)



Loss Estimates

The Governor's Climate Commission indicated that Virginia is "moving towards more widespread impacts under the driest conditions." Droughts can cause widespread and expensive damages across the entire District or Commonwealth, impacting many economic and ecological sectors. In Virginia, widespread drought can impact livestock, crops, agricultural lands, and over 808,000 acres of freshwater wetlands. Negative impacts from drought conditions will have rippling effects across the District due to the complex web of sectors that contribute to the production of goods and services. Reduced agricultural sector production can lead to higher prices for food, energy, and other essential products. Reduced income for farmers can lead to increased credit risk for financial institutions and lost revenue for local and state governments. Due to these complex relationships, it is difficult to accurately estimate financial damages from a prolonged drought event. Most likely, total damages from serious drought events would fall somewhere in the range of hundreds of thousands of dollars. Because water is non-replaceable as an essential resource for most organisms and many sectors of the economy, losses due to water shortage caused by drought are likely to be repetitive.



Vulnerability & Community Development Analysis

Communities with significant agricultural operations are most at risk of short-term droughts and rainfall or snow shortages. Dry periods, and the associated evapotranspiration, can lead to loss of moisture in soil and impact vegetation and crops.

The National Drought Mitigation Center's (NDMC) website contains the Drought Impact Reporter, which compiles and categorizes the impacts of reported droughts. As seen in the figures below, from 2015 through the beginning of 2020, Lee County had 8 drought reports, Scott County had 9 drought reports, and Wise County had 7 drought reports. These reports were classified by the NDMC as impacts because they caused an observable loss or change at a specific place and time. Recorded drought impacts in the LENOWISCO Planning District have included agricultural, energy, fire, plants and wildlife, relief, response and restrictions, and water supply and quality.

FIGURE: Droughts Impacts in Lee County, 2015-2020

Source: <https://droughtreporter.unl.edu/map/>





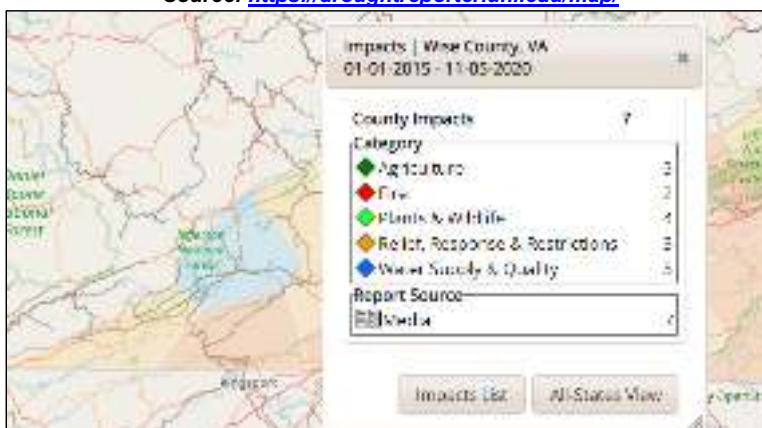
FIGURE: Droughts Impacts in Scott County, 2015-2020

Source: <https://droughtreporter.unl.edu/map/>



FIGURE: Droughts Impacts in Wise County, 2015-2020

Source: <https://droughtreporter.unl.edu/map/>



Impact on LENOWISCO Residents

Droughts do not often directly contribute to serious injuries or death, but some secondary hazards such as extreme heat or wildfire could create health problems or otherwise threaten residents. There are typically months of warning time leading up to severe drought events.



Impact on Essential Facilities, Critical Infrastructure, and Future Assets

All essential facilities are vulnerable to minor damages from drought, as they will encounter many of the same impacts as any other building within the jurisdiction. These impacts include water shortages, fires as a result of drought conditions, and inhabitants in need of medical care from the heat and dry weather. No structural damage to existing building stock is expected due to drought, however. Critical infrastructure will be minimally impacted by drought, as most impacts, if any, would be secondary in nature.

Severe droughts can create water shortages and lead to water restrictions. They may also contribute to reduced electricity production from hydroelectric dams. Most impacts on critical infrastructure are minimal and are related to secondary impacts.

Future Conditions

Higher temperatures and increasing variation in precipitation patterns are likely to increase the vulnerability of jurisdictions to extreme events along with compounding already existing stressors. Drought has been identified as a slow-moving stressor that contributes to acute and chronic mental health impacts such as anxiety and depression. The Virginia HMP (2018) notes that information provided by the Governor's Climate Commission indicates that Virginia is "moving towards more widespread impacts under the driest conditions." Drought data is not conclusive that chronic or increased drought conditions already have or will definitely evolve in

The Virginia HMP (2018) also warns that there is sufficient evidence to cause concern and to monitor future drought conditions. Additional concerns correlated to increased drought conditions are worsening effects of invasive species, insect pests, and plant disease as trees experience periodic moisture stress (EPA, 2016).

Impact on the Environment

Droughts can have a significant impact on local hydrology for both humans and animals. Droughts can reduce water quality when natural bodies of water are less able to dilute pollutants. Changes in salinity, bacteria, temperature, or pH in the water can affect the aquatic habitat. Water shortages decrease water supply and subsequently food supplies, working its way through the food chain and increasing mortality and diseases. Additionally, common impacts of drought may include diminished crop yield, erosion, wildfires, livestock reduction, and other ecosystem damages.

Impact on Operations

Most first responder operations should experience relatively little interruption during a drought event. Medical facilities may experience an increase in residents in need of medical care from the heat and dry weather, but this would only be true in extreme cases. Should a severe, prolonged drought event occur, firefighting efforts in urban or suburban areas may become more difficult, as using other chemicals or methods instead of water are not always appropriate.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Drought hazard.

Frequency & Probability ¹			Not Probable At All / Not Frequent At All	
Potential Magnitude and Scale ²			Minimally Vulnerable	
Physical Vulnerability Hazard Impact ²			Somewhat Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Minimally Capable	
Hazard Consequence & Impact Score ²			Somewhat Vulnerable	
Overall Risk Rating ⁴			Medium	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.4 Earthquake

The [U.S. Geological Survey \(USGS\)](#) defines earthquakes as ground shaking caused by the sudden release of accumulated strain by an abrupt shift of rock along a fracture in the earth or by volcanic or magmatic activity, or other sudden stress changes in the earth. Earthquakes cause both vertical and horizontal ground shaking which varies both in amplitude (the amount of displacement of the seismic waves) and frequency (the number of seismic waves per unit time), usually lasting less than 30 seconds. Earthquakes are measured both in terms of their inherent magnitude and in terms of their local intensity.

Virginia is near the center of the North American Plate and as such experiences a lower rate of seismic activity than plate boundaries. Earthquake activity within a tectonic plate (intraplate seismicity) can still cause extensive and severe damage. The area where the sudden rupture takes place is called the focus or hypocenter of the earthquake, which on the surface is called the earthquake epicenter. Earthquakes in Virginia typically occur between 3-15 miles below the surface.

There are two distinct seismic zones that are of significant relevance to the LENOWISCO Planning District:

- **Southern Appalachian Seismic Zone (East Tennessee Seismic Zone):** This zone is subject to frequent but small earthquakes and is the second most active seismic zone east of the Rocky Mountains. The zone has not recorded an earthquake greater than a magnitude 5.0 on the Richter Scale but has the potential to generate an earthquake with a magnitude of 7.5.
- **Giles County Seismic Zone:** Residents in this seismic zone have experienced small earthquakes, as well as infrequent larger events that cause some damage. There have been several events in the seismic zone that were felt across southwestern Virginia, typically occurring once every 10-20 years.



Hazard Extent

Both the intensity and magnitude of an earthquake provide measures for severity.

Intensity is the subjective observation of the effects of ground shaking and can vary based on site-specific factors and local geologic features, as well as the distance from the earthquake epicenter. Intensity is most commonly expressed using the Modified Mercalli Intensity Scale (described in the table below). Mercalli intensity is assigned based on eyewitness accounts. More quantitatively, the intensity may be measured in terms of peak ground acceleration (PGA) expressed relative to the acceleration of gravity (g) and determined by seismographic instruments.

TABLE: Abbreviated Modified Mercalli Intensity Scale	
Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations are similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows are broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys are broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects are thrown into the air.

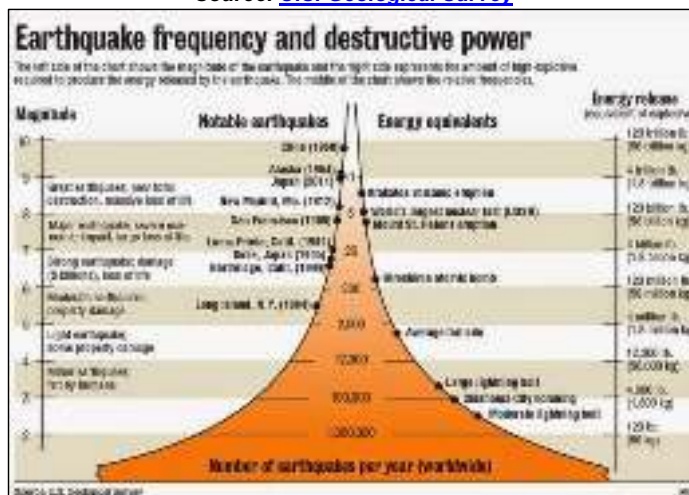


Magnitude is the amount of seismic energy released at the hypocenter of the earthquake, beneath the surface. Magnitude is represented by a single value determined by the earthquake waves recorded on instruments. Magnitude may be expressed using the familiar Richter Scale or using the moment magnitude scale (MMS) now favored by most technical authorities. Both the Richter Scale and the MMS are based on logarithmic formula meaning that a difference of one unit on the scales represents about a thirty-fold difference in the amount of energy released (and, therefore, potential to do damage). On either scale, significant damage can be expected from earthquakes with a magnitude of about 5.0 or higher. The table below compares an earthquake's magnitude with its relative intensity, as measured by the Modified Mercalli Scale.

TABLE: Earthquake Magnitude vs. Modified Mercalli Intensity Scale	
Earthquake Magnitude	Typical Maximum Modified Mercalli Intensity
1.0-3.0	I
3.0-3.9	II-III
4.0-4.9	IV-V
5.0-5.9	VI-VII
6.0-6.9	VII-IX
7.0 and higher	VIII or higher

The figure below illustrates the magnitude and associated release of energy for earthquake events based on frequency. Most earthquake events, including those in southwestern Virginia, are low magnitude, only periodically noticeable to humans.

FIGURE: Earthquake Magnitude and Energy Release
Source: [U.S. Geological Survey](#)

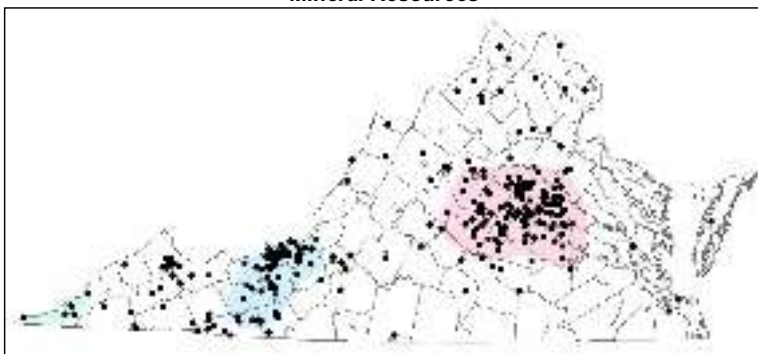




History/Previous Occurrences

There has been one federal disaster declaration for an earthquake in Virginia, in addition to several recorded historical events. The map below illustrates the locations of known earthquake epicenters in Virginia, including several in the LENOWISCO Planning District. There has been no recorded structural damage within the District from an earthquake event.

FIGURE: Earthquake Epicenters in Virginia
Source: Virginia Department of Mines, Minerals, and Energy - Division of Geology and Mineral Resources



As shown in the figure below, there is no record of an earthquake centered in the LENOWISCO Planning District since 1950 in the USGS record. Some earthquakes have occurred just outside of the District, in Kentucky, Tennessee, and other parts of Virginia, that can be felt inside the District. The map below shows every earthquake in the surrounding areas since 1950 that is greater than 2.5 in magnitude.

FIGURE: Historical Earthquakes near the LENOWISCO Planning District

Source: <https://earthquake.usgs.gov/earthquakes/search/>



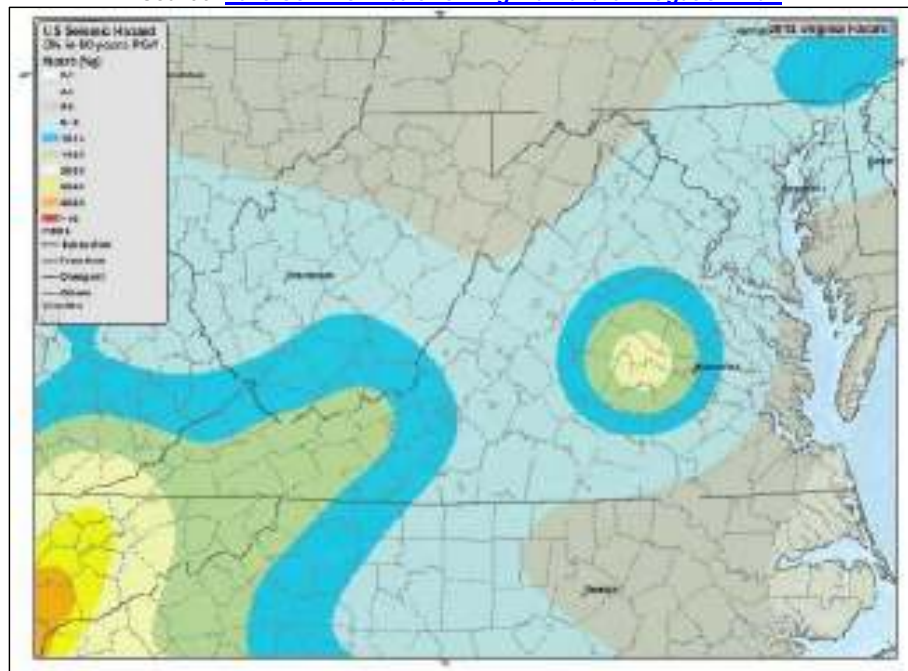


Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Minimally Probably/Minimally Frequent**, because this hazard was determined to be extremely rare with little to no documented history of significant occurrences or events. While it is possible that low impact events may occur on occasion, the hazard's overall impact on the District and participating jurisdictions would be very minor. The overall risk ranking for this hazard is **Medium**. A complete analysis of earthquake probability, using FEMA's HAZUS advanced level analysis tool, for the LENOWISCO Planning District is available at the end of this section.

The severity of an earthquake is based on site-specific factors, including distance from the epicenter, soil type, and more. A moderate magnitude earthquake in either seismic zone of southwestern Virginia is a low probability event, but one that could cause significant impacts and disruptions. A moderate earthquake can damage unreinforced buildings, their contents, and operations. Buildings in low probability earthquake regions are often not designed to withstand a moderate or significant earthquake event. The map below illustrates the probabilistic ground motion, assessing the intensity and frequency of seismic events. This potential is expressed as percent peak ground acceleration (% PGA) over a period of years.

FIGURE: Virginia Seismic Hazard: 2 Percent in 50 Years PGA Hazard
Source: [2018 Commonwealth of Virginia Hazard Mitigation Plan](#)





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The 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP) outlines a ranking of each jurisdiction in the LENOWISCO Planning District based on various risk factors. The City of Norton is the only jurisdiction in the LENOWISCO Planning District with an earthquake risk of "Medium-Low", according to the Commonwealth of Virginia HMP. All other jurisdictions have a "Low" risk ranking.

TABLE: Earthquake Hazard Ranking Parameters Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Low	Low	Medium-Low	Low	Medium-Low
Lee County	Medium	Low	Low	Low	Low	Medium	Low	Low
Scott County	Medium	Low	Low	Low	Low	Medium-Low	Low	Low
Wise County	Medium	Medium	Low	Low	Low	Medium	Low	Low



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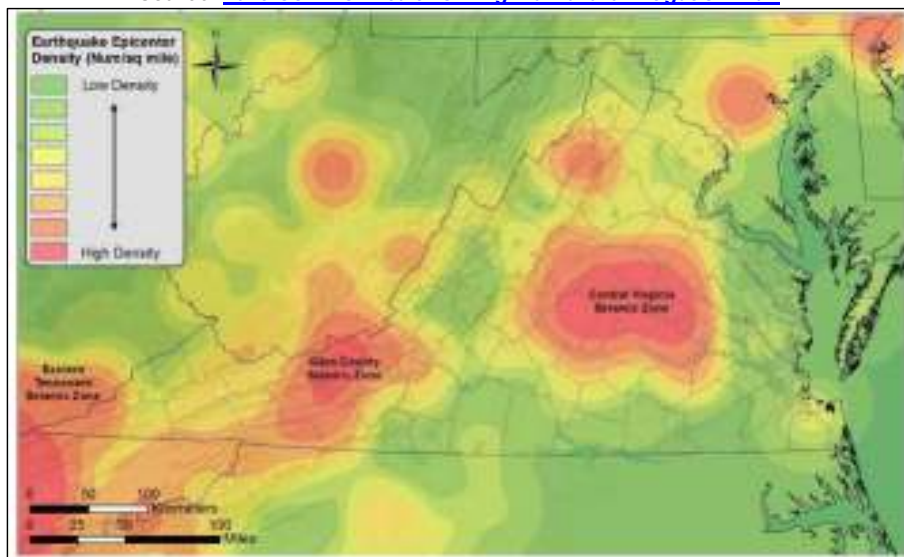


Geographic Location

An earthquake can impact all jurisdictions within the LENOWISCO Planning District, but some areas have a higher probability for significant ground shaking due to their proximity to active seismic zones. The map below shows the main zones in Virginia that are most susceptible to earthquakes. These zones are believed to be sources of most M>6 earthquakes during the past 1.6 million years around Virginia, though there has never been a quake of that magnitude recorded in Virginia.

FIGURE: Virginia Earthquake Epicenter Density

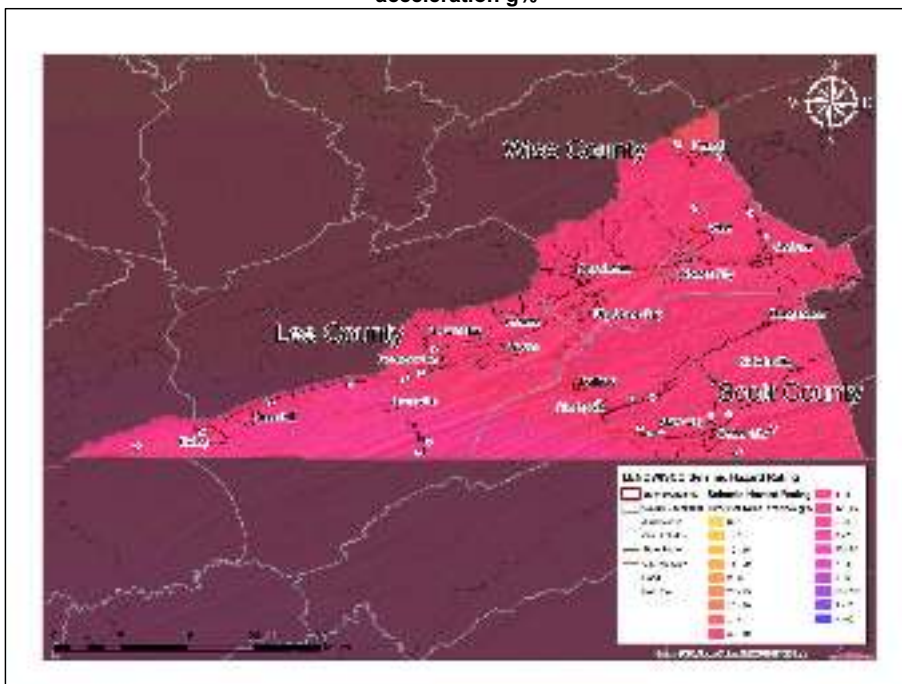
Source: [2018 Commonwealth of Virginia Hazard Mitigation Plan](#)





Lee County is located entirely within the Eastern Tennessee Seismic Zone, with the southern portion of Lee County being at the highest risk. Furthermore, the southeastern portion of Scott County is located within the Giles County Seismic Zone. As shown in the map below, Lee County and southwestern Scott County have some of the highest potentials for ground motion in the District, and therefore potential impacts, from an earthquake event. While the areas discussed are of particular concern, any seismic event in the region may have impacts throughout the District.

Figure: LENOWISCO Planning District Seismic Hazard Risk map based on ground acceleration g%



Loss Estimates

Only one major earthquake has been recorded in Virginia in recent history - a 5.8 magnitude event in 2011 in Louisa County, located in the Central Virginia Seismic Zone. The event caused a reported \$200-300 million dollars in damages and resulted in a Federal Disaster Declaration. The 2018 Commonwealth of Virginia HMP includes a detailed HAZUS-MH scenario of the 2011 event, detailing building and infrastructure damages. The scenario resulted in damages across the entire state, with the most significant impacts on residential buildings. Additionally, the scenario anticipated significant damages to bridges and school buildings, and moderate damage to water, wastewater, and natural gas utility lines.



The 2018 Commonwealth of Virginia HMP estimated losses across the region using HAZUS-MH based on a 2,500-year event, or a 0.04% annual risk. Such an event would create significant economic and structural losses, in addition to social impacts. Given the event details, the expected annualized losses for jurisdictions in the LENOWISCO Planning District were low. All three counties are expected to see less than \$25,000 in annualized losses, the lowest bracket for the State. Estimated losses are included in the table below.

TABLE: 2,500-year Earthquake Scenario Expected Annualized Loss by Jurisdiction <i>Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan</i>	
Jurisdiction	Annualized Loss
City of Norton	\$3,280
Lee County	\$11,981
Scott County	\$12,506
Wise County	\$19,669

Using a region-specific HAZUS earthquake probability advanced level analysis for a magnitude 5.0 event impacting the LENOWISCO Planning District, the total economic loss estimated for the earthquake is \$1,610,000, which includes building and lifeline related losses based on the region's available inventory. At the end of this section is more detailed information about these losses, which can be broadly grouped into three categories: business interruption, and transportation and utility lifeline losses.

Vulnerability and Community Development Analysis

An earthquake with a magnitude of 5.0 or greater poses potential impacts. Fatalities, injuries, and significant property damage are all possible vulnerabilities. Earthquakes can also trigger other events, such as landslides, dam failures, and subsequent flooding, and more. Historically, Virginia's recorded earthquakes have been magnitude 4.5 or less with minor damage such as cracks in foundations and falling chimneys ([DMME](#)). If Virginia experienced a larger magnitude event, at 6.0 or greater, it could lead to the collapse of bridges or tall buildings, damaged reservoirs and subsequent flash flooding, electrical fires, or damaged pipelines and waterlines.

The following sections include estimated impacts using a HAZUS earthquake probability advanced level analysis for a magnitude 5.0 event impacting the entire District.

Impact on LENOWISCO Residents

Residents who live or work in buildings that are not designed to withstand moderate to severe shaking from an earthquake event would be most at risk. Poorly built facilities will suffer structural damages at much lower levels of shaking than otherwise. Residents would be impacted by damaged or collapsed buildings, disrupted power and utilities, limited or restricted transportation, and the potential unavailability of first responders.

Economic losses for residents and businesses stem from the destruction of structures and infrastructure, interruption of business activity, and more. A severe earthquake event would contribute to widespread and significant losses. On the other hand, mild earthquakes cause little to no business disruption.



Casualties

HAZUS estimates the number of people that will be injured and killed by a magnitude 5 earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can be life-threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The table below provides a summary of the casualties estimated for this earthquake. The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM, and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial, and industrial sector loads are maximum and 5:00 PM represents peak commute time.

TABLE: LENOWISCO Planning District Earthquake Casualty Estimates					
Source: HAZUS Advanced Analysis, January 2021					
Scenario Details		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.00	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.00	0.00	0.00	0.00
	Other-Residential	0.20	0.01	0.00	0.00
	Single-Family	0.40	0.03	0.00	0.00
	Total	0.60	0.04	0.0	0.0
2 PM	Commercial	0.26	0.02	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.07	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.04	0.00	0.00	0.00
	Other-Residential	0.06	0.00	0.00	0.00
	Single-Family	0.12	0.01	0.00	0.00
	Total	0.55	0.02	0.00	0.00
5 PM	Commercial	0.19	0.02	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.02	0.00	0.00	0.00
	Other-Residential	0.08	0.00	0.00	0.00
	Single-Family	0.15	0.02	0.00	0.00
	Total	0.47	0.04	0.00	0.00



Impact on Essential Facilities, Critical Infrastructure, and Future Assets

All essential facilities are vulnerable to earthquakes. An essential facility would encounter many of the same impacts as any other building within the District. These impacts include structural failure and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). Areas along rivers or other bodies of water are more susceptible to liquefaction and land shaking which can cause buildings to tilt or sink into the ground. The HAZUS earthquake probability analysis for the District estimates that no essential facilities would experience damage of greater than 50% - detailed in the table below.

TABLE: Expected Damage to Essential Facilities Source: HAZUS Advanced Analysis, January 2021				
Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on Day 1
Hospitals	7	0	0	4
Schools	49	0	0	49
EOCs	3	0	0	3
Police Stations	17	0	0	15
Fire Stations	32	0	0	32

During an earthquake, the impacts on infrastructure could include broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to the community); and railway failure from broken or impassable railways. Bridges also could fail or become impassable, causing traffic risks. It is also possible that power disruptions due to earthquakes could affect communication infrastructure.

Future development, including buildings and infrastructure, should be designed to withstand the impacts of a moderate to significant magnitude earthquake. Any structures not designed to seismic standards are at greater risk of collapse or damage.

Future Conditions

The impacts of climate variation on earthquake probability are unknown. The Virginia HMP (2018) notes that the primary concern is secondary impacts of earthquakes, such as further liquefaction from soils saturated by severe storms and flooding.

Impact on the Environment

In the event of an earthquake, environmental impacts would most likely stem from secondary hazards such as hazardous materials spills or broken utility lines. Major earthquakes can cause significant land and vegetation deformation, but a mild earthquake will cause minimal environmental damage.

Impact on Operations

A major earthquake event may lead to damaged water and energy lines, leading to a disruption in emergency response services. Additionally, road or transportation system damages could



limit evacuation efforts or the ability of first responders to reach injured persons. A severe event would place significant stress on local emergency operations, requiring most police, fire, and emergency medical personnel, overwhelming or potentially disabling disaster services. Mild earthquakes would have little impact on operations.



HAZUS Earthquake Probability Analysis Loss Estimates

The tables provide details on estimated losses for the LENOWISCO Planning District based on a HAZUS earthquake probability analysis for a magnitude 5.0 event.

Building-Related Losses

The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. Business interruption losses are the losses associated with the inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

HAZUS estimates that about 49 buildings will be at least moderately damaged. This is well under 1% of the buildings in the region. No buildings are estimated to be damaged beyond repair. The tables below summarize the expected damage and loss. The total building-related losses were \$4.73 million. By far, the largest loss was sustained by the residential occupancy category which made up over 55% of the total loss.

TABLE: Expected Building Damage by Occupancy Source: HAZUS Advanced Analysis, January 2021										
Building Occupancy Type	None		Slight		Moderate		Extensive		Complete	
	Count	%	Count	%	Count	%	Count	%	Count	%
Agriculture	62.69	99%	0.23	0%	0.06	0%	0.00	0%	0.00	0%
Commercial	1,265.85	99%	5.62	0%	1.38	0%	0.15	0%	0.00	0%
Education	97.52	99%	0.40	0%	0.09	0%	0.00	0%	0.00	0%
Government	77.54	99%	0.45	0%	0.08	0%	0.00	0%	0.00	0%
Industrial	300.57	99%	1.13	0%	1.62	0%	0.03	0%	0.00	0%
Other Residential	10,095.88	99%	97.07	0%	21.51	0%	0.16	0%	0.00	0%
Religion	173.13	0%	0.67	0%	0.19	0%	0.03	0%	0.00	0%
Single-Family	29,332.05	99%	83.80	0%	21.70	0%	2.33	0%	0.13	0%
Total	41,405.23	99%	189.37	0%	46.63	0%	2.70	0%	0.13	0%



TABLE: Building-Related Economic Loss Estimates (Millions of Dollars)

Source: HAZUS Advanced Analysis, January 2021

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0148	0.0455	0.0011	0.0084	0.0698
	Capital-Related	0.0000	0.0062	0.0327	0.0006	0.0011	0.0407
	Rental	0.0450	0.0185	0.0278	0.0006	0.0018	0.0937
	Relocation	0.1574	0.0385	0.0356	0.0036	0.0155	0.2506
	Subtotal	0.2024	0.1491	0.1416	0.0059	0.0268	0.4541
Capital Stock Losses							
	Structural	0.2404	0.0698	0.0578	0.0089	0.017	0.3494
	Non-Structural	0.5538	0.0988	0.0414	0.0064	0.0181	0.4416
	Content	0.0236	0.0041	0.0078	0.0027	0.0029	0.0411
	Inventory	0.0000	0.0000	0.0000	0.0005	0.000	0.0000
	Subtotal	1.6356	0.4192	0.1772	0.0986	0.0641	0.8321
Total		2.1448	0.4903	0.3188	0.1046	0.0910	1.5869



Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, HAZUS computes the direct repair cost for each component only. There are no losses computed by HAZUS for business interruption due to lifeline outages. The losses for the transportation and utility systems are displayed separately below.

TABLE: Expected Damage to the Transportation Systems Source: HAZUS Advanced Analysis, January 2021						
System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	48	0	0	48	48
	Bridges	320	0	0	444	444
	Tunnels	0	0	0	0	0
Railways	Segments	169	0	0	207	207
	Bridges	211	0	0	211	211
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	4	0	0	4	4
	Runways	2	0	0	2	2



TABLE: Transportation System Economic Losses (Millions of Dollars)
Source: HAZUS Advanced Analysis, January 2021

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1,892.0217	0.0000	0.00
	Bridges	753.0123	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Subtotal	2,645.034	0.0000	0.00
Railways	Segments	530.1004	0.0000	0.00
	Bridges	927.2976	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	1,457.398	0.0000	0.00
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	0.00
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	0.00
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	0.00
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	0.00
Airport	Facilities	17.5789	0.0466	0.92
	Runways	75.4195	0.0000	0.00
	Subtotal	92.9984	0.0466	0.92
Total (Millions of Dollars)		93.035		0.92



TABLE: Expected Utility System Facility Damage
Source: HAZUS Advanced Analysis, January 2021

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	With Functionality > 50%	
				After Day 1	After Day 7
Potable Water	10	0	0	10	10
Wastewater	46	0	0	46	46
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	13	0	0	13	13

TABLE: Expected Utility System Pipeline Damage (Site Specific)
Source: HAZUS Advanced Analysis, January 2021

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	11,138	3	0
Wastewater	6,683	0	0
Natural Gas	2,997	0	0
Oil	0	0	0

TABLE: Expected Potable Water and Electric Power System Performance
Source: HAZUS Advanced Analysis, January 2021

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	35,902	0	0	0	0	0
Electric Power		0	0	0	0	0



TABLE: Utility System Economic Losses (Millions of Dollars)

Source: HAZUS Advanced Analysis, January 2021

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00000	0.0000	0.00
	Facilities	309.69	0.0112	0.00
	Distribution Lines	358.5103	0.0091	0.00
	Subtotal	668.2003	0.0203	0.00
Wastewater	Pipelines	0.0000	0.0000	0.00
	Facilities	4,524.8613	0.2338	0.00
	Distribution Lines	215.1062	0.0045	0.00
	Subtotal	9,479.407	0.2383	0.00
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.1659	0.00
	Distribution Lines	143.4041	0.0025	0.00
	Subtotal	143.4041	0.1684	0.00
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	0.00
Electrical Power	Facilities	796.0858	0.0115	0.00
	Subtotal	796.0858	0.0115	0.00
Communication	Facilities	1.209	0.0000	0.00
	Subtotal	1.209	0.0000	0.00
Total (Millions of Dollars)		11,084.3062	0.4385	0.00



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Earthquake hazard.

Frequency & Probability ¹			Not Probable At All / Not Frequent At All	
Potential Magnitude and Scale ²			Minimally Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Minimally Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			Medium	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.5 Flooding

Flooding is defined by the National Weather Service (NWS) as the inundation of normally dry areas because of increased water levels in an established watercourse. Two types of flooding events are included in this plan:

- **Riverine or Stream Flooding:** Riverine flooding occurs when a channel receives more water than it can hold, and the excess water flows over its banks and inundates low-lying areas, causing a flood (FEMA 2007). Riverine flooding can occur due to rapid snowmelt or prolonged or heavy rainfall, which is also a cause of flash flooding.
- **Flash Flooding:** Flash floods result from a large amount of rain in a short period of time, typically within six hours of an event (NWS 2009). This type of event is particularly hazardous in mountainous areas or other places with restricted floodplain storage. More urbanized areas may see flash flooding due to a lack of permeable surfaces.

Flooding can be natural, human-caused, or a combination of both. Human-caused flooding includes dam failure, levee failure, and activities that increase the rate and amount of runoff, such as paving, reducing ground cover, and clearing forested areas. The amount of damage caused by a flood is influenced by the speed and volume of the water flow, the length of time the impacted area is inundated, the amount of sediment and debris carried and deposited, and the amount of erosion that may take place.

Flooding is a dynamic natural process. Along rivers, streams, and coastal bluffs, a cycle of erosion and deposition is continuously rearranging and rejuvenating the aquatic and terrestrial systems. Although many plants, animals, and insects have evolved to accommodate and take advantage of these ever-changing environments, property and infrastructure damage often occurs when people develop coastal areas and floodplains, and natural processes are altered or ignored.

Flooding can also threaten life, safety, and health and often results in substantial damage to infrastructure, homes, and other property. The extent of damage caused by a flood depends on the topography, soils, and vegetation in an area, the depth and duration of flooding, velocity of flow, rate of rising, and the amount and type of development in the floodplain.

Flood Terminology

Several flood-related terms are frequently used in this plan and are defined below.

- **Flood Insurance Study (FIS):** A Flood Insurance Study is the official report provided by the Federal Insurance Administration, which provides flood profiles, the flood boundary-floodway map, and the water surface elevation of the estimated 100-year base flood.
- **Flood Insurance Rate Map (FIRM):** The Flood Insurance Rate Maps (FIRM) are the official maps on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.
- **100-year Base Flood:** Base Flood means a flood having a 1% chance of being equaled or exceeded in any given year. Also referred to as the 100-year flood. Since the 100-year flood level is statistically computed using existing data, as more data comes in, the level of the 100-year flood will change. As more data are collected, or when a river basin is altered in a way that affects the flow of water in the river, re-evaluation is needed.



Alterations can include dams and urban development, and other human-made changes in a basin that affect floods (USGS).

- **500-year Flood:** a flood that has a 0.2% of being equaled or exceeded each year. The nomenclature can be confusing and does not mean this flood will only happen every 500 years. This type of flood has at least a 6% of occurring in a 30-year time period with the 100-year flood.
- **Floodplain:** A floodplain is an area adjacent to a lake, river, stream, estuary, or another water body that is subject to flooding. If left undisturbed, the floodplain serves to store and discharge excess floodwater. In riverine systems, the floodplain includes the floodway.
- **Floodway:** Floodway means the channel of a river or other watercourse and the adjacent areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation by more than one foot.

Flooding in Virginia

According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan, 38 of the 64 federal disaster declarations in the state between 1957 and 2016 included flooding impacts. Flooding is one of the most common hazards in Virginia, and the western parts of the state are most at risk of riverine flooding and occasional flash flooding. Flooding can occur at any time of the year in Virginia, but heavy rains from hurricanes, tropical systems, and seasonal rain patterns are most common in the spring, summer, and fall.

The Virginia Department of Emergency Management operates the Integrated Flood Observation and Warning System (IFLOWS) network consisting of 279 rain gauges and 72 stream gauges located primarily along the I-81 corridor in western Virginia. The gauges collect and report data in real-time to local, state, and federal agencies. The National Weather Service relies on the system to issue updates and warnings of potential flooding hazards.

Flooding in the LENOWISCO Planning District

Flooding is the most significant and frequent natural hazard in the LENOWISCO Planning District, especially flash flooding after a period of intense or sustained rainfall. The District is a mountainous region with steep ridges and pronounced valleys, with three major water basins – the Clinch, Powell, and Holston river basins. Several streams and tributaries are located within these basins. The Pound River and other smaller tributaries located in the northeastern portion of the district drain into the Levisa Fork of the Big Sandy River.

The highly mountainous terrain and associated steep slopes cause rainwater to run off rapidly, quickly filling streambeds. Flood-producing storms can occur throughout the year; historically, however, the most common months for significant flooding are 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.



FIGURE: Commonwealth of Virginia Watersheds
Source: Virginia Department of Conservation and Recreation



Hazard Extent

Under the National Flood Insurance Plan (NFIP), the Federal standard for floodplain management is the 100-year floodplain. This area is chosen using historical data such that in any given year, there is a 1% chance of a Base Flood (also known as 100-year Flood or Regulatory Flood). Flood Insurance Rate Maps (FIRMs) identify flood zones through detailed hydrologic and hydraulic studies. These zones represent the areas susceptible to the 1% annual chance flood, or 100-year flood. Where possible, FEMA also determines a Base Flood Elevation (BFE) for the 100-year floodplain, which is the calculated elevation of flooding during this event and a commonly used standard for determining flood risk and managing potential floodplain development. These maps provide a more definitive representation of the highest flood risks in the communities. All jurisdictions in Virginia now have digitized FIRMs, available online through the [Virginia Flood Risk Information System \(VFRIS\)](#).

NFIP Participation

All jurisdictions in the LENOWISCO Planning District participate in NFIP except the Town of Nickelsville in Scott County. The district has no communities within the 100-year flood plain hazard areas that are not participating in the NFIP and no communities under suspension or revocation of participation in the NFIP.

Currently, no jurisdiction in the LENOWISCO Planning District participates in the Community Rating System (CRS). To encourage communities to go beyond the minimum requirements and further prevent and protect against flood damage, the NFIP established the CRS. To qualify for CRS, communities can do things like make building codes more rigorous, maintain drainage systems, and inform residents of flood risk. In exchange for becoming more flood ready, the CRS community's residents are offered discounted premium rates. Based on the community's CRS ratings, they can qualify for up to a 45% discount on annual flood insurance premiums ([FEMA, 2020](#)).



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History/Previous Occurrences

During the analysis timeframe (2015-2020) for the HMP update, 12 events were recorded in the NOAA National Centers for Environmental Information (NCEI) Database. Most of the events impacted multiple areas in the LENOWISCO Planning District. For the reported events, property damage totaled \$225,500.

TABLE: Flood and Flash Flood Events in LENOWISCO from 01/01/2015 to 10/01/2020								
Source: www.ncdc.noaa.gov/stormevents								
Jurisdiction	Event Type	Dates of Occurrence	Direct Deaths	Direct Injuries	Reported Property Damage	Reported Crop Damage	Indirect Deaths	Indirect Injuries
City of Norton	Flood	3/4/2015 3/5/2015 2/10/2018	0	0	\$8,000 \$30,000 \$5,000	\$0	0	0
	Flash Flood	8/8/2016	0	0	\$3,000	\$0	0	0
Lee County	Flood	3/4/2015 2/10/2018 2/6/2020	0	0	\$500 \$0 \$0	\$0	0	0
Scott County	Flood	3/5/2015 4/23/2017 2/10/2018	0	0	\$1,000 \$1,000 \$0	\$0	0	0
	Flash Flood	5/27/2017 4/19/2019	0	0	\$1,000 \$0	\$0	0	0
Wise County	Flood	3/4/2015 4/22/2017 2/10/2018 2/6/2020	0	0	\$20,000 \$0 \$7,000 \$196,000	\$0	0	0
	Flash Flood	7/27/2016 5/26/2018 6/26/2018	0	0	\$6,000 \$0	\$0	0	0



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Event Details

- **March 4-5, 2015:** An unusually deep snowpack across southwest Virginia underwent melting from warming temperatures and liquid rain falling upon it. Flooding in low-lying areas, streams, and rivers resulted and became widespread. Flooding closed numerous roads across all three counties in the District. Some homes and structures reported flooding in the City of Norton and Wise County. One mobile home was destroyed in the City of Norton due to a mudslide, but no injuries were reported. Across the LENOWISCO Planning District, this flooding event caused a reported \$59,500 in property damages.
- **July 27, 2016:** Wise County experienced flash flooding from summer convection. Water entered several homes and covered several roadways, causing a reported \$6,000 in property damage.
- **August 8, 2016:** The City of Norton experienced flash flooding due to summer thunderstorms, resulting in several flooded roadways and affected businesses. The event caused a reported \$3,000 in property damage.
- **April 22-23, 2017:** Scott and Wise counties experienced heavy rain leading to some flooding near Banner and Gate City, resulting in road closures and a reported \$1,000 in property damage.
- **May 27, 2017:** A summer storm event causes flooding in northern Scott County, resulting in high water across roadways and a reported \$1,000 in property damage.
- **February 10, 2018:** A weather front brought unseasonably warm and humid conditions to the entirety of southwest Virginia, resulting in heavy rains across the District. Subsequent flooding led to multiple road closures across all three counties, as well as mudslides in Wise County. Some residents were evacuated in Big Stone Gap, and there was one water rescue in Powell Valley, with no injuries. The event resulted in a reported \$12,000 in property damage across the District.
- **May 26, 2018:** Isolated flooding in Wise County with some road closures but no reported property damage.
- **June 26, 2018:** Isolated flooding in Wise County with some road closures but no reported property damage.
- **April 19, 2019:** Isolated flooding in Scott County with some road closures but no reported property damage.
- **February 6, 2020:** A low-pressure system causes heavy rainfall of 5-6" across both Lee and Wise counties. Flooding closed several roadways and highways, with the most significant damage near Big Stone Gap causing a reported \$196,000 in property damage.
- A more detailed spreadsheet of recent events can be accessed through [this link](#).

Additional flood history and data are organized by watershed. All counties in the LENOWISCO Planning District have portions in multiple watersheds.



Clinch River Basin

The flood stage for the Clinch River Basin near Speers Ferry in Scott County is 18 feet, which has been exceeded 61 times according to NWS Advanced Hydrologic Prediction Service records, including seven events during the HMP analysis period (2015-2020). Three recorded events have exceeded the major flood stage threshold of 32 feet, with a record-high crest of nearly 37 feet in April 1977. The most significant flooding event during the HMP analysis period was on April 7, 2020, with a crest of 28.52 feet, and on March 5, 2015, with a crest of about 28 feet. Both events exceeded the moderate flood stage threshold. The table below includes the top 30 events on the Powell River.

TABLE: Historic Crest Heights on the Clinch River Source: NWS Advanced Hydrologic Prediction Service		
Flood Category	Crest Height	Date
Major Flood Stage (32 ft)	36.69 ft	4/5/1977
	33.0 ft	2/1/1962
	32.3 ft	3/19/2002
Moderate Flood Stage (28 ft)	29.93 ft	3/12/1963
	28.92 ft	1/30/1957
	28.52 ft	3/7/2020
	28.19 ft	3/17/1973
	28.10 ft	3/5/2015
Flood Stage (18 ft)	27.60 ft	2/28/1902
	27.43 ft	12/31/1969
	27.23 ft	1/26/1978
	27.0 ft	2/11/1994
	26.80 ft	2/11/2018
	26.64 ft	2/24/2019
	26.54 ft	5/7/1984
	25.85 ft	2/3/1923
	25.60 ft	4/24/2017
	25.19 ft	3/30/1975
	24.70 ft	12/22/1926
	24.50 ft	2/17/2003
	24.43 ft	3/7/1967
	24.20 ft	4/17/1998
	23.95 ft	5/7/1958
	23.61 ft	5/8/1971
	23.60 ft	12/11/1972
	23.50 ft	1/8/1946
	23.32 ft	4/13/2020
	23.16 ft	2/18/1944
	23.10 ft	1/30/1932
	23.10 ft	2/2/1950



Powell River Basin

The flood stage on the Powell River Basin at Jonesville is 18 feet, which has been exceeded 53 times according to NWS Advanced Hydrologic Prediction Service records. During the HMP analysis period (2015-2020), there have been six events exceeding the flood stage. Moderate flood stage is 30 feet, which has been exceeded seven times, with no events during the HMP analysis period. The table below includes the top 30 events on the Powell River.

TABLE: Historic Crest Heights on the Powell River		
Source: NWS Advanced Hydrologic Prediction Service		
Flood Category	Crest Height	Date
Major Flood Stage (35 ft)	44.32 ft	4/5/1977
Moderate Flood Stage (30 ft)	33.36 ft	3/12/1963
	33 ft	1/18/1918
	32.4 ft	3/18/2002
	32.16 ft	12/31/1969
	30.8 ft	1/8/1946
	30.12 ft	2/16/2003
	29.3 ft	2/11/2018
Flood Stage (18 ft)	29.03 ft	3/7/1967
	27.19 ft	2/6/2020
	26.78 ft	1/30/1957
	26.75 ft	3/17/1973
	26.59 ft	2/11/1994
	26.2 ft	3/5/2015
	25.85 ft	2/14/1948
	25.64 ft	1/30/1932
	25.64 ft	2/18/1944
	25.59 ft	5/7/1984
	24.28 ft	2/3/1939
	24.04 ft	1/11/1974
	23.73 ft	3/6/1963
	23.62 ft	12/10/1971
	23.53 ft	4/16/1956
	22.75 ft	4/28/1970
	22.59 ft	2/3/1937
	22.53 ft	1/31/1950
	22.07 ft	4/6/1936
	21.7 ft	2/13/1966
	21.6 ft	3/26/1965
	21.2 ft	4/24/2017



Holston River Basin

The flood stage on the North Fork of the Holston River at Gate City is 12 feet, which has been exceeded 43 times according to NWS Advanced Hydrologic Prediction Service records. Moderate flood stage is 15 feet, which has been exceeded 16 times, including four events during the HMP analysis period (2015-2020). Four historic events have reached major flood stage, exceeding 18 feet, with the most significant event in 1962 with a recorded crest height of more than 22 feet. One event, on April 24, 2017, during the HMP analysis period reached major flood stage. The table below includes the top 30 events on the Powell River.

Big Moccasin Creek, and its major tributary Little Moccasin Creek, are part of the Holston River Basin and have a long history of significant flooding. Big Moccasin Creek is fed by tributaries originating from high mountain ridges throughout the drainage area. Steep mountainous terrain allows for a high potential for rapid flooding following a moderate to significant rain event or spring snowmelt. The NWS does not record historic crests on the Big Moccasin Creek.

TABLE: Historic Crest Heights on the North Fork of the Holston River Source: NWS Advanced Hydrologic Prediction Service		
Flood Category	Crest Height	Date
Major Flood Stage (18 ft)	22.50 ft	2/1/1862
	19.79 ft	4/5/1977
	19.36 ft	3/19/2002
	18.54 ft	4/24/2017
Moderate Flood Stage (15 ft)	17.50 ft	2/12/2018
	16.73 ft	1/30/1957
	16.42 ft	3/12/1963
	16.33 ft	2/7/2020
	15.97 ft	4/13/2020
	15.89 ft	2/24/2019
	15.83 ft	3/30/1975
	15.62 ft	12/11/1972
	15.27 ft	5/8/1984
	15.14 ft	3/17/1973
	15.10 ft	11/20/2003
	15.00 ft	2/11/1994
Flood Stage (12 ft)	14.75 ft	8/14/1940
	14.44 ft	2/18/1944
	14.42 ft	1/26/1978
	14.32 ft	4/28/1970
	14.13 ft	12/31/1969
	14.10 ft	4/16/1956
	14.05 ft	4/18/1998
	13.96 ft	1/27/1996
	13.95 ft	5/7/1958
	13.91 ft	11/07/1977
	13.75 ft	1/22/1979
	13.70 ft	1/8/1946
	13.66 ft	3/14/1975
	13.62 ft	3/6/1963



Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Very Frequent/Very Probable** because significant occurrences of this hazard have happened recently and will likely occur again in the future. The overall risk ranking for this hazard is **High**.

Flooding is the top hazard in Virginia based on both probability and impact. The portions of the LENOWISCO Planning District most susceptible to flooding are those directly adjacent to the area's major waterways but can also occur along the smaller tributaries. Due to the local terrain, most development in the district is located in the valleys along these rivers. Development generally consists of residential and agricultural uses, with commercial districts typically confined within the incorporated towns. A significant amount of development in the District is in the floodplain.

The 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP) outlines a ranking of each jurisdiction in the LENOWISCO Planning District based on various risk factors. Across the state, flooding is considered the top hazard based on probability and impact to all jurisdictions. The City of Norton and Lee County have a "Medium-Low" risk to flooding, while Scott and Wise counties are defined as "Medium" risk.

TABLE: Flood Hazard Ranking Parameters <i>Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan</i>								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Medium-Low	Low	Medium-Low	Medium-Low	Medium-Low
Lee County	Medium	Low	Low	Medium-Low	Low	Medium-Low	Medium-Low	Medium-Low
Scott County	Medium	Low	Medium-Low	Medium-Low	Low	Medium	Medium-Low	Medium
Wise County	Medium	Medium	Low	Medium-Low	Low	High	Medium-Low	Medium



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Geographic Location

Clinch River Basin: The Clinch River is one of the major rivers in the LENOWISCO Planning District, with a drainage area of roughly 1,145 square miles. Much of this area is situated in Scott County, but portions are in Lee and Wise Counties. The Clinch River 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 the steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high.

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

As noted in the previous 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 often proven. The impact of watershed changes over time should be minimal due to the rural nature of the area.

Powell River Basin: The Powell River is another major river in the area, with a drainage area of roughly 938 square miles. A majority of this area is located within Lee County, with portions of the watershed in Wise County. 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 the 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 district are numerous, and floods on the Powell River and its tributaries are well documented. The determined flood stage for the Powell is eight feet. The two largest recorded floods occurred in April 1977 and March 1963, with the river cresting over 44 feet near Jonesville. As with most floods in this area, information regarding damages from these events is not readily available. A Virginia State Water Control Board report (1977) and a TVA report (1972) provide much information regarding previous floods. Records from these events indicate several buildings inundated with floodwaters, while roadways were blocked.

The Powell River, North Fork of the Powell, South Fork of the Powell, and Callahan Creek have been studied in detail, with BFEs determined for the 100-year flood. The 100-year floodplains along these rivers vary from 100 feet wide to more than 1,600 feet, depending on local topography. For areas along small streams and creeks in this basin, with minimal development and low damage potential, approximate methods were used to determine the extent of the floodplain, with no BFEs determined.



As noted elsewhere, large floods have occurred on the Powell River. This does not preclude the occurrence of a 100-year flood event in the future. The impact of watershed changes over time should be minimal, due to the area's rural nature.

Holston River Basin: The North Fork Holston River is the third major river in the district. Most of the flood information available is for Big Moccasin Creek with a drainage area of approximately 95 square miles.

The North Fork of the Holston River, Big Moccasin Creek, and Little Moccasin Creek have been studied, with BFEs determined for the 100-year flood. The 100-year floodplains along these rivers vary from 300 feet wide to more than 1,000 feet, depending on local topography. For areas along small streams and creeks in the Holston River area, with minimal development and low damage potential, approximate methods were used to determine the extent of the floodplain, and no BFEs were determined.

As noted, a 100-year flood has not been exceeded on the Holston River, which does not preclude the occurrence of a future 100-year event. The impact of watershed changes over time should be minimal due to the rural nature of the area.

Loss Estimates

According to the National Centers for Environmental Information, the total property damage for LENOWISCO Planning District from 1950-2016 was \$4,149,000 and the annualized losses were \$62,863.63. The NOAA National Centers for Environmental Information (NCEI) Database indicates that flooding remains a costly issue for the District with an event occurring as recently as February 6, 2020, causing \$196,000 in property damages.

TABLE: Jurisdictional Annualized Losses from Flooding (1950-2016) <i>Source: National Centers for Environmental Information</i>				
Jurisdiction	Property Damage	Crop Damage	Total Damages	Annualized Losses
City of Norton	\$1,156,000	-	\$1,156,000	\$17,515.15
Lee County	\$1,103,000	-	\$1,103,000	\$16,712.12
Scott County	\$264,000	-	\$264,000	\$4,000
Wise County	\$1,626,000	-	\$1,626,000	\$24,636.36



The following tables provide a summary of the extent and value of private property within the 100-year and 500-year flood plains in each county in the LENOWISCO Planning District. Across the entire District, there is an estimated value of \$396.43 million of private property located in the 100-year floodplain, with more than half of that total located in Wise County. Most of the property located in the 100-year flood plain is residential, 97.6% in Lee County, 64.7% in Scott County, and 65.9% in Wise County. Floodplain maps are available in the County Hazard Mitigation Annexes.

TABLE: Property in the Floodplain in Lee County (in Millions of Dollars)
Source: HAZUS Advanced Analysis, January 2021

Occupancy	100-Year Flood				500-Year Flood			
	Building	Content	Inventory	Subtotal	Building	Content	Inventory	Total
Residential	39.59	20.26	0.0	59.85	50.06	25.14	0.0	75.20
Commercial	0.21	0.48	0.01	0.70	1.25	2.57	0.11	3.39
Industrial	0.14	0.30	0.05	0.48	0.22	0.44	0.07	0.73
Other	0.07	0.20	0.01	0.28	0.27	0.71	0.01	1.00
Total	40.01	21.24	0.07	61.31	51.80	28.87	0.19	80.85

TABLE: Property in the Floodplain in Scott County (in Millions of Dollars)
Source: HAZUS Advanced Analysis, January 2021

Occupancy	100-Year Flood				500-Year Flood			
	Building	Content	Inventory	Subtotal	Building	Content	Inventory	Total
Residential	57.12	29.90	0.0	87.02	68.37	35.07	0.0	103.44
Commercial	2.21	4.96	0.18	7.35	2.92	6.17	0.23	9.32
Industrial	8.71	20.24	3.24	32.19	9.65	21.93	3.44	35.02
Other	1.89	5.96	0.02	7.87	2.37	6.87	0.02	9.26
Total	69.92	61.05	3.44	134.42	83.31	70.03	3.70	157.04

TABLE: Property in the Floodplain in Wise County (in Millions of Dollars)
Source: HAZUS Advanced Analysis, January 2021

Occupancy	100-Year Flood				500-Year Flood			
	Building	Content	Inventory	Subtotal	Building	Content	Inventory	Total
Residential	88.29	43.96	0.0	132.25	108.12	53.68	0.0	161.80
Commercial	12.91	33.25	0.93	47.08	16.87	40.75	1.14	58.75
Industrial	1.71	2.87	0.43	5.01	2.16	3.75	0.57	6.48
Other	3.03	13.23	0.10	16.36	3.97	15.39	0.10	19.46
Total	105.94	93.32	1.45	200.70	131.12	113.56	1.81	246.49



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NFIP: Repetitive Loss and Severe Repetitive Loss

FEMA defines a Repetitive Loss (RL) structure as a structure covered by a contract of flood insurance issued under the NFIP, which has suffered flood loss damage on two occasions during a 10-year period that begins on the date of the second loss, in which the cost to repair the flood damage is 25% of the market value of the structure at the time of each flood loss.

From 1978-2016, no unmitigated properties with a Severe Repetitive Loss (SRL) claim above \$1 million exist within the LENOWISCO Planning District. An SRL property has at least four NFIP claim payments over \$5,000 each (building and contents) or two or more separate claims payments with the cumulative amount exceeding the market value of the building.

The following tables summarize RL structures, losses, and payments in the District since 1978.

TABLE: Repetitive Loss Buildings and Payments (1978-2020)					
Jurisdiction	Total RL Buildings	Total RL Losses	Total Payments	Insured Losses	Insured Payments
Lee County	0	0	\$0	0	\$0
<i>Town of Jonesville</i>	0	0	\$0	0	\$0
<i>Town of Pennington Gap</i>	2	4	\$196,918	0	\$0
<i>Town of St. Charles</i>	0	0	\$0	0	\$0
Scott County	3	4	\$47,204	0	\$0
<i>Town of Clinchport</i>	0	0	\$0	0	\$0
<i>Town of Duffield</i>	0	0	\$0	0	\$0
<i>Town of Dungannon</i>	0	0	\$0	0	\$0
<i>Town of Gate City</i>	0	0	\$0	0	\$0
<i>Town of Nickelsville</i>	Does not participate in NFIP				
<i>Town of Weber City</i>	0	0	\$0	0	\$0
City of Norton	5	11	\$133,891	1	\$7,140
Wise County	22	44	\$425,688	7	\$100,014
<i>Town of Appalachia</i>	1	2	\$6,030.00	0	\$0
<i>Town of Big Stone Gap</i>	8	18	\$158,725	0	\$0
<i>Town of Coeburn</i>	5	10	\$288,562	3	\$150,069
<i>Town of Pound</i>	3	3	\$16,740	0	\$0
<i>Town of St. Paul</i>	0	0	\$0	0	\$0
<i>Town of Wise</i>	11	17	\$286,456	2	\$79,031
LENOWISCO Planning District TOTAL	60	113	\$1,560,218	13	\$336,257



The table below summarizes NFIP insurance policies and claims paid in the District since 1978.

TABLE: NFIP Policies and Claims Paid (1978-2020)			
Jurisdiction	Number of Policies	Total Claims since 1978	Total Paid since 1978
Lee County	34	37	\$256,229.86
<i>Town of Jonesville</i>	0	3	\$9,661
<i>Town of Pennington Gap</i>	3	16	\$436,619.98
<i>Town of St. Charles</i>	3	17	\$92,567.65
Scott County	60	30	\$277,722.46
<i>Town of Clinchport</i>	0	1	\$0
<i>Town of Duffield</i>	0	0	\$0
<i>Town of Dungannon</i>	0	0	\$0
<i>Town of Gate City</i>	5	2	\$63,352.03
<i>Town of Nickelsville</i>	Does not participate in NFIP		
<i>Town of Weber City</i>	1	3	\$101,335.84
City of Norton	23	24	\$146,606.36
Wise County	98	154	\$949,811.99
<i>Town of Appalachia</i>	14	12	\$22,935.44
<i>Town of Big Stone Gap</i>	28	67	\$351,410.48
<i>Town of Coeburn</i>	15	31	\$453,182.42
<i>Town of Pound</i>	43	64	\$261,232.24
<i>Town of St. Paul</i>	0	2	\$17,398.11
<i>Town of Wise</i>	23	47	\$385,207.37
LENOWISCO Planning District TOTAL	350	510	\$3,825,273.23

Vulnerability & Community Development Analysis for Flooding Hazard

Much of the LENOWISCO Planning District is at risk of riverine and flash flooding. The most vulnerable areas of the community will be those most affected by floodwaters in terms of the potential loss of life, damages to homes and businesses, and disruption of community services and utilities. Residential properties are at risk to the most significant damage and property losses across the District, but several essential facilities could be moderately or significantly damaged in a 100-year or 500-year flood event.

Due to existing development and very steep topography outside the river valleys, developable land in the LENOWISCO Planning District is scarce. A dominant trend in the area is redevelopment, with older, lower value structures replaced by newer construction with higher values. This is especially true with older mobile homes 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 of damages due to flooding in the district.

Impact on LENOWISCO Residents

In the public survey completed in the Hazard Mitigation Plan update, over 40% of survey participants indicated that flooding is a medium priority for mitigation, and over 35% of survey participants indicated that flooding is a high priority for mitigation. Damage to housing, vehicles, land, crops, or livestock from flood events can be very high during riverine or flash floods. It is



possible that flooding can often cause deaths to occur if floodwaters become deep/swift enough to sweep away people or vehicles. It is possible that the sick, disabled, or elderly may not be mobile enough to escape rising floodwaters and may become trapped in their houses. During flooding events, residents may also be at an increased risk of waterborne diseases. For many, the psychological impact of major floods can be intense. Loss of loved ones, homes, and livelihoods can create intense psychological and social disruption.

As shown, a wide variety of building types are present in the floodplains of the District. Roughly 67 percent are residential properties, with many of the residential properties either mobile homes or low-density residential properties. The table below summarizes the estimated number, value, and predominant use of the structures located in the floodplain of all FEMA recognized flood sources.

TABLE: Structures at Risk by Flooding Source Source: 2013 LENOWISCO Hazard Mitigation Plan				
Flood Source	Estimated Number of Structures	Estimated Total Value	Most Prevalent Building Type	Second Most Prevalent Building Type
Lee County				
Clinch River	25	\$1,250,000	Single Family Residential (65%)	Manufactured Home (20%)
Powell River	690	\$34,000,000	Single Family Residential (64%)	Manufactured Home (20%)
Scott County				
Clinch River	685	\$35,000,000	Single Family Residential (63%)	Manufactured Home (20%)
Holston River	400	\$20,000,000	Single Family Residential (62%)	Manufactured Home (21%)
Wise County				
Clinch River	1,060	\$35,200,000	Single Family Residential (38%)	Manufactured Home (23%)
Levisa Fork	900	\$31,800,000	Single Family Residential (46%)	Manufactured Home (13%)
Powell River	1,375	\$41,245,000	Single Family Residential (48%)	Manufactured Home (10%)
City of Norton				
Guest River	140	\$2,015,000	Single Family Residential (40%)	Manufactured Home (22%)
Powell River	110	\$435,000	Single Family Residential (49%)	Manufactured Home (10%)



Mobile homes are scattered throughout the area. The estimated average value of these structures along the various rivers is approximately \$30,000. These structures tend to be more vulnerable than other residential types due to their lesser structural stability and flood-prone construction materials as well as the reduced means these residents have to protect themselves from potential flood damage.

TABLE: Data Profile Source: <i>American Community Survey, 2014-2018</i>				
	City of Norton	Lee County	Scott County	Wise County
Median Home Value	\$91,700	\$88,000	\$94,400	\$85,600
Reside in a Mobile Home	15.1% (309)	21.9% (2,583)	25.9% (2,991)	27.7% (4,976)



Impact on Essential Facilities, Critical Infrastructure, and Future Assets

The impacts of floodwaters on essential 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. The following tables outline the number of critical facilities located in the 100-year and 500-year floodplains in the LENOWISCO Planning District. There are eight essential facilities expected to sustain moderate or substantial damage from a 100-year flooding event in the LENOWISCO Planning District. This includes one fire station in Lee County, one fire station in Scott County, and three fire stations and three police stations in Wise County. Maps of critical facilities located in the floodplain are available in the County Hazard Mitigation Annexes.

TABLE: Essential Facilities in the Floodplain in Lee County
Source: HAZUS Advanced Analysis, January 2021

Classification	100-Year Flood				500-Year Flood			
	Total	Moderate Damage	Substantial Damage	Loss of Use	Total	Moderate Damage	Substantial Damage	Loss of Use
Emergency Operation Centers	1	0	0	0	1	0	0	0
Fire Stations	10	1	3	2	10	2	3	3
Rescue Squad	4	0	0	0	4	0	0	0
Hospitals	1	0	0	0	1	0	0	0
Police Stations	3	0	1	1	3	0	0	0
Schools	11	0	0	0	11	1	0	1

TABLE: Essential Facilities in the Floodplain in Scott County
Source: HAZUS Advanced Analysis, January 2021

Classification	100-Year Flood				500-Year Flood			
	Total	Moderate Damage	Substantial Damage	Loss of Use	Total	Moderate Damage	Substantial Damage	Loss of Use
Emergency Operation Centers	1	0	0	0	1	0	0	0
Fire Stations	9	1	0	1	9	1	0	1
Rescue Squad	2	0	0	0	2	0	0	0
Hospitals	0	0	0	0	0	0	0	0
Police Stations	4	0	0	0	4	0	0	0
Schools	14	0	0	0	14	0	0	0



TABLE: Essential Facilities in the Floodplain in Wise County
Source: HAZUS Advanced Analysis, January 2021

Classification	100-Year Flood				500-Year Flood			
	Total	Moderate Damage	Substantial Damage	Loss of Use	Total	Moderate Damage	Substantial Damage	Loss of Use
Emergency Operation Centers	1	0	0	0	1	0	0	0
Fire Stations	9	3	0	3	9	3	0	3
Rescue Squad	6	0	0	0	6	0	0	0
Hospitals	3	0	0	0	3	0	0	0
Police Stations	11	3	0	3	11	4	1	5
Schools	21	0	0	0	21	0	0	0

There are four wastewater treatment plants located near the rivers or their tributaries, but 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.

Future Conditions

Increased flood risk is one of the highest noted impacts of changing climatic patterns. Widespread heavy rains in recent years have led to flooding, soil erosion, and water quality issues from nutrient runoff into those systems. Human land use has influenced the structure and function of natural resources and when vegetation has been removed or undergoes a major change, runoff and flooding both tend to increase. As hydrology changes in response to changing precipitation patterns, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk; and the magnitude of high-frequency flood events (e.g., 10-year floods) will likely increase. Greater storm intensity will result in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. Historical hydrologic data are used to model floods.

With the changes, model calibration will be needed more frequently, new forecast-based tools will have to be developed, and a standard of practice that explicitly considers climate change should be adopted. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, floodways, bypass channels, and levees, as well as the design of local sewers and storm drains. Restoring systems like forested floodplains, utilizing open space preservation, and



implementing agricultural best management strategies that increase vegetative cover (such as cover crops and riparian buffers) can help reduce flooding risks and protect water quality.

Impact on the Environment

Intense flooding can lead to damage to crops and topsoil, displacement of ecosystems, and the spread of pollution or diseases.

Impact on Operations

Flooding events may require significant resources and assistance from local emergency responders as well as state, federal, or community service organizations such as the Red Cross. Rapid access for large emergency vehicles has a maximum depth of 0.9-1.2m (2.9-3.9ft). If flood depths exceed this amount, first responders may not be able to access areas in need of assistance. Damage to critical infrastructure may also inhibit the ability of first responders to carry out emergency operations.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Flooding hazard.

Frequency & Probability ¹			Very Probable / Very Frequent	
Potential Magnitude and Scale ²			Somewhat Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Very Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Minimally Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			High	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



1.6.6 Karst & Subsidence

Land subsidence is the sinking or lowering of the land surface. Most land subsidence in the US is caused by human activities, such as intensive groundwater withdrawals and petroleum extraction. In 1999, [USGS reported](#) that 80% of subsidence in the U.S. resulted from human impact on subsurface water due to land and water-use practices. Some of the most studied examples are in the Santa Clara Valley of California and the Houston-Galveston region of Texas. Land subsidence can result in increased coastal flooding along vulnerable shorelines.

Three processes cause land subsidence - the compaction of aquifer systems, drainage and oxidation of organic soils, and the collapse of susceptible rocks also known as Karst (USGS, 1999). Karst is inclusive of many surface and subsurface conditions that can create issues in engineering geology. Karst areas have distinct features including fissures, tubes, and caves, which are developed by the solution of carbonate and other rocks. These areas typically feature sinking streams, cavern openings, and closed depressions. The carbonate rocks that are typically associated with karst landscapes in Virginia are common in the western mountainous regions of the state.

Karst has the potential for more sudden events like cover-collapse sinkholes which can fall rapidly. Although these rapid events gain more attention, most sinkholes in karst develop gradually. Karst formations are significantly influenced by local conditions, but human-caused and natural. Naturally occurring sinkholes are formed through the slow dissolution of the underlying rock. Human-caused sinkholes are triggered through changes to the local hydrology, including pavement runoff and poor drainage along highways.

Hazard Extent

Geographic extent for the Karst hazard is defined as the percent of the jurisdiction where the risk is "high" for karst-related events. According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP), the geographic extent for karst is "low" in all jurisdictions in the LENOWISCO Planning District, meaning less than 25% of the jurisdiction has a "high" risk of karst-related events. According to the HMP, the karst hazard cannot be easily expressed in specific recurrence intervals as with other hazard events.

History/Previous Occurrences

There have been no federal disaster declarations or NOAA NCEI recorded events for subsidence-related events. Additionally, there have been no recorded karst-related sinkhole events in the LENOWISCO Planning District or the Commonwealth of Virginia. According to the 2018 Virginia HMP, there is no comprehensive long-term record of past events. There is significant documentation of land-subsidence, but only in the southern Chesapeake Bay area.

While there is no official record of karst sinkhole events, representatives from the LENOWISCO Planning District reported a variety of sinkholes impacting their jurisdictions, including in Scott County, Wise County, Norton, Big Stone Gap, Coeburn, Pound, and Wise. These events ranged from small sinkholes on agricultural property to larger sinkholes damaging roadways and foundations. These events occurred across the region, with some stemming from poor drainage and others from collapsed underground mine shafts. Both Scott and Wise counties have numerous abandoned mines that can lead to land subsidence and water quality issues.



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Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Somewhat Probable/Somewhat Frequent** because significant occurrences of this hazard have happened on occasion (even though isolated or low impact events may occur with more regularity). The overall risk ranking for this hazard is **Medium**.

Karst formations are highly influenced by local conditions, both human-caused and natural. All of the jurisdictions in the LENOWISCO Planning District were marked as low risk for both the karst and land subsidence hazards in the 2018 Virginia HMP. The analysis below provides detailed ranking parameters.

TABLE: Karst & Land Subsidence Hazard Ranking Parameters Source: Commonwealth of Virginia Hazard Mitigation Plan (HMP), 2018								
Jurisdiction Name	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Low	Low	Low	Low	Low
Lee County	Medium	Low	Low	Low	Low	Low	Low	Low
Scott County	Medium	Low	Low	Low	Low	Low	Low	Low
Wise County	Medium	Medium	Low	Low	Low	Low	Low	Low



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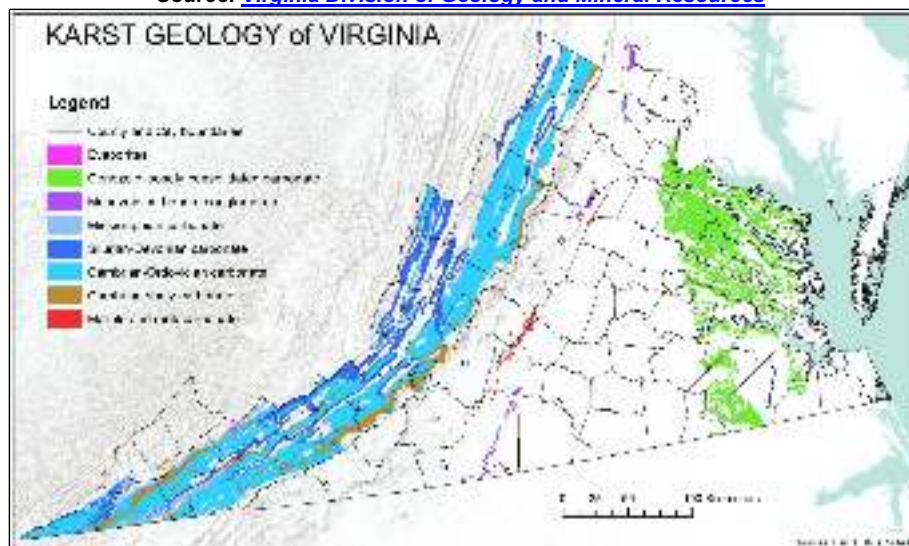
Land subsidence is a site-specific hazard and poses a risk to areas with low-lying topography and susceptibility to sea-level rise. In Virginia, land subsidence poses the greatest risk to the Chesapeake Bay region due to unconsolidated aquifer systems and vulnerable coastline, shown in the figure below.

[illegible]

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FIGURE: Karst Geology of Virginia
Source: [Virginia Division of Geology and Mineral Resources](#)



Loss Estimates

Due to a lack of historical data and more detailed mapping, it is difficult to reliably estimate losses. The 2018 Commonwealth of Virginia Hazard Mitigation Plan does not provide annualized loss estimated due to the scale of available karst mapping and the lack of available valuation data.

Vulnerability and Community Development Analysis

Current land-use practices on karst landscapes pose a risk to buildings, roads, and other transportation infrastructure, as well as stormwater infrastructure and sewers. By diverting surface water, creating reservoirs, or otherwise changing local hydrology, development can accelerate sinkhole formation. Human-induced sinkholes have doubled since 1930, in addition to steep increases in related insurance claims (FEMA). Subsidence is generally not covered by standard homeowners' insurance.

Impact on LENOWISCO Residents

Sinkholes can damage homes and other property, and residents experiencing impacts will be very localized. Any decrease in elevation through land subsidence poses a threat to residents and property by exacerbating flood conditions.



Impact on Essential Facilities, Critical Infrastructure, and Future Assets

Karst-related sinkholes cause localized but significant damage to property and infrastructure. As the majority of the LENOWISCO Planning District includes karst terrain, it is not possible to assess the specific risk to essential facilities.

Sinkholes can create significant impacts on transportation and water infrastructure. Virginia Department of Transportation recorded 500 sinkholes damaging roads across the Commonwealth. Additionally, a sinkhole provides a direct path between surface water and groundwater aquifers. Sinkholes can significantly increase the potential for polluted drinking water or other water contamination. Virginia has experienced contaminated karst aquifers from petroleum products, agricultural products, sewage, household garbage, and other sources. The Virginia Health Department discourages using karst springs as a drinking water supply and requires periodic testing of springs that are used.

Future infrastructure and development in karst landscapes will be vulnerable to sinkholes and other land subsidence events. Vulnerability will further increase for areas that do not limit changes to natural hydrologic systems. Groundwater contamination is a significant vulnerability in karst landscapes, and the safety of drinking water supplies should be an important consideration for future development.

Future Conditions

Karst development is influenced by climate. While sinkholes tend to be caused by human-made issues, like broken water mains, the conditions are worsened by protracted drought followed by heavier rain patterns. The Virginia HMP (2018) notes that given Virginia's extensive karst formations, which are found in parts of LENOWISCO, the combination of increased drought conditions and heavy rains can be expected to increase the frequency and possibly the severity of karst-related sinkholes in the Commonwealth.

Impact on the Environment

Groundwater contamination is the most significant environmental impact associated with karst landscapes. As described above, karst terrain is highly vulnerable to water contamination and pollution, accelerated by groundwater pumping and poor land-use management. a common problem in populated areas overlying karst terrain. Depending on the contaminant, chemicals or other pollution could remain in the groundwater for years after initial exposure.

Impact on Operations

Sinkholes could disrupt utilities, transportation routes, and the delivery of emergency services based on their location. Any disruptions would likely be limited and very localized.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Karst and Subsidence hazard.

Frequency & Probability ¹	Somewhat Probable / Somewhat Frequent		
Potential Magnitude and Scale ¹	Minimally Vulnerable		
Physical Vulnerability Hazard Impact ¹	Vulnerable		
Social Vulnerability Hazard Impact ¹	Vulnerable		
Community Conditions Hazard Impact ¹	Vulnerable		
Overall Capability and Capacity ²	Minimally Capable		
Mitigation ²	Minimally Capable		
Hazard Consequence & Impact Score ¹	Vulnerable		
Overall Risk Rating ³	Medium		
Legend			
Score	1: Vulnerability Rating	2: Capability and Capacity Rating	3: Overall Risk Rating
0 – 24	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Vulnerable	Capable	High
75 - 100	Very Vulnerable	Very Capable	Extreme
N/A	Not Applicable/Unknown	Not Applicable/Unknown	Not Applicable/Unknown



1.6.7 Landslide

Landslides are a serious geologic hazard common to almost every state in the United States. Across the country, landslides cause over \$1 billion in damages and between 25 to 50 deaths each year ([USGS](#)). Globally, landslides cause billions of dollars in damage and thousands of deaths and injuries.

A landslide is the downslope movement of soil and rock - a broad term that includes a variety of movements. Gravity is the driving force for landslides, but heavy rainfall, rapid snowmelt, steepening slopes due to erosion or stream incision, or earthquakes can all trigger landslide events. Human impacts, including slope modification or drainage alteration, can increase the likelihood of landslides. Wildfires can lower the threshold of precipitation needed to initiate a landslide event.

There are several types of landslides or earth movements, including:

- **Rockfalls:** large pieces of bedrock breaking off a cliff face and tumbling downslope
- **Rockslides:** a detached section of bedrock slides down an inclined surface, frequently along a bedding plane
- **Earth slides:** masses of soil moving down a slip face, usually on top of the bedrock
- **Creep:** slow, continuous, imperceptible downslope movement of soil and rock particles
- **Rotational Slides or Slumps:** result from the rotation of a cohesive unit of soil or rock down a slip surface, leaving a curved scarp
- **Debris flows:** develop on steep slopes because of heavy rainfall that saturates the soil, which under the extra weight and lubrication breaks loose and becomes slurry that takes everything with it, including large trees and houses. Channeled debris flows can reach speeds approaching a hundred miles an hour and strike without warning.

The location of landslides is based on both natural features and human-made conditions. The Virginia Division of Geology and Mineral Resources points to research from North Carolina demonstrating that about 56% of landslides occurred on slopes altered by development ([VDGMR](#)). Natural features typically include topography, geology, and precipitation.

- **Topography:** with steeper slopes comes greater forces of gravity, increasing the potential for failure of the slope's rocks or soils.
- **Geography:** The strength of the rock, soil, or debris dictates the slope's ability to resist the forces of gravity.
- **Precipitation:** water seeps into gaps between soil and rock, decreasing the slope's strength and resistance. Heavy rain is a key factor in landslide incidence.

In the LENOWISCO Planning District, there is an increased potential for landslides along roadways due to erosion or undercutting. Ground cover and vegetation on the slope can also influence the likelihood of a landslide event. Additionally, thin surface soils and steep topography throughout the District create conditions favorable to erosion and landslides. The widespread construction of roads, clearing of lands, and preparation of development sites on very steep slopes exacerbate the problem.



Hazard Extent

USGS offers six categories of landslide risk based on both susceptibility and incidence. **Susceptibility** is the relative likelihood of future landslides based on site-specific characteristics, such as topography and precipitation. **Incidence** is the number of landslides that have historically occurred in the area. High incidence is when greater than 15% of the area has been involved, moderate is between 1.5 - 15% of the area, and low incidence is less than 1.5% of the area. The six categories, from highest to lowest risk, include:

- High susceptibility and high incidence (>15%)
- High susceptibility and moderate incidence (1.5% - 15%)
- High susceptibility and low incidence (<1.5%)
- Moderate susceptibility and moderate incidence (1.5% - 15%)
- Moderate susceptibility and low incidence (<1.5%)
- Low susceptibility and low incidence (<1.5%)

History/Previous Occurrences

There are no official records that indicate the location or extent of landslides in the LENOWISCO Planning District. No debris flow events are recorded in the National Oceanic and Atmospheric Administration National Centers for Environmental Information ([NOAA NCEI](#)) storm events database. There have been no federal disaster declarations for landslide events in the District, and no events are noted in the 2018 Commonwealth of Virginia HMP. Most recorded landslide events are obtained through the Virginia Department of Transportation, as the events are often concentrated adjacent to roadways. Smaller landslides not occurring along roadways are not reported or recorded at this time.

While there is no official record of landslide events, representatives from the LENOWISCO Planning District reported a variety of events impacting their jurisdictions, including in two significant slides in Big Stone Gap and Pound. The 2019 landslide in Big Stone Gap threatened the municipal water supply at Big Cherry Lake Dam. The landslide in Pound impacted a vacant property but remains a threat to a residential area above the slide. Most of the other jurisdictions in the District reported landslides impacting roadways in and out of town, detailed in the Geographic Location section below. These roads are typically maintained by the Virginia Department of Transportation who is responsible for mitigating the hazard and addressing any damages.



Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Somewhat Probable/Somewhat Frequent** because significant occurrences of this hazard have happened on occasion (even though isolated or low impact events may occur with more regularity). The overall risk ranking for this hazard is **Medium**.

As noted, landslides are 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 on topographical and geologic factors, as well as other physical indicators. One of the best indicators of future landslide events is a history of past landslide activity, as these areas have demonstrated susceptibility to landslide occurrence. 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 LENOWISCO Planning District is not available.

The 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP) outlines a ranking of each jurisdiction in the LENOWISCO Planning District based on various risk factors. The City of Norton and Wise County are two jurisdictions considered "Medium-Low" risk to landslide events according to the 2018 HMP, as detailed below.

TABLE: Landslide Hazard Ranking Parameters <i>Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan</i>								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Low	Low	Low	Medium-High	Medium-Low
Lee County	Medium	Low	Low	Low	Low	Low	Low	Low
Scott County	Medium	Low	Low	Low	Low	Low	Low	Low
Wise County	Medium	Medium	Low	Low	Low	Low	Medium-High	Medium-Low



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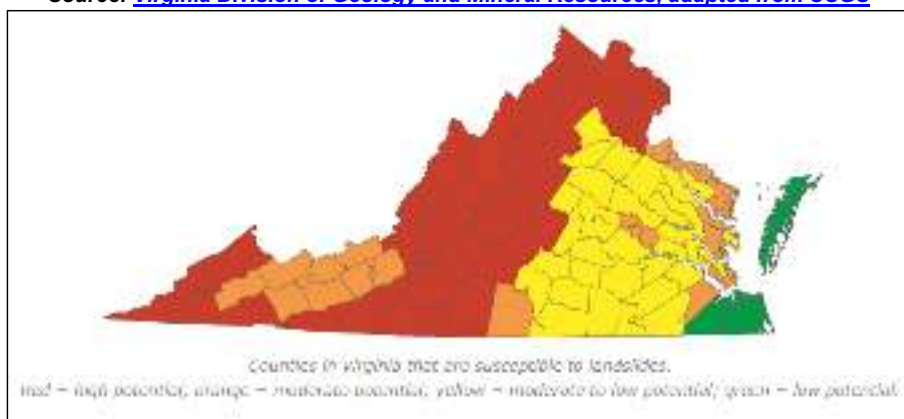


Geographic Location

Landslides are most common in the mountainous terrain of Virginia. Steep slopes and fractured bedrock combined with heavy rainfall lead to areas that are prone to significant movement. More than half of the Commonwealth is considered to have moderate or high potential of landslides, including the LENOWISCO Planning District, as shown in the map below.

FIGURE: Landslide Overview Map of Virginia

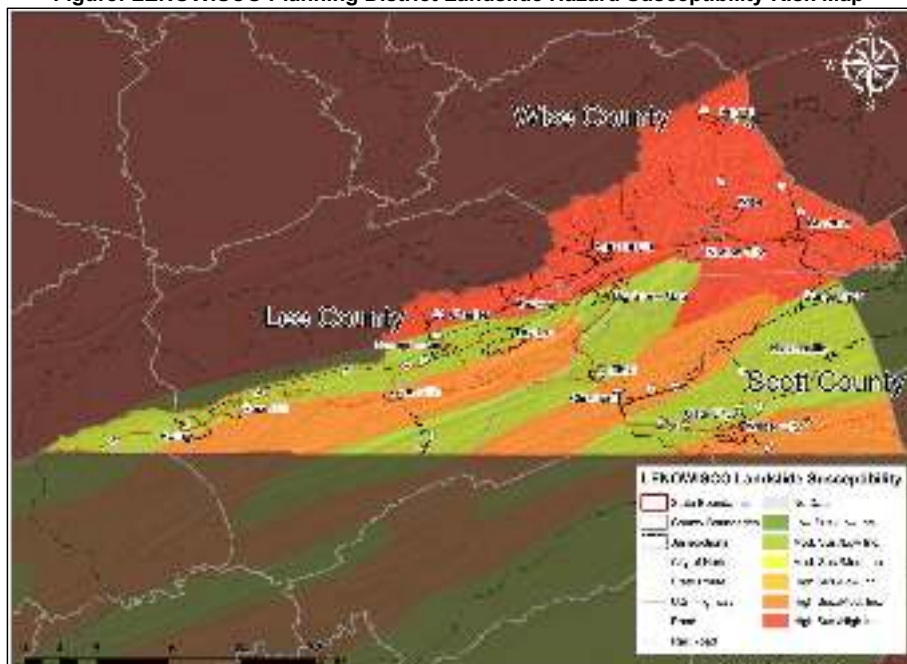
Source: [Virginia Division of Geology and Mineral Resources, adapted from USGS](#)





The map below illustrates landslide susceptibility in the three counties of the LENOWISCO Planning District. Wise County and the City of Norton, and the northern sections of Lee and Scott counties, have both high incidence and high susceptibility to a landslide event. Several other sections of the District, indicated in orange, have moderate incidence and high susceptibility.

Figure: LENOWISCO Planning District Landslide Hazard Susceptibility Risk Map



As depicted in the map above, many of the U.S. Highways throughout the District are located in high susceptibility landslide areas. According to records from the Virginia Department of Transportation, the following roadways have experienced landslide events:

Lee County

VDOT has documented seven locations in Lee County where historic landslide activity has occurred. All these landslide areas are included in the northern and eastern portions of the county. These locations include:

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



Scott County

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

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

Wise County

VDOT has identified seven primary landslide locations in Wise County, most of which are located along major roadways. These locations include:

- Black Mountain section of Rt. 160
- Norton Bypass section of U.S. 23
- Indian Creek Mountain north of Wise
- Pound Bypass section of U.S. 23, just north of J. W. Adams School
- U.S. 23 between the north junction with Rt. 610 and the base of the mountain in Powell Valley
- U.S. 23 in the town of Appalachia
- Alt. U.S. 58 in the vicinity of Route 657

Loss Estimates

There is not currently a reliable method to calculate annualized losses due to landslide events. Using data available in the NCEI Storm Events Database, the 2018 Commonwealth of Virginia HMP estimated an annualized damage of \$8,333 based on recorded events between 1998 and 2016.

Vulnerability and Community Development Analysis for Landslide Hazard

Due to the extremely steep slopes throughout the LENOWISCO Planning District, virtually all 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 District are in areas with more gradual slopes, reducing the risk of widespread damages in densely developed areas. However, most of the unincorporated areas throughout the District have extremely steep slopes. The potential for landslide damage to structures in these areas could be high.

Impact on LENOWISCO Residents

Homeowners insurance typically does not cover landslide damage, resulting in significant financial risk for LENOWISCO residents living on or near steep slopes. Socioeconomically disadvantaged individuals are at the greatest risk of financial instability due to property damages or extended periods of isolation due to blocked roadways.



Impact on Essential Facilities, Critical Infrastructure, and Future Assets

Landslides tend to have very localized impacts but could include damages to property and buildings or reduced property values in areas susceptible to landslides.

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. 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 to the loss of function of the roadway. Many roadways throughout the district provide the only direct access from one community to another, or potentially the only access to certain remote areas. Reduced access can increase the response time of emergency vehicles, creating a potentially serious threat to public safety.

Any future development occurring on or near steep slopes would be at risk to the impacts of landslide events.

Future Conditions

Slope stability is impacted by shifts in temperature, precipitation, and snowmelt. Variations in these patterns can yield slope instability, resulting in landslides. The Virginia HMP (2018) notes that stability impacts are certain with climate variability; however, consequences, such as type, extent, and magnitude, required longitudinal studies.

Impact on the Environment

Landslides can cause animal deaths, loss of agricultural and forest productivity, damming or alteration of streams and rivers, and reduced water quality.

Impact on Operations

Blocked roadways due to landslide events can significantly impact operations, especially the transportation of people, goods, and services between communities.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Landslide hazard.

Frequency & Probability ¹			Somewhat Probable / Somewhat Frequent	
Potential Magnitude and Scale ²			Minimally Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Somewhat Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			Medium	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.8 Non-Rotational Winds

Tropical cyclones can cause significant severe weather events in more inland communities, including storm surge flooding, extreme rainfall, thunderstorms, lightning, severe winds, and tornadoes. Riverine flooding can also result from significant storm surges that push inland. With extreme rainfall and severe wind, communities can also experience secondary impacts from landslides, debris flows, downed trees, and power outages.

Other non-rotational wind events include derechos, which are a widespread, straight-line windstorm linked to a band of severe thunderstorms. Derechos in Virginia mainly occur in June and July with the ability to produce damage comparable to tornadoes. Derechos consist of a wind damage area extending more than 240 miles and featuring wind gusts of at least 58 mph.

Hazard Extent

The most significant non-rotational wind hazard in Virginia are tropical cyclones/hurricanes, which are categorized on the Saffir-Simpson Hurricane Damage Scale, included in the table below. Virginia has experienced hurricane events reaching Category 2, including Hurricane Sandy in 2012. Meteorologists consider the water off the Virginia coast too cool to support a Category 5 storm. It is important to know that the intensity and damages caused by hurricane winds, as described in the table below, are based on potential property damage along the coast from a hurricane landfall. As the LENOWISCO Planning District is several hundred miles inland, wind damage from a hurricane event would be significantly less than as described on the Saffir-Simpson scale.

TABLE: Saffir-Simpson Hurricane Damage Scale <i>Source: National Weather Service National Hurricane Center</i>			
Category	Wind Speeds	Damage Potential	Damage Description (Wind Only)
Tropical Depression	<38 mph	Negligible	Wind effects: Scattered trees down, scattered power outages, some roads blocked due to downed trees and power lines. For example, neighborhoods could lose power for several days.
Tropical Storm	39-73 mph		
1	74-95 mph	Minimal	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, and vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph	Moderate	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.



3 (Major)	111-129 mph	Extensive	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (Major)	130-156 mph	Extreme	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (Major)	>157 mph	Catastrophic	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

History/Previous Occurrences

Damaging winds from severe thunderstorms occur throughout southwestern Virginia regularly. Wind damages are typically localized throughout the region and include broken tree limbs, blown down trees, damage to power lines, and moderate building damage.

The relatively large distance between the district and the Atlantic Coast limits 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 paths of most of these storms are to the east of the LENOWISCO Planning District, extremely high winds from these events are rare.

During the analysis timeframe (2015-2020) for the HMP update, 40 wind events (38 thunderstorm wind events and 2 high wind events) were recorded in the NOAA National Centers for Environmental Information (NCEI) database. Many events impacted multiple areas in the LENOWISCO district. There was one federal disaster declaration for Hurricane Florence (#3403) on September 11, 2018, including the entire state of Virginia. No damages were reported in the LENOWISCO Planning District from this event.



TABLE: High Wind and Thunderstorm Wind Events in LENOWISCO from 01/01/2015 to 08/01/2020

Source: www.ncdc.noaa.gov/stormevents

Jurisdiction	Event Type	Dates of Occurrence	Direct Deaths	Direct Injuries	Reported Property Damage	Reported Crop Damage	Indirect Deaths	Indirect Injuries
City of Norton	Thunderstorm Wind	7/13/2015 7/14/2015 5/29/2019	0	0	\$0	\$0	0	0
Lee County	Thunderstorm Wind	4/25/2015 7/13/2015 7/14/2015 5/7/2016 6/21/2016 6/23/2016 7/6/2016 3/1/2017 5/11/2017 5/20/2017 7/6/2017 4/4/2018 6/3/2018 7/20/2018 5/18/2019 6/21/2019 10/31/2019 7/23/2020	0	0	\$5,000 (4/25/2015)	0	0	0



Scott County	Thunderstorm Wind	4/19/2015	0	0	\$10,000 (4/19/2015)	\$0	0	0
		6/8/2015						
		7/13/2015						
		7/14/2015						
		7/4/2016						
		7/19/2016						
		8/14/2016						
		8/15/2016						
		3/1/2017						
		5/20/2017						
		5/24/2017						
		7/23/2017						
		10/31/2019						
		1/11/2020						
		7/5/2020						
		7/19/2020						
		7/24/2020						
Wise County	Thunderstorm Wind	6/21/2015	0	0	\$0	\$0	0	0
		7/13/2015						
		5/12/2016						
		6/22/2016						
		6/23/2016						
		5/19/2017						
		5/27/2017						
		6/26/2018						
		5/29/2019						
		8/20/2019						
		10/31/2019						
	High Wind	11/18/2015 4/23/2018	0	0	\$0	\$0	0	0



Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Very Frequent/Very Probable** because significant occurrences of this hazard have happened recently and will likely occur again in the future. The overall risk ranking for this hazard is **High**.

Non-rotational wind events are a regular occurrence in the LENOWISCO Planning District. The 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP) outlines a ranking of each jurisdiction in the District based on various risk factors. Across the state, non-rotational wind is considered the top hazard based on probability and impact to all jurisdictions. Lee and Scott counties have a "Medium-Low" risk to wind events, while the City of Norton and Wise County are considered "Medium" risks.

TABLE: Non-Rotational Wind Hazard Ranking Parameters <i>Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan</i>								
Jurisdiction Name	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	High	Medium-High	Medium-Low	Low	Medium
Lee County	Medium	Low	Low	High	Medium	Medium-Low	Low	Medium-Low
Scott County	Medium	Low	Medium	Medium-High	Low	Medium-Low	Low	Medium-Low
Wise County	Medium	Medium	Low	Medium-High	High	Medium-Low	Low	Medium



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Geographic Location

Most hurricanes affect eastern Virginia due to their proximity to the coast, but more recent impacts from tropical cyclones have extended further inland, including Hurricane Irma in 2017. Virginia typically sees hurricanes between June and November. A storm originating in the Atlantic is defined as a hurricane when the maximum sustained winds reach 74 miles per hour. Below this level, it is defined as either a tropical storm or tropical depression.

With tropical cyclones approaching from the coast, the eastern parts of Scott and Wise counties are at slightly higher risk than Lee County. However, LENOWISCO is uniformly at risk to other types of non-rotational winds, including derechos. High wind events, primarily severe thunderstorms, have historically occurred in every jurisdiction. LENOWISCO 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 (USBC), the minimum design wind speed for the area is 90 mph. It is worth noting that localized geography, such as mountain ranges and gorges, can contribute to potential damages caused by wind events.

Loss Estimates

The vulnerability of a building to a high wind event is based on design wind pressures and building construction types.

- **Design Wind Pressures:** Buildings must be designed to withstand both external and internal wind pressures on the structural framing and exterior elements. Virginia's building code dictates to what design wind speed a structure must be designed. 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 exist for the district.
- **Building Type:** The type of building construction has an 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 produced in large numbers of identical or smaller units; typically include light metal structures or mobile homes.
 - **Non-Engineered Wood:** Wood buildings not specifically engineered during design; may include single and multi-family residences, some 1-2 story apartment units, and small commercial buildings.
 - **Non-Engineered Masonry:** Masonry buildings not specifically engineered during design; may include single and multi-family residences, some 1-2 story apartment units, and small commercial buildings.
 - **Lightly Engineered:** Structures may combine masonry, light steel framing, open-web steel joists, wood framing, and wood rafters. Some portions of these buildings have been engineered while others have not. Examples include motels, commercial, and light industrial buildings.
 - **Fully Engineered:** These 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.



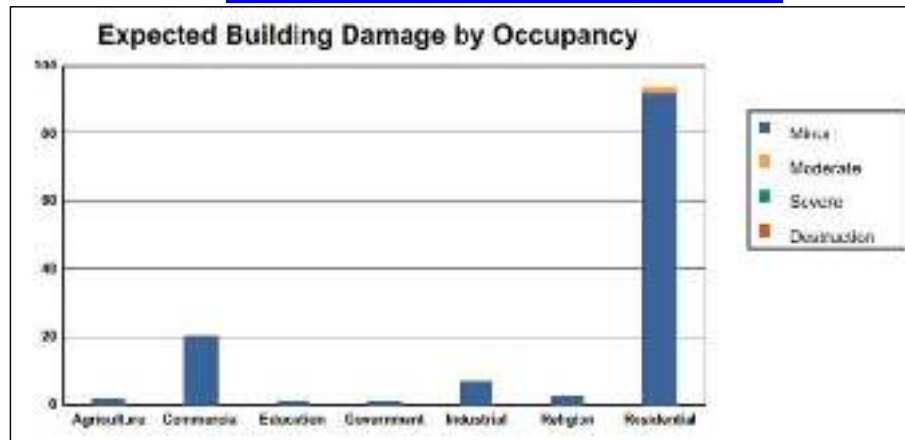
Other types of structures found throughout the district that are vulnerable to damages during high wind events are metal framed buildings, primarily associated with light industrial buildings, as well as some agricultural buildings. According to the Virginia USBC, agricultural buildings, such as barns 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 is significant.

Other factors that affect 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, and roof coverings, and sheathing. Any failure or breach of the envelope can lead to increased pressures on the structure's interior, further damage to contents and framing, and possible collapse.

The LENOWISCO Planning District is in VDEM Region 4, which includes 18 counties in southwestern Virginia. The 2018 Commonwealth of Virginia HMP analyzed potential damages by VDEM region based on a 100-year wind event using FEMA's HAZUS-MH. The analysis showed that most building damage would be to residential structures, but overall damage would be minor. The analysis estimated that two buildings in the region would be moderately damaged by the event, as illustrated in the figure below.

FIGURE: VDEM Region 4 - 100-Year Probabilistic Wind Event, Expected Building Damage by Occupancy

Source: [2018 Commonwealth of Virginia Hazard Mitigation Plan](#)





HAZUS-MH also estimated economic losses for a 100-year wind event, based on the total direct losses for the entire VDEM Region 4. The table below shows the annualized loss estimates for the LENOWISCO Planning District.

TABLE: HAZUS-MH Hurricane Wind Annualized Loss Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan	
Lee County	\$19,871
Scott County	\$20,747
Wise County	\$32,629

The following building types are required by the American Society of Civil Engineers to be designed for a 100-year wind event:

1. Office buildings where more than 300 people congregate in one area;
2. Buildings that will be used for a hurricane or another emergency shelter;
3. Buildings housing a daycare center with a capacity greater than 150 occupants;
4. Buildings designated for emergency preparedness, communication, or emergency operation center or response;
5. Buildings housing critical national defense functions; and
6. Buildings containing sufficient quantities of hazardous materials.

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 southwestern 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 is estimated to be 107 percent of the 50-year wind speed or 96.3 mph.

TABLE: Potential Wind Damage by Building Type Source: 2013 LENOWISCO HMP				
Building Type	50-Year Event (90 mph)		100-Year Event (96.3 mph)	
	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%



Vulnerability & Community Development Analysis

High wind events can impact the entire LENOWISCO Planning District, and accordingly, all development should consider the impacts of a 50-year or 100-year wind event. The planning areas in the District all have their own building codes, meaning not all cities have the same standard building code. The vulnerability of infrastructure due to high winds is highly dependent on construction equipment and quality. Manufactured homes are much more likely to be damaged due to high winds. As described elsewhere in this plan, the District includes a higher percentage of residents living in manufactured homes when compared to the national average.

TABLE: Data Profile Source: American Community Survey, 2014-2018			
Area	Total Population	Reside in a Mobile Home	Houses Built Before 1939
Lee County	24,134	21.9% (2,583)	11.4% (1,339)
Norton City	3,990	15.1% (309)	11.4% (233)
Scott County	22,009	25.9% (2,991)	13.5% (1,606)
Wise County	39,025	27.7% (4,976) and 0.1% (15) in a boat, RV or van	11.7% (2,096)

Impact on LENOWISCO Residents

Depending on the type of wind event, the damage sustained can range from extremely localized to widespread, and from moderate to devastating. Residents may experience impacts from high wind events including damaged and torn-off roofs; blown-out walls and garage doors; overturned vehicles; destroyed homes and businesses; and serious injury and loss of life.

The LENOWISCO 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. 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 district, most residential structures in the area could be classified as having a high level of vulnerability to damages should a high wind event occur.

While residential and commercial buildings in the District may sustain damage in a high wind event, it will likely be minimal or moderate damage. An analysis of VDEM Region 4, the 2018 Commonwealth of Virginia HMP estimated that no households would be displaced, and no people would be expected to seek temporary shelter in public shelters.



Impact on Essential Facilities, Critical Infrastructure, and Future Assets

The 2018 Commonwealth of Virginia HMP HAZUS-MH analysis of essential facilities in VDEM Region 4, summarized below. The results show that all essential facilities would be available for use or in service within one day after the high wind event.

TABLE: VDEM Region 4 - 100-Year Probabilistic Wind Event, Expected Damage to Essential Facilities Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan				
Classification	Total Facilities	Probability of at Least Moderate Damage >50%	Probability of Complete Damage >50%	Expected Loss of Use <1 Day
FOCs	2	0	0	2
Fire Stations	90	0	0	90
Hospitals	18	1	0	18
Police Stations	57	0	0	57
Schools	218	0	0	218

The potential impacts of a severe wind event to the District depend on the event's specific characteristics but can include broken tree branches and uprooted trees; snapped power, cable, and telephone lines; damaged radio, television, and communication towers. 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 district.

Future Conditions

The Virginia HMP (2018) highlights that future climate model projections suggest that tropical Atlantic sea surface temperatures (SSTs) will drastically warm during the 21st century. The upper tropospheric temperatures will warm even more than SSTs. The models also show predicted increasing levels of vertical wind shear over parts of the western tropical Atlantic.

Impact on the Environment

High winds can uproot trees and cause broken tree branches. Large-scale events could impact animals, damage farmland, and disrupt the food chain. If high winds damage power lines or cause gas leaks, it could cause fires or contamination.

Impact on Operations

High winds pose the greatest impact on the distribution of gasoline or other fuels and petroleum products, which may impact operations for organizations and businesses, in addition to back-up power generation.



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Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Non-Rotational Winds hazard.

Frequency & Probability ¹			Very Probable / Very Frequent	
Potential Magnitude and Scale ²			Somewhat Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Minimally Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			High	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.9 Tornado

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes a result of hurricanes and other tropical systems) when cool, dry air intersects and overrides a layer of warm, moist air, forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 200 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and can cause extreme destruction and turning normally harmless objects into deadly missiles.

Tornadoes occur as part of strong thunderstorms that develop in unstable atmospheric conditions. The strongest tornadoes form with supercells, rotating thunderstorms with a well-defined radar circulation called a mesocyclone. One in three supercells experiences a descent of clouds or funnel clouds. These thunderstorms can also produce damaging hail and severe straight-line winds even without a tornado occurrence.

Tornadoes can range from twenty feet in width to larger than a mile on the ground and are transparent until the vortex fills with water vapor, dust, dirt, or debris. Uniquely dangerous are rain-wrapped tornadoes. If there is heavy rainfall near a tornado, a tornado can become masked or wrapped in the rainfall and become hidden.

Hazard Extent

Tornadoes are classified according to the Enhanced Fujita (EF) tornado intensity scale. Originally introduced in 1971, the scale was modified in 2006 to define the damage and estimated wind scale better. The Enhanced Fujita Scale ranges from low-intensity EF0 with effective wind speeds of 65 to 85 miles per hour, to EF5 tornadoes with effective wind speeds of over 200 miles per hour. The Enhanced Fujita intensity scale is included in the table below.

TABLE: Enhanced Fujita (EF) Scale for Estimation of Tornado Wind Speeds Source: http://www.srh.noaa.gov/srh/jetstream/mesoscale/tornado.htm					
EF Scale	Class	Wind speed		Description	Description of Destruction
		mph	km/h		
F0	weak	65-85	105-137	Gale	Light damage, some damage to chimneys, branches are broken, signboards damaged, shallow-rooted trees blown over.
F1	weak	86-110	138-177	Moderate	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
F2	strong	111-135	178-217	Significant	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
F3	strong	136-165	218-266	Severe	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars are thrown about.



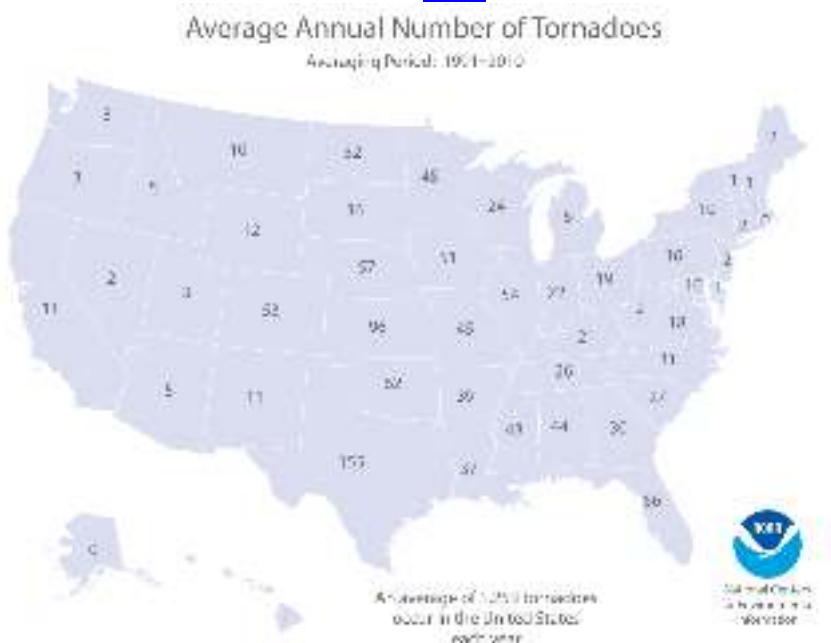
F4	violent	166-200	267-322	Devastating	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
F5	violent	> 200	> 322	Incredible	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Historic/Previous Occurrences

Annually about 1,253 tornados impact the US. This number is based on the latest decade-long study which also showed that an average of 18 tornados impacted Virginia from 1991-2010, with the average dropping to 0.3 EF3-EF5 tornados impacting Virginia annually. According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP), tornadoes can occur in any month but primarily occur from April through September in Virginia. From 1950-2006, Virginia ranked 28th in terms of the number of tornado touchdowns. Low-intensity tornadoes occur most frequently, and tornadoes rated EF2 or higher rarely occur in Virginia ([NOAA](#)). Participating jurisdictions in the LENOWISCO Planning District noted that they are more likely to experience straight-line winds than tornado events.

FIGURE: Tornado Annual Averages by State (1991–2010 averaging period)

Source: [NOAA](#)





During the analysis timeframe (2015-2020) for the HMP update, no tornados or funnel cloud events were recorded as impacting the area. Expanding the search to 10 years, three events were recorded in the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Database.

TABLE: Tornado and Funnel Cloud Events from 01/01/2010 to 12/31/2020 Source: NOAA National Centers for Environmental Information Storm Events Database								
Jurisdiction	Event Type	Dates of Occurrence	Direct Deaths	Direct Injuries	Reported Property Damage	Reported Crop Damage	Indirect Deaths	Indirect Injuries
City of Norton	Tornado - EF0	04/09/2011	0	0	\$50,000	0	0	0
Lee County	Tornado - EF1	3/2/2012	0	1	\$1,750,000	0	0	0
Town of Coeburn	Funnel Cloud	2/29/2012	0	0	\$0	0	0	0

Event Details:

- **April 9, 2011:** Boundary across the area triggered scatter severe thunderstorms during the afternoon and evening hours on the 9th. Storm reports were for both large hail and damaging thunderstorm winds. An EF-0 tornado with maximum winds at 80 mph, downed several trees and moderately damaged two old buildings in Norton, Virginia. The damage to the buildings consisted of a partial roof and wall collapsed along with a chimney collapsing.
- **March 2, 2012:** A deepening low-pressure system moved northeast from the Mid-Mississippi Valley through the Great Lakes and drove a warm front northward through the Southern Appalachian region during the afternoon, and an associated cold front swept across the area late Friday night. A total of three tornadoes, ranging in intensity from EF-0 to EF-1, were produced by the storm. One EF1 tornado with maximum winds at 110 mph started in Claiborne County, TN, and moved northeast into Lee County. The tornado destroyed two houses and damaged four additional houses in Lee County. Additionally, about 20 barns and outbuildings were damaged or destroyed along with miles of agricultural fence line being damaged or destroyed. The tornado path was roughly five miles and downed many trees along the path from Claiborne to Lee County. Residential losses total roughly \$350,000, and agricultural property losses totaled approximately \$1.3 million.
- **Other Events:** Expanding the event search to include "hail," 25 hail events have been recorded as impacting LENOWISCO from 01/01/2010 to 12/31/2020. Two of the hail events were associated with supercell thunderstorms that generated tornados. Supercell thunderstorms can span large areas, and of these two events, only one produced a tornado in the LENOWISCO region; the other produced tornados in Monroe County, Tennessee. The hail event that produced a tornado in LENOWISCO was also recorded under the "tornado" category on 3/2/2012.



Future Probability

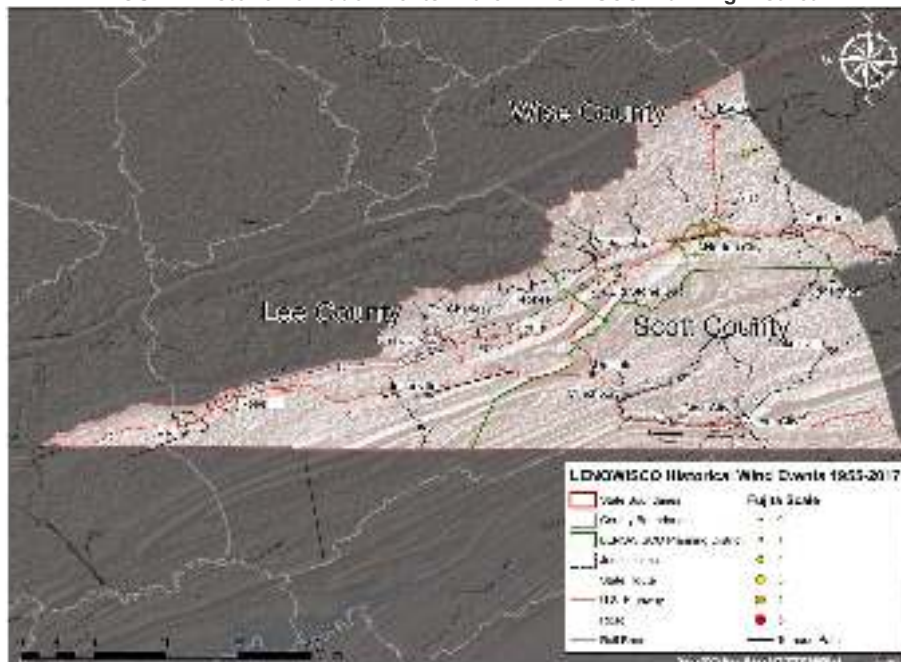
Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Somewhat Probable/Somewhat Frequent** because significant occurrences of this hazard have happened on occasion (even though isolated or low impact events may occur with more regularity). The overall risk ranking for this hazard is **Medium**.

The 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP) outlines a ranking of each jurisdiction in the LENOWISCO Planning District based on various risk factors. Nowhere in the District was ranked as "higher" risk for a tornado in the 2018 HMP given the southeastern and northern part of the Commonwealth have significantly higher tornado occurrences. The 2018 HMP analysis is included in the table below.

TABLE: Tornado Hazard Ranking Parameters <i>Source: Commonwealth of Virginia Hazard Mitigation Plan (HMP), 2018</i>								
Jurisdiction Name	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
Lee County	Medium	Low	Low	High	Low	Medium	Medium	Medium-Low
City of Norton	Low	Medium-High	Low	Low	Low	Low	Low	Low
Scott County	Medium	Low	Low	Low	Low	Medium-Low	Medium-Low	Low
Wise County	Medium	Medium	Low	High	Low	Medium-Low	Medium-Low	Medium-Low

The LENOWISCO Planning District is uniformly at risk of tornado events. According to the 2018 Virginia HMP, the three counties making up the LENOWISCO Planning District have a low or medium-low frequency of tornado events since 2016. According to the HMP, low-intensity tornadoes tend to be more frequently reported in higher population areas. There have been several, low-intensity tornadoes reported since 1955 in the District, as illustrated in the map below. The most intense tornado event in the District on record was an EF-2 event in northeast Wise County, between Pound and Wise.

FIGURE: Historic Tornado Events in the LENOWISCO Planning District



Due to the low number of historic tornado events in the LENOWISCO Planning District, as documented in the NOAA NCEI Storm Events Data, there is not currently a reliable method to calculate annualized losses.

Since tornadoes can occur in any area, the entire population and all buildings are vulnerable to tornadoes. To accommodate this risk, this plan will consider all buildings within the LENOWISCO Planning District as vulnerable.



The planning areas in the District all have their own building codes, meaning not all cities have the same standard building code. The vulnerability of infrastructure due to a tornado is highly dependent on construction equipment and quality. Low-intensity tornados, below an EF2, will likely not impact a well-constructed building. However, the tornado that impacted Lee County in 2012 was below an EF2 and produced extensive residential and agricultural damage.

Impact on Residents

A tornado would affect an entire population in the tornado's path most severely, but power outages and street closures have the potential to impact many more. Those most at risk from tornadoes include people living in mobile homes, campgrounds, and other dwellings without secure foundations or basements. People in automobiles are also very vulnerable to tornadoes. The elderly, very young, and the physically and developmentally disabled are particularly vulnerable when they have a lack of mobility to escape the path of destruction.

The table below highlights the statistics of the population most vulnerable to tornados. The [2014—2018 ACS 5-Year Data and Narrative Profiles](#) for City of Norton, Lee County, Scott County, and Wise County provide insights on the percentage and number of population members that are more susceptible to tornado impact. The Annexes to the plan further provide a breakdown of vulnerabilities within each community in the LENOWISCO Planning District.

TABLE: Data Profile Source: <i>American Community Survey, 2014-2018</i>					
Area	Total Population	Disabled	Individuals in Poverty	Individuals Over 65 years old	Speak English "less than very well"
City of Norton	3,990	23.6% (929)	29.4%	14.2% (689)	0%
Lee County	24,134	25.9% (5,859)	24%	19.7 % (4,759)	0.6% (139)
Scott County	22,009	24.8% (5,286)	18.6%	22.7% (4,999)	0.6% (123)
Wise County	39,025	26.9% (9886)	22%	16.9% (6,583)	0.5% (191)

People who may not understand watches and warnings due to language barriers are also at risk. While less than 1% of the population in each area was recorded as speaking English "less than very well," communication accommodations need to be made to ensure the entire population understands tornado watches and warnings.

Individuals over 65 years old and those with a disability may have limited mobility that prevents them from seeking safe shelter from a tornado. An average of 18.38% of the population is over 65 years old in the District. The area has a higher disabled population than most of the United States, with an average of 25.3% individuals having at least one disability in the District versus 12.6% for the entire United States.

Individuals lacking the resources, such as those living at or below the poverty level, will experience disproportionate challenges to recovering from a tornado. In LENOWISCO, a little

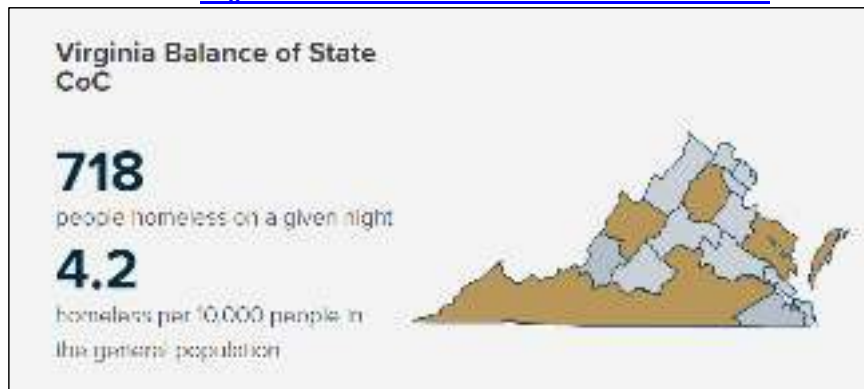


less than half of the population is living at or below the poverty line (23.5%). The average in the District is considerably higher than the national average of 14.1%.

Another vulnerable population is people that are experiencing homelessness. While exact data is not available on the number of residents in the District that are experiencing homelessness, the [National Alliance to End Homelessness](#) includes LENOWISCO in a much larger planning area that shows that 4.2 people of every 10,000 will experience homelessness. The 2018 ACS population data indicates that approximately 89,158 reside in the District. Using this data and assuming all areas grouped by the National Alliance to End Homelessness experienced similar trends, approximately nine people in the LENOWISCO Planning District would experience homelessness on any given night.

MAP: Virginia Homeless Statistics

Source: [Virginia Data for National Alliance to End Homelessness](#)



(areas on the map in brown are factored into the dataset)

Impact on Essential Facilities, Critical Infrastructure, and Future Assets

All essential facilities are vulnerable to tornadoes. An essential facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts will vary based on the magnitude of the tornado but can include structural failure, debris damage, roofs blown off, high winds, and loss of facility functionality (e.g., damaged police station impacts service to the community). Further damage can be caused if tornadoes are accompanied by heavy rain resulting in flooding (flash).

During a tornado, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. The impacts on these structures include broken, failed, or impassable roadways, broken or failed utility lines (e.g., loss of power or gas to the community), and railway failure from broken or impassable railways. Bridges could fail or become impassable, causing a risk to traffic.

Since tornadoes can occur anywhere in the county, any future development will have to be made with this hazard in mind. Mobile home parks, campgrounds, or any other facility without a secure foundation or basement will always be particularly vulnerable.



In the LENOWISCO Planning District, the percentage of residents residing in mobile homes is much higher than the national percentage. In the United States, 6.2% of housing units are mobile homes. In the District, the average percentage of housing units that are mobile homes between the three counties and the City of Norton is 22.65%. The residents in mobile homes, as well as the ones living in a boat, RV, or van, are particularly susceptible to tornado damage.

An additional consideration is the changes in building codes that have stabilized newer developments for hazard impacts. The table below includes homes that were built before 1939, and thus after building code changes.

TABLE: Data Profile Source: <i>American Community Survey, 2014-2018</i>			
Area	Total Population	Reside in a Mobile Home	Houses Built Before 1939
Lee County	24,134	21.9% (2,583)	11.4% (1,339)
Norton City	3,990	15.1% (309)	11.4% (233)
Scott County	22,009	25.9% (2,991)	13.5% (1,606)
Wise County	39,025	27.7% (4,976) and 0.1% (15) in a boat, RV or van	11.7% (2,096)

Future Conditions

Key ingredients for severe thunderstorms that lead to tornadoes include warm, moist air and winds that change with altitude (wind shear) to help organize a thunderstorm and create rotation. Large changes of wind with height are especially important for tornado formation. As the planet warms, the moisture content of the atmosphere will increase, as well as the energy available for producing storms. However, wind shear will likely decrease, due to a lower temperature contrast from pole to pole. The Virginia HMP (2018) highlights that since increasing warmth and moisture will create an environment more conducive to severe thunderstorms and tornadoes but decreased wind shear will create a less conducive environment, it is difficult to determine how the tornado hazard will change with a changing climate.

Impact on the Environment

Tornados can destroy trees, buildings, and other important infrastructure. Tornados have been known to kill animals, damage farmland, and disrupt the food chain. Tornados can also cause water contamination, impacting local flora and fauna, not to mention humans. If a tornado hits power lines or causes gas leaks, fires or contamination can also result.

Impact on Operations

Vulnerabilities associated with tornadoes include any staff active during the initial impact of a tornado. All personnel in vehicles are particularly vulnerable during a tornado. Should a tornado make roads impassable or disable communication lines, breakdowns or delays in all potential operations are possible. Private or public urban tree removal services are also vulnerable to tornadoes.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Tornado hazard.

Frequency & Probability ¹			Somewhat Probable / Somewhat Frequent	
Potential Magnitude and Scale ²			Somewhat Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Vulnerable	
Mitigation ³			Somewhat Capable	
Hazard Consequence & Impact Score ²			Minimally Capable	
Overall Risk Rating ⁴			Medium	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.10 Wildfire

Wildfire is defined by the USDA Forest Service as a fire, naturally caused or caused by humans, that is not meeting land management objectives ([U.S. Forest Service](#)). Wildfires, especially those in or near developed areas, can pose a significant threat to life and property. Wildfires in Virginia are typically human-caused incidents but can be exacerbated by drought conditions. Fire season in Virginia is considered to be spring (March and April) and fall (October and November).

Three important factors determine the formation of wildfires: weather, fuel, and topography.

- **Weather:** drought or long dry periods, low humidity, and windy conditions can contribute to an increased chance of wildfire ignition, as well as increase speed and intensity of the burn.
- **Fuel:** dry and low-humidity conditions cause fuels on the forest floor to dry out, including grasses, conifer needles, leaves, and small twigs or brush. Long dry periods can result in risk from even larger fuels.
- **Topography:** Wildfire events impact the stabilization of the soil by removing groundcover and vegetation. Decreased soil stability, an increased risk in areas with steep topography, can result in landslides, flooding, and erosion for years after a fire.

Hazard Extent

Geographic extent for the Wildfire hazard is defined as the percent of the jurisdiction that falls within a "high" risk according to the Virginia Department of Forestry Risk Assessment. According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP), the geographic extent for wildfire is "low" in all jurisdictions in the LENOWISCO Planning District, meaning less than 10% of the jurisdiction has a "high" risk of wildfire events. According to the HMP, the wildfire cannot be easily expressed in specific recurrence intervals as with other hazard events.

Historic/Previous Occurrences

Scott County was included in a federal disaster declaration for wildfire, according to the 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP). Planning committee participants noted that small wildfire events occur annually on the U.S. Forest Service and National Park Service land within the LENOWISCO Planning District. These wildfires have not resulted in residential property damages to date.

The [Federal Fire Occurrence Database](#) tracks wildfire events on federal lands between 1980-2016. Between 2000-2016, there was one Class F (300-1,000 acres) fire reported in the District, to the northeast of Dungannon at the edge of Scott and Wise counties. This fire was on U.S. Forest Service land. There were 38 Class B and C fires (up to 100 acres) on U.S. Forest Service land or National Park Service Land in the same timeframe.



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Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.13 (methodology) and Section 1.6.14 (results), this hazard is **Probable/Frequent** because occurrences of this hazard have happened regularly (even though isolated or low impact events may occur with more regularity). The overall risk ranking for this hazard is **High**.

All the jurisdictions in the LENOWISCO Planning District are at "low" risk to wildfire hazards, according to the 2018 Virginia HMP ranking parameters included in the table below. As wildfires are heavily influenced by changing weather conditions and human activities, there is no quantitative assessment of future probability available at a regional level in Virginia. According to the Virginia Department of Forestry (VDOF) Wildfire Risk Assessment, the Commonwealth experiences an average of 1,000 wildfires annually, burning 11,000 acres.

TABLE: Wildfire Hazard Ranking Parameters <i>Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan</i>								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Low	Low	Low	Low	Low
Lee County	Medium	Low	Low	Low	Low	Low	Low	Low
Scott County	Medium	Low	Low	Low	Low	Low	Low	Low
Wise County	Medium	Medium	Low	Low	Low	Low	Low	Low



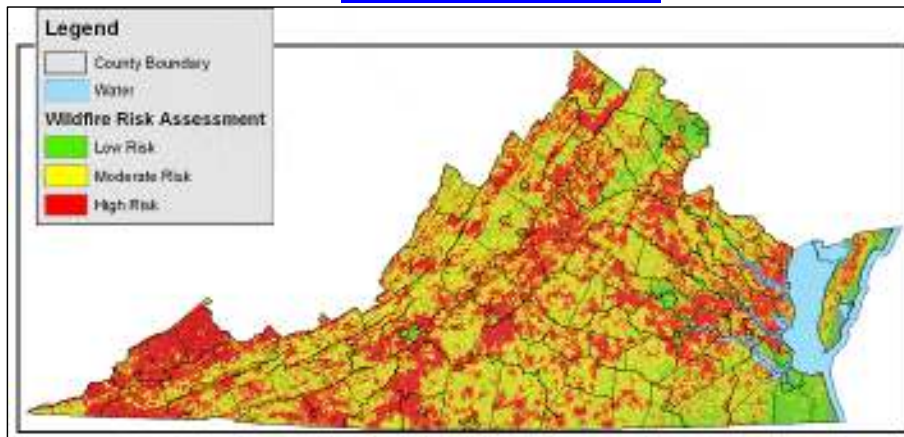
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Geographic Location

Areas of Virginia at risk to wildfire events are illustrated in the VDOF Wildfire Risk Assessment below, categorized as either low risk, moderate risk, or high risk. This map depicts the potential for wildfire based on several factors, including Slope, Aspect, Landcover, Distance to Railroads, Distance to Roads, Population Density, and Historical Fire Occurrence. Much of the LENOWISCO Planning District is "high risk" based on this assessment. VDOF is in the process of updating this risk assessment as a part of a wildfire mitigation project focused on the wildland-urban interface (WUI).

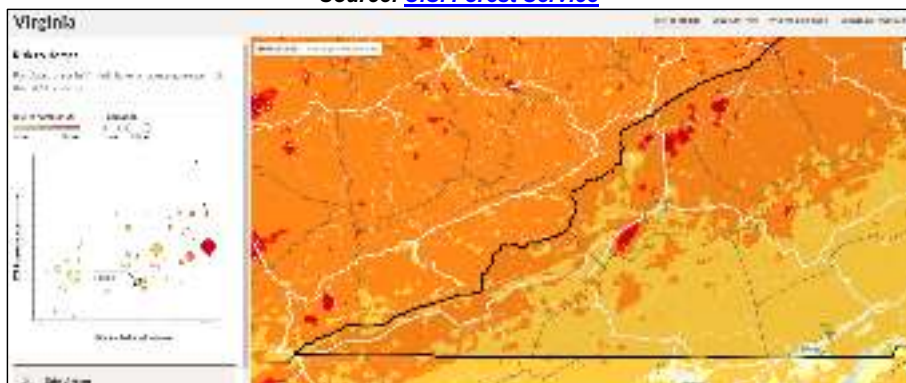
FIGURE: Virginia Wildfire Risk Assessment
Source: [Virginia Department of Forestry](#)



The U.S. Forest Service manages an interactive website that illustrates wildfire risk to communities across the country. A map of the "risk to homes" LENOWISCO Planning District is included below. According to this tool map, the LENOWISCO Planning District and southwestern Virginia as a whole have the greatest areas of risk in the state. Specifically, sections of Wise County along U.S. Highway 23 between Big Stone Gap and Norton, and south of Pound, have very high risk.



FIGURE: Wildfire Risk to Communities - Risk to Homes
Source: [U.S. Forest Service](#)



Loss Estimates

Due to the lack of wildfire events recorded in the NCEI Storm Events Database, it is difficult to accurately estimate annualized losses due to wildfire events. VDOF estimated \$2 million in annualized damages for the Commonwealth of Virginia in 2014-2015, inclusive of damages to timber, structures, and personal property.

Vulnerability and Community Development Analysis

New homes and development are increasingly located in the wildland-urban interface (WUI). WUI is the area where structures and other human development meet or intermingle with developed wildland. Expansion of the WUI poses significant challenges to wildfire management and impact, as it represents environments where forest and grassland fires can move quickly into neighborhoods. Portions of the LENOWISCO Planning District, across all three counties, include residential structures located in the WUI, as shown in the maps on the following pages.



MAP: 2010 Wildland-Urban Interface of Virginia

Source: [2010 Wildland-Urban Interface of the Conterminous United States, U.S. Forest Service](#)

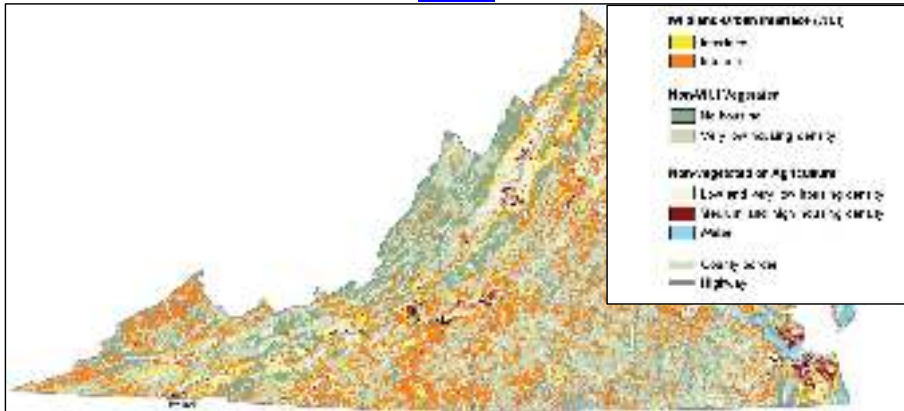


FIGURE: Lee County Wildland-Urban Interface

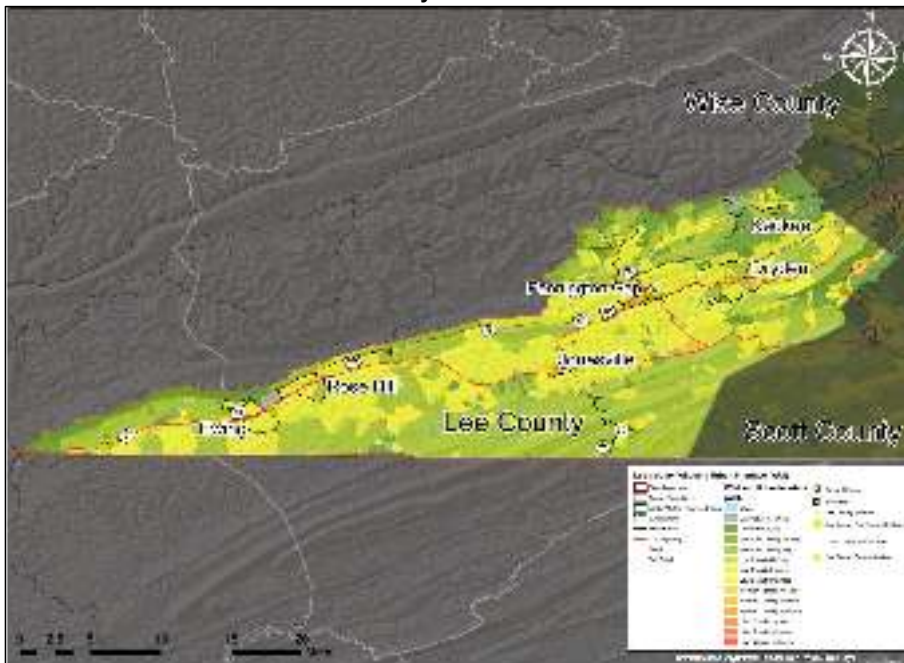




FIGURE: Scott County Wildland-Urban Interface

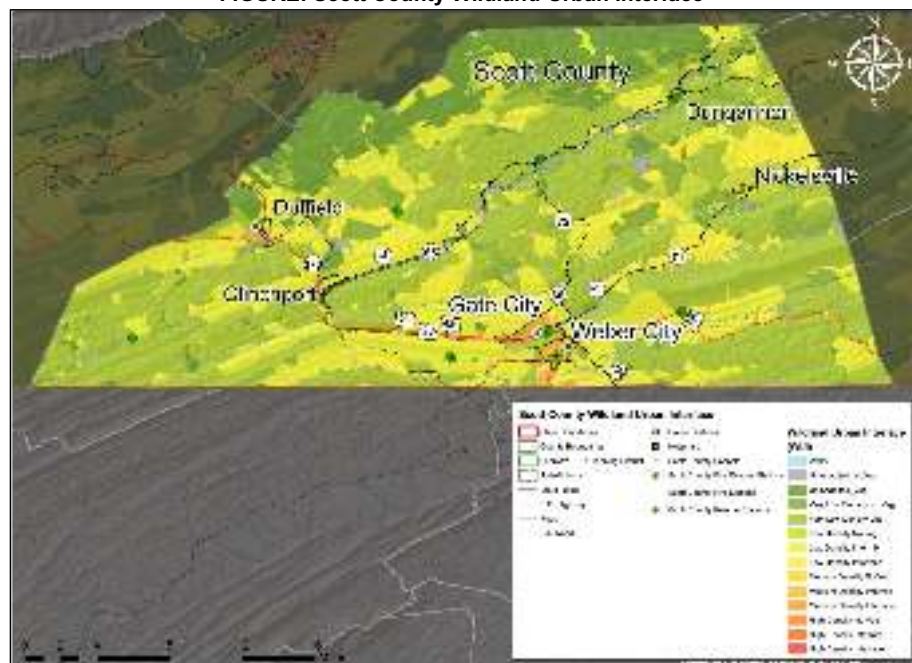
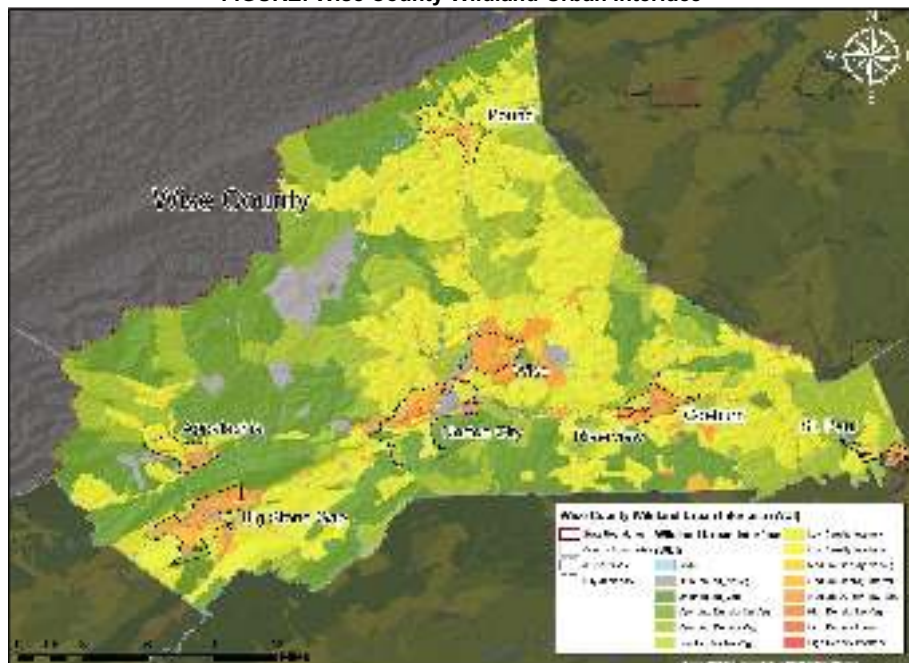




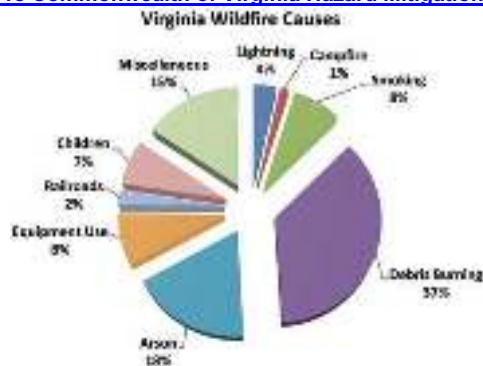
FIGURE: Wise County Wildland-Urban Interface



The leading cause of wildfire events in Virginia is debris burning, followed by arson. Human activities cause most wildfire events in the Commonwealth, with only 4% of fires caused by lightning strikes. As human and wildland interactions increase, as is the case with suburban development patterns, it is likely that the incidence of wildfire events in Virginia will grow.

FIGURE: Virginia Wildfire Causes from 1995-2016

Source: [2018 Commonwealth of Virginia Hazard Mitigation Plan \(HMP\)](#)





Impact on LENOWISCO Residents

Residents may be at risk to evacuation notices for larger wildfire events, and increasingly to smoke impacts from nearby fires. The 2020 historic wildfire season in the western United States resulted in smoke and degraded air quality across the country. Smoke from fires and the resulting poor air quality poses greater threats to those with underlying health conditions and the elderly.

Impact on Essential Facilities, Critical Infrastructure, and Future Assets

The vulnerability of property to wildfire is influenced by surrounding land cover and land management techniques. Urban areas are less vulnerable to wildfire, but suburban areas or those in the WUI are more vulnerable. Individual properties and buildings will be more vulnerable based on the clear distance around the structure and construction materials.

Future Conditions

Increasing temperatures yield an atmosphere that can hold more moisture which correlates to increased precipitation in the winter but declining rainfall in the summer. Drier soils and higher temperatures yields conducive environment for wildfire spread.

Impact on the Environment

Wildfires can have significant effects on the environment, including the destruction of trees and vegetation, and increased erosion or landslide risks that may threaten water quality. Wildfire can also allow some vegetation to flourish due to increased sunlight exposure at the ground level.

Impact on Operations

In Virginia, most wildfire response is handled at the local level. Fire events require the attention of local fire districts and would impact their operations. Wildfire could potentially impact major roads depending on the extent and location.



Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Wildfire hazard.

Frequency & Probability ¹			Probable / Frequent	
Potential Magnitude and Scale ²			Minimally Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Minimally Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			High	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



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1.6.11 Winter Storm

The National Weather Service ([NWS](#)) describes winter storms as weather conditions that produce heavy snow or significant ice accumulations. The National Severe Storms Laboratory ([NSSL](#)), a part of the National Oceanic and Atmospheric Administration (NOAA), defines a winter storm as a type of winter weather and an event in which the main types of precipitation are snow, sleet, or freezing rain. A winter storm is a combination of heavy snow, blowing snow, and/or dangerous wind chills. Severe winter weather refers to winter storm events including blizzards and ice storms. These hazards can happen independently of one another or at the same time. Winter weather hazard events occur when an excessive amount of snowfall or other related winter weather, such as severe ice storms, high winds, and cold temperatures affect residents' safety, transportation, and ability to work and deliver goods.

Typically, winter storms form from a combination of **cold air** (below freezing temperatures in the clouds and near the ground), **lift** (raise the moist air to form clouds causing precipitation), and **moisture** (used to form clouds and perceptions). The combination is essential to create a winter storm.

Severe winter weather consists of various forms of precipitation and strong weather conditions. This may include one or more of the following: freezing rain, sleet, heavy snow, blizzards, icy roadways, extremely low temperatures, and strong winds. The most common winter weather events in southwestern Virginia include:

- **Ice Storms:** Ice storms are one of the most dangerous types of winter storms and typically occur when precipitation falls from above freezing (32 degrees Fahrenheit) temperatures and comes in contact with air or surfaces that are below freezing. During ice storms, ice accumulates on the ground surfaces, power lines, and trees. Ice causes dangerous conditions on the ground, reducing traction and rendering slick surfaces.
- **Blizzards and Snowstorms:** Significant snowstorms are characterized by the rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility. Severe winter weather also occurs in the form of blizzards and heavy snow. A blizzard is characterized by periods of heavy snow and high winds (at least 35 miles per hour) lasting more than 3 hours. Visibility is decreased to less than a quarter of a mile. Although extreme cold often accompanies blizzard conditions, a blizzard does not necessarily have to occur in extremely cold conditions. Heavy snow is classified as snow accumulations expected to approach or exceed six inches in 12 hours or eight inches in 24 hours. Heavy snow is not necessarily accompanied by significant wind, freezing rain, or sleet.
- **Snow:** Most precipitation that forms in wintertime clouds starts as snow. The top layer of the storm is usually cold enough to create snowflakes.
- **Sleet:** Sleet occurs when snowflakes only partially melt, and they fall through a shallow layer of warm air.
- **Freezing Rain:** Freezing rain occurs when snowflakes descend into a warmer layer of air and melt completely.



FIGURE: Snow Formation
Source: [NOAA](https://www.noaa.gov)



FIGURE: Sleet Formation
Source: [NOAA](https://www.noaa.gov)

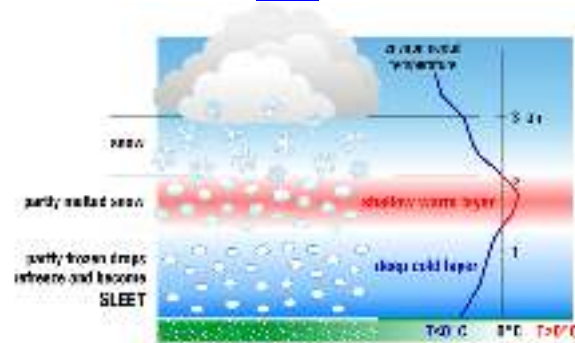
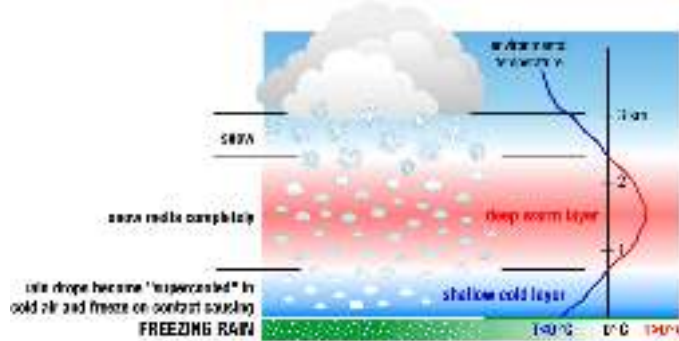


FIGURE: Freezing Rain
Source: [NOAA](https://www.noaa.gov)





Hazard Extent

The National Weather Service provides a classification system for various types of winter storm events. Severe winter weather can often be forecasted a few days in advance, allowing more time to prepare life and safety measures, notify residents, and position resources. National Weather Service definitions include:

- **Winter Storm Watch:** Issued when there is a potential for heavy snow or significant ice accumulations, usually 24 to 36 hours in advance.
- **Winter Storm Warning for Snow:** Issued for winter storms producing at least 6 inches of snow in a 12-hour period or at least 8 inches of snow in a 24-hour period.
- **Winter Storm Warning for Sleet:** Issued by the National Weather Service for winter storms producing at least a half ($\frac{1}{2}$) inch of sleet.
- **Blizzard Warning:** Issued for winter storms with sustained or frequent winds of 35 mph or higher with considerable falling and/or blowing snow that frequently reduces visibility to a quarter ($\frac{1}{4}$) mile or less. These conditions are expected to prevail for a minimum of 3 hours.
- **Ice Storm Warning:** Issued when freezing rain produces more than a quarter ($\frac{1}{4}$) inch accumulation of ice.
- **Winter Weather Advisory for Snow and Blowing Snow:** Issued for winter storms with 25-34 mph winds and blowing snow that frequently reduces visibility to a quarter ($\frac{1}{4}$) mile or less.
- **Winter Weather Advisory for Snow:** Issued for winter storms producing 3 to 5 inches of snow. Occasionally will be issued for winter storms producing 2 to 4 inches of snow.
- **Winter Weather Advisory for Sleet:** Issued for winter storms producing less than a half ($\frac{1}{2}$) inch of sleet



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History/Previous Occurrences

During the analysis timeframe (2015-2020) for the HMP update, 12 events were recorded in the NOAA National Centers for Environmental Information (NCEI) Database. Most of the events impacted multiple areas in LENOWISCO.

TABLE: Blizzard, Heavy Snow, and Ice Storm Events in LENOWISCO from 01/01/2015 to 08/01/2020 Source: NOAA National Centers for Environmental Information Storm Events Database								
County	Event Type	Dates of Occurrence	Direct Deaths	Direct Injuries	Reported Property Damage	Reported Crop Damage	Indirect Deaths	Indirect Injuries
Lee	Blizzard	3/4/2015	0	0	0	0	0	0
	Heavy Snow	2/17/2015 2/21/2015 1/20/2016 1/22/2016 2/14/2016 3/12/2018 12/9/2018						
Scott	Heavy Snow	2/16/2015 2/21/2015 1/20/2016 1/22/2016 2/14/2016 12/9/2018						
Wise	Blizzard	3/4/2015						
	Heavy Snow	2/16/2015 2/17/2015 2/21/2015 2/26/2015 1/20/2016 1/22/2016 2/8/2016 2/14/2016 1/6/2017 3/12/2018 12/9/2018						
	Ice Storm	2/16/2015 3/4/2015						



Other major events in the LENOWISCO Planning District, prior to 2015, include:

- **January 20-22, 1985:** an arctic cold front swept across the state. New temperature records were set at several locations, and fresh snow helped wind chill temperatures plunge well below zero.
- **Winter 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.
- **March 12-15, 1993:** The “Super Storm of March ’93” or “The Storm of the Century” affected 26 eastern and central states and resulted in a federal disaster declaration. Snowfall across the region ranged from 12 to 48 inches depending on elevation. Far southwestern Virginia saw 30 to 42 inches of snow, the most in more than 25 years. Winds produced blizzard conditions with snowdrifts up to 12 feet. Interstates were shut down. Shelters were opened for 4,000 stranded travelers. The Virginia National Guard helped with emergency transports and critical snow removal.
- **February 10–11, 1994:** an ice storm caused some areas of southern Virginia to receive up to three inches of ice, causing tremendous tree damage and power outages for up to a week.
- **January 6, 1996:** The “Blizzard of ’96” or “Great Furlough Storm” contributed to as much as 30 to 36 inches of snow over the western mountains.
- **December 2009:** A week before Christmas, a Nor’easter slammed the East Coast, breaking records for a December snowfall. Thousands were left without power, some for several days, in the biggest snowstorm to affect western Virginia since the January 1996 storm.
- **October 2012:** Many snowstorms affecting the LENOWISCO district follow familiar storm tracks, but Hurricane Sandy brought an unusual mix of weather conditions to the Eastern seaboard. Wise County saw as much as 10 inches of snow, while much of Lee County had a minor dusting.

TABLE: Historic Snowfall Amounts	
Source: 2013 LENOWISCO Hazard Mitigation Plan	
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
December 18-20, 2009	8-12 inches
October 30-31, 2012	6-10 inches



Future Probability

Based on the Community Vulnerability Risk and Resiliency (CVR2) assessment, detailed in Section 1.6.3 (methodology) and Section 1.6.5 (results), this hazard is **Very Frequent/Very Probable** because significant occurrences of this hazard have happened recently and will likely occur again in the future. The overall risk ranking for this hazard is **High**.

The City of Norton and Wise County are two jurisdictions considered to be at "higher" risk to winter weather events according to the 2018 Commonwealth of Virginia Hazard Mitigation Plan. The western and northern areas of the Commonwealth experience greater risk in general, based on trends in lower temperatures, snowfall, and winter precipitation of all types.

TABLE: Winter Weather Hazard Ranking Parameters Source: <i>2018 Commonwealth of Virginia Hazard Mitigation Plan</i>								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Low	Low	High	High	Medium
Lee County	Medium	Low	Low	Low	Low	Medium-High	Medium-High	Medium-Low
Scott County	Medium	Low	Low	Low	Low	Medium-High	Medium-High	Medium-Low
Wise County	Medium	Medium	Low	Low	Low	High	High	Medium



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Geographic Location

Although the Commonwealth of Virginia is not generally associated with severe winter storms, the mountainous area in the southwest region regularly experiences several snow storms each year. Winter weather events in Virginia typically include snowstorms, freezing temperatures, ice storms, and sleet or freezing rain. Most often, winter weather results from Nor'easter storm patterns which can produce significant snowstorms throughout the mid-Atlantic, typically between November and April. Nor'easters also bring strong winds, which when combined with frozen precipitation can significantly damage trees and utility lines.

One of the most significant seasonal snowfalls in the Commonwealth's history took place in Wise County during the winter of 1995-1996 when a recorded 124.2 inches of snow fell. On average, southwestern Virginia will experience one or two severe winter storms each year. Snowfalls amounts for these storms can vary from a few inches to a foot of snow in extreme cases. The higher elevations of the district (i.e. High Knob in the Jefferson National Forest) can experience as much as 48 inches of snow in a severe winter storm.

The winter storm hazard can impact all jurisdictions within the LENOWISCO Planning District, but the total average annual snowfall within the district varies by jurisdiction. Lee County has an average annual snowfall of 14 inches per year, Scott County 9 inches per year, Wise County 37 inches per year, and the City of Norton 15 inches.

Loss Estimates

Economic impacts arise from numerous sources including hindered transportation of goods and services, flooding due to burst water pipes, forced closing of businesses, the inability of employees to reach the workplace, damage to homes and structures, automobiles, and other belongings by downed trees and branches, loss of livestock and vegetation and many others. There were no reported losses from winter weather events in the LENOWISCO Planning District from 2015-2020. The 2018 Virginia HMP estimates a statewide annualized loss of about \$5.4 million based on the NOAA NCEI Storm Events Database. This is likely an underestimate, as it does not include many societal costs such as lost productivity and energy consumption.

Vulnerability and Community Development Analysis

Winter storms are a regular occurrence in the LENOWISCO Planning District. Storm impacts are distributed across the entire District. Impacts increase in communities with higher annual snowfall (Wise County) and those that are isolated by a few critical roadways that may be impacted by winter storm conditions and heavy snowfall. While the District is accustomed to winter storm events, communities can be crippled by road closures that can limit emergency response, utility repair, or supply delivery. Planning committee members noted that power outages can last up to a week after a major winter storm, and the overhead power lines across the region are vulnerable to outages and damage from heavy snow.

Impact on LENOWISCO Residents

In the public survey completed to information the Hazard Mitigation Plan update, over 50% of the public survey participants selected winter storms as a high risk hazard for the District, and over 40% of the public survey participants indicated that winter storms are medium risk hazards



for the District. The vulnerability to severe winter storms is like extreme temperatures. Severe winter weather poses a threat to the lives and safety of individuals exposed. Most deaths correlated to winter storms are not directly related to the storm itself. The three causes of deaths commonly associated with "side-effects" of winter storms are:

- Traffic accidents on icy roads.
- Heart attacks while shoveling snow.
- Hypothermia from prolonged exposure to cold.

While everyone is at-risk during a winter storm, the actual threat varies by a person's specific situation. Of injuries related to ice and snow ([NSSL](#)):

- About 70% occur in automobiles.
- About 25% are people caught out in the storm.
- The majority are males over 40 years old.

Of injuries related to exposure to cold ([NSSL](#)):

- 50% are people over 60 years old.
- Over 75% are males.
- About 20% occur in the home.

Severe winter weather events are a threat to all residents, but certain groups are especially at risk and require special attention from jurisdictions. Those most at risk from severe winter weather include the elderly, people with disabilities or requiring medical support, and socioeconomically disadvantaged individuals.

People with disabilities, including those with mental health disorders, limited communication, or physical disabilities are very vulnerable to severe winter storms. Physically disabled individuals may rely on power for life-essential treatments such as oxygen, dialysis, or heart-monitoring devices. These critical devices may become dysfunctional during a power outage. Individuals with limited mobility or agility, including the elderly, are also at greater risk of injuries from falling on slippery surfaces. An average of 18.38% of the population is over 65 years old in the District. The LENOWISCO Planning District has a higher disabled population than most of the United States, with an average of 25.3% individuals having at least one disability in the District versus 12.6% for the entire United States. Some jurisdictions noted specific concerns for dialysis patients who need access to services from the regional dialysis center in Norton. This service can be disrupted due to power outages, as well as impassable roads after a significant storm.

Socioeconomically disadvantaged individuals, especially those without access to adequate heating at home or reliable vehicles, will experience disproportionate vulnerability to winter weather dangers. In LENOWISCO, a little less than a quarter of the population is living at or below the poverty line (23.5%). The average in LENOWISCO is considerably higher than the national average of 14.1%. Additionally, Individuals experiencing homelessness are extremely at risk of exposure due to lack of adequate shelter, limited access to heat, or poor clothing options. Individuals without stable housing may also seek shelter in structures that are vulnerable to winter weather events.



The table below highlights the statistics of the population most vulnerable to winter weather events. The [2014—2018 ACS 5-Year Data and Narrative Profiles](#) for the City of Norton, Lee County, Scott County, and Wise County provides insights on the percentage and number of population members that are more susceptible to tornado impact. The Annexes to the plan further provide a breakdown of vulnerabilities within each community in LENOWISCO.

TABLE: Data Profile Source: <i>American Community Survey, 2014-2018</i>				
Area	Total Population	Disabled	Individuals in Poverty	Individuals Over 65 years old
City of Norton	3,990	23.6% (929)	29.4%	14.2% (689)
Lee County	24,134	25.9% (5,859)	24%	19.7 % (4,759)
Scott County	22,009	24.8% (5,286)	18.6%	22.7% (4,999)
Wise County	39,025	26.9% (9886)	22%	16.9% (6,583)

Impact on Essential Facilities and Other Property

Essential facilities will experience similar impacts as other buildings in the district. Impacts to facilities could include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow.

Critical infrastructure vulnerable to a winter storm includes roadways, utility lines/pipes, and bridges. Potential impacts include broken gas and/or electricity lines or damaged utility lines, damaged or impassable roads and railways, and broken water pipes. Excess ice accumulation and high-speed winds can significantly damage infrastructure, including power lines and communication towers, or causing fallen trees.

Any new development within the District will remain vulnerable to these events. However, because older structures are more likely to be vulnerable to heavy snow or ice, newer construction may be more resilient to this hazard.

Future Conditions

Changes in the climate have correlated with more frequent heavier seasonal snow years. This correlation is echoed in NOAA's Climate Change and Extreme Snow in the U.S. report. The report notes that approximately twice as many extreme U.S. snowstorms occurred in the latter half of the 20th century than the first (NOAA).

Impact on the Environment

Excess ice or significant snowfall can lead to significant tree damage and fallen branches. Winter conditions can impact livestock and make it more difficult for animals to access food and water. Additionally, wet or flooding conditions can impact local ecosystems, including encouraging the spread of mold/fungi, disrupting the local food chain, or spreading pollution.



Impact on Operations

Operations could be impacted by secondary hazards such as structural damage from snow, wind damage, hazardous driving conditions, service or communication disruptions, or power outages. These hazards may impact first responder capabilities and their prompt response to emergencies. Power outages may also cause many critical facilities to rely on backup power temporarily.

Hazard Evaluation and Impact/Consequence Assessment

Each hazard was evaluated using the Community Vulnerability Risk and Resilience (CVR2) process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. A complete summary of the CVR2 methodology is described in Section 1.6.13.

The following table summarizes the CVR2 results for the Winter Storm hazard.

Frequency & Probability ¹			Very Probable / Very Frequent	
Potential Magnitude and Scale ²			Somewhat Vulnerable	
Physical Vulnerability Hazard Impact ²			Vulnerable	
Social Vulnerability Hazard Impact ²			Vulnerable	
Community Conditions Hazard Impact ²			Vulnerable	
Overall Capability and Capacity ³			Somewhat Capable	
Mitigation ³			Somewhat Capable	
Hazard Consequence & Impact Score ²			Vulnerable	
Overall Risk Rating ⁴			High	
Legend				
Score	1: Frequency and Probability Rating	2: Vulnerability Rating	3: Capability and Capacity Rating	4: Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme



1.6.12 Solar Storm

The following profile was created for the Solar Storm hazard due to its inclusion in the 2018 Commonwealth of Virginia Hazard Mitigation Plan. The planning team unanimously determined not to complete a full hazard profile or include Solar Storm in the risk assessment and mitigation strategy due to a lack of information on potential vulnerabilities and hazard impacts. This decision can be revisited in the next update of the plan if additional data is made available.

Solar storms, and more broadly space weather, are caused by eruptions on the sun (solar flares and coronal mass ejections). These storms are the result of changes in the flow of solar particles and magnetic fields from the sun. Solar storms can occur in near-Earth space or Earth's atmosphere. Technology is particularly vulnerable to space weather and solar storms. Solar storms include three categories:

- **Geomagnetic storms:** electrical currents that can have a significant impact on electrical transmission equipment, which can result in widespread electrical failures and interruptions to navigational and GPS systems. Additionally, geomagnetic storms can affect satellites, which we rely on for radio and television, credit card transmission, and cell phones.
- **Solar radiation storms:** these storms are of greatest concern for aircraft control.
- **Radio blackouts:** impact high-frequency communications and the sectors that rely on them, including emergency responders.

NOAA's Space Weather Prediction Center (SWPC) forecasts space weather to help avoid or mitigate the impacts of solar storms. This includes real-time monitoring and forecasting of solar events, and issues watches, warnings, and alerts.

Hazard Extent

According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan (HMP), the solar storm hazard cannot be easily expressed in specific recurrence intervals as with other hazard events.

History/Previous Occurrences

There are no recorded occurrences of solar storm events or impacts in either the LENOWISCO Planning District or the Commonwealth of Virginia, according to the 2018 Virginia HMP. The last recorded solar storm event on Earth was more than 150 years ago.



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Future Probability

The probability of a solar storm event cannot be predicted, but NASA can provide some warning of storms before we feel their impacts. This hazard has a low probability for the entirety of the LENOWISCO Planning District as well as within the Commonwealth of Virginia HMP.

TABLE: Solar Storm Hazard Ranking Parameters <i>Source: 2018 Commonwealth of Virginia Hazard Mitigation Plan</i>								
Jurisdiction	Population Vulnerability	Population Density	Injuries & Fatalities	Property Damage	Crop Damage	Events	Geographic Extent	Total Risk Ranking
City of Norton	Low	Medium-High	Low	Low	Low	Low	Low	Low
Lee County	Medium	Low	Low	Low	Low	Low	Low	Low
Scott County	Medium	Low	Low	Low	Low	Low	Low	Low
Wise County	Medium	Medium	Low	Low	Low	Low	Low	Low

Geographic Location

If a solar storm were to occur, it would have wide-reaching impacts across the LENOWISCO district as well as the Commonwealth and eastern seaboard.

Loss Estimates

Due to the lack of intensity-damage models for solar storm events, it is not currently possible to estimate losses.



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Vulnerability and Community Development Analysis

The most significant impact of a solar storm event would be the disruption of electrical power transmission and high-frequency radio transmission. The LENOWISCO Planning District, Virginia, and the world are increasingly reliant on these systems for communication, emergency operations, essential services, and critical infrastructure. All of this technology is vulnerable to a solar storm event.

Impact on LENOWISCO Residents

Residents are likely to experience impacts due to the disruption of power systems, communication, or other technologies. These disruptions could affect the delivery of services or short-term economic impacts.

Impact on Essential Facilities, Critical Infrastructure, and Other Property

Essential facilities are likely to be impacted by electrical outages and communications issues because of a solar storm event.

The greatest impact of a solar storm is the disruption of electrical power transmission and high-frequency radio communications. The power grid and power distribution could also be disrupted. There is also the possibility of partial or system-wide blackouts due to voltage instability and high-power demand from tripped transformers.

Impact on the Environment

Electrical issues stemming from a solar storm event could lead to an increased risk of fires.

Impact on Operations

High-frequency radio communication is commonly used across government agencies and private industries. Many essential operations depend on reliable access to communications, posing significant vulnerability to solar storms or other space weather.

1.6.13 Risk Assessment Methodology

The LENOWISCO Planning District recognizes that the Hazard Risk Assessment is the fundamental building block of the four core functions of emergency management: mitigate, prepare, respond, and recover. In today's hazard environment, emergency management is the crux of solving the complex challenges that face communities during an emergency or following a disaster.

The Federal Emergency Management Agency (FEMA) defines mitigation as "the effort to reduce the loss of life and property by lessening the impact of disasters" ([FEMA, 2018](#)). FEMA furthers this definition by providing three key areas that need to happen before a disaster. These areas are analyzing risk, reducing risk, and insuring against risk. FEMA also asserts that disasters can happen at any time and in any place, which is an important reason why all communities need to be empowered to assess short and long-term risks. While assessing involves financial backing, the actual implementation of mitigation tactics involves the most



significant financial barriers. Mitigation financial barriers must be reframed as investments and preventative measures to a much higher economic and human loss that could result from an unmitigated disaster ([FEMA, 2018](#)).

Mitigation should be viewed as a proactive solution to protect a community ahead of any threat of an emergency or disaster impact. Mitigation can provide whole communities with the tools to be resilient before and after a disaster. While mitigation tactics do require financial investment, both short-term for implementation and long-term for maintenance, investing in mitigation should ultimately lessen the financial burden on society. The Multi-Hazard Mitigation Council initially estimated that each dollar spent on mitigation saves society an average of four dollars, which equates to a 400% savings on disaster spending, which is a growing domestic fiscal burden. More recently, the Multi-Hazard Mitigation Council reported that every \$1 invested in mitigation building equates to \$11, thus an 1100% savings. Another study found that \$1 spent on hazard mitigation can save the nation \$6 in future disaster costs ([NIBS, 2019](#)).

Hazard Assessment Methodology

The objective of the risk methodology is to devise a process to compare and evaluate which hazards are the greatest threats to the District and where mitigation actions should be focused to provide the best value. The Risk Assessment describes, analyzes, and assesses the risks facing the District from natural hazards. Natural hazards are those events that are a result of our surrounding environment, such as tornadoes and flooding.

Past disaster events, both natural and human-caused, indicate that disasters cannot be viewed or solved as isolated instances. In other words, the rising number of disasters and ensuing damages, including human losses, can be “symptoms of broader and more basic problems.” These problems stem from the intricate relationships society shares with both the natural and constructed environments.

According to Dr. Denis Mileti:

“Many disaster losses – rather than stemming from unexpected events – are the predictable result of interactions among three major systems: the physical environment, which includes hazardous events; the social and demographic characteristics of the communities that experience them; and the buildings, roads, bridges, and other components of the constructed environment”.

Source: Mileti, Denis (1999). Disasters by Design. Joseph Henry Press: Washington, DC.

Dr. Mileti’s findings demonstrate that these destructive events must be understood and assessed from a holistic point of view and that current and future solutions for reducing damages and human losses must acknowledge that disasters occur at the intersection of the physical environment, social community characteristics, and the constructed environment. While the escalating losses from disasters will continue to result, in part, from the continuing expansion of the built environment, it can also be attributed to the fact that “all these systems – and their interactions – are becoming more complex with each passing year.”

Therefore, the Risk Assessment assumed that hazard events exacerbate pre-existing conditions of a community and that a community’s hazard risk is a function of its vulnerability and potential hazard impact. To mitigate these risks and hazards, capacities, and capabilities of managing



potential impacts are evaluated as well as a disaster's cascading effects on communities, residents, essential services, and critical assets. The figure below provides a general illustration of this relationship between the pre-existing conditions in a city (i.e., pre-disaster vulnerability and efforts to mitigate and build capabilities) and the potential impact from various hazards.

Although incorporating vulnerability, capability, and cascading impacts in a risk assessment are complex, it is imperative to include these relationships in the methodology to the best ability possible to ensure the usefulness of the outputs. Understanding these interdependent relationships can assist in operational, hazard, agency, and community planning.

Many of the hazards in the Risk Assessment do not pose a significant risk because of their low probability of occurring or minimal impact; however, these hazards are still addressed in this Plan. Hazards that were determined to not occur in the District were removed from the Risk Assessment.

Community Vulnerability Risk and Resiliency (CVR2)

Each hazard is evaluated using the CVR2 process, which is based on the probability of a hazard occurring, the potential magnitude of the hazard, and potential impacts. The CVR2 hazard assessment also provides consideration to the community's efforts to mitigate and build capacity to manage each hazard threat. The CVR2 hazard risk analysis incorporates the outputs provided by the vulnerability and capability/capacity indices to provide an overall hazard risk score that can be prioritized. The following table identifies the indicators and measurements, describes why these are important, and presents the key used to evaluate each indicator.

Building off the theoretical finding that disasters are not isolated events, the CVR2 process analyzes a series of vulnerability indices to evaluate the different types of impacts that may be possible by the hazard. Categories are areas of potential vulnerability (for example, social vulnerability) and are further evaluated based on a series of scientific indicators like special population types such as the elderly. Each indicator is assessed to provide a complete picture of the potential impact that each hazard poses on the community. The following table identifies the indicators and measurements, describes why these are important, and presents the key used to evaluate each indicator.



TABLE: Hazard Assessment

Indicators & Measurements	Description	Rating Key	
Hazard-Specific Frequency & Probability	Frequency of past occurrences and the probability of future incidents based on predictive modeling or scientific research.	Extreme	
		High	
		Medium	
		Low	
Hazard-Specific Magnitude & Scale	The potential magnitude of the hazard and scale or size of the hazard.	Extreme	
		High	
		Medium	
		Low	
Capability & Capacity	The community's ability and capacity to manage the hazard, such as floodplain management programs or anti-terrorism surveillance.	Very Capable	
		Capable	
		Somewhat Capable	
		Minimally Capable	
Mitigation Assessment	The community's efforts to mitigate the hazard, such as buying out flood-prone properties, building codes, etc.	Very Capable	
		Capable	
		Somewhat Capable	
		Minimally Capable	
Consequence & Impact Assessment	The potential severity of the impacts and consequences of the event. This assessment provides consideration to the Hazard Impact Analysis.	Extreme	
		High	
		Medium	
		Low	



TABLE: Hazard Impact Analysis

Categories and Indicators	Rating Key	Physical Vulnerabilities Hazard Impact Analysis
Physical Vulnerabilities Hazard Impact Analysis - Critical Infrastructure - Key Resources - Building Stock	The built environment provides the setting for human activity, ranging in scale from personal residential structures and buildings to neighborhoods and cities that often include supporting infrastructures, such as transportation networks, energy, and water systems. The CVR2's Physical Vulnerability Index (PVI) evaluates critical infrastructure, key resource assets, and building stock risk exposure to hazards using a series of indicators and measurements.	Very Vulnerable Vulnerable Somewhat Vulnerable Minimally Vulnerable
Social Vulnerabilities Index (SVI) Hazard Impact Analysis - Special Populations - Cultural Conditions - Socio-Economic Conditions	Social vulnerability can be broadly viewed as the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a hazard or threat. Social vulnerability can also be looked at as the susceptibility of community groups (elderly, children, etc.) to the impacts of hazards, as well as their resiliency or ability to adequately recover from them. It should be noted that susceptibility is not only a function of demographic characteristics, but also more complex factors such as health care provision, social capital, and access to lifelines. The CVR2's Social Vulnerability Index (SVI) evaluates the hazard risk exposure of special population types, socio-economic conditions, and cultural conditions using a series of open-source data measurements. There are a number of potential special populations that may be used in the descriptions below including: - Children: Those under 18 years old - Dialysis Patients: Patients who are reliant on dialysis to survive - Disabled: Those who have a mental or cognitive disability - Elderly: Those over 65 - Low-Income/Poor: Those who do not make a living wage or are below the poverty line - Non-English speakers - Pet Owners: Those who live with and/or take care of animals - Transient: Tourists, commuters, and homeless - University Students: Those who attend a college or university - Vehicle Ownership: Those who do not have access to a vehicle	Very Vulnerable Vulnerable Somewhat Vulnerable Minimally Vulnerable
Community Conditions Vulnerability Index (CVI) Hazard Impact Analysis - Community Organizations - Economic Conditions - Environmental Conditions - Government Conditions - Special Properties	Community-level indicators are measures of conditions that consider how the area may be impacted during a hazard event. A community is a complex system of many interconnected components. This assessment is not meant to capture this system in its entirety, but rather, to focus on specific categories of indicators. The CVR2's Community Conditions Vulnerability Index (CVI) focuses specifically on four broad categories (economic, environmental, community organizations, and governmental conditions), comprised of a series of evidence-based indicators and measurements of community vulnerability.	Very Vulnerable Vulnerable Somewhat Vulnerable Minimally Vulnerable



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The value of the CVR2 assessment is the ability to compare a wide variety of hazards and threats, from floods to acts of terrorism, using the same format for each hazard type. The scoring mechanism enables the community to identify areas of strength and weakness, as well as support the case for further mitigation and planning projects to build up the area's resilience.

Limitations

The analysis of hazards is complicated by several factors including laws, customs, ethics, values, attitudes, political preferences, complex infrastructures, and the built environment. The hazard analysis developed for the Plan should be considered an initial step to evaluate the community's hazards. A hazard analysis, however, does provide a wealth of valuable information that is essential for identifying goals, prioritizing actions, planning, and preparedness, and recovering and mitigating future hazards.

The assessment of data and identifying the risk to a community is not hard science. It is not possible to predict hazards or their impacts. Hazard analysis data and conclusions are not absolute. The perception of what constitutes a risk, and a judgment of its impact, can differ from individual to individual. The changing natural, built, or societal environments can have a significant effect on each hazard assessment. For this reason, it is essential to update this document periodically. A hazard risk assessment does provide a guide to evaluate the District's risks and guide the mission of protecting its residents and interests.

Hazard Risk Determination

The determination of the risks associated with each hazard was not based on empirical values. Instead, it is based on a function of the probability of the event occurring and its potential impact. This approach was necessary due to the complexities of a uniformed all-hazard approach and the numerous direct and indirect factors for the District.

At the most fundamental level, both DHS and FEMA recognize that risk is equal to the frequency (and/or probability) multiplied by consequence ($R = F \times C$). More specifically, to have a certain level of risk, there must be a probability or likelihood for that event to occur. Likewise, if the event does happen, but there is no impact or consequence, the level of risk is negated or substantially reduced.

Determining the Probability

The likelihood, frequency, and/or probability of a hazard occurring in the District was established by assessing each hazard with the following factors, as described below. Actual data and/or predictive models and/or analyses were used in determining the likelihood/frequency/probability of the hazards. Local subject matter expertise was leveraged when data/analyses were insufficient and/or incomplete in describing the actual likelihood of a hazard. The frequency/probability score is meant to represent the probability or likelihood of a "significant or unusual" incident, but not necessarily the worst-case scenario. The decision to use "significant or unusual" incidents in determining probability was made to eliminate factoring recurrent and/or common hazard incidents that would bias the probability score for specific hazards, such as, but not limited to severe thunderstorms, transportation incidents, etc. Furthermore, these recurrent and/or common hazard incidents would not necessarily pose a significant threat to the District,



nor would they require additional capabilities beyond what is normal. This approach is consistent with the THIRA guidelines.

Frequency/Probability Factors: In determining frequency/probability, the tool assessed the following factors for each hazard.

- In general, how would you rate the probability of this hazard occurring in your jurisdiction?
- Since 1952 (past 60 years), how would you rate the frequency of this hazard occurring in your jurisdiction?
- On average, what do most predictive models indicate is the probability of this hazard occurring in your jurisdiction?
- How would you rate the frequency of events that have occurred within the jurisdictional boundaries of your jurisdiction in the last five years?

Scores were assigned based on the following measurements below. As described previously, actual data and/or predictive models and/or analyses, when available, were used in determining the best option. Local subject matter expertise was leveraged when data/analyses were insufficient and/or incomplete in describing the actual probability of a hazard:

- Unlikely/Not Probable at All/Not Frequent At All
 - Extremely rare and/or no documented history of significant occurrences or events; or
 - Significant events may occur every 100 or more years
- Possibly/Somewhat Probable/Somewhat Frequent
 - Rare significant occurrences with at least one to two documented or anecdotal historical events; or
 - Significant events may occur every 25-100 years
- Likely/Probable/Frequent
 - Occasional significant occurrences with at least three or more documented historic events; or
 - Significant events may occur every 5 to 25 years.
- Highly Likely/Very Probable/Very Frequent
 - Frequent events with a well-documented history of significant occurrences; or
 - Significant events may occur every 1 to 5 years.

Overall Frequency/Probability Scores: Once frequency/probability was determined for each hazard; one of four categories was assigned based on the corresponding score. The higher the number, the more probable the hazard is likely to occur in the District.

TABLE: Frequency/Probability Ranges		
Very Probable/Very Frequent	Score: 75-100	
Probable/Frequent	Score: 50-74	
Somewhat Probable/Somewhat Frequent	Score: 25-49	
Not Probable at All/Not Frequent At All	Score: 0-24	



Determining the Consequence

Whereas measuring the frequency/probability of a hazard is often straightforward, defining, and measuring the consequence is more complicated. At the most basic level, the consequence is an assessment of the potential impact(s) if the attack or hazard incident occurs. In this assessment, the result of an event (or the impact) will be interdependent on the following factors: vulnerabilities (i.e., social, physical, and community conditions), capabilities and capacities, mitigation, and the characteristics (i.e., magnitude, scale, etc.) of the hazard event or attack itself. Again, the frequency/probability of the hazard is not included in assessing the consequence because, without the event, there is no consequence or impact.

As stated previously, the process assumes that hazard events exacerbate pre-existing conditions of a community. To understand and capture the likely consequence of an event, one must not only understand the characteristics of the hazard (magnitude, scale, extent, etc.) but must also understand the features of the impacted community and its associated vulnerabilities and capabilities. The figure below provides a visual sample of how pre-existing community conditions were determined.

Sample of the Vulnerability Index Methodology and Process

The algebraic conceptual framework that drives the CVR2 tool is based on the overarching premise that the impacts of a disaster are a direct correlation to the pre-existing conditions and vulnerabilities of the community; and secondly, although risk exposure can be reduced, a community can never wholly eliminate disaster impacts by implementing mitigation projects or by building capabilities and capacities.

Risk Assessment Methodology and Formula

$$\left[\text{Frequency and Probability} \times \text{Potential Magnitude Scale} \right] \left[\frac{\left[\frac{fP}{fC} \left[\frac{\text{Average Actual Vulnerability Impact Score} - \text{Average Potential Vulnerability Impact Score}}{\text{Average Community Conditions Vulnerability Impact Score}} \right] \right]}{\left[\frac{fC}{fM} \left[\frac{\text{Average Capabilities & Capacity Score}}{\text{Average Mitigation Score}} \right] \right]} \right] \left[\frac{fV}{fX} \right]$$

The algorithm above recognizes that the potential impact from a hazard is a function of the pre-existing vulnerabilities in a community. Additionally, the algorithm recognizes that although you can reduce your potential impact and vulnerability to hazards by increasing your capability and implementing mitigation, the vulnerability cannot be eliminated. Communities cannot achieve absolute resiliency to any hazard.

More specifically, the variable **fV** represents the numeric relationship that although there is a direct correlation between a community's vulnerability and potential impacts; the extent of the vulnerability exposure varies from hazard to hazard. Similarly, **fX** represents the numeric relationship that recognizes that capabilities, capacities, and ability to mitigate cannot eliminate a threat and, therefore, cannot be absolute. In simple terms, vulnerability, capability, and mitigation will never be more than 100% or less than 0% (both of which would be practically and theoretically impossible).



Finally, the algorithm recognizes that communities can have vulnerabilities, capabilities, capacities, and the ability to mitigate that are specific to the community and therefore, should be considered all hazards. This is represented in the **fv1** and **fx1** variables. An example of this would be a community's overall level of preparedness or trust in government. Additionally, communities may also have hazard-specific vulnerabilities or taken hazard-specific measures to mitigate or build capabilities to manage a specific hazard. This is represented by the **fv2** and **fx2** variables. An example of this would be a community participating in FEMA's National Flood Insurance Program.

1.6.14 Hazard Rankings

Each hazard was scored as to magnitude and frequency of occurrence, as well as assigned an overall risk ranking through the CVR2 Community Hazard Risk Assessment Methodology outlined in the previous section. The legend below outlines the scoring categories and assigned ratings.

Legend				
Score	Frequency & Probability Rating	Vulnerability Rating	Capability and Capacity Rating	Overall Risk Rating
0 – 24	Not Probable at All/ Not Frequent At All	Minimally Vulnerable	Minimally Capable	Low
25 – 49	Somewhat Probable/ Somewhat Frequent	Somewhat Vulnerable	Somewhat Capable	Medium
50 – 74	Probable/Frequent	Vulnerable	Capable	High
75 - 100	Very Probable/ Very Frequent	Very Vulnerable	Very Capable	Extreme
N/A		Not Applicable	Not Applicable	Not Applicable



The table below provides a summary of frequency and probability, as well as overall risk ranking by hazard. The table includes a comparison to the hazard rankings included in the 2013 Hazard Mitigation Plan. Hazards that were not included in the 2013 Risk Assessment are noted as not applicable. The 2013 plan included the additional hazards of Severe Thunderstorm/Hail and Extreme Heat, which were not included in the 2021 plan. A comparison of this hazard ranking with public survey results is included later in this section.

TABLE: Hazard Risk Ranking for LENOWISCO Planning District <i>Complete Hazard Ranking Table is included here</i>					
Hazard	2021 Hazard Rankings				2013 Risk Ranking
	Frequency & Probability	Frequency & Probability	Risk Ranking	Risk Ranking	
Flooding	75	Very Probable/Very Frequent	69	High	High
Non-Rotational Wind	75	Very Probable/Very Frequent	68	High	Medium-High (combined with Tornado)
Winter Storm	75	Very Probable/Very Frequent	67	High	Medium-High
Wildfire	50	Probable/Frequent	53	High	Medium
Communicable Disease	38	Somewhat Probable/ Somewhat Frequent	47	Medium	N/A
Landslide	44	Somewhat Probable/ Somewhat Frequent	47	Medium	Medium (combined with Land Subsidence, Soil Erosion)
Karst/Subsidence	31	Somewhat Probable/ Somewhat Frequent	41	Medium	Low (Karst topography only)
Tornado	25	Somewhat Probable/ Somewhat Frequent	39	Medium	Medium-High (combined with Non-Rotational Wind)
Drought	19	Not Probable at All/ Not Frequent at All	28	Medium	Medium-High
Earthquake	13	Not Probable at All/ Not Frequent at All	25	Medium	Medium
Dam Failure	6	Not Probable at All/ Not Frequent at All	19	Low	Low



Finally, the table below provides the complete results of the CVR2 Community Hazard Risk Assessment. Further details on the CVR2 assessment are in the Risk Assessment Methodology section.

TABLE: Hazard Risk Assessment Results, Part One										
Hazard	Frequency & Probability		Potential Magnitude & Scale		Physical Vulnerability Hazard Impact Rating		Social Vulnerability Hazard Impact Rating		Community Conditions Hazard Impact Rating	
Communicable Disease	38	Somewhat Vulnerable	45	Somewhat Vulnerable	41	Somewhat Vulnerable	74	Vulnerable	66	Vulnerable
Dam Failure	6	Minimally Vulnerable	31	Somewhat Vulnerable	60	Vulnerable	61	Vulnerable	63	Vulnerable
Drought	19	Minimally Vulnerable	2	Minimally Vulnerable	49	Somewhat Vulnerable	55	Vulnerable	50	Vulnerable
Earthquake	13	Minimally Vulnerable	17	Minimally Vulnerable	64	Vulnerable	55	Vulnerable	53	Vulnerable
Flooding	75	Very Vulnerable	30	Somewhat Vulnerable	67	Vulnerable	76	Very Vulnerable	67	Vulnerable
Karst/Subsidence	31	Somewhat Vulnerable	16	Minimally Vulnerable	55	Vulnerable	65	Vulnerable	60	Vulnerable
Landslide	44	Somewhat Vulnerable	8	Minimally Vulnerable	60	Vulnerable	69	Vulnerable	58	Vulnerable
Non-Rotational Wind	75	Very Vulnerable	35	Somewhat Vulnerable	64	Vulnerable	74	Vulnerable	66	Vulnerable
Tornado	25	Somewhat Vulnerable	25	Somewhat Vulnerable	67	Vulnerable	74	Vulnerable	63	Vulnerable
Wildfire	50	Vulnerable	16	Minimally Vulnerable	64	Vulnerable	74	Vulnerable	65	Vulnerable
Winter Storm	75	Very Vulnerable	32	Somewhat Vulnerable	67	Vulnerable	74	Vulnerable	66	Vulnerable



TABLE: Hazard Risk Assessment Results, Part Two

Hazard	Overall Capability & Capacity		Mitigation		Hazard Consequence & Impact Score		Risk Ranking	
Communicable Disease	27	Somewhat Capable	27	Somewhat Capable	58	Vulnerable	47	Medium
Dam Failure	31	Somewhat Capable	39	Somewhat Capable	55	Vulnerable	19	Low
Drought	35	Somewhat Capable	17	Minimally Capable	43	Somewhat Vulnerable	28	Medium
Earthquake	25	Somewhat Capable	22	Minimally Capable	50	Vulnerable	25	Medium
Flooding	25	Somewhat Capable	11	Minimally Capable	63	Vulnerable	69	High
Karst/Subsidence	19	Minimally Capable	6	Minimally Capable	53	Vulnerable	41	Medium
Landslide	27	Somewhat Capable	28	Somewhat Capable	51	Vulnerable	47	Medium
Non-Rotational Wind	25	Somewhat Capable	22	Minimally Capable	62	Vulnerable	68	High
Tornado	25	Somewhat Capable	17	Minimally Capable	60	Vulnerable	39	Medium
Wildfire	32	Somewhat Capable	22	Minimally Capable	57	Vulnerable	53	High
Winter Storm	34	Somewhat Capable	33	Somewhat Capable	61	Vulnerable	67	High



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Repetitive Loss Summary

According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan, Virginia has 6,564 know repetitive loss properties, according to the National Flood Insurance Program (NFIP) Policies, Claims, and Repetitive Loss Statistics. Based on the FEMA list which is based on the Biggert-Waters Flood Insurance Reform Act of 2012, 60 of these properties are in the LENOWISCO Planning District. More detail on RL structures is available in the Flood Hazard Profile (Section 1.6.5).

During the planning process, LENOWISCO Planning District requested the Repetitive Loss data from VDEM. VDEM requested the data from FEMA. Given the current pandemic, FEMA alerted VDEM of the delay in supplying Repetitive Loss data. Several jurisdictions in the District are aware of repetitive loss properties within their area and since the 2013 HMP, some acquisition projects have occurred. Given the history of repetitive loss, the jurisdictions that experience continued impacts from flooding developed mitigation actions to support flood reduction. Once the Repetitive Loss data is provided, it will be added to the plan to support the need for flood reduction mitigation projects and ensure the plan complies with 44CFR§201.4.

A repetitive loss property is a structure that:

- Has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25% of the market value of the structure at the time of each flood event; and
- At the time of the 2nd incidence of flood-related damage, the contract for flood insurance contains the increased cost of compliance coverage

A severe repetitive loss property is a structure that:

- Is covered under a contract for flood insurance made available under the NFIP; and
- Has incurred flood-related damage
 - For which four or more separate claims payments have been made under flood insurance coverage with the amount of each such claim exceeding \$5,000, and with the cumulative amount of such claims payments exceeding \$20,000; or
 - For which at least two separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

Given the 60 RL structures in the LENOWISCO Planning District, many of the identified Mitigation Strategies (Section 1.7) highlight actions to reduce flooding to property.



Public Survey Comparison

Public involvement was an essential component to developing the plan and ensuring mitigation actions were informed not only by the Hazard Risk Ranking but considered the public's opinion.

One of the survey questions asked, "Do you believe that your household and/or place of business might ever be threatened by the following hazards? Please rate what hazards present the greatest risk." The public response indicated that Winter Storm was the highest risk hazard, followed by Communicable Disease, as illustrated in the figure below. The Hazard Rankings (Section 1.6.14) similarly identify Winter Storm as a high-risk hazard, while Communicable Disease received a medium risk ranking. Perceived risk to a Communicable Disease was likely elevated during the development of this plan due to the ongoing COVID-19 pandemic.

This question also demonstrated that the public did not fully recognize the potentially damaging impact of Flooding events could have across the District. The core planning team discussed the ongoing impact of flooding on downtown areas, critical facilities, public buildings, roads, and bridges. During the first planning team meeting (detailed in Section 1.4), the planning team indicated that Flooding was one of the top hazards facing the District. The planning team recognized that Flooding will continue to be both a high frequency and high impact hazard if left unmitigated. While flooding is not a new hazard in the District, in 2013 it was rated as the highest hazard, the survey demonstrated that the public may not fully understand the potential impact and frequency of flooding events.

FIGURE: Public Survey Responses, Question 15

For the public to rate a hazard as a threat to their place of business or household, they must believe the following hazard is likely to threaten their life and property. The greatest risk is Low Risk = Low Impact on threat to life and property damage; Medium Risk = Medium Impact on threat to life and property damage; High Risk = High Impact on threat to life and property damage.

Hazard	Low Risk		Medium Risk		High Risk		Very High Risk		Sample Size
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Communicable Disease	84	20.9%	84	20.9%	71	17.9%	5	1.3%	199
COVID-19	84	20.9%	84	20.9%	8	2.0%	2	0.5%	199
Earthquake	228	57.9%	24	6.0%	8	2.0%	2	0.5%	199
Flooding	74	18.5%	11	2.8%	21	5.3%	2	0.5%	199
Power Outage	179	44.8%	21	5.3%	8	2.0%	16	4.0%	199
Exotic	81	20.4%	21	5.3%	8	2.0%	18	4.5%	199
Severe Weather	205	51.8%	81	20.4%	8	2.0%	22	5.5%	199
Wildfire	208	52.0%	11	2.8%	11	2.8%	8	2.0%	199
Low Confidence Areas	11	2.8%	8	2.0%	11	2.8%	1	0.3%	199
Spill/Release	114	28.5%	74	18.5%	8	2.0%	14	3.5%	199
Tsunami	84	20.9%	84	20.9%	7	1.8%	5	1.3%	199
Nuclear	74	18.5%	81	20.4%	26	6.5%	1	0.3%	199
Volcanic Activity	2	0.5%	24	6.0%	88	22.0%	14	3.5%	199

Survey respondents noted other high-priority hazards as winter storms and flooding, followed by wildfires and tornados. When combined with the previous question, community members see the importance of mitigating flooding issues, but do not see it as high risk. The other hazards are in alignment with the hazard assessment results.

As stated in the introduction, the purpose of this study was to determine if the use of a video-based assessment tool could be used to measure the following self-rated skills: (1) the ability to identify and describe the components of a patient's history and physical examination; (2) the ability to identify and describe the components of a patient's history and physical examination; and (3) the ability to identify and describe the components of a patient's history and physical examination. The study was designed to determine if the use of a video-based assessment tool could be used to measure the following self-rated skills: (1) the ability to identify and describe the components of a patient's history and physical examination; (2) the ability to identify and describe the components of a patient's history and physical examination; and (3) the ability to identify and describe the components of a patient's history and physical examination.

	10-MINUTE PERIOD		20-MINUTE PERIOD		30-MINUTE PERIOD		45-MINUTE PERIOD		60-MINUTE PERIOD		PERCENT
	Count	Score	Count	Score	Count	Score	Count	Score	Count	Score	
Correct choice in 10 seconds	4,000	14	3,500	14	25,000	5	50,000	5	50,000	5	100
Eliminate	54	14.5%	25	41.0%	46	21.7%	22	54%	0	60%	13
Remove	47	15.5%	29	43.5%	24	4.4%	5	5.5%	3	4.5%	10
Reveal	6	8.0%	23	3.5%	23	14.0%	95	58.0%	4	5.0%	100
Pay Reveal	10	24.0%	81	48.5%	37	27.0%	10	7.5%	10	7.5%	100
End	10	24.0%	9	20.2%	10	10.2%	7	27%	28	27.5%	100
Score Reveal	15	23.5%	24	27.5%	47	20.7%	12	25%	12	18.0%	100
Final Reveal	11	17.5%	82	53.0%	53	51.0%	25	19.0%	6	5.0%	100
End Political Report	11	8.0%	88	63.0%	68	31.0%	15	7.5%	10	7.5%	100
Score Reveal	40	55.5%	21	41.0%	14	5.5%	5	5.0%	23	17.0%	100
Remove	16	8.0%	23	41.0%	98	51.0%	14	12.0%	4	5.0%	100
Reveal	5	8.0%	14	24.0%	28	40.0%	48	21.0%	4	5.0%	100
Score Reveal	0.0%	12	7.5%	82	61.2%	38	60.0%	6	6.0%	100	



Interestingly, the most significant outlier across both questions is Non-Rotational Winds. Survey respondents generally ranked this as a medium risk hazard (46.5%) and a medium priority (41%) or low priority (38%) for mitigation actions. When asked what hazard events have caused damages in the past, wind events (including tornados and hurricanes) were frequently mentioned, as illustrated in the word cloud below. Non-Rotational Wind events tend to be frequent but lower impact hazards, likely contributing to this misalignment. People living in vulnerable housing, including mobile homes, may see this as a more significant hazard.

FIGURE: Public Survey Responses, Question 17





1.7 Mitigation Strategy

The Mitigation Planning Team organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals and mitigation actions were developed based on these tasks. The team held a series of meetings designed to develop the mitigation strategy as described further throughout this section.

1.7.1 Mitigation Goals

Goals for this mitigation plan are statements that:

1. Represent the desires of the entire community
2. Include all members of the community both public and private
3. Can be accomplished in the future whether near-term or long-term

The Goals from the previous plan were:

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

Goals form the basis for mitigation actions that will be taken and are not dependent on the feasibility of implementation. Mitigation actions, which are different than goals, define how to accomplish the goals and are specific and measurable. The new goals were developed in coordination with the goals presented in the Commonwealth of Virginia 2018 Hazard Mitigation Plan. The goals were prioritized with one (1) being the most critical.

The following are the Goals, for the 2021 LENOWISCO Hazard Mitigation Plan:

1. Protect the lives, health, and safety of LENOWISCO residents and visitors, maintain critical societal functions before, during, and after a disaster.
2. Identify and implement mitigation projects that will minimize a hazard's impact on existing and future developments, including reducing risk to NFIP repetitive loss and severe repetitive loss properties.
3. Incorporate mitigation into existing and future policies, plans, regulations, and laws in LENOWISCO.
4. Promote and support a whole community approach to mitigation that encourages residents, businesses, and public entities to become more disaster resilient. residents, businesses, and public entities to become more disaster resilient.



1.7.2 Mitigation Actions

Plan participants assessed hazard mitigation actions, including from FEMA documents, the 2013 Hazard Mitigation Plan, the 2018 Commonwealth of Virginia Hazard Mitigation Plan, and suggestions from participating communities. From January-February 2021, virtual meetings were conducted with each participating jurisdiction to review mitigation actions based on the hazard analysis for the jurisdiction. In accordance with 44 CFR §201.6(c)(3)(i), the hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. All mitigation actions have an Action Planning & Implementation and assigned Goal.

Following the jurisdiction meeting, the core planning team identified mitigation actions that were identified by most jurisdictions. Of these actions, the core planning team discussed and decided which actions would be best managed at the District level. The core planning team crosswalked all jurisdiction mitigation actions to ensure that each jurisdiction had at least two (2) mitigation actions per hazard. The mitigation actions can include "all-hazard" actions and mitigation actions at the District or County level that directly impact the jurisdiction. The priority mitigation actions correspond with the jurisdiction risk assessment.

The mitigation strategy was further evaluated by the steering committee during the final meeting held on February 18, 2021, resulting in:

- District-wide new mitigation actions: 19
- District-wide ongoing mitigation actions: 6
- District-wide completed mitigation actions: 1
- District-wide removed mitigation actions: 2
- Jurisdiction new mitigation actions: 105
- Jurisdiction completed mitigation actions: 4
- Jurisdiction removed mitigation actions: 3

This section includes the following:

- **LENOWISCO Mitigation Actions:** District-Wide Mitigation Actions
- **Municipal Mitigation Actions**

Each entities' Mitigation Actions are organized as follows:

- **New Mitigation Actions:** New actions identified during this 2021 update process
- **Ongoing Mitigation Actions:** These ongoing actions were included in the previous update and have yet to be completed. Some of these actions have no definitive end. During the 2021 update, these "ongoing" mitigation actions were modified and/or amended, as needed, to better define the action.
- **Completed Mitigation Actions:** Completed actions since 2013. Completed actions also included a brief description of the "Resulting Reduction or Limitation of Hazard Impact(s) Achieved" to show the resulting benefits of implementing the mitigation initiative.



Mitigation Action Plan

The Action Plan is designed to capture important details intended to support the implementation of the action. The Action Plan is pulled into a document with all mitigation actions for the District and by jurisdiction to facilitate and encourage the annual review and maintenance of each mitigation strategy. The document allows the Lead Agency/Organization to document the yearly status of the project before and/or during the planning team meeting.

TABLE: Mitigation Action Plan Form	
Mitigation Action	
Year Initiated	2021
Applicable Jurisdiction	
Lead Agency/Organization	
Supporting Agencies/Organizations	
Applicable Goal	
Potential Funding Source	
Estimated Cost	
Benefits	
Projected Completion Date	
Priority and Level of Importance	
Actual Completion Date	

Recommended Mitigation Action/Implementation Plan and Project Description	
Action/Implementation Plan and Project Description:	

TABLE: STAPLEE Prioritization Table	
Item	Score
Social: Do you agree or disagree that the mitigation action is more likely to: be acceptable to the community; does not adversely affect a particular segment of the population; does not cause relocation of lower-income people, and is compatible with the community's social and cultural values.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1
Technical: Do you agree or disagree that the mitigation action is technically effective in providing a long-term reduction of losses and has minimal secondary adverse impacts.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1
Administrative: Do you agree that your jurisdiction/organization has the necessary staffing funding to carry-out this mitigation action.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1



Political: Do you agree or disagree that the mitigation action has the support of the public and stakeholders who have been offered an opportunity to participate in the planning process.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1
Legal: Do you agree or disagree that the jurisdiction or implementing agency has the legal authority to implement and enforce the mitigation action.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1
Economic: Budget constraints can significantly deter the implementation of mitigation actions. Do you agree or disagree that the mitigation action is cost-effective, as determined by a cost-benefit review, and is possible to fund.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1
Environmental: Do you agree or disagree that the mitigation action is sustainable and does not have an adverse effect on the environment, complies with federal, state, and local environmental regulations, and is consistent with the community's environmental goals.	- Strongly Agree = 5 - Agree = 4 - Neither Agree or Disagree = 3 - Disagree = 2 - Strongly Disagree = 1
Total: maximum possible score is 35	

TABLE: Mitigated Hazards	
	All Hazards
	Communicable Disease
	Dam Failure
	Drought
	Earthquake
	Flooding
	Karst & Subsidence
	Landslide
	Non-rotational Winds
	Tornado
	Wildfire
	Winter Storm



Mitigation Action Parameters

While the preference is to provide definitive project completion dates, this is not possible for every mitigation action. Therefore, the parameters for the timeline (**Projected Completion Date**) are as follows:

- **Short Term** = to be completed in 1 to 5 years
- **Long Term** = to be completed in greater than 5 years
- **Ongoing** = currently being funded and implemented under existing programs, and/or is seeking funding and necessary approvals.

Mitigation Action Estimated Cost

While the preference is to provide definitive costs (dollar figures) for each mitigation action, this is not possible for every mitigation action. Therefore, the estimated costs for the mitigation initiatives identified in this Plan were identified as high, medium, or low, using the following ranges:

- **Low:** less than \$10,000
- **Medium:** from \$10,000 to \$100,000
- **High:** greater than \$100,000

Mitigation Action Prioritization Process

The mitigation action must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed actions were weighed against multiple factors as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC) grant program. A less formal approach was used because some actions may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. The mitigation actions were prioritized and evaluated as shown on the individual mitigation action worksheets (using the **STAPLEE** method) for each recommended mitigation initiative.

County and municipal stakeholders evaluated each mitigation action with the following categories and questions.

Social:

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower-income people?

Technical:

- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation action address continued compliance with the NFIP?



Administrative:

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

Political:

- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

Legal:

- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolutions in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?
- Does the mitigation action address continued compliance with the NFIP?

Economic:

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be "tabled" for implementation until outside sources of funding are available?

Environmental:

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

Priority was assessed by requesting that every new mitigation action submitted by departments and municipalities go through a ranking process (for each of the prioritization factors), which was a numbering system from 1 to 5 with 1 being less important and 5 is more important.

Each of the participating communities was invited to participate in a series of workshops in which goals, objectives, and actions were discussed, identified, updated, and prioritized. Each participant in this session was provided with a number of resources to help them identify relevant mitigation actions including the [FEMA Mitigation Ideas Handout](#).

All potential actions that arose through this process are included in this Plan. A final draft of the Plan was presented to all stakeholders to allow them to provide final edits and approval of the actions and their priority.



2021 Hazard Mitigation Priorities

The implementation of the mitigation plan is critical to the overall success of the mitigation planning process. The first step is to decide, based upon many factors, which action will be undertaken first. To pursue the top priority first, the analysis and prioritization of the strategies/actions are important. Some actions may occur before the mitigation strategies representing the highest priority due to financial, engineering, environmental, permitting, and site control issues.

The planning team prioritized mitigation actions based on the STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria, explained in the Mitigation Strategy section, and discussion with the planning committees. Mitigation actions with the highest scores represent those mitigation initiatives that represent the highest priority. In addition to the STAPLEE Method, the planning team identified those actions that represented the greatest importance and priority to the District. It should be noted that, although the STAPLEE Method provides a standardized process for assigning priority/importance across all participating jurisdictions, there may be additional factors and considerations that elevate the status of a mitigation strategy/action.

The previous plan did not provide a full analysis to determine mitigation priorities. The planning team provided ongoing mitigation actions from the 2013 plan a priority level using the STAPLEE evaluation and jurisdiction input.

Since 2013, the LENOWISCO Planning District and participating jurisdictions experienced continued limitations on staffing and capacity for Emergency Management programs. Limited financial, staff, and planning capability have slowed progress on mitigation actions and continue to restrict efforts to advance projects. Most jurisdictions in the Planning District lack dedicated staff positions to seek out project funding or lead new planning efforts. Due to these conditions the planning team's input was an important consideration in the prioritization process, placing an emphasis on project cost and staff capability to serve as project champions. In addition to assigning priorities for the new projects, priorities for the previous projects were evaluated and updated.



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District-wide Mitigation Actions 1-6							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action/Strategy	Lead Agency	Support Agencies	Goal
1	New	Started in some jurisdictions	All-Hazard	Develop and deliver a Community Emergency Response Team (CERT) program for the LENOWISCO District and recruit members from all participating jurisdictions.	Local Emergency Operations Coordinators	County and municipal fire and police departments	4 - Whole Community
2	New	Started in some jurisdictions	All-Hazard	Certify and/or maintain participation in StormReady Certification Program for all LENOWISCO District communities.	Local Emergency Operations Coordinators	None	3 - Polices & Plans
3	New	Not Started	All-Hazard	Ensure each jurisdiction has an updated sheltering plan that includes disease spread prevention, necessary supplies, methods of transportation, and priority populations for welfare checks.	Lenowisco Health District	Local Emergency Operations Coordinators	1 - Protection
4	New	Started in some jurisdictions	All-Hazard	Ensure each jurisdiction has a Continuity of Operations Plan that includes both natural hazards and epidemic/pandemic considerations.	County Administrators; Town Managers	Local Emergency Operations Coordinators	3 – Policies & Plans 4 - Whole Community
5	New	Not Started	All-Hazard	Evaluate which building code adoption and enforcement activities are best suited for jurisdictions across the District to reduce risk to a variety of hazards.	Local Building and Zoning Administrators	Local Emergency Management Coordinators; Virginia DCR	3 – Policies & Plans
6	New	Not Started	All-Hazard	Evaluate activities to improve building code enforcement, including universal applicability of the Building Code Effectiveness Grading Schedule and advancing participation in the Community Rating System.	Local Building and Zoning Administrators	Local Emergency Management Coordinators; Virginia DCR	3 – Policies & Plans



District-wide Mitigation Actions 1-6							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	FEMA, VDEM, Local funds,	Low	Medium	High	Short-Term	Provide information about the CERT program and 72-hour preparedness to residents through local publications, neighborhood organizations, churches, etc.; Identify the needs of local CERT programs and attain funding to purchase CERT supplies	28
2	Local funds, National Weather Service	Low	Medium	High	Ongoing	Identify and outline local requirements for StormReady certification; develop an action plan to certify or maintain certification as appropriate using a planning calendar with identified goals, objectives and benchmark dates.	28
3	VDH, FEMA, VDEM, DHHS	Medium	High	Medium	Short-Term	Review and update existing shelter plans to ensure they address new practices based on COVID-19. Jurisdictions without plans will work to identify funding streams to assist with plan development, apply for grants as appropriate, and work toward developing plans.	15
4	FEMA, VDEM	Medium	Medium	High	Short-Term	Review and update existing continuity plans to ensure they address any new objectives based on COVID-19. Jurisdictions without plans will work to identify funding streams to assist with plan development, apply for grants as appropriate, and work toward developing plans.	28
5	HMGP, HMA	Low	Medium	Medium	Ongoing	Secure technical support to review and evaluate residential building codes. Generate recommended improvements across multiple hazards. Prioritize and propose improvements to jurisdictions. Research model code for proposed updates.	22
6	HMGP, HMA	Low	Medium	Medium	Ongoing	Secure technical support to identify opportunity areas for improved enforcement. Propose enforcement strategy to local jurisdictions.	23



District-wide Mitigation Actions 7-12							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
7	New	In Progress	Communicable Disease	Update the LENOWISCO Health District Pandemic and Communicable Disease Plan using lessons learned from the COVID-19 pandemic.	LENOWISCO Health District	Local Emergency Operations Coordinators	3 - Policies & Plans
8	New	Not Started	Communicable Disease	Identify local and regional mitigation actions through the exercise of the LENOWISCO Pandemic and Communicable Disease Plan and development of a COVID-19 After Action Report.	LENOWISCO Health District	Local Emergency Operations Coordinators	3 - Policies & Plans
9	New	Not Started	Dam Failure	Encourage all owners and operators of high-hazard dams in the District to create and maintain Emergency Action Plans (EAP).	Emergency Management	Dam owners and operators; Virginia DCR	3 - Policies & Plans
10	New	Not Started	Earthquake	Initiate a benefit-cost analysis of seismic improvements across the LENOWISCO District to determine priority retrofitting needs.	Building and Zoning Officers	Local Emergency Operations Coordinators; Virginia DMME	2 - Mitigation
11	Existing	In Progress	Flooding	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances and take steps to participate in the Community Rating System (CRS).	Local Floodplain Coordinators	Local Emergency Operations Coordinators	3 - Policies & Plans
12	Ongoing	New	Flooding	Develop a District-wide project to identify, target, secure funding for, and advance acquisition, demolition, and reconstruction of FEMA's Repetitive Loss Properties and other known flood prone areas.	Local Floodplain Coordinators	Local Emergency Operations Coordinators; Community Planners	1 - Protection 2- Mitigation 3 - Policies & Plans

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District-wide Mitigation Action 7-12							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
7	VDH, FEMA, VDEM, DHHS	Medium	Medium	High	Short-Term	Develop an after-action report on the challenges and successes from the COVID-19 pandemic. Convene a 'whole community' group to inform a county-wide plan that addresses mitigation, prevention, and operational changes.	28
8	VDH, FEMA, VDEM, DHHS	Medium	Medium	Medium	Short-Term	After existing plans are updated or new plans developed, seek funding sources and exercise the plans. Develop an After-Action Report/Implementation Plan and identify mitigation actions through the exercise process.	21
9	Virginia DCR; FEMA, VDEM	Low	Medium	Medium	Ongoing	Prioritize high-hazard dams without EAPs (two in the District as of 2021) and contact owners/operators. Encourage the development of an EAP. Maintain a schedule of needed updates to current EAPs and keep contact with owners and operators as needed.	23
10	USGS, Earthquake Hazards Program Grant; HMA Funds	Medium	Medium	Low	Short-Term	Seek funding for Benefit-Cost Analyses. Once funding is secure, conduct analyses on vulnerable structures and infrastructure.	13
11	Local funds	Low	Medium	High	Ongoing	Maintain NFIP and CRS compliance in all jurisdictions. For jurisdictions not currently participating the CRS, take steps to determine the process for participation, seek funding as appropriate, and document progress toward participation.	28
12	HMA Programs, Local funds	High	High	Medium	Ongoing	Work with local jurisdictions to create a database of known flood prone and SL/SRL properties. Prioritize vulnerable structures and apply for funding for acquisition, elevation, demolition, and reconstruction projects. The District will support the maintenance of a database of acquisition projects to track progress.	19

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District-wide Mitigation Actions 13-19							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action/Strategy	Lead Agency	Support Agencies	Goal
13	New	Not Started	Flooding	Investigate nature-based systems, such as bioretention systems, to lessen the impact of heavy rainfall flooding.	Public Works and Local Floodplain Coordinators	Virginia DCR	1 - Protection 2- Mitigation
14	New	Not Started	Karst	Develop a public awareness and education campaign for local property owners located in karst-terrain or near/on abandoned mining property. Offer information on mine water run-off and opportunities for property owners to improve drainage systems.	Local Emergency Operations Coordinators	Virginia DMME	4 - Whole Communit y
15	New	Not Started	Karst	Partner with the Virginia Department of Mines, Minerals, and Energy to identify, prioritize, implement, and maintain drainage projects near mines.	Building and Zoning Officers	Virginia DMME	2 - Mitigation
16	New	Not Started	Landslide	Determine the best natural conservation method to increase slope stability.	Public Works	VDOT; U.S. Forest Service	1 - Protection 2- Mitigation
17	New	Not Started	Wildfire	Develop a LENOWISCO Community Wildfire Protection Plan with specific regional and local actions for wildfire mitigation.	LENOWISCO Planning District Commission	Local Fire Departments, U.S. Forest Service; VDOF	3 - Polices & Plans
18	New	Not Started	Wildfire	Promote public awareness campaigns for individual property owners living in the Wildland/Urban Interface (WUI), including participation in the FireWise program.	Local Fire Departments	U.S. Forest Service; VDOF	4 - Whole Communit y
19	New	Not Started	Wildfire	Identify vulnerable structures and apply for funding to implement wildfire mitigation projects. These are projects to mitigate the risk to at-risk structures and associated loss of life from the threat of future wildfire through: Defensible Space for Wildfire; Application of Ignition-resistant Construction; and Hazardous Fuels Reduction.	Local Fire Departments	U.S. Forest Service; VDOF	1 - Protection



District-wide Mitigation Actions 13-19							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
13	HMGP, HMA Flood Mitigation Assistance Program, EPA Section 319 Nonpoint Source Management Program	High	High	Medium	Ongoing	The District will first need to conduct a study to determine the cost, priority areas, and the best type of bioretention system for the District. The study will include a cost benefit analysis to determine the best system to reduce the burden to the storm sewer system and overall flood reduction. Use the study to solicit bids for the selected bioretention system.	23
14	USGS, Earthquake Hazards Program Grant; HMA Funds, Local funds	Medium	Low	Medium	Short-Term	Work with DMME and USGS to seek funding and best practice public awareness campaigns for karst terrain. Implement best practice programs through with available grant support.	23
15	Virginia DMME, VDEM, EPA	High	Low	Medium	Ongoing	Work with DMME to identify and prioritize project sites. Work with property owners to grant easements for projects. Secure funding for town maintenance of projects.	24
16	VDOT, VDOF, HMGP, BRIC	High	High	Medium	Ongoing	The District conducts a study to determine the most cost efficient natural-method to increase slope stability, given the increased potential for landslides through other hazard occurrences like soil saturation and vegetative decrease from wildfires and droughts. An example solution would be improved drainage through planting native vegetation. The added vegetation improves slope stability through decreased soil saturation and root structure.	20
17	VDOF	Medium	Medium	High	Short-Term	Seek grant funding and assistance to develop a CWPP for the District.	29
18	VDOF	Medium	Low	Medium	Ongoing	Work with state, and federal forestry offices to identify best practice public awareness campaigns and conduct those campaigns in the local jurisdictions.	23
19	VDOF, HMGP, BRIC	Medium	High	Medium	Ongoing	Locate and map structures in the WUI areas. Conduct vulnerability assessment on those structures and determine the best mitigation actions to protect them. Apply for funding based on the outcomes of the assessments.	25



City of Norton Mitigation Actions 1-5							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	In Progress	All-Hazard	Secure funding to purchase a back-up generator for the Josephine Wastewater Pump Station and other critical infrastructure priority sites as identified.	Public Works	CNW Regional Wastewater Treatment Authority	1 - Protection 4 - Whole Community
2	New	Not Started	Drought	Ensure adequate back-up potable water supplies to supplement municipal water sources through 1) purchase of portable storage tanks for potable water, including a specific back-up water supply for the regional dialysis center in Norton; and 2) securing contracts with water suppliers.	Public Works	Norton Emergency Management, Fresenius Kidney Care	1 - Protection
3	New	In Progress	Flooding	Update the preliminary design and cost assessment and secure funding for a complete stormwater system replacement at three identified drainage basins experiencing significant localized flooding and damage (7th Street Basin, 10/11th Streets Drainage Basin, and Main Line Trunk) and others as identified.	Public Works	Emergency Management	2 - Mitigation
4	New	Update	Dam Failure	Update the inundation study for the Norton Reservoir Upper and Lower Dams.	Public Works	Emergency Management	1 - Protection
5	New	Not Started	Dam Failure	Conduct an annual tabletop exercise for a dam failure event.	Public Works	Emergency Management	1 - Protection 3 - Plans & Policies



City of Norton Mitigation Actions 1-5							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Seek grant funding and assistance.	18
2	FEMA, VDEM	Medium	High	High	Short-Term	Identify priority locations and water service vulnerabilities. Secure funding for storage tanks. Identify potential contractors for emergency water supply.	27
3	FEMA, VDEM	High	High	High	Short-Term	Seek grant funding and assistance for the assessment update.	28
4	FEMA, USACE, VA DCR	Medium	High	High	Ongoing	Seek grant funding and assistance to update previous inundation studies.	30
5	Local funds	Low	Medium	Low	Ongoing	Identify and recruit priority participants that would be involved in resident notification and evacuation. Seek funding and technical assistance to coordinate and manage a table-top exercise. Develop an after-action report to identify and implement necessary improvements.	14



City of Norton Mitigation Actions 6-11							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
6	New	Not Started	Earthquake Landslide	Initiate a benefit-cost and alternatives analysis for relocating/replacing gas chlorine storage at the Norton Water Treatment Plant.	Public Works	Wise County PSA	2 - Mitigation 4 - Whole Community
7	New	Not Started	Landslide	Identify and scope mitigation projects for potential landslide areas on critical roadways in/out of Norton.	VDOT	Public Works	2 - Mitigation
8	New	Not Started	Non- Rotational Wind Tornado Winter Storm	Initiate an assessment of necessary improvements to the Norton Community Center to serve as a designated tornado and severe weather shelter.	Emergency Management	Parks and Recreation, American Red Cross	1 - Protection
9	New	Not Started	Non- Rotational Wind Tornado Winter Storm	Secure sufficient sheltering supplies and a back-up generator for the Norton Community Center.	Emergency Management	Parks and Recreation, American Red Cross	1 - Protection 4 - Whole Community
10	New	Not Started	Non- Rotational Wind Tornado Winter Storm	Initiate a benefit-cost analysis of building storm shelters/safe rooms at various mobile home parks across Norton.	Emergency Management	Building and Zoning	1 - Protection
11	New	Not Started	Wildfire	Secure funding for increased wildland training and protective equipment.	Norton Fire Department	USFS, VA Department of Forestry	1 - Protection



City of Norton Actions 6-11							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
6	EPA, FEMA, VDEM	Medium	Medium	Medium	Short-Term	Seek funding for Benefit-Cost Analyses. Once funding is secure, conduct analyses on design and scope of alternatives.	21
7	VDOT, USDOT, FHWA, USFS, VA DOF	High	Medium	Medium	Ongoing	Review historic data on landslide events affecting roadways in partnership with VDOT. Determine priority mitigation actions. Determine authority responsible for improvements. Secure funding for projects as needed.	21
8	FEMA, VDEM, DHHS	Medium	Medium	High	Short-Term	Identify shelter capacity and safety features based on sheltering plan and federal, state, and local regulations.	28
9	FEMA, VDEM, DHHS, VDH	High	High	High	Short-Term	Review and update existing shelter plans to ensure they address new practices based on COVID-19. Secure funding for additional sheltering supplies as identified through plan updates.	28
10	FEMA, VDEM, Local funds	Medium	Medium	Medium	Short-Term	Seek funding for Benefit-Cost Analyses. Once funding is secure, conduct analyses on design and scope of shelters/safe rooms.	21
11	FEMA AFG, VDEM	High	Medium	Medium	Short-Term	Identify training and equipment needs. Secure funding for improvements.	22



City of Norton Mitigation Actions 12-14							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
12	New	Not Started	Winter Storm	Secure resources for transporting dialysis patients to/from the regional dialysis center (Fresenius Kidney Care) during severe weather events.	Emergency Management	Fresenius Kidney Care; Norton Fire Department, Kidney Community Emergency Response (KCER) Program	1 - Protection
13	New	Not Started	Winter Storm	Secure a back-up generator for at least one gas station in Norton, and other locations to be identified, to serve as a back-up fuel supply for essential government vehicles.	Public Works	Emergency Management, Police, and Fire Departments	1 - Protection
14	New	Not Started	Winter Storm	Initiate an alternatives analysis to address salt storage and supply needs, ideally in partnership with VDOT.	Public Works	VDOT	1 - Protection 3 - Plans & Policies



City of Norton Mitigation Actions 12-14							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
12	DHHS, local funds	Medium	Medium	Medium	Ongoing	Identify vulnerable groups and geographic extent for transportation. Recruit a volunteer base and/or transportation options. Develop a plan and communication system.	19
13	FEMA, VDEM	High	Medium	Medium	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	21
14	VDOT, USDOT, FHWA	Medium	Low	Low	Short-Term	Assess capacity and design needs. Scope alternatives and costs. Secure funding for purchase.	14



Lee County Mitigation Actions 1-4							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	All-Hazard	Develop and deliver a public education and awareness program of mitigation strategies, including limiting the spread of communicable diseases.	Emergency Management	LENOWISCO Health District; community-based and faith-based organizations	4 - Whole Community
2	New	Not Started	All-Hazard	Develop an inventory of at-risk public buildings and infrastructure and prioritize mitigation projects based on those providing the most benefit (at the least cost) to the County and residents.	Public Works	Emergency Management	2 - Mitigation 4 - Whole Community
3	New	Not Started	Drought	Establish sufficient public water system interconnects between communities and across county and state lines.	Lee County PSA	Public Works	1 - Protection
4	New	Not Started	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Purchase at least three generators for emergency shelters and ensure all shelters are wired for portable generators (including any locations in Pennington Gap).	Emergency Management	Lee County Public Schools	1 - Protection



Lee County Mitigation Actions 1-4							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	VDEM, VDH, local funds	Low	Low	Medium	Short-Term	Identify priority populations for outreach and appropriate platforms and communication tools. Work with state agencies to seek funding and best practice public awareness campaigns. Implement best practice programs through awarded grant support, when available.	22
2	HMA, USACE	Medium	Medium	Medium	Short-Term	Develop an inventory of un-reinforced masonry buildings to target for mitigation; Develop an inventory of commercial and public buildings in need of flood, windstorm, and earthquake mitigation; Identify at-risk bridges for flood and earthquake hazards, identify enhancements, and implement projects needed to reduce the risks; and Review and improve utility operations and services to mitigate for natural hazards.	19
3	Local funds	Medium	Medium	Medium	Ongoing	Prioritize additional water sources. Outreach to other PSAs and municipal providers to draft an interconnect agreement. Revise and revisit as needed.	19
4	FEMA, VDEM	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	27



Pennington Gap (Lee County) Mitigation Actions 1-4							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	All-Hazard	Develop and deliver a public education and awareness program of mitigation strategies, including limiting the spread of communicable diseases.	Emergency Management	LENOWISCO Health District; community-based and faith-based organizations	3 - Plans & Policies 4 - Whole Community
2	New	Not Started	All-Hazard	Develop an inventory of at-risk public buildings and infrastructure and prioritize mitigation projects based on those providing the most benefit (at the least cost) to the Town and residents.	Public Works	Emergency Management	2 - Mitigation 4 - Whole Community
3	New	Not Started	Communicable Disease	Establish an emergency shelter for those experiencing homelessness that meets social distancing standards.	Social Services	Emergency Management	1 - Protection
4	New	Not Started	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Work with the County to purchase at least three generators for emergency shelters and ensure all shelters are wired for portable generators (including any locations in Pennington Gap).	Emergency Management	Lee County Public Schools	1 - Protection



Pennington Gap (Lee County) Mitigation Actions 1-4							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	VDEM, VDH, local funds	Low	Low	Medium	Short-Term	Identify priority populations for outreach and appropriate platforms and communication tools. Work with state agencies to seek funding and best practice public awareness campaigns. Implement best practice programs through awarded grant support, when available.	20
2	HMA, USACE	Medium	Medium	Medium	Short-Term	Develop an inventory of un-reinforced masonry buildings to target for mitigation; Develop an inventory of commercial and public buildings in need of flood, windstorm, and earthquake mitigation; Identify at-risk bridges for flood and earthquake hazards, identify enhancements, and implement projects needed to reduce the risks; and Review and improve utility operations and services to mitigate for natural hazards.	18
3	DHHS	Medium	Medium	Medium	Short-Term	Identify service population needs and managing organization capacity (CBO, faith-based org, city-operated, etc.) Scope project design and cost. Secure funding for construction and operations.	18
4	FEMA, VDEM	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	28



Pennington Gap (Lee County) Mitigation Actions 5-8							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
5	New	Not Started	Flooding	Initiate an impact assessment for the potential tunnel failure of Wallen Creek.	Public Works	VDOT	2 - Mitigation
6	New	Not Started	Non-Rotational Wind Tornado Winter Storm	Conduct a survey to estimate the costs of burying utility lines.	Public Utility Companies	Public Works	1 - Protection
7	New	Not Started	Wildfire	Secure a new apparatus for the local fire department that can respond to wildfire/grassfire events, as well as additional protective equipment.	Pennington Gap Fire Department	Town Administrator/ Clerk	1 - Protection 4 - Whole Community
8	New	Not Started	Winter Storm	Secure additional heavy equipment for snow removal operations.	Public Works	VDOT	1 - Protection



Pennington Gap (Lee County) Mitigation Actions 5-8							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
5	VDOT	Medium	Medium	Medium	Short-Term	Scope the project cost and secure funding for an assessment. Scope the cost and design of structural mitigation.	22
6	FEMA, VDEM	Medium	Medium	Low	Short-Term	Secure funding and a contractor for survey estimate. Conduct survey and identify priority areas for project investment. Consider a Benefit-Cost Analysis of burying powerlines.	11
7	U.S. Fire Administration, USFS, Virginia DOF	High	Medium	Medium	Short-Term	Complete an assessment of equipment costs. Secure funding for purchase.	23
8	FEMA, VDEM	High	Low	Low	Long-Term	Scope equipment needs and cost. Identify and secure funding.	14



Scott County Mitigation Actions 1-4							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	New	All-Hazard	Develop an inventory of at-risk public buildings and infrastructure and prioritize mitigation projects based on those providing the most benefit (at the least cost) to the County and residents.	Public Works	Emergency Management	2 - Mitigation 4 - Whole Community
2	New	In Progress	All-Hazard	Develop and implement outreach and educational programs aimed at mitigating and reducing the risk of natural hazards, particularly those residing in flood-prone areas, mobile homes subject to high winds and tornadoes, and residents at-risk to extreme weather and/or communicable disease.	Emergency Management	Community-based and faith-based organizations	4 - Whole Community
3	New	New	Dam Failure	Install an outdoor warning system for residents within the Bark Camp Dam inundation area.	Emergency Management	DCR, USACE	1 - Protection
4	New	New	Drought	Expand the public water supply through Scott County Public Service Authority to provide a reliable and safe water supply to residents using wells/springs.	Scott County PSA	Public Works	1 - Protection



Scott County Mitigation Actions 1-4							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	HMA, USACE	Medium	Medium	Medium	Short-Term	Develop an inventory of un-reinforced masonry buildings to target for mitigation; Develop an inventory of commercial and public buildings in need of flood, windstorm, and earthquake mitigation; Identify at-risk bridges for flood and earthquake hazards, identify enhancements, and implement projects needed to reduce the risks; and Review and improve utility operations and services to mitigate for natural hazards.	21
2	VDEM, Local funds	Medium	Medium	Medium	Ongoing	Identify priority populations for outreach and appropriate platforms and communication tools. Work with state agencies to seek funding and best practice public awareness campaigns. Implement best practice programs through awarded grant support, when available.	25
3	Virginia DCR, FEMA	Medium	High	Medium	Short-Term	Develop a project scope based on the inundation area that includes the number and type of signals/structures. Secure funding. Install warning system. Conduct an outreach and awareness campaign to notify residents of the new system.	22
4	Local funds	High	Medium	Medium	Ongoing	Prioritize additional water sources. Scope project costs, including pump installation and equipment. Secure funding for project.	22



Scott County Mitigation Actions 5-9							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
5	New	New	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Purchase at least three generators for emergency shelters and ensure all shelters are wired for portable generators (including any locations in Gate City).	Emergency Management	Scott County Public Schools	1 - Protection
6	New	New	Flooding	Conduct a water study to document the need for improved storm drain infrastructure.	Public Works	Floodplain Coordinator	2 - Mitigation
7	New	New	Landslide	Identify and scope mitigation projects for potential landslide areas on critical roadways.	Virginia Department of Transportation	Public Works	2 - Mitigation
8	New	New	Wildfire	Explore changes to building and zoning code to encourage fire protective development strategies.	Building & Zoning	Fire Department	2 - Mitigation
9	New	New	Winter Storm	Secure funding for contract plowing/road clearing services to supplement low-priority routes maintained by VDOT.	Public Works	VDOT	1 - Protection



Scott County Mitigation Actions 5-9							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
5	FEMA, VDEM, DHHS	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	28
6	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	24
7	VDOT, USDOT, FHWA, USFS, VDOF	High	Medium	Low	Long-Term	Review historic data on landslide events affecting roadways in partnership with VDOT. Determine priority mitigation actions. Determine authority responsible for improvements. Secure funding for projects as needed.	14
8	Local funds	Low	Medium	Low	Long-Term	Review best practices in code and ordinances for fire protective development. Prioritize and recommend changes.	13
9	VDOT	Medium	Medium	Low	Ongoing	Scope project extent and costs. Identify potential contractors. Secure funding for contract support.	13



Gate City (Scott County) Mitigation Actions 1-4							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	New	All-Hazard	Develop an inventory of at-risk public buildings and infrastructure and prioritize mitigation projects based on those providing the most benefit (at the least cost) to the County and residents.	Public Works	Emergency Management	2 - Mitigation 4 - Whole Community
2	New	In Progress	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Advance property mitigation as identified in the 2019 Gate City Housing Needs Assessment, including homes identified in the floodway and vacant/abandoned properties.	Community Development; Building & Zoning	Floodplain Coordinator	2 - Mitigation
3	New	New	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Create a strategy to inspect and document vacant buildings that may pose a threat to public safety during a hazard event.	Building & Zoning	Public Works	2 - Mitigation 3 - Plans & Policies
4	New	New	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Work with the County to purchase at least three generators for emergency shelters and ensure all shelters are wired for portable generators (including any locations in Gate City).	Emergency Management	Scott County Public Schools	1 - Protection



Gate City (Scott County) Mitigation Actions 1-4							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	HMA, USACE	Medium	Medium	Medium	Short-Term	Develop an inventory of un-reinforced masonry buildings to target for mitigation; Develop an inventory of commercial and public buildings in need of flood, windstorm, and earthquake mitigation; Identify at-risk bridges for flood and earthquake hazards, identify enhancements, and implement projects needed to reduce the risks; and Review and improve utility operations and services to mitigate for natural hazards.	24
2	FEMA, VDEM	High	High	High	Ongoing	Provide information to owners of identified properties on acquisition/buy-out program options. Secure funding for property acquisition/demolition/relocation efforts. Secure funding for improvements for individual properties.	29
3	Local funds	Low	Medium	High	Short-Term	Review vacant/abandoned properties identified in the 2019 housing needs assessment. Prioritize those that require inspection or immediate mitigation based on public safety needs. Secure funding to address mitigation needs.	29
4	FEMA, VDEM	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	29



Gate City (Scott County) Mitigation Actions 5-8							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
5	New	In Progress	Flooding	Advance mitigation action items identified in the watershed survey to determine the source of flooding at Grogan Park, conducted by the Army Corps of Engineers.	Public Works	Army Corps of Engineers	2 - Mitigation
6	New	Not Started	Flooding	Install a back-up generator at the Gate City water treatment plant and in the water distribution system.	Public Works	VDH	1 - Protection
7	New	New	Flooding	Initiate culvert improvements or replacement at the East Jackson Street and Jones Street intersection.	Public Works	Floodplain Coordinator	2 - Mitigation
8	New	New	Winter Storm	Secure additional heavy equipment for snow removal operations.	Public Works	Emergency Management	1 - Protection



Gate City (Scott County) Mitigation Actions 5-8							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
5	FEMA, VDEM, local funds	High	High	High	Ongoing	Complete the watershed survey in partnership with the Army Corps of Engineers. Prioritize needed mitigation actions identified through survey. Scope project costs and design. Secure funding to complete projects.	31
6	FEMA, VDEM, local funds	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Identify and secure funding.	30
7	VDOT, FEMA, VDEM	High	High	High	Short-Term	Scope the project cost and design. Identify and secure funding.	29
8	FEMA, VDEM	High	Low	Low	Long-Term	Scope equipment needs and cost. Identify and secure funding.	14



Wise County Mitigation Actions 1-4							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	All-Hazard	Develop an inventory of at-risk public buildings and infrastructure and prioritize mitigation projects based on those providing the most benefit (at the least cost) to the County and residents.	Wise County Public Works	Emergency Management	2 - Mitigation 4 - Whole Community
2	New	In Progress	All-Hazard	Develop and implement outreach and educational programs aimed at mitigating and reducing the risk of natural hazards. Add specific hazards and target populations here.	Emergency Management	Community-based and faith-based organizations	4 - Whole Community
3	New	Not Started	Dam Failure	Update mapping of permitted and unpermitted coal slurry ponds throughout the county.	Wise County Geographic Information Officer	DMME, DCR	2 - Mitigation
4	New	Not Started	Drought	Ensure adequate back-up potable water supplies to supplement municipal water sources through 1) purchase of portable storage tanks for potable water, including a specific back-up water supply for the regional dialysis center in Norton; and 2) securing contracts with water suppliers.	Wise County Emergency Management	Wide County Public Works	1 - Protection



Wise County Actions 1-4							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	HMA, USACE	Medium	Medium	Medium	Short-Term	Develop an inventory of un-reinforced masonry buildings to target for mitigation; Develop an inventory of commercial and public buildings in need of flood, windstorm, and earthquake mitigation; Identify at-risk bridges for flood and earthquake hazards, identify enhancements, and implement projects needed to reduce the risks; and Review and improve utility operations and services to mitigate for natural hazards.	20
2	VDEM, Local funds	Medium	Medium	Medium	Ongoing	Identify priority populations for outreach and appropriate platforms and communication tools. Work with state agencies to seek funding and best practice public awareness campaigns. Implement best practice programs through awarded grant support, when available.	23
3	FEMA BRIC, HMA, HMGP, EPA, VA DEQ	Medium	Low	Low	Short-Term	Create an updated map and identify potential outflow risks, including abandoned mine shafts, karst areas, and underground water sources. Identify downstream vulnerabilities and risks associated with slurry contaminates.	14
4	FEMA, VDEM	Medium	Medium	High	Short-Term	Identify priority locations and water service vulnerabilities. Secure funding for storage tanks. Identify potential contractors for emergency water supply.	27



Wise County Mitigation Actions 5-11							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
5	Existing	In Progress	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Purchase generators for emergency shelters at JW Adams Elementary School (Pound), Union Elementary (Big Stone Gap), Wise Elementary School, and other locations as identified. Ensure all shelters are wired for portable generators.	Wise County Emergency Management	Wise County Public Schools	1 - Protection
6	New	Not Started	Flooding	Identify and prioritize upgrades to sewer and water service infrastructure located in flood-prone areas, including those that cross creeks.	Wise County Public Works	VDH	1 - Protection
7	New	Not Started	Flooding	Secure funding for debris removal and stream clean-outs in the identified problem areas, including the North Fork of the Pound River, near Big Stone Gap, and near Coeburn.	Local Public Works Departments	DWR	2 - Mitigation
8	New	Not Started	Karst	Investigate the development and implementation of a karst terrain ordinance in the county.	Wise County Zoning and Development	Local Building & Zoning Officers	3 - Polices & Plans
9	New	In Progress	Karst	Secure funding to repair the sinkhole on Knowledge Drive in partnership with Town of Pound.	Public Works	VDOT	2 - Mitigation
10	New	Not Started	Landslide	Initiate a geotechnical impact assessment of the Big Stone Gap Water Treatment Plan from the 2019 Big Cherry Landslide.	Public Works	Wise County Public Service Authority	2 - Mitigation
11	New	Not Started	Landslide	Investigate the development and implementation of a landslide ordinance to prevent further development/construction in landslide areas of the county.	Wise County Zoning and Development	Local Building & Zoning Officers	3 - Polices & Plans
12	New	Not Started	Winter Storm	Secure additional heavy equipment for snow removal operations.	Wise County Public Works	Norton and Big Stone Gap Public Works	1 - Protection



Wise County Actions 5-12							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
5	FEMA, VDEM, local funds	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	28
6	FEMA, local funds, VDEM, VPH	High	Medium	Low	Long-Term	Review best practices in code and ordinances for development in karst terrain. Prioritize and recommend changes.	14
7	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
7	Local funds	Low	Low	Low	Short-Term	Determine where karst areas and future development may intersect; study the feasibility and impacts of ordinances.	12
8	VDOT	High	High	High	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	24
9	Virginia DCR, FEMA	Medium	High	High	Short-Term	Identify project scope and cost. Identify and recruit technical experts. Secure funding and assistance.	25
10	Local funds	Low	Low	Low	Short-Term	Review best practices in code and ordinances for development in highly susceptible landslide areas. Prioritize and recommend changes.	14
11	FEMA, VDOT	High	Medium	Medium	Short-Term	Scope equipment needs and cost. Identify and secure funding.	22



Big Stone Gap (Wise County) Mitigation Actions 1-6							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	All-Hazard	Ensure an effective mass notification system for residents for events within town limits.	Emergency Management	Police and Fire departments	4 - Whole Community
2	New	In Progress	Drought	Ensure adequate back-up potable water supplies to supplement municipal water sources through 1) purchase of portable storage tanks for potable water; and 2) securing a microfiltration system for potable water.	Public Works	Emergency Management	1 - Protection
3	New	In Progress	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Purchase generators for emergency shelters at JW Adams Elementary School (Town of Pound), Union Elementary (Big Stone Gap), Wise Elementary School, and other locations as identified. Ensure all shelters are wired for portable generators.	Wise County Emergency Management	Wise County Public Schools	1 - Protection
4	New	Not Started	Flooding	Conduct an assessment to mitigate flooding at Stone Bridge (Proctor Street).	Public Works	Floodplain Coordinator	2 - Mitigation
5	New	Not Started	Flooding	Conduct an assessment of base flood elevation at mobile home park and relocation or elevation needs for residents.	Building & Zoning	Floodplain Coordinator	2 - Mitigation
6	New	Not Started	Flooding	Secure funding for debris removal and stream clean-outs in the identified problem areas, including the North Fork of the Pound River, near Big Stone Gap, and near Coeburn.	Local Public Works Departments	DWR	2 - Mitigation



Big Stone Gap (Wise County) Mitigation Actions 1-6							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	VDEM, FEMA	Medium	Medium	Medium	Short-Term	Investigate the use of the FEMA Integrated Public Alert and Warning System (IPAWS) for Alerting Authorities; Deploy a public awareness campaign to encourage use of existing systems.	26
2	FEMA, VDEM	Medium	Medium	High	Short-Term	Identify priority locations and water service vulnerabilities. Secure funding for storage tanks. Identify potential contractors for emergency water supply.	27
3	FEMA, local funds	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	28
4	FEMA, VDOT	Medium	Medium	Medium	Short-Term	Secure funding for an assessment. Prioritize needed mitigation actions identified. Scope project costs and design. Secure funding to complete projects.	24
5	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Identify project scope and cost. Develop communications and educational materials for residents. Secure funding and assistance.	22
6	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23



Big Stone Gap (Wise County) Mitigation Actions 7-11							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
7	New	Not Started	Karst	Initiate a geotechnical study for karst terrain.	Building & Zoning	Virginia DMME	2 - Mitigation
8	New	Not Started	Landslide	Initiate a geotechnical impact assessment of the Big Stone Gap Water Treatment Plan from the 2019 Big Cherry Landslide.	Public Works	Wise County Public Service Authority	2 - Mitigation
9	New	Not Started	Landslide	Secure funding to install riprap to limit rockfall and further erosion along the Big Cherry Lake Dam.	Public Works	DCR	2 - Mitigation
10	New	Not Started	Non-Rotational Winds Tornado	Investigate the development and implementation of a tie-down ordinance for mobile homes.	Building & Zoning	Town Planning Department	2 - Mitigation 3 - Plans & Policies
11	New	Not Started	Winter Storm	Secure additional heavy equipment for snow removal operations and salt storage.	Public Works	Wise County and City of Norton Public Works	1 - Protection



Big Stone Gap (Wise County) Mitigation Actions 7-11							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
7	Virginia DMME, VDEM, EPA	Medium	Low	Low	Long-Term	Identify technical experts as project partners. Secure funding and assistance.	13
8	Virginia DCR, FEMA, VDEM	Medium	High	High	Short-Term	Identify project scope and cost. Identify and recruit technical experts. Secure funding and assistance.	27
9	Virginia DCR, FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Secure funding for project execution.	19
10	Local funds	Low	Medium	Medium	Short-Term	Review best practices in code and ordinances, as well as enforcement and compliance strategies. Prioritize and recommend changes.	17
11	FEMA, VDEM, VDOT	High	Low	Low	Long-Term	Scope equipment needs and cost. Identify and secure funding.	14



Coeburn (Wise County) Mitigation Actions 1-9							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	Drought	Address water quality concerns at Toms Creek Reservoir (Municipal Water Source).	Public Works	DWR	1 - Protection 3 - Plans & Policies
2	New	Not Started	Drought	Secure funding to make necessary upgrades to the water treatment facility and/or replacement of water lines between the facility and town.	Public Works	VDH	1 - Protection
3	New	Not Started	Flooding	Conduct a water study or survey to determine the need for future dredging of the Clinch River / Little Tom's Creek.	Public Works	DWR	2 - Mitigation 3 - Plans & Policies
4	New	Not Started	Flooding	Secure funding for an infiltration and inflow project to upgrade the wastewater system.	Public Works	VDH	1 - Protection 4 - Whole Community
5	New	Not Started	Flooding	Secure funding for debris removal and stream clean-outs in the identified problem areas, including the North Fork of the Pound River, near Big Stone Gap, and near Coeburn.	Local Public Works Departments	DWR	2 - Mitigation
6	New	Not Started	Dam Failure	Secure coal slurry above town at Tom's Creek Mine.	Virginia DMME	Public Works	1 - Protection 2 - Mitigation
7	New	Not Started	Dam Failure	Commission an engineering study of deteriorating banks of the Tom's Creek Reservoir.	Public Works	DWR, USACE	2 - Mitigation
8	New	Not Started	Karst	Identify and replace deteriorating water and drainage lines that can lead to sinkholes.	Public Works	VDH	2 - Mitigation
9	New	Not Started	Non-Rotational Wind Tornado Winter Storm	Conduct a survey to estimate the costs of burying utility lines.	Public Works	VDOT	1 - Protection



Coeburn (Wise County) Mitigation Actions 1-9							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	Virginia DCR; FEMA, VDEM	Medium	High	Medium	Short-Term	Conduct an assessment of water quality threats from environmental and physical factors at the reservoir. Identify potential mitigation actions based on assessment. Seek funding to make necessary improvements.	26
2	FEMA, VDEM	High	Medium	Medium	Long-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
3	Virginia DCR; FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	18
4	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
5	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
6	Virginia DMME	High	High	Medium	Short-Term	Work with Virginia DMME to understand project scope and mitigation options. Scope extent and cost. Seek funding as needed.	24
7	Virginia DCR; FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	24
8	Virginia DMME	High	Medium	Medium	Ongoing	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
9	FEMA, VDEM	Medium	Low	Low	Short-Term	Secure funding and a contractor for survey estimate. Conduct survey and identify priority areas for project investment. Consider a Benefit-Cost Analysis of burying powerlines. Securing project funding and assistance as needed.	14



Pound (Wise County) Mitigation Actions 1-5							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	All-Hazard	Develop an MOU to use the Job Corps facility as an emergency shelter or respite housing during disaster events, including public health emergencies.	Wise County Emergency Management	US Dept of Labor	1 - Protection 3 - Plans & Policies 4 - Whole Community
2	New	In Progress	Earthquake Flooding Non-Rotational Wind Tornado Winter Storm	Secure funding to demolish condemned structures in hazard-prone areas. Priority will be given to qualifying RL/SRL structures.	Public Works	Building, Zoning, and Code Enforcement	2 - Mitigation
3	New	In Progress	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Purchase generators for emergency shelters at JW Adams Elementary School (Town of Pound), Union Elementary (Big Stone Gap), Wise Elementary School, and other locations as identified. Ensure all shelters are wired for portable generators.	Wise County Emergency Management	Wise County Public Schools	1 - Protection 4 - Whole Community
4	New	Not Started	Flooding	Conduct a water study to document the need for improved storm drain infrastructure.	Public Works	Floodplain Coordinator	2 - Mitigation
5	New	Not Started	Flooding	Secure funding for debris removal (trees, etc.) in the North Fork of the Pound River.	Public Works	DWR	2 - Mitigation
6	New	Not Started	Flooding	Secure funding for debris removal and stream clean-outs in the identified problem areas, including the North Fork of the Pound River, near Big Stone Gap, and near Coeburn.	Local Public Works Departments	DWR	2 - Mitigation



Pound (Wise County) Mitigation Actions 1-6							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	Local funds, DHHS, VDH	Low	Medium	Medium	Short-Term	Identify service population needs and managing organization capacity (CBO, faith-based org, city-operated, etc.) Scope project design and cost. Secure funding for construction and operations.	23
2	FEMA, VDEM	High	High	Medium	Ongoing	Provide information to owners of identified properties on acquisition/buy-out program options. Secure funding for property acquisition/demolition/relocation efforts. Secure funding for improvements for individual properties.	21
3	FEMA, VDEM, local funds	High	Medium	High	Short-Term	Scope the costs for purchase and installment. Prioritize sites based on community and resident vulnerability, site size, and secured resources. Identify and secure funding.	29
4	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
5	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23
6	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	23



Pound (Wise County) Actions 7-11							
Action #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
7	New	Not Started	Flooding	Identify and partner with an environmental protection organization to begin removal of invasive species along riverbanks.	Public Works	DWR	2 - Mitigation
8	New	In Progress	Karst	Secure funding to repair the sinkhole on Knowledge Drive in partnership with Wise County.	Public Works	VDOT	2 - Mitigation
9	New	In Progress	Landslide	Secure funding to repair damage from the landslide behind the bank building and mitigate further damage and sliding.	Public Works	VDEM	2 - Mitigation
10	New	Not Started	Landslide	Identify and mitigate potential landslide areas on critical roadways in/out of Pound.	VDOT	Public Works	2 - Mitigation 3 - Plans & Policies
11	New	Not Started	Wildfire	Secure funding for additional protective equipment, including turn-out gear for volunteer firefighters.	Pound Fire Department	Emergency Management	1 - Protection



Pound (Wise County) Actions 7-11							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
7	Local funds	Low	Low	Medium	Short-Term	Scope project extent and costs. Identify potential partner organizations. Secure funding for project execution.	21
8	VDOT	High	High	High	Short-Term	Scope project extent and costs. Identify potential contractors. Secure funding for project execution.	27
9	VDEM, FEMA	High	High	High	Short-Term	Secure grant funding for the project.	27
10	VDOT, USDOT, FHWA, USFS, VA DOF	High	Medium	Medium	Ongoing	Review historic data on landslide events affecting roadways in partnership with VDOT. Determine priority mitigation actions. Determine authority responsible for improvements. Secure funding for projects as needed.	22
11	U.S. Fire Administration, USFS, Virginia DOF	Medium	Medium	Medium	Short-Term	Complete an assessment of equipment costs. Secure funding for purchase.	19



St. Paul (Wise County) Mitigation Actions 1-4							
Actions #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	All-Hazard	Initiate the licensing of the Town of St. Paul Fire Department as an EMS agency to reduce the reliance on neighboring jurisdictions.	St. Paul Fire Department	VDH	1 - Protection 3 - Plans & Policies 4 - Whole Community
2	New	In Progress	All-Hazard	Incorporate emergency shelter designation and back-up generator capacity into the design of the new St. Paul Fire Department.	Fire Department	Emergency Management	1 - Protection 3 - Plans & Policies 4 - Whole Community
3	New	Not Started	Drought Dam Failure	Ensure adequate back-up potable water supplies to supplement municipal water sources and protect from potential coal slurry contamination through 1) the scope, cost estimate, and installation of a new water intake on the Clinch River, and 2) purchasing water hauling trucks.	Public Works	Emergency Management	1 - Protection 4 - Whole Community
4	New	Not Started	Earthquake	Establish a contract for immediate replacement and/or repair of alternate parts for water and sewer systems in case of significant damage.	Public Works	Emergency Management	2 - Mitigation 3 - Plans & Policies



St. Paul (Wise County) Actions 1-4							
Actions #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	Local funds	Medium	High	High	Short-Term	Research regulations and licensing requirements. Secure funding for improvements, training, and application process as needed.	27
2	Local funds	High	High	High	Short-Term	Research emergency shelter design requirements and applicable federal/state regulations. Incorporate findings into ongoing design phase. Seek funding for mitigation elements as needed. Apply for official shelter designation.	28
3	FEMA; VDEM, Virginia DMME; Virginia DCR	Medium	Medium	Medium	Short-Term	Identify priority locations and water service vulnerabilities. Secure funding for storage tanks. Identify potential contractors for emergency water supply.	20
4	Local funds	Low	Medium	Low	Short-Term	Identify potential contractors for alternate parts. Develop and establish contract. Seek funding as needed.	14



St. Paul (Wise County) Mitigation Actions 5-8							
Actions #	New/Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
5	New	Not Started	Earthquake Landslide	Determine structural and non-structural mitigation needs for ongoing and future damage to Third Avenue Bridge and nearby water line in partnership with VDOT.	Public Works	VDOT	2 - Mitigation
6	New	Not Started	Flooding	Replace two aging flood gates (currently protecting Morgan McClure Ford and an apartment building) which no longer seal properly.	Public Works	Floodplain Coordinator	2 - Mitigation
7	New	Not Started	Flooding	Replace the raw water intake on the Clinch River which is currently inaccessible and at-risk to service disruption during flooding events.	Public Works	VDH, DWR	2 - Mitigation 4 - Whole Community
8	New	Not Started	Winter Storm	Ensure all outlying pump stations are equipped/wired for a portable generator; purchase a portable generator to ensure continued water service.	Public Works	VDH	1 - Protection 4 - Whole Community



St. Paul (Wise County) Mitigation Actions 5-8							
Actions #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
5	VDOT, USDOT, FHWA	High	High	High	Ongoing	Review historic data on landslide events affecting the bridge in partnership with VDOT. Determine priority mitigation actions. Determine authority responsible for improvements. Secure funding for projects as needed.	29
6	FEMA, VDEM	Medium	Medium	Medium	Short-Term	Scope the project cost and design. Identify and secure funding.	25
7	FEMA, VDEM	High	Medium	Medium	Short-Term	Scope the project cost and design. Identify and secure funding.	22
8	FEMA, VDEM	High	Medium	Medium	Short-Term	Scope the project cost and design. Identify priority sites for initial improvements. Identify and secure funding as needed.	21



Wise (Wise County) Mitigation Actions 1-7							
Action #	New/ Existing	Status	Hazard(s) Mitigated	Mitigation Action	Lead Agency	Support Agencies	Goal
1	New	Not Started	Communicable Disease	Establish a mutual support agreement for contracted services (increased sanitation, etc.) during a declared pandemic.	Wise County Health Department	VDH	1 - Protection
2	New	Not Started	Dam Failure	Install an outdoor warning system for residents within the Bear Creek Dam / Wise Reservoir inundation area.	Emergency Management	DCR, USACE	1 - Protection
3	New	Not Started	Dam Failure Drought	Conduct a project scope to purchase and install a new pump and control equipment for the back-up well to the Wise Municipal Water Source.	Wise County Public Service Authority	VDH, DWR	2 - Mitigation
4	New	Not Started	Flooding	Initiate improvements and repairs to culvert, road damages, and storm drainage infrastructure at Yellow Creek/Railroad Avenue and School Avenue.	Public Works	VDOT, VDEM, Army Corps, BCR	2 - Mitigation
5	New	Not Started	Landslide	Repair the high wall on Lake Street and enhance structural protections to prevent damages to the roadway from future landslides.	Public Works	VDOT	3 - Policies & Plans
6	New	Not Started	Wildfire	Secure a new apparatus for the local fire department that can respond to wildfire/grassfire events, as well as additional protective equipment.	Wise Fire Department	Town Administrator/ Clerk	1 - Protection
7	New	Not Started	Winter Storm	Construct a salt storage facility to improve critical roadway access and reduce supply issues.	Public Works	VDOT	1 - Protection



Wise (Wise County) Mitigation Actions 1-7							
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation	STAPLEE Score
1	Local funds	Low	Low	Medium	Short-Term	Wise County and the Town of Wise will establish a mutual support agreement and grant funding to support contracted services such as increased sanitation and cleaning of buildings and other facilities. This will require identifying potential contractors, securing funding, and identifying priority needs for services based on lessons learned from the COVID-19 pandemic.	19
2	Virginia DCR, FEMA, VDEM	Medium	High	Medium	Short-Term	Develop a project scope based on the inundation area that includes the number and type of signals/structures. Secure funding. Install warning system. Conduct an outreach and awareness campaign to notify residents of the new system.	23
3	FEMA, VDEM	Low	Medium	Medium	Short-Term	Seek funding and assistance.	22
4	FEMA, VDOT, VDEM	High	High	Medium	Short-Term	Conduct a project scope, cost and design assessment. Seek funding and assistance.	23
5	VDOT, USDOT, FHWA, USFS, VA DOF	High	High	Medium	Short-Term	Review historic data on landslide events affecting the roadway in partnership with VDOT. Determine possible mitigation actions. Determine authority responsible for improvements. Secure funding for projects as needed.	24
6	U.S. Fire Administration, USFS, VA DOF	High	Medium	Medium	Short-Term	Complete an assessment of equipment costs. Secure funding for purchase.	26
7	VDOT, USDOT, FHWA	High	Medium	Low	Long-Term	Assess capacity and design needs. Scope alternatives and costs. Secure funding for purchase.	14



Ongoing, Completed, or Removed Actions

Many mitigation actions identified in 2013 were unable to be completed due to the lack of funding and staffing. In the years coming, jurisdictions in the District have made mitigation planning and action a top priority. The first step to completing many of the projects remaining from the 2013 plan will be identifying funding sources. Other actions have been completed since the 2013 plan, adapted in new actions, or removed due to discontinued participation.

District-Wide On-Going Actions 1-7					
Action #	Hazard(s) Mitigated	Mitigation Action/Strategy	Lead Agency	Support Agencies	Goal
1	Flooding	Target FEMA's Repetitive Loss Properties, and other known repetitively flooded properties, throughout the district for potential mitigation projects.	Local Floodplain Coordinators	Local Emergency Operations Coordinators; Community Planners	1 - Protection 2- Mitigation 3 - Polices & Plans
2	Flooding	Support Public Works initiatives to improve stormwater infrastructure throughout the area.	Local Floodplain Coordinators	Local Emergency Operations Coordinators; Community Planners	2 - Mitigation
3	All-Hazards	Perform analysis of emergency communication systems in all jurisdictions to ensure compatibility during an event.	Local Emergency Operations Coordinators	911 PSAPs in the District	1 - Protection 4 - Whole Community
4	All-Hazards	Initiate and encourage dialogue with public utility companies about incorporating mitigation as infrastructure is laid, maintained, or repaired.	Planning District	Public Utilities	1 - Protection 2- Mitigation
5	All-Hazards	Develop "hazard information centers" on local communities' websites, in public libraries and via social media, where individuals can find hazard and mitigation information.	Planning District	Local Emergency Operations Coordinators; Community Planners; Website and Social Media Coordinators	1 - Protection 4 - Whole Community
6	Wildfire	Utilize existing wildfire maps to prioritize potential project areas in the district.	LENOWISCO Planning District Commission	Local Fire Departments, U.S. Forest Service; Virginia Department of Forestry	2 - Mitigation



District-Wide On-Going Actions 1-7						
Action #	Funding Source	Estimated Cost	Benefits	Priority	Timeline	Action Planning & Implementation
1	HMA Programs, Local funds	High	High	Low	Ongoing	Work with the State, PDC, and localities to identify vulnerable structures and apply for funding to implement acquisition, elevation, and demolition projects. RL and SRL properties are targeted for this project type. Acquisition and demolition projects completely remove the structure from the floodplain, reducing any future damages. The District will also support the jurisdictions in keeping an accurate account and database of projects.
2	HMA Programs, Local funds, Public Utility Funding	High	High	Medium	Ongoing	Many of the jurisdictions have made improvements to their stormwater infrastructure since the 2013 plan. As additional funding is available, the District will support jurisdictions in further improving their stormwater infrastructure.
3	FEMA, VDEM, Local funds	Medium	High	High	Ongoing	Identify continuing funding for the CodeRed warning system; Investigate the use of the FEMA Integrated Public Alert and Warning System (IPAWS) for Alerting Authorities; Deploy a public awareness campaign to encourage use of existing systems.
4	Local Funds	Low	High	Medium	Ongoing	While the utility companies are ultimately responsible for the installation costs, the District will continue to be proactive with including the utility companies in mitigation discussions and educational sessions. Further, cost-share mitigation efforts are included under jurisdiction mitigation plans in this update.
5	Local Funds	Low	High	Medium	Ongoing	The District continues to recognize the need to provide more information on hazard mitigation to the public. Since 2013, many jurisdictions and the County have created a social media presence to share information with the residents. Not all residents have computers or smart phones so the District is looking at initiatives to supply the hazard mitigation information in public spaces frequented by the public.
6	Virginia Department of Forestry	Low	High	High	Long-Term	As funding is identified for wildfire mitigation projects, the District will continue to utilize the Wildfire Maps and Wildland Urban Interface maps created by the Department of Forestry to identify areas of primary concern. The District will support maps updates to ensure the maps remain current.



Completed Actions 1-5				
Action #	Status	Mitigation Action/Strategy	Applicable Jurisdiction	Action Planning & Implementation
1	Completed	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.	District-wide	Since the 2013, the District supported jurisdictions in educating the public on acquisition projects and acquisition projects have occurred as funding is allocated. The public is aware of the need for acquisition, relocation, and elevation projects.
2	Completed	Stormwater mitigation, upgrades to main interceptor in central business district	Norton	The City of Norton completed a number of stormwater mitigation projects since the 2013 plan. The City of Norton developed a new targeted mitigation action to continue enhancing the community's flooding resilience.
3	Completed	Stormwater mitigation, drainage culverts underneath downtown	Pennington Gap	Since the 2013 plan, stormwater mitigation projects were implemented. The primary concern for flooding is now the potential tunnel failure and a new mitigation action was identified.
4	Completed	Potential residential acquisition project(s) in flood-prone areas	Scott County	Since the 2013 plan, several acquisition projects occurred in Scott County. Exact dates of acquisition were not recorded and a past mitigation action under the District was updated to include better tracking of acquisition projects. Scott County recognizes that flooding remains a hazard likely to impact the area and developed a new mitigation action focused on improved stormwater drainage.
5	Completed	Potential residential acquisition project(s) in flood-prone areas	Town of Wise	Since the 2013 plan, several acquisition projects occurred. Exact dates of acquisition were not recorded and a past mitigation action under the District was updated to include better tracking of acquisition projects. The town identifies the need for better drainage and improved culverts as the primary mitigation actions necessary to continue to enhance the town's resilience from flooding.



Removed Mitigation Actions 1-5				
Action #	Status	Mitigation Action/Strategy	Applicable Jurisdiction	Action Planning & Implementation
1	Removed	Investigate critical facilities to evaluate resistance to wind, fire, landslide and flood hazards. Examine critical facilities within the district's communities and make recommendations to address deficiencies.	District-wide	The District recognized the need to reframe the action to specific hazards and specific critical facilities and the importance of jurisdictions serving as the lead agency for critical facilities within their jurisdiction. The action is reframed under jurisdictions.
2	Removed	Evaluate the district's community floodplain ordinances and enforcement procedures that may be outdated for possible upgrades.	District-wide	The District continues to support floodplain management; however, the revisions of ordinances is best done and supported at the County-level.
3	Removed	Potential residential acquisition project(s) in flood-prone areas	Jonesville	Jonesville did not participate in the 2021 update. The acquisition project continues as a District-wide initiative.
4	Removed	Need for early warning system in town	Jonesville	Jonesville did not participate in the 2021 update
5	Removed	Need improvements in early warning system in town.	Pennington Gap	



1.7.3 Plan Integration Strategy

Plan integration is the process by which communities look critically at their existing planning framework and align efforts to build a safer, smarter community. Plan integration involves a two-way exchange of information and incorporation of ideas and concepts between the LENOWISCO Planning District Hazard Mitigation Plan and other community plans. Specifically, plan integration involves the incorporation of hazard mitigation principles and actions into community plans and community planning mechanisms.

The 2013 mitigation actions were not incorporated into other county or city plans due to limited staff capacity. However, the ongoing revisions to comprehensive plans for some counties and local jurisdictions provide the perfect opportunity for the mitigation plan and actions to be incorporated into these plans.

The LENOWISCO Planning District and its participating jurisdictions are committed to the integration of mitigation into other community plans and efforts. The recent guidance provided by FEMA Region 3, [*Reducing Risk in the Floodplain*](#), provides integration methods to ensure limited resources are utilized effectively, and plans are better coordinated. The floodplain guidance applies to the Hazard Mitigation Plan being well integrated with other plans and future initiatives. Several new or updated planning efforts, as well as ordinance updates, are included as new mitigation actions. Additionally, the draft HMP was shared with local jurisdiction staff for review and incorporation in upcoming plans and ordinances. Ongoing plan integration efforts include:

- All mitigation actions should be reviewed and incorporated when their county, city, or town Comprehensive Plan, Emergency Operation Plan (EOP), and Comprehensive Emergency Management Plan (CEMP) are updated.
- Jurisdictions should consider mitigation actions, especially high-priority projects, in budget plans.
- Local floodplain managers should integrate the mitigation actions with floodplain and NFIP planning.
- Building and zoning officials should investigate updated or new zoning ordinances outlined in the mitigation actions.
- County and town administrators should integrate mitigation actions with ongoing Continuity of Operations Planning (COOP).
- Local fire departments and Forest Service officials will integrate the Plan and action items with future Community Wildfire Protection Plan and Wildland-Urban Interface Plans.
- Local economic development committees and the regional Economic Development District will integrate the Plan and action items with the upcoming Comprehensive Economic Development Strategy (CEDS) plan update in 2021-2022.
- Future land development projects and regulations should utilize the hazard assessment information provided in the HMP.
- The public will continue to be a part of hazard mitigation updates, and community partnerships will be important to mitigation action implementation and integration across jurisdictional plans.



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1.7.4 NFIP Mitigation Actions

The following mitigation strategies and actions demonstrate LENOWISCO and its participating jurisdictions' continued support and compliance with NFIP requirements, as appropriate. Only those actions that demonstrate specific support and compliance with the program are included. Other flood-related projects were not included in this section.

Table: NFIP-Specific Mitigation Actions

Jurisdiction	Status	Year Initiated	Hazard(s) Mitigated	Mitigation Action	Lead Agency/ Organization	Supporting Agency	Priority
District-Wide	Existing	2013	Flooding	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances and take steps to participate in the Community Rating System (CRS).	Local Floodplain Coordinators	Local Emergency Operations Coordinators	High
Scott County	New	2021	Flooding	Conduct a water study to document the need for improved storm drain infrastructure.	Public Works	Floodplain Coordinator	Medium
Gate City	New	2021	Earthquake Flooding Non-Rotational Winds Tornado Winter Storm	Create a strategy to inspect and document vacant buildings that may pose a threat to public safety during a hazardous event.	Building & Zoning	Public Works	High
Big Stone Gap	New	2021	Flooding	Conduct an assessment of base flood elevation at mobile home parks and relocation or elevation needs for residents.	Building & Zoning	Floodplain Coordinator	Medium
Pound	New	2021	Earthquake Flooding Non-Rotational Wind Tornado Winter Storm	Secure funding to demolish condemned structures in hazard-prone areas. Priority will be given to qualifying RL/SRL structures.	Public Works	Building, Zoning, and Code Enforcement	Medium



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Section 1.8 Plan Maintenance and Implementation

The Disaster Mitigation Act of 2000 requires the monitoring, evaluation, and updating of the hazard mitigation plan every five years. This hazard mitigation plan is designed to be a “living” document and therefore will be reviewed and updated within five years from its approval date. The LENOWISCO Planning District hazard mitigation planning team will provide leadership and guidance throughout the plan’s life cycle (i.e., monitoring, evaluating, and updating.) Updates will allow municipal leaders and the public to provide input into the process. The public will be notified of this opportunity via legal public notices.

The LENOWISCO Planning District multi-hazard mitigation plan maintenance process includes a schedule for annual monitoring and evaluation of the programmatic outcomes established in the Plan and for producing a formal Plan revision every five years.

1.8.1 Formal Review Process

Since the development of the 2013 Hazard Mitigation Plan (HMP) and the updated 2021 HMP, LENOWISCO Planning District has continued to monitor, evaluate, and update the Plan. The monitoring, evaluating, and updating process will continue throughout the next 5 years.

The Plan will be reviewed on an annual basis by the core planning team and reviewed and revised every five years to determine the effectiveness of programs and to reflect changes that may affect mitigation priorities. The LENOWISCO Planning District will be responsible for contacting the planning team members and organizing the review. Members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan. The planning team will review the goals and action items to determine their relevance to changing situations in the District, as well as changes in Federal policy, and to ensure they are addressing current and expected conditions. The planning team will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any newly available data. The organizations responsible for the various action items will report on the status of the projects, the success of various implementation processes, difficulties encountered, the success of coordination efforts, and which strategies should be revised or removed.

LENOWISCO Planning District will be responsible for ensuring the updating of the Plan. LENOWISCO Planning District and the planning team will also notify all holders of the Plan and affected stakeholders when changes have been made. The updated Plan will be submitted to the Commonwealth of Virginia and to the Federal Emergency Management Agency for review and approval.



1.8.2 Monitoring, Evaluating, and Updating the Plan

To ensure the Plan continues to provide an appropriate path for risk reduction throughout the District, it is necessary to regularly evaluate and update it. The planning team will be responsible for monitoring the status of the Plan and gathering appropriate parties to report the status of mitigation actions. The planning team will convene on an annual basis to determine the progress of the identified mitigation actions. The planning team will also be an active participant in the next plan update. As the Multi-Hazard Mitigation Plan matures, new stakeholders will be identified and encouraged to join the existing planning team.

LENOWISCO Planning District is responsible for contacting planning team members and organizing the annual meeting. The planning team's responsibilities include:

- Members of the planning team will be readily available to engage via meetings or e-mail correspondence between annual meetings. If the need for a special meeting (due to new developments or a declared disaster) occurs in the District, the planning team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.
- Reassess the Plan considering any major hazard event. The committee will convene within 90 days of any major event to review all applicable data and to consider the risk assessment, plan goals, objectives, and action items given the impact of the hazard event.
- Annually reviewing each goal and objective to determine its relevance and appropriateness.
- Monitor and evaluate the mitigation strategies in this Plan to ensure the document reflects current hazard analyses, development trends, code changes and risk analyses and perceptions.
- Ensure the appropriate implementation of annual status reports and regular maintenance of the Plan. The planning team will hear progress reports from the parties responsible for the various implementation actions to monitor progress.
- Create future action plans and mitigation strategies. These should be carefully assessed and prioritized using the benefit-cost analysis (BCA) methodology that FEMA has developed.
- Ensure the public is invited to comment and be involved in mitigation plan updates.
- Ensure that the District complies with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR.
- Review the multi-hazard mitigation plan in connection to other plans, projects, developments, and other significant initiatives.
- Significant updates or modifications to the Plan during the five-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval.
- Coordinate with appropriate municipalities and authorities to incorporate regional initiatives that transcend the boundaries of the District.
- Update the plan every five years and submit for FEMA approval.
- Amend the plan whenever necessary to reflect changes in State or Federal laws and statutes required in 44 CFR.



1.8.3 The Five-Year Action Plan

This section outlines the implementation agenda that the planning team should follow five years following the adoption of this Plan, and then every five years thereafter. The planning team, led by LENOWISCO Planning District, is responsible to ensure the Multi-Hazard Mitigation Plan is updated every five years.

The planning team will consider the following an action plan for the first 5-year planning cycle. It should be noted that the schedule below can be modified as necessary and does not include any meetings and/or activities that would be necessary following a disaster event (which would include reconvening the planning team within 90 days of a disaster or emergency to determine what mitigation projects should be prioritized during the community recovery). If an emergency meeting of the planning team occurs, this proposed schedule may be altered to fit any new needs.

Year 0:

- **January – March 2021:** Update Multi-Hazard Mitigation Plan, including a series of planning team meetings & public meetings. Submit 2021 Multi-Hazard Mitigation Plan for State and FEMA approval.
- **April – December 2021:** Work on mitigation actions. The core planning team will stay in contact with lead departments/municipalities to keep tabs on mitigation project status and progress.
- Participating jurisdictions will formally adopt the 2021 Multi-Hazard Mitigation Plan upon State and FEMA approval.

Year 1:

- **January – March 2022:** Prepare for and promote the first annual plan review and public meetings. District and participating jurisdictions will provide a status update for each mitigation action/project.
- **April 2022:** Reconvene planning team for first annual mitigation meeting. Introduce the concept of mitigation plan integration with other planning documents. Host first annual public meeting.
- **May – December 2022:** Work on mitigation actions. The core planning team will stay in contact with lead departments/municipalities to keep tabs on mitigation project status and progress. Encourage plan integration efforts.

Year 2:

- **January – March 2023:** Prepare for and promote second annual plan review and public meetings. District and participating jurisdictions will provide a status update for each mitigation action/project.
- **April 2023:** Reconvene planning team for second annual mitigation meeting. Review plan integration efforts. Host second annual public meeting.
- **May – December 2023:** Work on mitigation actions. The core planning team will stay in contact with lead departments/municipalities to keep tabs on mitigation project status and progress. Encourage plan integration efforts.



Year 3:

- **January – March 2024:** Prepare for and promote third annual plan review and public meetings. District and participating jurisdictions will provide a status update for each mitigation action/project.
- **April 2024:** Reconvene planning team for third annual mitigation meeting. Review plan integration efforts. Host third annual public meeting.
- **May – December 2024:** Work on mitigation actions. The core planning team will stay in contact with lead departments/municipalities to keep tabs on mitigation project status and progress. Encourage plan integration efforts.
- LENOWISCO Planning District will ask planning team members to volunteer to begin the process of bringing in a contractor to make plan updates for 2026 completion.

Year 4:

- **January – March 2025:** Prepare for and promote four annual plan review and public meetings. District and participating jurisdictions will provide a status update for each mitigation action/project.
- **April 2025:** Reconvene planning team for fourth annual mitigation meeting. Review plan integration efforts. Host fourth annual public meeting.
- **May – December 2025:** Work on mitigation actions. The core planning team will stay in contact with lead departments/municipalities to keep tabs on mitigation project status and progress. Encourage plan integration efforts.

Year 5:

- **January – December 2026:** Update 2021 Multi-Hazard Mitigation Plan, including a series of mitigation planning team meetings and public meetings.
- Submit 2026 Multi-Hazard Mitigation Plan for State and FEMA approval. Repeat.



1.8.4 Annual Mitigation Steering Committee Meeting

During each annual mitigation meeting, the planning team will be responsible for a brief evaluation of the 2021 Multi-Hazard Mitigation Plan and to review the progress on mitigation actions.

Plan Evaluation

To evaluate the plan, the mitigation planning team should answer the following questions:

- Are the goals and objectives still relevant?
- Is the risk assessment still appropriate, or has the nature of the hazard and/or vulnerability changed over time?
- Are current resources appropriate for implementing this Plan?
- Have lead agencies participated as originally proposed?
- Has the public been adequately involved in the process? Are their comments being heard?
- Have departments been integrating mitigation into their planning documents?

If the answer to each of the above questions is “yes,” the plan evaluation is complete. If any questions are answered with a “no,” the identified gap must be addressed.

Review of Mitigation Actions

Once the plan evaluation is complete, the planning team must review the status of the mitigation actions. To do so, the mitigation planning team should answer the following questions:

- Have the Mitigation Actions been implemented as planned?
- Have outcomes been adequate?
- What problems have occurred in the implementation process?

A similar table should be utilized to evaluate all mitigation actions to track annual updates and progress for each mitigation action. Lead agencies/organizations will be tasked to provide an annual status update for each action.

Meeting Documentation

Each annual mitigation meeting must be documented, including the plan evaluation and review of Mitigation Actions. The tables on the following pages can be used to guide and document plan maintenance and evaluation, updates to mitigation actions, and on-going public involvement. The workbook is designed to provide clear guidance for each annual mitigation meeting with an outline of key tasks.

Documentation for the Mitigation Committee key tasks should include:

- **Committee Meeting Date:** Record the date, time, and location of the Mitigation Committee Meeting in the plan maintenance table. Capture meeting minutes as a separate document.
- **Participating Jurisdictions:** Record meeting participants, their jurisdiction, and contact information. List participating jurisdictions in the plan maintenance table.



- **Description of Mitigation Action Changes:** Ask each jurisdiction to provide a status update on mitigation actions. Record revisions, completed actions, or proposed additions. Consider the following questions: 1) Have the mitigation actions been implemented as planned? 2) Have the outcomes been adequate? 3) What problems have occurred during implementation? Include a summary of mitigation action status updates in the plan maintenance table.
- **Description of Plan Integration Strategies:** Ask each jurisdiction to describe how the HMP has been integrated into other planning and/or policy efforts. Reference the Plan Integration section of the plan for guidance. Include a summary of ongoing plan integration strategies in the plan maintenance table.
- **Description of Plan Evaluation Results:** Facilitate a conversation with the Committee to evaluate the HMP. Consider the following questions: 1) Are the goals and objectives still relevant? 2) Is the risk assessment still appropriate, given recent events or changes in vulnerability? 3) Are current resources appropriate for implementation? 4) Have lead agencies participated as proposed? Include a summary of the plan evaluation in the plan maintenance table.

Documentation for Public Involvement key tasks should include:

- **Public Comment Period:** Record the dates that the Plan was posted for public review.
- **Public Meeting Date:** Record the date, time, and location of the Annual Public Meeting below. Capture meeting minutes as a separate document.
- **Description of Public Involvement Activities:** Describe the opportunities for public involvement in plan review, including the required public meeting. Consider posting the Executive Summary and/or a summary of previous plan evaluation for more accessible comment and review.
- **Description of Public Involvement Results:** Describe how the feedback received from the public will be incorporated into future plan updates or applied to the Committee's plan evaluation process.



LENOWISCO HMP Update Annual Plan Maintenance - Mitigation Committee						
Year	Mitigation Committee Key Tasks	Committee Meeting Date	Participating Jurisdictions	Mitigation Action Changes	Integration Strategies	Evaluation Results
2022	1) Host committee meeting; 2) Jurisdiction updates to mitigation actions; 3) Review plan integration opportunities; 4) Request complete NFIP data from FEMA; 5) Evaluate key plan sections and submit amendment with NFIP data and any other needed changes; 5) Submit plan review summary to VDEM					
2023	1) Host committee meeting; 2) Jurisdiction updates to mitigation actions; 3) Review plan integration opportunities; 4) Evaluate key plan sections and consider amendments; 5) Review 2023 Virginia HMP; 6) Submit plan review summary to VDEM					
2024	1) Host committee meeting; 2) Jurisdiction updates to mitigation actions; 3) Review plan integration opportunities; 4) Evaluate key plan sections and consider amendments; 5) Secure resources for plan update (scope, funding, contractor, etc.); 6) Submit plan review summary to VDEM					
2025	1) Host committee meeting; 2) Jurisdiction updates to mitigation actions; 3) Review plan integration opportunities; 4) Secure participants for plan update; 5) Consider new hazard events (including human-caused and technological) for update; 6) Request RL/SRL data; 7) Reach out to previously non-participating jurisdictions to encourage participation in the 2026 update (share the benefits of grant funding eligibility); 7) Submit plan review summary to VDEM					
2026	1) Solicit participation from all jurisdictions; 2) Actively solicit public involvement in plan update process; 3) Request input from neighboring jurisdictions; 4) Complete plan update; 5) Submit to VDEM and FEMA for Approval					



LENOWISCO HMP Update Annual Plan Maintenance - Public Involvement					
Year	Public Involvement Key Tasks	Public Comment Period	Public Meeting Date	Public Involvement Activities	Public Involvement Results
2022	1) Post plan for public review and comment; 2) Host public meeting				
2023	1) Post plan for public review and comment; 2) Host public meeting				
2024	1) Post plan for public review and comment; 2) Host public meeting				
2025	1) Post plan for public review and comment; 2) Host public meeting				
2026	1) Public meeting to review the hazards and introduce plan update (invite neighboring jurisdictions and VDEM); 2) Public survey; 3) Neighboring jurisdictions invited to review plan; 4) Public Meeting to review plan draft; 5) Post plan for public review				



1.8.5 Continued Public Involvement

LENOWISCO Planning District is dedicated to involving the public directly in the review and updates of the Plan. The planning team is responsible for the review and update of the Plan. The public will also provide input into Plan revisions and updates. Copies of the Plan will be kept by appropriate District and municipalities.

Public meetings will be held when deemed necessary by the planning team. The meetings will provide a forum where the public can express concerns, opinions, or new alternatives that can then be included in the Plan. LENOWISCO Planning District will be responsible for using District resources to publicize the public meetings and maintain public involvement.

To further facilitate continued public involvement in the planning process, the LENOWISCO Planning District will ensure that:

- Once adopted, a digital copy of this plan will be maintained in each jurisdiction and in the LENOWISCO Planning District. The District will keep a hard copy and digital copy of the Plan at the LENOWISCO Planning District building for public comment.
- The District will conduct outreach after a disaster incident to remind members of the importance of mitigation and to solicit mitigation ideas to be included in the Plan.
- Education efforts for hazard mitigation will be ongoing through the county emergency management offices. The public will be notified of periodic planning meetings through notices in the local newspaper or press releases. The regional public education campaign will include mitigation actions for residents to undertake, such as raising appliances in the lower level of homes and buying proper insurance.
- Public meetings will be held annually to allow the public to receive information on plan updates and offer input on plan improvements.
- As the Plan is updated annually, a summary of the changes will be added to the LENOWISCO Planning District's website with an updated version of the plan (to include 2022 action updates, etc.) for the public to monitor progress and remain engaged.
- Comments from the public on the Plan will be received by LENOWISCO Planning District and forwarded to the committee for discussion, as appropriate and as needed.

1.8.6 Implementation and Integration through Existing Plans and Programs

Hazard mitigation practices must be incorporated within existing plans, projects, and programs. Therefore, the involvement of all departments, private non-profits, private industry, and appropriate jurisdictions is necessary to find mitigation opportunities within existing or planned projects and programs. To execute this, the planning team will assist and coordinate resources for the mitigation actions and provide strategic outreach to implement mitigation actions that meet the goals and objectives identified in this plan.

The results of this Plan will be incorporated into ongoing planning efforts throughout the District. LENOWISCO Planning District and its incorporated jurisdictions will update zoning plans and related ordinances, as necessary, and as part of regularly scheduled updates. Each community will be responsible for updating and integrating elements of the Plan into the community's own respective community plans and ordinances.



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Appendix A: Public Involvement & Steering Committee Meetings

Public involvement was a critical component of the Hazard Mitigation Plan and Appendix A highlights the main involvements of the public, including the Community Preparedness Survey questions and summary of responses, public and planning team meetings, and public notification of plan review.



A.1 Survey Questions

LENOWISCO Community Preparedness Survey

Instructions

To Whom It May Concern:

LENOWISCO Planning District is conducting a study to better understand the preparedness needs and risk perceptions of its residents as part of the Hazard Mitigation Plan update process. To do so, a questionnaire has been distributed throughout Lee County, Scotty County, Wise County, and City of Norton. Your feedback is greatly needed and appreciated!

The questionnaire should only take about 10 minutes to complete. All responses will be kept confidential, and your participation is strictly voluntary. Your input will enable the LENOWISCO Planning District to better serve you.

Survey Completion Date

Please complete the survey by January 31, 2021.

CONTACT US

If you have any questions, please contact:

Frank W. Kibler
Senior Planner, LENOWISCO Planning District Commission
fkibler@lenowisco.org
(276) 431-2206
www.lenowisco.org

DEFINITIONS

Hazard Mitigation: The purpose of hazard mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. Mitigation forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage.

Thank you for your participation.

Residency

1) Do you live and/or work in LENOWISCO Planning District? Please select the best answer that applies to your current situation.*

- ☐ I work/live in Lee County
 - ☐ I work/live in Scott County
 - ☐ I work/live in Wise County
 - ☐ I work/live in City of Norton
 - ☐ Other - Write In
 - ☐ No, I do not live or work in the LENOWISCO Planning District
-



Residency and Employment Information

2) Approximately how many years have you lived in LENOWISCO Planning District?

- ☐ 0-2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ 11-20 years
- ☐ 21 or more years
- ☐ Not Applicable
- ☐ Do Not Know
- ☐ Other (please specify): _____

3) Approximately how many years have you worked in LENOWISCO Planning District?

- ☐ 0-2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ 11-20 years
- ☐ 21 or more years
- ☐ Not Applicable
- ☐ Do Not Know
- ☐ Other (please specify): _____

4) Please indicate which community in LENOWISCO Planning District you live in.

- ☐ City of Norton
- ☐ Town of Appalachia
- ☐ Town of Big Stone Gap
- ☐ Town of Clinchport
- ☐ Town of Coeburn
- ☐ Town of Duffield
- ☐ Town of Dungannon
- ☐ Town of Gate City
- ☐ Town of Jonesville
- ☐ Town of Nickelsville
- ☐ Town of Pennington Gap
- ☐ Town of Pound
- ☐ Town of St. Charles
- ☐ Town of St. Paul
- ☐ Town of Weber City
- ☐ Town of Wise
- ☐ Unincorporated Lee County
- ☐ Unincorporated Scott County
- ☐ Unincorporated Wise County
- ☐ Other - Write In

5) Please indicate which community in LENOWISCO Planning District you work in.

- ☐ City of Norton
- ☐ Town of Appalachia



- ☐ Town of Big Stone Gap
- ☐ Town of Clinchport
- ☐ Town of Coeburn
- ☐ Town of Duffield
- ☐ Town of Dungannon
- ☐ Town of Gate City
- ☐ Town of Jonesville
- ☐ Town of Nickelsville
- ☐ Town of Pennington Gap
- ☐ Town of Pound
- ☐ Town of St. Charles
- ☐ Town of St. Paul
- ☐ Town of Weber City
- ☐ Town of Wise
- ☐ Unincorporated Lee County
- ☐ Unincorporated Scott County
- ☐ Unincorporated Wise County
- ☐ Other - Write In

General Preparedness

6) Please indicate what type of device(s) you use to access the internet. Select ALL that apply.

- ☐ Computer/laptop at home
- ☐ Computer/laptop at work/office
- ☐ iPad/tablet
- ☐ Cell phone
- ☐ Public computer (i.e. library)
- ☐ I do not have access to the Internet
- ☐ Do Not Know
- ☐ Other (please specify): _____

7) Please indicate those activities you have done to prepare for emergencies and disasters.
Please select ALL that apply.

I have...

- ☐ Smart 911/Rave Alert
- ☐ An emergency preparedness plan
- ☐ Flood Insurance
- ☐ A 72 hour kit/disaster supply kit
- ☐ Visited local government web site(s) for emergency preparedness information
- ☐ An evacuation plan
- ☐ A weather radio
- ☐ Signed up for emergency alerts for LENOWISCO Planning District (from any source)
- ☐ Done nothing
- ☐ Other (please specify): _____



8) Have any of the reasons below prevented you from pursuing additional preparedness activities? Please select ALL that apply.

- ☐ I don't think it will make a difference.
- ☐ I don't know what to do.
- ☐ I don't have the time.
- ☐ It costs too much.
- ☐ I don't need to prepare because emergency responders (fire, police, etc.) will help me during an emergency.
- ☐ None of the above apply to me.
- ☐ Other (please specify): _____

9) Please indicate where you go to obtain emergency and disaster preparedness related information? Please select ALL that apply.

- ☐ Municipal government websites
- ☐ County government website
- ☐ Virginia Commonwealth government website
- ☐ Federal government websites (example: www.fema.gov)
- ☐ Web search (example: bing.com, google.com)
- ☐ Social media (example: Facebook, twitter, google , etc.)
- ☐ Voluntary organizations (example: American Red Cross, Salvation Army, etc.)
- ☐ Religious Organization
- ☐ Local English-speaking television
- ☐ Local English-speaking radio
- ☐ Local Spanish-speaking radio
- ☐ National News (Radio and Television)
- ☐ Print Media - English (example: newspapers)
- ☐ Brochures and Newsletters
- ☐ Word of Mouth (example: friends, family, co-workers)
- ☐ Other (please specify): _____
- ☐ Do Not Know
- ☐ Not Applicable

10) Please indicate how you expect to receive alerts and information during an emergency. Please select ALL that apply.

- ☐ A weather radio
- ☐ Private Weather Phone Applications (ex. Weather Channel, Wunderground, Weather Bug, AccuWeather, etc.)
- ☐ Preparedness Phone Applications (ex. FEMA, Red Cross, etc.)
- ☐ Local Media Phone Applications
- ☐ LENOWISCO Emergency Management website
- ☐ Local Television Media
- ☐ Local Radio
- ☐ Social Media
- ☐ Word of Mouth
- ☐ Do Not Know
- ☐ Other (please specify): _____



11) Would you agree or disagree with the following statements?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know
My jurisdiction is providing the services necessary to prepare me for a disaster.	☐	☐	☐	☐	☐	☐
I am familiar with LENOWISCO Planning District's website and can easily obtain information about emergencies and disasters.	☐	☐	☐	☐	☐	☐
During times of emergency, information is provided in a language and format I can understand.	☐	☐	☐	☐	☐	☐
I can easily obtain emergency information in times of crisis.	☐	☐	☐	☐	☐	☐

12) Please indicate how LENOWISCO Planning District can better assist you in preparing for emergencies and disasters (example: provide preparedness materials in my language).

13) If a disaster (i.e. snowstorm) impacted LENOWISCO Planning District, knocking out electricity and running water, would your household be able to manage on its own for at least three (3) days?

- ☐ Yes
☐ Maybe
☐ No
☐ Do Not Know

14) Which of the following may prevent you from recovering from a disaster? Please select ALL that apply.

- ☐ Lack of financial savings



- ☐ Disruption in employment
- ☐ No access to healthcare
- ☐ Mental health concerns
- ☐ Lack of insurance (i.e. home owners insurance, renter's insurance, flood insurance, etc.)
- ☐ Lack of alternative housing options
- ☐ Lack of outside support from family
- ☐ Limited food supply
- ☐ Limited water supply
- ☐ No alternative power supply
- ☐ Not Applicable
- ☐ Do Not Know
- ☐ Other (please specify): _____

Hazards

15) Do you believe that your household and/or place of business might ever be threatened by the following hazards? Please rate what hazards present the greatest risk.

Low Risk = Low impact on threat to life and property damage

Medium Risk = Medium impact on threat to life and property damage

High Risk = High impact on threat to life and property damage

	Low Risk	Medium Risk	High Risk	Not Applicable
Communicable Disease	()	()	()	()
Drought	()	()	()	()
Earthquake	()	()	()	()
Flooding	()	()	()	()
Dam Failure	()	()	()	()
Earthquake	()	()	()	()
Karst	()	()	()	()
Subsidence	()	()	()	()
Landslide	()	()	()	()
Non-Rotational Winds	()	()	()	()
Solar Storm	()	()	()	()
Tornado	()	()	()	()
Wildfire	()	()	()	()
Winter Storm	()	()	()	()

16) Please select the answer that best describes your experience.

Minor = Repairable, non-structural damage to a home or damage from flood waters when the waterline is 18 inches or below in a conventionally built home or when the waterline is in the floor system of a manufactured home.



Major = Structural damage or other significant damage that requires extensive repairs or damage from flood waters when the waterline is 18 inches or above in a conventionally built home or when the waterline enters the living space of a manufactured home.

Catastrophic = Significant enough damage that the home is deemed a total loss.

() I have never experienced property damage or loss from a disaster(s)

() I have experienced minor property damage and loss from a disaster(s)

() I have experienced major property damage and loss from a disaster(s)

() I have experienced catastrophic property damage and loss from a disaster(s)

17) If you have experienced any damage(s) or injury(ies) from a disaster, please describe the first event:

What hazard caused the damages/losses and/or injuries? (Example: flooding, wind, winter storm) : _____

Where did the damage/loss occur? (Example: my home, on a roadway or intersection, at work, on vacation, etc.) : _____

Please describe the damages and/or injuries. (Example: basement flooded, roof was damaged, vehicle was damaged, broken bones, lacerations, etc.):

18) If you have experienced any damage(s) or injury(ies) from a disaster, please describe the second event:

What hazard caused the damages/losses and/or injuries? (Example: flooding, wind, winter storm) : _____

Where did the damage/loss occur? (Example: my home, on a roadway or intersection, at work, on vacation, etc.) : _____

Please describe the damages and/or injuries. (Example: basement flooded, roof was damaged, vehicle was damaged, broken bones, lacerations, etc.):

19) If you have experienced any damage(s) or injury(ies) from a disaster, please describe the damages and/or injuries.

What hazard caused the damages/losses and/or injuries? (Example: flooding, wind, winter storm) : _____

Where did the damage/loss occur? (Example: my home, on a roadway or intersection, at work, on vacation, etc.) : _____



Please describe the damages and/or injuries. (Example: basement flooded, roof was damaged, vehicle was damaged, broken bones, lacerations, etc.):

20) Please select the best answer. The risks associated with LENOWISCO Planning District's most prevalent hazards are:

- ☐ increasing quickly
- ☐ increasing slowly
- ☐ staying the same
- ☐ decreasing slowly
- ☐ decreasing quickly
- ☐ Do not know
- ☐ Not applicable
- ☐ Other (please specify): _____

21) Based on YOUR PERCEPTION of your jurisdiction's hazards, to what degree of emphasis would you expect your jurisdiction to mitigate the following hazards?

Mitigation definition: The purpose of mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. Mitigation forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage.

•**No Mitigation Needed** = No mitigation on this hazard is expected or needed

•**Low Priority** = This hazard should be mitigated, but is not a high priority compared to other hazards

•**Medium Priority** = It is important to mitigate this hazard

•**High Priority** = It is a high priority to emphasize mitigation for this hazard

	Low Risk	Medium Risk	High Risk	Not Applicable
Communicable Disease	☐	☐	☐	☐
Drought	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐
Flooding	☐	☐	☐	☐
Dam Failure	☐	☐	☐	☐



Earthquake	()	()	()	()
Karst	()	()	()	()
Subsidence	()	()	()	()
Landslide	()	()	()	()
Non-Rotational Winds	()	()	()	()
Solar Storm	()	()	()	()
Tornado	()	()	()	()
Wildfire	()	()	()	()
Winter Storm	()	()	()	()

Evacuation

22) If an evacuation was ordered for your area, please indicate how likely you would be to do the following.

	Very Likely	Somewhat Likely	Not Very Likely	Not Likely at All	Do Not Know	Not Applicable
Immediately evacuate as instructed.	()	()	()	()	()	()
I would first consult with family and friends outside my household before making a decision to evacuate.	()	()	()	()	()	()
Wait and see how bad the situation is going to be before deciding to evacuate.	()	()	()	()	()	()
Refuse to evacuate no matter what.	()	()	()	()	()	()

23) What might prevent you from leaving your place of residence if there was an evacuation order? Please select ALL that apply.

- ☐ Pet
- ☐ Livestock
- ☐ Job
- ☐ Need to care for another person
- ☐ Spouse/Significant Other won't leave
- ☐ Need to stay and protect property
- ☐ Lack of money



- ☐ No place to go
- ☐ No transportation
- ☐ Traffic
- ☐ Lack of gas/fuel for vehicle
- ☐ Disability/Health Issues
- ☐ Other (please specify): _____
- ☐ No obstacles would prevent me from evacuating
- ☐ I would refuse to evacuate no matter what

24) If you were to evacuate, where would you most likely stay? Please select the best answer.

- ☐ Shelter/evacuation center
- ☐ Church or place of worship
- ☐ Workplace
- ☐ Home of a friend or relative
- ☐ Hotel/motel
- ☐ Do Not Know
- ☐ Other (please specify): _____

25) In an evacuation, would you or anyone in your household require special assistance?

- ☐ Yes
- ☐ Maybe
- ☐ No
- ☐ Do Not Know
- ☐ Not applicable
- ☐ Other (please specify): _____

26) If yes, would that assistance be provided by someone within your household, by an outside agency, or by a friend or relative outside your household?

- ☐ Within household
- ☐ Friend/Relative (outside household)
- ☐ Outside Agency
- ☐ Do Not Know
- ☐ Not Applicable
- ☐ Other (please specify): _____

27) If applicable, please indicate what kind of outside assistance your household may need during an evacuation (i.e. Transportation, Medical, etc.)

Demographic Questions

28) What type of structure do you live in?

- ☐ Detached single family home
- ☐ Duplex, triplex, quadruple home
- ☐ Multi-family building – 2 stories or more (apartment/condo)



- () Mobile home
() Manufactured home
() Recreational vehicle (RV)
() Some other type of structure
() Do Not Know
() Not Applicable
() Other (please specify): _____

29) Do you own or rent your home/place of residence?

- () Own
() Rent
() Do Not Know
() Not Applicable
() Other (please specify): _____

30) How many persons, including yourself, are currently living in your household?

	1	2	3	4	5	6	7	8	9	10 or more
Under age 5										
Ages 6 - 10										
Ages 11 - 19										
Ages 20 - 44										
Ages 45 - 64										
Ages 65- 79										
Ages 80										

31) Which of the following best describes your race/ethnicity? Please select ALL that apply.

- [] American Indian or Alaska Native
[] Hawaiian or Other Pacific Islander
[] Asian or Asian American
[] Black or African American
[] Hispanic or Latino
[] Non-Hispanic White
[] Other (please specify): _____

32) Please indicate the language(s) spoken in your household. Please select ALL that apply.

- [] English
[] Spanish
[] Other Indo-European language
[] Asian and Pacific Island language



[] Other (please specify): _____

33) Please indicate your sex.

- ☐ Female
☐ Male
☐ Not Applicable

Contact

34) (OPTIONAL): Would you like more information on how you can be more prepared?

- ☐ Yes
☐ No

35) (OPTIONAL): Would you be interested in participating in a free training led by The Community Emergency Response Team (CERT) Program on disaster preparedness? More information on the CERT Program is available on the next page.

- ☐ Yes
☐ No

36) (OPTIONAL): Would you like to be entered into the raffle for the prize?

- ☐ Yes
☐ No

37) To receive information on LENOWISCO Planning District Emergency Management, please provide your name, e-mail, and phone number below. We will ensure your information is kept confidential.

Name: _____
Phone: _____
E-mail: _____

Thank You!

This concludes the survey. Thank you for your time!



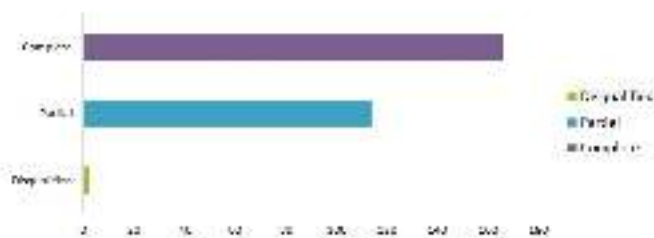
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A.2 Survey Results

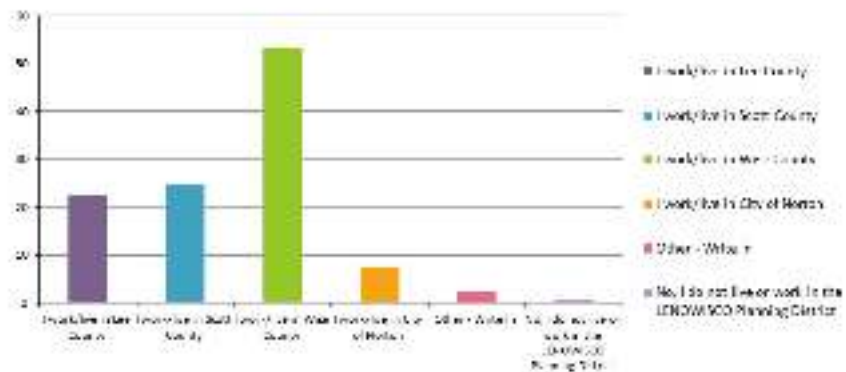
The following questions were included in the public survey. Short answer responses are excluded to protect survey respondent's personal information.

Response Statistics



	Count	Percent
Complete	90	90%
Partial	18	18%
No Response	2	2%
Total	110	

1. Do you live and/or work in the LENOWISCO Planning District? Please select all that apply.



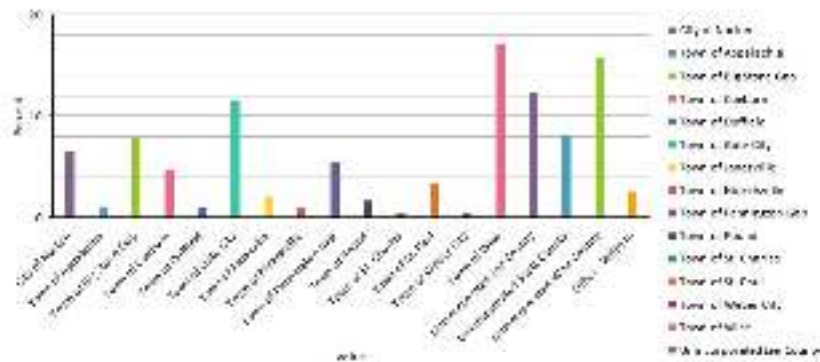


2. Approximately how many years have you lived in the LENOWISCO Planning District?

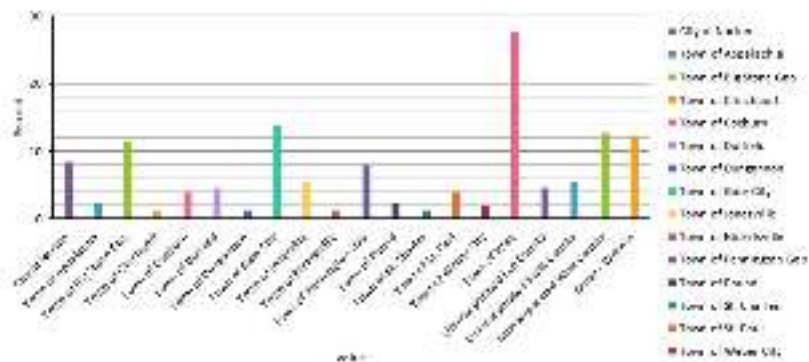


3. Approximately how many years have you worked in the LENOWISCO Planning District?





5. Please indicate which community in the LENOWISCO Planning District you work in.

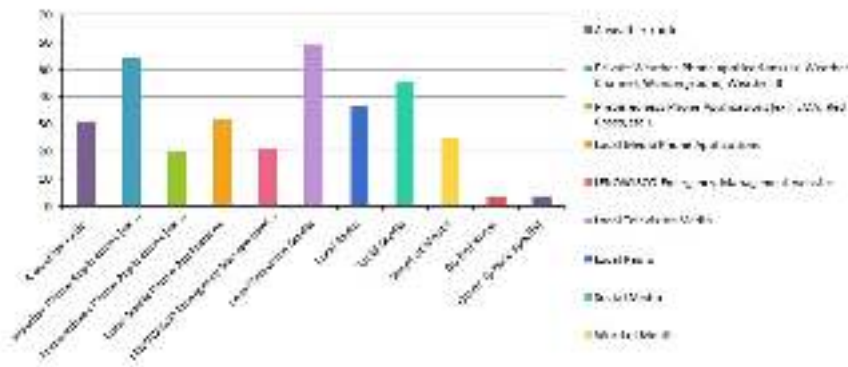


Device Type	Percentage (%)
Laptop/Notebook	~85
Smartphone	~65
Tablet	~55
Cell phone	~95
Tablet/Smartphone	~5
Other	~1
Public computer (e.g., library)	~1
Other (e.g., kiosk, pay public computer)	~1

Research Topic	Number of Publications
Low-to-high risk	8
Emergency response plan	11
Low-to-high risk	4
High-to-low risk	19
Low-to-high risk	14
Low-to-high risk	12
Low-to-high risk	20
Low-to-high risk	28
Low-to-high risk	18
Low-to-high risk	2

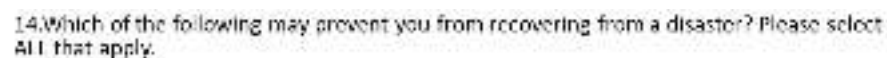


10. Please indicate how you expect to receive alerts and information during an emergency. Please select All that apply.



11. Would you agree or disagree with the following statements?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My household is at risk of flooding.	45%	35%	15%	5%	0%
My household is at risk of wind damage.	40%	30%	20%	10%	0%
My household is at risk of fire.	35%	25%	25%	15%	0%
My household is at risk of power outages.	30%	20%	30%	20%	0%
My household is at risk of gas leaks.	25%	15%	35%	25%	0%
My household is at risk of earthquakes.	20%	10%	40%	30%	0%
My household is at risk of hurricanes.	15%	10%	45%	30%	0%
My household is at risk of tornadoes.	10%	5%	50%	35%	0%



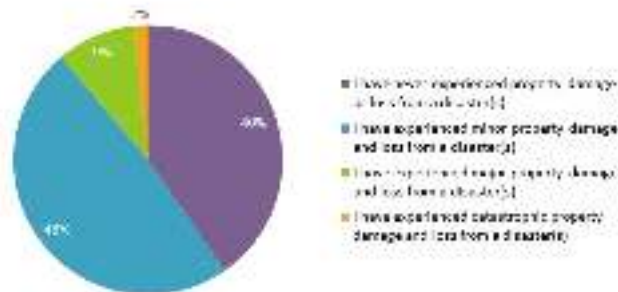


The provided earth science data on the plan reflects the magnitude of the following hazard threat to which households around the greatest risk. Low flood level impact on threat to life and property damage/Minor flood/flood level impact on threat to life and property damage/High Risk = High impact on threat to life and property damage

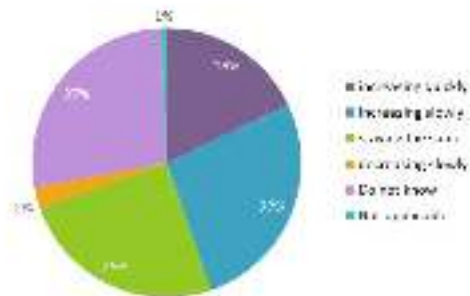
	Low Flood		Minor Flood		High Flood		Greatest Risk		Properties
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Overall Count	81	20.8%	81	20.8%	71	18.4%	2	0.5%	154
Low Flood	81	20.8%	34	8.4%	8	2.0%	2	0.5%	124
Minor Flood	22	5.5%	34	8.4%	8	2.0%	2	0.5%	124
High Flood	0	0.0%	11	2.8%	21	5.3%	2	0.5%	124
Properties	154	39.6%	21	5.3%	0	0.0%	16	4.1%	154
Count	81	20.8%	21	5.3%	8	2.0%	12	3.0%	154
Percent	20.8%	5.5%	8.4%	2.1%	2.0%	2.0%	3.0%	0.5%	154
Low Flood	20.8%	5.5%	8.4%	2.1%	2.0%	2.0%	3.0%	0.5%	154
Minor Flood	5.5%	1.4%	8.4%	2.1%	2.0%	2.0%	3.0%	0.5%	154
High Flood	0.0%	0.0%	2.8%	0.7%	5.3%	1.3%	0.5%	0.1%	154
Properties	39.6%	10.1%	5.3%	1.3%	0.0%	0.0%	4.1%	1.0%	154
Count	81	20.8%	21	5.3%	8	2.0%	12	3.0%	154
Percent	20.8%	5.5%	8.4%	2.1%	2.0%	2.0%	3.0%	0.5%	154
Low Flood	20.8%	5.5%	8.4%	2.1%	2.0%	2.0%	3.0%	0.5%	154
Minor Flood	5.5%	1.4%	8.4%	2.1%	2.0%	2.0%	3.0%	0.5%	154
High Flood	0.0%	0.0%	2.8%	0.7%	5.3%	1.3%	0.5%	0.1%	154
Properties	39.6%	10.1%	5.3%	1.3%	0.0%	0.0%	4.1%	1.0%	154

The provided data is based on the following definitions:

Minor = Significant, non-structural damage to a home or damage from flood waters when the water level is 12 inches or below in a residentially built home or when the water level is the floor level of a residential home.
Major = Structural damage or other significant damage that would include significant damage from flood waters when the water level is 12 inches or above in a residentially built home or when the water level enters the living space of a residential home.
Total High = Significant damage through the entire residential area.



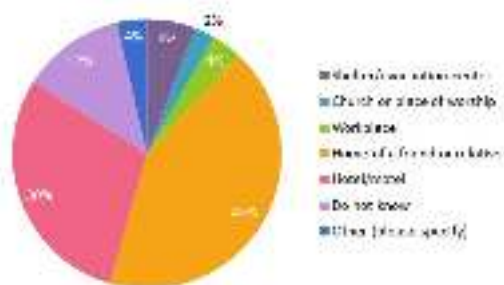
20. Please select the best answer. The risks associated with LENDWSICD Planning District's most prevalent hazards are:

[illegible]

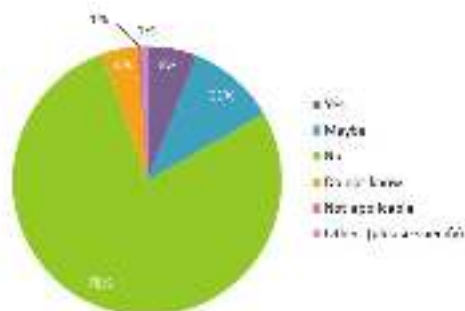
Category	North America		Europe		Asia-Pacific		Latin America		Africa		Global Average	
	Q1 Sales	Q1 Profit	Q1 Sales	Q1 Profit	Q1 Sales	Q1 Profit	Q1 Sales	Q1 Profit	Q1 Sales	Q1 Profit		
Electronics	1200	240	950	190	1500	300	800	160	600	120	1150	230
Software	800	160	700	140	1100	220	500	100	400	80	750	150
Services	600	120	500	100	700	140	300	60	200	40	450	90
Hardware	400	80	350	70	500	100	200	40	150	30	350	70
Peripherals	200	40	180	36	250	50	100	20	80	16	200	40
Mobile Devices	300	60	250	50	400	80	150	30	100	20	300	60
Wearables	150	30	120	24	200	40	80	16	50	10	150	30
Smart Home	100	20	80	16	120	24	50	10	30	6	100	20
IoT Devices	50	10	40	8	60	12	20	4	10	2	50	10
Cloud Services	700	140	600	120	900	180	400	80	300	60	750	150
Security Solutions	300	60	250	50	400	80	150	30	100	20	300	60
Network Equipment	200	40	180	36	250	50	100	20	80	16	200	40
Enterprise Software	500	100	450	90	600	120	300	60	200	40	500	100
CRM Systems	250	50	200	40	300	60	150	30	100	20	250	50
ERP Systems	150	30	120	24	200	40	100	20	80	16	150	30
HR Software	100	20	80	16	120	24	50	10	30	6	100	20
Marketing Automation	50	10	40	8	60	12	20	4	10	2	50	10



24. If you were to evacuate, where would you most likely stay? Please select the best answer.

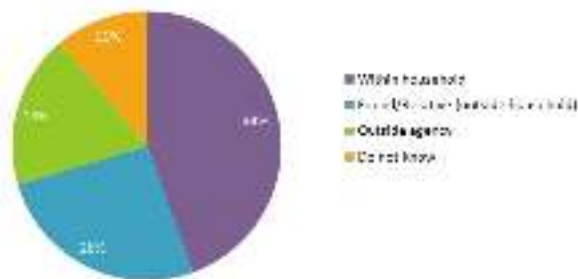


25. In an evacuation, would you or anyone in your household require special assistance?

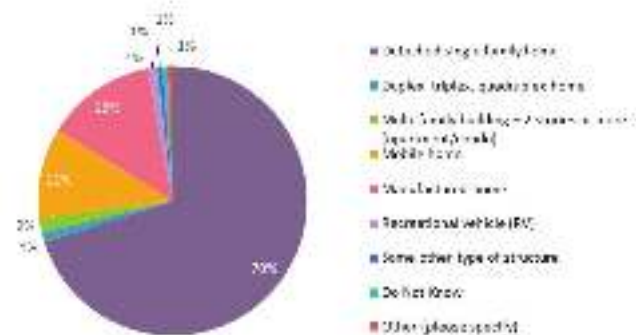




26. If yes, would that assistance be provided by someone within your household, by an outside agency, or by a friend or relative outside your household?

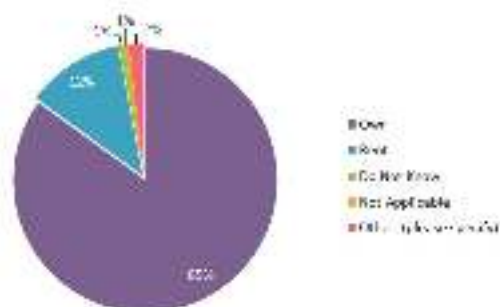


28. What type of structure do you live in?





29. Do you own or rent your home/place of residence?

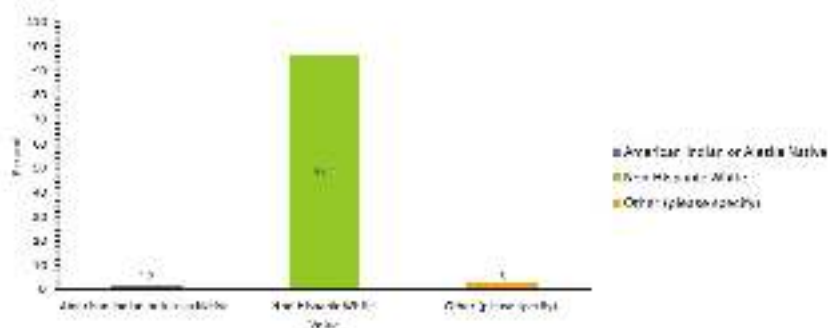


30. How many persons, including yourself, are currently living in your household?

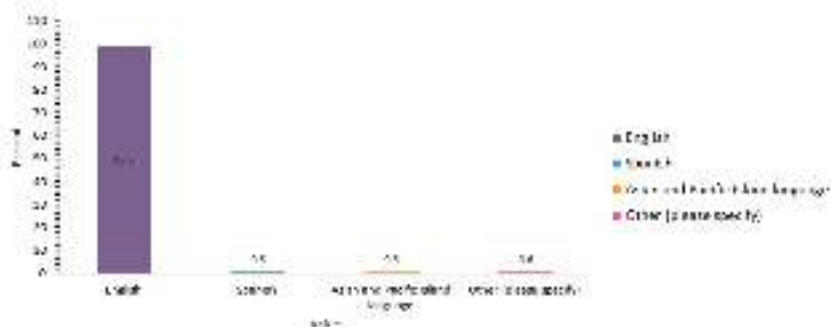
	1	2	3	4	5	6	7	8	9	10 or more	Total
Uninc	80.7% 3	16.7% 2	2.0% 1	8.0% 1	3.0% 2	2.0% 2	2.0% 2	3.0% 3	2.0% 2	6.0% 1	12
RIH 2	50.0% 15	2.0% 3	5.0% 2	5.0% 3	5.0% 3	5.0% 3	5.0% 3	5.0% 3	5.0% 3	5.0% 3	59
RIE	10.0% 22	2.0% 2	1.0% 1	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	44
IT 14	10.0% 14	11.2% 15	5.7% 8	2.0% 3	3.0% 4	2.0% 3	2.0% 3	3.0% 4	2.0% 3	3.0% 4	79
20104	25.0% 16	8.0% 10	5.0% 7	5.0% 7	5.0% 7	5.0% 7	5.0% 7	5.0% 7	5.0% 7	5.0% 7	54
41-04	11.2% 11	11.2% 11	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	2.0% 2	24
20115	8.0% 4	2.0% 2	2.0% 2	2.0% 2	3.0% 3	2.0% 2	2.0% 2	3.0% 3	2.0% 2	12.0% 6	9
Total	100%										



31. Which of the following best describes your race/ethnicity? Please select ALL that apply.

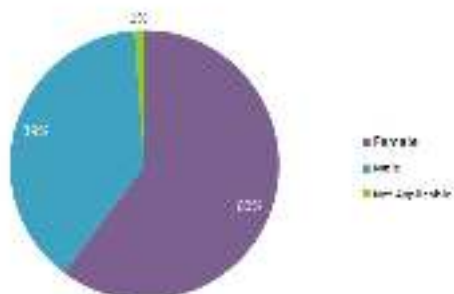


32. Please indicate the language(s) spoken in your household. Please select ALL that apply.

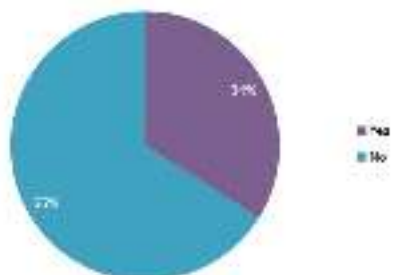




33. Please indicate your sex.



34.(OPTIONAL): Would you like more information on how you can be more prepared?





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A.3 Press Releases

Below are the invite and the press release that was sent to community stakeholders and media sources to promote the Community Preparedness Survey and Hazard Mitigation Plan Review. Following these images are examples of the advertisement that went out to the community a.

Press Release: Public Draft Review & Meeting



FOR IMMEDIATE RELEASE
January 22, 2021

Contact:
Telephone:
Cell:
Email:

David Miller, Executive Director
(202) 453-0200
(202) 453-0017
dave@lenowisco.org
www.lenowisco.org

**LENOWISCO District Residents Invited to
Provide Feedback on Regional Hazard Mitigation Plan Draft**

LENOWISCO – January 22, 2021 – The LENOWISCO Planning District Commission (PDC) has been working with Designated Solutions Consulting to update the district's comprehensive hazard mitigation plan. One is pleased to announce the district's full draft. The plan details the district and how that can impact the jurisdiction in the LENOWISCO planning district, and strategies for mitigating those impacts.

Residents and stakeholders are invited to review and provide feedback on the updated hazard mitigation plan. There are two ways to provide feedback. The first is to attend the virtual public meeting. The second is to provide feedback online.

- **Attend the meeting, February 14, 2021 10:00 AM - 12:00 PM (EST)**
- **Link: <https://us02web.zoom.us/j/90816170303>**
- **Please note you do not need to download the application and can paste the link into a browser.**
- **Call in Line – 1 (800) 343-0333**
- **Call in Line Access Code: 908 161 70303**

For additional information, residents are invited to log on to the online public meeting at <https://us02web.zoom.us/j/90816170303>. The LENOWISCO jurisdiction – City, County, and Town – might have requests for clarification or comments. Please email info@lenowisco.org or call (202) 453-0200. The feedback will be used to help the planning team finalize the Hazard Mitigation Plan update. During the meeting, highlights of the plan will be presented and time will be provided for residents to ask questions and provide feedback.

Following the meeting, there will be a public meeting for all interested parties to comment through February 25th on the LENOWISCO website.

There will also be a meeting for all LENOWISCO jurisdiction members, at 2:00 PM (EST) 2021.

Established in 1963, the LENOWISCO Planning District Commission is a coalition of seven local Virginia Regional Governments that work to coordinate planning and development in the Commonwealth of Virginia. LENOWISCO serves the Counties of Lee, Scott, and Wise, and the City of Norton.



SR Technology Trail, Leesville, VA 24644
Phone: (202) 453-0200 • Fax: (202) 453-0008
14511616121@lenowisco.org • www.lenowisco.org

Executive Director: David Miller • **Executive Director: David Miller**





Town of Wise Website: Public Survey

A screenshot of the Town of Wise website's public survey page. The page has a green header with the 'wise' logo and navigation links for 'HOME' and 'GOV'. The main content area is white with a green border. It features a title 'The Place To Be In Southwest Virginia', a paragraph about the LENOWISCO Planning District's study, a link to the survey, a survey completion date, and contact information for Frank W. Kibler, Senior Planner.

The Place To Be In Southwest Virginia

The LENOWISCO Planning District is conducting a study to better understand the emergency preparedness needs and risk perceptions of its residents as part of the Hazard Mitigation Plan update process. To do so, a questionnaire has been distributed throughout the Planning District, and your participation is requested.

The questionnaire should take about 10 minutes to complete. All responses will be kept confidential, and your participation is strictly voluntary. Your input will enable the Planning District to better serve you in times of disaster.

To participate, please click the following link:
<https://surveyalchemer.com/s/552855/L-ENOWISCO-Community-Preparedness-Survey>

Survey Completion Date: Please complete the survey by January 31, 2021.

CONTACT US: If you have any questions, please contact:
Frank W. Kibler
Senior Planner
LENOWISCO Planning District Commission
377 Technology Trail Lane, Suite 101
Duffield VA 24244
fkibler@lenowisco.org



LENOWISCO Website: Public Survey

The next LENOWISCO Board of Directors Meeting will be held on February 1, 2021 at 5:30 p.m.

[Click Here for the Board's Regional Small Business Recovery Assistance Grant Program Application](#)

On behalf of our district localities, LENOWISCO is presently updating its regional hazard mitigation plan. Part of that effort involves soliciting public input, via the survey link below. Your participation would be greatly appreciated!

<https://survey.alchemer.com/s3/5952833/LENOWISCO-Regional-Hazard-Mitigation-Plan-Survey>

Established in 1980, the LENOWISCO Planning District Commission is authorized under the Virginia Regional Cooperation Act to serve as one of the twenty-two planning district commissions in the Commonwealth of Virginia. LENOWISCO serves the Counties of Lee, Smith, Giles and the City of Norton.

The Commission is composed by the Appalachian Regional Commission as an ABC Local Development District and by the Economic Development, Administration and General Development District. LENOWISCO has been heavily involved in local infrastructure planning and development. Emphasis has been placed on Community Development, Economic Development, Transportation and Public Utility Infrastructure. We pride ourselves on adapting to the changing needs of our region.

Tweets by @lenowisco

LENOWISCO @lenowisco
Join us together!
<https://survey.alchemer.com/s3/5952833/LENOWISCO-Regional-Hazard-Mitigation-Plan-Survey>
01/13/2021

LENOWISCO @lenowisco
On behalf of our district localities, LENOWISCO is presently updating its regional hazard mitigation plan. Part of that effort involves soliciting public input, via the survey link below. Your participation would be greatly appreciated!
<https://survey.alchemer.com/s3/5952833/LENOWISCO-Regional-Hazard-Mitigation-Plan-Survey>

LENOWISCO Twitter: Public Survey

LENOWISCO PDC @lenowisco · Jan 13

On behalf of our district localities, LENOWISCO is presently updating its regional hazard mitigation plan. Part of that effort involves soliciting public input, via the survey link below. Your participation would be greatly appreciated!

survey.alchemer.com/s3/5952833/LENOWISCO-Regional-Hazard-Mitigation-Plan-Survey

5 likes, 1 retweet



LENOWISCO Health District Facebook: Public Survey

The screenshot shows a Facebook post from the official page of Lenowisco Health District. The post is dated January 10, 2021. The text of the post explains that the planning district is conducting a study to better understand the emergency preparedness needs and risk perceptions of its residents as part of the Hazard Mitigation Plan update process. It mentions that a questionnaire has been distributed throughout the planning district and that participation is requested. The post states that the questionnaire should take about 10 minutes to complete, all responses will be kept confidential, and participation is strictly voluntary. It provides a link to the survey: <https://survey.galaxyonline.org/Lenowisco-Community-Preparedness-Survey>. The survey completion date is set for January 31, 2021. Below the post, there are two comments. The first comment is from 'Dorothy Smith' who says 'Completed and shared.' and has one like. The second comment is from 'Margaret Gilliam Kayler' who says 'Survey on my 212' and has one like. The post also has two likes and one share indicated by icons.



Scott County Virginia Star: Public Draft Review & Meeting

BE PREPARED.

How prepared are you? Natural disasters can happen within a moment's notice and can leave you and your family feeling helpless. If you don't have an effective plan in place.

LENOWISCO Fund - Disaster Readiness Guide is here! Understanding the preparation needs and the importance of the resources provided by the Hazard Mitigation Plan update process. Help them provide you with the tools and information necessary to help you and your loved ones reduce risk and loss by controlling the future.

LENOWISCO's guide is prepared and approved. You can find it on the LENOWISCO website at www.lenowisco.com.

The survey was completed by a survey 2014

OFFICE of
SCOTT COUNTY
www.scottcountyva.gov

**LENOWISCO District
Residents Invited to
Provide Feedback on
Hazard Mitigation
Plan Draft**

The LENOWISCO District is currently in the process of updating its Hazard Mitigation Plan. The plan is a critical tool for the District to help protect its residents and property from natural disasters. The plan is currently in the draft stage and we are inviting residents to provide feedback on the plan. The plan is currently in the draft stage and we are inviting residents to provide feedback on the plan. The plan is currently in the draft stage and we are inviting residents to provide feedback on the plan.

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12-0 Thursday, January 24, 2013 12:39pm The above email notification

[illegible]

"The Food Corridor is a great way to increase the health of the community," says the project's director, David H. Smith, of the University of Maryland System. "We're looking at the food system as a whole, from the farm to the fork."

Working in a highly regulated environment with over 30 years of experience in the field of child nutrition, Smith is a leading expert on the subject. "It's a complex, multi-faceted issue," he says. "We're looking at the food system as a whole, from the farm to the fork."

Smith is a leading expert on the subject. "It's a complex, multi-faceted issue," he says. "We're looking at the food system as a whole, from the farm to the fork."

A plan review meeting is set for Feb. 18.

On the other hand, according to the American Medical Association, the use of a medical device to deliver a drug is not a new concept. The use of a medical device to deliver a drug is a well-established practice. The use of a medical device to deliver a drug is a well-established practice. The use of a medical device to deliver a drug is a well-established practice.

A plan review meeting is set for Feb. 18.



Local Newspaper: Public Draft Review & Meeting

and 2021 and 2022. The plan is to be updated every five years. The plan is to be updated every five years. The plan is to be updated every five years.

The plan is to be updated every five years. The plan is to be updated every five years. The plan is to be updated every five years.

Insurance Rates Down? Ask Us!

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Feedback On Regional Hazard Mitigation Plan Draft

The LENOWISCO Planning District is currently working with Integrated Solutions Corporation to update the plan. The plan is to be updated every five years. The plan is to be updated every five years. The plan is to be updated every five years.

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Virtual Transfer Fair On February

The purpose of the virtual transfer fair is to provide information to students and parents about the transfer process. The fair will be held on February 10th, 2021.

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The Coalfield: Public

Sports | Page 4 | **Business section** | **Business local news** | Page 5 | **Classifieds** | **Local news** | **Business section**

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to view the full
page on the
website.

the
Coalfield
PROGRESS

2021 Progress Report: Looking for the best of the best

TUESDAY
February 2, 2021

Vol. 10 • No. 10

10 Pages

NOTHING IS TOO GOOD
FOR THE BEST OF THE BEST

Bills seek early end to coal tax credits

JACK LEVINE
STAFF WRITER

Legislative action through the General Assembly, it appeared, would put an end to the controversial and costly tax credits now given to coal mine owners. 2021 legislation, however, is projected to extend the credits until 2025, according to a report from the House Finance Committee.

The House Finance Committee, which is the lead committee on the bill, is expected to report the bill to the House floor in the next few days. The bill, H.R. 100, is expected to pass the House in the next few days.

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Bus stop

Food is
venture's
focus

JACK LEVINE
STAFF WRITER

The new bus stop, which is the first of its kind in the area, is expected to be completed by the end of the year. The bus stop, which is the first of its kind in the area, is expected to be completed by the end of the year.

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Comments are sought on regional hazard plan

The Lenowisco Planning District is seeking comments from the public on its regional hazard plan. The plan, which is the first of its kind in the area, is expected to be completed by the end of the year.

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COVID cases

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News Break - Kingsport Times-News: Public Draft Review & Meeting



Times News: Public Draft Review & Meeting





LENOWISCO Website: Public Draft Review & Meeting



**The next LENOWISCO Board of Directors Meeting will be held on
April 5, 2021 at 5:30 p.m.**

On behalf of four district localities, LENOWISCO is presently updating its regional hazard mitigation plan. The draft plan is available for public review HERE.

Residents and the business community are invited to review and provide feedback. A virtual Hazard Mitigation Plan Public Review meeting is scheduled for Thursday, February 18, 2021, 5:30 PM - 6:30 PM EST.

Link: <https://global.gotomeeting.com/join/754348812>
Please note you do not need to download the application and can paste the link into a browser!
Call-in (USA): +1 (877) 240-0212
Call-in Line Access Code: 704-540-6713

Following the meeting, the updated Hazard Mitigation Plan will be open for public comment HERE through February 23rd.

Your participation will be greatly appreciated!

Times News Twitter: Public Draft Review & Meeting



Times-News Online @timesnewsline · Jan 24

LENOWISCO seeks feedback on regional hazard mitigation plan draft.

LENOWISCO seeks feedback on regional hazard mitigation plan draft. Residents and businesses in Lee, Wise and Scott counties and the city of Norton are invited to review the draft plan. timesnews.net



WN - Kingsport Times-News: Public Draft Review & Meeting





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A.4 Sign-in Sheets

TABLE: LENOWISCO Hazard Mitigation Meeting Attendees	
Summary	
Meeting Date	Meeting Duration
October 8, 2020 12:45 PM CDT	94 minutes
Details	
Name	Organization
Jane Bennet	Town of Pound
Alan Bailey	Lee County
Betsy Lopez	ISC
Cassandra Wolff - ISC	ISC
Dane Poe	Lee County
Earl Carter	Town of St. Paul
Edward Wolff - ISC	ISC
Frank K	LENOWISCO Planning District
Fred Ramey	City of Norton
Freda Starnes	Scott County
Greg Jones	Town of Gate City
Harrington, Sara	VDEM
Jessica Swinney	Wise County
Laura Craft	Town of Wise
Leah Rausch	ISC
Matt Stanley	ISC
Stephen McElroy	City of Norton
Todd Lagow	City of Norton



TABLE: LENOWISCO Hazard Mitigation Meeting Attendees

Summary	
Meeting Date	Meeting Duration
December 16, 2020 9:45 AM CST	72 minutes
Details	
Name	Organization
Jimmy Williams	Town of Coeburn
Jane Bennet	Town of Pound
Betsy Lopez	ISC
Brian Skidmore	Town of Pennington Gap
Cassandra Wolff	ISC
Dane Poe	Lee County
Earl Carter	Town of St. Paul
Frank Kibler	LENOWISCO Planning District
Greg Jones	Town of Gate City
Jeff.Brickey	Scott County
Jessica Swinney	Wise County
Laura Craft	Town of Wise
Leah Rausch	ISC
Matt Stanley	ISC
Matthew Bright	Town of Big Stone Gap
Stephen Lawson	Town of Big Stone Gap
Stephen McElroy	City of Norton
Todd Lagow	City of Norton



TABLE: Jurisdiction Hazard, Mitigation, and Capability Assessment Meetings		
Jurisdiction	Stakeholder(s) on Call	Meeting Date and Time
Scott County	Jeff Brickey	1/6/2021 2-3 PM (CT)
Town of Coeburn	Jimmy Williams	1/8/2021 3-4 PM (CT)
Town of Pennington Gap	Brian Skidmore	1/11/21 8-9 AM (CT)
Town of Wise	Laura Roberts	1/11/21 9-10 AM (CT)
Wise County	Jessica Swinney	1/13/21 9-10 AM (CT)
Town of Gate City	Greg Jones	1/20/21 9-10 AM (CT)
Lee County	Dane Poe	1/20/21 1-2 PM (CT)
Town of Pound	Jane Bennett	1/21/21 2-3 (CT)
Norton	Todd Lagow	1/25/21 12-1 PM (CT)
St. Paul	Earl Carter	1/28/21 2:30-3:30 PM (CT)
Town Big Stone Gap	Matthew Bright	2/1/21 9-10 AM (CT)



Final Stakeholder Meeting: Draft Plan Review Attendees	
Summary	
Meeting Date	Meeting Duration
February 18, 2021 12:44 PM CST	87 minutes
Details	
Name	Organization
Todd Lagow	City of Norton
Dane Poe	Lee County
Frank Kibler	LENOWISCO Planning District
Jeff Brickey	Scott County
Matthew Bright	Town of Big Stone Gap
Jimmy Williams	Town of Coeburn
Greg Jones	Town of Gate City
Brian Skidmore	Town of Pennington Gap
Jane Bennet	Town of Pound
Earl Carter	Town of St. Paul
Laura Roberts	Town of Wise
Jessica Swinney	Wise County
Sara Harrington	Virginia Department of Emergency Management (VDEM)
Betsy Lopez	Integrated Solutions Consulting – Project Lead
Leah Rausch	Integrated Solutions Consulting – Planner
Matt Stanley	Integrated Solutions Consulting – Principal Manager
Cassandra Wolff	Integrated Solutions Consulting – GIS Analyst / Planner



Public Draft Plan Review Attendees	
Summary	
Meeting Date	Meeting Duration
February 18, 2021 4:16 PM CST	45 minutes
Details	
Name	Email Address
+19542456628	
Betsy Lopez	betsy.lopez@i-s-consulting.com
Cassandra Wolff - ISC	cassandra.wolff@i-s-consulting.com
Frank Kibler	fkibler@lenowisco.org
Leah Rausch	leah.rausch@i-s-consulting.com
Matt Stanley	matt.stanley@i-s-consulting.com
Michael Riebe	riebetrucks@gmail.com

Appendix A: Application Form for Grant and Loan Requests for All Categories

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Name of Local Government: Town of Wise, VA

Category Being Applied for (check one):

☒ Capacity Building/Planning

☐ Project

☐ Study

NFIP/DCR Community Identification Number (CID) 510179

Name of Authorized Official and Title: Laura C. Roberts, Town Manager

Signature of Authorized Official: Laura C. Roberts

Mailing Address (1): P.O. Box 1100

Mailing Address (2): _____

City: Wise State: VA Zip: 24293

Telephone Number: (276) 328-6013 Cell Phone Number: (276) 275-6856

Email Address: mcr@townofwise.org

Contact and Title (If different from authorized official): Seagan Walsh

Mailing Address (1): P.O. Box 1100

Mailing Address (2): _____

City: Wise State: VA Zip: 24293

Telephone Number: (276) 828-6013 Cell Phone Number: (276) 890-4101

Email Address: wise@wise-townofwise.org

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes X No _____

Categories (select applicable activities that will be included in the project and used for scoring criterion):

Capacity Building and Planning Grants

☒ Floodplain Staff Capacity.

☒ Resilience Plan Development

☐ Revisions to existing resilience plans and integration of comprehensive and hazard mitigation plans.

☐ Resource assessments, planning, strategies, and development.

☐ Policy management and/or development.

☐ Stakeholder engagement and strategies.

☐ Other: _____

Study Grants (Check All that Apply)

☐ Revising other land use ordinances to incorporate flood protection and mitigation goals, standards, and practices.

- ☐ Conducting hydrologic and hydraulic (H&H) studies of floodplains. *Changes to the base flood, as demonstrated by the H&H must be submitted to FEMA within 6 months of the data becoming available.*
- ☐ Studies and Data Collection of Statewide and Regional Significance.
- ☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard.
- ☐ Other relevant flood prevention and protection project or study.
- ☐ Pluvial studies.
- ☐ Studies to aid in updating floodplain ordinances to maintain compliance with the NFIP, or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks, freeboard, or other higher standards, RiskMAP public noticing requirements, or correcting issues identified in a Corrective Action Plan.

Project Grants and Loans (Check All that Apply – Hybrid Solutions will include items from both the “Nature-Based” and “Other” categories)

Nature-based solutions

- ☐ Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development, and where the flood mitigation benefits will be achieved as a part of the same project as the property acquisition.
- ☐ Wetland restoration.
- ☐ Floodplain restoration.
- ☐ Construction of swales and settling ponds.

- ☐ Living shorelines and vegetated buffers.
- ☐ Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool, or the acquisition of developed land for future conservation.
- ☐ Dam removal.
- ☐ Stream bank restoration or stabilization.
- ☐ Restoration of floodplains to natural and beneficial function.

Other Projects

- ☐ Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.
- ☐ Dam restoration.
Beneficial reuse of dredge materials for flood mitigation purposes
- ☐ Removal or relocation of structures from flood-prone areas where the land will not be returned to open space.
- ☐ Structural floodwalls, levees, berms, flood gates, structural conveyances.
- ☐ Storm water system upgrades.
- ☐ Medium and large-scale Low Impact Development (LID) in urban areas.
- ☐ Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development, and where the flood mitigation benefits will not be achieved as a part of the same project as the property acquisition.
- ☐ Other project identified in a DCR-approved Resilience Plan.

Location of Project or Activity (Include Maps): Town of Wise

NFIP Community Identification Number (CID#): 510179

Is Project Located In an NFIP Participating Community? ☒ Yes ☐ No

Is Project Located in a Special Flood Hazard Area? ☐ Yes ☒ No

Flood Zone(s) (If Applicable): _____

Flood Insurance Rate Map Number(s) (If Applicable): _____

Total Cost of Project: \$ 30,000.⁰⁰

Total Amount Requested \$ 27,000.⁰⁰

Amount Requested as Grant \$ 27,000.⁰⁰

Amount Requested as Project Loan (Long-Term, not including short-term loans for up-front costs)

RVRF Loan Amount Requested as Project Match (Not including short-term loans for up-front costs)

Amount Requested as Short-Term loan for Up-Front Costs (not to exceed 20% of amount requested as Grant) _____

For projects, planning, capacity building, and studies in low-income geographic areas: Are you requesting that match be waived? ☒ Yes ☐ No

SCOPE OF WORK NARRATIVE

NEED

The Town of Wise, located in the heart of Wise County, Virginia, is highly vulnerable to frequent flooding due to its mountainous geography and outdated stormwater infrastructure. The town's development occurred before modern floodplain management practices were in place, leading to buildings and infrastructure being situated directly along flood-prone areas. The town's proximity to steep mountainous terrain causes stormwater runoff to accumulate rapidly in two major creeks, Glade Creek and Yellow Creek, which traverse the town. These creeks, along with the tributary to Yellow Creek, are the primary sources of flooding, especially during significant rainfall events. Past mining activities have also contributed to drainage issues, increasing runoff and further overwhelming the creeks.



Map 1: Town of Wise Municipal Boundaries

The current drainage structures and culverts are inadequate, unable to manage the runoff from heavy rain events. This has resulted in repeated flooding throughout residential areas and the central business district. An example of flooding



Photo 1: L.F. Addington School Bus Bridge Damage (2013)

impacts can be seen at the intersection of Railroad Avenue, School Avenue, Yellow Creek Road, and Vassar Street, where a bridge located nearby on school property used by school buses collapsed during a flood event. In the case of an extreme flooding event, if this intersection were to become impassable, there would be no means of evacuation via motor vehicle for approximately 85 households. Property owned by the Town of Wise Public Works Department, traffic circulation, and bus routes for Wise Primary School and L.F. Addington Middle School would also be severely impacted.

Sediment buildup and bank erosion along the creek further contribute to the issue, causing water to frequently overflow the banks and flood surrounding areas. Recent weather patterns, including more frequent and intense precipitation, combined with over 52 inches of annual snowfall, contribute to regular flooding. The Town of Wise receives the highest amount of annual snowfall of any locality in Virginia, which poses a significant risk to flooding, especially when combined with unseasonably warm weather or additional rainfall after a major snow event.

Despite previous efforts to acquire and demolish properties in the floodplain through Hazard Mitigation Grant Program projects, most properties along Gade Creek and Yellow Creek remain privately owned, limiting the town's ability to perform critical maintenance. The Town of Wise has faced approximately 15 federally declared disaster events since 1977 due to precipitation, most recently in October 2024 resulting from the impact of Hurricane Helene in late September 2024. The town is in urgent need of enhanced floodplain management capabilities to effectively mitigate these recurring risks. Without this project, the town's ability to address flooding will remain limited, leading to ongoing threats to public safety, property, and critical infrastructure.



Photo 2: Yellow Creek Road Power out, Flooding (2017)



Photo 3: Flood Waters Between I. F. Adair High Middle School and Wise Primary School (2022)

This project seeks to enhance the Town of Wise's capacity to manage flood risks by certifying a staff member as a Certified Floodplain Manager (CFM) and developing a Flood Resiliency Plan. These efforts will align with existing planning documents, such as the LENOXSCO Hazard Mitigation Plan, the Town of Wise Comprehensive Plan, and the Wise County Comprehensive Plan, all of which emphasize sustainable development, flood mitigation, and resilience against climate impacts.

DEMOGRAPHIC INFORMATION



Photo 4: Town of Wise Census Profile (2024)

OVERVIEW

DEMOGRAPHICS AND ECONOMIC CHANGES

The Town of Wise has experienced significant shifts tied to the decline of the coal industry, which historically shaped the local economy and demographics. This decline has led to outmigration, population loss, and an aging demographic. The town's current population stands at around 2,971, with a broader trade area encompassing over 60,000 residents. Despite the economic challenges, the presence of the University of Virginia's College at Wise (UVA Wise) remains a major stabilizing force, significantly influencing the town's youthful demographic composition and offering opportunities for growth through educational services.

HOUSING AND ECONOMIC CHALLENGES

Housing remains a critical issue in Wise. The existing stock consists primarily of single-family homes, many of which are older. There is minimal new construction, and the town lacks adequate rental and affordable housing options. Approximately 31% of renters and 11% of homeowners in Wise are cost-burdened, meaning they spend a significant portion of their income on housing. The scarcity of affordable housing impedes economic development, as both local businesses and UVA Wise face challenges in recruiting employees and students due to limited suitable housing options.

ECONOMIC DRIVERS AND OPPORTUNITIES

UVA Wise is identified as the town's primary economic engine, along with government services and local businesses, including retail and tourism. The town's strategic location as the county seat and a regional commerce hub positions it to serve a larger population from surrounding areas. Despite economic difficulties, there is growing interest in entrepreneurship, tourism, and outdoor recreation. Wise has the potential to leverage these assets, particularly with improvements in infrastructure and downtown revitalization projects.

FLOODING IMPACTS ON POPULATION

Flooding issues in the Town of Wise significantly impact the population, especially vulnerable groups, such as low-income residents, the elderly, and renters, who may have limited resources to adapt or recover from flood events. The town's demographic profile, which includes an aging population and a high proportion of cost-burdened renters and homeowners, highlights the urgency of addressing these flooding challenges.

SOCIAL EQUITY ANALYSIS

Flooding disproportionately affects marginalized populations, amplifying pre-existing social and economic vulnerabilities. In Wise, lower-income households and those living in older housing stock are at greater risk, as these homes are less likely to have been built with modern flood-resistant features. This creates a cycle where economically disadvantaged

residents experience more severe impacts from flooding, such as property damage, displacement, and higher costs for repairs—burdens that they are often unable to bear. C&C Mobile Home Park in the Town of Wise, for example, is partially located in the floodplain and floodway. There's only one entrance to C&C MHP, which includes a privately-owned bridge crossing Glade Creek.

By targeting these vulnerable groups through a Flood Resilience Plan, Wise can directly address social equity issues. Including proactive measures in the plan, such as pursuing Community Rating System (CRS) designation and providing community education on flood risks, can reduce the disproportionate impact on these populations, creating a safer and more equitable environment for all residents.



Photo 5: Flooding in C&C Mobile Home Park (2011)

DEVELOPING A FLOOD RESILIENCE PLAN

Implementing a comprehensive Flood Resilience Plan is a crucial step toward reducing flood risks and enhancing overall community well-being. This plan will include recommendations for updating infrastructure, such as stormwater management systems, mitigating flood risks, and updating the existing floodplain ordinances. The plan will also consider the benefits of pursuing CRS designation, and the staff capacity required to administer the CRS program. The plan will also prioritize accessible communication and emergency planning tailored to reach and assist vulnerable residents who may not have the resources or mobility to react swiftly during a flood.

TRAINING A CERTIFIED FLOODPLAIN MANAGER (CFM)

The Town of Wise does not have the financial capacity to hire additional staff dedicated to floodplain management. Considering this, training an existing staff member to become a Certified Floodplain Manager (CFM) is an important strategy for Wise. A CFM would possess the expertise to manage the town's floodplain more effectively, ensuring that development aligns with best practices for flood risk reduction. This role is pivotal in securing grants and resources from federal and state agencies, providing the town with additional funds to implement flood mitigation measures.

OVERALL IMPACT

By developing a Flood Resilience Plan and Training a CFM, Wise can take a proactive approach to reduce flooding impacts, address social inequities, and enhance overall quality of life. These measures will protect not only the town's infrastructure and economy but also support its most vulnerable populations, creating a safer and more resilient community.

GOALS AND OBJECTIVES

The goals of this project focus on capacity building and planning for long-term flood mitigation.

- **Goal 1:** Train a town staff member to become a Certified Floodplain Manager (CFM), providing the Town of Wise with internal expertise to oversee floodplain management.
 - a. Objective: Complete the CFM certification within 12 months, enabling the staff member to effectively implement zoning and floodplain regulations, enforce floodplain regulations and ordinances, and recommend implementation of mitigation projects outlined in the Town of Wise Flood Resiliency Plan.
- **Goal 2:** Develop a Flood Resiliency Plan.
 - a. Objective: Work with a consultant to draft the plan, which will evaluate historical data, existing conditions, and future conditions, and incorporates flood resilience goals and objectives. The plan will prioritize areas for stormwater infrastructure improvements and property acquisitions, while addressing vulnerable populations and underserved areas.

This project directly aligns with both the Town of Wise Comprehensive Plan, which emphasizes flood control and sustainable land use, and the Wise County Comprehensive Plan, which seeks to protect natural resources and support development that avoids flood-prone areas.

WORK PLAN

Major Activities:

1. **Floodplain Manager Certification:** The Department of Planning and Zoning will oversee the certification of one employee, Town Planner/Zoning Administrator Reagan Wash, as a CFM. This staff member will then be responsible for administering the Town of Wise Floodplain Management Program to regulate development in flood-prone areas. She will also be responsible for identifying flood mitigation projects, creating educational programming for the public on flood resiliency, and utilizing the flood resiliency plan to update the Town of Wise Comprehensive plan.
2. **Flood Resiliency Plan Development:**
 - a. Phase 1: Assessment and Data Collection: The Planning and Zoning Department will work with the consultant to evaluate historical and existing conditions, assess existing stormwater infrastructure, and identify areas most at risk of flooding, including areas outside the Special Flood Hazard Areas.
 - b. Phase 2: Plan Development: The Flood Resiliency Plan will be created according to DCR's Resilience Plan Requirements.
 - c. Stakeholder Engagement: Engage residents, business owners, and neighboring jurisdictions to gather input on proposed solutions and to hear their first-hand experience with flooding in the Town of Wise. Stakeholder engagement will occur throughout both phases of plan development.

Responsible Parties:

- **Town of Wise Department of Planning and Zoning:** The department will lead the project, working closely with the consultant to develop the Flood Resiliency Plan.
- **Consultant:** A hired expert will guide the creation of the Flood Resiliency Plan, ensuring that it aligns with both local and regional planning documents. The Lane Group has been procured by the Town of Wise to assist with the development of the Flood Resiliency Plan.
- **Stakeholder Advisory Committee:** A committee will be established that consists of local stakeholders and experts in environmental science. This committee will meet regularly during plan development and aid town staff and the consultant in conducting research, reviewing plan drafts, and promoting educational opportunities to their respective groups/organizations and to the community in general.

Timeframe:

- Floodplain Manager Certification: 12 months.
- Flood Resiliency Plan Development: 18 months, with phases for assessment/data collection and plan development. Due to the impacts of Hurricane Helene, it is anticipated that the development of the Flood Resiliency Plan will take more time than is usual. Ideally, the plan would be developed within a year of the award announcement, but planning for 18 months will provide a buffer if delays are encountered.

MAINTENANCE PLAN

The Town of Wise will establish a long-term maintenance plan for the adopted Flood Resiliency Plan, including regular inspections and maintenance of stormwater systems, creek beds, and flood-prone infrastructure to inform Flood Resiliency Plan updates. The Town of Wise Floodplain Administrator will ensure that future developments meet resilience standards and standards required by the Town of Wise floodplain ordinance, minimizing additional flood risks.

By aligning with the Town of Wise Comprehensive Plan and the Wise County Comprehensive Plan, the Town of Wise Flood Resiliency Plan will provide a framework for planning policies that promote sustainable land use and minimize or prevent development in high-risk flood areas.

Evaluation and Indicators of Success:

- Indicator 1: Successful certification of the Floodplain Manager within the project timeline.
- Indicator 2: Completion and adoption of the Town of Wise Flood Resiliency Plan.
- Indicator 3: Measurable reduction in flood-related damage through infrastructure improvements and enforcement of updated policies and ordinances.
- Indicator 4: Increased awareness in the community on flood resilience, available resources, and general knowledge on floodplain management.

The effectiveness of the Town of Wise Flood Resiliency Plan will be evaluated through annual reviews, comparing flood event data pre- and post-implementation. The project will also be benchmarked against the flood mitigation goals set forth in the LRSOW SCO Hazard Mitigation Plan and the Wise County Comprehensive Plan, ensuring regional alignment. Changes to the plan, if needed, will be recommended to the Wise Town Council by the Planning Commission for adoption.

Appendix B: Budget Narrative Template

Applicant: <u>Town of Wise, VA</u> Name: <u>Community Flood Preparedness Fund & Resilient Virginia Revolving Loan Fund</u> Detailed Budget Narrative Period of Performance: <u>Date of Award</u> through <u>18 months</u> Submission Date: <u>1/24/2025</u>									
Grand Total State Funding Request									\$ 27,000
Grand Total Local Share of Project									\$ 3,000
Federal Funding (if applicable)									\$
Project Grand Total									\$ 30,000
Locality Cost Match									% 10
Financed By Cost Type	Personnel	Admin	Travel	Equipment	Supplies	Contracts	Indirect Costs	Other Costs	Total
Federal Share (if applicable)									
Local Share						2,911.00		89.00	3,000.00
State Share - CFFP Grant						26,199.00		801.00	27,000.00
State Share - 0% Match Loan									
Pre-Award/Startup									
Maintenance									
Total	\$	\$	\$	\$	\$	\$ 29,110.00	\$	\$ 890.00	\$ 30,000.00

BUDGET NARRATIVE

Estimated Total Project Cost: \$30,000.00

Budget Breakdown:

1. Consultant Services for Flood Resiliency Plan Development

- a. **Cost:** \$29,110.00
- b. **Amount Requested from CFPP:** \$26,199.00
- c. **10% Local Match:** \$2,911.00
- d. **Description:** The Town of Wise will contract with an external consultant (The Lane Group) to develop a comprehensive Flood Resiliency Plan. The consultant brings necessary expertise in flood resilience, which is crucial for the development of a plan that meets local and state requirements and aligns with regional goals.

2. Certified Floodplain Manager (CFM) Certification and Dues

- a. **Cost:** \$890.00
- b. **Amount Requested from CFPP:** \$801.00
- c. **10% Local Match:** \$89.00
- d. **Description:** This funding will cover the costs associated with the certification of a Town of Wise staff member as a Certified Floodplain Manager (CFM). This includes examination fees and three years of dues to both the Association of State Floodplain Managers and the Virginia Floodplain Managers Association. The CFM certification and membership to both organizations will build local capacity, allowing the Town of Wise to manage flood risks more effectively. Upskilling existing staff ensures that the Town of Wise can sustainably manage its floodplains and implement informed policies that mitigate flood risks.

Item	Total Cost	CFPP Request	Local Match	Notes
Consultant	\$29,110.00	\$26,199.00	\$2,911.00	The Lane Group
CFM Exam Fee	\$185.00	\$166.50	\$18.50	
ASFPMA Dues	\$540.00	\$486.00	\$54.00	3 years
VFMA Dues	\$165.00	\$148.50	\$16.50	3 years

Match Waiver Request:

The Town of Wise respectfully requests a waiver of the 10% match requirement for the following reasons:

1. **Project Cost Under \$50,000.00:** As outlined in the guidelines, projects with total costs under \$50,000.00 may request a match waiver. This project, with a total cost of \$30,000.00, qualifies for this waiver consideration.
2. **Low Median Household Income:** The Town of Wise has a median household income of \$42,944.00, which is 49% of the median for Virginia, of \$87,249.00 (2022 U.S. Census). This substantial income gap highlights the economic challenges faced by the town's residents and further justifies the need for financial support without requiring a local match.

3. **Opportunity Zone Designation:** The Town of Wise is located within a designated Opportunity Zone. Opportunity Zones are designed to spur economic development in low-income communities by providing tax incentives to encourage long-term investment. This designation further supports the town's case for a match waiver, as the project will directly contribute to the town's resilience and sustainability by improving local planning capacity in an economically disadvantaged area.
4. **Distressed Counties in Appalachia:** The Appalachian Regional Commission (ARC) classifies each county within its footprint based on an analysis of how counties perform compared to national averages. This index based classification system considers three-year average unemployment rates, per capita market income, and poverty rates. Wise County, within which the Town of Wise is located, is one of four counties in Virginia considered to be Distressed. Distressed counties are the most economically depressed counties as they rank in the worst 10 percent of the nation's counties.

Additional Notes:

While the Town of Wise is requesting a waiver, it is understood that this waiver may not be granted, therefore the Town of Wise is committed to providing the 10% match in order to see this plan come to fruition.

When the budget was initially being calculated, estimates for sending a Town of Wise staff member to the Emergency Management Institute for the "E0273 Managing Floodplain Development through the NFIP" had been included in the budget. After Hurricane Helene, DCR, in partnership with the University of Virginia's College at Wise, were able to host a local "G-273 Managing Floodplain Development through the NFIP" in Abingdon, VA from January 13-16, 2025. The staff member from the Town of Wise that will be taking the CFM exam participated in this training. The budget narrative and breakdown have been changed to reallocate the training and travel expenses for the E0273 course to the estimated cost of hiring a consultant. This was done because the training in Abingdon removed the need to attend E0273 as well as there being no time to get a revised resolution from Wise Town Council for a lower grant request.

RESOLUTION NO. 28, 2024

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF WISE, VIRGINIA AUTHORIZING
THE SUBMITTAL OF A GRANT APPLICATION TO THE VIRGINIA DEPARTMENT OF
CONSERVATION AND RECREATION FOR A VIRGINIA COMMUNITY FLOOD PREPAREDNESS
FUND GRANT

WHEREAS, the Town of Wise has experienced challenges in the past with flooding; and

WHEREAS, the Town of Wise desires to apply to the Virginia Department of Conservation and Recreation for a Virginia Community Flood Preparedness Fund grant to develop a resiliency plan and obtain floodplain management training for an estimated cost of \$30,000.00; and

WHEREAS, the Virginia Community Flood Preparedness Fund grant program requires a 10 percent match for localities located within Low-income Geographic Areas; and

NOW, THEREFORE BE IT RESOLVED, that the Wise Town Council authorizes the submission of the grant application and agrees to provide a 10 percent match of the total awarded amount up to \$3,000.00; and

BE IT FURTHER RESOLVED, that the Town Manager of the Town of Wise is hereby authorized to sign any and all documents concerning this application.

VOTING "AYE": Teresa Adkins, Jeffery Dotson, Robin Dotson, Cavnor Smith, Jr.

VOTING "NAY": None

ABSENT: Ben Conway

ABSTENTIONS: None

ADOPTED AND EFFECTIVE THIS THE 22nd DAY OF OCTOBER, 2024.

TOWN OF WISE, VIRGINIA

Teresa Adkins
MAYOR

ATTEST:

Shirley F. Collins
CLERK OF COUNCIL

Appendix C: Checklist All Categories

(Benefit-cost analysis must be included if the proposed Project is over \$2 million.)

Virginia Department of Conservation and Recreation

Community Flood Preparedness Fund Grant Program

- ☐ Detailed map of the project area(s) (Projects/Studies)
- ☐ FIRMette of the project area(s) (Projects/Studies)
- ☐ Historic flood damage data and/or images (Projects/Studies)
- ☒ A link to or a copy of the current floodplain ordinance *Link provided in WebGrants application*
- ☐ Non-Fund financed maintenance and management plan for project extending a minimum of 10 years from project close
- ☒ A link to or a copy of the current comprehensive plan *Link provided in WebGrants application*
- ☒ Social vulnerability index score(s) for the project area from VFRIS SVI Layer
- ☐ If applicant is not a town, city, or county, letters of support from affected localities
- ☐ Letter of support from impacted stakeholders
- ☒ Budget Narrative
- ☐ Supporting Documentation, including the Benefit-Cost Analysis tool or narrative (for projects over \$2 million)
- ☒ Authorization to request funding from the Fund and/or RVRP Match loan from governing body or chief executive of the local government
- ☐ Signed pledge agreement from each contributing organization
- ☒ Detailed budget and narrative for all costs

Appendix D: Scoring Criteria

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

SCORING CRITERIA PER CATEGORY

Projects

Eligible Projects, up to 30 points.

- Acquisition (30)
- Wetland/floodplain restoration, Construction of swales and settling ponds, Living shorelines and vegetated buffers, Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia's* "Floodplain and Flooding Resilience" layer or a similar data driven analytic tool, Dam removal, Stream bank restoration or stabilization, Restoration of floodplains to natural and beneficial function. (25)
- Other nature-based approach (20)
- Hybrid approach resulting in nature-based solution (15)
- All other projects (10)

Social Vulnerability Index Score, up to 10 points.

- Very High Social Vulnerability (More than 1.5) (10)
- High Social Vulnerability (1.0 to 1.5) (8)
- Moderate Social Vulnerability (0.0 to 1.0) (5)
- Low Social Vulnerability (-1.0 to 0.0) (0)
- Very Low Social Vulnerability (Less than -1.0) (0)

Community scale of benefits, up to 30 points.

- More than one census block (30)
- 50-100% of census block (25)
- 25-49% of census block (20)
- Less than 25% of census block (0)

Expected lifespan of project, up to 10 points.

- 10 -14 Years (3)
- 15 - 20 Years (5)
- Over 20 Years (10)

Remedy for NFIP probation or suspension (yes 5, no 0)

Proposed project part of a low-income geographic area (yes 10, no 0)

Proposed project implements a Chesapeake Bay TMDL BMP (yes 5, no 0)

SCORING CRITERIA PER CATEGORY

Studies

Revising floodplain ordinances to maintain compliance with the NFIP or to incorporate higher standards that may reduce the risk of flood damage, 30 points.

Creating tools or applications to identify, aggregate, or display information on flood risk or

creating a crowd-sourced mapping platform that gathers data points about real-time flooding. This could include a locally or regionally based web-based mapping product that allows local residents to better understand their flood risk, *25 points*.

Conducting hydrologic and hydraulic studies of floodplains. Applicants who create new maps must apply for a Letter of Map Change through the Federal Emergency Management Agency (FEMA), *15 points*.

Studies and Data Collection of Statewide and Regional Significance. Funding of studies of statewide and regional significance and proposals will be considered for the studies listed below, *Up to 45 points*.

- Updating precipitation data and IDF information (rain intensity, duration, frequency estimates) including such data at a sub-state or regional scale on a periodic basis. *(45)*
- Regional relative sea level rise projections for use in determining future impacts. *(45)*
- Vulnerability analysis either statewide or regionally to state transportation, water supply, water treatment, impounding structures, or other significant and vital infrastructure from flooding. *(45)*
- Flash flood studies and modeling in riverine regions of the state. *(45)*
- Statewide or regional stream gauge monitoring to include expansion of existing gauge networks. *(45)*
- New or updated delineations of areas of recurrent flooding, stormwater flooding, and storm surge vulnerability in coastal areas that include projections for future conditions based on sea level rise, more intense rainfall events, or other relevant flood risk factors. *(45)*
- Regional flood studies in riverine communities that may include watershed scale evaluation, updated estimates of rainfall intensity, or other information. *(45)*
- Regional hydrologic and hydraulic studies of floodplains. *(45)*
- Studies of potential land use strategies that could be implemented by a local government to reduce or mitigate damage from coastal or riverine flooding. *(40)*
- Other proposals that will significantly improve protection from flooding on a statewide or regional basis *(35)*

Social Vulnerability Index Score, up to 10 points.

- Very High Social Vulnerability (More than 1.5) *(10)*
- High Social Vulnerability (1.0 to 1.5) *(8)*
- Moderate Social Vulnerability (0.0 to 1.0) *(5)*
- Low Social Vulnerability (-1.0 to 0.0) *(0)*
- Very Low Social Vulnerability (Less than -1.0) *(0)*

Remedy for NFIP probation or suspension *(yes 5, no 0)*

Proposed project part of a low-income geographic area *(yes 10, no 0)*

Proposed project implements a Chesapeake Bay TMDL BMP *(yes 5, no 0)*

SCORING CRITERIA PER CATEGORY

Capacity Building and Planning

Eligible Capacity Building and Planning Activities. Up to 100 points.

Development of a new resilience plan *(95)*

Revisions to existing resilience plans and integration of comprehensive and hazard

mitigation plans (60)

Resource assessments, planning, strategies, and development (40)

Policy management and/or development (35)

Stakeholder engagement and strategies (35)

Goal planning, implementation, and evaluation (25)

Long term maintenance strategy (25)

Other proposals that will significantly improve protection from flooding on a statewide or regional basis approved by the Department (15)

Social Vulnerability Index Score, up to 10 points.

- Very High Social Vulnerability (More than 1.5) (10)
- High Social Vulnerability (1.0 to 1.5) (8)
- Moderate Social Vulnerability (0.0 to 1.0) (5)
- Low Social Vulnerability (-1.0 to 0.0) (0)
- Very Low Social Vulnerability (Less than -1.0) (0)

Community scale of benefits, up to 30 points.

- More than one census block (30)
- 50-100% of census block (25)
- 25-49% of census block (20)
- Less than 25% of census block (0)

Remedy for NFIP probation or suspension (yes 5, no 0)

Proposed project part of a low-income geographic area (yes 5, no 0)

2022 COMPREHENSIVE PLAN

OF

THE TOWN OF WISE, VIRGINIA

**Prepared for the Town Council of the Town of Wise, Virginia by
the Town of Wise Planning Commission, LENOWISCO
Planning District Commission, and with Input
From Virginia Department of Transportation**

TOWN OF WISE COUNCILMEMBERS

Teresa Adkins, Mayor

Ben Conway, Vice-Mayor

Caynor Smith, Jr.

Jeffery Dotson

Robin Dotson

Leonard Rogers, Town Attorney

TOWN OF WISE PLANNING COMMISSION MEMBERS

Greg Widener, Chairman

Duane Phillips, Vice-Chairman

Teresa Adkins

Mike Clisso

Kelly Sorah

Reagan Walsh, Town Planner

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Mapping:

- Zoning
- Future Land Use and Transportation
- Existing Land Use
- Existing and Proposed Community Facilities
- Existing and Future Outdoor Recreation
- Existing Water Distribution System
- Existing Sewer System

INTRODUCTION

A. History

The area now considered to be the Town of Wise was originally referred to as the Big Glades and incorporated as the Town of Gladeville because of the open expanse of land stretching from the center of town to the area of Glade Creek. When Wise County was formed in 1856, Gladeville was the principal town of the County with a population of 250 persons. To avoid confusion with another post office of the same name in West Virginia, the name "Gladeville" was changed to Wise Court House in May 1858, and then was shortened to "Wise" in 1895.

Settlement in this area was slow due to a lack of fertile soil for agriculture, Indian raids, and access problems caused by the mountainous terrain. Initial interest in settling Wise County was spurred by the discovery of iron ore and coal in the late 1870s. Developers purchased nearly all coal producing lands by 1880. A "boom" period followed in 1890 with the advent of the railroads to transport lumber, coal, and iron ore to eastern and southern markets. The County and its seat of government at Wise flourished from 1890 to 1910, with the County population expanding from 9,345 persons to 34,162 during this twenty-year period; an increase of 266 percent. Coal production peaked in 1926 with the mining of 6.5 million tons of coal and the employment of 6,500 men. Lumbering operations declined and iron ore production ceased, leaving coal as the basis of the County's economy. During the 1950s, the use of diesel fuel on the railroads and the decreased use of coal for home heating began the boom-bust cycles for coal production, which largely affected local economies until 2012 at which time Environmental Protection Agency regulations stifled the coal economy from any growth.

(Historical perspective taken in part from History of Wise County, Virginia, Luther F. Addington, 1956 and The Wise County Comprehensive Plan, December 1988)

B. Purpose of the Plan

In accordance with section 15.2.2223 of the Code of Virginia, "The comprehensive plan shall be general in nature, in that it shall designate the general or approximate location, character, and extent of each feature shown on the plan and shall indicate where existing lands or facilities are proposed to be in use...Such plan, with accompanying maps, plats, charts, and descriptive matter shall show the planning commission's long range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:

"The designation of areas for various types of public and private development and use...
The designation of a system of transportation facilities...
The designation of a system of community service facilities...
The designation of historical areas and areas for urban renewal...

An official map, a capital improvement program, a subdivision ordinance, and a zoning ordinance and zoning district map."

Further, as a minimum "in the preparation of a comprehensive plan, the local commission shall survey and study...use of land, production of food and fiber, characteristics and conditions of existing development, trends of growth or changes, natural resources, population factors, employment and economic factors, existing public facilities, drainage, flood control and flood damage prevention measures, transportation facilities, the need for housing..."

Within the context of the State enabling legislation governing the preparation of a comprehensive plan, this planning document represents a resource of pertinent community data in addition to its primary function - a guide for the local growth and development of the Town of Wise.

The Comprehensive Plan is prepared for design year 2035 for the Town of Wise and surrounding urbanized areas extending at least a mile to 1-1/2 miles beyond the existing Town corporate limits. The Plan is intended to reflect the current objectives of local officials and citizens of Wise and current conditions, but will also set forth a series of long-range objectives to allow for anticipated conditions occurring within the next ten years.

C. Plan Organization

The Wise Comprehensive Plan consists of three major sections.

The first section presents a profile of the community including a brief review of related plans and activities that may have an influence on planning for the Town, physiographic and natural features, population characteristics and trends, local economy and employment data, and a housing and neighborhood analysis. The community profile serves as a basis for analysis of the physical development potential and the social and economic well-being of the Town of Wise.

The second major section of the plan presents the goals and objectives as determined by the existing land use, transportation, utilities and community facilities, and summarizes major findings of the background analysis in terms of planning factors which influence future development.

The third major section of the plan deals with specific implementation of plan recommendations throughout the zoning and subdivisions ordinances and capital improvements program.

A separate section containing mapping is included in the Comprehensive Plan following the text sections. Existing zoning, existing and future land use mapping, existing and future transportation mapping, existing water and sewer line mapping, existing and future community facilities, and existing and future recreation mapping are included.

SECTION I - PROFILE OF COMMUNITY

A. Community Facilities – Parks & Recreation

The Town of Wise Sports Complex, located on Veldon Dotson Boulevard along Airport Road, near Lonesome Pine Airport, features soccer fields, lighted baseball fields, softball Fields and a cross country trail. A new indoor batting facility was added by the Little League Baseball organization, and additional bathroom facilities were added to accommodate the growing soccer league. Central High School has recently been using the park for its cross country matches and created a cross country trail in 2012.

Arrowhead Park, located on Varner Avenue across from the Wise Primary School parking lot, has metal picnic shelters and play equipment for children as well as swings for both toddlers and children.

The Wise Municipal Pool facility is also located within Arrowhead Park and contains a heated H-shaped zero-depth entry pool equipped with two slides, a large fountain, several small fountains, and a four-lane lap pool. The municipal pool facility also contains a “kiddie pool”, concessions stand, a beach volleyball court, bath house, and ample deck space for sunbathers and non-swimmers.

Gateway Garden, located at the intersection of Norton Road and West Main Street, was constructed in 2009 and has a stone-paved plaza, metal benches for seating, a surrounding dry-stacked stone wall, seasonal perennial flowers and shrubs, and serves as the location for the annual Christmas Tree.

Big Glades Community Square, located at 309 East Main Street, is a community gathering space constructed in 2010 and provides an outdoor amphitheater with a covered stage flanked by eight covered farmers market bays, a bathroom facility, four covered picnic tables, and a self-contained recirculating water feature. The facility is surrounded by perennial landscaping which incorporates the stacked Gladeville Sandstone in columns, walls, and seating areas. The facility is ADA accessible. Concerts, outdoor movies, and other public events are held at the facility which draws folks into the heart of downtown Wise.

B. The University of Virginia’s College at Wise

The University of Virginia’s College at Wise, founded in 1954 and occupying a 396-acre campus, is the only four-year, state –supported college in far southwestern Virginia. It is also the only branch of the University of Virginia. UVA Wise is a public liberal arts college offering 33 majors, 39 minors, and 24 teaching licensures. UVA Wise also offers numerous pre-professional study tracks. The college currently competes in seven men’s sports and eight women’s sports, recently adding track and field for both men and women. UVA Wise is accredited by the Southern Association of Colleges and Schools’ Commission on Colleges (SACSCOC). The college is also currently a member of the South Atlantic Conference and an active member of NCAA Division II. The current

number of students enrolled is 2,021. The Board approved headcount is 2,500 and they do expect that this number may change and go upward. In 2022, the Virginia General Assembly authorized UVA Wise to offer master's degrees for the master's level of courses.

C. Shopping Centers

Wise is home to three area shopping centers. The Ridgeview Center and Wise County Plaza are located along US Route 23 featuring several large store chains and restaurants, and locally-based small businesses. The IGA Shopping Center is located in downtown Wise and features a locally-based grocery store chain, pharmacy, and several locally-owned small retail businesses. Other retail and service centers are found throughout the downtown corridor offering a diverse array of small and large businesses from which consumers can choose.

D. Woodland Drive Development

In addition to the shopping centers, Woodland Drive has been developed along US 23 and features a large home goods and construction center, several large restaurant chains, a large grocery chain, and a large automotive dealership.

E. CNW Regional Wastewater Authority

The Coeburn-Norton-Wise (CNW) Regional Wastewater Authority provides wastewater treatment for partnering towns in addition to other area communities. The authority is chartered by the state and has a permitted capacity to treat 6.5 million gallons of wastewater per day. The allotted capacity for the Town of Wise is 1.78 mgd.

F. Bear Creek Water Treatment Plant

The Town of Wise owns its own public water system with its reservoir and water treatment plant located on Bear Creek just east of the town with a production capacity of 1.5 million gallons per day. The 2012 Bear Creek reservoir project raised the level of the reservoir by five feet, thus increasing the water supply to more closely match the capacity to treat.

G. Wireless Telecommunication Providers

An increase in both wireless telecommunication providers and wireless telecommunication towers throughout not only the Town of Wise, but the entire county, allows the residents in the Town of Wise the option to use wireless telecommunication, landline telecommunication, or both.

H. Related Plans and Activities

Current and future planning efforts for the Town of Wise are influenced by planning activities of neighboring jurisdictions, Wise County, and regional agencies and authorities. Planning activities which affect the future development of Wise may range from the general, comprehensive plans of neighboring jurisdictions, to the more specific site plans of industrial or commercial developments. A brief review of related planning efforts and activities that may affect recommendations contained in the Town of Wise Comprehensive Plan are outlined as follows.

1) Wise County Comprehensive Plan

The current Wise County Comprehensive Plan was prepared by the Wise County Planning Commission, with assistance from the LENOWISCO Planning District Commission, and was adopted by the County Board of Supervisors in May of 2018. County-wide statistics on physical characteristics, natural resources, the economy and population, land use and land use suitable, housing, public water and sewer, community facilities, and transportation form a basis for goals and objectives. These goals for development in the County, including its incorporated towns, provide a foundation for specific comprehensive plan recommendations.

The goals set forth by the current Wise County Comprehensive Plan for the Town of Wise include:

- a. Enhancement of the natural setting of the Town of Wise, and to promote a greater awareness of the natural beauty and positive attributes of the area.
- b. Encouraging harmonious and wise use of land through future development decisions.
- c. Promoting feasible solutions to relieve current traffic problems and support specific land use objectives.
- d. Providing opportunities to increase the supply, and to improve the quality and affordability of housing for Town of Wise residents.
- e. Expansions of present utility systems to serve both present and future needs of the Wise area population.
- f. Provide community facilities commensurate with the needs of the present and future population.
- g. Make effective use of implementation tools provided to the Town of Wise to carry out plan goals and objectives.

2) City of Norton Comprehensive Plan

The City of Norton, the Town of Wise's closest neighbor to the west, adopted a Comprehensive Plan in 1983 which was reviewed and updated March 13, 2003. It contains several considerations and recommendations pertinent to the future growth of the Town of Wise that include:

- a. The need for a cooperative understanding between the Town of Wise and City of Norton with regard to the land area located between Wise and Norton. One option worthy of consideration for both jurisdictions is consolidation.
- b. The call for utility problems of circa 1980 (i.e., secondary sewage treatment and adequate water supply and distribution) to be resolved on a regional basis, involving the Town of Wise and Wise County, with improvements implemented well before the turn of the century.
- c. A suggestion that an intergovernmental effort be made with the County and Town of Wise to promote development of a major industrial complex served by both four-lane divided highways and railroad spurs near the interchange of US23 and US 58-A, and to promote regional cooperation in the control of roadside development along major arteries such as US Route 58 Alternate and US23 Bypass.
- d. A recommendation to consolidate the separate sewage disposal systems of the City and Town into an enlarged and modernized regional system, which would be upgraded to include secondary treatment of effluent.

3) LENOWISCO Regional Planning District Commission

LENOWISCO was established as the first of 22 planning district commissions in the Commonwealth of Virginia in 1969 and serves the Counties of Lee, Scott, Wise, and the City of Norton. Its primary purpose is to promote the orderly and efficient development of the physical, social, and economic elements of the district by coordinating, planning, and assisting the localities that make up the district. LENOWISCO's Board of Directors consists of 15 members appointed by Lee, Wise, and Scott Counties and the City of Norton. LENOWISCO serves as the communicator between local governments and federal and state agencies.

LENOWISCO is federally recognized by the Appalachian Regional Commission (ARC) as an ARC Local Development District and by the Economic Development Administration as an Economic Development District. LENOWISCO is also heavily involved in local infrastructure planning and development.

One of the primary duties of the LENOWISCO Planning District Commission is the preparation and adoption of various regional strategic plans to include the Comprehensive Economic Development Strategy and the Regional Hazard Mitigation Plan. LENOWISCO also provides grant writing, grant management, and Geographic Information Services (GIS) assistance to the localities in the district.

4) Regional Water and Sewer Service

Under the direction of LENOWISCO, the Wise County Public Service Authority, the City of Norton, and each of the towns in Wise County prepared a regional water study in November 1998. This study looked at the best operational methods for water and sewer transmission and treatment to serve the entire county/city and provide growth opportunities.

Coeburn-Norton-Wise Regional Wastewater Authority provides wastewater treatment for the Town, along with other localities, and has a permitted capacity to treat 6.5 million gallons of wastewater per day. Bear Creek Reservoir, located just off State Route 646 at State Route 829, is the town's water source.

5) Commonwealth Transportation Board (CTB) and the Six-Year Improvement Plan

The Commonwealth Transportation Board created a vision for multimodal transportation across the Commonwealth of Virginia. This vision is outlined in Virginia's Transportation Plan, VTrans. The CTB in conjunction with other state agencies develops VTrans to identify transportation needs which can be addressed by infrastructure improvement projects, transportation strategies, creation of new policies, or modification of existing policies. This Comprehensive Plan for the Town of Wise was developed with input from the Virginia Department of Transportation.

As the Town of Wise develops transportation-related projects, consideration must be made with regard to specific needs addressed by VTrans. This is crucial to ensuring that the town's transportation goals align with those of the CTB, which enables the town to receive funding assistance for these projects. Projects proposed by the town are screened by the CTB, which are then prioritized based on alignment with VTrans needs. VTrans was last updated in 2020 and identifies issues that need to be addressed over a 10-year period (Mid-term Needs) as well as develops long term planning strategies.

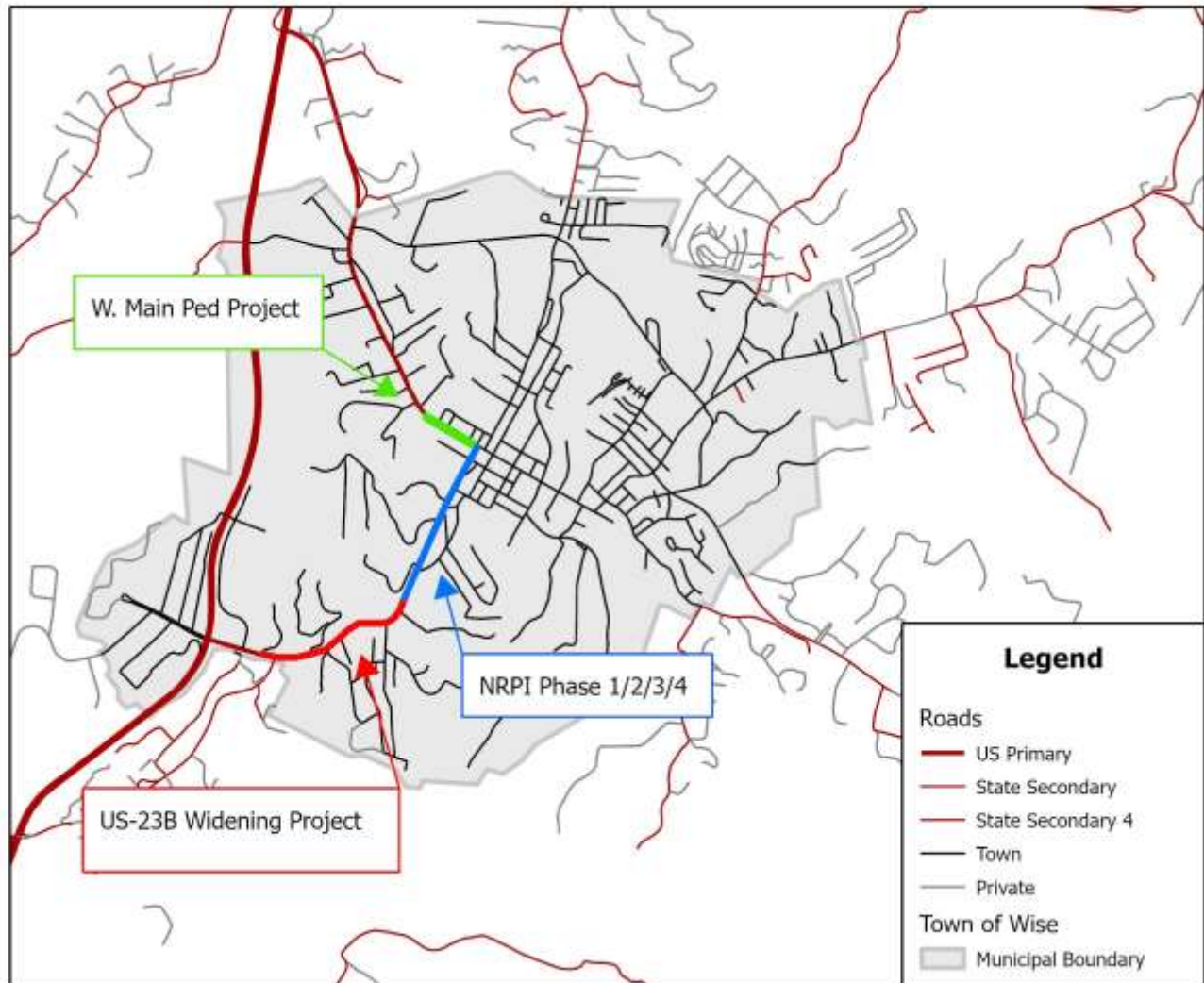
The CTB through coordination with the Virginia Department of Transportation (VDOT) oversees a Six-Year Improvement Program which outlines anticipated projects across the Commonwealth. This program is updated yearly. The Town of Wise currently has five active projects listed with the program. Project names and cost estimates are listed below.

1. **Norton Road Pedestrian Improvement Project Phase 1 - \$1,047,000**
 - a. VTrans Need: Pedestrian Safety, Pedestrian Access to Activity Centers
2. **Norton Road Pedestrian Improvement Project Phase 2 and 3 - \$895,000**
 - a. VTrans Need: Pedestrian Safety, Pedestrian Access to Activity Centers
3. **Norton Road Pedestrian Improvement Project Phase 4 - \$584,000**
 - a. VTrans Need: Pedestrian Safety, Pedestrian Access to Activity Centers
4. **Widen Business Route 23 to Four Lanes - \$10,444,000**
 - a. VTrans Need: Congestion Mitigation, Roadway Safety

5. **West Main Street Pedestrian Improvement Project - \$1,269,930**

a. VTrans Need: Pedestrian Safety, Pedestrian Access to Activity Centers

Map 1: Town of Wise Six-Year Improvement Program Projects



I. Environmental Characteristics

The physical characteristics of an area - topography, drainage and flooding conditions, soil types, location of large areas of forests/vegetation, and mine reclamation areas - work together to influence the future development of Wise and the surrounding area. Typical of the southwest Virginia region in which Wise is located, many of these physical features restrict development and require special protection to be preserved as unique elements which contribute to the Town's setting in the region.

1) Physiography

The Town of Wise and most of Wise County is located in the Cumberland Mountain section of the Appalachian Plateau physiographic province. The Town lies 2450 feet above sea level and is the highest point of population in the County. Indian Mountain (Elev. 2600 MSL) rises to the north and Guest Mountain (Elev. 2900 MSL), immediately south of town. Approximately one-half of the land area in Town is within the hilly and rolling (Ridgeland) plateau, while the remaining portion of the Town lies within the steep, less deeply dissected Appalachian Plateau. The hilly and rolling Ridgeland Plateau, confined to the center of town and extending east, has been dissected only to a small extent by streams, and the plateau-like surface has remained relatively unchanged. Difference in relief ranges from a minimum of 100 feet to a maximum of 350 feet, and slopes range from two percent to 20 percent. Portions of this area are suitable for farming and urban type development. The steep, less deeply dissected plateau surrounding the town center to the north, south, and west is characterized by somewhat linear ridges and rounding knobs. The difference in relief ranges from a minimum of 200 feet to a maximum of 600 feet. Under some circumstances, portions of these areas may be suitable for development.

Approximately 50 percent of the land area within and immediately around Wise consists of slopes exceeding 20 percent, which generally precludes any large-scale development other than scattered single-family residential. Ten to fifteen percent of the land area has slopes from 10-20 percent, which can accommodate many types of urban uses with the exception of large-scale development such as industry or large commercial centers. Slopes of less than 10 percent represent 35 to 40 percent of the land area and are principally developed.

2) Geology and Soil Conditions

The Appalachian Plateau where the Town of Wise is located is characterized by generally flat-lying, relatively undisturbed, alternating beds of sandstone, shale, and coal. Mineral rights are very often not owned by the present surface dweller, or mining that is not evident from the surface may have taken place. For these reasons, settling and/or unstable bedrock are possible, and urban development should proceed cautiously. Coal reserves, under any given piece of property, should be evaluated in light of future mining that may affect the surface use of the property.

The predominant soil types in Wise and surrounding vicinity include the following:

- Coeburn silt loam, hilly phase
- Muskingum fine sandy loam, hilly phase
- Rolling stony land (Muskingum soil materials)
- Philo loam
- Muskingum stony loam, hilly phase
- Hartsells fine sandy loam, rolling phase
- Atkins loam
- Jefferson stony loam, rolling phase

There are three broad classifications of soil types in and around the Town of Wise. Those soils capable of being used for a wide range of uses from cropland development are limited to approximately 10-15 percent of the area. Soils with a mid-range capability for supporting future development are confined to those areas of moderately steep slopes (20 percent). By far the largest category (65 percent) of soils are those which are limited in their use. These soils are principally the Muskingum, which cover about three-fourths of Wise County, and are primarily forested on steep slopes. It is important to note that this largest category of soils is not suitable for development without provision of public sewer services prior to initial development, because the soils will not allow for installation of wastewater drain fields.

J. Flood Plains and Flood Prone Areas

Many of the land areas characterized by relatively level topography and soils suitable for development are also located within flood prone areas of Yellow and Glade Creeks and their tributaries. The 100-year flood plain of Yellow Creek primarily affects properties immediately south of Park Avenue and north of Vanover and Gilliam Streets. A relatively narrow floodplain (100 feet along each side of Yellow Creek tributary) indicates flooding problems for the mostly residential properties south of Hurricane Road east to the corporate line. A triangle of property formed by Old Hurricane and Hurricane Roads lies wholly within the 100-year flood plain of Yellow Creek. Flooding from Glade Creek largely affects downtown properties on both sides of Main Street between Modoc Avenue and Nottingham Street. A relatively narrow floodplain extending north following Spring Street and Birchfield Road affects a large concentration of residents located in this area. The most serious flood of record occurred during the spring of 1977 when substantial property damage was reported in the Wise area. During 2004 and 2016, the town participated in hazard mitigation grants, funding projects that allowed the town to purchase 27 properties that were located within the flood plains of either Glade Creek or Yellow Creek. The residents relocated out of harm's way, and the structures were demolished leaving grassy areas for overflow when the creeks exceed their banks during heavy rain. The town will continue to identify grant programs which will reduce the number of people and homes in harm's way along the two creeks. Newly passed legislation eliminates the need to calculate Benefit Cost Ratios for properties in the 100-year floodplains for acquisition and demolition projects. Development in the flood plain is guided by the Town's Zoning Ordinance which doesn't permit development in the

floodway. Development is permitted in 100-year and 500-year floodplain, however; this development is restricted.

K. Population Characteristics and Trends

According to the U.S. Census of Population, the incorporated Town of Wise had a population of 2,971 in 2020. This figure represents a decline of population from a 1990 population count of 3,193. The decline in population from 1990 to 2020 is not only occurring in the Town of Wise, but also in the surrounding areas. The decrease in population for 2020 is also shown in Wise County and LENOWISCO. The population of 2020 has been added for the Town of Wise, Wise County, LENOWISCO and Virginia. A comparison of the Town of Wise population trends to adjacent jurisdictions and Wise County is shown in Table 1.

TABLE 1 POPULATION TRENDS				
YEAR	TOWN OF WISE	WISE COUNTY	LENOWISCO	VIRGINIA
1990	3,193	39,573	91,520	6,187,358
1994	3,395	39,600	92,100	6,551,500
1996	3,124	39,000	90,700	6,666,200
2000	3,255	40,123	91,019	7,078,515
2010	3,286	41,452	94,174	8,001,024
2020	2,970	37,206	83,566	8,631,393

Table 2 outlines the age distribution of the population of the Town of Wise in comparison with Wise County. This distribution is taken from the Population Census information available for 2010 and 2020.

TABLE 2 POPULATION AGE DISTRIBUTION TOWN OF WISE AND WISE COUNTY				
AGE GROUP	2010 TOWN OF WISE	2010 WISE COUNTY	2020 TOWN OF WISE	2020 WISE COUNTY
19 and under	597	9,997	606	8,671
20-64	2136	25,590	1488	22,415
65 and over	553	5,865	876	7,468

Table 3 shows the population distribution by race for the Town of Wise taken from both the 2010 Census of Population and the 2020 Census of Population.

TABLE 3 POPULATION BY RACE TOWN OF WISE				
RACE	2010	%	2020	%
White	3,157	96.1	2,760	92.9
Black	33	1	68	2.3
American Indian, Eskimo, or Aleut	4	0.1	0	0
Asian or Pacific Islander	28	0.9	21	0.7
Hispanic	42	1.28	98	3.3
Other	22	0.7	24	0.8

L. Employment and Labor Force Characteristics

The largest single-industry group of employed residents in the Town of Wise and Wise County characteristically has been coal mining, but it has been on the decline. However, the trend in the last several years for Town residents has shown a dramatic increase in professional, health services, educational services, and related services. This dominance of these service industries as a place of employment for Town residents is largely due to the proximity of the University of Virginia's College at Wise, the County Health Department and Clinic, Wise County Public Schools, and the function the Town serves as the County seat. The Wise County School system is the largest single employer located in the Town.

There has been some growth in wholesale and retail trade in the Town of Wise.

Table 4 provides an overview of the Town of Wise, Wise County, and City of Norton labor force characteristics for the year 2010. Unfortunately, the 2020 information has not been released. To view the most up to date information as it is released, you can go to <https://www.census.gov/2020census>.

TABLE 4					
EMPLOYMENT BY INDUSTRY GROUP					
TOWN OF WISE/CITY OF NORTON/WISE COUNTY					
	TOWN OF WISE		CITY OF NORTON		WISE COUNTY
INDUSTRY GROUP	2010		2010		2010
Agriculture, Forestry & Fisheries, Mining	179		NF		1716
Construction	37		103		1047
Manufacturing, Non-Durable & Durable	54		165		684
Transportation, Communications, Utilities	31		228		995
Wholesale and Retail Trade	198		412		2597
Finance, Insurance, Real Estate	132		121		619
Professional, Health Services, Education					
Services and Related Services	772		732		4671
Public Administration	52		112		1081
Other Industry/Not Reported	85		83		639

1) Unemployment

Table 5 shows that rates of unemployment in Virginia and Wise County have been cyclical in nature. The unemployment rate for Wise County increased dramatically from 1990 to 1996, while the state of Virginia only endured a small increase in unemployment. The 2000 information shows a substantial decrease in unemployment for both areas. However, substantial increases occurred during the period between from the 2000-2010 Census. This distribution is taken from the Population Census information available.

TABLE 5		
UNEMPLOYMENT LEVELS		
	UNEMPLOYMENT	UNEMPLOYMENT
YEAR	RATE FOR WISE COUNTY	RATE FOR VIRGINIA
1990	8.30%	4.30%
1996	15.40%	4.50%
2000	5.00%	2.40%
2010	7.60%	7.10%
2020	7.60%	4.60%

2) Income Characteristics

Tables 6, 7, 8, and 9 illustrate income characteristics for Virginia, LENOWISCO Planning District, and Wise County. This distribution is taken from the Population Census information available from 2000, 2010, and 2021.

Table 6 compares the Average Weekly Wage for Wise County, LENOWISCO Planning District, and the state of Virginia from 2000 to 2021. All three areas saw an increase in average weekly wages.

TABLE 6			
AVERAGE WEEKLY WAGES TOTAL ALL INDUSTRIES			
YEAR	Wise County	LENOWISCO	VIRGINIA
2000	\$507	\$500	\$661
2010	\$670	\$661	\$845
2021	\$886	\$726	\$1,424

Table 7 illustrates the average Median Family Income for the Town of Wise, Wise County, LENOWISCO Planning District, and the state of Virginia, and reflects the average weekly wage increase seen in Table 6 above. The median family income increased from 2000-2020.

TABLE 7				
MEDIAN FAMILY INCOME				
YEAR	Town of Wise	Wise County	LENOWISCO	VIRGINIA
1997	NF	\$26,593	\$24,557	\$40,209
2010	\$36,875	\$34,717	\$45,229	\$63,302
2020	\$51,329	\$41,285	\$38,549	\$66,149

Table 8 presents the average Per Capita Income level for the Town of Wise, Wise County, the LENOWISCO Planning District, and the state of Virginia. The 2010 per capita income declined slightly in Wise County, but increased dramatically in the LENOWISCO Planning District area, and increased slightly in the state from 2010-2020.

TABLE 8				
PER CAPITA INCOME				
YEAR	Town of Wise	Wise County	LENOWISCO	VIRGINIA
1999	\$18,760	\$18,677	\$17,336	\$29,794
2010	NF	\$18,458	\$26,880	\$33,040
2020	\$28,684	\$21,508	\$22,861	\$34,967

Table 9 shows the percentage of the population that have an annual household income below the federally mandated Family Poverty Level for the Town of Wise, Wise County, the LENOWISCO Planning District, and the state of Virginia. The family poverty level increased by two-percent in the Town of Wise from 2010 to 2020.

TABLE 9				
FAMILY POVERTY LEVEL				
YEAR	Town of Wise	Wise County	LENOWISCO	VIRGINIA
1997	19.80%	23.10%	23.30%	11.60%
2010	10.80%	21.60%	17.80%	10.70%
2020	12.80%	19.90%	21.70%	11.20%

M. Housing and Neighborhood Analysis

The Town of Wise and the immediately surrounding areas were divided into 14 separate planning areas for study purposes. Eight of the study areas are located wholly or partially within the Town corporate limits, while six cover the outlying areas. A brief description of each planning area follows.

Stephens. Located northwest of the Town outside the corporate limits west of the US Route 23 Bypass, the community principally consists of an area within a highway loop formed by Rt. 823, Rt. 625 and Rt. 624 back to the US Route 23 Bypass. Stephens is a coal mine community centered around Glamorgan Coal operations served by a Norfolk/Southern Railroad line. Approximately 91% of all residences are single family; approximately 10 mobile homes are located on individual lots. Exterior housing conditions are generally sound, and opportunities exist for rehabilitation of several older structures which are characteristic of the early twentieth century coal mining community.

Glamorgan. North of the Town corporate limits on both sides of Business Route 23, the Glamorgan area is characterized by a mixture of strip commercial land uses oriented to the highway, and single family residential and mobile homes on scattered lots. Approximately two-thirds of the residences are single family detached, and one-third are mobile homes on single lots. It is not uncommon to find substandard housing in the area. Based on visual exterior surveys, nearly one-fourth of the units are standard while approximately 76% were found in below-average conditions. Access from Route 23 is limited to gravel drives that are frequently in diminished condition. Some of the area is overgrown and debris has gathered at a few locations.

Beckner Chapel. This planning area is also located north of the Town corporate boundaries, and consists of the land area on both sides of Route 636 (Birchfield Road). The area is primarily residential; approximately six commercial establishments are located on scattered sites along Route 636. About two-thirds of the dwelling units are single family residential and one-third are mobile home units. The majority of the mobile home units are located within a mobile home park immediately north of Country Manor Mobile Home Park inside the Town corporate limits. Camp Bethel, an active summer camp facility, is also located in the area off Route 759. Housing conditions are generally good in this area, although approximately 17% of the units were considered to be deteriorating.

Addington. Addington includes the land area within the northwestern most quadrant of the Town. The area is bisected by Addington Avenue, which runs east-west linking US Route 23 Bypass with Business Route 23 (Main Street). This area contains both single family dwellings and mobile homes, including three mobile home parks as well as several commercial buildings. Housing units are in standard condition. Strip commercial uses extend throughout the area along Route 23 from Addington Avenue to Hall Avenue. Some commercial properties along Route 23 in Addington are in less than perfect condition, and some have been converted to multi-family residential structures.

Central High School. The area surrounding the former Central High School complex is primarily residential with a mix of single family dwellings and mobile homes located in mobile home parks. Conditions of the housing units are standard and substandard.

Virginia Avenue. The Virginia Avenue study area includes the residential neighborhoods surrounding the Wise County School Board property and the Wise County Career and Technical Center east of the former Central High School property and west of Old Hurricane Road (Route 680). Almost two-thirds of the residential units in this area are mobile homes which are located within four mobile home parks. The majority of the single family and mobile home residences are in standard condition.

Hurricane Road. Hurricane Road has the greatest number of residential units of all study areas and includes the area located generally between Old Hurricane Road and Darden Drive. Multi-family units are concentrated in this area. Commonwealth Apartments, Baugh Apartments, and Gilliam Court Apartments are all located within this study area. Approximately half of the units are in standard condition while the others are substandard. A large portion of the Hurricane Road area east of Darden Drive and south of Hurricane Road within the corporate limits is occupied by reclaimed strip mine property owned by the University of Virginia's College at Wise and is reserved for future expansion of the campus.

Old Wise. The area defined as Old Wise is the center of Town consisting of all Central Business District commercial uses and immediately adjacent, older residential neighborhoods. A major portion are single family, and there are several mixed-use apartment units located above stores in commercial buildings along Main Street. The condition of housing units in the Central Business District is generally good. There are minimal units located along Main Street that are considered to be dilapidated. Commercial enterprises are primarily confined to Main Street with some concentration of offices behind the Wise County Courthouse. There is a continuing concern regarding road maintenance due to heavy truck traffic along Main Street; however, the structures are in good, sound condition. Included in the Old Wise study area are the Wise County Courthouse and the Wise Primary and Middle School complex.

Old Coeburn Road. This study area includes the property south of Darden Drive (Route 646), Old Coeburn Road, Yellow Creek Road, and Woodland Court. The principal use is residential except for the commercial uses on the east side of Park Avenue and scattered along the south end of Coeburn Road. Approximately 60% of the residential units are single family detached residences. Multi-family units including apartments, duplex units, and attached condominium units are also included in this area. Housing conditions are generally good with the majority of the units being standard. Substandard housing occurs in isolated pockets.

Wise General. The area surrounding the property once utilized by the Wise General Hospital and the Wise County Public Library consists of four residential neighborhoods. All are single family detached residences, mostly in standard condition.

Parsons Gap. The Parsons Gap study area is the southern-most region within the corporate limits, and consists mostly of older residential subdivisions with access from Route 23 Business. Commercial uses are limited. Eighty-seven percent of the residential uses are single family detached dwellings. There is one small mobile home lot and the other mobile homes are on single lots. More than 75% of the units are in standard condition with only pockets of deterioration found in certain areas.

Shopping Plaza. The area designated as the Shopping Plaza is the area to the west of US 23 and contains two shopping centers – Wise County Plaza and Ridgeview Centre, along with associated commercially developed outparcels.

Hamiltontown. The area known as Hamiltontown is made up of the acreage south of the Town corporate limits on both sides of Route 757 (Wise-Norton Road). As in the other study areas, all the commercial uses relate to the main route. Route 757 is now the main thoroughfare to both the Walmart Shopping Center and the new Central High School. The houses are primarily single family detached structures with only a couple of mobile homes on individual lots. Housing conditions are generally standard with minimal areas of deterioration.

University of Virginia's College at Wise. The presence of the 396-acre (125 acres developed) campus of the University of Virginia's College at Wise provides a very suitable eastern entrance into the community from Route 646 (Darden Drive). Commercial land uses are confined to a triangle formed by Old Coeburn Road and Route 646. Housing conditions are generally good and there are no mobile homes in this study area.

Additional Newly Developed Housing Options Outside Corporate Limits of Wise. The surrounding unincorporated area has seen an increase in a variety of housing options. There are two developed double-wide manufactured housing subdivisions – Robinette Subdivision off Birchfield Road and Mountain Meadows Subdivision off Old Hurricane Road. Another housing option with both Town water and sewer service is Bear Creek Subdivision which contains developed detached single-family dwellings. Currently, the Walk to Campus student housing complex adjacent to the eastern side of the UVA Wise campus is completed and opened in 2014. This housing complex offers students one-, two-, three- and four-bedroom rental units within walking distance of the college campus.

The following series of tables presents housing statistics for the Town of Wise, Wise County, the LENOWISCO Planning District, and the state of Virginia. Table 10 illustrates the Median Value of Housing for the before mentioned localities. This distribution is taken from the Census information available from 2000 to 2020.

TABLE 10				
MEDIAN VALUE OF HOUSING				
YEAR	Town of Wise	Wise County	LENOWISCO	VIRGINIA
2000	\$81,700	\$65,700	\$63,900	\$125,400
2010	\$126,800	\$82,400	\$83,650	\$249,700
2020	\$136,000	\$87,300	\$90,600	\$282,800

Table 11 shows the Total Housing Units for the localities of the Town of Wise, Wise County, the LENOWISCO Planning District, and the state of Virginia. This distribution is taken from the Census information available from 2000 to 2020.

TABLE 11				
TOTAL HOUSING UNITS				
YEAR	Town of Wise	Wise County	LENOWISCO	VIRGINIA
2000	1,594	17,792	42,179	2,904,192
2010	1,549	17,935	43,435	3,365,855
2020	1,496	16,638	41,178	3,562,258

Table 12 illustrates the Total Housing Units by Type for the localities of the Town of Wise, Wise County, and the state of Virginia. This distribution is taken from the Census information available from 2000 and 2010. The 2020 information is not available at this time.

TABLE 12			
HOUSING UNITS BY TYPE			
2000 YEAR/TYPE	Town of Wise	Wise County	VIRGINIA
SINGLE FAMILY UNITS	873	11,042	1,810,353
MULTI FAMILY UNITS	319	1,413	625,422
MOBILE HOMES	405	5,281	185,282
2010			
SINGLE FAMILY UNITS	963	12,131	2,452,933
MULTI FAMILY UNITS	189	1,300	725,311
MOBILE HOMES	396	4,501	186,758

Table 13 shows the Number of Housing Units Built by Year for the localities of the Town of Wise, Wise County, and the state of Virginia. This distribution is taken from the Census information available from 1990-2000 and 2000-2009. No data is available for 2009 up to date.

TABLE 13			
NUMBER OF HOUSEING UNITS BUILT BY YEAR BUILT			
YEAR	TOWN OF WISE	WISE COUNTY	VIRGINIA
1990-2000	220	3176	579,721
2000-2009	55	1733	502,630

Table 14 shows the relationship between the Town of Wise, Wise County, and the state of Virginia in terms of Average Household Size. This distribution is taken from the Census information available from 2000 to 2020.

TABLE 14			
AVERAGE HOUSEHOLD SIZE			
YEAR	TOWN OF WISE	WISE COUNTY	VIRGINIA
2000	2.17	2.44	2.54
2010	2.31	2.50	2.54
2020	2.17	2.34	2.64

N. Transportation Characteristics and Analysis

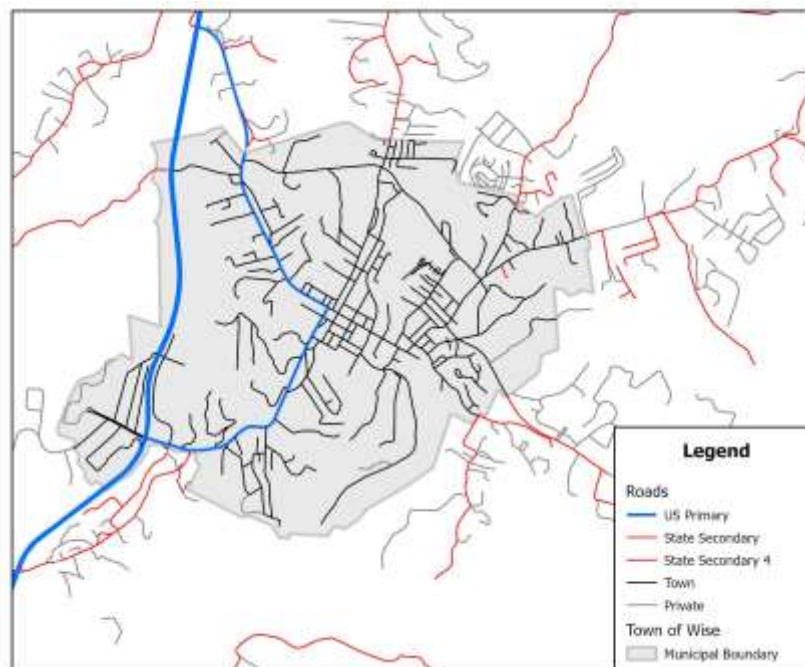
1) Streets, Roads, and Highways

The Town of Wise is served by a network of streets, roads, and one major highway. With the town being the county seat for Wise County, the town experiences higher levels of traffic volume and congestion when compared to surrounding localities. This is especially true when local public schools, to include the University of Virginia's College at Wise, are in session.

US-23, a four-lane divided highway, runs through the western portion of the town and provides access to the City of Norton, neighboring counties, Kentucky, and Tennessee. Three major shopping centers and numerous restaurants are located off of US-23 and provide services to town residents as well as travelers from across the region. US-23 is a major factor in the economic development capacity for the town as it is the primary route used by non-residents and those from out-of-state who come to the town to shop.

US-23 Business, which runs from the intersection with US-23 along Norton Road into town and continues westerly along West Main Street, is the main thoroughfare through the Town of Wise and experiences the highest volume of traffic.

Map 2: Transportation Map – Functional Classifications



Access to the town from major roads is limited and proves to be an issue during extreme weather events, large local events, and during construction. Access to town is primarily gained through Norton Road, West Main Street, and Darden Drive.

Norton Road and West Main Street both connect to US-23 and Darden Drive connects to US-58A by way of Coeburn Mountain and Tacoma Mountain Roads. During heavy snowfall events, access to town is restricted due to the slope of these roads and can be an issue for emergency responders.

Streets within and maintained by the town are in generally good condition, though improvements need to continue to be made to improve walkability and promote other means of transportation. The Town of Wise maintains all public roads within its corporate boundaries with the exception of US-23.

2) Cumberland Airport Commission - Lonesome Pine Airport

The Lonesome Pine Airport is located at 6225 Airport Road, approximately 3 miles from downtown Wise, and is owned by the Cumberland Airport Commission. The airport has one lighted runway measuring 5,280 ft. long by 100 ft. wide and has the following capacity: single wheel – 42,000 lbs, dual wheel – 55,000 lbs, dual tandem wheels – 100,000 lbs. The Lonesome Pine Airport has 12 single engine air craft, 3 multi-engine air craft, 1 jet engine aircraft, 1 helicopter, and 1 ultralight air craft. The airport is open to the public and offers pilot instruction, aircraft rental and annual surveying services. There is no air traffic control tower at the airport.

The airport received \$9.32 million in Federal Aviation Administration grants and in other federal infrastructure grants in 2022 to upgrade the runway and lighting system. Phase 1 of the project will be comprised of resurfacing the eastern half of the runway and improving the drainage system. This phase is estimated to be completed by mid-October, 2022. Phase 2 of the project is estimated to begin in the spring of 2023 and will involve resurfacing the western half of the runway and replacing the runway lighting system. Estimated completion is scheduled for early fall of 2023.

3) Public Transportation

The Town of Wise does not currently operate a system for public transportation. Mountain Empire Transit, a service provided by Mountain Empire Older Citizens, serves the citizens of Wise, Lee, Scott Counties and the City of Norton. A new program, MetGo!, was developed to provide a rideshare service for the citizens of the Town of Wise and City of Norton. MetGo! has plans to expand their service area, which will allow the residents of the Town of Wise to travel further without needing personal transportation.

A more detailed outline of the needs, goals, and recommendations for transportation can be found in Section Two of this plan. Additional transportation mapping can also be found at the end of this plan.

SECTION II - GOALS AND OBJECTIVES

The long-range goals and related short-range objectives presented below serve as the centerpiece for this planning document. Such goals and objectives build upon opportunities and problems identified through analysis of background materials, and provide guidance for the adoption of specific policies to implement plan recommendations.

A. Environmental Goals and Objectives

Goal: Enhance the natural setting of the Town; promote a greater awareness of the natural beauty and positive attributes of the area.

Objectives:

- 1) Actively promote appreciation and use of scenic and surrounding areas in the town through development of passive recreation opportunities along Yellow Creek, Glade Creek, and throughout the town.
- 2) Promote environmentally sound and aesthetically pleasing development through judicious review of proposed site and building plans in accordance with the Town Zoning and Subdivision Ordinances.
- 3) Promote inclusion of "green" areas in development plans, in conjunction with commercial development.
- 4) Encourage the general maintenance and upkeep of existing residences through the enforcement of the local housing code, as well as the ordinance on abandoned vehicles and yard maintenance.
- 5) To include environmentally friendly "green construction" options in the zoning ordinance such as grass paving for overflow parking and green roofing on buildings in the Central Business District.
- 6) A Farmers Market Facility has been established in the B-3 Central Business District. Encourage expansion of the farmer's market located at the Big Glades Amphitheater.
- 7) To encourage energy conservation methods to include solar and wind power for residential structures.

Goal: Recreational Facilities Enhancements, Improvements and Creation of Outdoor Recreation.

Objectives:

- 1) To provide a link from the Bear Creek Reservoir Trail through the Town of Wise Sports Complex to the UVA Wise Trails.
- 2) To provide a network of walking and bicycling trails throughout Wise with special emphasis on linking Yellow Creek to UVA Wise and UVA Wise to the Town of Wise Sports Complex.
- 3) To provide possible use for VDEM properties additional public parks or recreational fields.
- 4) To develop an RV park on VDEM properties.
- 5) To provide additional access to Buchanan Park Trails.

Goal: Encourage development of additional residential areas in undeveloped and underdeveloped areas.

Objectives:

- 1) Amend the Zoning Ordinance to permit mixed use (retail/residential uses) in B-1 Zoning District to include Park Avenue.
- 2) Develop property across from former JJ Kelly High School.
- 3) Develop Straughan property along US23 N to tie into existing neighborhoods.
- 4) Encourage redevelopment of existing aging and deteriorating neighborhoods throughout the Town.

B. Transportation Goals and Objectives

Goal: Promote solutions to mitigate traffic congestion and support specific land use objectives to increase roadway and pedestrian safety.

Objectives:

- 1) Coordinate ingress-egress of all development plans with future highway improvements.
- 2) Work closely with VDOT officials in planning new routes and making improvements to existing routes that will alleviate traffic congestion and vehicular conflicts in coordination with Virginia's Transportation Plan – VTrans.
- 3) Provide new access roads into appropriately zoned areas to stimulate planned potential residential and commercial development.
- 4) Develop improved routes for internal circulation within the Central Business District, which accommodate proposals for external traffic circulation, such as Varner Street and Lake Street.
- 5) Provide for commercial areas along the US-23 Corridor, with access that does not provide additional impediments to through traffic on US-23.
- 6) Provide a by-pass truck route around Wise and eliminate thru truck traffic in the Central Business District (Varner Street or Addington Avenue/Lake Street realignment).
- 7) Provide transportation alternatives such as safe, lighted sidewalks in areas where no sidewalks exist or sidewalks are deteriorated and in need of upgrade.
- 8) Connect sidewalks and improve walkability in areas that have missing links by building new sidewalks, curb and gutter, and crosswalks when needed. Areas include but are not limited to Park Avenue, Darden Drive, Hurricane Road, Lake Street, West Main Street, Norton Road, Birchfield Road, and Railroad Avenue.
- 9) Enhance pedestrian safety by implementing stamped crosswalks in areas with high pedestrian activity.

The following goals were developed by LENOWISCO with assistance from the Town of Wise in 2011, and incorporated into the 2035 Rural Long Range Transportation Plan – a vision plan that addresses the needs of the transportation system within the LENOWISCO Planning District. Because these transportation plans are living documents, some of the goals originally written for the 2035 Rural Long Range Transportation Plan have either been completed or amended to better suit the transportation needs for the Town of Wise. The goals that are still relevant today are listed below.

Short Term Goals Specific to the Town of Wise:

- 1) US-23 Business (Norton Road) from US-23 to Cherry Street – Widen roadway to four-lane urban standard.
- 2) Improve pedestrian transportation safety by completing the sidewalk system from neighborhoods to commercial areas.
- 3) Improve bicycling transportation safety by constructing bicycling lanes along major thoroughfares in Town (Main Street, Park Avenue, Darden Drive, Hurricane Road, and Lake Street).

Mid-Term Goals Specific to the Town of Wise:

- 1) Main Street at Railroad Avenue/Oakwood Avenue, SE – Apply access management and add right turn lane on eastbound approach.
- 2) Addington Avenue from US-23 to US-23 Business – Reconstruct roadway to two-lane rural standards. Align Addington Avenue with Lake Street and consider signalization based on warrant analysis at US-23/Addington Avenue thereby providing a much needed intersection safety improvement.

Long Term Goals Specific to the Town of Wise:

- 1) US23 (Orby Cantrell Highway)/US23 Business (Norton Rd) – Provide two through-lanes in each direction on minor approaches, add second left turn lane on both US23 approaches, and channelize southbound right turn to a free-flow movement.
- 2) VA646 (Darden Drive) from Park Avenue/Hurricane Road to the eastern corporation limit of Wise – Widen to urban three-lane roadway providing congestion mitigation between the Town of Wise and the University of Virginia's College at Wise.
- 3) Varner Street from Norton Road to Yellow Creek Road – Reconstruct roadway to urban two-lane standard to improve roadway safety and transit access to activity centers.

- 4) Provide an additional access bridge from East Main Street to Yellow Creek Road for residents along Yellow Creek and Woodland Court giving them an alternate transit access to activity centers.
- 5) Realign School Avenue, Yellow Creek Road, Varner Street, and Railroad Avenue to provide a true four-way intersection and bridge across Yellow Creek which will improve roadway safety and mitigate congestion due to the two adjacent public schools.

Transportation Goals Outside Corporation Limits with Direct Impacts to Town of Wise:

- 1) Construction of Innovation Highway from US-58 to the Lonesome Pine Regional Business and Technology Park which will greatly reduce traffic congestion in downtown Wise by providing an alternate route to the park.

C. Housing Goals and Objectives

Goal: Provide opportunities to increase the supply, quality, and affordability of housing for residents.

Objectives:

- 1) Encourage the construction of new single family and multi-family housing in designated areas suitable for such development through the provision of utilities and roads.
- 2) Encourage the general maintenance and upkeep of existing residences through the enforcement of local housing code, as well as the ordinance on abandoned vehicles and yard maintenance.
- 3) Provide incentives for general neighborhood improvements and individual property rehabilitation by targeting comprehensive public improvement programs in neighborhoods exhibiting the greatest need.
- 4) Adopt neighborhood revitalization programs for blighted areas.
- 5) Work with Wise County to determine whether or not some boundary adjustments can be made to increase developable land.

Goal: Encourage development of additional residential areas in undeveloped and underdeveloped areas.

Objectives:

- 1) Encourage development of vacant land in the Ridgefield area and Birchfield Road area.
- 2) Promote mixed commercial/residential uses along Lake Street.
- 3) Encourage residential development along the recently logged property situated between the former Appalachian Regional Hospital property and the Laurel Hills Subdivision along Norton Road, and property along Safenest Avenue and the Timbers Subdivision.
- 4) Encourage revitalization of older subdivisions to include mobile home parks, by eliminating blighted homes and replacing them with structurally sound and updated homes.

Goal: To encourage development of affordable housing and adequate housing opportunities for all age groups.

Objectives:

- 1) To encourage development of affordable, mid-priced housing, which is continuing to grow, along with providing quality rental properties for not only college students, but for young professionals who may not want the responsibility and liability attached with purchasing a property.
- 2) To consider the merits of retirement complexes given the diversity of age groups within the Town of Wise. It is necessary to provide adequate housing opportunities for all age groups. Additionally, the specific needs of each age group must be considered along with the types of houses in which they are interested, their financial capacity, and community needs.

D. Public Facilities Goals and Objectives

Goal: Expand and improve present utility systems to serve both present and future needs of the Town of Wise and surrounding area.

Objectives:

- 1) Develop a comprehensive arrangement with Norton, Wise County, and the Wise County Public Service Authority for the provision of regional sewer and water treatment facilities, and equitable extension of such services to areas that are not presently served.
- 2) Use the extension of appropriately sized sewer and water facilities into potential development areas as a positive development incentive.

Goal: To encourage development of community facilities commensurate with the needs of the present and future population.

Objectives:

- 1) Recognizing the public need to provide neighborhood-level parks within the community; work toward achieving a standard of 2.5 acres of neighborhood park facilities for every 1,000 people in the Town of Wise.
- 2) Cooperate with County and/or City officials, when appropriate, in the provision of certain public facilities such as community recreation, schools, libraries, fire and rescue, which work best when planned on an area-wide basis.

E. Wireless Telecommunications Goals and Objectives

Goal: To encourage managed development of wireless communication infrastructure, while at the same time not unreasonably interfering with the development of the competitive wireless communication marketplace.

Objectives:

- 1) To maintain and preserve the residential character of the Town and its neighborhoods, and to promote the creation of an attractive and harmonious community.
- 2) To ensure that wireless communication towers and related wireless communication facilities are compatible with surrounding land uses.
- 3) To provide a uniform and comprehensive set of standards for the development and installation of wireless communication towers, antennas, and related facilities.

Goal: To promote public safety and to avoid the risk of damage to adjacent properties by ensuring that wireless communication towers and related wireless communication facilities are properly designed, constructed, modified, and maintained.

Objectives:

- 1) Minimize the adverse visual impacts of wireless communication towers and related facilities through careful design, siting, landscape screening, and innovative camouflaging techniques.
- 2) Horizontally separate wireless communication towers from residential neighborhoods and visually sensitive areas to the extent necessary to minimize visual obstruction.
- 3) Encourage the use of alternative support structures, collocation of new antennas or existing wireless communication towers, camouflaged towers, and construction of towers with the ability to maximize additional providers.
- 4) Ensure that collocation opportunities are fully met before permitting new wireless communication towers.
- 5) Ensure timely removal of obsolete or abandoned equipment at no cost to residents of the Town.

F. Implementation Goals and Objectives

Goal: Make effective use of implementation tools provided to the Town to carry out plan goals and objectives.

Objectives:

- 1) Continue to review and revise the Comprehensive Plan at least every five years, so that it can be a useful guide for future growth and development.
- 2) Establish a set of procedures that will encourage systematic reference of proposed improvements to standards, goals, and objectives set forth by the Comprehensive Plan.
- 3) Develop and use zoning and subdivision ordinances that establish practical land use regulations, standards for design, and environmental quality.
- 4) Develop a priority list of proposed major capital improvements, and recommended programs for accomplishment based on a fiscal forecast of the Town.

G. Land Use Goals and Objectives

Goal: Encourage harmonious and wise use of land through future development decisions.

Objectives:

- 1) The Zoning and/or Subdivision ordinances state that whenever practical, we require aesthetic improvements such as trees, landscaped buffers, and underground utilities to provide attractive divisions between conflicting land uses.
- 2) Consider the expansion beyond present corporate boundaries into areas most suitable for land development, which will strengthen the Town's tax base.
- 3) Maximize the use of all areas within the corporate limits and provide for housing- type transition zones.
- 4) Develop a cooperative understanding between the Town of Wise and City of Norton with regard to the land use decisions for the area located between Wise and Norton. One option worthy of consideration for both jurisdictions is consolidation.

Goal: In the Central Business District, encourage downtown revitalization

using the Town of Wise Strategic Economic Development Plan from which to establish goals and objectives.

Objectives:

- 1) Developing a community meeting place in the Central Business District at which a variety of events and activities can take place; i.e., farmers market, music venue, festivals, and community events.
- 2) Developing a streetscape theme (from the downtown master plan) for trashcans, street lights, flags and banners, etc... which can be implemented as funding becomes available.
- 3) Providing incentives such as façade improvement grants to existing businesses in the Central Business District to encourage revitalization.
- 4) Work with the County on amending its Enterprise Sub-zones to include the Central Business District and/or the shopping center.
- 5) Create a design committee to assist with establishing design guidelines for new construction in the Central Business District to encourage revitalization.
- 6) Develop a community meeting place in the Central Business District called a "senior citizen center/recreation center".

Goal: Identify areas in the Town of Wise for potential growth sufficient to meet projected residential and commercial growth for at least 10 but not more than 20 years, which may include phasing of development, and to establish these designated growth areas pursuant to the Code of Virginia Section 15.2-2223.1. The following designated growth area has been identified and established pursuant to the Code of Virginia Section 15.2-2223.1:

- 1) Property adjacent to US-23 Business (Norton Road) from Cherry Street to Hamilton Street which is shown on the Future Transportation and Land Use map herein.

Objectives:

- 1) To incorporate the Traditional Neighborhood Development plans in the designated growth area(s) described above as property adjacent to US23 Business (Norton Road) from Cherry Street to Hamilton Street shown on the Comprehensive Plan Future Land Use Map which may include:
 - a. Pedestrian-Friendly Road Design within the residential development.
 - b. Interconnection of new local streets in the development with existing streets found in the existing adjacent residential subdivisions as well

- as well as with US23 Business (Norton Road).
 - c. Connect the two existing adjacent subdivisions with the new residential development area via streets and sidewalks.
 - d. Maintain and preserve the natural barrier between US23 Business (Norton Road) and the new development area.
 - e. Mixed use neighborhoods, including mixed housing types with affordable housing, to meet the projected family income distributions of future residential growth.
 - f. Reduction in front and side yard building setbacks.
 - g. Reduction of subdivision street widths and turning radius at subdivision street intersections.
- 2) To provide for the following developable acreage densities in the identified growth area(s):
 - a. At least four single family residents per acre
 - b. At least six townhouses per acre
 - c. At least 12 apartments, condominium units or cooperative units per acre
 - 3) To provide an authorized floor area ratio of at least 0.4 per acre for commercial development in identified commercial growth area(s).
 - 4) To provide commercial developers within Designated Commercial Growth Areas the available Enterprise Zone incentives when the commercial development is located in the Wise County Enterprise Subzone and designated growth area(s).
 - 5) To modify the Town of Wise Zoning Ordinance and Map to create a Designated Growth Area overlay zoning district, and incorporate the Traditional Neighborhood Development Design regulations into the minimum standards for residential development in the Town of Wise Zoning Ordinance.

H. Economic Development

Goal: To provide a variety of retail and services businesses to meet needs of present and future population.

Objectives:

- 1) To encourage entrepreneurs to locate within the Town's Central Business District by continuing to offer incentives in the Wise County Enterprise Sub-Zone, which runs through the Town of Wise along Darden Drive, Park Avenue, Main Street, Norton Road, and the two shopping centers along US-23.
- 2) To provide opportunities for joint promotions and advertising to businesses by keeping Town representation in the Wise Business Association through support of the Wise Business Association activities and festivals.

- 3) To maintain current listing of available properties zoned for business use on the Town of Wise webpage.
- 4) To participate in county-wide and regional recruitment activities, when possible, to attract a variety of industrial and commercial businesses that provide many employment opportunities with “living wages” for the present and future populations.
- 5) To provide quality of life amenities by partnering with private employers to improve recreation, tourism, shopping, and housing needs.
- 6) To develop and implement a strategic economic development master plan.
- 7) To rezone the R-B section of Park Avenue to B-1 Neighborhood Business and add mixed use (retail and residential) as permitted uses.

Goal: To provide opportunities for workforce development, training, and retraining programs for displaced workers.

- 1) To encourage Wise County Schools to expand their technical skills programs.
- 2) To encourage UVA Wise to expand their software engineering programs.
- 3) To encourage UVA Wise to develop and implement a master’s degree program in business, education, nursing, and other fields of study predicted for growth.
- 4) To encourage Mountain Empire Community College to offer associate degrees and training certificates commensurate with the present and future needs of local industries.
- 5) To encourage additional education entities.
- 6) To encourage development of affordable early childcare and daycare facilities with trained employees/caregivers.

SECTION III - IMPLEMENTATION OF PLAN

A. Administration of The Plan

The Wise Comprehensive Plan document represents the continuation of formal, organized planning for the Town and immediate planning area. The plan should serve as a foundation for addressing local problems and recognizing future needs and demands of growth. The plan offers an opportunity to the Town leaders to apply appropriate controls and direct both public and private investments in a logical manner to achieve short-range objectives and long-range goals.

The following sections address legal status, policy, and administration of the Wise Comprehensive Plan required to promote an efficient application of plan provisions.

B. Legal Status of the Plan

The following excerpts are taken from Title 15.2, Chapter 22 Code of Virginia, 1950 and support the legal foundation for the comprehensive plan.

15.2-2232 - Whenever the local commission shall have recommended a comprehensive plan or part thereof for the municipality and such plan shall have been approved and adopted by the governing body, it shall control the general or approximate location, character and extent of each feature shown on the plan. Thereafter, unless such feature is already shown on the adopted master plan or part thereof no street, park or other public area, public building or public structure, public utility facility or public service corporation facility other than railroad facility, whether publicly or privately owned, shall be constructed, established or authorized, unless and until the general location or approximate location, character, and extent thereof has been submitted to and approved by the local planning commission as being substantially in accord with the adopted comprehensive plan or part thereof. In connection with any such determination the commission may, and at the direction of the governing body shall, hold a public hearing after notice as required.

C. Plan Adoption

The following provisions taken from Title 15.2 Chapter 22, outline the general procedures to be followed by the Town of Wise in adopting the Comprehensive Plan.

15.2-2225 - Notice and Hearing on Plan. Recommendation by local commission to governing body. Prior to the recommendation of a comprehensive plan or any part thereof, the local commission shall give notice and hold a public hearing on the plan. After such public hearing has been held the commission may approve, amend and approve, or disapprove the plan. Upon the approval of the plan, the commission shall by resolution recommend the plan to the governing body.

15.2-2226 - Adoption or Disapproval of Plan by Governing Body. After certification of the plan or part thereof, the governing body after a public hearing with notice as required

shall proceed to a consideration of the plan or part thereof and shall approve and adopt, amend and adopt, or disapprove the same within ninety days after date of adoption of such resolution.

15.2-2227 - Return of the Plan to Commission; Resubmission. If such governing body disapproves the plan, then it shall be returned to the local commission for its reconsideration, with a written statement of the reasons for its disapproval.

The commission shall have sixty days in which to reconsider the plan and resubmit it with any changes to the governing body.

15.2-2228 - Adoption of Parts of Plan. As the work of preparing the comprehensive plan progresses, the local commission may, from time to time, recommend and the governing body approve and adopt, parts thereof, and such part shall cover one or more major sections or divisions of the municipality or one or more functional matters.

D. Maintenance of the Plan

15.2-2223 – Requires that VDOT review the transportation plan changes prior to approval by the governing body.

15.2-2229 - Amendments. After the adoption of a comprehensive plan, all amendments to it shall be recommend, and approved and adopted, respectively. If the governing body desires an amendment, it may direct the local commission to prepare an amendment and submit it to public hearing within sixty days after formal written request by the governing body.

15.2-2230 - Plan to be Reviewed At Least Once Every Five Years. At least once every five years, the comprehensive plan shall be reviewed by the local commission to determine whether it is advisable to amend the plan.

Significant new developments, i.e., state highway proposals; location of new industry, shopping center, or residential subdivision; expansion of major public/private uses, etc., should trigger a re-evaluation of the adopted comprehensive plan. Review and appropriate revisions to the plan ensuring consistency with major proposals should be made to maintain it in a current condition. Changes in the plan should only be made in the best interest of established goals and objectives. Development proposals, which are contrary to the plan, require serious consideration within the context of the plan's provisions.

The end result of unwarranted plan revision would be to leave the Town without any enforceable plan.

E. Plan Implementation

Private property development and public improvement efforts can be coordinated with the plan through the use of applicable regulatory measures - zoning ordinance, subdivision regulations, building and housing codes. An adopted Capital Improvement Program also provides a mechanism for the local governing body to schedule public improvements in accordance with the plan over both a five-year period and on an annual basis.

15.2-2239 - Local Commissions to Prepare and Submit Annually Capital Improvement Programs to Governing Body or Official Charged with Preparation of Budget. A local commission may, and at the direction of the governing body shall, prepare and revise annually a capital improvement program based on the comprehensive plan of the municipality for a period not to exceed the ensuing five years. The commission shall submit the same annually to the governing body, or to the chief administrative officer or other official charged with preparation of the budget for the municipality, at such time as it or he shall direct. Such capital improvement program shall include the commission's recommendations, and estimates of cost of such facilities and the means of financing them, to be undertaken in the ensuing fiscal year and in a period not to exceed the next four years, as the basis of the capital budget for the municipality. In the preparation of its capital budget recommendations, the commission shall consult with the chief administrative officer or other executive head of the government of the municipality, the heads of departments and interested citizens and organizations and shall hold such public hearings as necessary unless otherwise required.

15.2-2240 - Municipalities to Adopt Ordinances Regulating Subdivision and Development of Land. The governing body of any locality shall adopt an ordinance to assure the orderly subdivision of land and its development.

15.2-2280 - Zoning Ordinances Generally. Any locality may, by ordinance, classify the territory under its jurisdiction or any substantial portion thereof into districts of such number, shape and size as it may deem best suited to carry out the purposes of this article, and in each district, it may regulate, restrict, permit, prohibit, and determine the following:

The use of land, buildings, structures and other premises for agricultural, business, industrial, residential, flood plain and other specific uses;

The size, height, area, bulk, location, erection, construction, reconstruction, alteration, repair, maintenance, razing or removal of structures;

The areas and dimensions of land, water, and air space to be occupied by buildings, structures and uses, and of courts, yards, and other open spaces to be left unoccupied by uses, structures, including variations in the size of lots based on whether a public or community water supply or sewer system is available and used;

The excavation or mining of soil or other natural resources. For the purpose of zoning, the governing body of a municipality shall have jurisdiction over the incorporated area of the municipality.

The Zoning Ordinance and Subdivision Regulations for the Town of Wise accompany this plan document. Legal enforcement is explained within the text of these regulations. The comprehensive plan must be used as the reference by which zoning requests, development proposals, and the zoning of subdivision regulations are reviewed for approval or disapproval. Zoning and subdivision regulations are the tools intended to accomplish the plan's objectives.

F. Regional Review and Coordination

Local town planning requires coordination with other adjacent jurisdictions: Wise County, Regional, State, and Federal development proposals and plans. Without coordination among these jurisdictions, the danger of planning efforts being duplicated or conflicting will result in ineffective programs and unnecessarily high development costs. The LENOWISCO Planning District Commission is the most appropriate agency to provide regional coordination and review of related plans.

Special coordination efforts with the City of Norton, particularly in the provision of urban services, need to be continued to assure that efforts are not duplicated and costs are minimized. As more and more services are jointly provided through the Town of Wise and the City of Norton, the two jurisdictions may wish to consider initiating formal consolidation proceedings.

G. Level of Professional Planning Assistance

Planning assistance is presently provided to the Town of Wise by the staff of LENOWISCO and through contracted services of private planning consultants for special projects. Communities with a population less than 10,000 typically do not require an in-house planning staff to administer daily planning functions. Special needs of the local planning commission, which may warrant additional planning assistance from LENOWISCO and/or a planning consultant in order to implement the adopted comprehensive plan, may include the following:

- 1) Maintenance of the Comprehensive Plan - Unforeseen changes in development trends, population growth or effects of economic changes resulting from new industrial commercial development, annexation, or consolidation; all would have a major impact on long-range community planning, which would need to be reflected in the Comprehensive Plan.
- 2) Expansion of Major Elements of the Comprehensive Plan - The need for neighborhood studies, a plan for the Central Business District, housing need analysis, and economic development studies may evolve from the recommendations contained in the Comprehensive Plan. Such special

studies should be used to expand on plan generalities and be treated as amendments to the adopted Comprehensive Plan.

- 3) Review and Administration of Housing, Building, Zoning and Subdivision regulations, and Development proposals which affect provisions of the Comprehensive Plan.
- 4) Assist in determining the most appropriate State and Federal assistance programs through which Wise may participate to aid in implementing proposed community improvements.
- 5) Promote local citizen involvement in planning by conducting public education programs on the Comprehensive Plan and related planning processes.

H. Public Education and Community Involvement

The Town of Wise should continue to expand a public awareness program to inform local citizenry, including local commission members, on local planning efforts and issues. The intent of such program is to solicit citizen participation in making planning decisions, and to promote public support for existing and future community improvement efforts. A classroom-type program could be offered to adult and student groups through the Wise County Career and Technical Center and/or the University of Virginia's College at Wise, or through a series of lectures of citizens' advisory groups, civic organizations, and other interested individuals. Local planning commission members should be encouraged to attend Planning Commissioner Institute training sessions offered periodically throughout the year by the Virginia Department of Housing and Community Development (VDHCD). Educational materials are also available from VDHCD, which should be distributed to local planning commissioners.

Additional measures, which can be promoted by the Town to increase public awareness of local planning, include the following:

- 1) Development of a brochure or graphic foldout depicting the Comprehensive Land Use and Transportation Plan on one side and an executive summary of major plan elements on the reverse side.
- 2) Exhibits and displays of important plan elements placed in Town Hall, local bank lobbies, UVA Wise, public schools, etc.
- 3) Newspaper coverage of comprehensive plan adoption process, highlights of land use and special zoning issues, in-depth series of articles on land use problems and opportunities in and around Wise, series of interviews with individuals in responsible positions in local and regional governmental agencies, business, and industry who influence future land use decisions.

ORDINANCE NO. 1, 2011

AN ORDINANCE AMENDING ARTICLE 4, SECTION 9 OF THE ZONING ORDINANCE AND SUBDIVISION REGULATIONS OF THE TOWN OF WISE, VIRGINIA, BY UPDATING REGULATIONS PERTAINING TO DEVELOPMENT IN THE FLOOD PLAIN DISTRICTS AS REQUIRED BY THE DEPARTMENT OF CONSERVATION AND THE FEDERAL EMERGENCY MANAGEMENT AGENCY

WHEREAS, the Federal Emergency Management Agency has updated the Town of Wise Flood Plain mapping effective February 18, 2011 and the Department of Conservation has reviewed Article 4, Section 9 of the Town of Wise Zoning Ordinance and Subdivision Regulations wherein several required changes have been suggested regarding development in the Flood Plain; and

WHEREAS, the Wise Town Council wishes to amend Article 4, Section 9 of the Zoning Ordinance and Subdivision Regulations of the Town of Wise, Virginia, adopted March 23, 1987, to incorporate the required changes by the Department of Conservation and Resources and FEMA with regard to development in the Flood Plain; and

WHEREAS, this matter had been previously referred to the Planning Commission of the Town of Wise, Virginia who considered the same at a meeting held on January 4, 2011 after advertisement and notice as provided by statute and ordinance, and the Commission adopted PC Resolution No. 1, 2011, recommending that the Wise Town Council approve said Zoning Ordinance Amendment; and

WHEREAS, The Town Council of the Town of Wise, Virginia met on Tuesday January 25, 2011 at 7:00 p.m. in Council Chambers of the Wise Municipal Building at 501 W. Main Street and held a public hearing for the purpose of consideration of an amendment to Article 4, Section 9 of the Zoning Ordinance and Subdivision Regulations for the Town of Wise; and

WHEREAS, notice of the time and place of the public hearing and meeting of said Town Council were advertised as provided by statute and ordinance in The Coalfield Progress a newspaper having general circulation in the Town of Wise, Virginia, and said hearing was open to the public and persons desiring to be heard were given an opportunity to present testimony; and

WHEREAS, after review of the guidelines and standards for amending the text of the Zoning Ordinance as set forth in Article 9 of the Zoning Ordinance and Subdivision Regulations of the Town of Wise, Virginia; and careful consideration of the testimony offered, the Wise Town Council wishes to amend Article 4, Section 9 of the Zoning Ordinance as set forth in the attached.

NOW THEREFORE, BE IT ORDAINED AND ENACTED by the Town Council for the Town of Wise, Virginia that Article 4 Section 9 of the Zoning Ordinance and

Subdivision Regulations of the Town of Wise, Virginia, be amended and reenacted as set forth in the attached.

BE IT ORDANIED AND ENACTED by said Town Council that all other provisions of the aforementioned Ordinance shall remain unchanged. The authority for this amendment is contained in Virginia Code Section 15.2-1427-D and in Article 9 of the Zoning Ordinance and Subdivision Regulations of the Town of Wise, Virginia.

ORDAINED, ENACTED AND EFFECTIVE THIS THE 25TH DAY OF JANUARY 2011.

VOTING "AYE": Erra Sutherland, Caynor Smith, Teresa Adkins, Luther Adkins, Clifton Carson

VOTING "NAY": - None -

ABSENT FROM MEETING: - None -

ABSTENTIONS: - None -

TOWN OF WISE, VIRGINIA

Erra Sutherland
MAYOR

ATTEST: Rebecca M. Bryant
CLERK OF COUNCIL

SECTION 9. FLOOD PLAIN ORDINANCE

Section 9.1 General Provisions

Section 9.1.1 Statutory Authorization and Purpose

This ordinance is adopted pursuant to the authority granted to localities by Virginia Code Section 15.2-2280. The purpose of these provisions is to prevent: the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- A. Regulating uses, activities, and development which, alone or in combination with other existing or future uses, activities, and development will cause unacceptable increases in flood heights, velocities, and frequencies;
- B. Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;
- C. Requiring all those uses, activities, and developments that do occur in flood-prone districts to be protected and/or flood-proofed against flooding and flood damage; and,
- D. Protecting individuals from buying land and structures which are unsuited for intended purposes because of flood hazards.

Section 9.1.2 Applicability

These provisions shall apply to all privately and publicly owned lands within the jurisdiction of the Town of Wise, Virginia and identified as being flood prone.

Section 9.1.3 Compliance and Liability

- A. No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of this ordinance and any other applicable ordinances and regulations which apply to uses within the jurisdiction of this ordinance.
- B. The degree of flood protection sought by the provisions of this ordinance is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by manmade or natural causes, such as ice jams and bridge openings restricted by debris. This ordinance does not imply that districts outside the floodplain district or land uses permitted within such district will be free from flooding or flood damages.
- C. Records of actions associated with administering this ordinance shall be kept on file and maintained by the Town of Wise Flood Plain Administrator.

- D. This ordinance shall not create liability on the part of the Town of Wise or any officer or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

Section 9.1.4 Abrogation and Greater Restrictions

This ordinance supersedes any ordinance currently in effect in flood-prone districts. Any ordinance, however, shall remain in full force and effect to the extent that its provisions are more restrictive.

Section 9.1.5 Severability

In any section, subsection, paragraph, sentence, clause or phrase of this ordinance shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining portions of this ordinance. The remaining portions shall remain in full force and effect; and for this purpose, the provisions of this ordinance are hereby declared to be severable.

Section 9.1.6 Penalty for Violations

Any person who fails to comply with any of the requirements or provisions of this Section shall be subject to the penalties for violation set forth in Article 10 of this zoning ordinance, as amended.

In addition to the above referenced penalties, all other actions are hereby reserved, including an action in equity for the property enforcement of this article. The imposition of a fine or penalty for any violation of, or noncompliance with this Section shall not excuse the violation or noncompliance or permit it to continue; and all such persons shall be required to correct or remedy such violations or noncompliances within a reasonable time. Any structure constructed, reconstructed, enlarged, altered or relocated in noncompliance with this article may be declared by the Town of Wise to be a public nuisance and abatable as such. Flood insurance may be withheld from structures constructed in violation of this section.

Section 9.2 Definitions

- A. Base Flood – The flood having a one percent chance of being equaled or exceeded in any given year.
- B. Base Flood Elevation – The Federal Emergency Management Agency designated one hundred (100) – year water surface elevation. The water surface elevation of the base flood in relation to the datum specified on the community's Flood Insurance Rate Map. For the purposes of this ordinance, the one hundred (100) – year flood or 1% annual chance of flood.
- C. Basement – Any area of the building having its floor sub-grade (below ground level) on all sides.

- D. Board of Zoning Appeals - The board appointed to review appeals made by individuals with regard to decisions of the Zoning Administrator in the interpretation of this Section.
- E. Development - Any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.
- F. Elevated Building - A non-basement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, or columns (posts and piers).
- G. Encroachment - The advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a flood plain, which may impede or alter the flow capacity of a flood plain.
- H. Flood or flooding -
 - 1. A general or temporary condition of partial or complete inundation of normally dry land areas from:
 - a. the overflow of inland or tidal waters; or,
 - b. the unusual or rapid accumulation or runoff of surface waters from any source; or,mudflows which are proximately caused by flooding as defined in paragraph (1) (b) of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.
 - 2. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (1) (a) of this definition.
- I. Flood Insurance Rate Map (FIRM) - an official map of a community on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).
- J. Flood Insurance Study (FIS) - an examination, evaluation and determination of flood hazards and if appropriate corresponding water surface elevations, or an examination, evaluation and determination of mudflow and/or flood-related erosion hazards.
- K. Flood plain or flood-prone area - Any land area susceptible to being inundated by water from any source.
- L. Flood proofing - any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

- M. Floodway -- The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.
- N. Freeboard -- A factor of safety usually expressed in feet above a flood level for purposes of flood plain management. "Freeboard" tends to compensate for the main unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed. When a freeboard is included in the height of a structure, the flood insurance premiums will be significantly cheaper.
- O. Highest Adjacent Grade -- The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.
- P. Historic Structure -- Any structure that is:
1. listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
 2. certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
 3. individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or,
 4. individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified by an approved state program as determined by the Secretary of the Interior.
- Q. Lowest floor -- The lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Federal Code 44 CFR Section 60.3.
- R. Manufactured Home -- A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For flood plain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days, but does not include a recreational vehicle.
- S. Manufactured Home Park or Subdivision -- A parcel or contiguous parcels of land divided into two or more manufactured home lots for rent or sale.
- T. New Construction -- For the purposes of determining insurance rates, structures for which the "start of construction" commenced on or after April 15, 1981 and includes any subsequent improvements to structures. For flood plain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a flood plain

- management regulation adopted by the Town of Wise and includes any subsequent improvements to such structures.
- U. Recreational Vehicle – A vehicle which is built on a single chassis; 400 sq ft or less when measured at the largest horizontal projection; designed to be self propelled or permanently towable by a light duty truck; and designed primarily not for use as a permanent dwelling but as a temporary living quarters for recreational camping, travel or seasonal use.
- V. Shallow flooding area – A special flood hazard area with basic flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.
- W. Special Flood Hazard Area – The land in the flood plain subject to a one (1%) percent or greater chance of being flooded in any given year as determined in Section 9.3.2 of Article 4.
- X. Start of Construction. For other than new construction and substantial improvement, under the Coastal Barriers Resource Act means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the state of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.
- Y. Structure – for flood plain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.
- Z. Substantial damage – Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
- AA. Substantial improvement – Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial

damage regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or
 2. Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.
- BB. Violation – the failure of a structure or other development to be fully compliant with the community's flood plain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required is presumed to be in violation until such time as that documentation is provided.
- CC. Watercourse – A lake, river, creek, stream, wash, channel or other topographic feature on or over which water flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

Section 9.3. Establishment of Zoning Districts

Section 9.3.1 – Description of Districts

A. Basis of Districts

The various flood plain districts shall include special flood hazard areas. The basis for the delineation of these districts shall be the Flood Insurance Study (FIS) and the Flood Insurance Rate Maps (FIRM) for Wise County and the Town of Wise prepared by the Federal Emergency Management Agency, Federal Insurance Administration, dated February 18, 2011, and any subsequent revisions or amendments thereto.

The boundaries of the Special Flood Hazard Area and the Flood Plain Districts are established as shown on the Flood Insurance Rate map which is declared to be a part of this ordinance and which shall be kept on file at the Town of Wise offices.

1. The Floodway District is delineated, for purposes of this ordinance, using the criterion that certain areas within the flood plain must be capable of carrying the waters of one hundred (100)-year flood without increasing the water surface elevation of that flood more than one (1) foot at any point. The areas included in this District are specifically defined in Table 6 of the Flood Insurance Study and shown on the accompanying Flood Insurance Rate Map.
2. The Special Flood Plain District shall be those areas identified as an AE Zone on the maps accompanying the Flood Insurance Study

- for which one hundred (100) year flood elevations have been provided.
3. The Approximated Flood Plain District shall be those areas identified as an A or A99 Zone on the maps accompanying the Flood Insurance Study. In these zones, no detailed flood profiles or elevations are provided, but the one hundred (100) year flood plain boundary has been approximated.
 4. The Shallow Flooding District shall be those areas identified as Zone AO or AH on the maps accompanying the Flood Insurance Study.
- B. Overlay Concept
1. The Flood Plain Districts described above shall be overlays to the existing underlying zoning districts as shown on the Official Zoning Ordinance Map, and as such, the provisions for the flood plain districts shall serve as a supplement to the underlying district provisions.
 2. If there is any conflict between the provisions or requirements of the Flood Plain Districts and those of any underlying district, the more restrictive provisions and/or those pertaining to the flood plain districts shall apply.
 3. In the event any provision concerning a Flood Plain District is declared inapplicable as a result of any legislative or administrative actions or judicial decision, the basic underlying provisions shall remain applicable.

Section 9.3.2 District Boundary Changes

The delineation of any of the Flood Plain Districts may be revised by the Town of Wise where natural or man-made changes have occurred and/or where more detailed studies have been conducted or undertaken by the U.S. Army Corps of Engineers or other qualified agency, or an individual documents the need for such change. However, prior to any such change, approval must be obtained from the Federal Insurance Administration.

Section 9.3.3 Interpretation of District Boundaries

Initial interpretations of the boundaries of the Flood Plain Districts shall be made by the Flood Plain Administrator. Should a dispute arise concerning the boundaries of any of the Districts, the Board of Zoning Appeals shall make the necessary determination. The persona questioning or contesting the location of the District Boundary shall be given a reasonable opportunity to present his case to the Board and to submit his own technical evidence if he so desires.

Section 9.3.4 Submitting Technical Data

A community's base flood elevation may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a community shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

Section 9.4 District Provisions

Section 9.4.1 – Permit and Application Requirement

A. Permit Requirement

All uses, activities, and development occurring within any flood plain district, including placement of manufactured homes, shall be undertaken only upon the issuance of a zoning permit. Such development shall be undertaken only in strict compliance with the provisions of this Ordinance and with all other applicable codes and ordinances as amended, such as the Virginia Uniform Statewide Building Code and the Town of Wise Subdivision Regulations. Prior to issuance of any such permit, the Town of Wise Flood Plain Administrator shall require all applications to include compliance with all applicable state and federal laws and shall review all sites to assure they are reasonably safe from flooding. Under no circumstances shall any use, activity, and/or development adversely affect the capacity of the channels or floodways of any watercourse, drainage ditch, or any other drainage facility or system.

B. Site Plans and Permit Applications

All applications for development within any flood plain district and all building permits issued for the flood plain shall incorporate the following information:

1. The elevation of the Base Flood at the site.
2. The elevation of the lowest floor (including basement).
3. For structures to be flood-proofed (non-residential only), the elevation to which the structure will be flood-proofed.
4. Topographic information showing existing and proposed ground elevations.

Section 9.4.2 - General Standards

The following provisions shall apply to all permits:

- A. New construction and substantial improvements shall be according to the VA USBC, and anchored to prevent flotation, collapse or lateral movement of the structure.

- B. Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state anchoring requirements for resisting wind forces.
- C. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
- D. New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
- E. Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.
- F. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.
- G. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters.
- H. On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.

In addition to provisions A-H above, in all special flood hazard areas, the additional provisions shall apply:

- I. Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within this jurisdiction a permit shall be obtained from the U.S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Flood Plain Management) and the Federal Insurance Administrator.
- J. The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.

Section 9.4.3 Specific Standards

In all special flood hazard areas where base flood elevations have been provided in the Flood Insurance Study or generated according to Section 9.4.6, the following provisions shall apply:

- A. Residential Construction – New construction or substantial improvement of any residential structure including manufactured homes shall have the lowest floor, including basement, elevated to one foot freeboard or above the base flood elevation.

- B. Non-Residential Construction – New construction or substantial improvement of any commercial, industrial, or non-residential building or manufactured home shall have the lowest floor, including basement, elevated to one foot freeboard or above the base flood elevation. Buildings located in all A1-30, AE, and AH zones may be flood-proofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the BFE plus one foot are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation in relation to mean sea level to which structures are floodproofed shall be maintained by the Flood Plain Administrator.
- C. Elevated Buildings

Fully enclosed areas, of new construction or substantially improved structures, which are below the regulatory flood protection elevation shall:

1. not be designed or used for human habitation, but shall only be used for parking of vehicles, building access or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment standard exterior door or entry to the living area (stairway or elevator).
2. be constructed entirely of flood resistant materials below the regulatory flood protection elevation;
3. include in Zones A, AO, AE, and A1-30, measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exist of floodwaters. To meet this requirement, the openings must either be certified by a professional engineer or architect or meet the following minimum design criteria:
 - a. Provide a minimum of two openings on different sides of each enclosed area subject to flooding.
 - b. The total net area of all openings must be at least one (1) square inch for each square foot of enclosed area subject to flooding.
 - c. If a building has more than one enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.
 - d. The bottom of all required openings shall be no higher than one (1) foot above the adjacent grade.

- c. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.
- f. Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes and therefore do not require openings. Masonry or wood underpinning, regardless of structural status is considered an enclosure and requires openings as outlined above.

D. Standards for Manufactured Homes and Recreational Vehicles

1. All manufactured homes placed, or substantially improved, on individual lots or parcels in expansions to existing manufactured home parks or subdivisions, in a new manufactured home park or subdivision or in an existing manufactured home park or subdivision on which a manufactured home has incurred substantial damage as the result of a flood, must meet all the requirements for new construction, including the elevation and anchoring requirements in this section.
2. All recreational vehicles placed on sites must either
 - a. be on the site for fewer than 180 consecutive days;
 - b. be fully licensed and ready for highway use (a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions); or,
 - c. meet all the requirements for manufactured homes in Article 4, Section 9.4.2 and 9.4.3(d).

Section 9.4.4 - Standards for the Floodway District

The following provisions shall apply within the Floodway District:

- A. Encroachments, including fill, new construction, substantial improvements and other developments are prohibited unless certification such as hydrologic and hydraulic analyses (with supporting technical data) is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the base flood. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the Town of Wise Flood Plain Administrator.

Development activities which increase the water surface elevation of the base flood may be allowed, provided that the applicant first applies - with the Town of Wise's endorsement - for a conditional Flood Insurance Rate Map and floodway revision, and receives the approval of the Federal Emergency Management Agency.

- B. If Article 4, Section 9.4.4 (A) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Article 4 Section 9.
- C. The placement of manufactured homes (mobile homes) is prohibited, except in an existing manufactured homes (mobile homes) park or subdivision. A replacement manufactured home may be placed on a lot in an existing manufactured home park or subdivision provided the anchoring, elevation, and encroachment standards are met.
- D. Permitted Uses in the Flood Way Areas: In the Floodway, the following uses and activities are permitted provided that they are in compliance with the provisions of the underlying zoning district and are not prohibited by any other ordinance and provided that they do not require structures, fill, or storage of materials or equipment which would result in an increase in the flood levels of the base flood:
1. Agricultural uses such as general farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, sod farming and wild crop harvesting.
 2. Public and private recreational uses and activities such as parks, day camps, picnic grounds, golf courses, boat launching and swimming areas, hiking and horseback riding trails, wildlife and nature preserves, game farms, fish hatcheries, trap and skeet ranges, and hunting and fishing areas.
 3. Residential uses such as yard areas, gardens, play areas and parking areas.
 4. Industrial and commercial uses such as yard areas, parking and loading areas, airport landing strips, etc.

Section 9.4.5 – Standards for the Special Flood Plain District

The following provisions shall apply within the Special Flood Plain District:

Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the areas of special flood hazard designated as Zones A1-30 and AE on the Flood Insurance Rate Map, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the Town of Wise.

Development activities in Zones A1-30, AE, and AH on the Town of Wise Flood Insurance Rate Map which increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the developer and/or applicant first applies, with the Town of Wise's endorsement, for a conditional Flood Insurance Rate Map revision, and receives the approval of the Federal Emergency Management Agency.

Section 9.4.6 – Standards for Approximated Flood Plain

The following provisions shall apply with the approximate flood plain district:

The Approximated Flood Plain District shall be that flood plain area for which no detailed flood profiles or elevations are provided, but where a one hundred (100) year flood plain boundary has been approximated. Such areas are shown as Zone A on the maps accompanying the Flood Insurance Study. For these areas, the one hundred (100) year flood elevations and floodway information from federal, state and other acceptable sources, shall be used, when available. It is recommended that the applicant refer to FEMA 265, "Managing Flood Plain Development in Approximate Zone A Areas, A Guide for Obtaining and Developing Base (100 year) Flood Elevations."

Where the specific one hundred (100) year flood elevation cannot be determined for this area using other sources of data, such as the U.S. Army Corps of Engineers Flood Plain Information Reports, U.S. Geological Survey Flood-Prone Quadrangles, etc., an applicant for a proposed use, development and/or activity greater than 50 lots or 5 acres, whichever is lesser, shall determine this elevation. For development proposed in the approximate flood plain the applicant must use technical methods that correctly reflect currently accepted technical concepts, such as point on boundary, high water marks, or hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the Town of Wise Flood Plain Administrator.

The Town of Wise Flood Plain Administrator reserves the right to require a hydrologic and hydraulic analyses for any development.

When such base flood elevation data is utilized, the lowest floor shall be elevated to one foot freeboard or above the base flood elevation. During the permitting process, the Town of Wise Flood Plain Administrator shall obtain:

1. the elevation of the lowest floor (including the basement) of all new and substantially improved structures; and,
2. if the structure has been flood-proofed in accordance with the requirements of this article, the elevation in relation to mean sea level to which the structure has been flood proofed.

Section 9.4.7 – Standards for Subdivision Proposals

- A. All subdivision proposals shall be consistent with the need to minimize flood damage;
- B. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
- C. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards; and

- D. Base flood elevation data shall be provided for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed fifty lots or five acres, whichever is the lesser.

Section 9.5 - Variances: Factors to be Considered

Variances shall be issued only upon a showing of good and sufficient cause; after the Board of Zoning Appeals has determined that failure to grant the variance would result in exceptional hardship to the applicant and after the Board of Zoning Appeals has determined that the granting of such variance will not result in unacceptable or prohibited increases in flood heights, additional threats to public safety, extraordinary public expense; and will not create nuisances, cause fraud or victimization of the public or conflict with local laws or ordinances.

While the granting of variances generally is limited to a lot size less than one-half acre, deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases. Variances may be issued by the Board of Zoning Appeals for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the provisions of this section.

Variances may be issued to new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that the criteria of this section are met, and the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

In passing upon applications for variances, the Board of Zoning Appeals shall satisfy all relevant factors and procedures specified in other sections of the zoning ordinance and consider the following additional factors:

- A. The danger to life and property due to increased flood heights or velocities caused by encroachments. No variance shall be granted for any proposed use, development, or activity within any Floodway District that will cause any increase in the one hundred (100) year flood elevation.
- B. The danger that materials may be swept on to other lands or downstream to the injury of others.
- C. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.
- D. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.
- E. The importance of the services provided by the proposed facility to the community.
- F. The requirements of the facility for a waterfront location.

- G. The availability of alternative locations not subject to flooding for the proposed use.
- H. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
- I. The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.
- J. The safety of access by ordinary and emergency vehicles to the property in time of flood.
- K. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.
- L. The historic nature of a structure. Variances for repair or rehabilitation of historic structures may be granted upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- M. Such other factors which are relevant to the purposes of this ordinance.

The Board of Zoning appeals may refer any application and accompanying documentation pertaining to any request for a variance to any engineer or other qualified person or agency for technical assistance in evaluating the proposed project in relation to flood heights and velocities, and the adequacy of the plans for flood protection and other related matters.

Variance shall be issued only after the Board of Zoning Appeals has determined that the granting of such will not result in unacceptable or prohibited increases in flood heights; additional threats to public safety; extraordinary public expense; and will not create nuisances, cause fraud or victimization of the public or conflict with local laws or ordinances.

Variances shall be issued only after the Board of Zoning Appeals has determined that the variance will be the minimum required to provide relief.

The Board of Zoning Appeals shall notify the applicant for a variance, in writing and signed by the Zoning Administrator, that the issuance of a variance to construct a structure below the one hundred (100) year flood elevation increases the risks to life and property and will result in increased premium rates for flood insurance.

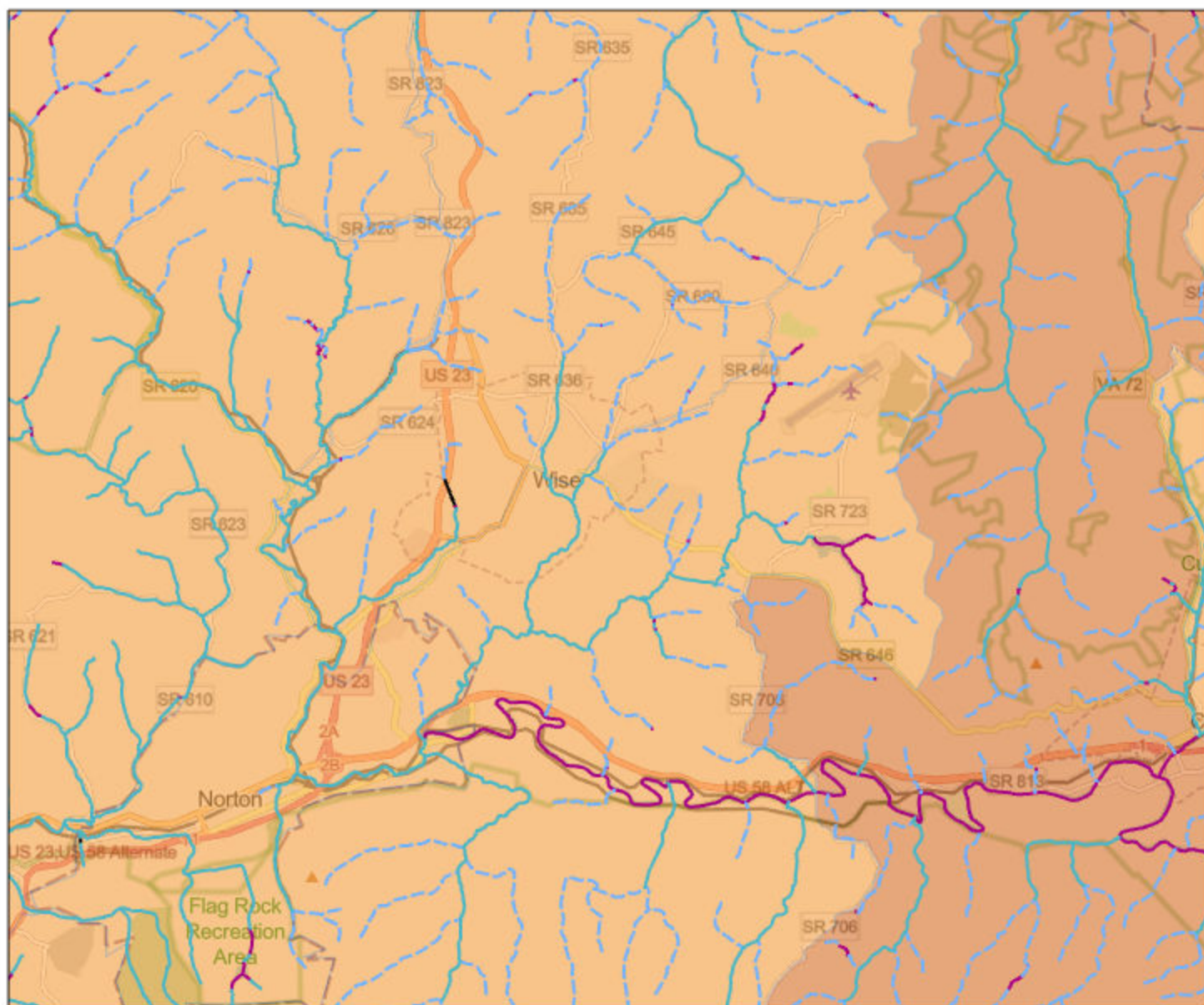
A record shall be maintained of the above notification as well as all variance actions, including justification for the issuance of the variances. Any variances that are issued shall be noted in the annual or biennial report submitted to the Federal Insurance Administrator.

Section 9.6 – Existing Structures in Flood Plain Areas

A structure or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions may be continued subject to the following conditions:

- A. Existing structures in the Floodway Area shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the proposed expansion would not result in any increase in the base flood elevation.
- B. Any modification, alteration, repair, reconstruction or improvement of any kind to a structure and/or use located in any flood plain areas to an extent of amount of less than 50% of its market value shall conform to the VA USBC.
- C. The modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use, regardless of its location in a flood plain area to an extent or amount of 50% or more of its market value shall be undertaken only in full compliance with this ordinance and shall require the entire structure to conform to the VA USBC.

Town of Wise Social Vulnerability Index Score (Moderate)



October 26, 2024

NHD Flowline

- Artificial Path
- Connector
- Stream/River: Intermittent
- Stream/River: Perennial

Social Vulnerability Index

- Moderate Social Vulnerability
- High Social Vulnerability

Scale: 1:116,261



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VIMS WILLIAM & MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE
CENTER FOR COASTAL RESOURCES MANAGEMENT

ADAPTVA

RESOLUTION NO. 28, 2024

**A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF WISE, VIRGINIA AUTHORIZING
THE SUBMITTAL OF A GRANT APPLICATION TO THE VIRGINIA DEPARTMENT OF
CONSERVATION AND RECREATION FOR A VIRGINIA COMMUNITY FLOOD PREPAREDNESS
FUND GRANT**

WHEREAS, the Town of Wise has experienced challenges in the past with flooding; and

WHEREAS, the Town of Wise desires to apply to the Virginia Department of Conservation and Recreation for a Virginia Community Flood Preparedness Fund grant to develop a resiliency plan and obtain floodplain management training for an estimated cost of \$30,000.00; and

WHEREAS, the Virginia Community Flood Preparedness Fund grant program requires a 10 percent match for localities located within Low-Income Geographic Areas; and

NOW, THEREFORE BE IT RESOLVED, that the Wise Town Council authorizes the submission of the grant application and agrees to provide a 10 percent match of the total awarded amount up to \$3,000.00; and

BE IT FURTHER RESOLVED, that the Town Manager of the Town of Wise is hereby authorized to sign any and all documents concerning this application.

VOTING “AYE”: Teresa Adkins, Jeffery Dotson, Robin Dotson, Caynor Smith, Jr.

VOTING “NAY”: None

ABSENT: Ben Conway **ABSTENTIONS:** None

ADOPTED AND EFFECTIVE THIS THE 22nd DAY OF OCTOBER, 2024.

ATTEST: Sumia F. Coleman
CLERK OF COUNCIL

TOWN OF WISE, VIRGINIA
Ben Smith
MAYOR