

Westmoreland Hazard Mitigation Plan Update 2016



Westmoreland, New Hampshire

Prepared by the:

**Town of Westmoreland Hazard Mitigation Committee
&
Southwest Region Planning Commission
37 Ashuelot Street
Keene, NH 03431
(603) 357-0557
www.swrpc.org**

FEMA Final Approval December 15, 2016



FEMA



SWRPC
37 Ashuelot Street
Keene, New Hampshire 03431
(603) 357-0557

TABLE OF CONTENTS

EXECUTIVE SUMMARY iii

1. INTRODUCTION 1

Purpose 1

Authority 1

Funding Source 1

Scope of the Plan 1

Methodology 1

Public Participation 3

Resources Used in the Plan 3

Resource List for Hazard Mitigation Committee 3

Plan Updates 4

Acknowledgements 5

Overall Hazard Mitigation Goals 6

2. COMMUNITY PROFILE 7

Town Overview 7

Disaster Risk 8

Existing Land Uses 8

Development Trends 9

Population Trends 10

Changes in Development 10

Development in Hazard Areas 10

National Flood Insurance Program (NFIP) 11

Continued Compliance with NFIP 11

3. HAZARD IDENTIFICATION 12

Flooding Disaster Declarations 12

Flooding-Localized - Medium Risk 13

Wildfire - Medium Risk 13

Tornado/Downburst/Severe Wind -Medium Risk 13

Hurricane/Tropical Storm - Medium Risk 14

Severe Winter Weather - Medium Risk 17

Erosion - Medium Risk 19

Man-Made Hazards/ Hazardous Materials - Low Risk 19

Man-Made Hazards/Dams - Low Risk 19

Past and Potential Hazards Map Back of Plan

4. ASSESSING PROBABILITY, SEVERITY, AND RISK 21

Vulnerability and Risk Assessment Chart 21

5. POTENTIAL HAZARDS AND VULNERABILITY ASSESSMENT 22

Flooding 22

Wildfire 23

Erosion 23

Tornado/Downburst/Severe Wind 23

Hurricane/Tropical Storm 23

Severe Winter Weather 24
 Man-Made Hazards/ Hazardous Materials 24
 Man-Made Hazards/Dams 24

Critical Facilities Map Back of Plan

6. CRITICAL FACILITIES25

Category 1 - Emergency Response Services 25
 Category 2 - Non-Emergency Response Facilities 26
 Category 3 - Facilities/Populations to Protect 27
 Category 4 - Potential Resources 27
 Critical Facilities Map Back of Plan

7. EXISTING MITIGATION STRATEGIES AND PROPOSED IMPROVEMENTS.....29

Description of Existing Programs 29
 Existing Protection Matrix 30
 Status of Previous Priority Mitigation Action.....32

8. POTENTIAL AND PROPOSED MITIGATION STRATEGIES.....33

Prioritizing Proposed Mitigation Action (STAPLEE) 36
 STAPLEE Chart 37

9. IMPLEMENTATION SCHEDULE AND ACTION PLAN38

Implementation Strategy for Priority Mitigation Actions - Summary Chart 38

10. ADOPTION, IMPLEMENTATION, MONITORING AND UPDATES.....39

Adoption 39
 Implementation 39
 Monitoring & Updates 39
 Implementation of the Plan through Existing Programs 40
 Continued Public Improvement.....40
 Certificate of Adoption.....41

APPENDICES

Hazard Description Appendix A
 Risk Assessment Appendix B
 Technical Resource..... Appendix C
 Hazard Mitigation Resource Profile/Grant Programs Appendix D
 Documentation of the Planning Process Appendix E
 Project Status Sheet Appendix F

MAPS

Past and Potential Hazards Map..... back pocket of binder
 Critical Facilities Map.....back pocket of binder

Executive Summary

The Westmoreland Hazard Mitigation Plan serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Westmoreland Hazard Mitigation Committee and contains statements of policy adopted by the Board of Selectmen.

Natural hazards are addressed as follows:

- Flooding
- Tornado/Downburst/Severe Wind
- Hurricane/Tropical Storm
- Wildfire
- Severe Winter Weather
- Erosion
- Hazardous Materials
- Dam Failure

The Westmoreland Hazard Mitigation Committee, identified “Critical Facilities” and “Areas at Risk” as follows:

Critical Facilities

- Town Hall
- Schools & Day Cares
- Fire Station
- Town Garage
- Town Library
- Cheshire County Facility (Home, Farm and prison)
- Churches/Religious Facilities
- Fuel Storage Areas

Areas at Risk

- ALL town roads were determined either to have been previously impacted or to have significant potential of being impacted in the future.
- Bridges on Evacuation Routes

The Westmoreland Hazard Mitigation Committee identified existing hazard mitigation programs as follows:

- Westmoreland Emergency Operations Plan
- FERC/ North Walpole Dam Action Plan
- Radiological Evacuation Plan
- Best Management Practices
- Flood Warning System
- Emergency Power Backup Program
- Local Road Design Standards
- Shoreland Protection Program
- Emergency Snow Removal Plan (informal)
- Hazardous Material Plan
- Town Adopted Building Code
- Town Radio System
- Tree Maintenance Program
- Town Master Plan
- Town Capital Improvements Plan
- Mutual Aid
- Bridge Design Standards
- Local Bridge Maintenance Program
- School Evacuation Plan
- State and Federal Dam Programs
- Town Warning System
- River Stewardship Program
- Code Enforcement Officer
- Mutual Aid
- Member of NFIP
- Evacuation Plan of Maplewood Nursing Home

The Westmoreland Hazard Mitigation Committee prioritized newly identified hazard mitigation strategies as follows:

1. Provide public education & outreach about the importance of NFIP. Encourage participation.
2. Provide public outreach & education on the River Stewardship Plan.
3. Continue ongoing monitoring by town & NHDOT of state roads and culverts. Maintain communications with state agencies.
4. Update the Westmoreland Emergency Operations Plan.
5. Continue hazardous materials training for Fire Dept.
6. Install a generator at Town Hall.
7. Continue to update and educate the public on hazard mitigation, preparedness, evacuation, shelters. Add links to NH HSEM and FEMA on the Town website.
8. Update the list of potential local resources (sand, backhoes, chainsaws, etc.) in the event of a hazard.
9. Create and maintain a list of special needs residents.
10. Respond to concerns of erosion that have the potential of physical or property impact. Seek actions to address the situation.
11. Maintain updated local road design standards as needed.
12. Upgrade the culvert at McAdam Road.
13. Upgrade the culvert at Hunt Road/ NH 63.
14. Upgrade the culvert at Spofford Road.
15. Upgrade other problem culverts.

CHAPTER 1 INTRODUCTION

Purpose

The Westmoreland Hazard Mitigation Plan Update 2016 is a planning tool to be used by the Town of Westmoreland, as well as other local, state and federal governments, in their efforts to reduce the effects from natural and man-made hazards. By maintaining an updated Hazard Mitigation Plan, the town is eligible to receive grant funding for mitigation projects.

Authority

This Multi-Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act), herein enacted by Section 104 of the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390). This Act provides new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts. The development and periodic update of this plan satisfies the planning requirements of the Disaster Mitigation Act (DMA) of 2000 which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).

Funding Source

This Plan was funded by the NH Homeland Security and Emergency Management, with grants from FEMA's Pre-disaster Mitigation Program.

Scope of the Plan

The scope of this Plan includes the identification of natural hazards affecting the Town of Westmoreland, as identified by the Hazard Mitigation Committee. The hazards were reviewed under the following categories as outlined in the 2013 State Hazard Mitigation Plan:

Flood, Erosion, Wildfire,
Hurricane/Tropical Storm,
Tornado/Severe Wind/ Downburst,
Severe Winter Weather, Dam Breach, Hazardous Materials Spills

After careful review of the historical natural disasters in and near the Town of Westmoreland, the committee determined that the risk of drought, extreme heat, earthquake, lightning, landslide and snow avalanches do not pose enough of a risk to the Town of Westmoreland to include in this plan.

Methodology

Using FEMA's Local Multi-Hazard Mitigation Planning Guidance, the Westmoreland Hazard Mitigation Team developed the content of the Westmoreland Hazard Mitigation Plan by following the tasks set forth in the handbook. The Committee held monthly meetings, open to the public, from April 6 to June 15, 2016 in order to develop the Plan.

Tasks to complete the Plan Update:

Task 1: Determine the Planning Area & Resources: This task was conducted by town staff and the Regional Planning Commission. The results of this research were shared with the Committee and can be found in Chapter 2, "Community Profile".

Task 2: Building the Planning Team: The Emergency Management Director contacted town officials, department heads, and residents who might wish to volunteer their time and serve on a committee. The Westmoreland Board of Selectmen appointed the committee members.

Task 3: Create an Outreach Program: This task was used throughout the plan and is a vital part of the plan's success. Many of the proposed actions involve a community outreach component for individuals to use as a means to reduce the risk of loss of life and property from future natural and man-made hazards.

Task 4: Review Community Capabilities: The Committee brainstormed on the type of hazards and locations that have sustained or could be susceptible to each hazard within the town. The results were the Hazard Identification Map, which can be found at the end of the Plan.

The Committee then identified and catalogued all of the critical facilities within the town. The result is found in Chapter 6, "Critical Facilities Analysis," with a location map at the end of the Plan.

Task 5: Conduct a Risk Assessment: The Committee conducted several assessments to help determine the gaps in coverage. These include Vulnerability Assessments and Assessing Probability, Severity, and Risk. In addition to the assessments, the existing mitigation strategies were reviewed to determine where gaps in coverage exist and areas that need improvement.

Task 6: Develop a Mitigation Strategy: The Committee identified plans and policies that are already in place to reduce the effects of man-made and natural hazards. Then the Committee evaluated the effectiveness of the existing measures to identify where they can be improved. The results are found in Chapter 8, "Mitigation Strategies." The Committee then developed the Mitigation Action Plan, Chapter 9, which is a clear strategy that outlines who is responsible for implementing each project, as well as when and how the actions will be implemented and the funding source.

Task 7: Keep the Plan Current: It is important to the Town of Westmoreland that this plan be monitored and updated annually or after a presidentially declared disaster. Chapter 10 addresses this issue.

Task 8: Review & Adopt the Plan: The Committee members reviewed and approved each section of the plan as it was completed. After acceptance by the Committee, the Plan was submitted to the New Hampshire Homeland Security and Emergency Management and the Federal Emergency Agency Region 1 Office, for review. At a public meeting, the Board of Selectmen formally adopted the plan on December 1, 2016. The plan was then granted formal approval by FEMA on December 15, 2016.

Task 9: Create a Safe & Resilient Community: The committee discussed the mitigation actions in the Action Plan and the ways in which the implementation of the actions will be beneficial to the community. Annual reviews of the Action Plan by the committee are needed to maintain the timeframes identified for completion of activities. Incorporation of the plan into other land use plans and the Capital Improvement Plan help to ensure that the goals of the plan are met. Implementation of the actions prior to a hazardous event can be funded through a variety of resources found at the end of this plan in Appendix D.

A final draft of this Plan was made available to the Committee and the public for review and comment. The

document was also provided to the NH Homeland Security and Emergency Management for their review and comment.

On December 1, 2016, the Westmoreland Board of Selectmen held a duly-noticed public hearing to adopt the Westmoreland Hazard Mitigation Plan Update 2016. Copies were made available at the Town Offices and the Town website for public review.

Public Committee Meetings

Working committee meetings held at Westmoreland Town Office on the following dates:
April 6, April 28, May 11, and June 23, 2016.

An email was sent to each committee member, prior to each meeting that contained information from the previous meeting, an agenda (Appendix E), and information to be covered. Agendas were posted at the Town Office to encourage public participation.

Public Participation:

In addition, an article was printed in the Southwest Region Planning Commission Newsletter prior to the first meeting to inform the members of the community as well as surrounding communities and other interested stakeholders in participating in this plan update. Copies of the newsletter were sent to the 34 towns within the region, the Cheshire County Office, businesses, and other interested parties. It is also available on the Southwest Region Planning Commission website. In addition to the SWRPC newsletter and website, an email of the SWRPC Happenings was sent to approximately 430 addresses, including neighboring communities, county, businesses, and academia. The email contains notices of public meetings and events. A copy of this mailing is included in Appendix E.

A copy of the draft plan was made available for public review and input at the Town Office from July 25 to August 3, 2016. In addition, the draft plan was also available for public viewing on the Town website to reach a broad range of interested parties. A copy of the public notice for the public viewing period is in Appendix E. There were no comments from the public received following the public viewing period.

Resources Used in Plan Preparation

In addition to the Handbook that was used as a framework for this plan, additional resources used included the Westmoreland Hazard Mitigation Plan (2011), Town Master Plan (2016), Town Reports, the FEMA Community Information System website (to obtain data about the town's National Flood Insurance Program status), the State of New Hampshire Hazard Mitigation Plan 2013, and a number of resources identified in **Appendix C**.

Resource List for the Hazard Mitigation Committee

Westmoreland's Emergency Management Director (EMD), or designee, reviewed and coordinated with the following agencies in order to determine if any conflicts existed or if there were any potential areas for cooperation. Training support has been offered by some of those on this resource list.

New Hampshire Homeland Security and Emergency Management: 1-800-852-3792

Field Representative: Danielle Morse
Mitigation Planner: Whitney Welsh

New Hampshire Office of Energy and Planning
Jennifer Gilbert - Floodplain Management Coordinator 271-2155

New Hampshire Department of Environmental Services-Dam Bureau
Nancy McGrath - Public Information Officer 271-3406

New Hampshire Department of Transportation:

John Kallfelz (District 4) Swanzey, NH 352-2302

Eversource Utility:

Laurel Boivin Keene, NH 357-7309 Ext. 5115
1-800-662-7764

Westmoreland School Principal:

Mark Hayward Westmoreland, NH 03467 399-4421

Plan Updates

During the planning process, the Committee reviewed relevant portions of the previous hazard mitigation plan and updated those portions accordingly. Unchanged sections were incorporated into the plan while other sections were amended to reflect changes. Particular attention was given to the previous mitigation strategies that have been completed to give a status update on those that remain on the list. The previous plan was used as a basis to begin the update. Amendments were made in each chapter to reflect changes that have occurred during the five year period. Included in the changes were:

- Ch. I- Introduction- updated Methodology, Acknowledgements, etc., and added Plan Updates;
- Ch. II- Community Profile - NFIP policies updated, added Continued Compliance with NFIP;
- Ch. III- Hazard Identification- updated hazards and their location, updated the Hazards Map;
- Ch. IV- Assessing Probability, Severity, and Risk - updated risk assessment;
- Ch. V- Vulnerability Assessment- estimated potential losses;
- Ch. VI- Critical Facilities - updated locations;
- Ch. VII- Existing Mitigation Strategies and Proposed Improvements - updated chart and other data, updated chart for Status of Previous Mitigation Action Items;
- Ch. VIII- Proposed Mitigation Strategies - updated STAPLEE chart;
- Ch. IX- Prioritized Implementation Schedule - updated Action Plan;
- Ch. X- Adoption, Implementation, Monitoring and Updates - Adoption certificate, updated information;
- Appendices - agendas, resources, public documentation.

This update was prepared with assistance from professional planners at Southwest Region Planning Commission trained in Hazard Mitigation Planning. Data and maps used to prepare this plan are available at their office and should be used in preparing future updates.

Acknowledgements

The Westmoreland Board of Selectmen extends special thanks to the Westmoreland Hazard Mitigation Committee as follows:

Bill Chase, *Westmoreland Emergency Management Director (EMD)*
Tom Finnegan, *Westmoreland Emergency Management Director, Firefighter*
Bob Hamilton, *Westmoreland Deputy EMD*
Lauren Bressett, *Westmoreland Planning Board Chair*
Mark P Hayward Jr., *Westmoreland School Principal*
Gary Hudson, *Westmoreland Road Agent*
Edwin Johnson, *Westmoreland Deputy Fire Chief*
Harry Nelson, *Westmoreland Fire Chief*
Jack Zeller, *Westmoreland Board of Selectman*

The Westmoreland Board of Selectmen offers thanks to the New Hampshire Homeland Security and Emergency Management for developing the State of New Hampshire Multi-Hazard Mitigation Plan Update 2013 (<http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf>) which served as a model for this plan. In addition, special thanks are extended to the staff of the Southwest Region Planning Commission for professional services, process facilitation and preparation of this document.

FEMA Final Approval: December 15, 2016

Hazard Mitigation Goals

The Westmoreland Hazard Mitigation Committee reviewed the goals set forth in the New Hampshire Hazard Mitigation Plan Update – 2013. The committee generally concurs with those goals and has amended them to better meet the goals of the town.

Town of Westmoreland, NH

The overall Goals of the Town of Westmoreland with respect to Hazard Mitigation are stipulated here:

1. To improve upon the protection of the general population, the citizens of the Town of Westmoreland and guests, from all natural and man-made hazards.
2. To reduce the potential impact of natural and man-made disasters on the Town of Westmoreland's Emergency Response Services, Critical Facilities, and infrastructure.
3. To reduce the potential impact of natural and man-made disasters on the Town of Westmoreland's economy, natural resources, historic/cultural treasures, and private property.
4. To improve the Town of Westmoreland's Emergency Preparedness and Disaster Response and Recovery Capability.
5. To reduce the Town of Westmoreland's risk with respect to natural and man-made hazards through outreach and education.
6. To identify, introduce and implement cost-effective Hazard Mitigation measures so as to accomplish the Town's Goals and Objectives and to raise the awareness of and acceptance of Hazard Mitigation opportunities generally.
7. To address the challenges posed by climate change as they pertain to increasing risks in Westmoreland's infrastructure and natural environment (such as upsizing culverts to accommodate the increase in stormwater).
8. To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals.
9. To provide a safe educational environment to students of Westmoreland's public schools.

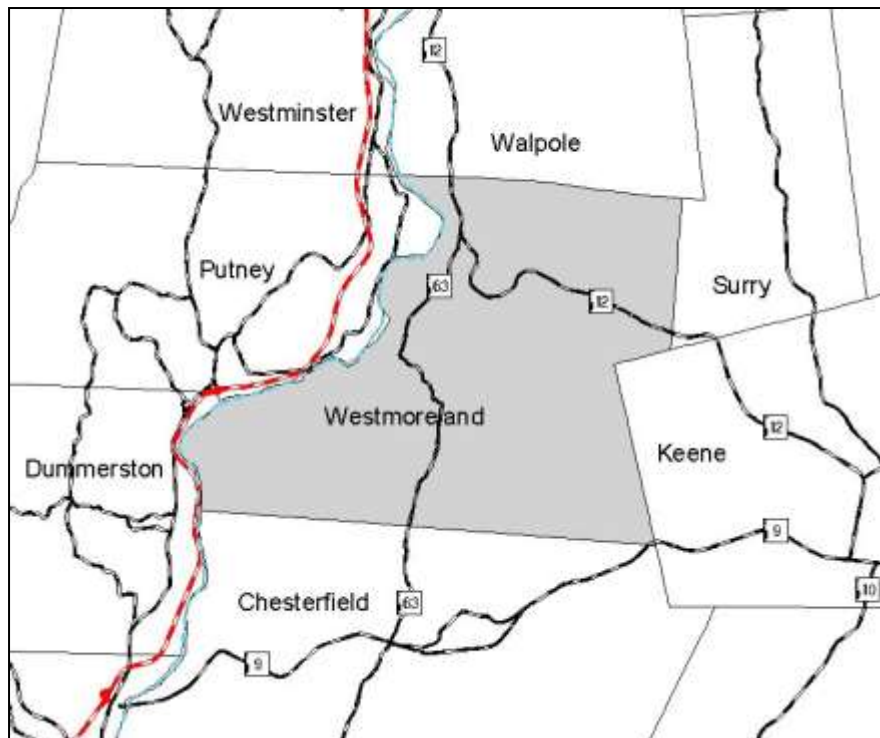
CHAPTER 2

COMMUNITY PROFILE

Introduction

The Town of Westmoreland is located in the western portion of Cheshire County, in Southwest New Hampshire. Westmoreland is bounded on the north side by Walpole, easterly by Surry and Keene, southerly by Chesterfield and westerly by the Connecticut River. The Town has a population of 1,874 (including Maplewood Nursing Home).¹

Location Map of Westmoreland, NH



The Town of Westmoreland consists of 35.9 square miles and .9 square miles of inland water. There are several small first order streams in the Town of Westmoreland. The vast majority of these streams drain small valleys into the Connecticut River to the west.

The topography of Westmoreland consists of rolling hills interrupted by narrow valleys. The higher areas vary from very stony loam to rock outcrops. Westmoreland's elevation starts at 220 feet on the Connecticut River at the Chesterfield Town Line and rises to 1,500 feet in the eastern side of town at the Surry border.

According to U.S. Climate Data, the average high temperature in 2015 was 31°F in January and 83°F in July. The annual precipitation in 2015 was 43.6 inches of rainfall and 55 inches of snowfall.

¹ Population data from the US Census-2010.

A three-member Board of Selectmen governs the Town of Westmoreland. The Town maintains a part-time Assistant to the Selectman and part-time Fire Chief, with a volunteer Fire Department. There is a full-time Road Agent. The Cheshire Medical Center and the Dartmouth-Hitchcock Clinic are located in Keene, 10 miles east of Westmoreland and the Brattleboro Hospital is located to the west in Vermont.

Disaster Risk

Westmoreland is prone to a variety of man-made and natural hazards. These include: flooding, wildfires, severe wind/downburst/tornadoes, hurricanes/tropical storms, severe winter weather, erosion, hazardous materials spills, and dams.

Flooding, wildfires, severe wind/downburst/tornadoes, hurricanes/tropical storms, and severe winter weather are the greatest concern and all carry a medium risk as indicated in the Vulnerability and Risk Assessment chart on page 21. None have caused personal injury or loss of life, and no structural damage has been reported as a result of these natural hazards, however several road washouts have occurred due to flooding and stormwater management.

Existing Land Uses*

The total land area of Westmoreland is roughly 23,100 acres or approximately 35.9 square miles. Of this, approximately 22 percent is presently devoted to residential, commercial, institutional, industrial, agricultural, governmental, and road use. The remaining acreage is occupied by woodland, wetlands, surface water, or undeveloped open land.

Agriculture is the most predominant active use of land in Westmoreland. Farms, pastures, and fields for growing corn and hay are scattered throughout the town, with major concentrations along the Connecticut River and in the central and southern portions of town.

Industrial use represents the second largest land use category in Westmoreland. Included are a large crushed stone operation (1082 acres), the Hubbard Farms Research Center and several small manufacturing enterprises that account for approximately 1,200 acres of the town's current land inventory.

Residential is the next most predominant use of land in Westmoreland. There is approximately 618 acres of residential land scattered throughout the town with major concentrations in and around the South Village, East Westmoreland, Westmoreland Depot and Park Hill areas. This estimate is based upon a 2000 Census figure of 618 housing units (576 occupied) and assuming a one acre average of yard per house. Residential land use is predominantly single-family homes.

Roads account for approximately 63.5 miles of town and state roads in Westmoreland. This translates into approximately 278 acres of land in the community.

Commercial land activity accounts for an estimated 96 acres, and is concentrated in and around South Village and along NH Route 12 corridor with other small-scale commercial uses scattered throughout the town. The source for this acreage is based upon a list of 48 businesses provided by the town office.

Institutional and governmental uses account for approximately 31 acres. These land uses include churches, schools, cemeteries and town buildings, and are concentrated primarily in the town's villages. The Maplewood Nursing Home and the Cheshire County Jail building are also included in this category; however the "County Farm" is considered an agricultural use. There appears to be no noticeable increase in these acres. The Cheshire County Jail was closed in 2010 and the future use of the building has not yet been determined.

In total, approximately 5,003 acres, or 22 percent of Westmoreland’s area, is actively and regularly used for the above-mentioned categories of land use. This leaves some 18,097 acres, or 78 percent, open and potentially available for future development. Much of this land is probably unsuitable for future development for a variety of reasons. Large sections of Westmoreland are still remote and relatively inaccessible due to a lack of roads. Other areas are incompatible with intensive development due to the physical constraints of the land itself which include steep slopes, wetlands, seasonal high water tables, floodplains, and shallow to bedrock soils. Finally, the future land use policies of the town itself may preclude the intensive development of certain areas. The preservation of farmland or major aquifers are possible examples of land that could be preserved under such a policy. In order to develop a realistic future Land Use Plan, each of these factors must be carefully considered.

*Westmoreland Master Plan

Development Trends

The Town of Westmoreland continues to experience growth pressures due in large part to the continued commercial and industrial growth of Keene, Brattleboro and Bellows Falls coupled with a decline in the number of available locations to place homes and businesses there. Another significant reason is the perceived quality of life to be experienced in town including a highly regarded school system and strong sense of community. These changes have not been without consequences. To what extent these changes will affect and influence the town and to what extent the town will influence changes will depend predominately on how it plans, prepares, and looks ahead to the future.

Westmoreland, in addition to having the same opportunities and challenges as other communities does have many natural attributes that are aesthetically unique assets. If proper planning takes into consideration limiting factors such as topography, these natural attributes can remain an asset rather than a liability to development.

According to the 2010 US Census, the number of housing units in Westmoreland was 630 units. The chart below shows the trend in the housing supply based on the number of residential building permits issued from 2010 to 2014. This information was recently supplied by the NH Office of Energy and Planning in a report: *New Hampshire’s Housing Supply: Current Estimates and Trends, December 2015*.

HOUSING SUPPLY: RESIDENTIAL BUILDING PERMITS ISSUED BETWEEN 2010 - 2014

Housing Unit Type	Total Units 2010 Census	2010	2011	2012	2013	2014	Total Estimated Housing Units
Single-family	630	0	0	1	3	3	637
Multi-family	36	0	0	0	0	0	36
Manufactured Housing	14	0	0	0	0	0	14
Total Units	680	0	0	1	3	3	687

Source: NH Office of Energy and Planning

Population Trends

The table below shows population in Westmoreland for each decade between 1970 and 2010 according to the US Census. There was a population increase in each of the decades, however the *rate* of increase (growth rate) has consistently declined during this time period.

Westmoreland 1970 - 2010

	1970	1980	1990	2000	2010
Population	998	1452	1596	1747	1874
% Change	---	45.5%	9.9%	9.5%	2.3%

Source: U.S. Census

Future Development Patterns*

All signs seem to indicate that Westmoreland is slated for continual growth. Pressures from the surrounding towns and the community’s attractiveness are dictating an increased use of land in the community. In spite of the fact that Westmoreland has many areas that are topographically and geologically unsuitable for development, there is adequate land available for future uses proposed. However, these can only provide for and maintain the town’s present characteristics if proper planning has taken place.

The determination of land use patterns not only provides but also sets the pattern for the town to control its future growth. Because of the imminent possibility of more and larger subdivision developments, the town must take heed in planning for its future. It is important that future development be so located as to be accessible to community facilities and highway networks without undue expense to the town. This is to say, for example, that school buses and fire department vehicles can have reasonable access to development densities that would require these town services frequently. Density patterns should be established based on soil suitability for development and the community’s ability to provide services.

Many of Westmoreland’s assets are a direct result of the natural setting and landscape. Its protection is one that present generations must strive for, if indeed, they desire to retain the community qualities that are present today. The hilltops, the large forested areas, the beautiful vistas such as the Partridge Brook Basin, the Connecticut River Valley, and the ridge created by Cass Hill and Bald Hill in the western portion of the town, are indeed, unique features that help make Westmoreland what it is today.

Yet there is need for the accommodation of employment opportunities, such as industrial and commercial development in the community. These, however, should be so located that they can readily reach regional and interregional highway facilities.

Future growth should be in accordance with the Land Use Plan of the Master Plan. The Land Use Plan addresses the future needs of the individual in the community, the town, as well as its role as part of a regional entity, and makes provisions to retain desirable features while at the same time creating new assets as changes in growth take place.

* Westmoreland Master Plan

Population Projections

Population projections are an important component in planning for the future. Projections are beneficial to help communities begin to plan and budget for Capital Improvement Projects. Since population projections are based on a set of assumptions, changes can be significant if the assumptions used in the calculations are not met. For example, a tropical storm that destroys a large employer or causes infrastructure damages to that facility, can cause a significant economic hardship to the business that may ultimately result in its closure and loss of jobs. This can then result in an outward migration of residents from the community. Therefore, population projections should only be used as a basis to begin planning for the future.

The New Hampshire Office of Energy and Planning (NH OEP) prepares population projections every five

years for each community in New Hampshire. The projections for Westmoreland are presented below in five-year intervals up to the year 2040, beginning with the census count from the year 2010. Using these projections, Westmoreland is expected to experience a slow growth over the next 25 years.

Population Projections Between 2010 and 2040

	2010	2015	2020	2025	2030	2035	2040
Westmoreland	1874	1899	1946	1972	1992	2004	2007

Source: NH Office of Energy & Planning, November 2013

Changes in Development

The demographic trends in the previous sections indicate that Westmoreland’s population and development is increasing at a slower rate than in previous decades. This provides an opportunity to plan for future events rather than react as they occur. As the population continues to grow, new development has been outside of the flood prone areas which has helped to protect the residents from any increase in vulnerability of hazards. As the intensity of storms continues to increase though, it is important to review the existing programs and strategies, and improve upon areas that are needed. The plan was revised with this in mind and strategies were considered during the committee meetings.

Development in Hazard Areas

Hazards identified in this plan are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. Currently, there are 10 structures located within the Special Flood Hazard Area (SFHA) in Westmoreland.

National Flood Insurance Program (NFIP)

Westmoreland is a participating member of the National Flood Insurance Program and entered into the program on April 2, 1986. Digital Flood Insurance Rate Maps (DFIRMs) with the effective date of May 23, 2006 are used for flood insurance purposes. The most recent Flood Insurance Study was also done on May 23, 2006. There are approximately 10 structures located in the FEMA designated Special Flood Hazard Areas (SFHA’s), and 9 NFIP Policies, which is an increase of 6 policies since the previous Hazard Mitigation Plan. There are currently no “Repetitive Loss Properties” insured under the NFIP within the Town of Westmoreland.

Continued Compliance with NFIP Requirements

The Town of Westmoreland acknowledges the importance of maintaining requirements set forth in the National Flood Insurance Program. As such, the town took steps related to continued compliance with the program that will help to reduce or eliminate the potential for loss of life and property due to flooding. The following actions have been taken since the last Hazard Mitigation Plan and will continue to be implemented throughout the life of this plan:

- maintained and replaced culverts (Thompson Road);
- continued enforcement of the Floodplain Development Ordinance;
- continued enforcement of the Building and Zoning Ordinances.

**CHAPTER 3
HAZARD IDENTIFICATION**

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Westmoreland. The Past and Potential Hazards and Critical Facilities Map at the end of this Plan reflects the contents of this list. A description/definition of each hazard type is found in **Appendix A** of this Plan.

- Flooding
- Wildfires
- Severe Wind/Downburst/Tornadoes
- Hurricanes/Tropical Storms
- Severe Winter Weather
- Erosion
- Hazardous Materials Spills
- Dams

Hazard events were researched using a wide variety of sources. Sources and techniques included interviewing long-time residents of Westmoreland; gathering information from the State of New Hampshire Hazard Mitigation Plan; and gathering information from governmental and non-profit web sites. The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Westmoreland. The Past and Potential Hazards Map at the end of this Plan reflects the contents of this list.

Hazard	Date	Location	Description of Areas Impacted
Flooding- Disaster Declarations			
Below is a listing of Disaster Declarations for flooding events within the State of New Hampshire. Several severe events have caused significant damage to structures and roadways within the Southwest Region.			
Flood	1927	Southern NH	Damage to Road Network. Caused many roads to wash out.
Flood	March 11-21, 1936	NH State	Damage to Road Network. Flooding caused by simultaneous heavy snowfall totals, heavy rains and warm weather.
Flood/ Severe Storm	August 27, 1986	Cheshire, Hillsborough Counties, NH	FEMA Disaster # 771-DR (Presidentially Declared Disaster) \$1,005,000 in damage
Flood / Severe Storm	April 16, 1987	Cheshire, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, & Sullivan Counties, NH	FEMA Disaster Declaration # 789- DR (Presidentially Declared Disaster). Flooding of low-lying areas along river caused by snowmelt and intense rain. \$4,888,889 in damage.
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	FEMA Disaster Declaration # 876. Flooding caused by a series of storm events with moderate to heavy rains. \$2,297,777 in damage.
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford, Sullivan Counties, NH	FEMA Disaster Declaration # 1144- DR. Flooding caused by heavy rains. \$2,341,273 in damage.
Flood	July 2, 1998	Southern NH	FEMA Disaster Declaration # 1231. Severe storms and flooding.
Flood	July-Aug 2003	Cheshire & Sullivan Counties	FEMA Disaster Declaration # 1489. Severe storms and flooding. NH 12 washed out locally.
Flood	October 26th 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding.

Hazard	Date	Location	Description of Areas Impacted
Flooding- Disaster Declarations			
Flood	October- November 2005	Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan counties	FEMA Disaster Declaration # DR-1144- NH DR-1610
Flood	May 25th, 2006	Belknap, Carroll, Hillsborough, Merrimack, Rockingham, and Strafford Counties, NH	FEMA Disaster Declaration # 1643. Severe storms and flooding.
Flood	April 16, 2007	All counties, NH	FEMA Disaster Declaration # 1695. Severe storms and flooding.
Flood	May 26-30, 2011	Coos and Grafton County	FEMA Disaster Declaration # DR-4006; May flood event. No significant local impact.
Flood	May 29-31, 2012	Cheshire County	FEMA Disaster Declaration # 4065; \$3,046,189 (Statewide assistance). Significant local impact. Several roads washed out. FEMA provided \$49,278 in local assistance.
Flood	June 26-July 3, 2013	Cheshire, Sullivan, and Grafton Counties	FEMA Disaster Declaration #4139; \$6,389,704 (Statewide assistance). Significant local impact including a culvert failure resulting in the washout of NH 12. NH 63 also washed out and needed to be rebuilt. FEMA provided \$89,777 for road repairs and \$373,343 for replacement of the River Road North Bridge (75%) in local assistance.
Flooding- Localized- Medium Risk			
Below is a list of past occurrences of flooding in Westmoreland.			
Flooding	Seasonal flooding	McAdam Road, Makinen Road, Hurricane Road, River Road, Spofford Road	Steep slopes and heavy rain have caused these roads to have minor occasional flooding, however, no structures have been impacted and no town services needed, therefore no specific dates are recorded.
Wildfires- Medium Risk			
Potential hazard- As timber harvesting is reduced, wood roads close, debris builds up on the ground, the potential for wildfire increases town-wide. The entire town is at risk with minimal forest fire protection. Wildfires are classified according to size: Class A - one-fourth acre or less; Class B - more than one-fourth acre, but less than 10 acres; Class C - 10 acres or more, but less than 100 acres; Class D - 100 acres or more, but less than 300 acres; Class E - 300 acres or more, but less than 1,000 acres; Class F - 1,000 acres or more, but less than 5,000 acres; Class G - 5,000 acres or more.			
Wildfire	2014	River Road	Class B. No structures involved and no impact to utilities. Less than 10 acres were burned. Mutual aid from Chesterfield assisted; approximately 2-3 hours to extinguish; no local injuries reported.
Wildfire	2014	River Road	Class B. Less than 10 acres burned. No structures involved and no impact to utilities; approximately 2 hours to extinguish; no local injuries reported.
Tornados, Downbursts, and Severe Wind - Medium Risk			
Past and Potential hazard- Town at risk from severe localized blasting winds. Structural damage potential; such events cause small blocks of downed timber. High elevations at greatest risk. Old trees along roads at risk of falling and causing damage to structures during wind events. Potential for loss of electricity. Downbursts are sometimes mistaken for tornados and can cause very similar damage. There have been no recorded or documented incidents of downbursts in Westmoreland.			

The **Enhanced Fujita Scale** is used to rate the intensity of a tornado by examining the damage caused by the tornado once it has passed. (see scale below).

EF-Scale Number, Wind Speed, Frequency, and Type of damage

EF-0

Wind Speed: 65-85 mph; Frequency: 53.5%

Minor or no damage. Some damage to gutters, siding and roofs; breaks branches off trees; pushes over shallow-rooted trees.

EF-1

Wind Speed: 86-110 mph; Frequency: 31.6%

Moderate damage. Roofs severely stripped; mobile homes damaged or overturned; windows and glass broken, loss of exterior doors.

EF-2

Wind Speed: 111-135 mph; Frequency: 10.7%

Considerable damage. Roofs torn off well constructed homes; foundations of framed homes shifted; mobile homes demolished; large trees snapped or uprooted; light object missiles generated; cars lifted off of ground.

EF-3

Wind Speed: 136-165 mph; Frequency: 3.4%

Severe Damage. Entire stories of well-constructed houses destroyed; severe damage to large building and malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown.

EF-4

Wind Speed: 166-200 mph; Frequency: 0.7%

Extreme Damage. Well-constructed houses completely leveled; cars thrown and large missiles generated.

EF-5

Wind Speed: >200 mph; Frequency <0.1%

Total Destruction. Strong frame houses lifted off foundations and carried considerable distances to disintegrate; steel reinforced concrete structures are critically damaged; tall buildings collapse.

Source: <http://www.tornadoproject.com/fscale/fscale.htm>

Tornados, Downbursts, and Severe Wind- Medium Risk (cont.)

Hazard	Date	Location	Description of Areas Impacted
Tornado	September 15, 1922	Cheshire County	F2
Tornado	September 13, 1928	Cheshire County	F2
Tornado	August 13, 1963	Cheshire County	F2
Tornado	June 6, 1963	Cheshire County	F2
Tornado	July 3, 1997	Swanzey, NH	An F1 tornado caused severe tree loss in Swanzey, destroyed a building and damaged the stables at the Cheshire Fairgrounds. No injuries reported locally.
Tornado	July 3, 1997	Greenfield, NH	An F2 Tornado caused damage to a summer camp, the recycling center and completely destroyed a lumber facility.
Tornado	May 23, 1998	Hillsborough County	F2. No significant damage or injuries reported locally.
Tornado	July 24, 2008	Deerfield/Northwood	EF2. No significant damage or injuries reported locally.

Hurricanes (Category given if known) and Tropical Storms- Medium Risk

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating system based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph.

<http://www.nhc.noaa.gov/aboutsshws.php>

**Saffir-Simpson Hurricane Wind Scale
Category, Sustained Winds, and Types of Damage**

Category 1

Wind Speed: 74-95 mph, 64-82 kts

Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, 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

Category 2

Wind Speed: 96-110 mph, 83-95 kts

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.

Category 3

Wind Speed: 111-129 mph, 96-112 kts

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.

Category 4

Wind Speed: 130-156 mph, 113-136 kts

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.

Category 5

Wind Speed: 157 mph or higher, 137 kts or higher

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.

Source: <http://www.nhc.noaa.gov/aboutsshws.php>

Hazard	Date	Location	Description of Areas Impacted
Hurricanes and Tropical Storms- Medium Risk (cont.)			
Hurricane	October 9, 1804	n/a	n/a
Gale	Sept. 23, 1815	n/a	Winds > 50mph
Hurricane	Sept. 8, 1869	n/a	n/a
Hurricane	September 21, 1938	Southern New England	Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total storm losses of \$12,337,643 (1938 dollars). 186 mph maximum winds.
Hurricane (Carol)	August 31, 1954	Southern New England	Category 3, winds 111-130 mph. Tree and crop damage in NH, localized flooding
Hurricane (Edna)	September 11, 1954	Southern New England	Category 3 in Massachusetts. This Hurricane moved off shore but still cost 21 lives and \$40.5 million in damages throughout New England. Following so close to Carol it made recovery difficult for some areas. Heavy rain in NH
Hurricane (Donna)	September 12, 1960	Southern and Central NH	Category 3 (Category 1 in NH). Heavy flooding in some parts of the State.
Tropical Storm	October 7, 1962	Coastal NH	Heavy swell and flooding along the coast
Tropical Storm	August 28, 1971	New Hampshire	Center passed over NH resulting in heavy rain and damaging winds

Hazard	Date	Location	Description of Areas Impacted
Hurricanes and Tropical Storms- Medium Risk (cont.)			
Hurricane (Belle)	August 10, 1976	Southern New England	Primarily rain with resulting flooding in New Hampshire. Category 1
Hurricane (Gloria)	September, 1985	Southern New England	Category 2, winds 96-110 mph. Electric structures damaged; tree damages. This Hurricane fell apart upon striking Long Island with heavy rains, localized flooding, and minor wind damage in NH
Hurricane (Bob)	August 19, 1991	Southern New England	Structural and electrical damage in region from fallen trees. 3 persons were killed and \$2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR.
Hurricane (Edouard)	September 1, 1996	Southern New England	Winds in NH up to 38 mph and 1 inch of rain along the coast. Roads and electrical lines damaged.
Tropical Storm (Floyd)	September 16-18, 1999	Southern New England	FEMA DR-1305-NH. Heavy Rains.
Hurricane (Katrina)	2005	Gulf Region- Southern US	Caused an estimated \$100 billion in damages.
Tropical Storm (Tammy)	October 5-13, 2005	East Coast of US	Remnants of Tammy contributed to the October 2005 floods which dropped 20 inches of rain in some places in NH.
Tropical Storm (Irene)	2011	New England states	FEMA Disaster Declaration #DR-4026 and EM- 3333. No significant damage recorded locally. No local injuries.
Tropical Storm (Sandy)	October 26- November 8, 2012	Eastern United States	FEMA Disaster Declaration # DR 4095; NH Counties that received the most damage were Belknap, Carroll, Coos, Grafton, Rockingham, and Sullivan. No significant damage recorded locally. No local injuries.

Source: USGS Hazards Program

Severe Winter Weather- Medium Risk

Three types of winter events are heavy snow, ice storms and extreme cold. Occasionally heavy snow will collapse buildings. Ice storms have disrupted power and communication services. Extreme cold affects the elderly. These random events make it difficult to set a cost to repair or replace any of the structures or utilities affected. The chart below is an indicator of the severity of ice storms and can assist emergency management officials in predicting the length of power outages based on wind speed and amount of ice accumulation during the storm. This index is similar to those that are used to predict the severity of tornados and hurricanes. Planning ahead will mitigate the damage and prepare communities for severe ice events days in advance.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) <small>*Revised October, 2011</small>	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 – 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	< 15	
2	0.10 – 0.25	25 – 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 – 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 – 35	
	0.50 – 0.75	15 – 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 – 35	
	0.75 – 1.00	15 – 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Source: SPIA Index.com

Severe Winter Weather- (cont.)

Hazard	Date	Location	Description of Areas Impacted
Ice Storm	December 17-20, 1929	New Hampshire	Unprecedented disruption and damage to telephone, telegraph and power system. Comparable to 1998 Ice Storm (see below)
Blizzard	February 14-17, 1958	New Hampshire	20-30 inches of snow in parts of New Hampshire
Snow Storm	March 18-21, 1958	New Hampshire	Up to 22 inches of snow in south central NH
Snow Storm	January 18-20, 1961	New Hampshire	Up to 25 inches of snow in southern NH
Snow Storm	February 2-5, 1961	New Hampshire	Up to 18 inches of snow in southern NH
Snow Storm	January 11-16, 1964	New Hampshire	Up to 12 inches of snow in southern NH
Blizzard	January 29-31, 1966	New Hampshire	Third and most severe storm of 3 that occurred over a 10-day period. Up to 10 " of snow across central NH

Severe Winter Weather (cont.)

Hazard	Hazard	Hazard	Hazard
Snow Storm	December 26-28, 1969	New Hampshire	Up to 41 inches of snow in west central NH
Snow Storm	February 18-20, 1972	New Hampshire	Up to 19 inches of snow in southern NH
Snow Storm	January 19-21, 1978	New Hampshire	Up to 16 inches of snow in southern NH
Blizzard	February 5-7, 1978	New Hampshire	New England-wide. Up to 25 inches of snow in central NH
Snow Storm	February, 1979	New Hampshire	President's Day storm
Ice Storm	January 8-25, 1979	New Hampshire	Major disruptions to power and transportation
Snow Storm	April 5-7, 1982	New Hampshire	Up to 18 inches of snow in southern NH
Ice Storm	February 14, 1986	New Hampshire	Fiercest ice storm in 30 yrs in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to New London NH.
Extreme Cold	Nov-Dec, 1988	New Hampshire	Temperature was below 0 degrees F for a month.
Ice Storm	March 3-6, 1991	New Hampshire	Numerous outages from ice-laden power lines in southern NH.
Snow Storm	1997	New Hampshire	Power outages throughout New Hampshire due to heavy snowfall
Ice Storm	January 15, 1998	New Hampshire	Federal disaster declaration DR-1199-NH, 20 major road closures, 67,586 without electricity, 2,310 without phone service, \$17+ million in damages to Public Service of NH alone.
Snow Storm	February 2006	New Hampshire	Trees down and power outages due to heavy snowfall.
Ice Storm	December 8, 2008	New Hampshire	Downed trees and power lines, power outages up to 1 Month; Some residents were without power for 2 weeks. Evacuation of elderly resident due to power outage.
Snow Storm	October 29-30, 2011	New Hampshire	FEMA Disaster Declaration # DR-4049 (Hillsborough and Rockingham Counties). Severe snowstorm event. Snowfall 34" in a 24 hour period. Minimal impact locally. No local injuries reported.
Snow Storm	February 8-10, 2013	New Hampshire	February blizzard "Nemo", exceeded previous snow fall amounts; category B Declaration # DR4105. Minimal impact locally. Few reported electrical outages locally. No local injuries reported.
Snow Storm	November 2014	New Hampshire	"Thanksgiving Storm"- was declared the 4 th largest power outage in NH history. Many communities received over 12" of snow. Some local power outages lasted 2 days. No local injuries reported.
Snow Storm	January 2015	New Hampshire	Several successive snow storms that dumped in excess of 10" each. No serious impact to Town residents except several days of school closures.

Erosion -Medium Risk

Some steep slopes exist that have the potential for erosion. Maintaining vegetation on slopes and avoiding clearcutting of trees on steep grades will reduce the severity of erosion during heavy rain events. The extent of erosion occurs over time and is exacerbated by heavy rains. Road embankments may experience erosion during heavy rain events which could undermine the road and cause damage to the surface leaving the road to be impassable. Areas of concern were identified by the committee and are shown on the Past and Potential Hazard Map. A house was removed in June 2016 on NH 12 due to erosion that caused structural damage. Areas of considerable erosion has occurred along the shoreline of the Connecticut River, especially along River Road and Ferry Road.

Hazardous Materials Spills- Low Risk

Transportation of chemicals and bio-hazardous materials through town on NH 12 and NH 63 by truck is a concern. The severity of such an event greatly varies depending on the type of hazardous material, location, and response time, as well as other contributing factors such as wind and rain. Hazardous spills can contaminate the air, land, and water and cause serious health hazards or death. In 2015, a logging truck on Hat Road ruptured fuel tanks resulting in 50-60 gallons of diesel fuel leaking. No death or injury, however, soil had to be removed to clean up the site. The Westmoreland Fire Department was called as well as the Southwest Mutual Aid and the NH HazMat team.

Dam Failure- Low Risk

The town has not experienced any dam failures.

Potential hazard- The Table below shows the dams in Westmoreland that are registered with the State of New Hampshire.

The State of New Hampshire classifies dams into the following four categories:

NM – Non-menace	S – Significant hazard	Blank- Non-Active
L – Low hazard	H – High Hazard	

Detailed description of classification terms:

Non-Menace structure means a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is:

- Less than six feet in height if it has a storage capacity greater than 50 acre-feet; or
- Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.

Low Hazard structure means a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:

- No possible loss of life.
- Low economic loss to structures or property.
- Structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassable or otherwise interrupt public safety services.
- The release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than two-acre-feet and is located more than 250 feet from a water body or water course.
- Reversible environmental losses to environmentally-sensitive sites.

Significant Hazard structure means a dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:

- No probable loss of lives.
- Major economic loss to structures or property.
- Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services.
- Major environmental or public health losses, including one or more of the following:
- Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair.
- The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more.
- Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.

High Hazard means a dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of:

- Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions.
- Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot.
- Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services.

Westmoreland Hazard Mitigation Plan Update 2016

- The release of a quantity and concentration of material, which qualify as “hazardous waste” as defined by RSA 147-A:2 VII.
- Any other circumstance that would more likely than not cause one or more deaths.

Generally, all Class H dams need to have Emergency Action Plans, and most Class S dams also require them. There are five Class NM dams within the Town of Westmoreland and one Class S dam according to the Department Of Environmental Services Dam Bureau. The Class S dam is the Cheshire County Wastewater lagoon for the Cheshire County facilities at that location. There is no Emergency Action Plan required for this dam.

DAM #	HAZCL	STATUS	NAME	RIVER	HEIGHT	IMPND	OWNER
D251001		RUINS	HARTWELL SAWMILL DAM	PARTIDGE BROOK	9		MR JOHN BURT
D251002		RUINS	PARTRIDGE BROOK SAWMILL DAM	PARTIDGE BROOK	6		MR HAROLD PLOOF
D251003		RUINS	MILL BROOK SAWMILL DAM	MILL BROOK	8		MR F W ALDRICH
D251004		RUINS	PARTRIDGE BROOK	PARTIDGE BROOK			UNKNOWN
D251005		RUINS	PARTRIDGE BROOK	PARTIDGE BROOK			UNKNOWN
D251006		RUINS	ALDRICH BROOK	ALDRICH BROOK			OWNER UNKNOWN
D251007	NM	ACTIVE	PARTRIDGE BROOK	PATRIDGE BROOK			UNKNOWN
D251008		NOT BUILT	SACHS FARM POND DAM	UNNAMED STREAM		0.92	MRS DEWEY
D251009		NOT BUILT	DEWEY FARM POND DAM	UNNAMED STREAM			MRS DEWEY
D251010		BREACHED	HUBBARD FARM POND DAM	UNNAMED BROOK	6	0.3	HUBBARD FARMS
D251011	NM	ACTIVE	RECREATION POND DAM	TR PARTRIDGE BROOK	14	0.25	MR WILLIAM CLEARY
D251012	NM	ACTIVE	DETENTION POND 1 DAM	RUNOFF	17	0.62	MR DONALD BREHM
D251013	NM	ACTIVE	DETENTION POND 2 DAM	RUNOFF	22.5	0.8	MR DONALD BREHM
D251014		NOT BUILT	DETENTION POND 3 DAM	RUNOFF	8.2	2.2	MR DONALD BREHM
D251015	NM	ACTIVE	SY POND	UNNAMED STREAM	9	0.14	MRS WALTER P SY
D251016	S	ACTIVE	CHES CNTY WW LAGOON	NA	20	0.6	CHESHIRE CNTY FACILITIES

Source: Department of Environmental Services Dam Bureau- 2015

- There is no history of dam breach or failure in Westmoreland.
- A dam breach could potentially cause death, injury, or structural damage, however, this is unlikely with the few dams in town.

In addition to the dams in the chart above, there is a beaver dam on Glebe Road (Harvey Pond), South Village Road, Owls Hill Road, and Spofford Road near the Town Line.

**CHAPTER 4
POTENTIAL HAZARDS and VULNERABILITY ASSESSMENT
ASSESSING PROBABILITY, SEVERITY AND RISK**

Vulnerability and Risk Assessment

The vulnerability and risk assessment provides information to enable the town to identify and prioritize appropriate mitigation actions to reduce losses from the identified hazards. For each hazard type shown in the table below, the committee assigned a value to reflect the Human, Property and Business impact of each hazard to determine the vulnerability. Then, the committee assigned a probability value reflecting the likelihood this hazard will occur in the next 25 years. The severity and risk was calculated from the inputted values. The final column indicates the risk of each hazard, allowing the committee to see which hazards pose the greatest risk to the community. Low-Medium-High (1-2-3) risk was assigned as shown below.

Risk factor: 1-3- Low (L) 4-6- Med (M) 7-9- High (H)

	Human Impact Probability of death or injury 1=Low 2=Medium 3=High	Property Impact Physical losses and damages 1=Low 2=Medium 3=High	Business Impact Interruption of service 1=Low 2=Medium 3=High	Probability Likelihood this will occur in 25 years 1=Low 2=Medium 3=High	Severity Average of human, property, business impacts	Risk Severity x Probability	Risk Level Low Medium High
Flooding	1	2	2	3	1.7	5	Medium
Wild Fire	2	2	1	3	1.7	5	Medium
Tornado/downburst/wind	2	3	3	2	2.7	5	Medium
Hurricane/tropical storm	1	2	3	2	2	4	Medium
Severe Winter Weather	1	1	3	3	1.7	5	Medium
Erosion	1	2	1	3	1.3	4	Medium
HazMat Spills	1	1	1	1	1	1	Low
Dam Failure	1	1	1	1	1	1	Low

The Past and Potential Hazards Map is located in the back pocket of binder of the plan

**CHAPTER 5
POTENTIAL HAZARDS and VULNERABILITY ASSESSMENT**

The following is a list of natural and manmade disasters, and the areas affected by them, that could affect the Town of Westmoreland. The “Past and Potential Hazards Map” at the end of this Plan reflects the contents of this list. After careful review of the historical natural disasters in and near the Town of Westmoreland the committee determined that the risk of drought, extreme heat, earthquakes, lightning, landslide, and snow avalanches do not pose enough of a risk to the town to include in this plan for the following reasons- drought, extreme heat, and lightning are better addressed in the Emergency Operations Plan and by preparedness outreach methods; earthquakes in this region are of low intensity and impact; the terrain is not steep enough for landslides or avalanches but instead has been identified as erosion.

In order to determine estimated losses due to natural and man made hazards in Westmoreland, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. These figures exclude both the land value and contents of the structure. The value of all structures, including exempt structures such as schools and churches, is \$132,876,800. The median value of a home in 2016 in Westmoreland is \$184,010 according to the New Hampshire Housing Finance Authority. The data below was calculated using FEMA’s Understanding Your Risks: Identifying Hazards and Estimating Losses. In addition, the Committee completed the Vulnerability Assessment Worksheets which provided more data to estimate the potential losses. Since hazard vulnerability assessment is dependent on such a range of variables, such as the type, magnitude and precise location of a future hazard, such assessments are far from an exact science. Therefore, it is understood that the monetary values arrived at through this assessment represent gross estimates. The probabilities of the following hazard events occurring in town have been ranked from low to high risk.

Flooding - Medium Risk

The Town has experienced flooding due to heavy stormwater runoff and will continue to experience problems unless more permanent solutions are developed with the coordination and cooperation of state agencies such as NH DOT and NH DES. In particular, the village area along NH 12 is at the base of steep terrain and two brooks that can rise quickly during these heavy storm events. The committee stated that these two agencies have studied this area, but no resolution has been determined at the time of this writing.

Ferry Road- \$552,030: Approximately 3 structures have the potential to be affected by flood waters. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$552,030.

- Annual event - some flooding in floodplain from both spring runoff and heavy summer/fall rains
- Annual damage/repair to the road surface
- Annual repair and upkeep to bridge and culverts

Makinen Road - Medium Risk - \$580,500: Approximately 1 residential structures have been affected or have the potential to be affected by flood waters. Heavy rains and runoff has caused Mill Brook to overflow its banks and wash the road out.

Thompson Road (Partridge Brook)- \$300,000: Approximately 1 residential structure could be affected by heavy rain runoff or rapid snowmelt. Cost of repairing or replacing to be \$300,000.

- Steep slopes on sides of road amplify the velocity of runoff to the road surface

South Village Road area and Makinen Road area: - \$1,472,080: Approximately 8 structures could be affected by heavy runoff. Cost of repairing or replacing could reach \$1,472,080. This cost does not include land damages and content of structures. Damage to NH South Village Road could potentially affect a large portion of Westmoreland attempting to evacuate to the east to get to NH 12.

- Culverts were upgraded in 2003

Wildfire - Medium Risk - Approximately \$1,000/acre: As timber harvesting is reduced, wood roads close, and debris builds up on the ground, the potential for wildfire increases town-wide. Downed timber from the 2008 ice storm and other severe weather events adds a fire danger risk for wooded areas. There is minimal forest fire protection in town.

- Increased risk on Mount Gilboa, Torrey Hill and the wooded portion of town
- Mount Gilboa, London and Wentworth Roads - remain open for fire fighting purposes
- There is a potential of disruption of services such as power and phone;
- There is a potential for collapse of structures, roads and bridges;
- There is a potential for injury or death;
- This is more likely to occur in the forested areas.

Erosion - Medium Risk - No Record of Cost: There are several areas of known erosion shown on the Past and Potential Hazards Map. The erosion is primarily along roadsides due to improperly maintained roadside drainage systems as well as undersized culverts. The damage due to erosion is mainly in the form of undercut roadways. Erosion usually affects infrastructure such as roads and bridges, but they can also affect individual structures and businesses. Since this hazard has already occurred in isolated parts of town, damages from this hazard could be expected to range from a few thousand dollars to a few million dollars, depending on the severity of the event and infrastructure impacted.

- There is a potential for mud and debris to enter the streams;
- There is a potential for mud and debris onto roads and could cause temporary road closures.
- The potential for severe erosion exists along the Connecticut River, especially during extreme events such as hurricanes, tropical storms, and extended periods of heavy rainfall.
- Erosion caused by flooding can lead to the undermining of roads and can result in detours.

Tornado/downburst/ severe wind - Medium Risk - Estimate of Cost – \$2,657,536: The southwestern portion of the state is considered a special wind hazard area as demonstrated by the high proportion of tornadoes and severe wind events that are experienced there annually. On July 3, 1997 several tornadoes struck this section of the state. An F1 tornado caused severe tree loss in Swanzy, destroying a building and damaged the stables at the Cheshire Fairgrounds. At the same time an F2 tornado struck Greenfield causing damage to a summer camp, the recycling center and completely destroying a lumber facility. Fortunately, no deaths resulted from these events. Although outside the southwest region, the 2008 Barnstead Tornado caused significant damage and also involved loss of life. Therefore, this is a real hazard and the damage it could inflict should not to be taken lightly. An estimated damage to 10% of structures in town with 20% damages is \$2,657,536. Estimated cost does not include building contents, land values or damages to utilities. River corridors and hill tops are susceptible.

- There is a potential of disruption of services such as power and phone;
- There is a potential for loss of life and property;
- Potential for damage to structures, roads and bridges;
- This could occur Townwide.

Hurricane/tropical storm - Medium Risk - Estimate of Cost - \$3,321,920: A major hurricane or tropical storm can cause significant damage to a community. Most of the damage is caused by high water and high winds. Since

Westmoreland is inland from the coast, less damage would be expected to occur here than in coastal areas. A major hurricane or tropical storm can cause significant damage to a community. Hurricanes can and do create flooding. Estimated wind damage to 5% of the structures with 10% damage \$664,384. Estimated flood damage 10% of the structures with 20% damage \$2,657,536. Estimated cost does not include building contents, land values or damages to utilities.

- There is a potential of disruption of services such as power and phone;
- There is a potential for downed trees onto structures and roads.
- There is a potential for loss of life and property;
- This could occur Townwide.

Severe Winter Weather - Medium Risk - No Record of Cost: Heavy snow, ice storms and extreme cold are three types of winter events that cause concern. Occasionally heavy snow years will collapse buildings. Ice storms have disrupted power and communication services. Timberland has been severely damaged. Extreme cold affects the elderly. Westmoreland's recent history has not recorded any loss of life due to the extreme winter weather. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

- Area has been subject to extremely heavy snow falls, records of early 1900s and into the 1950s and 1960s indicate this
- 1969 heavy snow - several 3 feet events
- 1988 temperature below 0 degrees for a month (Nov.- Dec.)
- 2008 ice storm - power outages and downed wires
- River Road, Owls Hill Road, Carriage Lane, Paine Road, Glebe Road, and NH Route 63 and 12 - snow pack shortens road widths - affects accessibility of firefighting and rescue equipment
- There is a potential of disruption of services such as power and phone;
- There is a potential for loss of life and property;
- Potential for damage to structures, roads and bridges;
- This could occur Townwide.

Man-Made Hazards - Hazardous Materials - Low Risk - No Record of Cost: Chemicals are found everywhere. They purify drinking water, increase crop production, and simplify household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal.

- Transportation of chemicals and bio-hazardous materials through town on NH 12 and 63 by truck is a concern. It was noted that many parcels in Town have private dumps.
- A spill could cause water contamination or airborne pollutants to residents which may cause illness or death.

Man-Made Hazards - Dams - Low Risk - No Record of Cost: The Past and Potential Hazards Map depicts the location of several dams within the Town of Westmoreland. There is no history of dam breach or failure in Westmoreland.

- A dam breach could potentially cause death, injury, or structural damage, however, this is unlikely with the few dams in town.

**CHAPTER 6
CRITICAL FACILITIES**

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort
- Maintains an existing level of protection from hazards for the community
- Would create a secondary disaster if a hazard were to impact it

Critical Facilities Within Hazard Areas

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. Two identified critical facilities fall within the 100-year floodplain. The facilities are identified in the following table:

FACILITY NAME	FACILITY TYPE	BUILDING TYPE	ADDRESS
Wastewater Treatment Facility	Wastewater Facility	Wastewater Treatment Facility	River Road
Bridge	Bridge	Bridge	River Road

The Critical Facilities List for the Town of Westmoreland has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Westmoreland's Hazard Mitigation Planning Committee has broken up this list of facilities into four categories. The first category contains facilities needed for Emergency Response in the event of a disaster. The second category contains Non-Emergency Response Facilities that have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Westmoreland. The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster. The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster. The Critical Facilities Map at the end of this Plan identifies these facilities.

Category 1 - Emergency Response Services:

The town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards.

1. Emergency Operations Center

Westmoreland Fire Station - NH Route 63

2. Fire Station

Westmoreland Fire Station - NH Route 63

3. Emergency Fuel Facilities

Town Municipal Garage - McAdam Road

Mac's Store – NH Route 12

Big Deal- NH Route 9 in Spofford

4. Emergency Shelters

Westmoreland School - Glebe Road (existing)

Maplewood Nursing Home - River Road (existing) Town Hall - NH Route 63 (proposed)

Fellowship Hall - NH Route 63 (proposed)

5. Evacuation Routes

NH Route 63
River Road
NH Route 12
Spofford Road
South Village Road
Glebe Road

6. Bridges Located on Evacuation Routes

NH Route 12 - Aldrich Brook
Beaver Brook
Mill Brook
NH Route 63 - Partridge Brook
Mill Brook
River Road - Ox Brook
Partridge Brook
Spofford Road

7. Town Garage - McAdam Road

8. Communications

Cell Tower - Keene Hill on NH Route 9
Aldrich Road
Reynolds Road (2)
Highland Hill

Fairpoint Substation - NH Route 63 in Town center

Remote Terminals:

- River Road across from 810
- Glebe Road around 580
- NH Route 63 near Goodrum's Cross Rd.
- NH Route 12/Old Rt. 12 intersection
- NH Route 12/Discount Grocery parking lot

Category 2 - Non Emergency Response Facilities:

The town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Westmoreland.

1. Water Supply

County Facility Water Supply - River Road
School Water Supply - Glebe Road
Town Hall - NH Route 63
Fellowship Hall - NH Route 63
Pioneer School - Mount Gilboa Road (private)
Fire Station - NH Route 63

2. Problem Culverts

Hunt Road - NH Route 63
Thompson Road - Unnamed tributary to Mill Brook
McAdam Road - Unnamed perennial stream

Partridge Brook Road - Partridge Brook

3. Watershed Issue (flooding)

Area from the summit of NH Route 12 to South Village Road;
and area from Mount Gilboa Road to NH Route 12. Heavy runoff from steep grades flows into Old Mill Brook and White Brook.

Category 3 - Facilities/Populations to Protect:

The third category contains people and facilities that need to be protected in event of a disaster.

1. Special Needs Population - identified by confidential survey administered by Emergency Medical Services.

- Oxygen-dependent people
- People on a lifeline
- People assisted by Home Health
- Shut-ins and disabled
- Mentally challenged
- Elderly
- Hearing impaired
- Sight impaired

2. Recreation Areas

- Westmoreland School Recreation Field - Glebe Road
- Pioneer School Playground - Mount Gilboa Road
- Ballfields - NH Route 12/Mount Gilboa Road

3. Nursing Homes

- Maplewood Nursing Home - River Road

4. Churches

- Westmoreland United Church - NH Route 63
- Union Church- NH Route 12

5. Historic Buildings/Sites

- Town Hall and Town Village - NH Route 63
- Park Hill Area - NH Route 63
- Corner School - River Road/Poocham Road

Category 4 - Potential Resources:

Contains facilities that provide potential resources for services or supplies.

1. Food/Water

- Mac's - NH Route 12
- Big Deal- NH Route 9, Spofford
- United Natural Foods, NH Route 9, Westmoreland
- C & S Groceries, Keene
- Community Kitchen, Keene

2. Hospitals

- Medical Facilities Located in Keene, Peterborough & Brattleboro, VT

3. Gravel Pits/ Quarries

Cold River Materials - NH Route 12 (quarry)
Earl McLanning - River Road (sand pit)
Cersosimo - River Road (gravel)
Graves – Old Route 12 N (gravel & quarry)

4. Miscellaneous Resources

Emergency Broadcast & Television: WKNE, WMUR

Transportation: Busses - Richard Delano Transportation
Trucks - National Guard, Keene
Bus- First Student
Thomas Transportation, Swanzey

Beds, Cots, Blankets: National Guard
Red Cross

Rescue Equipment: Westmoreland Snowmobile Club

Heavy Equipment: Wesley Staples
Bill Patnode
Pat Rawson Construction
M.E. Matthews
Art Chickering

The Critical Facilities Map is located in the back pocket of binder of the plan.

CHAPTER 7

EXISTING MITIGATION STRATEGIES & PROPOSED IMPROVEMENTS

The Westmoreland Hazard Mitigation Committee reviewed each hazard and their related strategies to determine any gaps in coverage. They identified the following existing mitigation strategies related to:

Description of Existing Programs

- **Town Emergency Operations Plan (2015)** -The purpose of the EOP is to have a set structure for carrying out necessary functions in order to provide for the common defense and to preserve the lives and property of the people of Westmoreland from the threat of harm in the event of any natural or man-made disaster.
- **Federal Emergency Regulatory Commission (FERC)/ North Walpole Action Plan** (Bellows Falls Hydro Dam) outlines the procedures to be used as a guide in the event that critical conditions develop which may lead to failure of the facility resulting in an uncontrolled release of water resulting in downstream damage.
- **Erosion & Sedimentation Control Best Management Practices** are used as provided by the State. This is used in Site Plan Review and Subdivision applications.
- **School Evacuation Plan (2015)** - Designated plan to evacuate town school in the event of an emergency or disaster addressing bussing, transportation routes (primary and alternative), traffic & crowd control, end destination and parental notification.
- **Town-adopted Building Code** - Westmoreland maintains a building inspector and has adopted provision of the NH Life Safety Code and the NH State Building Code which includes the International Building Code, International Plumbing Code, International Mechanical Code, International Energy Conservation Code and National Electric Code. Current program is working. Updated editions of code books are obtained as they become available.
- **Code Enforcement** - Code enforcement is done by the Westmoreland Board of Selectmen.
- **Building Inspector and Zoning Administrator**- Reviews permits and administers applications.
- **Local Road Design Standards** - Standards set by the town and the Highway Department to ensure a constant construction benchmark.
- **Bridge Design Standards** - Adopted from NH DOT standards.
- **Local Bridge Maintenance Program** - Guidelines and schedules for annual upkeep of local town bridges and culverts.
- **Winter Rescue** - goes into effect during extreme winter conditions providing rescue services to the town through the fire department.
- **Town Master Plan (2016)** - A guidance document to ensure that overall development in town is sustainable, meeting the needs of the citizens by setting forth steps and guidelines for a sound living environment through intelligent growth.
- **National Flood Insurance Program** - The town is a participating member of the NFIP and should continue to comply with NFIP requirements.

- **Mutual Aid** - Provides assistance to all aspects of Westmoreland’s Emergency Management Services in town.
- **River Stewardship Plan** - Guidelines designed to protect the river and its resources developed by the state for towns that border protected rivers throughout New Hampshire.
- **Emergency Snow Removal Program** - An informal plan in place to contract assistance in the event of an excessive snowfall in Westmoreland.
- **Hazardous Material Regulations** - State regulations, town enforced.
- **Town Warning System** - Town implemented warning system utilizing the town siren.
- **Best Management Practices (BMP’s)** - BMP’s are established by the state for erosion and sediment control.
- **Town Radio System** - The existing system has dead spots along River Road due to antenna placement.
- **Hazardous Materials Plan** - New Hampshire regulations regarding hazardous materials, etc., are enforced in the Town of Westmoreland.
- **Shoreland Water Quality Protection Act** - Designates a protective buffer along the shoreline of the Connecticut River in accordance to NH DES Regulations.
- **Maplewood Evacuation Plan**- An evacuation plan to assist residents, employees, and visitors of the nursing home

Existing Protection Matrix

The Westmoreland Hazard Mitigation Committee has developed the summary matrix of existing hazard mitigation strategies presented on the following pages. This matrix, a summary of the preceding information, includes the type of existing protection (Column 1), area covered (Column 2), the responsible local agent (Column 3), the effectiveness and or enforcement of the strategy (Column 4), the identified improvements or comments (Column 5). Recommended changes will be considered for priority mitigation strategies in the next chapter.

Effectiveness of the existing protection is rated Fair, Average, Good or Unknown: Fair- needs improvements; Average- meets general expectations; Good- meets and sometimes exceeds expectations; Unknown- not yet used or unable to quantify effectiveness.

Existing Protection Matrix

Existing Protection	Description/Area Covered	Responsible Local Agent	Effectiveness (Poor, Avg, Good)	Comments/ Recommended Changes
Westmoreland Emergency Operations Plan (EOP)	2015 most recent update/whole Town covered	EMD	Good	Implementing in progress.
FERC/North Walpole Dam Action Plan	Towns down river of dam	Owner of Hydro Facility and FERC	Unknown	Unable to obtain a copy of the plan.

Existing Protection	Description/Area Covered	Responsible Local Agent	Effectiveness (Poor, Avg, Good)	Comments/ Recommended Changes
Best Management Practices(BMPs) for Soil & Erosion	State guidelines for roads and soil erosion/Whole town	State and local Conservation Commission	Average	Continue using Best Management Practices for town projects.
Winter Rescue	Townwide	Fire Department	Good	No changes needed at this time.
Code Enforcement	Enforce Building and Zoning Ordinances	Board of Selectmen	Good	Continue inspections and enforcements.
Town Warning System	Fire whistle, vehicle mounted loudspeaker, and Reverse 911 (Town)	Fire Chief and EMD	Good	No changes needed at this time.
Shoreland Water Quality Protection Act	Designates a protective buffer along waterbodies.	DES, LAC & Conservation Commission	Good	No changes needed at this time.
Hazardous Materials Plan	State Plan	Fire Chief	Unknown	Training for Fire Dept./Materials needed for Fire Department.
Town Adopted Building Code	State Standards Whole Town	Selectmen/ Building Inspector	Good	No changes needed at this time.
Town Radio System	Town wide frequency. Well-coordinated/whole town	Fire Chief and Road Agent	Average	Need additional antenna location.
Public Awareness - Education Programs	Townwide	EMD/Selectmen	Average	Continue to inform residents.
Town Master Plan (2016)	Update 2016/Townwide	Planning Board	Good	No changes needed at this time.
Mutual Aid	Provides assistance to all aspects of Emergency Management Services/whole town	Fire Chief, EMD, Road Agent, and Selectmen	Good	Continue Mutual Aid for Services.
Participating Member of National Flood Insurance Program	Townwide	Emergency Management Director	Average	Encourage participation/continue compliance.
Emergency Backup Power Program	Fire Station has 3 small portable systems/whole town.	EMD	Good	Install a permanent generator at the Town Hall.
Local Road Design Standards	Townwide	Planning Board and Road Agent	Fair	Updated in 2008: updates technology changes.
Local Bridge Maintenance Program	Townwide	DOT	Good	State inspects all red listed bridges annually, and others bi-annually.
School Evacuation Plan	Elementary School	School Principal	Good	No changes needed at this time.
River Stewardship Plan	Connecticut River Joint Commission	Connecticut River Joint Commission	Good	Continue Outreach & Education.

STATUS OF PREVIOUS PRIORITY MITIGATION ACTIONS

Status of Previous Priority Mitigation Actions

The following table provides a status update for the Priority Mitigation Actions identified in the original Plan. Previously identified mitigation actions are noted as completed, deleted, ongoing, or deferred to the updated Plan's new mitigation strategies list.

MITIGATION ACTION	STATUS	EXPLANATION OF STATUS
Upgrade Culvert at Hunt Road/ NH Route 63	Deferred*	Lack of funding. Continue to this Action Plan.
Upgrade Culvert at Thompson Road	Completed	Culvert was replaced with larger culvert.
Upgrade Culvert at McAdam Road	Deferred*	Lack of funding. Continue to this Action Plan.
Upgrade Culvert at Partridge Brook Road	Deleted	It was determined that this culvert is not a priority.
Upgrade Other Problem Culverts	Ongoing*	This is an ongoing action that covers culverts that have not yet been identified as problems.
Public Education & Outreach About the Importance of NFIP	Ongoing*	This is an ongoing action that will be continued to this Action Plan.
Training on the Importance of NFIP for Town Boards & Employees	Deleted	Not interested in training beyond the outreach and education listed above.
Public Outreach & Education on River Stewardship Plan	Ongoing*	This is an ongoing action that will be continued to this Action Plan.
Maintain Updated Local Road Design Standards As Needed	Ongoing*	This is an ongoing action that will be continued to this Action Plan.
Update Master Plan	Completed	The Master Plan was updated in 2016.
Better Radio Coverage Throughout Town	Deleted	Not a mitigation action.
Update/Implement Winter Rescue Plan	Deleted	Not a mitigation action.
FERC/North Walpole Dam Action Plan-need a copy of plan	Deleted	Not a mitigation action. Should be included in the Emergency Operations Plan.
Hazardous Materials Training for Fire Dept.	Ongoing*	This is an ongoing action that will be continued to this Action Plan.
Install Generators at Town Hall/Fire Department and School	Deferred*	The fire department and school now have generators. One is still needed at the Town Hall. Continue as new action.
Modify Existing Hazardous Materials Plan to Local Needs	Deleted	The State's plan is sufficient. No interest to modify to local needs. Not a mitigation action.
Town Warning System Upgrade-Reverse 911 Needed	Completed	Residents sign up for notifications in the event of emergencies.
Adopt Local Shoreland Protection Ordinance.	Deleted	The Town uses the State's Shoreland Water Quality Protection Act.

CHAPTER 8

POTENTIAL AND PROPOSED MITIGATION STRATEGIES- IDENTIFYING GAPS IN COVERAGE

The following programs and activities are aimed at mitigating the effects of the identified potential hazards. As more information becomes available for other hazards that may have the potential to impact the town of Westmoreland, additional strategies will be added to the Hazard Mitigation Plan Update 2016. The identified strategies are not only meant to address reducing the effects of hazards on existing buildings and infrastructure, but also to address reducing the effects of hazards on new buildings and infrastructure.

In addition to the programs and activities that Westmoreland is currently undertaking to protect its residents and property from natural and manmade disasters, a number of additional strategies were identified by the Local Hazard Mitigation Committee for consideration. The process of compiling a comprehensive list of all mitigation strategies currently in place throughout the Town helped the committee to identify gaps in the existing coverage and improvements which could be made to the existing strategies. New strategies were identified for each general hazard type using the following categories: Prevention (programs and policies), Property Protection, Structural Projects, Emergency Services, Public Education and Involvement.

In addition to the mitigation strategies proposed generally for each hazard type as indicated above, the committee brainstormed actions for specific potential hazard areas identified in Chapter 3. The section below shows proposed mitigation actions for both general hazard types and specific potential hazard areas. Each strategy was discussed to determine realistic strategies to be included in the STAPLEE chart.

Potential Mitigation Strategies

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
Flooding	Maintain a culvert inventory and assessment.	Improve access to remote locations. Promote flood proofing for structures in the floodplain.	Maintain ditching, install properly sized culverts, widen road and shoulders and improve surface on the town roads.	Continue to participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	Continue to provide information to the public about NFIP.
	Update local road design standards.				
Wild Fires	Install Fire Danger/Risk level sign.	Continue to implement the fire ponds/dry hydrant management plan to provide increased access to and upkeep of water sources for fire protection.	Install cisterns for more comprehensive fire protection.	Continue the Fire Prevention Program including carbon monoxide, fire and evacuation information.	Provide residents with information on fire safety & prevention (such as Fire Wise).
	Sponsor local level one (1) firefighting training (on weekends).		Strategically locate more fire ponds to cover blank spaces throughout town.		

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
Tornados/Severe Wind/ Downbursts	Develop roadside storm drainage and tree clearance maintenance programs.				Provide information for residents to understand ways to mitigate potential damage during a tornado/ severe wind/downbursts.
Hurricanes/ Tropical Storms	Develop roadside storm drainage and tree clearance maintenance programs.	Consider requirement for new construction to withstand severe wind speeds.			Provide information for residents to understand ways to mitigate potential damage during a hurricane.
Severe Winter Weather	Update the Emergency Snow Removal Plan.	Coordinate with Eversource to trim tree branches near power lines.		Install emergency backup power at Town Hall.	Disseminate information to residents about proper use of generators and the importance of maintaining the heating system to prevent carbon monoxide poisoning and fires.
		Trim tree branches near critical facilities, town structures, and roadways.		Update & implement Winter Rescue Plan including ice rescue training for Fire and Highway departments.	
Erosion	Inspect road embankments for signs of erosion and undermining of roadway.	Enforce building codes and ordinances.		Stabilize with plantings, retaining walls, and rip rap.	Education of public on Shoreland Water Quality Protection Act.
	Establish erosion and sedimentation control plan to be used during town maintenance work.	Continue to implement BMP's throughout town for all construction work to reduce non-point pollutants from entering waterways.			Public outreach and education on River Stewardship Plan.
	Adopt local Shoreland Protection Ordinance.				
Hazardous Materials	Continue hazardous materials training for the Fire Department.				Disseminate outreach material on proper disposal of hazardous household materials and medicines.

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
Dams					Accessible information booths/bulletin boards for visitors and citizens to provide basic emergency plans on evacuation routes, shelters and medical services.
All Hazards	Develop mutual aid pacts with surrounding communities to share resources in order to be better prepared for emergency situations.				News releases and fact sheets on all phases of hazard mitigation and preparedness – include in town newsletter, Westmorelander.
	ICS/NIMS Training for town depts.				Update Master Plan, Zoning Ordinances, Subdivision and Site Plan Regulations with current technical and smart growth practices.

Prioritizing Proposed Mitigation Actions

Each proposed mitigation strategy identified in the previous section was ranked in order to determine a prioritized list of strategies to implement. The method of ranking used for this Hazard Mitigation Plan was the STAPLEE method.

STAPLEE is an acronym for a general set of criteria common to public administration officials and planners. It stands for the Social, Technical, Administrative, Political, Legal, Economic and Environmental criteria for making planning decisions. Questions to ask about suggested actions include:

- **Social:** Is the proposed action socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- **Technical:** Will the proposed action work? Will it create more problems than it solves?
- **Administrative:** Can the community implement the action? Is there someone to coordinate and lead the effort?
- **Political:** Is the action politically acceptable? Is there public support both to implement and to maintain the project?
- **Legal:** Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- **Economic:** What are the costs and benefits of this action? Does the cost seem reasonable for the size of the problem and the likely benefits?
- **Environmental:** How will the action impact the environment? Will the action need environmental regulatory approvals?

Preliminary Prioritization

The Westmoreland Hazard Mitigation Team assigned a score (Good=3, Average=2, Poor=1) to each strategy for its effectiveness related to the critical evaluation factors listed above. The values were totaled and the mitigation priorities were listed according to the scores.

STAPLEE Chart

Mitigation Strategy (Good=3, Average=2, Poor=1)	Is it Socially acceptable?	Is it Technically feasible & potentially successful?	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environ-mentally beneficial?	Total Score
Provide public education & outreach about the importance of NFIP. Encourage participation.	3	3	3	3	3	3	3	21
Provide public outreach & education on the River Stewardship Plan.	3	3	3	3	3	3	3	21
Continue ongoing monitoring, by Town & NHDOT, of State roads and culverts. Maintain communications with NHDOT, NHDES, and NHHSEM.	3	3	3	3	3	3	3	21
Update the Westmoreland Operations Plan (2015)	3	3	3	3	3	3	3	21
Continue hazardous materials training for Fire Dept.	3	3	3	3	3	3	3	21
Install a generator at Town Hall.	3	3	3	3	3	3	3	21
Continue to update and educate the public on hazard mitigation, preparedness, evacuation, shelters. Add links to NH HSEM and FEMA on the Town website.	3	3	3	3	3	3	3	21
Update the list of potential local resources (sand, backhoes, chainsaws, etc.) in the event of a hazard.	3	3	3	3	3	3	3	21
Create and maintain a list of special needs residents.	3	3	3	3	3	3	3	21
Respond to concerns of erosion that have the potential of physical or property impact. Seek actions to address the situation.	3	3	3	3	3	3	3	21
Maintain updated local road design standards as needed.	3	3	3	2	3	3	3	20
Upgrade the culvert at McAdam Road.	3	3	3	3	3	2	3	20
Upgrade the culvert at Hunt Road/ NH 63.	3	3	3	3	3	2	3	20
Upgrade the culvert at Spofford Road.	3	3	3	3	3	2	3	20
Upgrade other problem culverts.	3	3	3	3	3	2	3	20

SECTION 9 PRIORITIZED IMPLEMENTATION SCHEDULE AND ACTION PLAN

The following questions were asked to develop an implementation schedule for the identified priority mitigation strategies:

Who? Who will lead the implementation efforts? Who will put together funding requests and applications?

When? When will these actions be implemented, and in what order?

How? How will the community fund these projects? How will the community implement these projects? What resources will be needed to implement these projects?

As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

The Committee created a prioritized schedule for implementation of the plan. The following terms are used to provide a general timeframe to complete the actions: Short term: 1-2 years; Mid-term: 3-4 years; Long term: 4-5 years; Ongoing: Some actions do not have a completion date and are considered to be ongoing actions that will continue through the duration of the plan.

Action Plan

Mitigation Action	Who (Leadership)	When (Deadline)	How (Funding Source and Estimated Cost)
Provide public education & outreach about the importance of NFIP. Encourage participation.	EMD	Short-term	Town budget; under \$100
Provide public outreach & education on the River Stewardship Plan-Connecticut River Joint Commission (CRJC).	CRJC representative	Short-term	Town budget; under \$100
Continue ongoing monitoring, by Town & NHDOT, of State roads and culverts. Maintain communications with NHDOT, NHDES, and NHHSEM.	Road Agent/ Board of Selectmen	Ongoing	Town budget; under \$100
Update the Westmoreland Operations Plan (2015)	EMD	Long-term	FEMA Grant; \$6000
Continue hazardous materials training for Fire Dept.	Fire Chief	Ongoing	Town budget & grants; under \$500
Install a generator at Town Hall.	Deputy EMD	Long-term	Town budget & grants; \$10,000
Continue to update and educate the public on hazard mitigation, preparedness, evacuation, shelters. Add links to NH HSEM and FEMA on the Town website.	Board of Selectmen	Ongoing	Town budget; under \$100
Update the list of potential local resources (sand, backhoes, chainsaws, etc.) in the event of a hazard.	EMD	Mid-term	Town budget/grants Under \$750
Create and maintain a list of special needs residents.	EMD	Mid-term	Town budget/grants Under \$750
Respond to concerns of erosion that have the potential of physical or property impact. Seek actions to address the situation.	EMD	Ongoing	Town budget; under \$100
Maintain updated local road design standards as needed.	Planning Board/ Road Agent	Mid-term	Town budget; under \$500
Upgrade the culvert at McAdam Road.	Road Agent	Long-term	Town budget/grants \$50,000-\$100,000
Upgrade the culvert at Hunt Road/ NH 63.	Road Agent	Long-term	Town budget/grants \$50,000-\$100,000
Upgrade the culvert at Spofford Road.	Road Agent	Long-term	Town budget/grants \$50,000-\$100,000
Upgrade other problem culverts.	Road Agent	Long-term	Town budget/grants \$50,000-\$100,000

CHAPTER 10
ADOPTION, IMPLEMENTATION, MONITORING & UPDATE

ADOPTION

The Westmoreland Board of Selectmen adopted the Westmoreland Hazard Mitigation Plan on December 1, 2016. A copy of the resolution can be found at the end of this chapter. Adopted policy addresses the actions for implementation set forth in the prioritized implementation schedule (action plan) in the previous chapter and in the “Monitoring & Updates” sub-section contained in this Chapter. All other sections of this Plan are supporting documentation for information purposes only and are not included as the statement of policy.

A copy of the public hearing notice for the Board of Selectmen meeting at which the plan was adopted is included in **Appendix E**. The plan was available to the public via a hard copy at the town offices prior to the Selectmen meeting. Any comments were considered and addressed prior to adoption of the plan.

IMPLEMENTATION

The priority mitigation strategies that were identified by the committee will be implemented through the Board of Selectmen with assistance from the Emergency Management Director, to ensure that the appropriate person or group that was identified in the plan in Chapter 9 succeeds in the implementation of the activity. These activities will be reviewed to ensure that they correspond to the existing programs and land use regulations. This will ensure that the actions taken are done in the best interest of the town.

MONITORING & UPDATES

Recognizing that many mitigation projects are ongoing, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the plan where necessary.

In order to track progress and update the Mitigation Strategies identified in the Action Plan (Chapter 9), it is recommended that the Town revisit the Westmoreland Hazard Mitigation Plan Update 2016 annually, or after a hazard event. The Emergency Management Director is responsible for initiating this review and should consult with the Board of Selectmen and other key local officials. Changes should be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with STAPLEE, the timeframe, the community’s priorities, and funding resources. Priorities that did not make the implementation list, but identified as potential mitigation strategies, should be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.

The local jurisdiction is required by 44 CFR §201.6(d)(3) to review and revise its plan, and resubmit it for approval within **5 years** in order to continue to be eligible for mitigation project grant funding. In keeping with the process of adopting the Westmoreland Hazard Mitigation Plan Update 2016, a public hearing to receive public comment on Plan maintenance and updating should be held during the annual review period and the final product adopted by the Board of Selectmen appropriately. FEMA approval date was **December 15, 2016**.

IMPLEMENTATION OF THE PLAN THROUGH EXISTING PROGRAMS

In addition to work by the Hazard Mitigation Committee and town departments, several other mechanisms exist which will ensure that the Westmoreland Hazard Mitigation Plan Update 2016 receives the attention it requires for satisfactory use.

Master Plan

The Master Plan was updated in 2016. Portions of the Westmoreland Hazard Mitigation Plan Update 2010 were considered during the drafting of the plan. It is an intention of this plan that the Planning Board considers it as an amendment into the Master Plan. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to encourage that the Westmoreland Hazard Mitigation Plan is adopted as a chapter of the Master Plan or by reference in the Appendix.

Zoning Ordinance and Regulations

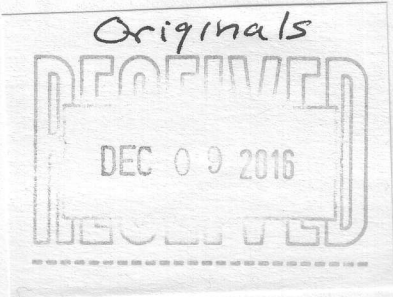
Some of the implementation strategies proposed may involve revisions to the Subdivision Regulations and/or the Site Plan Review Regulations. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to develop appropriate language for the modifications.

Continued Public Involvement

On behalf of the Hazard Mitigation Committee, the Emergency Management Director (EMD), under direction of the Board of Selectmen, will be responsible for ensuring that town departments and the public have adequate opportunity to participate in the planning process. Administrative staff may be utilized to assist with the public involvement process. For the yearly update process, techniques that may be utilized for public involvement include:

- Provide personal invitations to Budget Committee members;
- Provide personal invitations to town department heads;
- Include an article in the Town newsletter, *The Westmorelander*;
- Post notices of meetings at the Town Office, Library, local businesses, and on the Town website;
- Post flyers of the project at the Town Office, Library, and local businesses; and
- Submit newspaper articles for publication to the *Keene Sentinel* and the *Monadnock Ledger*.

A number of Implementation Action items which will be undertaken relate to public education and involvement. Additionally, the public will be invited to participate in the yearly process of updating the Westmoreland Hazard Mitigation Plan Update 2016. These outreach activities could be undertaken during the plan's annual review and during any Hazard Mitigation Committee meetings the Board of Selectmen calls to order.



**CERTIFICATE OF ADOPTION
WESTMORELAND, NEW HAMPSHIRE
BOARD OF SELECTMEN**

**A RESOLUTION ADOPTING THE
WESTMORELAND HAZARD MITIGATION PLAN UPDATE 2016**

WHEREAS, the Town of Westmoreland has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2016 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between April 6 and June 23, 2016 regarding the development and review of the Westmoreland Hazard Mitigation Plan Update 2016; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for the Town of Westmoreland; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Westmoreland, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the Town of Westmoreland eligible for funding to alleviate the impacts of future hazards; now therefore be it RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Westmoreland;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Westmoreland this ~~1st~~ day of December 2016

Russell A. White
Westmoreland Board of Selectmen Chairman

[Signature]
Board of Selectmen

Clyde R. Stelber
Board of Selectmen

ATTEST *JoAnn LeBarre*

APPENDICES

Appendix A: Hazard Descriptions

The following list describes hazards that have occurred or have the potential to occur in the Town of Westmoreland. The descriptions provided are those used in the State of NH Hazard Mitigation Plan.

Flooding

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges. Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to go.

100-year Floodplain Events

- Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term 100- year flood does not mean that a flood will occur once every 100 years. Rather, it is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase “1% annual chance of flood.” What this means is that there is a 1% chance of a flood of that size happening in a year.

Rapid Snow Pack Melt

- Warm temperatures and heavy rains cause rapid snowmelt. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

River Ice Jams

- Rising waters in early spring breaks ice into chunks, which float downstream and often pile up, causing flooding. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice collecting in river bends and against structures presents significant flooding threats to bridges, roads, and the surrounding lands.

Severe Storms

- Flooding associated with severe storms can inflict heavy damage to property. Heavy rains during severe storms are a common cause of inland flooding.

Beaver Dams and Lodging

- Flooding associated with beaver dams and lodging can cause road flooding or flooding damage to property.

Wildfire

Wildfire is defined as an uncontrolled and rapidly spreading fire. A forest fire is an uncontrolled fire in a woody area. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. Grass fires are uncontrolled fires in grassy areas.

Tornado/Downburst/Severe Wind

Tornado-A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down they become a force of destruction.

Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage.

The Enhanced Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud “freight

train” noise. In comparison to a hurricane, a tornado covers a much smaller area but can be more violent and destructive.

Severe Wind-Significantly high winds occur especially during tornadoes, hurricanes, winter storms and thunderstorms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during severe wind occurrences.

Downburst-A downburst is a severe, localized wind blasting down from a thunderstorm. These “straight line” winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories:

- Microburst, which covers an area less than 2.5 miles in diameter, and
- Macrobust, which covers an area at least 2.5 miles in diameter.

Hurricane/ Tropical Storm

A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and may extend over 400 miles. High winds and flooding are primary causes of hurricane-inflicted loss of life and property damage. A tropical storm is a downgraded form of a hurricane with slower wind speeds.

Severe Winter Weather

Ice and snow events typically occur during the winter months and can cause loss of life, property damage and tree damage.

Heavy Snow Storms

- A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding, wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.

Ice Storms

- An ice storm involves rain, which freezes on impact. Ice coating at least one-fourth inch of thickness is heavy enough to damage trees, overhead wires and similar objects. Ice storms often produce widespread power outages.

Nor'easter

- A Nor'easter is a large weather system traveling from South to North passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic winds impact the coast and inland areas from a Northeasterly direction. The sustained winds may meet or exceed hurricane force, with larger bursts, and may exceed hurricane events by many hours (or days) in terms of duration.

Erosion

Erosion is the process in which soil is carried from one area to another, usually along slopes, by rain, river flow, stormwater runoff, or other means. Without stabilization, erosion can cause severe damage to roads, reduce water quality, and reduce property area at the top of embankments.

Man-Made Hazards

Hazardous Materials

Hazardous materials spills or releases can cause damage or loss to life and property. Short or long-term evacuation of local residents and businesses may be required, depending on the nature and extent of the incident.

Dam Breach and Failure

Dam failure results in rapid loss of water that is normally held by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property. Dam breach occurs when the water flows over the dam.

Appendix B: Risk Assessment

The following terms are used to analyze the hazards considered. High, Medium and Low are synonymous with 3, 2 and 1, respectively.

VULNERABILITY- An adjective description (High, Medium, or Low) of the potential impact a hazard could have on the town relating to human, business and property impacts. It is the ratio of population, property, commerce, infrastructure and services at risk relative to the entire town. Vulnerability is an estimate generally based on a hazard's characteristics, information obtained by the various town departments.

HIGH: The total population, property, commerce, infrastructure and services of the town are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst case scenario there could be a disaster of major to catastrophic proportions.

MEDIUM: (1) The total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard of moderate influence; or (2) the total population, property, commerce, infrastructure and services of the town are exposed to the effects of a hazard, but not all to the same degree; or (3) an important segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of moderate to major, though not catastrophic, proportions.

LOW: A limited area or segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of minor to moderate proportions.

PROBABILITY OF OCCURRENCE - An adjective description (High, Medium, or Low) of the probability of a hazard impacting the town within the next 25 years. Probability is based on a limited objective appraisal of a hazard's frequency using information provided by relevant sources, observations and trends.

HIGH: There is great likelihood that a hazardous event will occur within the next 25 years (1-2 events each year).

MEDIUM: There is moderate likelihood that a hazardous event will occur within the next 25 years (1-2 events each 5-10 years).

LOW: There is little likelihood that a hazardous event will occur within the next 25 years (1 event in 25 years).

SEVERITY - Calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

RISK - An adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 25 years. It is calculated by multiplying the probability of occurrence and vulnerability.

HIGH: (1) There is strong potential for a disaster of major proportions during the next 25 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 25 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the town's emergency management training and exercise program.

MEDIUM: There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and

mitigate against this hazard. This hazard should be included in the town's emergency management training and exercise program.

LOW: There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

Appendix C: Resources

Resources Used in the Preparation of this Plan

NH HSEM's *State of New Hampshire Natural Hazards Mitigation Plan* (2013)
FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses*
FEMA's *Local Multi-Hazard Mitigation Planning Guidance*
Westmoreland Town Report 2015
Westmoreland Master Plan 2016

Agencies

New Hampshire Homeland Security and Emergency Management (HSEM)	271-2231	
Field Representative Hillsborough County	271-2231	
Field Representative Cheshire County	271-2231	
Federal Emergency Management Agency (FEMA)	877-336-2734	
NH Regional Planning Commissions:		
Central NH Regional Planning Commission	226-6020	
Lakes Region Planning Commission	279-8171	
Nashua Regional Planning Commission	424-2240	
North Country Council	444-6303	
Rockingham Planning Commission	778-0885	
Southern New Hampshire Planning Commission	669-4664	
Southwest Region Planning Commission	357-0557	
Strafford Regional Planning Commission	994-3500	
Upper Valley Lake Sunapee Regional Planning Commission	448-1680	
NH Executive Department:		
Governor's Office of Energy and Community Services	271-2611	
NH Department of Cultural Resources:		271-2540
Division of Historical Resources	271-3483	
NH Department of Environmental Services:		271-3503
Air Resources	271-1370	
Air Toxins Control Program.....	271-0901	
Asbestos Program.....	271-1373	
Childhood Lead Poisoning Prevention Program.....	271-5733	
Environmental Health Tracking Program.....	271-4072	
Environmental Toxicology Program	271-3994	
Health Risk Assessment Program.....	271-6909	
Indoor Air Quality Program.....	271-3911	
Occupational Health and Safety Program.....	271-2024	
Radon Program	271-4764	
Geology Unit	271-3503	
Pollution Preventive Program.....	271-6460	
Waste Management	271-2900	
Water Supply and Pollution Control	271-3414	
Rivers Management and Protection Program	271-8801	
NH Office of Energy & Planning (OEP)		271-2155
Jennifer Gilbert, State Coordinator, Floodplain Management.....	271-1762	
NH Municipal Association		224-7447
NH Fish and Game Department		271-3421
Region 1, Lancaster.....	788-3164	
Region 2, New Hampton.....	744-5470	
Region 3, Durham	868-1095	
Region 4, Keene	352-9669	
NH Department of Resources and Economic Development:		271-2411
Economic Development	271-2629	
Travel and Tourism	271-6870	

Division of Forests and Lands	271-2214
Division of Parks and Recreation	271-3556
Design, Development, and Maintenance	271-2411
NH Department of Transportation	271-3734
Northeast States Emergency Consortium, Inc. (NESEC)	(781) 224-9876
US Department of Commerce:	(202) 482-2000
NOAA: National Weather Service; Taunton, Massachusetts	(508) 824-5116
US Department of the Interior:	202-208-3100
US Fish and Wildlife Service	225-1411
US Geological Survey	225-4681
US Army Corps of Engineers	(978) 318-8087
US Department of Agriculture:	
Natural Resource Conservation Service	868-7581
Cheshire County, Walpole	756-2988
Sullivan County, Newport	863-4297
Hillsborough County, Milford	673-2409 Ext. #4

Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP).....	NH Homeland Security and Emergency Management
406 Public Assistance and Hazard Mitigation.....	NH Homeland Security and Emergency Management
Community Development Block Grant (CDBG)	NH HSEM, NH OEP, also refer to RPC
Dam Safety Program	NH Department of Environmental Services
Emergency Generators Program by NESEC [‡]	NH Homeland Security and Emergency Management
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP)	NH HSEM, NH OEP
Flood Plain Management Services (FPMS)	US Army Corps of Engineers
Mitigation Assistance Planning (MAP)	NH Homeland Security and Emergency Management
Mutual Aid for Public Works	NH Municipal Association
National Flood Insurance Program (NFIP) [†]	NH OEP, NH HSEM
Power of Prevention Grant by NESEC [‡]	NH Homeland Security and Emergency Management
Project Impact	NH Homeland Security and Emergency Management
Roadway Repair & Maintenance Program(s).....	NH Department of Transportation
Section 14 Emergency Stream Bank Erosion & Shoreline Protection	US Army Corps of Engineers
Section 103 Beach Erosion	US Army Corps of Engineers
Section 205 Flood Damage Reduction	US Army Corps of Engineers
Section 208 Snagging and Clearing	US Army Corps of Engineers
Shoreline Protection Program	NH Department of Environmental Services
Various Forest and Lands Program(s)	NH Department of Resources and Economic Development
Wetlands Programs	NH Department of Environmental Services

[‡]NESEC - Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH HSEM for more information or visit the Consortium's website at <http://www.nesec.org/index.cfm>.

[†] Note regarding **National Flood Insurance Program (NFIP)** and **Community Rating System (CRS)**:
The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community's floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. The NH Office of Energy & Planning can provide additional information regarding participation in the NFIP-CRS Program.

FEMA REGION I MITIGATION PLANNING WEBLIOGRAPHY

Hazard Mitigation is sustained action taken to reduce or eliminate risk to people and their property from natural hazards over the longest possible term.

REGULATORY INFORMATION

Final Rule

44 CFR 201.6

<http://www.fema.gov/pdf/help/fr02-4321.pdf>

Disaster Mitigation Act of 2000 (DMA 2K)

<http://www.fema.gov/library/viewRecord.do?id=1935>

DISASTERS AND NATURAL HAZARDS INFORMATION

FEMA-How to deal with specific hazards

<http://www.ready.gov/natural-disasters>

Natural Hazards Center at the University of Colorado

<http://www.colorado.edu/hazards>

National Oceanic and Atmospheric Administration (NOAA): Information on various projects and research on climate and weather.

<http://www.websites.noaa.gov>

National Climatic Data Center active archive of weather data.

<http://lwf.ncdc.noaa.gov/oa/ncdc.html>

Northeast Snowfall Impact Scale

<http://www.erh.noaa.gov/rnk/Newsletter/Fall%202007/NESIS.htm>

Weekend Snowstorm Strikes The Northeast Corridor Classified As A Category 3 "Major" Storm

<http://www.publicaffairs.noaa.gov/releases2006/feb06/noaa06-023.html>

FLOOD RELATED HAZARDS

FEMA Coastal Flood Hazard Analysis & Mapping

<http://www.fema.gov/national-flood-insurance-program-0/fema-coastal-flood-hazard-analyses-and-mapping-1>

Floodsmart

<http://www.floodsmart.gov/floodsmart/>

National Flood Insurance Program (NFIP)

<http://www.fema.gov/nfip>

Digital quality Level 3 Flood Maps

<http://msc.fema.gov/MSC/statemap.htm>

Flood Map Modernization

<http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization>

Hilliard 2/20/2014 Pg. 2

Reducing Damage from Localized Flooding: A Guide for Communities, 2005 FEMA 511

<http://www.fema.gov/library/viewRecord.do?id=1448>

FIRE RELATED HAZARDS

Firewise

<http://www.firewise.org>

NOAA Fire Event Satellite Photos

<http://www.osei.noaa.gov/Events/Fires>

U.S. Forest Service, USDA

<http://www.fs.fed.us/land/wfas/welcome.htm>

Wildfire Hazards - A National Threat

<http://pubs.usgs.gov/fs/2006/3015/2006-3015.pdf>

GEOLOGIC RELATED HAZARDS

USGS Topographic Maps

<http://topomaps.usgs.gov/>

Building Seismic Safety Council

<http://www.nibs.org/?page=bssc>

Earthquake hazard history by state

<http://earthquake.usgs.gov/earthquakes/states/>

USGS data on earthquakes

<http://earthquake.usgs.gov/monitoring/deformation/data/download/>

USGS Earthquake homepage

<http://quake.wr.usgs.gov>

National Cooperative Geologic Mapping Program (NCGMP)

<http://ncgmp.usgs.gov/>

Landslide Overview Map of the Conterminous United States

<http://landslides.usgs.gov/learning/nationalmap/>

Kafka, Alan L. 2008. Why Does the Earth Shake in New England? Boston College, Weston

Observatory, Department of Geology and Geophysics

http://www2.bc.edu/~kafka/Why_Quakes/why_quakes.html

Map and Geographic Information Center, 2010, "Connecticut GIS Data", University of Connecticut

http://magic.lib.uconn.edu/connecticut_data.html

2012 Maine earthquake

http://www.huffingtonpost.com/2012/10/17/maine-earthquake-2012-new-england_n_1972555.html

[WIND-RELATED HAZARDS](#)

ATC Wind Speed Web Site

<http://www.atcouncil.org/windspeed/index.php>

Hilliard 2/20/2014 Pg. 3

U.S. Wind Zone Maps

<http://www.fema.gov/safe-rooms/wind-zones-united-states>

Tornado Project Online

<http://www.tornadoproject.com/>

National Hurricane Center

<http://www.nhc.noaa.gov>

Community Hurricane Preparedness Tutorial

<http://meted.ucar.edu/hurricane/chp/hp.htm>

National Severe Storms Laboratory, 2009, "Tornado Basics",

http://www.nssl.noaa.gov/primer/tornado/tor_basics.html

[DETERMINING RISK AND VULNERABILITY](#)

HAZUS

<http://www.hazus.org>

FEMA Hazus Average Annualized Loss Viewer

<http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cb8228309e9d405ca6b4db6027df36d9&extent=-139.0898,7.6266,-48.2109,62.6754>

Vulnerability Assessment Tutorial: On-line tutorial for local risk and vulnerability assessment

<http://www.csc.noaa.gov/products/nchaz/htm/mitigate.htm>

Case Study: an example of a completed risk and vulnerability assessment

<http://www.csc.noaa.gov/products/nchaz/htm/case.htm>

[GEOGRAPHIC INFORMATION SYSTEMS \(GIS\) AND MAPPING](#)

The National Spatial Data Infrastructure & Clearinghouse (NSDI) and Federal Geographic Data Committee (FGDC) Source for information on producing and sharing geographic data

<http://www.fgdc.gov>

The OpenGIS Consortium Industry source for developing standards and specifications for GIS data

<http://www.opengis.org>

Northeast States Emergency Consortium (NESEC): Provides information on various hazards, funding resources, and other information

<http://www.nesec.org>

US Dept of the Interior Geospatial Emergency Management System (IGEMS) provides the public with both an overview and more specific information on current natural hazard events. It is supported by the Department of the Interior Office of Emergency Management.

<http://igems.doi.gov/>

FEMA GeoPlatform: Geospatial data and analytics in support of emergency management

<http://fema.maps.arcgis.com/home/index.html>

Hilliard 2/20/2014 Pg. 4

[DATA GATHERING](#)

National Information Sharing Consortium (NISC): brings together data owners, custodians, and users in the fields of homeland security, public safety, and emergency management and response. Members leverage efforts related to the governance, development, and sharing of situational awareness and incident management resources, tools, and best practices

<http://nisconsortium.org/>

The Hydrologic Engineering Center (HEC), an organization within the Institute for Water Resources, is the designated Center of Expertise for the US Army Corps of Engineers

<http://www.hec.usace.army.mil/>

National Water & Climate Center

<http://www.wcc.nrcs.usda.gov/>

WinTR-55 Watershed Hydrology

<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1042901>

USACE Hydrologic Engineering Center (HEC)

<http://www.hec.usace.army.mil/software/>

Stormwater Manager's Resource Center SMRC

<http://www.stormwatercenter.net>

USGS Current Water Data for the Nation

<http://waterdata.usgs.gov/nwis/rt>

USGS Water Data for the Nation

<http://waterdata.usgs.gov/nwis/>

Topography Maps and Aerial photos

<http://www.terraserver.com/view.asp?tid=142>

National Register of Historic Places

<http://www.nps.gov/nr/about.htm>

National Wetlands Inventory

<http://www.fws.gov/wetlands/> ICLUS Data for Northeast Region

http://www.epa.gov/ncea/global/iclus/inclus_nca_northeast.htm

PLANNING

American Planning Association

<http://www.planning.org>

PlannersWeb - Provides city and regional planning resources

<http://www.plannersweb.com>

FEMA RESOURCES

Federal Emergency Management Agency (FEMA)

www.fema.gov

Hilliard 2/20/2014 Pg. 5

National Mitigation Framework

<http://www.fema.gov/national-mitigation-framework>

Federal Insurance and Mitigation Administration (FIMA)

<http://www.fema.gov/fima>

Community Rating System (CRS)

<http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-rating-system>

FEMA Building Science

<http://www.fema.gov/building-science>

National Flood Insurance Program (NFIP)

<http://www.fema.gov/national-flood-insurance-program>

Floodplain Management & Community Assistance Program

<http://www.fema.gov/floodplain-management>

Increased Cost of Compliance (ICC): ICC coverage allows homeowners whose structures have been repeatedly or substantially damaged to cover the cost of elevation and design requirements for rebuilding with their flood insurance claim up to a maximum of \$30,000.

<http://www.fema.gov/national-flood-insurance-program-2/increased-cost-compliance-coverage>

National Disaster Recovery Framework

<http://www.fema.gov/national-disaster-recovery-framework>

Computer Sciences Corporation: contracted by FIMA as the NFIP Statistical Agent, CSC provides information and assistance on flood insurance to lenders, insurance agents and communities

www.csc.com

Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan: A Guidebook for Local Governments

<https://www.fema.gov/ar/media-library/assets/documents/89725>

Mitigation Best Practices Portfolio

<http://www.fema.gov/mitigation-best-practices-portfolio>

FEMA Multi-Hazard Mitigation Planning Website <http://www.fema.gov/multi-hazard-mitigation-planning>

FEMA Resources Page <http://www.fema.gov/plan/mitplanning/resources.shtm>

Hilliard 2/20/2014 Pg. 6

Local Mitigation Plan Review Guide <http://www.fema.gov/library/viewRecord.do?id=4859>

Local Mitigation Planning Handbook complements and liberally references the Local Mitigation Plan Review Guide above

<http://www.fema.gov/library/viewRecord.do?id=7209>

[HAZUS](#)

<http://www.fema.gov/protecting-our-communities/hazus>

Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

<http://www.fema.gov/library/viewRecord.do?id=6938>

Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials

<http://www.fema.gov/library/viewRecord.do?id=7130>

IS-318

Mitigation Planning for Local and Tribal Communities

Independent Study Course

<http://training.fema.gov/EMIWeb/IS/is318.asp>

REGION I MITIGATION PLANNING CONTACTS

Melissa Surette

Senior Planner

Phone: (617) 956-7559

Email: marilyn.hilliard@fema.dhs.gov

Josiah (Jay) Neiderbach

FEMA Region I – Mitigation Division

Phone: 617-832-4926 desk / 202-285-7769 cell

Email: josiah.neiderbach@fema.dhs.gov

OTHER FEDERAL RESOURCES

U.S. Army Corps of Engineers: Provides funding for floodplain management planning and technical assistance and other water resources issues.

www.nae.usace.army.mil

Natural Resources Conservation Service: Technical assistance to individual land owners, groups of landowners, communities, and soil and water conservation districts.

www.nrcs.usda.gov

NOAA Coastal Services Center

<http://www.csc.noaa.gov/>

Rural Economic and Community Development: Technical assistance to rural areas and smaller communities in rural areas on financing public works projects.

www.rurdev.usda.gov

Farm Service Agency: Manages the Wetlands Reserve Program (useful in open space or acquisition projects by purchasing easements on wetlands properties) and farmland set aside programs

www.fsa.usda.gov

National Weather Service: Prepares and issues flood, severe weather and coastal storm warnings. Staff hydrologists can work with communities on flood warning issues; can give technical assistance in preparing flood-warning plans.

www.weather.gov

Economic Development Administration (EDA): Assists communities with technical assistance for economic development planning

www.osec.doc.gov/eda/default.htm

National Park Service: Technical assistance with open space preservation planning; can help facilitate meetings and identify non-structural options for floodplain redevelopment.

www.nps.gov

Fish and Wildlife Services: Can provide technical and financial assistance to restore wetlands and riparian habitats.

www.fws.gov

Department of Housing & Urban Development

www.hud.gov

Small Business Administration: SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would qualify for) to install mitigation measures. They can also loan the cost of bringing a damaged property up to state or local code requirements.

www.sba.gov/disaster

Environmental Protection Agency

www.epa.gov

SUSTAINABILTY/ADAPTATION/CLIMATE CHANGE

Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards

Hilliard 2/20/2014 Pg. 8

<http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf>

Resilient Sustainable Communities: Integrating Hazard Mitigation& Sustainability into Land Use

<http://www.earth.columbia.edu/sitefiles/file/education/documents/2013/Resilient-Sustainable-Communities-Report.pdf>

U.S. EPA

<http://www.epa.gov/climatechange/>

NOAA National Ocean Service (NOS)

<http://oceanservice.noaa.gov/>

The Northeast Climate Research Center (NRCC) folks were heavily involved in climate data in the NCA, below. They have a wealth of historic climate data and weather information, trends, etc.

<http://www.nrcc.cornell.edu/>

NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments)

<http://ccrun.org/home>

Community and Regional Resilience: Perspectives from hazards, disasters, and emergency management

http://www.resilientus.org/library/FINAL_CUTTER_9-25-08_1223482309.pdf

National Fish, Wildlife and Plants Climate Adaptation Strategy www.wildlifeadaptationstrategy.gov

ICLEI Local Governments for Sustainability

<http://www.icleiusa.org/>

Kresge Foundation Survey

<http://www.kresge.org/news/survey-finds-communities-northeast-are-trying-plan-for-changes-climate-need-help-0>

New England's Sustainable Knowledge Corridor

<http://www.sustainableknowledgecorridor.org/site/>

The Strategic Foresight Initiative (SFI)

http://www.fema.gov/pdf/about/programs/oppa/findings_051111.pdf

Northeast Climate Choices

http://www.climatechoices.org/ne/resources_ne/nereport.html

Northeast Climate Impacts Assessment

<http://www.northeastclimateimpacts.org/>

Draft National Climate Assessment Northeast Chapter released early 2013

<http://ncadac.globalchange.gov/>

Northeast Chapter of the National Climate Assessment of 2009:

<http://www.globalchange.gov/images/cir/pdf/northeast.pdf>

Hilliard 2/20/2014 Pg. 9

NEclimateUS.org

ClimateNE

www.climatenortheast.com

Scenarios for Climate Assessment and Adaptation

<http://scenarios.globalchange.gov/>

Northeast Climate Science Center

<http://necsc.umass.edu/>

FEMA Climate Change Adaptation and Emergency Management

<https://www.ilis.dhs.gov/content/climate-change-adaptation-and-emergency-management-0>

Climate Central

<http://www.climatecentral.org>

OTHER RESOURCES

New England States Emergency Consortium (NESEC): NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Resources are available on earthquake preparedness, mitigation, and hurricane safety.

www.nesec.org

Association of State Floodplain Managers (ASFPM): ASFPM has developed a series of technical and topical research papers, and a series of Proceedings from their annual conferences.

www.floods.org

National Voluntary Organizations Active in Disaster (VOAD) is a non-profit, nonpartisan membership organization that serves as the forum where organizations share knowledge and resources throughout the disaster cycle—preparation, response, recovery and mitigation.

<http://www.nvoad.org/>

Appendix D: Hazard Mitigation Resource Profiles

The following are fact sheets about the various hazard mitigation grant program.

U.S. Army Corps of Engineers

Contacts:

John Kennelly, Chief, Special Studies Section (for Flood Plain Management Services activities), Phone: (978) 318-8505, Fax: (978) 318-8080, E-mail: John.R.Kennelly@usace.army.mil

Mike Keegan, Chief, Project Planning Section (for Section 14, 103, and 205 authorities), Phone: (978) 318-8087, Fax: (978)318-8080, E-mail: Michael.F.Keegan@usace.army.mil

Address: US Army Corps of Engineers
New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Description and Mission:

The Corps of Engineers is a multi-disciplinary engineering and environmental organization that has been identifying and meeting the water resources needs of the nation. These needs have been in the areas of flood damage reduction, flood plain information and management, navigation, shore protection, environmental restoration, water supply, streambank protection, recreation, and fish and wildlife resources conservation, as well as technical assistance in other water resources areas.

The New England District (NAE) of the Corps of Engineers is responsible for managing the Corps' civil responsibilities in a 66,000 square-mile region encompassing the [six New England states](#) east of the Lake Champlain drainage basin. The District and its [leadership](#) are headquartered in Concord, Massachusetts. The missions of the New England District are many and varied. They include:

- flood damage reduction
- navigation improvements and maintenance
- natural resource management
- streambank and shoreline protection
- disaster assistance
- environmental remediation and engineering
- engineering and construction management support to other agencies

Flood Mitigation Involvement:

As a result of the catastrophic floods in 1936, 1938 and 1955, the Corps was called upon to undertake a comprehensive flood damage reduction program. Since then the Corps has built many flood control structures throughout New England. These include 35 dams and reservoirs, five hurricane protection barriers (two are operated by the Corps) and approximately 60 local flood protection projects. The New

England District has also completed two nonstructural projects involving the relocation of flood prone property and the acquisition of natural flood storage areas. The Corps also provides technical assistance to states and municipalities in locally constructed flood damage mitigation projects and to promote wise and informed use of floodplain and natural retention areas in order to minimize potential future flood damages.

Mitigation Goals and Objectives:

The New England District has two primary mitigation objectives with respect to flood damage reduction. The first objective is the operation and maintenance of the 35 flood control reservoirs and two hurricane barriers that provide protection to the Connecticut, Merrimack, Thames, Naugatuck, and Blackstone River Basins. The second objective is to continue to work with the states and communities in New England to address flooding problems affecting the region.

Projects Desired: The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria.

COE Resources with Respect to Hazard Mitigation:

The New England Division assists in meeting national, regional and local needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

Section 14 - Emergency Stream Bank & Shoreline Protection: This work consists of evaluating alternatives to provide emergency protection to public facilities, such as highways and bridges that are threatened due to erosion. The current Federal limit on Section 14 projects is \$500,000. The local sponsor is required to provide 25 percent of the cost of developing plans and specifications and of construction.

Section 103 - Beach Erosion: Investigations conducted under this authority are to determine methods of protecting public facilities that have been threatened by beach erosion. Currently there is a Federal limit of \$2,000,000 and the local sponsor is required to contribute 35 percent of plans, specifications and construction. The local sponsor is also required to cost-share equally the cost of the feasibility investigation that exceeds \$100,000. The first \$100,000 is at full Federal expense.

Section 205 - Flood Damage Reduction: Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

Section 208 - Snagging and Clearing: This emergency program is designed to reduce flood damage potential by identifying and removing obstructions that contribute to flooding by causing higher flood stages in the floodways. The Federal limit under this program is \$500,000 and the local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

The New England Division also has two Planning Assistance Programs, which provide opportunities for the States to obtain assistance in addressing water resource issues. These programs are the Section 22, Planning Assistance to the States (PAS) program and the Section 206, Flood Plain Management Services (FPMS) program.

Planning Assistance to States Program (PAS): The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

**Ice Engineering Research Division
U.S. Army Cold Regions Research and Engineering Laboratory**

Contact:

Dr. J-C Tatinclaux, Chief, Ice Engineering Research Division

Phone: (603) 646-4187 Fax: (603) 646-4477

E-mail: Jean-Claude.Tatinclaux@cr102.usace.army.mil

Website: <http://www.crrel.usace.army.mil/ierd/>

Address: US Army Cold Regions Research and Engineering Laboratory
Ice Engineering Research Division
72 Lyme Road
Hanover, NH 03755-1290

Description and Mission:

The US Army Cold Regions Research and Engineering Laboratory (CRREL) is a Corps of Engineers' research laboratory that is dedicated to multi-disciplinary engineering and research that addresses the problems and opportunities unique to the world's cold regions. CRREL exists largely to solve the technical

problems that develop in cold regions, especially those related to construction, transport, and military operations. Most of these problems are caused by falling and blowing snow, snow on the ground, ice in the air and in the ground, river ice, ice on seas and lakes, and ice affects on manmade materials. CRREL serves the Corps of Engineers and its clients in three main areas:

- Traditional military engineering, which deals with problems that arise during conflict;
- Military construction and operations technology, i.e., the building and maintenance of military bases, airfields, roads, ports, and other facilities; and
- Civil works, which involves the Corps in such things as flood protection, navigation on inland waterways and coastal engineering.

CRREL also deals with cold regions problems for the other defense services, for civilian agencies of the federal government, and to some extent for state agencies, municipalities, and private industry.

CRREL's Ice Engineering Research Division (IERD) was created to research, analyze and solve ice problems in and around water bodies, including ice jam flooding and ice accumulation in lock chambers, to ice buildup at water intakes and the destructive forces that moving ice exerts on riverine or coastal structures. In cooperation with the New England District (NAE) of the Corps of Engineers (located in Concord, MA), IERD personnel provide technical assistance before, during, and after ice jam flood emergencies. IERD research has resulted in the design and construction of a number of low-cost ice control structures as well as nonstructural mitigation measures. IERD also provides instruction on dealing with river ice problems to local emergency management agencies.

Flood Mitigation Involvement:

IERD is frequently called upon by the various Corps Districts to provide technical assistance to states and municipalities in the form of emergency mitigation. IERD is also involved with Corps and local agencies in developing locally constructed flood damage mitigation projects and promoting wise and informed use of floodplain areas in order to minimize potential future flood damages.

Mitigation Goals and Objectives:

The IERD has two primary mitigation objectives with respect to flood damage reduction. The first objective is to work with the Corps and other federal, state, and local agencies to design and implement ice control methods to reduce ice-related flood potential. The second is to work with the states and communities in nationwide as well as in New England to address ice-related emergency flooding problems affecting the region.

Projects Desired: CRREL and IERD are a national resource ready to apply our unique facilities and capabilities to solve problems and conduct innovative, state-of-the-art research and technical support. There are a number of mechanisms that enable IERD and the rest of CRREL to partner with various Federal, non-DoD and private sector entities. The Federal Technology Transfer Act of 1986 (15 USC 3710a) allows CRREL to collaborate with any non-Federal partner on research and technical support consistent with the mission of the laboratory. The Intergovernmental Cooperation Act (31 USC 6505) lets CRREL work with state and local governments on a broad range of reimbursable projects. Under the "Authority to Sell" (10 USC 2539b), CRREL can provide test and evaluation services to the states and the private sector. This includes the testing and evaluation of materials, equipment, models, computer software, and other items. The laboratory can also provide support to other Federal agencies via the Economy in Government Act (31 USC 1535) through MOUs/MOAs that establish a framework for the partnership and provide a concise description of the planned work. CRREL's 35 active Cooperative Research and Development Agreements (CRADAs) with industry and academia and 17 Intergovernmental Cooperation Agreements with states and

local governments in 1998 demonstrate a robust program in this area and the relevance of CRREL's research to many segments of American society beyond DoD.

The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria. Through the Corps, IERD has been involved in Section 205 Flood Damage Reduction program, Section 22 Planning Assistance to States Program (PAS)) projects, the Section 206 Flood Plain Management Services (FPMS) program funded jointly with FEMA, and numerous instances of technical assistance.

CRREL IERD Resources with Respect to Hazard Mitigation:

Corps: CRREL works jointly with the Corps' New England Division to address regional and local ice-related hazard mitigation needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance Investigation, is 100 percent federally funded and must be completed within twelve months. The second phase, the Feasibility Investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

Section 205 - Flood Damage Reduction: Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

Section 22 - Planning Assistance to States Program (PAS): The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

Section 206 - Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical

assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Personnel:

IERD was created to research, analyze and solve ice problems in and around water bodies. The technical experience of the staff and their in-depth research and field capabilities combine with CRREL's unique Ice Engineering Facility to form one of the premier ice engineering organizations in the world. IERD has a staff of 15 engineers and technicians experienced in technical analyses, methods, and engineering solutions to ice problems -- that is, any situation where the effects of ice cause flooding, increase operational and maintenance requirements of water control projects, impede navigation, or adversely impact the environment in cold regions.

Equipment and Facilities:

The Ice Engineering Facility was built to increase the research capabilities of the U.S. Army Cold Regions Research and Engineering Laboratory. It is a two-story building approximately 160 by 210 feet containing three primary cold spaces: the test Basin, Flume, and Research Area. We have recently designed and built a new Wind Tunnel Facility. In addition there is a machine room in the basement, an instrumentation corridor separating the flume and test basin spaces, a shop/storage area, and one sample-storage cold room.

The Test Basin was designed primarily for large-scale work on ice forces on structures, such as drill platforms and bridge piers, and for tests using model icebreakers. The Basin is 30 feet wide, 8 feet deep and 120 feet long. The room is designed to operate at any temperatures between +65° and -10°F with very even temperature distribution, which results in uniform ice thickness. Other studies conducted in the Test Basin concern the formation of ice pressure ridges, ice problems in and around navigation locks, and vertical uplift forces.

The Flume is situated in a room where the temperature can be regulated between +65° and -20° F. The Flume is 2 by 4 feet in cross section and 120 feet long. It can tilt from +2° to -1° slope, have a flow capacity of nearly 14 cubic feet per second and have a refrigerated bottom. Some other studies conducted in the Flume are the formation of ice covers and frazil ice, the hydraulics of ice-covered rivers, the formation of ice jams, and the effect of ice covers on sediment transport and scour.

Possibly the most versatile portion of the Ice Engineering Facility is the Research Area. This room is 80 by 160 feet clear span and has a temperature range of +65° to -10°F. Piping capable of providing a flow of 1, 2, 4 or 8 cubic feet per second is located on one side of the room, and a large drain trough is on the other. The floor is designed for loads up to 400 pounds per square foot. Models of reaches can be constructed in this area to test ways to alleviate ice jams through channel modification. Tests of the bearing capacity of large ice sheets and cold-testing of vehicles and structures are a few of the other potential uses of this space. Tests conducted in this room will help to alleviate much of the flooding caused by ice jams.

USDA, Natural Resources Conservation Service

Contacts:

Gerald J. Lang, Technology Leader; Phone: (603) 868-7581, Fax: (603) 868-5301
E-mail: gerald.lang@nh.usda.gov

Edward Hansalik, Civil Engineer; Phone: (603) 868-7581, Fax: (603) 868-5301
E-mail: ehansalik@nh.usda.gov

Address: Federal Building
2 Madbury Road

Durham, NH 03824

Description and Mission:

The Natural Resources Conservation Service (NRCS) is a Federal agency within the US Department of Agriculture. The mission of the NRCS is to help people conserve, improve and sustain our natural resources and environment. NRCS, formerly the Soil Conservation Service, is the lead federal agency for conservation on private land. NRCS provides conservation technical assistance through local conservation districts and Resource Conservation and Development (RC&D) Councils to individuals, communities, watershed groups, tribal governments, federal, state, and local agencies, and others. NRCS has an interdisciplinary staff of professional engineers, planners, biologists, foresters, agronomists, and soil scientists working together to provide the necessary technical assistance to solve resource or environmental problems. NRCS products typically include conservation plans, study reports, engineering designs, and resource maps.

Authorities and Funding:

NRCS state and field offices derive funding from two possible sources, direct Federal appropriations and reimbursable agreements with agencies and units of government. NRCS manages several programs; Environmental Quality Incentive Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetland Reserve Program (WRP), Forestry Incentives Program (FIP), and Farmland Protection Program (FPP) which provide cost-share assistance to landowners and users (primarily agricultural or forestry land) to install conservation practices to restore and protect natural resources. NRCS can also provide technical assistance ranging from preliminary reviews to complete detail designs to landowners/users solving resource problems even if financial assistance is not being provided for the installation of conservation practices. This assistance is dependent on staff availability and priorities.

NRCS also manages the Emergency Watershed Protection (EWP) program, which can provide financial and technical assistance to units of government and groups to repair damages sustained from a natural disaster (flood, fire, hurricane, tornado) creating an imminent hazard to life and property. The restoration efforts must be environmentally and economically cost effective and typically includes clearing debris from clogged stream channels, stabilizing eroded stream banks and restoring vegetation for stabilization purposes. NRCS can also provide technical assistance to watershed associations or groups to develop comprehensive plans for improving or protecting the watershed environment (water quality, flood reduction, wildlife habitat).

Mitigation Involvement:

The NRCS can provide technical assistance to conduct inventories, to complete watershed or site-specific plans, or to develop detail engineering and construction designs for conservation applications that will help reduce future damages from natural disasters. Some examples of past mitigation efforts include: floodplain management studies for towns, site assessments of stream flow impairments, stabilization designs to protect structures which could sustain severe damages from another storm event, and small watershed plans addressing flooding problems. Some of these products can be provided through other conservation assistance efforts. However, the major jobs would require a reimbursable agreement with the state or towns to complete the work.

Mitigation Goals and Objectives:

With respect to hazard mitigation, the goal of the NRCS in New Hampshire is to meet the needs of the State and local governments by providing timely technical assistance to support recovery and restoration efforts. NRCS can contribute this technical assistance by interacting directly with

NHHSEM at the state level and having our field staff working directly with Town Emergency Management officials at the local level. Short-term goals are to establish contacts with local officials and the conservation districts at the field office level to facilitate quicker response times. Intermediate and long-term objectives are to improve the cooperative efforts of working with NHHSEM and establish additional contacts for providing timely technical assistance at the local level.

Projects/Planning Desired:

NRCS would like to work with local watershed associations to develop comprehensive plans addressing resource and environmental needs and opportunities in the priority watersheds as identified in the Unified Watershed Assessment. These plans can provide the basis for targeting and requesting special funding to meet the needs of the local watershed association. Technical assistance for planning and designing along with public information dissemination are the typical activities our agency can provide in this effort.

NRCS Resources with respect to Hazard Mitigation

Personnel:

NRCS in New Hampshire has a workforce of 45 staff members along with 5 multi-state staff members. Approximately 22 staff members consisting of engineers, biologists, foresters, conservation planners, and technicians are available to provide some assistance in mitigation efforts. Support staff of a GIS specialist, computer specialist, and public information specialist could assist in providing information for public outreach. This staff is available to provide limited assistance under our present program funding authorities. However, larger projects would require reimbursement for planning and design assistance.

Equipment, Physical Facilities and Other Capabilities:

All of our field offices and State office have computers and access to the internet. All of the field offices have survey equipment and all engineers have the use of CADD software. All field offices have access to small meeting rooms and access to the Federal Telecommunications System. Government vehicles are located at all field offices for use by government employees and could be made available in emergencies.

Northeast States Emergency Consortium (NESEC)

Contacts:

Edward S. Fratto, Executive Director: Phone: (781) 224-9876, Fax: (781) 224-4350
E-Mail: www.nesec.org

Address: Northeast States Emergency Consortium
1 West Water Street, Suite 205
Wakefield, MA 01880

Organization Description:

The Northeast States Emergency Consortium, Inc. (NESEC) is a 501(c)(3) not-for-profit natural disaster mitigation and emergency management organization, located in Wakefield, Massachusetts. NESEC is the only multi-hazard consortium of its kind in the country and is supported and funded

by the Federal Emergency Management Agency (FEMA). The eight Northeast States of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont form the consortium. NESEC has a full-time Executive Director, and Assistant. It is governed by a Board of Directors. The Board is comprised of the Directors of the State Emergency Management Agencies from each of the six New England States and the States of New York and New Jersey.

Organization Mission:

NESEC works in partnership with government and private organizations to reduce losses of life and property from natural disasters in the Northeast United States. The Northeast States are vulnerable to most of the natural hazards, including hurricanes, earthquakes, coastal and inland flooding, tornadoes and micro-bursts, forest fires, drought, lightning, blizzards and other forms of severe weather. Our developed urban areas and the desire to build and live on waterfront property have increased our degree of risk from natural hazards.

Mitigation Programs:

HAZUS: NESEC assists FEMA PROJECT IMPACT Communities in the use of HAZUS as a planning platform for incorporating multi-hazard disaster prevention initiatives. NESEC can produce a HAZUS report using default data for each of the initial PROJECT IMPACT Communities. Priority is given to PROJECT IMPACT communities, however assistance may be provided to other communities as resources allow. This report provides an excellent starting point for communities wishing to utilize HAZUS to identify potential hazards. The NESEC HAZUS Report is multi-hazard and usually contains information on earthquakes, tornadoes, flood and wind.

There is no fee or charge for producing the default HAZUS Report and meeting with the community to discuss the results. All HAZUS support is arranged in cooperation with the New Hampshire Homeland Security and Emergency Management (NHHSEM). Communities interested in participating should contact NHHSEM.

Emergency Generators: NESEC assists communities to establish a partnership with their electric utilities and service companies. The partnership would conduct an energy efficiency audit of the community, recommend cost saving measures, and implement a cost saving plan. Monthly savings could be used to fund emergency generator(s) for local critical facilities. The utility or energy service company could then lease, install, and maintain generator(s) in a community.

The community would pay a monthly charge for the lease agreement. This charge would not exceed the savings derived through energy efficiency measures, so there would be no capital outlay or additional cost to the community. In fact, some communities may be able to reduce their monthly electric bills in an amount that exceeds the cost of the generator(s) lease agreement.

Monthly savings and utility participation will vary from state to state and community-to-community depending on present electric power usage and efficiency measures and deregulation. There is no fee or charge for assisting communities in establishing partnerships with electric utilities. NESEC assistance will be provided as resources allow. All emergency generator support is arranged in cooperation with the New Hampshire Homeland Security and Emergency Management (NHHSEM). Communities interested in participating should contact NHHSEM.

Federal Mitigation Grant Programs

I. Pre-Disaster Mitigation Grant Program

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event.

Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.

<http://www.fema.gov/government/grant/pdm/index.shtm>

II. Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

<http://www.fema.gov/government/grant/hmgp/index.shtm>

III. Flood Mitigation Assistance (FMA) Program

The FMA program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the [National Flood Insurance Program](#) (NFIP).

FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program.

<http://www.fema.gov/government/grant/fma/index.shtm>

APPENDIX E
DOCUMENTATION OF THE PLANNING PROCESS



Southwest Region Planning Commission
37 Ashuelot Street Keene, NH 03431 603-357-0557 Fax 357-7440

Westmoreland Hazard Mitigation Plan Update

Meeting #1

AGENDA

April 6, 2016

7:00 p.m.

Westmoreland Town Offices

780 NH Rte. 63

Westmoreland, NH 03467

- 1. Status of Previous Hazard Mitigation Actions**
 - a. Review the Action Plan from the existing Hazard Mitigation Plan to determine what has been completed, deleted, or deferred to the updated plan.

- 3. Identify Past and Potential Hazards**
 - a. Review each hazard type on the “Identifying Hazards” chart
 - b. Add any new hazards that have occurred since the existing plan was adopted
 - c. Add any “potential hazard” concerns

- 4. Critical Facilities**
 - a. Review/update the Critical Facilities listed in Chapter IV of the existing plan

- 5. Assessing Probability, Severity and Risk**
 - a. Estimate probability, severity, and risk for each potential hazard

- 7. Next Meeting-** Thursday, April 28 at 7:00



Southwest Region Planning Commission
 37 Ashuelot Street Keene, NH 03431 603-357-0557 Fax 357-7440

**Westmoreland Hazard Mitigation
 Meeting # 1
 April 6, 2016**

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Tom Finnegan	firefighter	Finnegans02@gmail
Edwin Johnson	Deputy Fire Chief	
Mark P Hayward Jr.	School Principal	hayward@sau29.org
Lauren Bressett	Planning Board Chair	llb@unh.edu
Jack Zeller	Board of Selectmen	jackzeller@myfairpoint.net
Harry E. Nelson	Fire Chief	Wvfd1@myfairpoint.net
Gary Hudson	Road Agent	
Bill Chase	Emergency Management Director	bbchase@myfairpoint.net
Bob Hamilton	Deputy EMD	hamiltonbobj@gmail.com
Lisa Murphy	SWRPC	lmurphy@swrpc.org



Southwest Region Planning Commission

37 Ashuelot Street Keene, NH 03431 603-357-0557 Fax 357-7440

Westmoreland Hazard Mitigation Plan Update

Meeting #2

AGENDA

April 28, 2016

7:00 p.m.

Westmoreland Town Offices

780 NH Rte. 63

Westmoreland, NH 03467

- 1. Critical Facilities**
 - a. Review/update the Critical Facilities listed in Chapter IV of the existing plan
- 2. Existing Mitigation Strategies and Proposed Improvements**
 - a. Review the list of existing strategies and programs. Determine any needed improvements.
- 3. Hazard Mitigation Goals**
 - a. Determine the goals for the updated hazard mitigation plan.
- 4. Identify Gaps in Coverage**
- 5. Future Meetings- May 11 and 26 at 7:00**



Southwest Region Planning Commission

37 Ashuelot Street Keene, NH 03431 603-357-0557 Fax 357-7440

**Westmoreland Hazard Mitigation
Meeting # 2
April 28, 2016**

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Bill Chase	Emergency Management Director	bbchase@myfairpoint.net
Bob Hamilton	Deputy EMD	hamiltonbobj@gmail.com
Tom Finnegan	firefighter	Finnegans02@gmail
Edwin Johnson	Deputy Fire Chief	
Mark P Hayward Jr.	School Principal	hayward@sau29.org
Lauren Bressett	Planning Board Chair	llb@unh.edu
Jack Zeller	Board of Selectmen	jackzeller@myfairpoint.net
Harry E. Nelson	Fire Chief	Wvfd1@myfairpoint.net
Danielle Morse	NH HSEM	
Lisa Murphy	SWRPC	lmurphy@swrpc.org



Southwest Region Planning Commission
37 Ashuelot Street Keene, NH 03431 603-357-0557 Fax 357-7440

Westmoreland Hazard Mitigation Plan Update

Meeting #3

AGENDA

May 11, 2016

7:00 p.m.

Westmoreland Town Offices

780 NH Rte. 63

Westmoreland, NH 03467

1. Identify Gaps in Coverage

- a. Continue to identify gaps in coverage and potential mitigation strategies to eliminate those gaps.

2. Identify and Prioritize Mitigation Actions for Each Hazard

- a. Identify specific locations that should be added to the Action Plan.
- b. Use the STAPLEE Chart to identify and rank actions for each hazard.

3. Prepare an Action Plan

- a. Determine the Who, When, and Funding Source for each action identified in the STAPLEE Chart.

4. Discuss Implementation of the Plan through Existing Programs

- a. Determine ways to satisfy the requirement of plan implementation through existing programs.

5. Future Meetings- TBD



Southwest Region Planning Commission
 37 Ashuelot Street Keene, NH 03431 603-357-0557 Fax 357-7440

**Westmoreland Hazard Mitigation
 Meeting # 3
 May 11, 2016**

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Bill Chase	Emergency Management Director	bbchase@myfairpoint.net
Tom Finnegan	firefighter	Finnegans02@gmail
Mark P Hayward Jr.	School Principal	hayward@sau29.org
Lauren Bressett	Planning Board Chair	llb@unh.edu
Jack Zeller	Board of Selectmen	jackzeller@myfairpoint.net
Harry E. Nelson	Fire Chief	Wvfd1@myfairpoint.net
Edwin Johnson	Deputy Fire Chief	
Bob Hamilton	Deputy EMD	hamiltonbobj@gmail.com
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Westmoreland Hazard Mitigation Plan Update

Meeting #4

AGENDA

June 15, 2016

7:00 p.m.

Westmoreland Town Offices

780 NH Rte. 63

Westmoreland, NH 03467

1. Review and Editing of the Draft Plan

Review each section of the plan for accuracy.

2. Next Steps

Discuss the approval process and timeframes.

Westmoreland Hazard Mitigation

Meeting # 4

June 23, 2016

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Tom Finnegan	firefighter	Finnegans02@gmail
Edwin Johnson	Deputy Fire Chief	
Lauren Bressett	Planning Board Chair	llb@unh.edu
Jack Zeller	Board of Selectmen	jackzeller@myfairpoint.net
Harry E. Nelson	Fire Chief	Wvfd1@myfairpoint.net
Gary Hudson	Road Agent	
Bill Chase	Emergency Management Director	bbchase@myfairpoint.net
Bob Hamilton	Deputy EMD	hamiltonbobj@gmail.com
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Public Notice
Westmoreland, NH
Hazard Mitigation Plan Update Review

A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from July 25th through August 3rd at the Westmoreland Town Office during regular business hours (Monday, noon – 8pm and Tues-Fri 8am-4pm) or by going to the Town’s website at: www.westmorelandnh.com.

Written comments may be addressed to Bill Chase, Emergency Management Deputy and mailed to: Westmoreland Town Office, PO Box 55, Westmoreland, NH 03467 or by email at townofwestmoreland@myfairpoint.net.

Posted at Town Hall and Post Office and on town website: 7/22/2016

This is a snapshot of the Town webpage for the announcement of the public viewing period.



Westmoreland, New Hampshire

780 Rte. 63, PO Box 55, Westmoreland NH 03467
Phone: (603) 399-4471
FAX: (603) 399-4386
E-Mail: townofwestmoreland@myfairpoint.net

[Home](#) [Community News](#) [Services](#) [Boards & Committees](#) [Minutes](#) [Maps](#) [Contact](#)

Home

August 11 – Twilight walk at County Farm in Westmoreland to learn Invasive Plant Identification. [View Details Here](#)

Public Notice – Westmoreland Hazard Mitigation Plan Update Review

A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from July 25th through August 3rd at the Westmoreland Town Office during regular business hours (Monday, noon – 8pm and Tues-Fri 8am-4pm) or by clicking: [Hazard Mitigation Plan 2016](#) .

Written comments may be addressed to Bill Chase, Emergency Management Deputy and mailed to: Westmoreland Town Office, PO Box 55, Westmoreland, NH 03467 or by email at townofwestmoreland@myfairpoint.net.

REMINDER: NEW RECYCLING CENTER STICKERS BY JUNE 1ST



Public Hearing Notice
Westmoreland, NH
Hazard Mitigation Plan Update 2016

Notice is hereby given in accordance with Section 201.6 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted under Sec. 104 of the Disaster Mitigation Act of 2000 that the Westmoreland Hazard Mitigation Plan Update 2016 will be submitted to the Board of Selectmen at 6:30 p.m. on December 1, 2016 at the Town Hall during a regular meeting of the Board of Selectmen for adoption.

Upon a finding by the Board of Selectmen that the Westmoreland Hazard Mitigation Plan Update 2016 meets the approval of the Westmoreland Hazard Mitigation Committee, the Board of Selectmen will vote to accept the Plan and move immediately into public hearing on the merits of the proposal.

The Plan will be available for review prior to the meeting as of the date of this posting at the Selectmen's Office in the Town Hall during regular business hours, Monday noon to 8:00p.m. and Tuesday thru Friday, 8:00 a.m. to 4 p.m. Should the Plan not be accepted as complete, another submission meeting will be scheduled. Upon acceptance, should a decision not be reached following the public hearing, adoption of the Plan will stay on the Board of Selectmen's agenda until it is either approved or disapproved.

Posted at Town Hall and Post Office and on town website: 11/22/2016



FEMA

DEC 22 2016

Heather Dunkerley
State Hazard Mitigation Officer
Homeland Security & Emergency Management
33 Hazen Drive
Concord, NH 03303

Dear Ms. Dunkerley:

We would like to congratulate the Town of Westmoreland and the State of New Hampshire for their dedication and commitment to mitigation planning. The Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) Region I Mitigation Planning Team has completed its review of the Westmoreland Hazard Mitigation Plan Update 2016 and determined it meets the requirements of 44 C.F.R. Pt. 201.

With this plan approval, the Town of Westmoreland is eligible to apply to the New Hampshire Homeland Security and Emergency Management for mitigation grants administered by FEMA. Requests for mitigation funding will be evaluated individually according to the specific eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in your community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

Approved mitigation plans are eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Complete information regarding the CRS can be found at <http://www.fema.gov/national-flood-insurance-program-community-rating-system>, or through your local floodplain administrator.

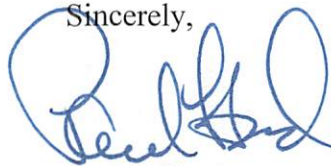
The Westmoreland Hazard Mitigation Plan Update 2016 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval within **five years of the plan approval date of December 15, 2016** in order to maintain eligibility for mitigation grant funding. We encourage the Town to continually update the plan's assessment of vulnerability, adhere to its maintenance schedule, and implement, when possible, the mitigation actions proposed in the plan.

Heather Dunkerley
Page 2

DEC 22 2016

Once again, thank you for your continued dedication to public service demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please do not hesitate to contact Melissa Surette at (617) 956-7559.

Sincerely,



Paul F. Ford
Regional Administrator

PFF: ms

cc: Fallon Reed, Chief of Planning, New Hampshire
Whitney Welch, Hazard Mitigation Planner, New Hampshire
Jennifer Gilbert, Asst. New Hampshire State NFIP Coordinator

Enclosure

