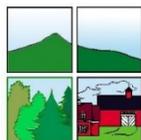


RICHMOND HAZARD MITIGATION PLAN UPDATE 2016

FEMA APPROVAL: JUNE 24, 2016



Prepared by the Richmond Hazard Mitigation Committee
and Southwest Region Planning Commission



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



FEMA

TABLE OF CONTENTS

Executive Summary iii

I. INTRODUCTION 1

 Background 1

 Purpose 1

 Authority 1

 Scope of the Plan 1

 Funding Source 1

 Methodology 1

 Public Meetings 3

 Public Participation 3

 Resources Used in Plan Preparation 3

 Plan Updates 4

 Acknowledgements 4

 Hazard Mitigation Goals 5

II. COMMUNITY PROFILE 6

 Existing Development Patterns 6

 Population Trends 6

 Population Projections 6

 Consideration for Development 7

 Current Development Trends 7

 Changes in Development 7

 National Flood Insurance Program (NFIP) 7

III. HAZARD IDENTIFICATION 8

 List of Hazards 8

 Flooding- Disaster Declarations 8

 Flooding- Localized- Low Risk 9

 Drought- Low Risk 10

 Wildfires- Medium Risk 10

 Lightning-High Risk 11

 Severe Wind/Downbursts/Tornados (Fujita Scale given if known)-High Risk 11

 Hurricanes (Category given if known) and Tropical Storms-High Risk 13

 Earthquakes (Magnitude given if known)- Low Risk 15

 Extreme Winter Weather- High Risk 17

 Hazardous Material Spills- Low-Medium Risk 19

 Erosion- Medium Risk 19

 Dams- Low-Medium Risk 20

IV. ASSESSING PROBABILITY, SEVERITY AND RISK 22

 Risk Assessment 22

V. VULNERABILITY ASSESSMENT/ESTIMATING POTENTIAL LOSSES 23

 Estimating Potential Losses 23

VI	CRITICAL FACILITIES	26
	Category 1 - Emergency Response Facilities & Services.....	26
	Category 2 - Non Emergency Response Facilities.....	27
	Category 3 - Facilities/Populations to Protect.....	27
	Category 4 - Potential Resources.....	28
	Critical Facilities within the Hazard Areas.....	28
VII.	EXISTING MITIGATION STRATEGIES & PROPOSED IMPROVEMENTS	29
	Review of Existing Programs.....	29
	Existing Protection Matrix - Summary Chart.....	30
	Previous Mitigation Action update.....	32
VIII.	PROPOSED MITIGATION STRATEGIES	34
	Identifying Gaps in Coverage.....	34
	Summary of New Strategies.....	36
	Prioritizing Proposed Mitigation Actions.....	38
	STAPLEE Ranking Matrix.....	39
IX.	PRIORITIZED IMPLEMENTATION SCHEDULE & FUNDING SOURCES	40
	Implementation Strategy for Priority Mitigation Actions - Summary Chart.....	40
X.	ADMINISTRATIVE PROCEDURES REGARDING ADOPTION OF THE PLAN	42
	Adoption.....	42
	Implementation.....	42
	Monitoring & Updates.....	42
	Implementation of the Plan through Existing Programs.....	43
	Continued Public Involvement.....	43
	Adoption Certificate.....	44
	 Appendices	
	Hazard Descriptions.....	Appendix A
	Risk Assessment.....	Appendix B
	Resources.....	Appendix C
	Hazard Mitigation Resource Profiles and Federal Grants.....	Appendix D
	Documentation of the Planning Process.....	Appendix E
	Project Status Sheet.....	Appendix F
	 MAPS	
	Past & Potential Hazards and Critical Facilities Map.....	Back of Plan

EXECUTIVE SUMMARY

The Richmond Hazard Mitigation Plan Update 2016 serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Richmond Hazard Mitigation Team and adopted by the Board of Selectmen.

- Flooding- Disaster Declarations
- Flooding- Localized areas
- Drought
- Wildfires
- Lightning
- Hurricanes/ Tropical Storms
- Severe Wind/Downbursts/Tornadoes
- Extreme Winter Weather
- Hazardous Materials Incidents
- Landslide/ Erosion
- Earthquakes
- Dams

The Richmond Hazard Mitigation Team, as shown per Section VI, identified “Critical Facilities” and “Areas at Risk” as follows:

Critical Facilities

- Town Emergency Operations Center
- Fire and Police Stations, Town Hall
- Evacuation Routes and bridges on evacuation routes
- Emergency fuel facilities
- Telephone facilities, transmission lines, and cell towers
- School & Day care centers
- Water-based facilities and utilities
- Shelters & Historical facilities
- Other (fuel storage)

Areas at Risk

- Trailer parks, mobile homes, manufactured homes
- Isolated and/or at-risk residential areas/units
- Recreational facilities
- Camp grounds
- Parks, Town beach, trails
- Churches
- Dam structures
- Hazardous materials storage/risk areas
- Bridge/Culverts/Roadway improvements needed
- Other risk factors (911 system - unnumbered homes)

The Richmond Hazard Mitigation Team identified existing hazard mitigation programs as follows:

- Storm Drain/culvert Maintenance
- Wetlands Protective Measures
- Town-Adopted Building Codes
- Hazardous Material Plan/team
- Town Warning System
- Emergency Operations Plan
- Road Design Standards
- Public Education Programs
- Public Health Plan
- Emergency Response Plans Summer Camps
- Bridge Maintenance Program

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

- Become a member of NFIP
- Investigate joining the Fire Wise Program.
- Provide information to the public about the benefits of the NFIP.
- Include the Hazard Mitigation Plan Update as an appendix in the Richmond Master Plan.
- Provide training/ information to the Planning Board and Town officials about development in the floodplain.
- Provide information or workshop to residents on water conservation/ drought resistant landscaping (ex. rain gardens).
- Update the town website with information about ways to mitigate the effects of natural hazards during severe weather events and include preparedness and emergency response information. Include Hazard Mitigation Plan on website.

- Hold a workshop for town officials about mitigation, preparedness and response for severe weather events.
- Continue implementing best management practices (BMPs) on town projects.
- Install a Smokey Bear sign to mitigate chances of forest fire and alert the public of conditions/risk
- Update the Local Emergency Operations Plan (2009).
- Coordinate with public and private camps to develop emergency response plans and obtain hard copies.
- Explore alternatives for a Town Warning System such as E911 or Code Red.
- Purchase and install a generator for Veterans Hall which is the shelter.
- Purchase and install a generator for Town Hall (currently wired).
- Repair or upgrade the bridge on Old Turnpike Road (currently red listed).
- Upgrade/expand the repeater to improve emergency responder communications.
- Become a member of the NH Public Works Mutual Aid
- Repair or upgrade the Mill Road bridge (currently red listed).

The Plan is scheduled to be reviewed and updated on a periodic basis.

CHAPTER I INTRODUCTION

Purpose

The Richmond Hazard Mitigation Plan Update 2016 is a planning tool to be used by the Town of Richmond, 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 past and potential natural and manmade hazards affecting the Town of Richmond, the determination of vulnerability of existing and future structures to the identified potential hazards, and the identification and discussion of new strategies aimed at mitigating the likely effects of potential hazards before they occur.

Methodology

Using the Local Hazard Mitigation Planning Handbook, the Richmond Hazard Mitigation Team developed the content of the Richmond Hazard Mitigation Plan by following the tasks set forth in the handbook. The Team held monthly meetings, open to the public, starting July 15 through October 21, 2015 in order to develop the plan. On June 13, 2016 the Richmond Board of Selectmen held a public hearing and adopted the plan. Final approval from FEMA was granted on June 24, 2016.

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 Town Administrator contacted town officials, department heads, and residents who might wish to volunteer their time and serve on a committee. The Richmond 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 Hazards 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," 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 Assessing Probability, Severity, and Risk (Chapter 4) and Assessing Vulnerability (Chapter 5). In addition to the assessments, the existing mitigation strategies were reviewed to determine where gaps in coverage exist and areas that need improvement (Chapter 7).

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 Richmond 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 June 13, 2016. The plan was then granted formal approval by FEMA on June 24, 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.

Public Committee Meetings:

Working committee meetings held at Richmond Town Office on the following dates:

July 15, August 3, September 2, and October 21, 2015.

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 Meetings with the Board of Selectmen:

June 13, 2016: The Board of Selectmen adopted the Richmond Hazard Mitigation Plan Update 2016 at a public hearing held at Richmond Town Office.

Public Participation:

An email was sent to each committee member, prior to each meeting that contained information from the previous meeting, an agenda, and information to be covered. A copy of the agenda for each meeting was posted at the Municipal Office and on the Town website for public viewing prior to the meeting to encourage 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 November 23, 2015 to December 7, 2015. 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 Richmond Hazard Mitigation Plan (2010), Town Master Plan (2004), Town Report (2014), 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 the resources identified in **Appendix C**.

Resource List for the Hazard Mitigation Committee

Richmond'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
110 Smokey Bear Boulevard
Concord, NH 03305

Field Representative: Shawna-Leigh Morton
Mitigation Planner: Parker Moore
Mitigation Officer: Elizabeth Peck

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

Richmond Town Office:
Heidi Wood, Town Administrator 336-5710 Ext. 11

Richmond School Principals:

Linda Kalloger, Principal
Monadnock Regional Middle/High School 580 Old Homestead Hwy, Swanzey, NH 352-6575

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 and to give a status update on those that remain on the list. The previous plan was used as a base 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 Assessing Vulnerability - 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 Administrative Procedures Regarding Adoption of the Plan - Adoption certificate, updated information;
- Appendices - agendas, resources, updated information.

This update was prepared with assistance from 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.

FEMA Final Approval: June 24, 2016

ACKNOWLEDGEMENTS

The Richmond Board of Selectmen extends special thanks to the Richmond Hazard Mitigation Team as follows:

John Janicki, <i>Richmond Emergency Mgmt. Dir.</i>	Melanie Ellis, <i>Richmond Fire Lieutenant</i>
William P. Pearsall, <i>Richmond Emergency Mgmt. Dir.</i>	John Holman, <i>Richmond Highway Contractor</i>
Ed Atkins, <i>Richmond Fire Chief</i>	Kathryn McWhirk, <i>Richmond Board of Selectmen</i>
Brendan Bosquet, <i>Richmond Police Chief</i>	Herbert Shaw, <i>Retired Richmond Fire Chief</i>

The Richmond 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.

Hazard Mitigation Goals

The Richmond Hazard Mitigation Committee reviewed the goals set forth in the State of New Hampshire Multi-Hazard Mitigation Plan Update 2013. The committee generally concurs with those goals and has amended them to better meet the goals of the town. These goals are generally the same as the previous goals since community needs for mitigating these hazards has not changed.

Town of Richmond, NH

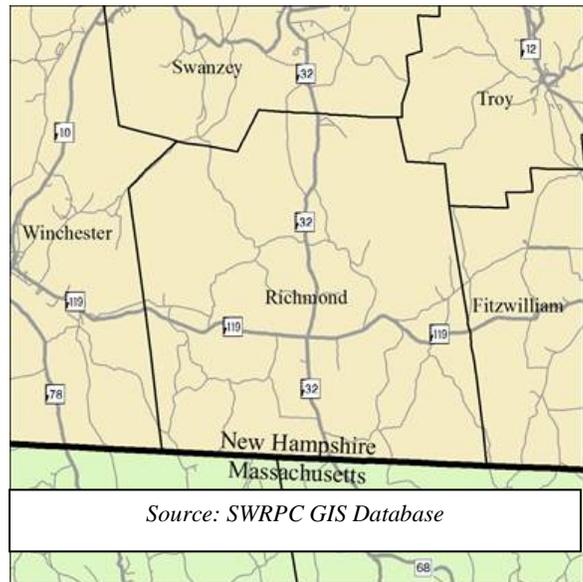
The overall Goals of the Town of Richmond with respect to Hazard Mitigation are stipulated here:

1. To improve upon the protection of the general population, the citizens of the Town of Richmond 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 Richmond's Emergency Response Services, Critical Facilities, and infrastructure.
3. To reduce the potential impact of natural and man-made disasters on the Town of Richmond's economy, natural resources, historic/cultural treasures, and private property.
4. To improve the Town of Richmond's Emergency Preparedness and Disaster Response and Recovery Capability.
5. To reduce the Town of Richmond'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 Richmond's infrastructure and natural environment.
8. To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals and with FEMA.

CHAPTER II COMMUNITY PROFILE

Existing Development Patterns

The Town of Richmond is located in Cheshire County in southwestern New Hampshire. Richmond is bordered by Winchester to the west, Swanzey and Troy to the north, Fitzwilliam to the east, and the state of Massachusetts to the south. It is a community governed by a 3 member Board of Selectmen, with a population of 1163 according to Town Clerk records in 2015. The population density is 24.9 people per square mile. Richmond has a total land area of 37.8 square miles (24,377 acres). Average temperature is 22 °F in January and 70°F in July. Average annual precipitation is 44.4 inches.



Population Trend

The following table shows the population in Richmond and the surrounding towns between the years of 1970 to 2010 based on US Census data. Richmond experienced a significant growth between 1970 to 1980 which was the later end of the “Baby Boomers”. The information on this table indicates that the population increased each decade between 1970 to 2010, but at a slower pace than each previous decade. The population change from 1970 to 2010 in Richmond greatly outpaced the state and county as indicated in the last column below.

Population Trend 1970-2010

	1970	1980	1990	2000	2010	% Change 1970-2010
Richmond	287	518	877	1077	1155	302%
Fitzwilliam	1362	1795	2011	2141	2396	76%
Swanzey	4254	5183	6236	6800	7230	70%
Troy	1713	2131	2097	1962	2145	25%
Winchester	2869	3465	4038	4144	4341	51%
Cheshire County	52,364	62,116	70,121	73,825	77,177	47%
New Hampshire	737,681	920,610	1,109,252	1,235,786	1,316,256	78%

Source: US Census 2010

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 table below indicates that the population of Richmond is expected to see a slight increase in population during the next thirty years with the highest rate of growth between 2015 and 2020.

Richmond Population Projections 2010 - 2040

Year	Population	% Change
2010*	1155	---
2015	1170	1.3%
2020	1199	2.5%
2025	1215	1.3%
2030	1227	1.0%
2035	1235	0.7%
2040	1237	0.2%

Source: NH OEP, Municipal Population Projections, Fall 2013 *actual 2010 US Census figure

Consideration for Development

Several factors have played, and will continue to play, an important role in the development of Richmond. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, poor soil conditions, and the availability of utilities such as public water and sanitary sewers. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Current Development Trends

Richmond remains a predominantly residential community with some commercial businesses, primarily established on Route 32 and 119. The number one industry is logging with recreational services second, as well as some “cottage” businesses. The table below shows the number of building permits issued between 2005 to 2015 which shows a decline in permits since 2009. A negative number likely represents the difference between demolition permits and building permits.

Building Permits Issued Between 2005 and 2015

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
# Permits Issued	6	3	4	3	8	4	0	1	-2	4	-5

Source: Town Records, NH Office of Energy & Planning (2015)

Changes in Development

The demographic trends in the previous sections indicate that Richmond’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.

National Flood Insurance Program (NFIP)

The Town is currently not participating in the National Flood Insurance Program (NFIP), but is actively working towards membership. In an effort to join the NFIP, the Town recently adopted a Floodplain Management Ordinance (in March of 2015) and has included NFIP membership in this Action Plan (page 40). The ordinance meets the minimum requirements of Section 60.3(b) of the National Flood Insurance Program regulations and applies to all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its “Flood Insurance Study for the Town of Richmond NH” 12-11-14 or as amended, together with the associated **Flood Insurance Rate Maps** dated May 23, 2006 or as amended. There are no Flood Insurance Policies and therefore no repetitive losses.

CHAPTER III: HAZARD IDENTIFICATION

PAST HAZARDS AND POTENTIAL HAZARDS

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Richmond. Hazard events were researched using a wide variety of sources. Sources and techniques included interviewing long-time residents of Richmond; gathering information from the State of New Hampshire Hazard Mitigation Plan (2013); and gathering information from governmental and non-profit web sites.

Appendix A provides a definition on all hazard types. The Hazard Mitigation Map at the end of this Plan reflects the contents of this list.

List of Hazards

- Flooding- Disaster Declarations
- Flooding- Localized areas
- Drought
- Wildfires
- Lightning
- Hurricanes/ Tropical Storms
- Severe Wind/Downbursts/Tornadoes
- Extreme Winter Weather
- Hazardous Materials Incidents
- Landslide/ Erosion
- Earthquakes
- Dams

Past and Potential Hazards Table

The following table shows each hazard type and areas that have experienced a natural or man-made hazard event, or have the potential to suffer damage if an event occurs. It also includes information on federally disaster declarations.

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.			
Hazard	Date	Location	Description of Areas Impacted
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. Run-off from melting snow with rain overflowed the rivers.
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.

FLOODING - DISASTER DECLARATIONS- CONTINUED			
Hazard	Hazard	Hazard	Hazard
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	October 26th 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding; severe property damage.
Flood	October-November 2005	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan counties	FEMA Disaster Declaration # DR-1144- NH
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; No significant local impact.
Flood	June 26-July 3, 2013	Cheshire, Sullivan, and Grafton Counties	FEMA Disaster Declaration #4139: No significant local impact.
FLOODING- LOCALIZED- LOW RISK			
Richmond does not have a history of localized flooding due to its higher elevation.			

Potential Hazards	Date	Location	Description of Areas Impacted
DROUGHT- LOW RISK			
<p>Richmond has not had experience with severe drought conditions. Below is a list of drought events within the State of New Hampshire. The severity of droughts can be found by referring to the Palmer Drought Severity Index used by the Climate Prediction Center and can be viewed at: http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml</p>			
Drought	1929-1936	Statewide	Regional. Recurrence Interval 10 to > 25 years
Drought	1939-1944	Statewide	Severe in southeast and moderate elsewhere. Recurrence Interval 10 to > 25 years
Drought	1947-1950	Statewide	Moderate. Recurrence Interval 10 to > 25 years
Drought	1960-1969	Statewide	Regional longest recorded continuous spell of less than normal precipitation. Encompassed most of the Northeastern US. Recurrence Interval > 25 years
Drought	2001-2002	Statewide	Third worst drought on record, exceeded only be the drought of 1956-1966 and 1941-1942.
Drought	Spring 2012	Statewide	Considered worse than the drought of 1941-42, however no damage locally.
WILDFIRES- MEDIUM RISK			
<p>Wildfire 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.</p>			
Wildfire	Potential	Townwide	The whole town is at risk with many large blocks of forest and problems accessing remote areas.
Wildfire	April 30, 2010	Benson Road	Approximately 2-5 acres burned. No structures damaged and no impact on utilities. The towns of Swanzey, Fitzwilliam, Troy and Winchester assisted the Richmond Fire Department.

LIGHTNING- HIGH RISK

The Table below categorizes lightning hazards according to the Lightning Activity Level (LAL) using cloud conditions and precipitation, and an estimate of lightning strikes per every 15 minutes.

LAL	Cloud & Storm Development	Lightning Strikes/15 min
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

Source:NOAA

The potential for lighting is greater in higher elevations. There have been unofficial reports of lightning strikes to residential properties, but none produced serious property damage or injury. No specific information on those incidents is available.

SEVERE WIND/TORNADOES/ DOWNBURSTS- HIGH 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.

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>

Past Hazards	Date	Location	Description of Areas Impacted
SEVERE WIND/TORNADOES/ DOWNBURSTS- HIGH RISK			
Below is a list of past occurrences and their locations.			
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 2, 1997	Cheshire County	F1
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 2, 1997	Cheshire County	F1
Tornado	May 23, 1998	Hillsborough County	F2
Severe Wind	July 1, 2001	Southern New Hampshire	Severe thunderstorms knocked down trees in Richmond and Rindge, and dropped large hail in Richmond and Manchester.
Tornado	July 24, 2008	Deerfield/Northwood	EF2. No recorded damage locally.

HURRICANES (CATEGORY GIVEN IF KNOWN) AND TROPICAL STORMS- HIGH RISK

Richmond’s inland location in southwestern New Hampshire reduces the risk of extremely high winds that are associated with hurricanes, however tropical storms have occurred. This is a town wide risk. A severe event could cause injury or death, damage to property, and disruption of utilities.

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>

Past Hazards	Date	Location	Description of Areas Impacted
Hurricane	August, 1635	n/a	None available
Hurricane	October 18-19, 1778	n/a	Winds 40-75 mph
Hurricane	October 9, 1804	n/a	None available
Gale	Sept. 23, 1815	n/a	Winds > 50mph
Hurricane	Sept. 8, 1869	n/a	None available

HURRICANES (CATEGORY GIVEN IF KNOWN) AND TROPICAL STORMS- (cont.) HIGH RISK			
Past Hazards	Date	Location	Description of Areas Impacted
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
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

Past Hazards	Date	Location	Description of Areas Impacted
HURRICANES (CATEGORY GIVEN IF KNOWN) AND TROPICAL STORMS- (cont.) HIGH RISK			
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
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 locally.
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.

EARTHQUAKES- LOW RISK

Most, if any, of the buildings in the Town have not been designed to withstand seismic activity. More specifically, the older historic buildings that are constructed of non-reinforced masonry are especially vulnerable to any moderate sized earthquake. In addition, utilities (water, gas, etc) are susceptible to earthquake damage. Richmond has experienced small earthquakes that have had no effect on the town’s infrastructure. However, if a large (6+ on the Richter Scale) occurred in or around the town, it is assumed that structural damage would be extensive town wide. The table below is used to categorize earthquakes using two different scales: Mercalli Scale and Richter Scale. The Richter Scale is more scientific and is based on the magnitude (amplitude of the largest seismic wave). The Mercalli Scale is based on observations by people who experienced the earthquake to describe its intensity.

Modified Mercalli Scale vs. Richter Scale		
Mercalli Intensity	Mercalli Observations	Richter Magnitude
I	Not felt by people	1-2
II	Felt by only a few people, especially on upper floors of buildings	3
III	Felt by people lying down, seated on hard surface, or in tall buildings	3.5
IV	Felt indoors by many, dishes and windows rattle	4
V	Generally felt by everyone; may wake from sleep	4.5
VI	Trees sway, objects fall from walls & tables	5
VII	Walls crack, some structural damage	5.5
VIII	Building damage noticeable	6
IX	Some buildings collapse	6.5
X	Ground cracks and landslides	7
XI	Few buildings survive, bridge damage, severe landslide	7.5
XII	Total Destruction, objects thrown into the air	8

Source: USGS Hazards Program

Earthquakes- Low Risk- con't.			
Past Hazards	Date	Location	Description of Areas Impacted
Earthquake	1638	Central New Hampshire	6.5-7
Earthquake	October 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	December 29, 1727	Off NH/MA coast	Widespread damage Massachusetts to Maine
Earthquake	November 18, 1755	Cape Ann, MA	6.0, much damage
Earthquake	1800s	Statewide New Hampshire	83 felt earthquakes in New Hampshire
Earthquake	1900s	Statewide New Hampshire	200 felt earthquakes in New Hampshire
Earthquake	March 18, 1926	Manchester, NH	Felt in Hillsborough County
Earthquake	December 20, 1940	Ossipee, NH	Both earthquakes of magnitude 5.5, both felt for 400,000 sq miles, structural damage to homes, damage in Boston MA, water main rupture.
Earthquake	December 24, 1940	Ossipee, NH	unknown
Earthquake	December 28, 1947	Dover-Foxcroft, ME	4.5
Earthquake	June 10, 1951	Kingston, RI	4.6
Earthquake	April 26, 1957	Portland, ME	4.7
Earthquake	April 10, 1962	Middlebury, VT	4.2
Earthquake	June 15, 1973	Near NH Quebec Border, NH	4.8
Earthquake	January 19, 1982	Gaza (west of Laconia), NH	4.5
Earthquake	October 20, 1988	Near Berlin, NH	4. No damage locally.
Earthquake	January 3, 2011	Northwest of Laconia	2.5. No damage locally.
Earthquake	August 23, 2011	Travelled up the east coast from Virginia to New Hampshire	5.8. No damage locally.
Earthquake	September 18, 2012	Southern New Hampshire	1.2. No damage locally.
Earthquake	October 16, 2012	Felt throughout most of the New England states; centered in Maine	4.0 No damage locally.
Earthquake	October 11, 2013	Concord	2.3. No damage locally.
Earthquake	January - December 2014	Statewide	8 earthquakes ranging from 1.6 - 2.3. No damage locally.
Earthquake	Jan.-July 2015	New Hampshire	5 small earthquakes ranging from 1.6 - 2.3. No damage locally.

EXTREME WINTER WEATHER- HIGH RISK

Three types of winter events are heavy snow, ice storms and extreme cold. Ice storms and heavy snow could disrupt power and communication services, which could leave residents without heat or water. 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. Structural damage is less likely with these events. The chart on the following page 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. Preparedness will mitigate the damage and prepare communities for severe ice events days in advance. The list below shows past occurrences.

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

EXTREME WINTER WEATHER- HIGH RISK-continued

Past Hazards	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

EXTREME WINTER WEATHER- HIGH RISK-continued

Past Hazards	Date	Location	Description of Areas Impacted
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 inches of snow across central NH
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 years in the higher elevations in the Monadnock region.
Extreme Cold	November-December, 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
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 minor power outages throughout Richmond due to heavy snowfall.

EXTREME WINTER WEATHER- HIGH RISK-continued

Past Hazards	Past Hazards	Past Hazards	Past Hazards
Ice Storm	December 8, 2008	New Hampshire	Downed trees and power lines, power outages up to 2 weeks.
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 hours.
Snow Storm	February 8-10, 2013	New Hampshire	February Blizzard "Nemo", exceeded previous snow fall amounts; category B Declaration # DR4105. No significant damage locally, minor power outages.
Snowstorm	November 26, 2014	New Hampshire	Thanksgiving Storm. The 4 th largest power outage in NH. Some residents lost power for up to 5 days.

HAZARDOUS MATERIAL SPILLS- LOW-MEDIUM RISK

Public transportation of chemicals and bio-hazardous materials through town on NH 119 and NH 32 by truck is a concern. A truck spilled hazardous materials on NH 119 near the Richmond/Fitzwilliam Town Line within the past 10 years. Hazard Spills can contaminate the drinking water and cause serious health hazards or death.

EROSION/LANDSLIDE- MEDIUM RISK

Slopes in excess of 25% are susceptible to landslides, especially where soils are thin or highly erodible. These areas are generally located near mountain peaks and along the sides of ridges. The extent of landslides 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 causing the road to be impassable. Although the Town has no history of landslide events, NH 32 has steep slopes that could experience minor landslides or erosion and cause the road to be impassable. If information becomes available regarding vulnerable risk locations or landslide occurrences, the plan will amended accordingly.

DAMS- LOW-MEDIUM RISK

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; 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; and/or 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; and 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; and/or 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; release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII; and/or any other circumstance that would likely than cause one or more deaths.

Generally, all Class H dams need to have Emergency Action Plans, and most Class S dams also require them. According to the Department of Environmental Services Dam Bureau, there are no Class H dams in Richmond. Below is a list of dams in Richmond.

DAM	HAZCL	STATUS	NAME	RIVER	HEIGHT	IMPND	DAM OWNER
D202001	---	BREACHED	TULLY BROOK I DAM	TULLY BROOK	10		DANIEL & CAROLYN OLNEY
D202002	NM	ACTIVE	BIG DAM ABBOTS POND	TULLY BROOK	8	16	MORGAN RESERVE HOMEOWNERS ASSOC
D202003	NM	ACTIVE	TULLY BROOK III DAM	TULLY BROOK	8	0.8	MORGAN RESERVE HOMEOWNERS ASSOC
D202004	---	RUINS	NORTHWEST POND DAM	TULLY BROOK	8	9.5	MORGAN RESERVE HOMEOWNERS ASSOC
D202005	---	BREACHED	WEST BRANCH RICE BROOK DAM	WEST BRANCH RICE BROOK			NH FISH AND GAME DEPARTMENT
D202006	---	EXEMPT	MORGAN RESERVE DAM	NATURAL SWALE	5	0.25	MORGAN RESERVE HOMEOWNERS ASSOC
D202007	L	ACTIVE	LARRYS POND DAM	TR TULLY BROOK	18.5	12	MORGAN RESERVE HOMEOWNERS ASSOC
D202008	---	EXEMPT	TILSEY BROOK DAM	TILSEY BROOK	5	5	TREE GROWERS INCORPORATED

DAM	HAZCL	STATUS	NAME	RIVER	HEIGHT	IMPND	DAM OWNER
D202009	NM	ACTIVE	FIRE POND	NATURAL SWALE	12	0.2	MR LARRY KOCH
D202010	NM	ACTIVE	TRIB ROARING BROOK DAM	TR ROARING BROOK	14.5	0.2	UNKNOWN
D202011	---	NOT BUILT	OLD CASS POND DAM	SPRAGUE BROOK	10	94	UNKNOWN
D202012	S	ACTIVE	YMCA CAMP TAKODAH SEWAGE LAGOON	TULLY BROOK	8	0.72	CHESIRE COUNTY YMCA

Source: Department of Environmental Services Dam Bureau-2015

After careful review of the historical natural disasters in and near the Town of Richmond, the committee determined that the risk of radon and snow avalanches do not pose enough of a risk to the Town of Richmond to include in this plan.

CHAPTER IV: ASSESSING PROBABILITY, SEVERITY AND RISK

The Committee members completed a Risk Assessment of all the types of hazards identified in Chapter III. **Appendix B** provides a detailed methodology for the Risk Assessment. The process involved assigning Low, Medium, or High values (numerically 1, 2 or 3) to each hazard type for its possible impact to Human, Property, and Business factors (vulnerability). A score of zero was given if the hazard was non-applicable. The same process was used to assign Low, Medium, or High, values (numerically 1, 2, or 3) to each hazard type with respect to the probability that the hazard would occur in the next 25 years (See **Appendix B** for specific methodology). The Severity was calculated by determining the average of the Human, Property, and Business impacts. Risk was calculated by multiplying severity by probability. Low, Medium, High risk was assigned as shown below.

0-1.9- Low 2.0-3.9- Low-Med 4-5.9- Med 6-7.9- Med-High 8-9- High

Risk Assessment

	Human Impact	Property Impact	Business Impact	Probability	Severity	Risk	Risk
	Probability of death or injury	Physical Losses and damages	Interruption of Service	Likelihood this will occur in 25 years	Avg. of Human/Property/Business	Severity x Probability	
Flooding	.5	1	2	1.5	1.17	1.8	Low
Drought	.5	.5	1	2.5	.67	1.7	Low
Wild Fire	2	3	.5	3	1.83	5.5	Med
Lightning	3	3	3	3	3.0	9.0	High
Hurricane/Tropical Storm	3	3	3	3	3.0	9.0	High
Earthquake	.5	.5	.5	.5	.5	.25	Low
Severe Wind/Tornado/Downbursts	3	3	3	3	3.0	9.0	High
Extreme Winter Weather	3	3	3	3	3.0	9.0	High
HazMat Spills	.5	2.5	1	2.5	1.3	3.3	Low-Med
Dam Failure (including beaver dams)	.5	1	1	3	.83	2.5	Low-Med
Erosion/Landslide	.5	2.5	2	3	1.67	5.0	Med

CHAPTER V: VULNERABILITY ASSESSMENT; IDENTIFYING POTENTIAL HAZARDS AFFECTING STRUCTURES; ESTIMATING POTENTIAL LOSSES

Existing and future structures have the potential of being affected by some of the hazards identified in this plan. Some hazards identified in this plan are regional or town wide risks and, as such, all structures, infrastructure and critical facilities fall into the hazard area.

In order to determine estimated potential losses due to future natural and man-made hazards, structures need to be assigned a value. Human losses were not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Also not included is the value of contents within structures. The value of all structures, including exempt structures such as schools and churches, is \$70,523,400 according to Richmond Town Assessing records as of March 2015. The median value of a single-family home was \$212,452 in 2013¹. The data below was calculated using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses.

Since hazard vulnerability assessment is dependent on 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.

Hazard Vulnerability Assessment- Estimating Potential Losses

Potential losses were calculated for each hazard area by multiplying the type and number of potentially at risk structures by the appropriate calculated average valuation.

Identifying Hazards

Geographic Information Systems (GIS) generated maps from the original plan were updated to illustrate Past Hazards, Potential Hazards and Critical Facilities as identified by the Richmond Hazard Mitigation Team. Full-size maps are on display at Richmond's Town Offices. In addition, summary listings of "Critical Facilities" and "Areas at Risk" are presented at the end of this section.

Hazard Vulnerability Assessment

Flooding - Low Risk- Estimated Cost \$1,062,260: The Town of Richmond has 5 residential structures located in the floodplain that have the potential to be affected by flood waters, including loss of life, property damage, and infrastructure damage to roads and utilities. If a flood occurred that caused 100% damage to 100% of the structures within the floodplains, the estimated cost of repairing or replacing is approximately \$1,062,260.

- 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;

Drought - Low Risk- No Record of Cost: Richmond has not had experience with severe drought conditions. Drought will increase the risk of wildfire, especially in areas of high recreational use and as more timberland is set aside as non-harvested timberland, the potential for the risk of wildfire will increase.

- Forested areas with high fuel content have more potential to burn
- Low risk, but would be experienced Townwide.

¹ Source: City-Data.com September 2015

- There is no public water available, therefore, residents could be without a water source if wells dry up.

Wildfire - Medium Risk - No Record of Cost: As timber harvesting is reduced, wood roads close, debris builds up on the ground, potential for wildfire increases Townwide. The entire town is at risk, however greater concerns are for the large wooded areas throughout town as indicated on the Past and Potential Hazards Map. There has been no history of large wildfires in Richmond. There is minimal forest fire protection (dependent on volunteer firefighters and problems with accessibility). Structures are at greater risk if a wildfire occurs during the workday since many of the volunteer firefighters work in other towns.

- Wildfires pose a risk of life and property loss as well as disruption of utility service.
- Recent ice storms, heavy snow and wind events cause additional branches and trees to fall creating ripe conditions for a fire to occur.

Earthquake - Low Risk - Estimated Cost \$13,475,640: Low potential for serious damage town wide. Structures are mostly of wood frame construction. An estimated loss to 20% of town assessed structural valuation is \$13,475,640.

- There is a potential for disruption of utilities;
- There is a potential for collapse of structures, roads and bridges;
- There is a potential for injury or death;
- This could occur Townwide.

Hurricane/Tropical Storm - High Risk– Estimated Cost \$1,694,455: Richmond's inland location in southwestern New Hampshire reduces the risk of extremely high winds that are associated with hurricanes. Hurricanes can and do create flooding. The estimated wind damage to 5% of the structures with 10% damage is \$336,891. The estimated flood damage to 10% of the structures with 20% damage is \$1,347,564. There is a potential for disruption of utilities;

- There is a potential for loss of life and property;
- There is a potential for downed trees onto structures and roads.
- This could occur Townwide.

Severe Wind/Downbursts/Tornado - High Risk – Estimated Cost \$1,347,564: The entire town is at risk from severe localized blasting winds. Such events can cause small blocks of downed timber. Higher elevations are at the greatest risk. Old trees along roads are at risk of falling across roads. There is potential damage to structures during severe wind events which may also include the loss of electricity. Downbursts are sometimes mistaken for tornados and can cause similar damage. These events are unpredictable, therefore, assessing damages is difficult. Buildings have not been built to Zone 2, Design Wind Speed Codes. Estimated damages to 10% of structures with 20% damages is \$1,347,564. Estimated cost does not include building contents, land values or damages to utilities.

- This could occur Townwide.

Lightning Strikes - High Risk: No Record of Cost: Lightning is an unpredictable hazard. It could strike anywhere in Richmond and potentially start a forest fire especially in periods of drought. High elevations and areas around waterbodies may be more susceptible to lightning strike incidents. The following have a greater potential of risk of a lightning strike: utility poles, antennas and cell towers, boaters, and hikers. There is no record of loss due to lightning strikes in Richmond. Past strikes have caused isolated damage to private property

but have not been documented.

- There is a potential of disruption of services such as power and phone;
- Lightning strikes could start a fire;
- This could occur Townwide.

Extreme Winter Weather - High Risk - No Record of Cost: Three types of winter events include heavy snow, ice storms and extreme cold which cause concern. Ice storms and heavy snow have disrupted power and communication services. Timberland has been severely damaged. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

- November 2014 Thanksgiving Storm. The 4th largest power outage in New Hampshire. Some residents lost power for up to 5 days in Richmond.
- There is a potential for disruption of utilities;
- There is a potential for loss of life and property;
- Potential for damage to structures, roads and bridges;
- This could occur Townwide.

Landslide/Erosion – Medium Risk - Potential-No Record of Cost: *Landslides* may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. *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. Although the Town has no history of landslide events, NH 32 has steep slopes that could experience minor landslides or erosion.

- There is a potential for mud and debris to enter the streams;
- There is a potential for mud and debris onto roads.

Dam Failure – Low-Medium Risk – Estimated Cost \$1,062,260: Dam breach or failure is a low to medium risk in Richfield, including loss of human life. Assuming 100% damage to 100% of the \$1,062,260 residential structures in the floodplain, along with losses to utilities and public properties, the total damage could exceed that figure.

- 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;

The Past and Potential Hazards Map depicts the location dams within the Town. The State of New Hampshire classifies dams into the following four categories: NM – Non-menace; L – Low hazard; S – Significant hazard; H – High Hazard. Generally, all Class H dams need to have Emergency Action Plans. There are no Class H dams in Richmond according to the Department Of Environmental Services Dam Bureau, however, beaver dams are a concern.

Hazardous Materials Spills – Low-Medium Risk - No Record of Cost: Hazardous materials spills could occur anywhere in Town, however the greatest concern is the transportation of chemicals and bio-hazardous materials on NH 32 and NH 119 by truck. A spill could cause water contamination or airborne pollutants to residents which may cause illness.

Chapter VI 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

The Critical Facilities List for the Town of Richmond has been identified using a Critical Facilities List provided by the State Hazard Mitigation Officer. Richmond's Hazard Mitigation Committee has divided 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 Richmond. 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. A table at the end of this section identifies critical facilities located in potential hazard areas.

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

Civil Defense Building- 17-2 Winchester Road

2. Fire Station

Richmond Center Fire Station – 17 Winchester Road

3. Police Station

Richmond Police Station- 15 Winchester Road

4. Emergency Shelters (not Red Crossed approved)

Old Veteran's Hall- Old Homestead Highway
Camp Takodah (generator available)- NH 119
Camp Wiyaka-Sandy Pond Road (seasonal)

5. Town Hall

105 Old Homestead Highway

6. Evacuation Routes

NH 119
NH 32

7. Bridges Located on Evacuation Routes

See Critical Facilities map for locations

8. Public Utilities

FAA Tower- Taylor Hill Road
Telephone Switching Station-NH 119/Old
Homestead Highway

Between County Road and Monument Road
Sandy Pond Road

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 Richmond.

1. Water Supply

Private Wells

2. Bridges/Problem Culverts

Mill Road - red listed bridge

Old Turnpike Road - red listed bridge

3. Emergency Fuel Facilities

NH DOT in Rindge or Swanzey

Town Shed has diesel fuel and some in tanks

4. Power stations, sub-stations, transmission lines

Cross-town transmission lines

Electric Substations

Underground fiber optic lines

5. Telephone facilities, transmission lines and cell towers

Switching stations all over Town

Cell towers

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

Mentally challenged

People on a lifeline

Elderly

People assisted by Home Health

Hearing impaired

Shut-ins and disabled

Sight impaired

2. Recreation Area Visitors

Town Beach

Amadon Park- 17 Winchester Road

Monadnock Metacomet Trail

3. Churches

St. Benedict's Church- Fay Martin Road

Richmond Community Church- NH 119

4. Historic Buildings/Sites

Town Hall

Library

Veteran's Building

Old Brick Church

Telephone Switching Station

5. High Population Areas

Camp Takodah
Camp Wiyaka

Shir-Roy Camping area
St. Benedict's Church

Category 4 - Potential Resources:

The fourth category contains facilities that provide potential resources for services or supplies.

1. Food/Water

Grocery stores in surrounding towns

2. Hospitals

Medical Facilities Located in Keene; Athol and Greenfield, MA; and Brattleboro, VT

3. Gravel Pits

NH 119- Davis
Mill Road- Holman

4. Heavy Equipment

John Holman- construction equipment
Kevin Duffy- trucks, plows

5. Miscellaneous Resources

Emergency Broadcast & Television: WKNE- 103.7 F.M.
WMUR- TV 9

Amateur Radio Emergency Service:

20 Old Homestead Highway
29 Old Homestead Highway
Fish Hatchery Road

Transportation:

Thomas Transportation- NH 12 Swanzey
Adventure Limousine- NH12 Marlborough

Bussees:

First Student in Swanzey

Beds, Cots, Blankets:

Red Cross

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. The following critical facilities fall within the 100-year floodplain:

FACILITY NAME	FACILITY TYPE	BUILDING TYPE	ADDRESS
Bridge/box culvert	Bridge/box culvert	Bridge/ box culvert	NH 119

CHAPTER VII EXISTING MITIGATION STRATEGIES & PROPOSED IMPROVEMENTS

REVIEW OF EXISTING PROGRAMS

The Richmond 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:

Flooding

- Emergency Operations Plan
- Road Design Standards
- Bridge Maintenance Program
- Storm Drain / Culvert Maintenance
- Wetlands Protection
- Building Code
- Town Warning System
- Emergency Response Plans Summer Camps

Drought/Lightning

- Public Education Programs
- Emergency Response Plans Summer Camps

Severe Wind (includes Tornadoes & Downbursts)

- Building Code
- Town Warning System
- Emergency Response Plans Summer Camps

Hurricanes/ Tropical Storms

- Building Code
- Emergency Operations Plan
- Town Warning System
- Emergency Response Plans Summer Camps

Wildfire

- Building Code
- Town Warning System
- Hazardous Materials Plan / Team
- Public Education Programs
- Emergency Response Plans Summer Camps

Ice & Snow Events

- Bridge Maintenance Program
- Storm Drain / Culvert Maintenance
- Building Code
- Town Warning System
- Wetlands Protection

Landslide/Erosion

- Road Design Standards
- Wetlands Protection

Earthquake

- Building Code
- Emergency Operations Plan
- Town Warning System
- Hazardous Materials Plan / Team

Man-Made Hazards

- Hazardous Materials Plan / Team
- Emergency Operations Plan
- Public Health Plan (Cheshire All Health Hazard Region)

EXISTING MITIGATION STRATEGIES & PROPOSED IMPROVEMENTS

This matrix is a summary of existing hazard mitigation strategies including: Type of existing protection (Column 1), Responsible Agent (Column 2), the area of town affected (Column 3), effectiveness (Column 4), and the identified improvements or changes needed (Column 5).

Effectiveness/ condition of the Existing Protection is rated Poor, Average, Good or Unknown : *Poor*- needs improvements; *Average*- meets general expectations; *Good*- meets and sometimes exceeds expectations; *Unknown*- not yet used or unable to quantify effectiveness.

EXISTING PROTECTION MATRIX

<u>COLUMN 1:</u> TYPE OF EXISTING PROTECTION	<u>COLUMN 2:</u> DESCRIPTION	<u>COLUMN 3:</u> RESPONSIBLE AGENT	<u>COLUMN 4:</u> EFFECTIVENESS/ CONDITION	<u>COLUMN 5:</u> COMMENTS/CHANGES NEEDED
Emergency Operations Plan (2009)	The Town's EOP meets the recommendations by the NH HSEM. This plan identifies the response procedures and capabilities of the Town of Richmond in the event of a natural or man-made disaster.	EMD	Average	Needs to be updated.
Building Code	The town complies with the State of New Hampshire Building Code which incorporates the IBC, IPC and NFPA. Currently there is a part-time code enforcement officer to enforce the standards.	Selectmen	Poor	Hired a part-time Zoning Compliance Officer. Need to hire a part-time code enforcement officer.
Emergency Warning System	Supplementing the Vermont Yankee sirens are PA systems in all Fire & Police vehicles.	VY/Fire/Police/SAU #38	Average/Good	Access to reverse 911 through SAU #38.
Road Design Standards	Richmond Subdivision and Site Plan Regulations include road design standards that control the amount and retention of storm water runoff.	Selectmen/Planning Board/Road Agent	Average	Designated Class VI roads are now emergency roads.
Bridge Maintenance Program	There are currently 2 bridges on the state Red List. Inspection and clean-up occur annually. The state inspects all bridges every other year and maintain their bridges.	Selectmen/Road Agent	Poor	2 bridges need to be repaired/upgraded (Mill Road and Old Turnpike Road).

<u>COLUMN 1:</u> TYPE OF EXISTING PROTECTION	<u>COLUMN 2:</u> DESCRIPTION	<u>COLUMN 3:</u> RESPONSIBLE AGENT	<u>COLUMN 4:</u> EFFECTIVENESS	<u>COLUMN 5:</u> COMMENTS/CHANGES NEEDED
Storm Drain / Culvert Maintenance	The Richmond Road Agent and the State DOT clean the drainage basins once a year and after major flooding events. Culverts are repaired as needed.	Selectmen/Road Agent	Average	Gravel roads could use drainage updates.
Wetlands Protection	The Zoning Ordinance contains wetland buffer regulations.	Planning Board	Good	Local citizen knowledge of local and state wetland regulations needs to be increased through educational outreach programs.
Hazardous Materials Plan / Team	There are no substantial Hazardous Material facilities that warrant a Hazardous Material Plan. A regional HazMat response team that serves the town.	Fire Chief/Police Department	Average	Additional containment equipment. Training and first response.
Public Education Programs	The Fire Dept. conducts periodic fire prevention programs. The Police Department conducts periodic programs.	Police/Fire/EMD	Average	Update town website.
Public Health Plan (Cheshire All Health Hazard Region)	The Public Health Emergency Preparedness Response Plan (PHEPRP) addresses public health emergencies.	Greater Monadnock All Health Hazard Region	Average	POD is in Troy
Emergency Response Plans Summer Camps	Emergency Response Plans for summer camps.	EMD/Health Officer	Average	The Plan for Takodah was received at the EOC in 2015.

Status of Previous Priority Mitigation Actions

The following table provides a status update for the Priority Mitigation Actions identified in the previous Plan. Previously identified mitigation actions are noted as completed, deleted, or deferred to the updated Plan's new mitigation strategies list. An explanation of the status is also provided.

Mitigation Action	Status	Explanation of Status
Conduct a drainage study for culvert upgrades on Taylor Hill Road and Whipple Hill Road.	Completed	The culverts have been cleaned and maintained.
Purchase and install a generator for Veterans Hall which is the shelter.	Deferred*	This should be included as a new mitigation action in this plan.
Purchase and install a generator for Town Hall (currently wired).	Deferred*	This should be included as a new mitigation action in this plan.
Purchase and install a generator for Emergency Services Complex.	Completed	A generator was installed in 2014.
Purchase repeater for emergency responder communications.	Deferred*	One has been purchased for the Police Department. Need one for Fire Department.
Replace bridge and upgrade culverts on Fay Martin Road (Tully Brook Watershed) to prevent isolation of homes from flooding.	Completed	The bridge was replaced in 2013 and pipes/culverts in 2014-2015.
Create fire lanes on Class 6 roads.	Completed	These are accessible for emergencies.
Replace water tanker truck.	Deleted	Not a mitigation action.
Develop a written agreement with Camp Takodah and purchase a generator for use as a shelter facility.	Completed	A generator has been installed in the dining hall.
Identify available resources for hazard materials intervention	Completed	This is done by Southwest Mutual Aid
Install panic buttons for town hall, library and Emergency Resource Complex.	Deleted	Not a mitigation action.
Update the EOP to identify alternative sources for emergency drinking water.	Deleted	Not a mitigation action. Include this in EOP.
Build a new fire station to meet hazard resistant standards.	Deleted	Not a mitigation action.
Construct shed for shelter supplies.	Deleted	Not a mitigation action.

Engage the Regional Planning Commission to conduct a Steep Slope study.	Deleted	Lack of funding.
Coordinate with public and private camps to develop emergency response plans.	Completed/Deferred*	Ongoing on an annual basis.
Provide haz-mat awareness training.	Completed	Not a mitigation action. This is available through Fire Rescue.
Purchase ATV for emergency access.	Completed	Not a mitigation action. Police & Fire Depts. each have one.
Investigate joining the Fire Wise Program.	Deferred*	Unfamiliar with the program but will consider it in this plan.
Chain saw for debris removal.	Completed	Not a mitigation action.
Chipper, chainsaw and safety equipment for debris removal.	Completed	Not a mitigation action.
Install a fire alarm system for town hall and provide data protection.	Deleted	Not a mitigation action.
Update existing UTV for winter weather rescue.	Completed	Not a mitigation action.
Replace Greenwoods Road culvert (Cass Pond Watershed).	Completed	Replaced/upgraded in 2012
Request Resource Conservation and Development (RC&D) water resource study.	Deleted	Not a mitigation action.
Update website for public education on shelter and emergency information during emergencies.	Deleted	Not a mitigation action. Include this in EOP.
Provide lightning awareness brochures for summer camps, school and private camp ground.	Deleted	Not a mitigation action. Include this in EOP.
Update EOP to identify snow mobile resources.	Deleted	Not a mitigation action. Include this in EOP.

*These actions were brought forward and considered along with new mitigation actions; all were then treated as potential actions and prioritized in a similar manner.

CHAPTER VIII: PROPOSED MITIGATION STRATEGIES

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 Richmond, 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.

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.

New Programs or Activities: Identifying Gaps in Coverage

In addition to the programs and activities that Richmond 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

Location Specific Programs or Activities

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 III. In these cases, the Committee felt that the risk to the location was so great, mitigation actions could be geared directly to mitigating hazards at that location.

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
All Hazards				Continue necessary training for all town officials and EMS.	Town Warning System-educate the public about Reverse 911 System
					Add information on Town website about mitigation and preparedness for all hazards.
Flooding	Become a member of NFIP.		Maintenance program for stormwater management.		Provide information to residents about the National Flood Insurance Program and how to get flood insurance.

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
	The town will enforce the updated FEMA Digital Flood Insurance Rate Maps/FIS and floodplain ordinance to ensure the NFIP requirements are maintained and implemented.				
Drought	Establish a Water Conservation Plan.				Provide information to residents on water conservation/ drought resistant landscaping.
Wild Fires	Become a Firewise Community.	Fire Pond/Dry Hydrant Mgmt Plan.			Install a Smokey Bear sign to mitigate chances of forest fire and alert the public of conditions/risk
Lightning			Consider installing grounding equipment on historic buildings.		Provide information for residents to understand ways to mitigate potential damage during a lightning storm.
Hurricanes/ Tropical Storms		Consider requirement for new construction to withstand severe wind speeds.			Provide information for residents to understand ways to mitigate potential damage during a hurricane/ tropical storm.
Earthquakes	Adopt stricter building codes to mitigate the effects of an earthquake.		Retrofit public buildings with earthquake standards.		Provide information to the public about reducing damage due to earthquakes.
Severe Wind/ Downbursts/ Tornadoes		Require tie-downs for structures (such as sheds).			Provide information for residents to understand ways to mitigate potential damage during severe wind, downbursts and tornadoes.
Extreme Winter Weather	Become a member of NH Public Works Mutual Aid.	Trim tree branches from power lines and structures.		Formalize Snow Removal Plan	Disseminate information to residents about proper use of generators and the importance of maintaining the heating system.

Hazard Type or Specific Location	Prevention	Property Protection	Structural Projects	Emergency Services	Public Information
Hazardous Materials Spills				Local training for hazmat response continued.	
Erosion	Adopt a Steep Slope ordinance. Adopt Sediment and Erosion Control Regulations	Increase vegetative buffers along waterbodies.			Provide information to the public about clearcutting on steep slopes.
Dam Failure	Relocate beavers				

SUMMARY OF NEW STRATEGIES

The Richmond Hazard Mitigation Team identified the following potential mitigation strategies related to:

Flooding

- Become a member of NFIP.
- Storm drain maintenance.
- Increase number of mobile generators.
- Best management practices including E&S plan, river stewardship, tree inventory, & stream maintenance.
- Culvert upgrades as needed.
- Update Local Emergency Operations Plan (2009).
- Develop a Town Warning System such as E911 or Code Red.
- Prepare a response to SWRPC’s project solicitation request for potential state highways projects to be considered for inclusion into the Ten Year Plan.
- Check problem culverts and drainage ditches prior to heavy rain event for debris.

Drought

- Develop a Town Warning System such as E911 or Code Red.
- Increase number of mobile generators.
- Consider adding Water Conservation Regulation & voluntary water ban if necessary.
- Provide outreach & education on ways to mitigate the effects of drought conditions.

Wildfire

- Fire Pond/Dry Hydrant Management Plan.
- Increase number of mobile generators.
- Update Local Emergency Operations Plan (2009).
- Develop a Town Warning System such as E911 or Code Red.
- Install a Smokey Bear sign to mitigate chances of forest fire and alert the public of conditions/risk.
- Become a Firewise Community

Lightning Strikes

- Install grounding devices on all public buildings.
- Increase number of mobile generators.
- Provide outreach & education on safety & prevention of lightning strikes.

Severe Wind/ Tornadoes/ Downbursts

- Develop a Town Warning System such as E911 or Code Red.
- Increase number of mobile generators.
- Update Local Emergency Operations Plan (2009).
- Provide a “safe house” for use during extreme wind events.

Hurricanes/ Tropical Storms

- Increase number of mobile generators.
- Best management practices-E&S plan, river stewardship, tree inventory, & stream maintenance.
- Update Local Emergency Operations Plan.
- Develop a Town Warning System such as E911 or Code Red.
- Provide outreach & education on ways to mitigate the effects of hurricanes and tropical storms.

Earthquake

- Increase number of mobile generators.
- Update Local Emergency Operations Plan (2009).
- Develop a Town Warning System such as E911 or Code Red.
- Provide outreach & education on ways to mitigate the effects of earthquakes.
- Adopt stricter building codes to mitigate the effects of an earthquake.

Ice & Snow Events

- Increase number of mobile generators.
- Formalize Snow Removal Plan.
- Best management practices-E&S plan, river stewardship, tree inventory, & stream maintenance.
- Update Local Emergency Operations Plan (2009).
- Develop a Town Warning System such as E911 or Code Red.
- Tree maintenance- Cut branches away from powerlines.
- Disseminate information to residents about proper use of generators and the importance of maintaining the heating system.
- Become a member of NH Public Works Mutual Aid.

Erosion/Landslide

- Consider Erosion Control ordinance.
- Increase buffer requirements along streams and other waterbodies.
- Provide information to the public about clearcutting on steep slopes.

Man-made Hazards (Dams, Hazard materials spills, Technological hazards)

- Increase number of mobile generators.
- Update Local Emergency Operations Plan (2009).
- Develop a Town Warning System such as E911 or Code Red.
- Host a workshop to promote well testing and ways to protect the aquifer. Provide other means of outreach & education.
- Relocate beavers.

PRIORITIZING PROPOSED MITIGATION ACTIONS

Using a similar methodology as the previous plan, new actions were identified based on the updated risk assessment and capability assessment. The new actions were prioritized in combination with the actions carried forward from the previous plan.

The goal of each strategy identified in the previous table is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each strategy. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation strategies and discussed in the table:

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

Each mitigation strategy was evaluated and assigned a score (Good = 3, Average = 2, Poor = 1) based on the above criteria. An evaluation chart with total scores for each strategy can be found in the table below. Each strategy was evaluated and prioritized according to the final score. The highest scoring strategies were determined to be of most importance, economically, socially, environmentally, and politically.

An additional factor that is not considered here but should be considered by the Committee on a project-by-project basis is the ability to find funding.

<p style="text-align: center;">STAPLEE CHART</p> <p style="text-align: center;">Mitigation Strategy</p>	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
Become a member of NFIP	3	3	3	3	3	3	3	21
Investigate joining the Fire Wise Program.	3	3	3	3	3	3	3	21
Provide information to the public about the benefits of the NFIP.	3	3	3	3	3	3	3	21
Include the Hazard Mitigation Plan Update as an appendix in the Richmond Master Plan.	3	3	3	3	3	3	3	21
Provide training/ information to the Planning Board and Town officials about development in the floodplain.	3	3	3	3	3	3	3	21
Provide information or workshop to residents on water conservation/ drought resistant landscaping (ex. rain gardens).	3	3	3	3	3	3	3	21
Update the town website with information about ways to mitigate the effects of natural hazards during severe weather events and include preparedness and emergency response information. Include Hazard Mitigation Plan on website.	3	3	3	3	3	3	3	21
Hold a workshop for town officials about mitigation, preparedness and response for severe weather events.	3	3	3	3	3	3	3	21
Become a member of the Public Works Mutual Aid	3	3	3	3	3	3	3	21
Continue implementing best management practices (BMPs) on town projects.	3	3	3	3	3	3	3	21
Install a Smokey Bear sign to mitigate chances of forest fire and alert the public of conditions/risk	3	3	3	3	3	3	3	21
Update the Local Emergency Operations Plan (2009).	3	3	3	3	3	3	3	21
Coordinate with public and private camps to develop emergency response plans and obtain hard copies.	3	3	3	3	3	3	3	21
Explore alternatives for a Town Warning System such as E911 or Code Red.	3	3	3	3	3	3	3	21
Purchase and install a generator for Veterans Hall which is a shelter.	3	3	3	3	3	3	3	21
Purchase and install a generator for Town Hall (currently wired).	3	3	3	3	3	3	3	21
Repair or upgrade the bridge on Old Turnpike Road (currently red listed).	3	3	3	3	3	3	2	20
Upgrade/expand the repeater to improve emergency responder communications.	2	3	3	2	3	3	3	19
Repair or upgrade the Mill Road bridge (currently red listed).	3	3	3	2	3	1	2	17

SECTION IX: PRIORITIZED IMPLEMENTATION SCHEDULE & FUNDING SOURCES

The Richmond Hazard Mitigation Team 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. Some actions do not have a completion date and are considered to be “Ongoing” actions that will continue through the duration of the plan.

Implementation Strategy for Priority Mitigation Actions			
Mitigation Action	Who (Leadership)	When (Deadline)	How (Funding Source and Estimated Cost)
Become a member of NFIP	Board of Selectmen	Short term	Town Budget Under \$100
Investigate joining the Fire Wise Program.	Fire Chief	Short term	Town Budget Under \$100
Provide information to the public about the benefits of the NFIP.	Emergency Management Director	Short term	Town Budget Under \$100
Include the Hazard Mitigation Plan Update as an appendix in the Richmond Master Plan.	Emergency Management Director	Long Term	Town Budget \$200
Provide training/ information to the Planning Board and Town officials about development in the floodplain.	Board of Selectmen	Mid-term	Town Budget/grants \$250
Provide information or workshop to residents on water conservation/ drought resistant landscaping (ex. rain gardens).	Conservation Commission	Mid-term	Town Budget Under \$100
Update the town website with information about ways to mitigate the effects of natural hazards during severe weather events and include preparedness and emergency response information. Include Hazard Mitigation Plan on website.	Emergency Management Director	Short term	Town Budget Under \$100
Hold a workshop for town officials about mitigation, preparedness and response for severe weather events.	Emergency Management Director	Short term	Town Budget \$500
Become a member of the Public Works Mutual Aid	Road Agent/ Board of Selectmen	Short Term	Town Budget \$25/year
Continue implementing best management practices (BMPs) on town projects.	Road Agent	Ongoing	Town Budget \$100-\$1000
Install a Smokey Bear sign to mitigate chances of forest fire and alert the public of conditions/risk	Fire Chief	Short term	Town Budget/grants \$5,000
Update the Local Emergency Operations Plan (2009).	Emergency Management Director	Short term	Town Budget/grants \$5,000
Coordinate with public and private camps to develop emergency response plans and obtain hard copies.	Emergency Management Director	Short term	Town Budget Under \$100
Explore alternatives for a Town Warning System such as E911 or Code Red.	Police Chief/Fire Chief	Long Term	Town Budget/grants \$5000
Purchase and install a generator for Veterans Hall which is a shelter.	Emergency Management Director	Mid-term	Town Budget/grants \$10,000
Purchase and install a generator for Town Hall (currently wired).	Emergency Management Director	Mid-term	Town Budget/grants \$5000
Repair or upgrade the bridge on Old Turnpike Road (currently red listed).	Road Agent	Long Term	Town Budget/grants \$200,000

Implementation Strategy for Priority Mitigation Actions			
Mitigation Action	Who (Leadership)	When (Deadline)	How (Funding Source and Estimated Cost)
Upgrade/expand the repeater to improve emergency responder communications.	Police Chief/Fire Chief/ Road Agent/EMD	Mid-term	Town Budget/grants \$10,000
Repair or upgrade the Mill Road bridge (currently red listed).	Road Agent	Long Term	Town Budget/grants \$200,000

SECTION X ADMINISTRATIVE PROCEDURES REGARDING ADOPTION OF THE PLAN

ADOPTION

The Richmond Board of Selectmen adopted the Richmond Hazard Mitigation Plan on June 13, 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.

IMPLEMENTATION

The top 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 Action Plan in Section IX) 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.

It is their responsibility to make sure the mitigation strategies when implemented conform to the other plans (Master Plan) and land use regulations (Zoning Ordinance) 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 (Section IX), it is recommended that the town revisit the Richmond Hazard Mitigation Plan Update 2016 annually, or after a hazard event. The Emergency Management Director is responsible for initiating this review and needs to consult with the Select Board 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. The public will continue to be invited and involved during this process. In keeping with the process of adopting the original Richmond Hazard Mitigation Plan, a public hearing to receive public comment on Plan maintenance and updating should be held during the annual review period.

Appendix F is meant to assist in the monitoring and evaluation of the plan on an ongoing basis.

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 Richmond Hazard Mitigation Plan receives the attention it requires for satisfactory use.

Master Plan

The Master Plan has not been updated since 2004, therefore, the previous Hazard Mitigation Plan was not incorporated into it. Where appropriate, recommendations from the Richmond Hazard Mitigation Plan Update 2016 will be inserted into future updates of the Master Plan. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to recommend that the Richmond Hazard Mitigation Plan Update 2016 is adopted as a Chapter or appendix of the Master Plan.

Zoning Ordinance and Regulations

The implementation strategies sometimes involve revisions to the Subdivision Regulations and/or the Site Plan Review Regulations as well as the Zoning Ordinance. As a result of the Implementation Plan in the 2010 Hazard Mitigation Plan, the Town has adopted a Floodplain Protection ordinance. This new ordinance will now enable the Town to be eligible for NFIP membership, which has been added as a new mitigation action. As additional needs develop that involve amendments to the Land Use regulations/ordinances, the Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to develop appropriate language for the change.

Capital Improvement Program

Projects that cannot be completed under the annual budget are included in the Capital Improvement Program. An example of the types of projects include: the 2012 culvert replacement and upsizing at the Greenwoods Road (Cass Pond watershed), and the 2013-2015 bridge and culvert replacements/upsizing on Fay Martin Road (Tully Brook watershed).

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 will be utilized for public involvement include:

- Provide personal invitations to town department heads;
- Post it on the Town website;
- Post notices of meetings at the Town Office and local businesses; and
- Submit newspaper articles for publication to the Keene Sentinel, Monadnock Ledger, and/or the Monadnock Shopper.

A number of Implementation Action items which will be undertaken relate to public education and involvement. Additionally, the public including area business owners, communities, and organizations will be invited to participate in the yearly process of updating the Richmond Hazard Mitigation Plan. These outreach activities will be undertaken during the Plan's annual review and during any Hazard Mitigation Committee meetings the Board of Selectmen calls to order. For all meetings regarding the Hazard Mitigation Plan, the public will be noticed per New Hampshire's Right-to-Know Law, RSA 91-A, and the meetings will be open to the public.

The Town of Richmond, NH Hazard Mitigation Plan must be reviewed, revised as appropriate, and resubmitted to FEMA for approval every **five years** in order to maintain eligibility for all Hazard Mitigation Assistance (HMA) funding. Approval of this plan was granted by FEMA on **June 24, 2016**.

CERTIFICATE OF ADOPTION

RICHMOND, NEW HAMPSHIRE

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE

RICHMOND HAZARD MITIGATION PLAN UPDATE 2016

WHEREAS, the Town of Richmond, 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

July 15, 2015 and October 21, 2015

WHEREAS, public and committee meetings were held between ~~October 2014 and March 2015~~ *SA* regarding the development and review of the Richmond Hazard Mitigation Plan Update 2016; and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Richmond, 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 Richmond 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 Richmond;
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 Richmond this *13*th day of *June, 2015 2016*

[Signature]

Richmond Board of Selectmen Chairman

[Signature]

Board of Selectmen

Board of Selectmen

ATTEST

[Signature]

APPENDICES

Appendix A: Hazard Descriptions

The following list describes hazards that have occurred or have the potential to occur in the Town of Richmond. 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.

Drought

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are rare in New Hampshire. They generally are not as damaging and disruptive as floods and are more difficult to define. The effect of droughts is indicated through measurements of soil moisture, groundwater levels, and stream-flow. However, not all of these indicators will be minimal during a drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground-water levels or increasing stream-flow. Low stream-flow correlates with low ground-water levels because ground-water discharge to streams and rivers maintains stream flow during extended dry periods. Low stream-flow and low ground-water levels commonly cause diminished water supply.

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.

Earthquake

New England is considered a moderate risk earthquake zone. An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric, water and phone lines, and often cause landslides, flash floods, fires, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and Mercalli scale.

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.

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 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.

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 can be *Microbursts*, which covers an area less than 2.5 miles in diameter, or a *Macrobursts*, which covers an area at least 2.5 miles in diameter.

Hurricane

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.

Landslide/Erosion

A *Landslide* is the downward or outward movement of slope forming materials reacting under the force of gravity. These include mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows. Landslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock.

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.

Lightning

Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the sun. Fires are a likely result of lightning strikes, and lightning strikes can cause death, injury, and property damage.

Extreme 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.

Man-Made Hazards

Hazardous Materials

- Hazardous materials spills or releases can cause damage of loss to life and property. Short or longterm 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.

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 worse 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)
 Town of Richmond, NH’s Hazard Mitigation Plan (2010)
 Town of Richmond, NH’s Town Report (2014)
 Town of Richmond, NH’s Master Plan
 FEMA’s Understanding Your Risks: Identifying Hazards and Estimating Losses
 FEMA’s Local Multi-Hazard Mitigation Planning Guidance

Agencies

New Hampshire Homeland Security and Emergency Management (HSEM)	271-2231
Field Representative Hillsborough County	271-2231
Field Representative Cheshire County	271-2231
Preparedness Planner:	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.

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 Quake 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](#)

Marilyn Hilliard

Senior Planner

Phone: (617) 956-7536

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.climate-northeast.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 and Federal Grant Programs

The following are resources that can be used in Hazard Mitigation projects:

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 effects 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

Grants: NESEC raises funds from government and private sources to support local mitigation projects. These funds are awarded on a competitive basis in the form of grants in the range of \$500-5,000. The name of this program is called the *Power of Prevention*. This program was funded at about \$50,000 in 1998 and \$35,000 in 1997. NESEC is pursuing 1999 funding. The program is presently unfunded. All grant programs are administered in cooperation with the NH Homeland Security and Emergency Management (NHHSEM). Communities interested in participating should contact NHHSEM.

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 provide 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 NH 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 NH 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/hmgrp/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

Richmond Hazard Mitigation Plan Update

Meeting #1

AGENDA

July 15

6:00 p.m.

**Richmond Fire Department
Emergency Operations Office
Richmond, NH 03461**

- 1. Introduction**
- 2. 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 and update the Critical Facilities listed in the existing plan
- 5. Assessing Probability, Severity and Risk**
 - a. Estimate probability, severity, and risk for each potential hazard
- 6. Existing Mitigation Strategies and Proposed Improvements**
 - a. Review list of strategies and programs found in the existing plan
- 7. Next Meeting- TBD**

Richmond Hazard Mitigation Plan Update

Meeting #2

AGENDA

August 3

6:00 p.m.

**Richmond Fire Department
Emergency Operations Office
Richmond, NH 03461**

- 3. Introduction**
- 4. 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. Assessing Probability, Severity and Risk**
 - b. Estimate probability, severity, and risk for each potential hazard
- 4. Hazard Mitigation Goals**
- 5. Identify Critical Facilities and Hazard Areas on the Map**
- 6. Identify Gaps in Coverage**
- 7. Next Meeting- TBD**

Richmond Hazard Mitigation Plan Update

Meeting #3

AGENDA

September 2

5:30 p.m.

**Richmond Fire Department
Emergency Operations Office
Richmond, NH 03461**

- 1. Identify and Prioritize Mitigation Actions for Each Hazard**
 - a. Use the STAPLEE Chart to identify and rank actions for each hazard.
- 2. Prepare an Action Plan**
 - a. Determine the Who, When, and Funding Source for each action identified in the STAPLEE Chart.
- 3. Discuss Implementation of the Plan through Existing Programs**
 - a. Determine ways to satisfy the requirement of plan implementation through existing programs.
- 4. Next Meeting- TBD**

Richmond Hazard Mitigation Plan Update

Meeting #4

AGENDA

October 21, 2015

6:00 p.m.

**Richmond Fire Department
Emergency Operations Office
Richmond, NH 03461**

- 1. Review Draft Plan**
- 2. Final Review & Edits of Hazard Mitigation Map**

**RICHMOND HAZARD MITIGATION
MEETING # 1**

July 15, 2015

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
John Janicki	Emergency Management Director	johnnyjanicki@gmail.com
Kathryn McWhirk	Board of Selectmen	239-6528
Herbert Shaw	Fire/Rescue	239-4238 hshaw@nerr.com
Brendan Bousquet	Police Chief	
Ed Atkins	Fire Chief	239-6337
Lisa Murphy	SWRPC	lmurphy@swrpc.org
John Holman	Highway Department	242-3660
William P. Pearsall	Emergency Management Director	

**RICHMOND HAZARD MITIGATION
MEETING # 2**

August 3, 2015

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Kathryn McWhirk	Board of Selectmen	239-6528
Melanie Ellis	Richmond Fire Lt.	239-6583
John Holman	Highway Department	242-3660
Ed Atkins	Fire Chief	239-6337
John Janicki	Emergency Management Director	johnnyjanicki@gmail.com 585-9046
Lisa Murphy	SWRPC	lmurphy@swrpc.org

**RICHMOND HAZARD MITIGATION
MEETING # 3**

September 2, 2015

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
John Janicki	Emergency Management Director	johnnyjanicki@gmail.com
William P. Pearsall	Emergency Management Director	
Melanie Ellis	Richmond Fire Lt.	239-6583
John Holman	Highway Department	242-3660
Ed Atkins	Fire Chief	239-6337
Kathryn McWhirk	Board of Selectmen	239-6528
Brendan Bousquet	Police Chief	
Lisa Murphy	SWRPC	lmurphy@swrpc.org

**RICHMOND HAZARD MITIGATION
MEETING # 4**

October 21, 2015

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Kathryn McWhirk	Board of Selectmen	239-6528
Melanie Ellis	Richmond Fire Lt.	239-6583
Ed Atkins	Fire Chief	239-6337
William P. Pearsall	Emergency Management Director	
Brendan Bousquet	Police Chief	
John Janicki	Emergency Management Director	johnnyjanicki@gmail.com 585-9046
John Holman	Highway Department	242-3660
Herbert Shaw	Fire/Rescue	239-4238 hshaw@nerr.com
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Public Notice

Richmond Hazard Mitigation Plan Update Review

A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from **November 23 to December 7, 2015** at the Richmond Town Office during regular business hours or by going to the Town's web site at: www.Richmond.nh.gov.

Written comments may be addressed to John Janicki or William P. Pearsall, Emergency Management Directors, and mailed to: Richmond Town Office, 105 Old Homestead Highway, Richmond, NH 03407 or by email to johnnyjanicki@gmail.com or lmurphy@swrpc.org.

This is a sample of the e-mail newsletter that is sent to approximately 350 addresses within the region and state. Recipients include Town officials and staff within the Southwest Region of New Hampshire,

businesses, county departments, academic institutions, stakeholder organizations, and interested individuals. Notice of the Richmond Hazard Mitigation Committee meetings were included in the publication prior to each meeting (July 10, July 24, August 21, and October 16, 2015 editions).



Happenings

from Southwest Region Planning Commission

In This Issue

[Federal Energy Regulatory Commission Scoping Meetings](#)

[Plein Air Day at Calhoun Family Forest](#)

[Power Lines, Pipelines and Power Plants: Siting New Hampshire's Energy Future](#)

[Weigh in on the Revised NH Wildlife Action Plan](#)

[Complete Streets demonstration events](#)

[Complete Streets Workshop Save the Date](#)



July 24, 2015

Dear Friends,

This periodic e-communication is intended to keep you apprised of happenings in and around our region related to planning, land use, and community. You are welcome to participate in these meetings, workshops, and other activities. We encourage you to share this newsletter with others who may be interested. For additional information on any of these events or notices, please contact us at Southwest Region Planning Commission at 357-0557 or admin@swrpc.org.

Sincerely,

Tim Murphy
Executive Director

Upcoming Meetings

August 3

The Richmond Hazard Mitigation Committee

will meet at 6:00 p.m. at the Richmond Fire Department. Richmond residents, members of neighboring communities, and other

Federal Energy Regulatory Commission Scoping Meetings

The staff of the Federal Energy Regulatory Commission (FERC) will prepare an environmental impact statement (EIS) that will discuss the environmental impacts of the

interested parties are welcome to attend. For additional information, please contact [Lisa Murphy](#).

September 16
The **Monadnock Alliance for Sustainable Transportation** will meet at 4:00 p.m. at 37 Ashuelot Street in Keene, NH. For more information, please contact [J.B. Mack](#).

Quick Links

[Commission Highlights](#)

[SWRPC Web Site](#)

Share This Newsletter

 [Send to a Colleague](#)

Northeast Energy Direct Project involving construction and operation of facilities by Tennessee Gas Pipeline Company, L.L.C. in Pennsylvania, New York, Massachusetts, New Hampshire, and Connecticut. FERC will use this EIS in its decision-making process and has asked for specific comments or concerns about the environmental impacts of the proposed project. There are four methods to provide comments, including the following public scoping meetings in our area:

Wednesday, July 29, 2015

6:30 p.m.

Nashua Radisson
11 Tara Boulevard
Nashua, NH 03062
(603) 888-9970

Wednesday, July 29, 2015

6:30 p.m.

Greenfield Middle School
195 Federal Street
Greenfield, MA 01301
(413) 772-1360

Thursday, July 30, 2015

6:30 p.m.

Milford Town Hall
Town Hall, One Union Square
Milford, NH 03055
(603) 249-0600

For additional details, including the location and times of all meetings as well as alternate means to provide comments, please click [here](#).

This was posted on the Richmond Town website for the public viewing period. The draft plan was also posted on the website.

**Public Notice
Richmond Hazard Mitigation Plan Update and Review**

A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from Monday, November 23, 2015 to Monday, December 7, 2015 at the Town Selectmen's Office during regular business hours (M 3-8, W 9-1 and TH 9-12) or by going on the Town's website at: www.richmond.nh.gov.

Written comments may be addressed to John Janicki or William Pearsall, Emergency Management Directors, and mailed to Town of Richmond, 105 Old Homestead Highway, Richmond, NH 03470 or by email: johnnyjanicki@gmail.com or lmurphy@swrpc.org.

APPENDIX F- PROJECT STATUS SHEET

Project Title	Page # in Plan	Date of Project Completion	Comments



FEMA

JUL 08 2016

Carol Jameson
Chairman of the Board
Town of Richmond
105 Old Homestead Highway
Richmond, NH 03470

Dear Ms. Jameson:

Thank you for the opportunity to review the Richmond Hazard Mitigation Plan Update 2016. The Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) Region I has evaluated the plan for compliance with 44 C.F.R. Pt. 201. The plan satisfactorily meets all of the mandatory requirements set forth by the regulations.

With this plan approval, the Town of Richmond is eligible to apply to 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 Richmond 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 June 24, 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.

Carol Jameson
Page 2

JUL 08 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: Leigh Cheney, Acting SHMO, New Hampshire
Whitney Welch, Hazard Mitigation Planner, New Hampshire
Jennifer Gilbert, Asst. New Hampshire State NFIP Coordinator
John Janicki, EMD, Richmond
Lisa Murphy, Senior Planner, SWRPC

Enclosure