Greenville Hazard Mitigation Plan Update 2015

GREENVILLE, NEW HAMPSHIRE

Photo from Town Website

Prepared by the:

Town of Greenville Hazard Mitigation Committee

&

Southwest Region Planning Commission
37 Ashuelot Street
Keene, NH 03431
(603) 357-0557
www.swrpc.org

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TABLE OF CONTENTS

EXECUTIVE SUMMARY vi

I. INTRODUCTION 1

Background 1
What is Hazard Mitigation? 1
Authority 1
Funding Source 1
Purpose 1
Scope of the Plan 1
Methodology 2
Resource List for Hazard Mitigation Committee 4
Acknowledgements 5
Overall Hazard Mitigation Goals of Greenville, NH 6

II. COMMUNITY PROFILE 7

Town Overview 7
Disaster Risk 7
Development Patterns 8
Consideration for Development 8
Current Development Trends 9
Road Improvement 9
Development in Hazard Areas 9
National Flood Insurance Program (NFIP) 9
Continued Compliance with NFIP 10

III. HAZARD IDENTIFICATION 11

Hazards 11
- Flooding – Disaster Declarations 11
- Riverine Flooding – Low-Medium Risk 12
- Flooding - Low Risk 13
- Drought - Low Risk 14
- Extreme Heat – Low-Medium Risk 15
- Wildfire - Low Risk 15
- Landslide - Low Risk 16
- Lightning Strikes - Low Risk 17
- Tornado – Low Risk 18
- Hurricane, Tropical Storm - Medium Risk 19
- Earthquake - Low Risk 21
- Severe Wind/Downburst – Low-Medium Risk 23
- Extreme Winter Weather - Medium Risk 23
- Man-Made Hazards/Hazardous Materials Spills – Low Risk 25
- Radon Air/Water - High Risk 25
- Man-Made Hazards/Dams - Low Risk 25
- Map of Dams 27

IV. ASSESSING PROBABILITY, SEVERITY AND RISK- ESTIMATING POTENTIAL LOSSES 28

V. CRITICAL FACILITIES 29

Critical Facilities within Hazard Areas 29
Category 1 - Emergency Response Services 29

Emergency Operations Center 29
Fire Station 29
Police Station 29
Ambulance 29
Emergency Fuel Facilities 29
Emergency Electrical Power Facility 29
Emergency Shelters 30
Dry Hydrants - Fire Ponds - Water Sources 30
Primary Evacuation Routes 30
Bridges Located On Primary Evacuation Routes 30
Town Garage/Transfer Station 30
Communications 30
Hospitals 30
Helicopter Landing Sites 30
Category 2 - Non-Emergency Response Facilities 31
Water Supply 31
Sewer & Sewer Infrastructure 31
Problem Culverts 31
Secondary Evacuation Routes 31
Transfer Station 31
Category 3 - Facilities/Populations to Protect 31
Special Needs Population 31
Senior Housing 32
Recreation Areas 32
Schools 32
Day Care Facilities 32
Churches 32
Historic Buildings/Sites 32
Camps/Parks/Campgrounds 32
Employment Centers 32
Apartment Complexes 32
Post Office 32
Hazardous Material Storage 32
Category 4 - Potential Resources 32
Food & Water 33
Hospitals/Medical Supplies 33
Gravel Pits 33
Gas 33
Heating Fuel 33
Building Material and Heavy Equipment Suppliers 33
Small Equipment/Contractors/Snow Removal 33
Miscellaneous Resources 33
Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas 34

VI. ASSESSING VULNERABILITY – IDENTIFYING POTENTIAL HAZARDS AFFECTING STRUCTURES; ESTIMATING POTENTIAL LOSSES 35

Hazard Vulnerability Assessment 35
Estimating Potential Losses 35
Flooding (including riverine) 35
Drought 36
Extreme Heat 36

Wildfire……37

Earthquake……37
Landslide……37
Radon Air/Water……37
Tornado……37
Hurricane/Tropical Storms……38
Severe Wind/Downburst……38
Lightning Strikes……38
Extreme Winter Weather……39
Man-Made Hazardous Materials……39
Man-Made Dam Failures……39

VII. EXISTING MITIGATION STRATEGIES AND PROPOSED IMPROVEMENTS ……40

Matrix of Existing Programs and Proposed Improvements……40
Town-Adopted Building Code……40
Building Inspector……40
Emergency Back-Up Power Program……40
Local Road Design Standards……40
Local Bridge Maintenance Program……40
Local Road Maintenance Program……40
Winter Storms Operations Plan……41
Town Master Plan……41
Mutual Aid……41
Fire Pond and Dry Hydrant Management Plan……41
Floodplain Ordinance……41
Hazardous Materials Spill Prevention Control and Counter Measures Plan……42
Fire Codes (NFPA)……42
Ambulance Service……42
Town-Sponsored Safety Awareness Program……42
Town Radio System……42
Floodplain Development Ordinance……43
Health Officer……43
Tree Maintenance Program……43
Emergency Management Plan……43
Beaver Control and Monitoring Plan……43
Slash Monitoring……43
Previous Mitigation Action Update……44

VIII. MITIGATION STRATEGIES……46

Preventative (Programs/Policies)……46
Training……46
Public Education & Information……47
Engineering……47
Property Protection……47
Structural Projects……47
Potential Hazard Location-Mitigation Actions……48
Prioritization of Proposed Mitigation Strategies……50

IX. PRIORITIZED IMPLEMENTATION SCHEDULE AND ACTION PLAN ……53

Summary of Critical Evaluation……53
Implementation Schedule and Action Plan……54

X. ADOPTION, IMPLEMENTATION, MONITORING & UPDATE.....56

Adoption 56
Monitoring & Updates 56
Implementation of the Plan through Existing Programs 57
Continued Public Involvement 57
Certificate of Adoption……58

APPENDICES

Hazard Descriptions.....Appendix A
Risk Assessment.....Appendix B
Resources/ FEMA Region I Mitigation Planning Webliography .....Appendix C
Hazard Mitigation Resource Profiles.....Appendix D
Documentation of the Planning Process ..... Appendix E
Project Status Sheets..... Appendix F
Fluvial Erosion Hazard Map & Descriptions .....Appendix G

Executive Summary

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

Natural hazards are addressed as follows:

- Flooding (Riverine, Ice/Snow Melt)
- Wind (Downburst, Tornado & Hurricane)
- Wildfire
- Extreme Winter Weather
- Radon (Air/Water)
- Drought
- Landslides
- Extreme Heat
- Earthquakes
- Lightning
- Erosion
- Man-Made (Hazardous Materials/Dam Breach)

The Greenville Hazard Mitigation Committee, as shown per Chapters III and IV, identified "Critical Facilities" and "Areas at Risk" as follows:

Critical Facilities

- Emergency Operations Center
- Fire Station
- Police Station
- Ambulance Service
- Emergency Fuel Facilities
- Emergency Electrical Power Facility
- Emergency Shelters
- Dry Hydrants/Fire Ponds/Water Sources
- Evacuation Routes & Bridges (Primary)
- Town Garage/Transfer Station
- Communications
- Hospitals
- Helicopter Landing Sites

Areas at Risk

- Areas southeast of Old Wilton Road/Baker Street
- Areas west of Main Street where Souhegan River flows through Town Center
- White Street
- Mill Street/Hubbard Hill Road Intersection
- Livingston Road
- Adams Hill Road near NH 31 Intersection
- Southeast of Intersection of NH 31 and Mason Road
- Intersection of East Road/ Kimball Road/Richardson Road Area
- NH 31 and New Hill Crest Road Area
- Hemlock Hills
- Area between NH 31 and Adams Hill Road
- NH 31East of NH 31 and North of Mason Road
- Intersection of Maldarelli Road and Barrett Road
- Merriam Hill Road and Mason Road
- Barrett Hill Road
- Area between Cross Street and Adams Hill Road
- High Street
- Adams Hill Road Area

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

- Town adopted Building Code
- Building Inspector
- Emergency Back-up Power
- Local Road Design Standards
- Local Bridge Maintenance Program
- Local Road Maintenance Program
- Winter Storm Operations
- Town Master Plan
- Mutual Aid - Police, Fire, Ambulance and Highway
- Fire Pond and Dry Hydrant Management Plan
- Hazardous Materials Spill Prevention Control & Counter Measures Plan
- Town Radio System
- Slash Monitoring
- Town Sponsored Safety Awareness Program
- Ambulance Service
- Floodplain Ordinance
- Health Officer
- Tree Maintenance Program
- Emergency Management Plan
- Fire Codes (NFPA)
- Beaver Control /Monitoring

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

1. Update Town website to include Hazard Mitigation methods and emergency preparedness for homeowners.
1. Informational outreach for the following hazards: tornados, hurricanes, wildfires, radon, lightning, hazardous spills, extreme heat, drought.
1. Enforce the 2009 updated FEMA Digital Flood Insurance Rate Maps/FIS and floodplain ordinance to ensure the NFIP requirements are maintained and implemented. Adopt updated FEMA floodplain maps.
1. Continue to update the Culvert Maintenance Plan on a yearly basis.
1. Install emergency generator at the Highway Department.
1. Update the Emergency Operations Plan.
1. Provide information to the public about Fluvial Erosion Hazard Zones.
2. Install fire sign at visible location.
2. Survey wells & reservoirs to determine closing vs. fence installation.
2. Stabilize steep slope near the impoundment – four houses at risk
2. Send written notification to NH DOT District 4, a list of needed repairs & upgrades to state highways and culverts.
2. Prepare a response to SWRPC's project solicitation request for potential state highways projects to be considered for inclusion into the Ten Year Plan.
2. Expand Fire Prevention Week to include Safety Awareness Programs such as campfire education, proper use of generators, radon detection, etc.
3. Update the Master Plan and incorporate the Hazard Mitigation as an appendix.
3. Continue operation-level training of Fire fighters and Police officers.
4. Develop a maintenance plan for fire ponds and hydrants.
5. Develop an Implementation Plan for Green Bridge.
6. Propose a revision to the Cluster Development Ord. or add a Conservation Subdivision ordinance (or similar).
7. Open roads to sunlight to prevent forest fires.

CHAPTER I: INTRODUCTION

Background

As a result of the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) mandated that all communities within New Hampshire establish local hazard mitigation plans as a means to reduce future losses from natural or man-made hazard events before they occur. In response to this mandate, the NH Homeland Security and Emergency Management (formerly Bureau of Emergency Management) contracted the Southwest Region Planning Commission (SWRPC) to develop a program that would achieve this goal. SWRPC prepared a hazard mitigation planning handbook to be used by local communities as a guide in the preparation of hazard mitigation plans. SWRPC then facilitated two hazard mitigation planning processes with selected communities as pilot projects. The resulting plans laid the foundation in an effort to enable all New Hampshire Regional Planning Commissions, through education outreach, the capability to assist their local communities, such as the Town of Greenville, in the preparation of local hazard mitigation plans.

What is Hazard Mitigation?

"Hazard Mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards" (44 CFR 206.401).

Authority

This Hazard Mitigation Plan was prepared under the authority of the planning requirements of Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390, which amended the Robert T. Stafford Act of 1988.

Funding Source

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

Purpose

The Greenville Hazard Mitigation Plan is a planning tool to be used by the Town of Greenville, as well as other local, state and federal governments, in their efforts to reduce the effects from natural and man-made hazards. This plan does not constitute any sections of Greenville's Master Plan or Town Ordinances.

Scope of the Plan

The scope of this Plan includes the identification of past and potential natural and manmade hazards affecting the Town of Greenville, 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 Guide to Hazard Mitigation Planning for New Hampshire Communities handbook, written by the Southwest Region Planning Commission, the Greenville Hazard Mitigation Committee developed the content of the Plan by following the ten step process set forth in the handbook and summarized below.

Step 1: Establish a Hazard Mitigation Planning Committee
The Town Administrator contacted town officials and residents who might wish to volunteer their time and serve on a committee.

Step 2: Identification Critical Facilities
The Committee identified all of the critical facilities within the Town. These were identified using four categories: Category 1 - Emergency Response Facilities & Services; Category 2 - Non Emergency Response Facilities; Category 3 - Facilities/Populations to Protect; and Category 4 - Potential Resources. The list of Critical Facilities is found in Chapter V, "Critical Facilities."

Step 3: Identification of Past and Potential Hazards
The Committee members identified the following hazards that could or have affected the Town of Greenville and the locations of these past and/or potential events:

Flooding	**Tornado**	**Hazardous Materials Spills**
Drought	**Hurricanes**	**Dams**
Extreme Heat	**Earthquakes**	**Landslides**
Wildfire	**Severe Wind/Downburst**	**Radon**
Lightning Strikes	**Extreme Winter Weather**	**Erosion**

The table in Chapter III contains information about all the past and potential hazards.

Step 4: Analyze Land Use and Development Trends
The Committee was asked to determine where future development would most likely take place in town. The information was compared to other documents such as Town Reports and the Town Master Plan. Chapter II, "Community Profile," shares this information.

Step 5: Risk Assessment
The Committee members completed a Risk Assessment for all of the types hazards identified in Step 3 in order to assess probability, severity and risk. Potential human impact, property impact and business impact for each hazard type were determined in addition to the likelihood of the hazard occurring within the next 25 years. Severity and risk were then calculated. (**Appendix B** provides the methodology for the risk assessment).

Step 6: Identifying What Mitigation Actions are already in Place
The Committee identified plans and policies that are already in place to reduce the effects of hazards. The Committee evaluated the effectiveness of the existing measures to identify where they can be improved. The results are found in Chapter VII, "Existing Mitigation Strategies." The Committee also identified programs in place that would not be categorized as mitigation strategies.

Step 7: Identify the Gaps in Protection
For each general hazard type or specific potential hazard location identified in Step 3, the Committee identified possible mitigation actions not currently in place. Each was identified in one of the following categories:

Preventative (Programs & Policies); Property Protection; Structural; Emergency Services; and/or Public Education & Information.

Step 8: Prioritizing Proposed Mitigation Actions
The Committee ranked the proposed mitigation actions developed in Step 7 using the STAPLEE method which analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of each project.

Step 9: Develop an Implementation Plan
Using the prioritized list of mitigation actions identified in Step 8, the Committee developed a clear strategy that outlines who is responsible for implementing each project, as well as when and how the actions will be implemented.

Step 10: Adopt and Monitor 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 New Hampshire Homeland Security and Emergency Management for initial review, and then forwarded to FEMA, for review and conditional approval. Once approved, the Plan was formally adopted by the Board of Selectmen February 4, 2015. It is important to the Town of Greenville that this plan be monitored and updated annually or after a Presidentially declared disaster. Chapter X addresses this issue. The Greenville Hazard Mitigation Plan Update 2015 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval every **five years** in order to maintain eligibility for Hazard Mitigation & Assistance Grants (HMA Grants).

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 10 step process was followed during the meetings. The original 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, updated goals;
Ch. II Community Profile - NFIP policies updated, added Continued Compliance with NFIP;
Ch. III Hazard Identification - updated hazards and their locations;
Ch. IV Assessing Probability, Severity, and Risk - updated risk assessment and valuation;
Ch. V Critical Facilities - updated locations, added maps of bridges and culverts, and dams;
Ch. VI Existing Mitigation Strategies and Proposed Improvements - updated chart and other data, added chart for Status of Previous Mitigation Action Items;
Ch. VII Mitigation Strategies - updated STAPLEE chart;
Ch. VIII Prioritized Implementation Schedule - updated Action Plan;
Ch. IX Adoption, Implementation, Monitoring and Updates - 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: February 26, 2015

Resources Used in Plan Preparation

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

Resource List for the Hazard Mitigation Committee

Greenville'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: 1-603-271-2231

33 Hazen Dr.
Concord, NH 03305

Field Representative: Danielle Morse
Mitigation Planner: Parker Moore
Mitigation Officer: Elizabeth Peck

New Hampshire Department of Transportation:
John Kallfelz (District 4) Swanzey, NH 03446 352-2302

Public Service of New Hampshire:
Laurel Brown Keene, NH 03431 357-7309 Ext. 5115
1-800-662-7764

Greenville/Mascenic District School Principals:

Marion Saari
Highbridge Hill Elementary School 171 Turnpike Road 878-4387
New Ipswich, NH 03071

Thomas Starratt
Boynton Middle School 500 Turnpike Road 878-4800
Grades 5 - 8 New Ipswich, NH 03071

Tom Kelly
Mascenic Regional High School 175 Turnpike Road 878-1113
Grades 9 – 12 New Ipswich, NH 03071

Committee Meetings and Public Participation in the Planning Process

Public Committee Meetings:

April 24, 2014, 79:30 – 11:30 a.m.: Working committee meeting held at Greenville Town Offices.
May 13, 2014, 9:30 – 11:30 a.m.: Working committee meeting held at Greenville Town Offices.
May 27, 2014, 9:30 – 11:30 a.m.: Working committee meeting held at Greenville Town Offices.
July 29, 2014, 9:30 – 11:30 a.m.: Working committee meeting held at Greenville Town Offices

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 Town Offices and on the Town website for public viewing prior to each 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 35 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.

Public Review:
Once the draft plan was complete, the public was given a chance to comment on the draft plan during the *Public Viewing Period* from August 27, 2014 to September 9, 2014. Notification of the draft available for public viewing was included 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.

February 4, 2015: The Board of Selectmen adopted the Local Hazard Mitigation Plan. Public hearing held at Greenville Town Offices. A copy of the public hearing notice can be found in **Appendix E**. Prior to this public hearing, the draft plan was made available to the public via hard copy at the town offices. All comments were addressed before final adoption.

Acknowledgements

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

Anthony Ste. Marie, Greenville Emergency Management Director
Kelley Collins, Greenville Town Administrator
Charles Buttrick, *Greenville* Fire Chief
Thomas Plourde, Greenville Road Agent
Gerald Curran, Greenville Water/Sewer Consultant
Rob Lauricella, Greenville Water/Sewer Consultant

The Greenville Board of Selectmen offers thanks to New Hampshire Homeland Security and Emergency Management for developing the State of New Hampshire Natural Hazards Mitigation Plan 2013 (http://www.nh.gov/safety/divisions/bem/HazardMitigation/haz_mit_plan.html) 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 Greenville Hazard Mitigation Committee reviewed the goals set forth in the New Hampshire Hazard Mitigation Plan – 2013. The committee generally concurs with those goals and has amended them to better meet the goals of the town.

Town of Greenville, NH

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

1. To improve upon the protection of the general population, the citizens of the Town of Greenville 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 Greenville's Emergency Response Services, Critical Facilities, and infrastructure.

3. To reduce the potential impact of natural and man-made disasters on the Town of Greenville's economy, natural resources, historic/cultural treasures, and private property.

4. To improve the Town of Greenville's Emergency Preparedness and Disaster Response and Recovery Capability.

5. To reduce the Town of Greenville'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 Greenville's infrastructure and natural environment.

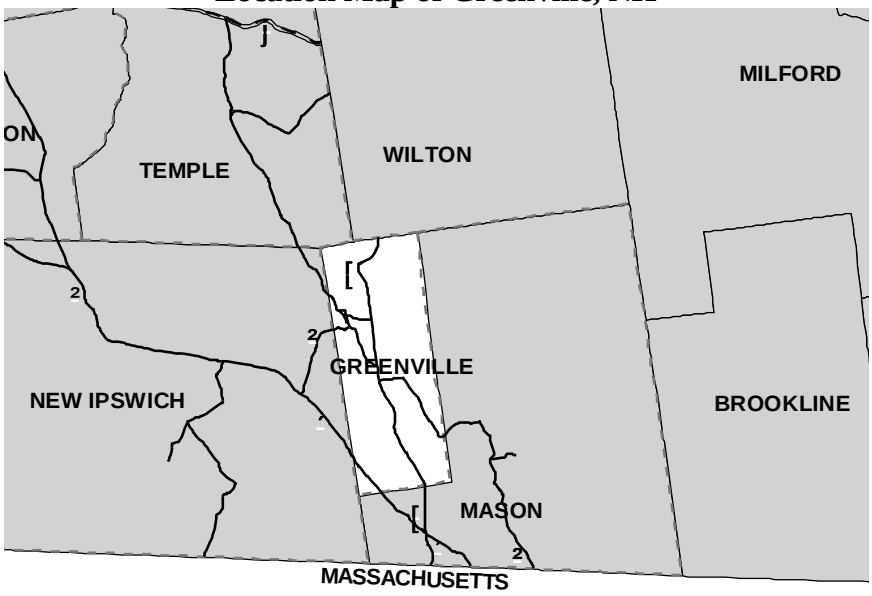
8. To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals and with FEMA.

CHAPTER II
COMMUNITY PROFILE

Town Overview

The Town of Greenville is located in the western portion of Hillsborough County, in Southwest New Hampshire. Greenville is bounded on the north side by Temple and Wilton, easterly and southerly by Mason, and westerly by New Ipswich. The Town population is 2,105.[1]

Location Map of Greenville, NH



The Town of Greenville consists of 6.9 square miles of land area. The Souhegan River flows through Greenville's Town Center. The topography of Greenville varies significantly, ranging from steep hills and slopes throughout town including Barrett Hill, to flatter areas dispersed throughout the community.

Greenville has a mid-latitude climate. Average summer temperature is 65 degrees Fahrenheit; average winter temperature is 20 degrees Fahrenheit. Average annual precipitation is 44 inches.

A three-member Board of Selectmen governs the Town of Greenville. The Town has a full-time Town Administrator, volunteer Fire Chief with a volunteer Fire Department, a full-time Police Chief, 3 full-time and 4 part-time police officers, 2 full-time and 3 full-time Highway Department employees, and a part-time Building Inspector. The Town contracts with Utility Partners for operation and maintenance of the Town's sewer and water systems. Ambulance service is provided by Souhegan Valley Ambulance Service located in New Ipswich. The Town's primary area hospital is Monadnock Community Hospital located in Peterborough, approximately 16 miles northwest of Greenville.

Disaster Risk

Greenville is prone to a variety of man-made and natural hazards. These include: flooding, severe wind events, wildfire, ice storms and severe winter storms, vehicle accidents, and dam failures.

[1] Population data from US Census Bureau (2010)

Flooding, whether from snow run-off, heavy rains or ice jams, carries the greatest risk for Greenville. Seasonal flooding of small streams and wetlands has not been recorded. In March 2010, the Town experienced a significant rain event which caused a major landslide on High Street into the Souhegan River impoundment. FEMA funds are being utilized to stabilize the slope.

Severe wind events and hurricane residuals have caused damage to Greenville. Over the years hurricanes have resulted in severe flooding, and unrecorded wind events have caused losses of timber, particularly in the several high points throughout town.

There have been several documented wild fires throughout town due to a variety of causes including lightning, cigarette litter along roadways, and accidents. Areas along heavily traveled roadways and wooded areas are at greatest risk.

Winter weather has proven to be a regular hazard throughout the town of Greenville each year. Greenville is susceptible to receiving large volumes of snow from Nor'easters due to its geographical proximity to the east coast where these storms track. The town has also received a fair share of damage from ice storms in winter months. Winter storms and wind events often cause power outages.

Development Patterns

Since 1980, there have been 478 building permits issued in the Town of Greenville. The Greenville Town Center has a greater density of development than exists in the outlying portions of town. This density of development is typical of New England villages, where lots are historically smaller. The Village is also the location of most of the Town's public and semi-public uses: the Town Hall, Police Department, Library, and Post Office.

The Town does have some agricultural land, predominantly used for orchards. Commercial uses are generally concentrated in the Town Center and include: public utilities, and professional and service offices. Industrial activity in Greenville occurs in converted historic mills located in the Town Center. In recent years, more development has occurred along the NH 31 corridor. Recreational opportunities include several small parks, a public pool and ball field located next to the Mascenic SAU Office. In addition, fishing, canoeing and other activities occur in or near the Souhegan River.

Consideration for Development

Several factors have played, and will continue to play, an important role in the development of Greenville. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, soil conditions, wetlands, and aquifers; and land set aside for conservation. These factors have an impact, both individually and cumulatively, on where and how development occurs.

The greatest potential for development occurs along existing road frontage, particularly NH 45 and NH 31 which run through Greenville. Additional potential exists if existing Class VI roads are upgraded to Class V roads, or if new roads are constructed. As communities to the south and east of Greenville continue to grow, the likelihood for additional development in Greenville also increases.

Current Development Trends

Greenville Population 1970-2010

	1970	1980	1990	2000	2010	% Change 1970-2010
Greenville	1,587	1,988	2,231	2,224	2,105	33%

Source: US Census 2010

Population Projections 2010-2040

	2010	2015	2020	2025	2030	2035	2040	% change 2010-2040
Greenville	2,105	2,011	1,934	1,974	2,005	2,022	2,022	-4%

Source: NHOEP Population Projections Fall 2013

Overall, land use patterns in Greenville are not expected to change, although there is some concern of development pressures as surrounding communities are facing growth pressure. However, Greenville is a geographically small community with a majority of developable land already built on. There are current approvals for new subdivisions which may have significant impact on the population size of Greenville with the potential addition of 160 housing units. Many have taken note of the pressure felt by the Town to become a bedroom community to Nashua and other regional economic centers.

Agriculture no longer plays a major role in Greenville's economy and will most likely not revive as a strong part of Greenville's economic future. The few remaining agriculture ventures are in the form of hayfields and orchards. There is the possibility of new commercial/retail development along some of the major thoroughfares in Town, particularly NH 31.

Road Improvements

Road improvements are an ongoing process in Greenville. Hemlock Hill Road was created to serve the partially completed subdivision on Hemlock Hill. Road improvements are limited by yearly State appropriations.

Development in Hazard Areas

Some of the hazards identified in this plan, such as hurricanes, tornadoes and ice storms, are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. Of the future developments known to the Town, none fall into identified flood hazard areas.

National Flood Insurance Program (NFIP)

Greenville is a participating member of the National Flood Insurance Program. Greenville joined the NFIP on July 28, 1975 through emergency entry, and regular entry on May 19, 1981. Flood Insurance Rate Maps, all bearing the effective date of September 25, 2009, are used for flood insurance purposes and are on file with the Greenville Planning Board. According to the FEMA CIS, there were no structures located in FEMA designated Special Flood Hazard Areas (SFHAs) as of October 25, 2013. There are 5 residential flood insurance policies totaling $1,060,600 and 5 non-residential policies totaling $915,300, resulting in 10 policies Townwide for $1,975,900. There has been one nonresidential paid loss for $1,642.55 and no repetitive losses. The flood insurance study was done on September 25, 2009.

Continued Compliance with NFIP Requirements

The Town of Greenville acknowledges the importance of maintaining requirements set forth in the National Flood Insurance Program. As such, the town took steps related to continued compliance with the program that will help to reduce or eliminate the potential for loss of life and property due to flooding.

The following actions have been taken since the last Hazard Mitigation Plan:

- monitored beaver population;
- maintained and replaced culverts;
- continued enforcement of the Floodplain Development Ordinance;
- continued enforcement of the Building Code Ordinance.

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While this update continues with structural projects, public outreach and education are also seen as a key to providing information to residents by raising an awareness of measures that they can take. Many of these items will be on-going actions to maintain awareness and continued monitoring.

CHAPTER III: HAZARD IDENTIFICATION

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Greenville. These hazards were identified from the State of New Hampshire Hazard Mitigation Plan (2013), the Federal Emergency Management Agency website, and from the previous Greenville Hazard Mitigation Plan.

Hazards

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

Hazard	Date	Location	Remarks/Description of Areas Impacted
FLOODING- DISASTER DECLARATIONS			
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

Hazard	Date	Location	Remarks/Description of Areas Impacted
FLOODING- DISASTER DECLARATIONS			
Flood/ Severe Storm	August 27, 1986	Cheshire, Hillsborough Counties, NH	FEMA Disaster # 771-DR (Presidentially Declared Disaster) $1,005,000 in damage
Flood / Severe Storm	April 16, 1987	Cheshire, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, & Sullivan Counties, NH	FEMA Disaster Declaration # 789- DR (Presidentially Declared Disaster). Flooding of low-lying areas along river caused by snowmelt and intense rain. $4,888,889 in damage.
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	FEMA Disaster Declaration # 876. Flooding caused by a series of storm events with moderate to heavy rains. $2,297,777 in damage.
Flood	October 29, 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan Counties, NH	FEMA Disaster Declaration # 1144- DR. Flooding caused by heavy rains. $2,341,273 in damage.
Flood	July 2, 1998	Southern NH	FEMA Disaster Declaration # 1231. Severe storms and flooding
Flood	October 26th 2005	Cheshire, Grafton, Merrimack, Sullivan, and Hillsborough Counties, NH	FEMA Disaster Declaration # 1610. Severe storms and flooding.
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	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. Bennington had multiple areas of flooding.
Flood	May 26-30, 2011	Coos and Grafton County	FEMA Disaster Declaration # DR-4006; May flood event.
Flood	May 29-31, 2012	Cheshire County	FEMA Disaster Declaration # 4065;
Flood	June 26-July 3, 2013	Cheshire, Sullivan, and Grafton Counties	FEMA Disaster Declaration #4139

Hazard	Date	Location	Remarks/Description of Areas Impacted
RIVERINE FLOODING- LOCALIZED- LOW-MEDIUM RISK			
Flooding	1936, 2005, and potential occurrences	Area west of Main Street where Souhegan River Flows through Town Center	Flooding of the Souhegan River onto NH 45 has occurred and has the potential to occur in this area due to accumulation of heavy rain and runoff. Flooding has the potential to damage two mill buildings, a commercial structure and three houses on Chamberlain Street. A 1936 flood incident caused water to rise twelve feet around a mill building. Dam has been raised since earlier storms. An October 2005 flood event resulted in flood waters flowing over the dam. Four upstream dams help to prevent potential dam breach and flooding.
Flooding	Potential Occurrences	Area Southeast of Old Wilton Road/Baker Avenue	Flood control dams were installed in Temple and New Ipswich in the 1960s to regulate flood waters. Though no structures have been affected by flood incidents and the flood control dams are effective, up to 7 structures in the White Street area could be affected by a major flood incident. Dam maintenance required by owners in abutting communities.
FLOODING- LOCALIZED- LOW RISK			
Flooding	1989, Past and Potential Occurrences	White Street	Spring rain and runoff causes a brook to overflow. Flood waters are restricted due to an undersized culvert on NH 31 which has caused and has the potential to cause a road washout. Water and sewer lines limit options for relocating or expanding the culvert or installing a deeper culvert. One structure was affected by past flooding in 1989, cost for repairs unknown. Four structures could be affected by future flooding.
Flooding	Past and Potential Occurrences	Adams Hill Road near NH 31 Intersection	Heavy rain and runoff causes flooding of a stream during most storm events. No structures have been affected by past flood incidents. Three structures could be affected by future flooding.

FLOODING- LOCALIZED- LOW RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Flooding	Past and Potential Occurrences	Southeast of Intersection of NH 31 and Mason Road	Heavy rain and runoff causes flooding of a parking area during storm events. This is an annual occurrence. Flooding of Mason Road has occurred, though no damage to the road resulted. Water from the Hemlock Hills development has increased the amount of runoff collecting in this area during storm events. If development continues in this area flooding could become a larger problem.
Flooding	Past and Potential Occurrences	Livingston Road	Increased development (Hemlock Hills) in this area has increased impervious surfaces and reduced potential for infiltration of heavy rain. Such rain events cause sheet flow of water along Livingston Road and flooding at both ends of Livingston Road where the road intersects with NH 31. One structure could be affected by flooding around the southerly intersection of Livingston Road and NH 31. The culvert at the lower crossing will be replaced with a much larger structure, using a FEMA grant, in Summer 2014.
Flooding	Past and Potential Occurrences	Intersection of East Road / Kimball Hill Road / Richardson Road	Heavy rain and runoff causes flooding of the road. The most recent flood incident occurred in October 2005. No structures have been or could be affected by a flood incident.
Flooding	Past and Potential Occurrences	Mill Street/Hubbard Hill Road Intersection	Increased development in this area has caused narrowing of the brook and clogging of the brook due to the accumulation of sedimentation. Spring rain and runoff and heavy rain events affect the area with water flowing over the road and into basements. Access to some homes could be problematic during flood incidents, the most recent of which occurred in the last two years (2004 - 2005). The number of homes affected by past incidents is unknown. Three homes could be affected with wet basements during a flood incident.
Flooding	Past and Potential Occurrences	High Street	Flooding led to a significant landslide on a steep slope on the north side of the Otis Falls Hydro impoundment on the Souhegan River.
DROUGHT- LOW RISK			
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- LOW RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
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.
EXTREME HEAT- LOW- MEDIUM RISK			
Extreme Heat	July, 1911	New England	11-day heat wave in New Hampshire
Extreme Heat	Late June to September, 1936	North America	Temps to mid 90s in the northeast
Extreme Heat	Late July, 1999	Northeast	13+ days of 90+ degree heat
Extreme Heat	Early August, 2001	New Hampshire	Mid 90s and high humidity
Extreme Heat	2002	New Hampshire	Several weeks of extreme heat
Extreme Heat	August 2-4, 2006	New Hampshire	Regional heat wave and severe storms.
WILDFIRES- LOW RISK			
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. The wildfires in Greenville have mostly been small in nature and caused by lightning strikes (Class A or B).			
Wildfire	2004	Hemlock Hills	A Lightning strike triggered a wildfire that was not discovered for two days. No structures were affected.
Wildfire	Past and Potential Occurrences	NH 31	Cigarettes or other causes such as traffic accidents have caused and have the potential to cause wildfires along this section of NH 31. Several small fires have been reported in the past. This is a largely wooded and heavily traveled area. No structures have been or could be affected.
Wildfire	Past and Potential Occurrences	East of NH 31 and North of Mason Road	Cigarettes or other causes such as traffic accidents have caused and have the potential to cause wildfires in this area. Several small fires have been reported in the past. In the mid-1980s, 20 acres burned during a very dry season due to something that ignited along the roadway. This is a largely wooded and heavily traveled area. No structures have been or could be affected.

WILDFIRES- LOW RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Wildfire	1998	Intersection of Maldarelli Road and Barrett Road	A lightning strike caused a wildfire. One house and one barn were destroyed; cost of damages unknown.
Wildfire	2003	Area between NH 31 and Adams Hill Road	A Wildfire was caused by juveniles south of the power lines. No structures were affected.
Wildfire	Potential Occurrence	Merriam Hill Road & Mason Road	This area has a high potential for lightning strikes due to the high elevation and the possibility of high traces of a metal resource in the ground such as iron ore. A number of homes could be affected by wildfires or lightning along this section of roadway.
Wildfire	Potential Occurrence	Area between Cross Street and Adams Hill Road	A steel water tank located in this area has increased potential for Lightning strikes. No past incidents have been reported. The tower is grounded. A lightning strike could cause a wildfire
Wildfire	Potential Occurrence	Barrett Hill Road	A steel water tank and cellular tower located on Barrett Hill Road have increased potential for Lightning strikes. No past incidents have been reported. Brush around the cellular tower has been cleared and both structures are grounded. A lightning strike could cause a wildfire.
Wildfire	Early 1980s	NH 31 between Barrett Road and Mason Road	A lightning strike caused a building and propane tank to ignite.
Wildfire	2011	Area off of NH 124	A lightning strike caused a small wildfire.
LANDSLIDE/EROSION- LOW-MEDIUM RISK			
Landslide/Erosion	March 31, 2010	High Street	A significant landslide on a steep slope on the north side of the Otis Falls Hydro impoundment on the Souhegan River. Total cost - $1,438,127. A FEMA grant provided 75% of the request or $1,078,595.25. Project completed in June 2014.

LIGHTNING- LOW- MEDIUM 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 3 must occur within the observation area. Moderate rain is common & 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

LIGHTNING- LOW- MEDIUM RISK (Con't)

Hazard	Date	Location	Remarks/Description of Areas Impacted
Lightning	2004	Hemlock Hills	A Lightning strike triggered a wildfire in 2004 that was not discovered for two days. No structures were affected.
Lightning	1998	Intersection of Maldarelli Road and Barrett Road	A lightning strike caused a wildfire. One house and one barn were destroyed; cost of damages unknown.
Lightning	Potential	Merriam Hill Road & Mason Road	This area has a high potential for lightning strikes due to the high elevation and the possibility of high traces of a metal resource in the ground such as iron ore. A number of homes could be affected by wildfires or lightning along this section of roadway.
Lightning	Early 1980's	NH 31 between Barrett Rd and Mason Rd	A lightning strike caused a building and propane tank to ignite.
Lightning	Potential	Barrett Hill Road	A steel water tank and cellular tower located on Barrett Hill Road have increased potential for Lightning strikes. No past incidents have been reported. Brush around the cellular tower has been cleared and both structures are grounded. Lightning could cause a wildfire.
Lightning	Potential	Area between Cross Street and Adams Hill Road	A steel water tank has increased potential for lightning strikes. No past incidents have been reported. The tower is grounded. A lightning strike could cause a wildfire.
Lightning	Past and Potential Occurrences	High Street	Many lightning strikes have occurred in this area. No structures have been affected by past incidents. The number of homes that could be affected by future incidents is difficult to predict.

Hazard	Date	Location	Remarks/Description of Areas Impacted
Lightning	August 2012:	2 Blanch Farm Road and 150 NH 45, Temple	The Intermediate Pump Station and the water treatment plant were damaged by a lightning strike. Repairs exceeded $25,000.

TORNADOS - LOW RISK

The 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).

Fujita Scale

F-Scale Number, Intensity Phase, Wind Speed, and Type of damage

F-0
Intensity Phase: Gale Tornado
Wind Speed: 40-72 mph
Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.

F-1
Intensity Phase: Moderate Tornado
Wind Speed: 73-112 mph
The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.

F-2
Intensity Phase: Significant Tornado
Wind Speed: 113-157 mph
Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.

F-3
Intensity Phase: Severe Tornado
Wind Speed: 158-206 mph
Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted

F-4
Intensity Phase: Devastating Tornado
Wind Speed: 207-260 mph
Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

F-5
Intensity Phase: Incredible Tornado
Wind Speed: 261-318 mph
Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged

F-6
Intensity Phase: Inconceivable Tornado
Wind Speed: 319-379 mph
These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

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

TORNADOS - LOW RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Tornado	July 28, 1748	Hillsborough County	n/a
Tornado	May 21, 1814	Hillsborough County	n/a
Tornado	September 15, 1922	Hillsborough County	F2
Tornado	July 2, 1961	Hillsborough County	F2
Tornado	June 9, 1963	Hillsborough County	F2
Tornado	July 19, 1966	Hillsborough County	F2
Tornado	July 17, 1968	Hillsborough County	F2
Tornado	August 20, 1968	Hillsborough County	F3
Tornado	July 2, 1997	Hillsborough County	F2
Tornado	May 23, 1998	Hillsborough County	F2

HURRICANES (Category given if known) and TROPICAL STORMS- MEDIUM RISK

Saffir-Simpson Hurricane Wind Scale

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)

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

HURRICANES (Category given if known) and TROPICAL STORMS- MEDIUM RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Hurricane	August, 1635	n/a	
Hurricane	October 18-19, 1778	n/a	Winds 40-75 mph
Hurricane	October 9, 1804	n/a	
Gale	September 23, 1815	n/a	Winds > 50mph
Hurricane	September 8, 1869	n/a	
Hurricane	September 21, 1938	Southern New England	Flooding caused damage to road network and structures. 13 deaths, 494 injured throughout NH. Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total storm losses of $12,337,643 (1938 dollars). 186 mph maximum winds. Significant flooding Townwide.
Hurricane (Carol)	August 31, 1954	Southern New England	Category 3, winds 111-130 mph. Extensive 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 New Hampshire.
Hurricane	1958	Greenville	Caused trees to fall onto roads including Mill Street and Pleasant Street
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 (Daisy)	October 7, 1962	Coastal NH	Heavy swell and flooding along the coast
Tropical Storm (Doria)	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 New Hampshire. Damaged roads and electric lines and caused severe flooding.

HURRICANES (Category given if known) and TROPICAL STORMS- MEDIUM RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Hurricane (Bob)	August 19, 1991	Southern New England	Structural and electrical damage in region from fallen trees. 3 persons were killed and $2.5 million in damages were suffered along coastal New Hampshire. Federal Disaster FEMA-917-DR
Hurricane (Eduard)	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.
Tropical Storm Sandy	October 26- November 8, 2012	Easter n United States	FEMA Disaster Declaration # DR-4095; Considered the costliest hurricane/tropical storm in US history with costs exceeding $70 billion. 253 deaths, millions of power outages.

EARTHQUAKES (Magnitude given if known)- LOW RISK

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. It is less scientific, but generally understood by all.

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 Earthquake Hazards Program

EARTHQUAKES (Magnitude given if known)- LOW RISK			
Hazard	**Date**	**Location**	**Remarks/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	
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	4.8
Earthquake	January 19, 1982	Gaza (west of Laconia), NH	4.5, walls and chimneys cracked, damage up to 15 miles away in Concord
Earthquake	October 20, 1988	Near Berlin, NH	4
Earthquake	July 3, 2007	Hillsborough, NH	Tremors felt in Bennington, NH
Earthquake	January 3, 2011	Northwest of Laconia	2.5
Earthquake	August 23, 2011	Travelled up the east coast from Virginia to New Hampshire	5.8
Earthquake	October 16, 2012	Felt throughout most of the New England states; centered in Maine	4.0

SEVERE WIND/DOWNBURST- LOW- MEDIUM RISK			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Severe Wind/ Downbursts	Potential Occurrences	Intersection of Old Dump Road, Merriam Hill Road and Darling Road, as well as the rest of Merriam Hill Road, Adams Hill Road, and Barrett Road.	Particular areas that may be impacted by severe winds. No known incidences have caused damage to any structures. Future development on Merriam Hill Road is a concern .

EXTREME WINTER WEATHER- MEDIUM RISK

The Sperry–Piltz Ice Accumulation Index, or SPIA Index, is an ice accumulation and ice damage prediction index that predicts the projected footprint, total ice accumulation, and resulting potential damage from approaching ice storms.

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

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	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.)

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	December 10-13, 1960	New Hampshire	Up to 17 inches of snow in southern NH

EXTREME WINTER WEATHER- MEDIUM RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Snow Storm	January 18-20, 1961	New Hampshire	Up to 25 inches of snow in southern NH
Snow Storm	February 2-5, 1961	New Hampshire	Up to 18 inches of snow in southern NH
Snow Storm	January 11-16, 1964	New Hampshire	Up to 12 inches of snow in southern NH
Blizzard	January 29-31, 1966	New Hampshire	Third and most severe storm of 3 that occurred over a 10-day period. Up to 10 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 yrs in the higher elecations in the Monadnock region. It covered a swath about 10 miles wide from the MA border to New London NH
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. Greenville was not significantly affected.
Snow Storm	2006	New Hampshire	Heavy snowfall
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 hour period.
Snow Storm	February 8-10, 2013	New Hampshire	February Blizzard "Nemo", exceeded previous snow fall amounts; category B Declaration # DR4105

EXTREME WINTER WEATHER- MEDIUM RISK (Con't)			
Hazard	**Date**	**Location**	**Remarks/Description of Areas Impacted**
Winter Storms	Past and Potential	Kimball Hill Road / Richardson Road / East Road Area	Winter storms cause treacherous travel along these roads. Falling trees and branches could be a problem due to heavy snow and ice. Access to homes and for emergency services could be limited during storm events.
Winter Storms	Past and Potential	Adams Hill Road Area	Winter storms cause treacherous travel along the road. Falling trees and branches could be a problem due to heavy snow and ice. Access to homes and for emergency services could be limited during storm events

HAZARDOUS MATERIALS SPILLS- LOW RISK

Potential along NH 31, NH 45, and NH 123.

RADON- LOW RISK

State of New Hampshire 2011 Average Radon Levels (per county)**

County	County Average	National Average	Difference
Belknap	2.6 pCİ/L	1.3 pCİ/L	1.3 pCİ/L
Carroll	8.8 pCİ/L	1.3 pCİ/L	7.2 pCİ/L
Cheshire	3.3 pCİ/L	1.3 pCİ/L	2.0 pCİ/L
Coös	8.8 pCİ/L	1.3 pCİ/L	7.2 pCİ/L
Grafton	4.5 pCİ/L	1.3 pCİ/L	3.2 pCİ/L
Hillsborough	5.3 pCİ/L	1.3 pCİ/L	4.0 pCİ/L
Merrimack	5.1 pCİ/L	1.3 pCİ/L	3.8 pCİ/L
Rockingham	5.6 pCİ/L	1.3 pCİ/L	4.3 pCİ/L
Strafford	6.2 pCİ/L	1.3 pCİ/L	4.9 pCİ/L
Sullivan	2.2 pCİ/L	1.3 pCİ/L	.9 pCİ/L

Picocuries Per Liter pCi/L): A unit of measure for levels of radon gas; becquerels per cubic meter is the metric equivalent-

**In 2011 NH State Legislature cut the NH Radon Program; this is the last updated information available

There are no known records of illness that can be attributed to radon in Town. Residents should be aware that radon is present. Houses with granite and dirt cellars are at increased risk. The State of NH Hazard Mitigation Plan (2013.) identifies communities in Hillsborough County as having a moderate risk for exposure to radon.

MAN MADE HAZARDS- DAMS- LOW RISK

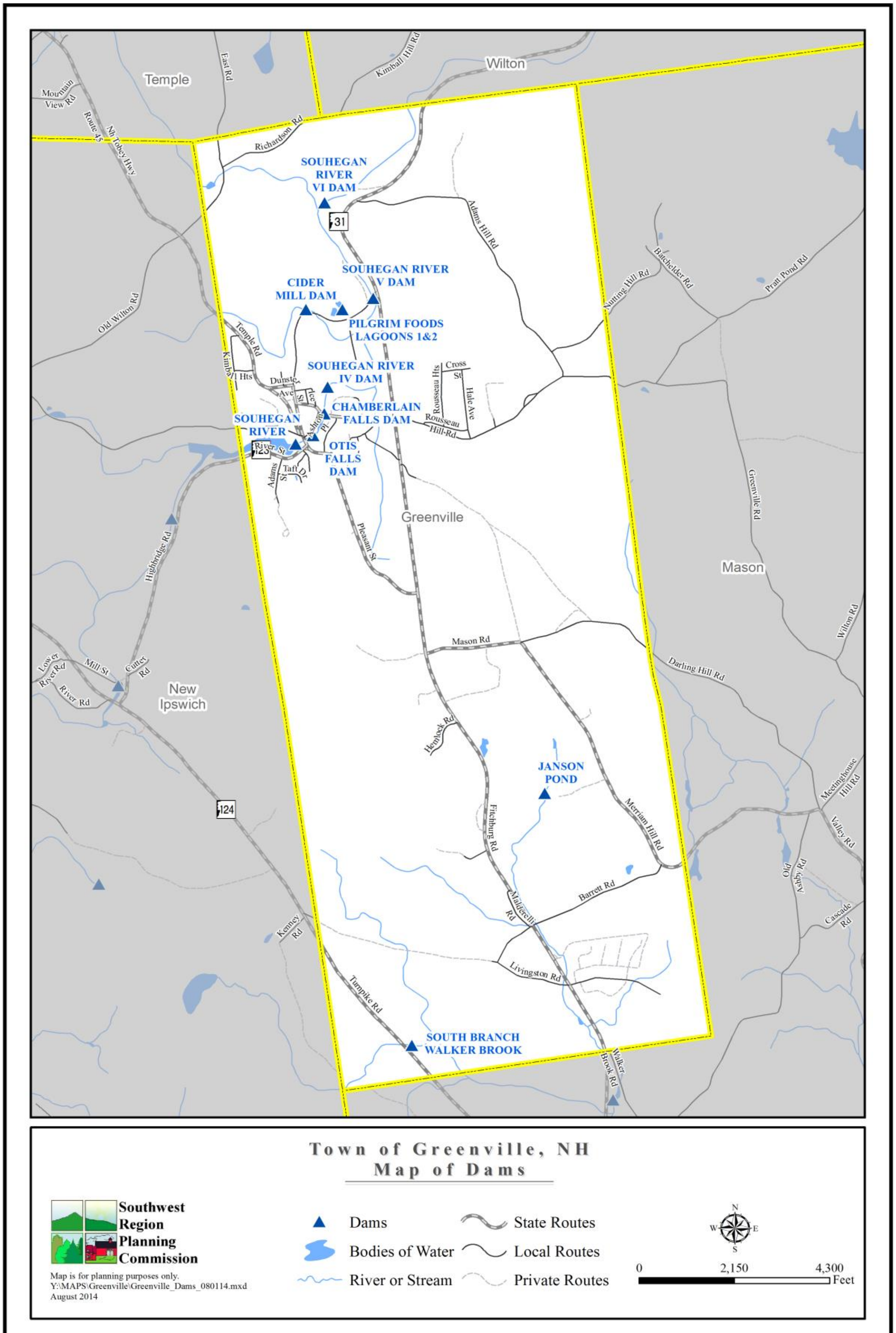
The State of New Hampshire classifies dams into the following four categories:

NM – Non-menace S – Significant hazard Blank- Non-Active

L – Low hazard H – High Hazard

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 ten dams located in Greenville, five are designated NM, two are designated L and the remaining three are inactive. The table on the next page shows all dams in the Town of Greenville.

GREENVILLE DAMS					
Dam #	**HAZARD CLASS**	**DAM NAME**	**OWNER**	**Height (Ft)**	**IMPND (Acres)**
101.01	L	OTIS FALLS DAM	ALDEN HYDRO LLC	27	8
101.02	NM	SOUHEGAN RIVER	GREENVILLE ELDERLY HOUSING	15	1.5
101.03	L	CHAMBERLAIN FALLS DAM	AQUAMILL PROPERTIES, LLC	20	0.5
101.04	---	SOUHEGAN RIVER IV DAM	OIL RECOVERY SYSTEMS	10	
101.05	---	SOUHEGAN RIVER V DAM	GREENVILLE ELECT. LIGHTING CO		
101.06	---	SOUHEGAN RIVER VI DAM	PSNH	27	
101.07	NM	SO. BRANCH WALKER BR.	MR THEO DE WINTER	13	0.5
101.08	NM	CIDER MILL DAM	OLD DUTCH MUSTARD CO	12	0.02
101.09	NM	PILGRIM FOODS LAGOONS 1&2	OLD DUTCH MUSTARD CO DBA PILGRIM FOOD	14	1.43
101.10	NM	JANSON POND	MR MICHAEL JANSON	17	0.43
Source: Department Of Environmental Services Dam Bureau 2014					


Temple
Wilton
Mason
New Ipswich
Greenville
SOUHEGAN RIVER VI DAM
SOUHEGAN RIVER V DAM
CIDER MILL DAM
PILGRIM FOODS LAGOONS 1&2
SOUHEGAN RIVER IV DAM
CHAMBERLAIN FALLS DAM
SOUHEGAN RIVER
OTIS FALLS DAM
JANSON POND
SOUTH BRANCH WALKER BROOK
Richardson Rd
East Rd
Kimball Hill Rd
Adams Hill Rd
Nutting Hill Rd
Batchelder Rd
Pratt Pond Rd
Old Wilton Rd
Mountain View Rd
Route 45
Nh Tobey Hwy
Temple Rd
Rousseau Hts
Cross St
Hale Ave
Rousseau Hill Rd
River St
Adams St
Taft Dr
Pleasant St
Highbridge Rd
Greenville Rd
Mason Rd
Darling Hill Rd
Wilton Rd
Lower River Rd
Mill St
Cutter Rd
River Rd
Hemlock Rd
Fitchburg Rd
Merriam Hill Rd
Meetinghouse Hill Rd
Valley Rd
Old Ashby Rd
Barrett Rd
Mandarelli Rd
Cascade Rd
Kenney Rd
Livingston Rd
Turnpike Rd
Walker Brook Rd
31
123
124
Town of Greenville, NH
Map of Dams
Southwest Region Planning Commission
Map is for planning purposes only.
Y:\MAPS\Greenville\Greenville_Dams_080114.mxd
August 2014
Dams
Bodies of Water
River or Stream
State Routes
Local Routes
Private Routes
0
2,150
4,300
Feet

Chapter IV: Assessing Probability, Severity and Risk
Estimating Potential Losses

The Committee members completed Risk Assessment Worksheets for all of the types hazards identified in Chapter III. 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. (A score of zero was given if the hazard was non-applicable). To assess probability, a 1, 2, or 3 value was assigned to each hazard type with respect to the likelihood that the hazard would occur in the next 25 years. 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. Definitions are listed in Appendix B. Estimated potential losses and areas of greatest risk are included in the table below.

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

	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 (Relative Threat)	
Riverine Flooding	.5	3	2.5	2	2	4	Med
Flooding	1	1.5	1.5	3	1.3	3.9	Low-Med
Drought	.5	1.5	1	.5	1	.5	Low
Extreme Heat	1.5	1	.5	2	1	2	Low-Med
Wild Fire	.5	1	.5	2.5	.67	1.7	Low
Lightning	.5	.5	1	3	.67	2	Low-Med
Tornado	2	2	2	.5	2	1	Low
Hurricane	.5	2	2	3	1.5	4.5	Med
Earthquake	2	2	2	.5	2	1	Low
Radon	.5	.5	.5	3	.5	1.5	Low
Severe Wind	2	2	2	1	2	2	Low-Med
Extreme Winter Weather	.5	1.5	3	3	1.7	5	Med
Landslide/ erosion	1	1.5	1.5	3	1.3	3.9	Low-Med
HazMat Spills	.5	1	1	1.5	.8	1.25	Low
Dam Failure	1	2.5	2.5	.5	2	1	Low

CHAPTER V
CRITICAL FACILITIES

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

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

Critical Facilities Within Hazard Areas

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. There are no identified critical facilities that fall within the 100-year floodplain.

The Critical Facilities List for the Town of Greenville has been identified using a Critical Facilities List provided by the State Hazard Mitigation Officer. Greenville'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 Greenville. 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**
   Greenville Town Hall – 46 Main Street

2. **Fire Station**
   7 River Street

3. **Police Station**
   38 Main Street

4. **Ambulance Service**
   Souhegan Valley Ambulance Service (services Greenville & New Ipswich)
   934 Turnpike Road, New Ipswich

5. **Emergency Fuel Facilities**
   Town Highway Garage - Fuel depot for Highway, Police & Fire Departments - 109 Wilton Road
   Country Mile Gas Station/Convenience Store - Fitchburg Road

6. **Emergency Electrical Power Facility (Generators)**
   Waste Water Treatment Plant - 109 Old Wilton Road
   Waste Water Pumping Station – 902 Fitchburg Road
   Greenville Estates next to Ashby Road
   Waste Water Pumping Station – 2 Blanch Farm Road, (next to the Country Mile Store)

Greenville Town Hall - 46 Main Street

7. Emergency Shelters

Sacred Heart Church - High Street
Former Greenville Elementary School - 16 Adams Street (no cooking facilities)
Greenville - New Ipswich Ambulance Bay (Souhegan Valley Ambulance Service) - Turnpike Road

8. Dry Hydrants - Fire Ponds - Water Sources

Dry Hydrants:	Fire Station
	Adams Hill Road (not dependable)
Fire Ponds:	Livingston Road & NH 31
	Corner of Mason Road & NH 31
	NH 124 – in front of 645 Turnpike Road (seasonal)
	Adams Hill Road (private, seasonal access)
	Barrett Road (seasonal)
	2 - Near Water Treatment Plant
	One on Old Wilton Road (seasonal access)

9. Primary Evacuation Routes

NH 31
NH 45
NH 123

10. Bridges Located on Primary Evacuation Routes

There are no bridges located on primary evacuation routes.

11. Town Garage/Transfer Station

209 Old Wilton Road (Same as Waste Water Treatment Plant)

12. Communications

Cellular Tower on Barrett Hill Road
Town Hall has Communication Towers for Police, Fire & Highway and the Fire Station has an antenna

Telephone Crossboxes - A major crossbox located at the intersection of Dunster Hill and Ash Street that serves portions of the Towns of Temple, New Ipswich, Mason, and Wilton

- Greenville Estates off Old Ashby Road
- Richardson Road

13. Hospitals

Monadnock Community Hospital (located in Peterborough)
Cheshire Medical Center (Keene)
St. Joseph's Hospital (Nashua)
Southern NH Medical Center (Nashua)
Health Alliance (Leominster, MA)
Nashoba Valley Deaconess Hospital (Ayer, MA)

14. Helicopter Landing Sites

Adams Street near the former Greenville Elementary School

American Legion Pavilion Field - Fitchburg Road
Other locations in town could be used for helicopter landings, though these are the designated landing sites.

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 Greenville.

1. Water Supply
Public Water Supply Wells - numerous locations; see Critical Facilities Map at back of Plan

2. Sewer & Sewer Infrastructure
Town sewer in the Town Center and Greenville Estates
Water in Town Center extends to Pleasant Street and Greenville Estates
Waste water pump station (2 Blanch Farm Road) & Treatment Plant (150 NH 45)

3. Problem Culverts
The Public Works Director should be contacted to identify particular problem culverts at a given time in addition to those listed below:
NH 31 (near Adams Hill Road and Mason Road)
White Street
Hubbard Hill & Mill Street
Mill Street & Baker Street
Richardson Road
Mason Center Road
Adams Hill Road (2)
Both ends of Livingston Road
Mason Road

4. Secondary Evacuation Routes
High Street to New Ipswich
Adams Hill Road to Mason
Merriam Hill Road to Darling Hill Road into Mason
Barrett Hill Road to Merriam Hill Road to Mason

5. Transfer Station
209 Old Wilton Road

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 Populations
List available at the Emergency Operations Center. List may include:
Oxygen-dependent people
People on a Lifeline
People assisted by Home Health Care
Shut-ins and disabled
Mentally challenged
Elderly
Hearing impaired
Sight impaired

2. Senior Housing
Greenville Falls - Main Street (2 buildings, 150 residents)

3. Recreation Areas
Pool house next to Mascenic SAU on Adams Street (ball field, pool, etc.)

4. Schools
Head Start Program - 16 Adams Street

5. Day Care Facilities
No registered childcare centers

6. Churches
Greenville Community Christian Church - Pleasant Street
Sacred Heart Church - High Street

7. Historic Buildings/Sites
None listed on the historic registry.

8. Camps
None

9. Parks/Campgrounds
None

10. Employment Centers
Sea Change (3 sites) - High Street, Mill Street, Main Street
Pilgrim Foods, Inc. - 68 Old Wilton Road
Nashoba Valley Structural Co. - 66 Old Mason Center Road
LaMarre Concrete Products, Inc. - 87 Adams Hill Road
Approved Color Corp. - 101 Adams Hill Road

11. Apartment Complexes
Pleasant Street Apartments (18 units)
Acton Place - Acton Court (2 buildings, 16 units each)

12. Post Office
15 Main Street

13. Hazardous Material Storage
Waste Water Treatment Plant - 109 Old Wilton Road
Approved Color Corp. - 101 Adams Hill Road
Pilgrim Foods, Inc. - 68 Old Wilton Road
Country Mile (gas/convenience store) - NH 31
Town pool - chlorine
Haffner's- Fitchburg Road, propane & #2 fuel

Category 4 - Potential Resources:
Contains facilities that provide potential resources for services or supplies.

1. Food & Water

No designated food resources
St. Vincent DePaul food pantry at Sacred Heart Church may be a resource

2. Hospitals/Medical Supplies

Limited supplies at Souhegan Valley Ambulance Service and Greenville Fire Station
Secondary hospitals include:

Cheshire Medical Center (Keene)
St. Joseph's Hospital (Nashua)
Southern NH Medical Center (Nashua)
Health Alliance (Leominster, MA)
Nashoba Valley Deaconess Hospital (Ayer, MA)

3. Gravel Pits

None

4. Gas

Country Mile (gas/convenience store) - NH 31

5. Heating Fuel

Haffner's Fuel- NH 31

6. Building Material and Heavy Equipment Suppliers

LaMarre Concrete Products, Inc. - 87 Adams Hill Road
Frost Farm - Mason Road
Washburn Windy Hill Orchard - Mason Road
Pitcherville/Fitchburg
Highway garage stockpiles material.

7. Small Equipment/Contractors/Snow Removal

LaMarre Concrete Products, Inc. - 87 Adams Hill Road
Frost Farm - Mason Road
Washburn Windy Hill Orchard - Mason Road
Dave's Tree Service - Kimball Heights
City Line Auto
Gauvin's Garage/Greenville Auto
West Side Auto - Adams Stre

8. Miscellaneous Resources

Emergency Broadcast & Television: WMUR

Transportation:	Buses – Peterborough Bus Company (Peterborough) - N & M Buses (New Ipswich) - Johnson Transportation (New Ipswich) - City Line Bus Trucks - Local Contractors, National Guard, Keene
Beds, Cots, Blankets:	National Guard Red Cross

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding	West of NH 31 and North of Baker Ave.	Sewer Department & Highway Garage HazMat - Sewage Treatment	none affected
	Main Street (North of High St./Chamberlain St. /South of River St.)	EOC, Elderly Housing, Fire Station, Med. Supplies and Water Source @ Fire Station	Main Street (P)* High Street (S)**
	Mill St./Hubbard St.	Problem culvert (State of NH)	Mill Street (P)
	Adams Hill Road (2)	none affected	Adams Hill Road (S)
	Mason Hill Rd./NH 31	Water source for fires, problem culvert, building material/heavy and small equip. Supplier, snow removal and small equipment	Mason Hill Road (P) NH 31(P)
	Livingston Rd./NH 31/Barrett Rd./Maldarelli Rd.	Problem culvert (2014 project)	NH 31 (P) Barrett Road (S)
	Livingston Road	Problem Culvert, Water Source	none affected
Wildfire	Along Eastern side of NH 31 from border with Wilton to Adams Hill Rd.	none affected	NH 31 (P)
Lightning Strikes	Along Merriam Hill Road	none affected	Merriam Hill Road (P)
	Along High Street	none affected	High Street (S)
	2 Blanch Farm Road	The Intermediate Pump Station	none affected
	150 NH 45	Waste Water Treatment Plant	NH 45 (P)
Winter Weather Impact Area	Adams Hill Road	Water Supply, 2 Problem Culverts, 2 Employment Centers, Hazmat Storage	Adams Hill Road (S)
Dam Failure	Mill Street	Town Hall	Mill Street (P)

* Primary (P)
** Secondary (S)

CHAPTER VI: ASSESSING VULNERABILITY- 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. 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.

In order to determine estimated losses due to natural and man-made hazards in Greenville, each hazard area was analyzed; results are shown below. Human losses were not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. Information was gathered from both the 2014 Greenville Assessor's records and from the NH Economic & Labor Market Information Bureau. The value of all structures, including exempt structures such as schools and churches, is $97,270,038 and the median value of a home in Greenville is $97,148 according to the Greenville Assessing records, as of May 27, 2014

As future development in Greenville is unpredictable at this time, it is uncertain as to how many future structures could be threatened by hazards. Only existing structures are considered.

Hazard Vulnerability Assessment

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.

Estimating Potential Losses

Flooding (including riverine) – Medium Risk ($2,427,400) The Town of Greenville has approximately 5 structures within the special flood hazard area. The vast majority of these structures are single-family homes with basements. Below is a list of past and potential areas in Greenville that are at risk of flooding. Estimates of damage are also indicated in locations with structures.

- Area west of Main Street where the Souhegan River flows through the Town center: Flooding of the Souhegan River onto NH 45 has occurred and has the potential to occur in this area due to accumulation of heavy rain and runoff. Flooding has the potential to damage two mill buildings, a commercial structure and three houses on Chamberlain Street. At 100% damage to 100% of the structures, estimated cost of repairing or replacing is $581,588. Cost for repairing or replacing the power lines, telephone lines, and road are not included. A 1936 flood incident caused water to rise twelve feet around a mill building. Dam has been raised since earlier storms. An October 2005 flood event resulted in flood waters flowing over the dam. Four upstream dams help to prevent potential dam breach and flooding.
- Area southeast of Old Wilton Road/Baker Avenue: Flood control dams were installed in Temple and New Ipswich in the 1960s to regulate flood waters. Though no structures have been affected by flood incidents and the flood control dams are effective, up to 7 structures in the White Street area could be affected by a major flood incident. The Souhegan River flows through this area. At 100% damage to 100% of the structures, estimated cost of repairing or replacing is $680,036. Cost for repairing or replacing the bridges, power lines, telephone lines, road and contents of structures are not included. Dam maintenance required by owners in abutting communities.

- White Street: Spring rain and runoff causes a brook to overflow. Flood waters are restricted due to an undersized culvert on NH 31 which has caused and has the potential to cause a road washout. Water and sewer lines limit options for relocating or expanding the culvert or installing a deeper culvert. One structure was affected by past flooding in 1989, cost for repairs unknown. Four structures could be affected by future flooding. At 100% damage to 100% of the structures, estimated cost of repairing or replacing is $485,740. Cost for repairing or replacing the bridges, power lines, telephone lines, road and contents of structures are not included.
- Adams Hill Road near NH 31 intersection: Heavy rain and runoff causes flooding of a stream during most storm events. No structures have been affected by past flood incidents. Three structures could be affected by future flooding. At 100% damage to 100% of the structures, estimated cost of repairing or replacing is $291,444. Cost for repairing or replacing the bridges, power lines, telephone lines, road and contents of structures are not included.
- Southeast of intersection of NH 31 and Mason Road: Heavy rain and runoff causes flooding of a parking area during storm events. This is an annual occurrence. Flooding of Mason Road has occurred, though no damage to the road resulted. Water from the Hemlock Hills development has increased the amount of runoff collecting in this area during storm events. If development continues in this area flooding could become a larger problem. No structures have been or could be affected by flood incidents at the present time.
- Livingston Road- Increased development (Hemlock Hills) in this area has increased impervious surfaces and reduced potential for infiltration of heavy rain. Such rain events cause sheet flow of water along Livingston Road and flooding at both ends of Livingston Road where the road intersects with NH 31. One structure could be affected by flooding around the southerly intersection of Livingston Road and NH 31. At 100% damage to 100% of the structures, estimated cost of repairing or replacing is $97,148. Cost for repairing or replacing the bridges, power lines, telephone lines, road and contents of structures are not included. The culvert at the lower crossing will be replaced with a much larger structure, using a FEMA grant, in summer 2014.
- Intersection of East Road/Kimball Hill Road/Richardson Road: Heavy rain and runoff causes flooding of the road. The most recent flood incident occurred in October 2005. No structures have been or could be affected by a flood incident.
- Mill Street/ Hubbard Hill Road intersection: Increased development in this area has caused narrowing of the brook and clogging of the brook due to the accumulation of sedimentation. Spring rain and runoff and heavy rain events affect the area with water flowing over the road and into basements. Access to some homes could be problematic during flood incidents, the most recent of which occurred in the last two years (2004 - 2005). The number of homes affected by past incidents is unknown. Three homes could be affected with wet basements during a flood incident. At 100% damage to 100% of the structures, estimated cost of repairing or replacing is $291,444. Cost for repairing or replacing the bridges, power lines, telephone lines, road and contents of structures are not included.

Drought – Low Risk - No Record of Cost: Greenville has had limited experience with severe drought conditions. Drought will increase the risk of wildfire, especially in wooded, undeveloped areas. Residents evacuated in 1950s due to high risk of wildfires from drought/low rainfall. Forested areas with high fuel content have more potential to burn. 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.

- Severe drought conditions existed in New Hampshire from 1960 to 1969
- Spring of 2012- drought conditions throughout the state. This was considered one of the top five worst droughts in New Hampshire's history.

Extreme Heat – Low-Medium Risk - No Record of Cost: Extreme heat can be dangerous to those residents with medical conditions and the elderly. It is important to have cooling areas and a good supply of water available. Extreme heat can add to the potential for wildfires and depletes the water supply for firefighting. Outreach and education on methods of dealing with extreme heat are important. In Greenville, elderly are at risk. Approximately 11 % of the town population is 65 and over. Limited water sources increases potential risk. Quantity of, and access to, water sources throughout town reduces risk.

Wildfire - Low Risk - No Record of Cost: There is plenty of fuel and much contiguous forested land. The whole town is at risk for wildfires. A lack of direct access to many remote areas within town adds to the danger. There is a substantial amount of debris on the ground from the Ice Storms of 1998 and 2008, wind shears, heavy winds, and logging practices. As timber harvesting is reduced, wood roads close, debris builds up on the ground, and the potential for wildfire increases town-wide.

Earthquake - Low Risk - $19,454,008: New Hampshire generally lies in a zone of moderate seismic vulnerability. Hillsborough County is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley.

Structures are mostly of wood frame construction. Assuming an estimated loss of 20% of town assessed structures, the estimated cost is $19,454,008. This does not include the costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures.

- Eight earthquakes were recorded in New Hampshire between January 2011 to March 2014 ranging in magnitudes of 1.6 to 5.8. There was no reported damage in Greenville.

Landslides/ Erosion – Low-Medium Risk - No Record of Cost: Steep slopes within the watersheds pose a threat to water quality.

- March 31, 2010 the Town experienced a significant landslide on a steep slope on the north side of the Otis Falls Hydro impoundment on the Souhegan River. The landslide precipitated the closure of High Street in Greenville which is a major route between Greenville and New Ipswich. Funding for the project included grants from FEMA and CDBG as well as the town budget. The total cost was $1,814,843 and the project was completed in June 2014.

Radon Air/Water - Medium Risk - No Record of Cost: Radon is a naturally occurring radioactive gas with carcinogenic properties. The gas is a common problem in many states, including New Hampshire. Data collected by the NH Office of Community and Public Health's Bureau of Radiological Health indicates that one third of the houses in New Hampshire have indoor radon levels that exceed the U.S. Environmental Protection Agency's "action level" of four Pico curies per liter for at least some portion of the year. Radon may also enter homes dissolved in drinking water from drilled wells. A higher level of radon in water from individual drilled wells is a common occurrence in New Hampshire.

No known records of illness has be attributed to radon in Greenville, however, residents should be aware that radon is present, particularly with older granite and dirt cellars. Hillsborough County has the highest rate of radon in the Southwest Region of New Hampshire and the fourth highest rating in the State. For additional information on the radon ratings, see the Radon Table on page 31.

Tornado - Low Risk - $1,945,400: Risk from tornados is considered to be high in Hillsborough County. The Fujita Scale is used to determine the intensity of tornadoes. Most tornadoes are in the F0 to F2 Class. Building to modern wind standards provides significant property protection from these hazard events.

New Hampshire is located within Zone 2 for Design Wind Speed for Community Shelters, which is 160 mph, and is also noted as being within a hurricane susceptible region. While it is difficult to assess the monetary impact a tornado may have on a community, the range of monetary damage shown below indicates an approximate amount that could be expected.

The southwestern portion of the state is considered a special wind hazard area as demonstrated by the high proportion of tornadoes and severe wind events that are experienced in this region annually. On July 3, 1997 several tornadoes struck this section of the state. An F1 tornado caused severe tree loss in Swanzey, destroying a building and damaging the stables at the Cheshire Fairgrounds. Although outside the southwest region, the 2008 Barnstead tornado caused significant damage and also involved loss of life. Therefore, this is a real hazard and the damage it could inflict should not to be taken lightly.

Greenville has no history tornados occurring in town. Buildings have not been built to Zone 2, Design Wind Speed Codes. An estimated damage to 10% of structures in town with 20% damages is $1,945,400. Estimated cost does not include building contents, land values or damages to utilities. River corridors and hill tops are susceptible.

Hurricane/Tropical Storms – Medium Risk - No Record of Cost - $2,431,750: A major hurricane can cause significant damage to a community. Hurricane Andrew in 1992 caused billions of dollars in damage in the State of Florida. A series of Hurricanes also hit Florida in 2004. And the extremely destructive Hurricane Katrina hit the Gulf Region in 2005, which caused an estimated $100 billion in damages. Most of the damage is caused by high water and high winds. Greenville's inland location in southwestern New Hampshire reduces the risk of extremely high winds that are associated with hurricanes. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. Hurricanes can, and do, create flooding. Estimated wind damage to 5% of the structures with 10% damage per structure is $486,350. Estimated flood damage to 10% of the structures with 20% damage per structure is $1,945,400. Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included. Possible flooding of evacuation routes is also a risk.

- 1938 hurricane was a major event - wind damage and flooding
- 1990s recorded a number of events with high winds and torrential rains
- Tropical Storm Irene (2011) and Tropical Storm Sandy (2012) caused significant damage to the Northeast U.S. A bridge in Greenville (that was under construction) needed repair due to the effects of Tropical Storm Irene.
- Power and phone lines - disruptions of services
- Flooding/washing of evacuation routes

Severe Wind/ Downburst – Low-Medium Risk - No Record of Cost: 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. 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. Downbursts are unpredictable therefore make cost estimates difficult to determine. Severe wind is a concern in areas of higher elevation in the Town of Greenville. Such events cause small blocks of downed timber. High elevations at greatest risk including. Old trees along roads at risk of falling and causing damage to structures during wind events.

Lightning Strikes – Low-Medium Risk- No Record of Cost: No record of loss of life or property from lightning strikes has been recorded in Greenville. Telephone and power outages occur when transformers are hit by lightning or when a tree gets struck and falls onto the lines. Antennas and satellites, church steeples, cupolas, and other upward protruding architectural features are at greater risk for lightning

strikes. Hikers, fisherman, and boaters are at risk during lightning events and should seek safe shelter. Forested areas with a high fuel load, such as excessive accumulation of downed timber due to timber removal or after severe weather events, are a high risk for forest fire during lightning storms.

- August 2012: The Intermediate Pump Station (2 Blanch Farm Road) and the Water Treatment Plant (150 NH 45, Temple) were damaged by a lightning strike. Repairs exceeded $25,000.

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

- The area has been subject to extremely heavy snow falls
- 1969 heavy snow - several 3 feet events
- 1988 temperature below 0 degrees for a month (Nov.-Dec.)
- 1998 and 2008 severe ice storm events throughout town
- The 2008 ice storm caused all of town to lose power. Some areas lost power for approximately two weeks.
- Elderly are affected by extreme weather

Man-Made Hazards - Hazardous Materials –Low Risk - No Record of Cost: Public transportation of chemicals and bio-hazardous materials through town by truck is a concern, especially on NH 123 and NH 31. Facilities that store hazardous materials near water resources pose a risk for groundwater contamination.

Man-Made Hazards – Dam Failure –Low Risk:

There are two dams in Greenville that are classified as Low Hazard and four dams classified as Non-Menace. There has been only one past incident of a dam breach at the Green Bridge Dam in 1936; after which the dam was removed completely. Three dams located in Greenville's Town Center could affect the road as well as residents in the towns of Wilton and Milford. These three dams were built around 1789 and are located on the upper and lower sides of Main Street. If the first dam is breached, flood waters will likely breach the second and third dams. All three dams are privately owned. Dam information provided by the NH Dam Bureau in 2014 and has been verified by Town officials.

CHAPTER VII
EXISTING MITIGATION STRATEGIES & PROPOSED IMPROVEMENTS

This step involves identifying existing mitigation strategies and Town programs and evaluate their effectiveness. This section outlines those programs and recommends improvements to ensure the highest quality emergency services possible.

Effectiveness of the Existing Protection is rated Good, Average, or Below Average : *Good-* meets and sometimes exceeds expectations; *Average*- meets general expectations; Below Average - needs improvements.

Existing Protection	Description/Area Covered	Responsible Local Agent	Effective-ness	Proposed Improvements/ Comments
Town-Adopted Building Code- The town employs a code enforcement officer and has adopted provisions of the NH Life Safety Code and the NH State Building Code which includes the International Building Code, International Plumbing Code, International Mechanical Code, International Energy Conservation Code and National Electric Code.	All New Construction – Town-wide	Building Inspector	Good	Need to improve communication between all departments. Building approval requires department head to sign-off. There is a need for more timely enforcement of new construction and for increased communication between all departments involved in inspections.
Building Inspector - Enforces building and zoning ordinances and reviews permit applications	Town-wide	Building Inspector	Good	No Comments at this time.
Emergency Back-up Power Program - The Town has propane powered back-up generators at both Water Pumping Stations and the Waste Water Treatment Plant. Town Hall has a back-up generator that serves the Town Hall and the Emergency Management Office. The Fire Station has 3 portable generators, one for use at the fire station. There is also a generator at the Sacred Heart Church. There are no generators at the Highway Department/Garage.	Pumping Stations Water Treatment Facilities Town Hall Fire Department	Contractor of Water Utilities Fire Chief Emergency Management Director	Good	Currently seeking to install transfer switches at water towers. The Town would like to add a generator at the Highway Department.
Local Road Design Standards - Standards set by the town and the Highway Department to ensure a constant construction benchmark	Town-wide for New Roads	Planning Board Road Agent	Good	Construction closely monitored.
Local Bridge Maintenance Program - Currently there is no local bridge inspection for the one locally owned bridge.	Town owned bridge	Highway Dept	Good	The Town is starting a maintenance program on one bridge (2014).
Local Road Maintenance Program - Greenville allocates approximately $35,000 each year to various roadway projects and receives approximately $37,000 of State appropriations. Funds are used for activities such as resurfacing, culvert replacement and repair.	Town-wide	Road Agent	Good	No funds set aside for emergency. Fair amount of private and State maintained roads. Need for additional funds as new town maintained roads are built.

Existing Protection	Description/Area Covered	Responsible Local Agent	Effective-ness	Proposed Improvements/ Comments
Winter Storms Operations Plan - A set of guidelines for the Highway Department and town personnel to follow during times of extreme winter weather	Town-wide	Road Agent	Good	The current plow policy and treatment plan for winter storm clean-up works well, however it involves long hours on behalf of the limited number of Department of Public Works employees. Need for additional funds for more staff to reduce hours worked and for upgrading equipment.
Town Master Plan - A Guidance document to ensure that overall development in town is sustainable, meeting the needs of the citizens by setting forth steps and guidelines for a sound living environment through well planned growth. There is a need for an update of the Master Plan by the Planning Board	Town-wide	Planning Board	Average	A Town Master Plan was completed in 1985 has not been updated since that time. The Planning Board is currently considering a Master Plan Update.
Mutual Aid - Provides assistance to all aspects of Greenville's Emergency Management Services including the Police and Fire Department, Ambulance Services and the Highway Department. Southwest NH Fire Mutual Aid (SWNHFMA), the Hillsborough County Sheriff's Department, the State Police, and neighboring communities provide mutual aid to Greenville. SWNHFMA serves 83 cities and towns, and the Hillsborough County Sheriff's Department serves all communities within Hillsborough County	Town-wide	Police Dept.	Good	Temple, Greenville, Mason, New Ipswich, Wilton, State Police Dept., and Hillsborough County Sheriff's Department
	Town-wide	Fire Dept.	Good	Southwest New Hampshire Fire Mutual Aid. Daytime coverage limited due to lack of volunteers
	Town-wide	Ambulance Service	Good	Verbal agreement with Jaffrey and Wilton and other areas would respond Day to day system could be limited in large incident. Daytime coverage limited due to lack of volunteers
Fire Pond and Dry Hydrant Management Plan - This designates a maintenance schedule for the local fire ponds and dry hydrants used by the Fire Department for water supply for fire prevention and suppression	Town-wide	Fire Department	Below Average	When possible, money has been set aside for dredging of ponds and maintenance of hydrants. However, there is no plan for the use of these funds. Need to create a plan that prescribes a regular maintenance plan for fire ponds and hydrants. New development requires fire protection resources FD looking into permits for dredging Fire Ponds
Floodplain Ordinance - The Town has adopted a floodplain ordinance in accordance with the National Floodplain Insurance Program standards	Town-wide	Planning Board	Good	Limited development proposals in floodplains

Existing Protection	Description/Area Covered	Responsible Local Agent	Effective-ness	Proposed Improvements/ Comments
Hazardous Materials Spill Prevention Control and Counter Measures Plan - This plan is on hand with the Fire Department in the event that there is an incident. Personnel in the Fire Department receive training for handling hazardous materials spills, and the Fire Dept. maintains a list of all Hazardous Material storage in Town. The Keene or Nashua HazMat Team is called upon in the event of a major spill.	Town-wide	Fire Department	Good	Could get updated HazMat equipment. Level of response limited by available equipment. FD maintains list of HazMat storage FD responds to small spills Nashua HazMat Teams responds to large incidents. 1 or 2 household HazMat collection days per year at Wilton Recycling Center
Fire Codes (NFPA)	All New Construction - Town-wide	Fire Inspector	Good	Update as necessary.
Ambulance Service - The Town is served by the Souhegan Valley Ambulance Services that provides service for both Greenville and New Ipswich. The Town also relies on ambulance service from Jaffrey and Wilton although no formal mutual aid agreements are in place	Town-wide	Souhegan Valley Ambulance Service	Good	Review staffing policy
Town-Sponsored Safety Awareness Program - The Fire Department conducts an annual Fire Prevention Awareness Week town-wide and in the Head Start Program.	Town-wide	Fire Department	Good	Fire Prevention Week, 1st week of October. Other than Fire Prevention Week in October, there are no other public safety awareness programs and hazard mitigation program sponsored by the Town. Suggestions have been made to create a safety awareness program specifically for the elderly and town-wide.
Town Radio System - The existing radio system for emergency responders includes mobile radios and low-band frequency radios for the Police and Fire Department and mobile radios for Ambulance Services. The highway department has low-band radios with which they can communicate with both the Police and Fire Departments. Hillsborough County Dispatch provides town-wide alert to emergency responders in the event of an incident. Emergency Management Department has portable radios but not mobiles, and the Department of Public Works has low-band frequency radios with which they can contact the Police Department and the Fire Department.	Town-wide	Fire Department, Police Department, Ambulance, Dept. of Public Works Emergency Mgmt.	Good	The Town should look at dispatch options to see how improvements can be made.

Existing Protection	Description/Area Covered	Responsible Local Agent	Effective-ness	Proposed Improvements/ Comments
Floodplain Development Ordinance- The town has an ordinance to control development in the 100-year floodplain as required by FEMA to remain eligible for the National Flood Insurance Program.	Townwide	Planning Board	High	Effective protection.
Health Officer - The Town Health Officer routinely inspects suspected health hazards in the community and engages in community outreach concerning health related issues	Town-wide	Nominated by Selectmen/Appointed by DHHS	Good	There is an existing Health Officer in town that has engaged in very successful public outreach programs. Focus on stagnant water mosquito issues and lead paint mitigation. Assistant Health Officer is Building Inspector.
Tree Maintenance Program - The Department of Public Works engages in an annual Tree Maintenance Program to remove possible hazards to structures, roads, and power lines	Town-wide	Road Agent	Good	Plan covers all roads at least annually.
Emergency Management Plan - The Town has adopted an Emergency Operations Plan that details actions to be taken in the event of an emergency	Town-wide	Emergency Management Director	Average	Plan needs updating. There is also a need for further funding to equip the Emergency Management Department with necessities for emergencies and a larger location for storage.
Beaver Control and Monitoring Plan- Beavers are trapped and moved to another location to reduce the building of dams and potential flooding	Town-wide	Road Agent	Good	Beaver dams are monitored on a regular basis by the Town.
Slash Monitoring-This is done to prevent forest fires.	Town-wide	Fire Chief	Good	Severe winds and ice storms can cause a significant amount of downed timber.

Previous Mitigation Action Update

The Hazard Mitigation Committee reviewed each Mitigation Action Item from the previous plan to determine the status of the proposed actions. A status of ***completed, deferred, or deleted*** is recorded in the table below.

Mitigation Action	Status	Comment
Floodplain Ordinance – adopt updated FEMA maps to remain a member of the NFIP program	Deferred	Continue as a new Mitigation Action.
Emergency Management Plan – update needed	Deferred	Continue as a new Mitigation Action.
Building and Fire Codes- timely enforcement and increased inter-dept. communication	Complete	Enforcement & communications l greatly improved.
Safety Awareness Programs – add to fire prevention week with other safety awareness programs	Complete	Completed and ongoing. Add as new Mitigation Action.
Fire Pond/Dry Hydrant Management Program – create a plan for the use of these funds.	Complete	Completed and ongoing. Add as new Mitigation Action.
Hazardous Material – new equipment	Deleted	Not a mitigation action.
Local Road Maintenance Program finding further funding	Deleted	Lack of funding available. Adjusting Town budget.
Town Master Plan -update needed	Deferred	Continue as a new Mitigation Action.
Winter Storm Operation Plan – more staff and updated equip.	Deleted	Not a mitigation action.
School Evacuation Plans- shared with all depts., test the plan	Deleted	Greenville Elementary School has been closed.
Emergency Power- outfitting of elementary school with back-up power	Deleted	Greenville Elementary School has been closed.
Continue Mutual Aid Agreements (fire, police, public works)	Complete	Completed and ongoing. Add as new Mitigation Action.
Purchase back hoe for the Highway Department	Deleted	Not a mitigation action.
Create plan to evacuate equipment from Highway Garage should flooding occur	Deleted	Not a mitigation action.
Purchase new forestry equipment for the Fire Dept.	Deleted	Not a mitigation action.
Culvert Maintenance Plan	Complete	Continue and update yearly.
Create a Hazard Situation Resource List	Deleted	Not a mitigation action.
Coordinate Interdepartmental Hazard Drills	Deleted	Not a mitigation action.
Revise Cluster Development Ordinance	Deferred	Revise and continue as new Mitigation Action.
Hazardous Tree Inventory	Complete	Trees removed as needed.
Update Town website to include emergency information and procedures	Deferred	Continue as a new Mitigation Action.

Mitigation Action	Status	Comment
Create a Coordination Plan with the Hydroelectric Plant	Delete	Move this action to EOP.
Purchase more signage for road closings and hazards	Deleted	Not a mitigation action.
Provide information on hazard/disaster preparedness and send with tax bills	Deleted	Not a mitigation action.
Purchase portable generator for school	Deleted	Greenville Elementary School has been closed.
Public TV as an outlet for community outreach	Complete	This has been a good source.
Install fencing around all water well locations	Complete	Complete & on-going. Continue as new Mitigation Action
Train all highway, police, fire and emergency management staff to use new radios	Deleted	Not a mitigation action..
Purchase medical supplies for emergency shelters	Deleted	Not a mitigation action.
Begin Shelter Coordination training for fire, police and emergency management	Deleted	Not a mitigation action.
Designate Short-Term Shelters	Deleted	Not a mitigation action.
Purchase cots for emergency shelters	Deleted	Not a mitigation action.
Green Bridge Maintenance (Old Wilton Rd. & NH 31)	Deferred	Evaluation & Maintenance Plan is done; needs implementation
Wire Elementary School for back-up power	Deleted	Greenville Elementary School has been closed.

CHAPTER VIII: MITIGATION STRATEGIES

The Hazard Mitigation Committee held a brainstorming session during the fourth committee meeting. In order to determine mitigation projects, the Committee used the following objectives:

Preventative (Programs & Policies)
Training
Public Education & Information
Engineering Projects
Property Protection
Structural Projects

With these in mind, the Committee reviewed their overall goals and the hazards, both man-made and natural, as identified in Chapter III. The Committee created a list of possible projects from the types of hazards for which Greenville is at risk. These non-prioritized items are in the directory below. A prioritized list and implementation schedule is included in the next chapter.

Preventative (Programs/Policies):

- Review Cluster Development Ordinance in order to address concerns regarding erosion during construction and the conservation of wetlands and steep slopes.
- Determine feasibility of using public television as an outlet for community outreach and as a public warning system.
- Begin maintenance work on the Green Bridge to ensure stability should a flood occur.
- Continue mutual aid pacts with surrounding communities to share resources in order to be better prepared for emergency situations.
- Maintain a culvert maintenance plan to ensure constant maintenance and upgrades are occurring.
- Develop maintenance plans for fire ponds and hydrants
- Update the Emergency Operations Plan
- Update the Greenville Master Plan and incorporate the Hazard Mitigation Plan update as an appendix
- Develop a hazardous tree inventory.
- Determine sites for shelters for those that have lost homes or cannot immediately return home due to hazards and prepare them for use.
- Identify space for a Public Safety Complex Town Office, EOC, Fire Department and Police Department.
- Coordinate a plan with NH Dam Bureau and the hydroelectric plant owner for water release on the Souhegan River to control flood water release during periods of heavy rain.
- Install grounding equipment on public structures.
- Consider adding a water conservation regulation and a voluntary water ban when necessary.
- Consider a location for a cooling center during periods of extreme heat.

Training:

- Begin training all highway, police, fire, and emergency management on radio operations.
- Continue operation –level training of Fire fighters and Police officers.

Public Education & Information:

- Explore possibilities for using local television to air town warnings and information videos on hazard prevention and property protection.
- Upgrade the Town website to include emergency information and procedures.
- Provide public information on hazard/disaster preparedness and ways to mitigate all hazards.
- Develop an early warning system for notifying residents of pending extreme weather events. Provide information regarding shelter location and emergency procedures in advance of and during the event.
- Install a fire danger/warning sign to inform the public of current conditions.

Engineering:

- Survey the wells and reservoirs to determine closings vs. fencing.

Property Protection:

- Enforce the 2009 updated FEMA Digital Flood Insurance Rate Maps/FIS and floodplain ordinance to ensure the NFIP requirements are maintained and implemented.
- Adopt the updated floodplain maps.
- Consider slope stabilization such as retaining walls, plantings, rip rap where necessary.

Structural Projects:

- Stabilize the steep slope near the impoundment
- Install emergency generator at the highway garage
- White Street culvert repair
- Determine a solution to run-off from Adams Hill to White Street.
- Install fencing around all water supply locations that are remaining open.

POTENTIAL HAZARD LOCATION -MITIGATION ACTIONS

The Greenville Hazard Mitigation Committee identified mitigation actions for the locations identified as possible future hazard areas identified in Chapter III. The Potential Hazard Actions Matrix on the following page identifies these proposed mitigation actions. The matrix includes the hazard type (Column 1), location, (Column 2), risk(s) (Column 3), mitigation actions (Column 4), and comments (Column 5). Mitigation actions identified in the matrix are further considered in Chapter VIII, and where determined feasible, have been integrated into the Hazard Mitigation Implementation Schedule. Risk definitions are found in Appendix B.

The Hazard Mitigation Committee made it a priority to focus the town's hazard mitigation efforts on hazards most likely to affect the community. Therefore, some hazards which have the potential to occur town-wide, but are unpredictable in terms of when, where, and how it would affect the community if it did occur, may not have identified mitigation strategies. The Committee agreed that potential mitigation strategies for each hazard type should be further considered during the annual review of the plan.

Hazard Type	Location	Risk(s)	Mitigation Actions	Comments
Riverine Flooding	Area SE of Old Wilton Road and Baker Avenue-7 structures including highway facility	Medium	Create berm or other permanent structure to block flood waters	Need funding options for this project.
			Move Highway Dept. & Public Safety Facility to higher ground/consolidate emergency & public safety facilities.	
	Area west of Main Street where Souhegan River runs through Town Center-2 mill buildings, Commercial structure, 3 houses	Medium	Coordinate plan with state and hydroelectric plant owner for water release.	Encourage NH Dam Bureau to discuss possibility of hydroelectric plant owner building a permanent fixture on his property to stop water overflow from the river during heavy rains
Flooding	Mill Street and Hubbard Hill Road Intersection-3 structures and access.	Low-Medium	Install new larger culvert.	State has been notified on numerous occasions of undersized culvert.
	Livingston Road- Access to structures	Low-Medium	Install new larger culvert at north end of road.	The south culvert has been dredged, replaced, and road has been raised. (2014)
	Adams Hill Road (south) near NH 31 Intersection. 3 structures	Low-Medium	State needs to repair culvert	Impacts White St. area
	SE of Intersection of NH 31 and Mason Road (Rt. 123)	Low-Medium	1) Increase culvert size 2) Raise road	This is a State Highway
Wildfire	Townwide	Low	1) Provide residents w/ information on fire safety/ prevention, 2) Install Smokey Bear fire risk sign.	Seek funding for sign.
Lightning Strikes	Townwide	Low-Medium	1) Provide residents with information on safety/prevention, 2) Install grounding devices.	Obtain outreach & education material on Lightning strikes.
Drought	Townwide	Low	1) Consider adding water Conservation Regulation & voluntary water ban if necessary. 2) Outreach & education.	Obtain outreach & education material on water conservation during drought conditions.

Hazard Type	Location	Risk(s)	Mitigation Actions	Comments
Extreme Heat	Townwide	Low-Medium	1)Consider site for cooling center. 2) Outreach & education.	Check on vulnerable populations during extreme heat conditions.
Radon Air/Water	Townwide	Low	Outreach & education for the importance of testing for radon.	Obtain outreach & education material on radon and testing.
Tornado	Townwide	Low	Outreach & education for emergency preparedness, and evacuation routes in the event of a tornado.	Obtain outreach & education material on tornados.
Hurricane/ tropical storms	Townwide	Medium	Outreach & education for mitigating severity of hurricanes & severe winds including emergency preparedness and evacuation routes if one occurs.	Obtain outreach & education material on hurricanes & tropical storms.
Earthquakes	Townwide	Low	Outreach & education for mitigating severity of earthquakes, including emergency preparedness, and evacuation routes if one occurs.	Obtain outreach & education material on earthquakes and aftershocks.
Severe Wind/Down burst	Townwide	Low-Medium	Outreach & education for mitigating severity of severe winds and down bursts, including emergency preparedness, and evacuation routes if one occurs.	Obtain outreach & education material on severe winds and downbursts.
Extreme Winter Weather	Townwide	Medium	1) Monitor the weather from the EOC, 2) Develop an early warning system for notifying residents of pending extreme weather incidents 3) Provide information regarding shelter locations and emergency procedures both in advance of and during an incident on public TV channel and website.	The following roads may have drifting snow: Adams Hill Rd., Barrett Rd., Darling Hill Rd., and Kimball Heights Rd.
Landslide/ Erosion	Steep slopes, riverbanks	Low-Medium	Consider slope stabilization where possible (planting, retaining walls, rip rap)	Previous incidents have occurred in town.
Man-Made Hazards – Dams	Otis Falls Dam, Souhegan River, Chamberlain Falls Dam, Souhegan River Dam IV, Souhegan River Dam V, Souhegan River Dam VI, South Branch Walker Brook, Pilgrim Foods Lagoons 1&2, Janson Pond	Low	Provide information to residents and business owners about evacuation routes and emergency procedures.	The Pilgrim Foods Lagoons 1&2 is under consent decree to close by 12/31/14.
Man-Made Hazards – Hazardous Materials	Town-wide	Low	1) Continue mutual aid with the Nashua Hazardous Response team, 2) Provide information to residents and business owners about evacuation routes and emergency procedures, 3) Provide information about proper disposal of hazardous household wastes and medicines.	Obtain outreach & education material on hazardous materials spills and proper disposal of hazardous household materials and medicines.

Prioritization of Proposed Mitigation Strategies

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. Using this method, changes in priorities of the previous mitigation plan can be made to reflect current trends and conditions. The following questions were asked about the proposed mitigation strategies and discussed in the table below:

- **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 on the next page. 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.

STAPLEE CHART

Proposed Mitigation Strategy	Is it **Socially** acceptable?	Is it **Technically** feasible?	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
Update Town website to include Hazard Mitigation methods and emergency preparedness for homeowners	3	3	3	3	3	3	3	21
Informational outreach for the following hazards: tornados, hurricanes, wildfires, radon, lightning, hazardous spills, extreme heat, drought, earthquake, severe winter weather.	3	3	3	3	3	3	3	21
Enforce the 2009 updated FEMA Digital Flood Insurance Rate Maps/FIS and floodplain ordinance to ensure the NFIP requirements are maintained & implemented.	3	3	3	3	3	3	3	21
Adopt updated FEMA maps.	3	3	3	3	3	3	3	21
Continue to update the culvert Maintenance Plan on a yearly basis.	3	3	3	3	3	3	3	21
Install emergency generator at the Highway Department	3	3	3	3	3	3	3	21
Update the Emergency Operations Plan	3	3	2.5	3	3	3	3	20.5
Provide information to the public about Fluvial Erosion Hazard Zones	3	3	2	3	3	3	3	20
Install fire danger sign at visible location	3	3	2	3	3	3	3	20
Survey the well area to determine where fences should be installed	3	3	2.5	3	2.5	3	3	20
Stabilize steep slope near the impoundment – four houses at risk	3	3	2.5	2.5	3	3	3	20
Send written notification to NH DOT District 4, a list of needed repairs & upgrades to state highways and culverts.	3	3	2	3	3	3	3	20
Prepare a response to SWRPC's project solicitation request for potential state highways projects to be considered for inclusion into the Ten Year Plan.	3	3	2	3	3	3	3	20
Expand Fire Prevention Week to include Safety Awareness Programs such as campfire education, proper use of generators, radon detection, etc.	3	3	2	3	3	3	3	20

Proposed Mitigation Strategy	Is it **Socially** acceptable?	Is it **Technically** feasible?	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
Update the Master Plan and incorporate the Hazard Mitigation as an appendix	3	3	1	3	3	2.5	3	18.5
Continue operation-level training of Fire fighters and Police officers	3	1.5	2	3	3	3	3	18.5
Develop a maintenance plan for fire ponds and hydrants	3	3	2.5	2.5	2	3	2.5	17.5
Develop an Implementation Plan for Green Bridge	3	1	2	3	3	1	2	15
Propose a revision to the Cluster Development Ord. or add a Conservation Subdivision ordinance (or similar)	3	1	1	2	2	3	2	14
Open roads to sunlight to prevent icing	3	1	2	1	1.5	1	1	10.5

The Hazard Mitigation Committee made it a priority to focus the town's hazard mitigation efforts on hazards most likely to affect the community. Therefore, some hazards which have the potential to occur town-wide, but are unpredictable in terms of when, where, and how it would affect the community if it did occur, may not have specific identified mitigation strategies. The Committee agreed that potential mitigation strategies for each hazard type should be further considered during the annual review of the plan

CHAPTER IX: PRIORITIZED IMPLEMENTATION SCHEDULE AND ACTION PLAN

Summary of Critical Evaluation

The Greenville Hazard Mitigation Committee reviewed each of the actions identified in the Summary of Recommended Improvements in Chapter VII, as well as mitigation strategies from the brainstorm and Potential Hazard Actions Matrix in Chapter VIII using the following factors to prioritize mitigation projects:

- Ability to reduce disaster damage
- Technical feasibility/potential success
- Ability for quick implementation
- Ability to comply with regulations
- Legal authority to implement
- Whether there are environmental approvals Required
- Ability to benefit the environment
- Positive cost/benefit review for local economy
- Ability to save/protect historic structures
- Administratively feasible
- Contributes to other community goals
- Level of social acceptability
- Level of political acceptability

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.

Implementation Schedule and Action Plan

The Greenville Hazard Mitigation Committee developed an action plan that outlines who is responsible for implementing each of the prioritized strategies determined in the previous chapters, as well as when and how the actions will be implemented. The following questions were asked to develop an implementation schedule for the identified priority mitigation strategies:

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

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

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

A fourth consideration was the cost/benefit of each proposed action. Comments regarding the cost/benefit of each project are included, along with the "who," "when," and "how" in the table on the following page.
As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

Mitigation Actions that were identified in Chapter VIII but did not score as a priority, will remain in the plan. As additional funding and staff becomes available, these strategies should be considered in future plan updates.

Once the plan is formally approved by FEMA, the Town will begin working on the actions listed below with an estimated completion date as noted in the Timeframe (When) column.

IMPLEMENTATION/ACTION PLAN

Mitigation Action	Who (Leadership)	When (Deadline)	How (Estimated Cost and Funding Source)	Cost/Benefit Comments
Update Town website to include Hazard Mitigation methods and emergency preparedness for homeowners	EMD and Assistant Administrator	June 2015	Town Budget Under $100	Benefits outweigh the cost
Informational outreach for the following hazards: tornados, hurricanes, wildfires, radon, lightning, hazardous spills, extreme heat, drought	Emergency Management Director	December 2015	Town Budget under $100	Benefits outweigh cost
Enforce the 2009 updated FEMA Digital Flood Insurance Rate Maps/FIS and floodplain ordinance to ensure the NFIP requirements are maintained and implemented.	Emergency Management Director	2015-2020 annually	Town Budget Under $100	Benefits outweigh cost
Adopt updated FEMA floodplain maps.	Emergency Management Director	December 2015	Town Budget Under $100	Benefits outweigh cost
Continue to update the Culvert Maintenance Plan on a yearly basis.	Road Agent	2015-2020 annually	Town Budget under $100	Very beneficial
Install emergency generator at the Highway Department	Road Agent	December 2015	Town Budget $1,500	Very beneficial
Update the Emergency Operations Plan	Emergency Management Director	June 2015	FEMA grant $5,000	Very beneficial
Provide information to the public about Fluvial Erosion Hazard Zones (see Appendix G)	EMD	December 2015	FEMA/DES grant	Benefits outweigh cost
Install fire sign at visible location	Fire Chief	June 2015	FEMA grant $5,000	Benefits outweigh cost
Survey wells & reservoirs to determine closing vs. fence installation.	Water/sewer Commission	December 2015	Town Budget $10,000	Benefits outweigh cost
Stabilize steep slope near the impoundment – four houses at risk	Board of Selectmen	2015-2020 annually	Town Budget/ FEMA grant $500,000 or greater	Very beneficial
Send written notification to NH DOT District 4, a list of needed repairs & upgrades to state highways and culverts.*	EMD/Board of Selectmen	2015-2020 annually	Town Budget Under $100	Benefits outweigh cost
Prepare a response to SWRPC's project solicitation request for potential state highways projects to be considered for inclusion into the Ten Year Plan.	EMD/Board of Selectmen	2015-2020 annually	Town Budget Under $100	Benefits outweigh cost

Mitigation Action	Who (Leadership)	When (Deadline)	How (Estimated Cost and Funding Source)	Cost/Benefit Comments
Expand Fire Prevention Week to include Safety Awareness Programs such as campfire education, proper use of generators, radon detection, etc.	Fire Dept. and EMD	2015-2020 October annually	Town Budget $500	Benefits outweigh the cost
Update the Master Plan and incorporate the Hazard Mitigation as an appendix	Planning Board	December 2016	Town Budget $30,000	Very beneficial
Continue operation-level training of Fire fighters and Police officers	EMD	Annually 2015-2020	Town Budget $100	Benefits outweigh cost
Develop a maintenance plan for fire ponds and hydrants	Fire Chief/Fire Warden	2015-2020 annually	Town Budget $10,000	Benefits outweigh cost
Develop an Implementation Plan for Green Bridge	Highway Dept. and BOS	June 30, 2015	Town Budget $10,000 to begin	Very beneficial
Propose a revision to the Cluster Development Ord. or add a Conservation Subdivision ordinance (or similar)	Planning Board and Code Enforcement	March 2016 Town Meeting	Town Budget/grant $3,000	Beneficial
Open roads to sunlight to prevent forest fires	Highway Dept.	Annually 2015-2020	$10,000	Beneficial

* The following culverts need to be upsized, however, they are on state roads and therefore are not within the jurisdiction of the Town of Greenville to replace:

1) Mill Street and Hubbard Hill Road intersection- larger culvert needs to be installed; 3 structures and access are at risk.
2) Adams Hill Road (south) near NH 31 intersection- repair or replace culvert with larger one; flooding impacts the White Street area; 3 structures are at risk.
3) SE of intersection of NH 31 and Mason Road (NH123) - Upsize culvert and raise the road

CHAPTER X: ADOPTION, IMPLEMENTATION, MONITORING & UPDATE

ADOPTION

The Greenville Board of Selectmen adopted the Greenville Hazard Mitigation Plan Update 2015 on February 4, 2015. 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 chart "Implementation Strategy for Priority Mitigation Actions" in Chapter IX and in the "Monitoring & Updates" sub-section contained in this chapter. All other sections of this Plan are supporting documentation for information purposes only and are not included as the statement of policy.

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

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 Prioritized Implementation Schedule (Chapter IX), the Town Hazard Mitigation Team will revisit the Greenville Hazard Mitigation Plan Update 2015 annually, or after a hazard event. The Emergency Management Director is responsible for initiating this review and needs to consult with the Board of Selectmen and other key local officials. Changes should be made to the Plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with the timeframe, the community's priorities, and funding resources. Priorities that did not make the implementation list, but identified as potential mitigation strategies, should be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation. In keeping with the process of adopting the Greenville Hazard Mitigation Plan Update 2015, a public hearing to receive public comment on Plan maintenance and updating will be held during the annual review period and the final product adopted by the Board of Selectmen appropriately.

Monitoring of the plan shall include periodic reports, meetings, site visits, and phone calls. The projects identified in this plan will be evaluated to make sure they are still applicable and practical. When the plan is evaluated, any changes should be incorporated into the plan in the annual update.

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

The Town of Greenville, NH Hazard Mitigation Plan Update 2015 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval every five years in order to maintain eligibility for Hazard Mitigation & Assistance Grants (HMA Grants).

This plan received FEMA final approval on **February 26, 2015.**

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

Master Plan

Implementation of the Master Plan has been ongoing since its most recent adoption in 1985. Recommendations from the Greenville Hazard Mitigation Plan will be considered for insertion into future updates of the Master Plan. The Master Plan is in need of updating, and has therefore not included any recent hazard mitigation actions or incorporation of the Hazard Mitigation Plan. It has, however, been included in the Prioritized Implementation Schedule in Chapter IX of this Plan. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to ensure that the Greenville Hazard Mitigation Plan is adopted into the Master Plan.

Zoning Ordinance and Regulations

Some of the implementation strategies proposed involve revisions to the Subdivision Regulations and/or the Site Plan Review Regulations as well as the Zoning Ordinance. The Local Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to develop appropriate language for the recommended modifications. Hazard Mitigation has been included in other plans through ordinances such as the Floodplain Development Ordinance, Building Code Ordinance, and the Manufactured Housing Ordinance.

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 Budget Committee members;
- Provide personal invitations to town department heads;
- Post notices of meetings at the Town Office, Library, and local businesses;
- Put notice on public access television
- Submit newspaper articles for publication appropriate newspapers and Town Newsletter; and
- Information added to the Town Website.

A number of Implementation Action items which will be undertaken relate to public education and involvement. Additionally, members of the public including area business owners, schools, communities, and organizations will be invited to participate in the yearly process of updating the Greenville Hazard Mitigation Plan Update 2015. 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 Greenville Hazard Mitigation Plan Update 2015, the public will be noticed and the meetings will be open to the public.

CERTIFICATE OF ADOPTION

GREENVILLE, NEW HAMPSHJRE

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE

GREENVILLE HAZARD MITIGATION PLAN UPDATE 2015

WHEREAS, the Town of Greenville has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2015 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between April 2014 and July 2014 regarding the development and review of the Greenville Hazard Mitigation Plan Update 2015; and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Greenville, 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 Greenville 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 Greenville;

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 (S) 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 Greenville this 4th day of February, 2015.

Greenville Board of Selectmen

Anthony Ste. Marie/Chairman

Douglas Reardon/Selectmen

Carla Mary/Selectperson

ATTEST

KELLEY A. COLLINS
MY COMMISSION EXPIRES
SEPT. 18, 2018
NOTARY PUBLIC
NEW HAMPSHIRE

1

APPENDICES

APPENDIX A:
HAZARD DESCRIPTIONS

The following list describes hazards that have occurred or have the potential to occur in the Town of Greenville. The descriptions provided are those used in the State of NH Hazard Mitigation Plan (2013).

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.

Extreme Heat

Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. These event conditions may impact the health of both humans and livestock. The State Hazard Mitigation Team is conducting additional research to more accurately characterize extreme heat hazards.

Wildfire

Wildfire is defined as an uncontrolled and rapidly spreading fire.

Forest Fires and Grass Fires

- 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.

Landslide

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

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.

Radon

Radon is a naturally occurring radioactive gas with carcinogenic properties. The gas is a common problem in many states, including New Hampshire. Data collected by the NH Office of Community and Public Health's Bureau of Radiological Health indicates that one third of the houses in New Hampshire have indoor radon levels that exceed the U.S. Environmental Protection Agency's "action level" of four Pico curies per liter for at least some portion of the year. Radon may also enter homes dissolved in drinking water from drilled wells. A higher level of radon in water from individual drilled wells is a common occurrence in New Hampshire.

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.

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.

Severe Wind

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

Downburst

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

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

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 show 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 long-term evacuation of local residents and businesses may be required, depending on the nature and extent of the incident.

Dam Breach and Failure

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

Appendix B:
Risk Assessment

The following terms are used to analyze the hazards. High, Medium and Low equal 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 worse 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 worse 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 this event will occur within the next 25 years (1-2 events each year).

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

LOW**:** There is little likelihood that this 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 severity.

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)
SWRPC's Hazard Mitigation Planning for New Hampshire Communities (10/02)
FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses
Local Mitigation Planning Handbook
Town of Greenville, NH's Master Plan
Town of Greenville Town Report 2012

1) Agencies

New Hampshire Homeland Security and Emergency Management (HSEM)……..……..…….271-2231
Field Representative Hillsborough County**:** Danielle Morse…...……..……..…….....603-223-3613
Field Representative Cheshire County: Liz Lufkin……..……...……..603-223-3613
Mitigation Officer**:** Parker Moore. ……...……...271-2231
Mitigation Planner**:** Elizabeth Peck ……..……...……..223-3655
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 883-0366
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 742-2523
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
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
Hillsborough County, Milford ..... 673-2409 Ext. #4

Mitigation Funding Resources

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

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

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

FEMA REGION I MITIGATION PLANNING WEBLIOGRAPHY

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

REGULATORY INFORMATION

Final Rule
44 CFR 201.6
http://www.fema.gov/pdf/help/fr02-4321.pdf

Disaster Mitigation Act of 2000 (DMA 2K)
http://www.fema.gov/library/viewRecord.do?id=1935

DISASTERS AND NATURAL HAZARDS INFORMATION

FEMA-How to deal with specific hazards
http://www.ready.gov/natural-disasters

Natural Hazards Center at the University of Colorado
http://www.colorado.edu/hazards

National Oceanic and Atmospheric Administration (NOAA): Information on various projects and research on climate and weather.
http://www.websites.noaa.gov

National Climatic Data Center active archive of weather data.
http://lwf.ncdc.noaa.gov/oa/ncdc.html

Northeast Snowfall Impact Scale
http://www.erh.noaa.gov/rnk/Newsletter/Fall%202007/NESIS.htm

Weekend Snowstorm Strikes The Northeast Corridor Classified As A Category 3"Major"Storm
http://www.publicaffairs.noaa.gov/releases2006/feb06/noaa06-023.html

FLOOD RELATED HAZARDS

FEMA Coastal Flood Hazard Analysis & Mapping
http://www.fema.gov/national-flood-insurance-program-0/fema-coastal-flood-hazard-analyses-and-mapping-1

Floodsmart
http://www.floodsmart.gov/floodsmart/

National Flood Insurance Program (NFIP)
http://www.fema.gov/nfip

Digital quality Level 3 Flood Maps
http://msc.fema.gov/MSC/statemap.htm

Flood Map Modernization
http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization

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

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/hurrican/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

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

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

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

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

Nan Johnson
Community Planner
Phone: 617-956-7672
Email: nan.johnson@fema.dhs.gov
Massachusetts; Rhode Island; Vermont

Brigitte Ndikum-Nyada
Community Planner
Phone: 617-956-7614
Email: brigitte.ndikum-nyada@fema.dhs.gov
Connecticut; Maine; New Hampshire

OTHER FEDERAL RESOURCES

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

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

NOAA Coastal Services Center http://www.csc.noaa.gov/

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

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

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

Economic Development Administration (EDA): Assists communities with technical assistance for economic development planning www.osec.doc.gov/eda/default.htm

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

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

Department of Housing & Urban Development www.hud.gov

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

Environmental Protection Agency www.epa.gov

SUSTAINABILTY/ADAPTATION/CLIMATE CHANGE

Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards
Hilliard 2/20/2014 Pg. 8
http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf
Resilient Sustainable Communities: Integrating Hazard Mitigation& Sustainability into Land Use
http://www.earth.columbia.edu/sitefiles/file/education/documents/2013/Resilient-Sustainable-Communities-Report.pdf

U.S. EPA
http://www.epa.gov/climatechange/
NOAA National Ocean Service (NOS)
http://oceanservice.noaa.gov/

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

NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments) http://ccrun.org/home

Community and Regional Resilience: Perspectives from hazards, disasters, and emergency management
http://www.resilientus.org/library/FINAL_CUTTER_9-25-08_1223482309.pdf

National Fish, Wildlife and Plants Climate Adaptation Strategy www.wildlifeadaptationstrategy.gov
ICLEI Local Governments for Sustainability http://www.icleiusa.org/

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

New England's Sustainable Knowledge Corridor http://www.sustainableknowledgecorridor.org/site/

The Strategic Foresight Initiative (SFI)
http://www.fema.gov/pdf/about/programs/oppa/findings_051111.pdf

Northeast Climate Choices http://www.climatechoices.org/ne/resources_ne/nereport.html

Northeast Climate Impacts Assessment http://www.northeastclimateimpacts.org/

Draft National Climate Assessment Northeast Chapter released early 2013
http://ncadac.globalchange.gov/

Northeast Chapter of the National Climate Assessment of 2009:
http://www.globalchange.gov/images/cir/pdf/northeast.pdf

Hilliard 2/20/2014 Pg. 9
NEclimateUS.org
ClimateNE
www.climatenortheast.com

Scenarios for Climate Assessment and Adaptation http://scenarios.globalchange.gov/

Northeast Climate Science Center http://necsc.umass.edu/

FEMA Climate Change Adaptation and Emergency Management
https://www.llis.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/

Additional Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/hazards/	Searchable database of references and links to many disaster-related websites.
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://disasterfinder.gsfc.nasa.gov/Disaster_Management/ /	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://waterdata.usgs.gov/nwis/rt	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/~floods	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/about/programs/nfip/index.shtm	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://thunder.msfc.nasa.gov/research.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://www.llnl.gov/hmc/	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoproject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.noaa.gov/	Information about and tracking of severe storms.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

APPENDIX D:
HAZARD MITIGATION
RESOURCE PROFILES

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@crl02.usace.army.mil
Website: http://www.crrel.usace.army.mil/ierd/

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

Description and Mission:

The US Army Cold Regions Research and Engineering Laboratory (CRREL) is a Corps of Engineers' research laboratory that is dedicated to multi-disciplinary engineering and research that addresses the problems and opportunities unique to the world's cold regions. CRREL exists largely to solve the technical problems that develop in cold regions, especially those related to construction, transport, and military operations. Most of these problems are caused by falling and blowing snow, snow on the ground, ice in the air and in the ground, river ice, ice on seas and lakes, and ice affects on manmade materials. CRREL serves the Corps of Engineers and its clients in three main areas:

- Traditional military engineering, which deals with problems that arise during conflict;

- Military construction and operations technology, i.e., the building and maintenance of military bases, airfields, roads, ports, and other facilities; and

- Civil works, which involves the Corps in such things as flood protection, navigation on inland waterways and coastal engineering.

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

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

Flood Mitigation Involvement:

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

Mitigation Goals and Objectives:

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

Projects Desired*: CRREL and IERD are a national resource ready to apply our unique facilities and capabilities to solve problems and conduct innovative, state-of-the-art research and technical support. There are a number of mechanisms that enable IERD and the rest of CRREL to partner with various Federal, non-DoD and private sector entities. The Federal Technology Transfer Act of 1986 (15 USC 3710a) allows CRREL to collaborate with any non-Federal partner on research and technical support consistent with the mission of the laboratory. The Intergovernmental Cooperation Act (31 USC 6505) lets CRREL work with state and local governments on a broad range of reimbursable projects. Under the "Authority to Sell" (10 USC 2539b), CRREL can provide test and evaluation services to the states and the private sector. This includes the testing and evaluation of materials, equipment, models, computer software, and other items. The laboratory can also provide support to other Federal agencies via the Economy in Government Act (31 USC 1535) through MOUs/MOAs that establish a framework for the partnership and provide a concise description of the planned work. CRREL's 35 active Cooperative Research and Development Agreements (CRADAs) with industry and academia and 17 Intergovernmental Cooperation Agreements with states and local governments in 1998 demonstrate a robust program in this area and the relevance of CRREL's research to many segments of American society beyond DoD.*

The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal

guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria. Through the Corps, IERD has been involved in Section 205 Flood Damage Reduction program, Section 22 Planning Assistance to States Program (PAS)) projects, the Section 206 Flood Plain Management Services (FPMS) program funded jointly with FEMA, and numerous instances of technical assistance.

CRREL IERD Resources with Respect to Hazard Mitigation:

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

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

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

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

Section 206 - Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Personnel:

IERD was created to research, analyze and solve ice problems in and around water bodies. The technical experience of the staff and their in-depth research and field capabilities combine with CRREL's unique Ice Engineering Facility to form one of the premier ice engineering organizations in the world. IERD has

a staff of 15 engineers and technicians experienced in technical analyses, methods, and engineering solutions to ice problems -- that is, any situation where the effects of ice cause flooding, increase operational and maintenance requirements of water control projects, impede navigation, or adversely impact the environment in cold regions.

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

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

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

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

USDA, Natural Resources Conservation Service

Contacts:

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

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

Address: Federal Building
2 Madbury Road
Durham, NH 03824

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

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

Kristin M. O'Brien, Assistant Executive Director: Phone: (781) 224-9876
Fax: (781) 224-4350
E-Mail: www.nesec.org

Address: Northeast States Emergency Consortium
419 Main Street, Suite 5
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, lighting, 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 New Hampshire Office of Emergency Management (NHOEM). Communities interested in participating should contact NHOEM.

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 New Hampshire Office of Emergency Management (NHOEM). Communities interested in participating should contact NHOEM.

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

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

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

Federal Mitigation Grant Programs

I. Pre-Disaster Mitigation Grant Program

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

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

II. Hazard Mitigation Grant Program

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

III. Flood Mitigation Assistance (FMA) Program

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

FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program. http://www.fema.gov/government/grant/fma/index.shtm

IV. Repetitive Flood Claims Program

The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al).

Up to $10 million is available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP).
www.fema.gov/government/grant/rfc/index.shtm

V. Severe Repetitive Loss Program

The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP).

The definition of severe repetitive loss as applied to this program was established in Section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a. An SRL property is defined as a **residential property** that is covered under an NFIP flood insurance policy and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or

(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten year period, and must be greater than 10 days apart.
http://www.fema.gov/government/grant/srl/index.shtm

FEMA

Program Information **Mitigation**

The Unified Hazard Mitigation Assistance Grant Programs

HMA
Hazard Mitigation Assistance

Hazard Mitigation Assistance

The Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) programs present a critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds.

A Common Goal

While the statutory origins of the programs differ, all share the common goal of reducing the risk of loss of life and property due to natural hazards.

Funding Disaster Recovery Efforts

The Hazard Mitigation Grant Program (HMGP) may provide funds to States, Territories, Indian Tribal governments, local governments, and eligible private non-profits following a Presidential major disaster declaration.

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the State requested by the Governor. The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration.

The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Indian Tribal governments, and local communities in implementing a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future disasters.

The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

The Repetitive Flood Claims (RFC) program is authorized by Section 1323 of the NFIA, 42 U.S.C. 4030, with the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time.

The Severe Repetitive Loss (SRL) program is authorized by Section 1361A of the NFIA, 42 U.S.C. 4102a, with the goal of reducing flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest amount of savings to the NFIF in the shortest period of time.

Additional HMA resources, including the HMA Unified Guidance, may be accessed at www.fema.gov/government/grant/hma/index.shtm

Available Funding

PDM, FMA, RFC, and SRL are subject to the availability of appropriations funding, as well as any directive or restriction made with respect to such funds.

HMGP funding depends on Federal assistance provided for disaster recovery.

General Requirements

All mitigation projects must be cost-effective, be both engineering and technically feasible, and meet Environmental Planning and Historic Preservation requirements in accordance with HMA Unified Guidance. In addition, all mitigation activities must adhere to all relevant statutes, regulations, and requirements including other applicable Federal, State, Indian Tribal, and local laws, implementing regulations, and Executive Orders.

All applicants and subapplicants must have hazard mitigation plans that meet the requirements of 44 CFR Part 201.

Program Comparisons

Cost Sharing

In general, HMA funds may be used to pay up to 75 percent of the eligible activity costs. The remaining 25 percent of eligible costs are derived from non-Federal sources.

The table below outlines the Federal and State cost share requirements.

COST SHARE REQUIREMENTS

Programs	Mitigation Activity Grant (Percent of Federal/ Non-Federal Share)
HMGP	75/25
PDM	75/25
PDM (subgrantee is small impoverished community)	90/10
PDM (Tribal grantee is small impoverished community)	90/10
FMA	75/25
FMA (severe repetitive loss property with Repetitive Loss Strategy)	90/10
RFC	100/0
SRL	75/25
SRL (with Repetitive Loss Strategy)	90/10

Eligible Applicants and Subapplicants

States, Territories, and Indian Tribal governments are eligible HMA Applicants. Each State, Territory, and Indian Tribal government shall designate one agency to serve as the Applicant for each HMA program. All interested subapplicants must apply to the Applicant.

The table below identifies, in general, eligible subapplicants.

ELIGIBLE SUBAPPLICANTS

Subapplicants	HMGP	PDM	FMA	RFC	SRL
State agencies	✔	✔	✔	✔	✔
Indian Tribal governments	✔	✔	✔	✔	✔
Local governments/communities	✔	✔	✔	✔	✔
Private non-profit organizations (PNPs)	✔				

✔ = Subapplicant is eligible for program funding

Individuals and businesses are not eligible to apply for HMA funds, however, an eligible subapplicant may apply for funding to mitigate private structures. RFC funds are only available to subapplicants who cannot meet the cost share requirements of the FMA program.

Eligible Activities

The table below summarizes eligible activities that may be funded by HMA programs. Detailed descriptions of these activities can be found in the HMA Unified Guidance.

ELIGIBLE ACTIVITIES

Mitigation Activities	HMGP	PDM	FMA	RFC	SRL
1. Mitigation Projects	✔	✔	✔	✔	✔
Property Acquisition and Structure Demolition or Relocation	✔	✔	✔	✔	✔
Structure Elevation	✔	✔	✔	✔	✔
Mitigation Reconstruction					✔
Dry Floodproofing of Historic Residential Structures	✔	✔	✔	✔	✔
Dry Floodproofing of Non-Residential Structures	✔	✔	✔	✔	
Minor Localized Flood Reduction Projects	✔	✔	✔	✔	✔
Structural Retrofitting of Existing Buildings	✔	✔			
Non-Structural Retrofitting of Existing Buildings and Facilities	✔	✔			
Safe Room Construction	✔	✔			
Infrastructure Retrofit	✔	✔			
Soil Stabilization	✔	✔			
Wildfire Mitigation	✔	✔			
Post-Disaster Code Enforcement	✔				
5% Initiative Projects	✔				
2. Hazard Mitigation Planning	✔	✔	✔		
3. Management Costs	✔	✔	✔	✔	✔

✔ = Mitigation activity is eligible for program funding

Management Costs

For HMGP only: The Grantee may request up to 4.89 percent of the HMGP allocation for management costs. The Grantee is responsible for determining the amount, if any, of funds that will be passed through to the subgrantee(s) for their management costs.

Applicants for PDM, FMA, RFC, or SRL may apply for a maximum of 10 percent of the total funds requested in their grant application budget (Federal and non-Federal shares) for management costs to support the project and planning subapplications included as part of their grant application.

Subapplicants for PDM, FMA, RFC, or SRL may apply for a maximum of 5 percent of the total funds requested in a subapplication for management costs.

National Flood Insurance Program (NFIP) Participation

There are a number of ways that HMA eligibility is related to the NFIP:

SUBAPPLICANT ELIGIBILITY: All subapplicants for FMA, RFC, or SRL must currently be participating in the NFIP, and not withdrawn or suspended, to be eligible to apply for grant funds. Certain non-participating political subdivisions (i.e., regional flood control districts or county governments) may apply and act as subgrantee on behalf of the NFIP-participating community in areas where the political subdivision provides zoning and building code enforcement or planning and community development professional services for that community.

PROJECT ELIGIBILITY: HMGP and PDM mitigation project subapplications for projects sited within a Special Flood Hazard Area (SFHA) are eligible only if the jurisdiction in which the project is located is participating in the NFIP. There is no NFIP participation requirement for HMGP and PDM project subapplications located outside of the SFHA.

PROPERTY ELIGIBILITY: Properties included in a project subapplication for FMA, RFC, and SRL funding must be NFIP-insured at the time of the application submittal. Flood insurance must be maintained at least through completion of the mitigation activity.

Application Process

Applications for HMGP are processed through the National Emergency Management Information System (NEMIS). Applicants use the Application Development Module of NEMIS, which enables each Applicant to create project applications and submit them to the appropriate FEMA Region in digital format for the relevant disaster.

Applications for PDM, FMA, RFC, and SRL are processed through a web-based, electronic grants management system (eGrants), which encompasses the entire grant application process. The eGrants system allows Applicants and subapplicants to apply for and manage their mitigation grant application processes electronically. Applicants and subapplicants can access eGrants at https://portal.fema.gov.

Application Deadline

The PDM, FMA, RFC, and SRL application period is from early June through early December. Applicants must submit a grant application to FEMA through the eGrants system. The HMGP application deadline is 12 months after the disaster declaration date and is not part of the annual application period. Details can be found in the HMA Unified Guidance.

FEMA Review and Selection

All subapplications will be reviewed for eligibility and completeness, cost-effectiveness, engineering feasibility and effectiveness, and for Environmental Planning and Historical Preservation compliance. Subapplications that do not pass these reviews will not be considered for funding. FEMA will notify Applicants of the status of their subapplications and will work with Applicants on subapplications identified for further review.

Details about the HMA Grant Application process can be found in the Hazard Mitigation Assistance Unified Guidance, which is available at **www.fema.gov/government/grant/hma/index.shtm**

GovDelivery Notifications

Stay up-to-date on the HMA Grant Programs by subscribing to GovDelivery notifications. Have updates delivered to an e-mail address or mobile device. To learn more, visit **www.fema.gov**

Contact Information

HMA Helpline: Tel 866-222-3580, or e-mail **hmagrantshelpline@dhs.gov**

Contact information for FEMA Regional Offices is provided at **www.fema.gov/about/contact/regions.shtm**

Contact information for each State Hazard Mitigation Officer (SHMO) is provided at **www.fema.gov/about/contact/shmo.shtm**

FEMA

APPENDIX E:
DOCUMENTATION OF THE PLANNING PROCESS

Greenville Hazard Mitigation Plan Update

Meeting #1

AGENDA

April 24, 2014
10:30 a.m.
Greenville Town Hall
Meeting Room
Greenville, NH 03048

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. **Community Profile** (Chapter II)
   a. Review the existing community profile and update with current development trends and conditions.

4. **Identify Past and Potential Hazards** (Chapter III)

   a. Review each hazard type and other information on the chart provided in Chapter III of existing plan
   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 (Chapter

5. **Review of Existing Mitigation Strategies**

   a. Review Existing Mitigation Strategies from existing plan (Chapter VI)
   b. Identifying Gaps in Coverage

6. **Next Meeting-** to be determined.

Greenville Hazard Mitigation
Meeting # 1

April 24, 2014

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Kelley Collins	Town Administrator	administrator@greenvillenh.org
Tony Ste. Marie	Emergency Management Director	Tonyste.marie@comcast.net
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Greenville Hazard Mitigation Plan Update

Meeting #2

AGENDA (amended)

May 13, 2014
9:30 a.m.
Greenville Town Hall
Meeting Room
Greenville, NH 03048

1. Status of Previous Hazard Mitigation Actions

a. Review the Action Plan from the existing Hazard Mitigation Plan to determine what has been completed, deleted, or deferred to the updated plan.

2 Assessing Probability

a. Review the Probability, Severity, and Risk with each hazard using the chart in Chapter IV

3.

4 Review of Existing Mitigation Strategies

a. Continue review of Existing Mitigation Strategies from existing plan (Chapter VI)
b. Identifying Gaps in Coverage

5. Review of Mitigation Strategies (Chapter VII)

a. Review of the Preventative, Training, Public Education & Information, Engineering & Structural Projects, and Property Protection goals and determine potential projects from the types of hazards in Greenville.
b. Update Potential Hazard Actions Matrix

Next Meeting- to be determined.

Greenville Hazard Mitigation
Meeting # 2

May 13, 2014

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Kelley Collins	Town Administrator	administrator@greenvillenh.org
Thomas Plourde	Road Agent	Highway@greenvillenh.org
Anthony Ste.Marie	EMD/ Selectmen	Tonyste.marie@comcast.net
Gerald Curran	Water/sewer/utility partner	gcurran@utilitypartnersllc
Rob Lauricella	Water/sewer/utility partner	rlauricella@utilitypartnersllc.com
Danielle Morse	NH HSEM	lmurphy@swrpc.org
Lisa Murphy	SWRPC	Danielle.morse@dos.nh.gov

Greenville Hazard Mitigation Plan Update

Meeting #3

AGENDA

May 27, 2014
9:30 a.m.
Greenville Town Hall
Meeting Room
Greenville, NH 03048

1. Continue Review of Existing Mitigation Strategies

a. Review Existing Mitigation Strategies from existing plan (Chapter VI)
b. Identifying Gaps in Coverage

2. Review of Mitigation Strategies (Chapter VII)

c. Review of the Preventative, Training, Public Education & Information, Engineering & Structural Projects, and Property Protection goals and determine potential projects from the types of hazards in Greenville.

3. Develop Strategies and Determine Priorities

a. List the proposed strategies and rate each one using the STAPLEE Chart

4. Develop the Action Plan (Chapter VIII)

a. Determine the Who, When, and How (funding) for each strategy in the STAPLEE Chart

Next Meeting- to be determined.

Greenville Hazard Mitigation
Meeting # 3

May 27, 2014

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Kelley Collins	Town Administrator	administrator@greenvillenh.org
Thomas Plourde	Road Agent	Highway@greenvillenh.org
Anthony Ste.Marie	EMD/ Selectmen	Tonyste.marie@comcast.net
Charles Buttrick	Fire Chief	cbuttrick@hotmail.com
Danielle Morse	NH HSEM	lmurphy@swrpc.org
Lisa Murphy	SWRPC	Danielle.morse@dos.nh.gov

Greenville Hazard Mitigation Plan Update

Meeting #4

AGENDA

July 29, 2014
9:30 a.m.
Greenville Town Hall
Meeting Room
Greenville, NH 03048

1. Continue STAPLEE Chart and Action Plan Development

a. Complete remaining strategies and consider any additional ones that may be missing from the list of proposed actions.

2. Review of Complete Draft of Hazard Mitigation Plan Update 2015

d. Review the draft plan and provide comments for edits to be included in the final plan.

3. Next Steps

b. Discuss the procedure for submittal of the plan to FEMA for their review and approval.

Greenville Hazard Mitigation
Meeting # 4

July 29, 2014

SIGN – IN SHEET

NAME	AFFILIATION or DEPARTMENT	CONTACT INFORMATION
Thomas Plourde	Greenville Road Agent	Highway@greenvillenh.org
Parker Moore	NHHSEM	Parker.moore@dos.nh.gov
Danielle Morse	NHHSEM	Danielle.morse@dos.nh.gov
Anthony Ste. Marie	Greenville EMD & Board of Selectmen	Tonyste.marie@comcast.net
Kelley Collins	Town Administrator	administrator@greenvillenh.org
Lisa Murphy	SWRPC	lmurphy@swrpc.org

PUBLIC NOTICE
Town of Greenville
Hazard Mitigation Plan Review

A copy of the Draft Hazard Mitigation Plan Update is available for public review and comment from August 27th to September 9th, 2014 at the Greenville Town Hall, during regular business hours or by emailing the Town Administrator at administrator@greenvillenh.org

Written comments may be addressed to Anthony Ste. Marie, Emergency Management Director – Town Hall and sent by mail to PO Box 343, Greenville NH 03048 or by email to greenvillebos@comcast.net

TOWN OF GREENVILLE,

NH LEGAL NOTICE OF PUBLIC

HEARING

Jannary 26, **2015**

Notice is hereby given in accordance with Section 201.6 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted under Sec. 104 of the Disaster Mitigation Act of 2000 that the Greenville Hazard Mitigation Plan Update 2015 will be submitted to the Board of Selectmen at 7:00 p.m. on Wednesday, February 4, 2015 at the The Meeting Room on the lower level of Town Hall, 46 Main Street during a meeting of the Board of Selectmen for adoption.

Upon a finding by the Board that the Greenville Hazard Mitigation Plan Update 2015 meets the approval of Greenville's Hazard Mitigation Planning Committee, the Board will vote to accept the Plan and move immediately into public hearing on the merits of the proposal.

The Plan will be available for review prior to the meeting as of the date of this posting at The Selectmen's Office, 46 Main Street, Greenville, NH during regular business hours Tuesday, Wednesday and Thursday 10 a.m. to noon and Tuesday and Thursdays from 1:00 p.m. to 4::00 p.m. and Wednesday 1:00 p.m. to 3:00 p.m. Should the Plan not be accepted as complete, another submission meeting will be scheduled. Upon acceptance, should a decision not be reached following the public hearing, adoption of the Plan will stay on the Board's agenda until it is either approved or disapproved.

Anyone needing assistance in attending this hearing should contact the Selectmen's Office one week prior to the hearing.

Posted: l/26/2015

Post Office

Town Hall

The following is an excerpt of an edition of the SWRPC Happenings which is an email that is distributed to over 400 recipients within the region. The list includes 35 towns, Cheshire County office, academia, businesses, and other interested stakeholders. It is updated and emailed twice each month to provide information about upcoming meetings and events.

Happenings

from Southwest Region Planning Commission

In This Issue

Economic Development Academy Launched

Alternative Fuel Vehicle Deployment Initiatives Funding Available

DOT Applications for Transportation Alternatives Program Sought

Erosion Control Field Day

Peterborough Conservation Commission to Map Invasive Plants

MtBE Funding Available from DES

Diesel Emission Reduction Grants

Upcoming Meetings

July 29

The **Greenville Hazard Mitigation Committee** will meet at 9:30 a.m. at the Greenville Town Hall to review the draft of the Greenville Hazard Mitigation Plan Update 2014. The meeting is open to the public. Neighboring towns and other interested parties are encouraged to attend and participate. For more information, please contact Lisa Murphy.

July 31

The **Monadnock Region Future Leadership Team** will meet at 3:00 p.m. at the SWRPC office. For more information, please contact Tara Germond.

The **Keene Green Bikes Initiative** will meet at 5:30 p.m. at the SWRPC office.

July 25, 2014

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

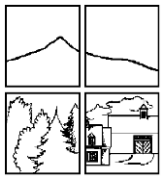
Economic Development Academy Launched

The University of New Hampshire Cooperative Extension (UNHCE), in partnership with the Office of the Senior Provost for Engagement and Academic Outreach and the University of New Hampshire Manchester, presents the inaugural launch of the Economic Development Academy (EDA), an intensive, practice-based course designed to build the skills of community and economic development leaders and practitioners. The format is designed to engage working professionals in a collaborative environment to learn and share strategies that are effective at growing and sustaining economic activity. Most important, EDA enables participants to network with other practitioners and experts so each can make real progress on a project in their own community. The EDA consists of seven sessions over a four month period - four in-class sessions (9:00 a.m.-4:00 p.m.) on August 25-26th, October 10th, November 21st; and three online sessions in September and October. The in-class sessions will be held at UNH Manchester (Pandora Building) located at 88 Commercial Street in Manchester. The cost is $350 and includes breakfast and lunch at each in-class session. **The deadline for applying is July 31, 2014**. Scholarships are

Below is a page from SWRPC Highlights, a monthly newsletter that is sent to the 35 towns in Southwestern New Hampshire, the Cheshire County office, academia, businesses, and other interested stakeholders.

S o u t h w e s t R e g i o n P l a n n i n g C o m m i s s i o n

37 Ashuelot Street Keene, NH 03431 603-357-0557 www.swrpc.org



Hazard Mitigation Update

Planning Commission staff has recently completed the Hazard Mitigation Plan update for the Town of Bennington. The Town of Greenville is also drafting their Hazard Mitigation Plan which is nearly complete. Upon completion of the plans, a public viewing period is held within the town for review and comment. After the public viewing period is complete, the plan is sent to FEMA for review and approval before it is considered approved. SWRPC will soon begin working with the Town of Temple on their Hazard Mitigation Plan update. The first meeting is scheduled for August 12, 2014 at 4:00 p.m. In addition to the Temple plan, staff will be working with the Towns of Hinsdale and Marlborough later this year to begin those updates. All of these meetings are open to the public. The public is encouraged to review and provide input for the development of these plans. For more information about hazard mitigation planning, please contact Lisa Murphy of Commission staff.

Community Development Block Grant Activities

During July, SWRPC staff was active in providing communities with support in administering several Community Development Block Grant (CDBG) projects. The Marlborough Homes project saw significant activity in the construction of 24 units of affordable housing in downtown Marlborough. SWRPC staff also completed the close-out report for two projects in the region. The Town of Greenville High Street Stabilization project repaired a road damaged by a slope failure in 2010. The Brookbend East Housing project involved the demolition and rebuilding of 40 units of affordable housing off Ivy Drive in Keene. For questions about any of these projects or to determine how the CDBG program might benefit your community, please contact Rebeckah Bullock of Commission staff.

APPENDIX F:
PROJECT STATUS SHEETS

The following form can be used to keep track of projects identified in the hazard mitigation plan that are in progress or that have been completed.

HAZARD MITIGATION PLAN- PROJECT STATUS

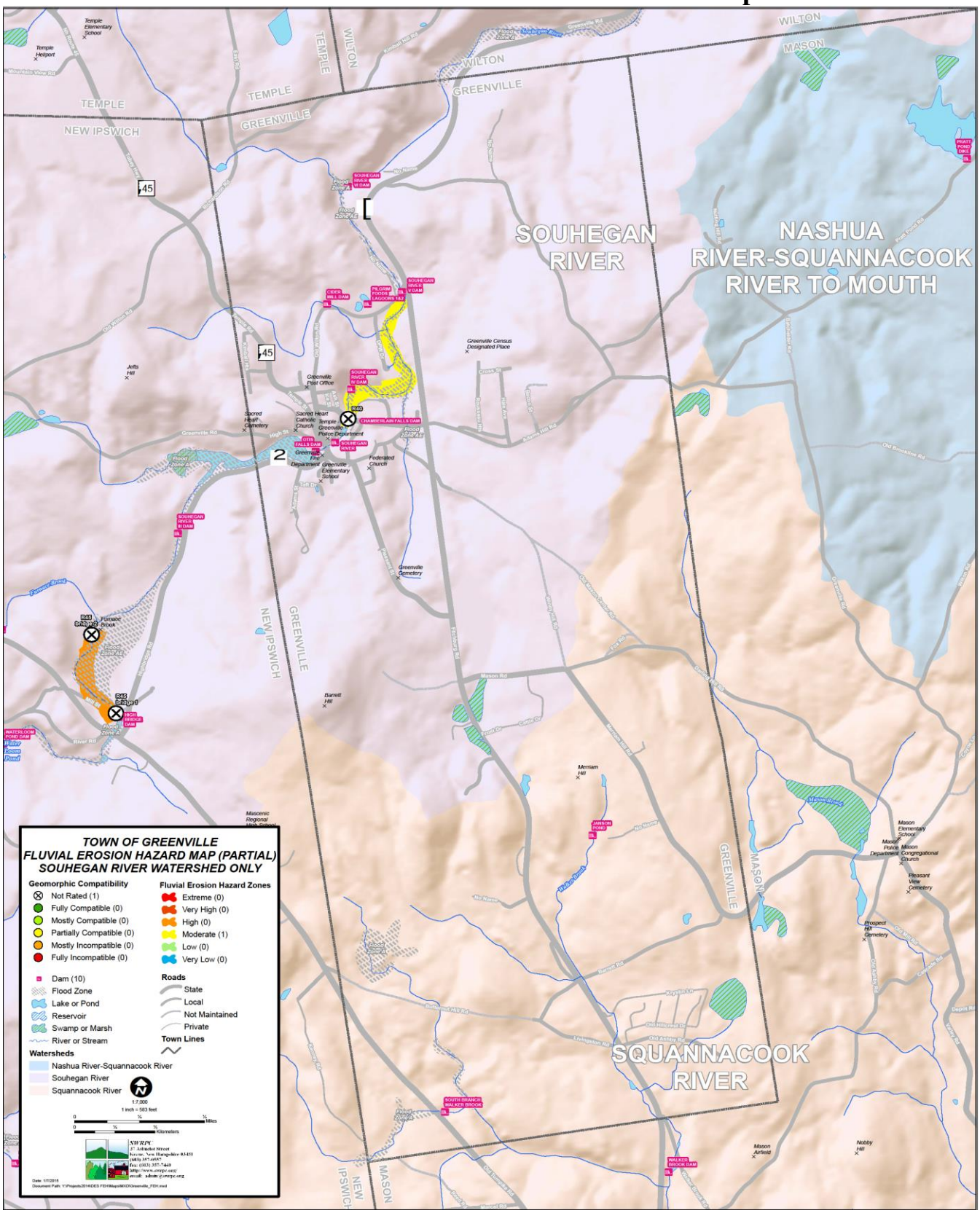
Project Title	Page # in Plan	Date of Project Completion	Comments

HAZARD MITIGATION PLAN- PROJECT STATUS

Project Title/Description	Page # in Plan	Date of Project Completion	Comments

APPENDIX G:
FLUVIAL EROSION HAZARD MAP & DESCRIPTION

Town of Greenville Fluvial Erosion Hazard Map



New Hampshire Geological Survey
New Hampshire Department of Environmental Services

Description of FEH Zones and Recommended Color Scheme

The fluvial erosion hazard zone, or meander belt, data is provided to you for river reaches that have been assessed for a project within New Hampshire. For each identified river reach herein, a suite of river geomorphology (condition) data are collected that provides an understanding of the river channel's sensitivity to future change (inclusive of bed and bank erosion) as a result of high flow events. The sensitivity for a reach is contained in the FEH zone shapefile in the field "FEH2RATING." Sensitivity for a reach can be in any one of six categories, based on its condition, ranging from Very Low to Extreme. Sensitivity can be defined as the potential of a river to respond to flood events, through bank erosion and lateral migration (across the floodplain) processes. Rivers, as a result of the combination of their geologic context and extent of historical development, will vary in their likelihood to experience flood-event driven rapid changes. Past activities, such as for example channel straightening, can increase the potential for change in a flood. Reaches already experiencing erosion are prone to such rapid changes, given the exposed bank materials available for the power of water to erode into. The occurrences of such features are incorporated into the sensitivity rankings, where generally, the greater number of features present that can cause changes, the higher the sensitivity to change. Broadly, assignment of an "Extreme" category means a reach that is experiencing considerable erosion of its beds and banks, and typically has flood chutes and meander cutoffs that maximize the potential for changing flow paths and further erosion during a large flood. Conversely, a rating of "Very Low" is typically found in a bedrock gorge, where the flow path will not change on time scales of concern to people.

Recommended Colorization Scheme

The following color scheme should be used to depict each of the following six sensitivity categories for mapping and display purposes:

Extreme Red
Very High Orange Red
High Orange
Moderate Yellow
Low Pale Green
Very Low Turquoise