Brookfield Hazard Mitigation Plan Update 2014

BROOKFIELD

This Plan integrates the following:

- **Hazard Mitigation Plan (FEMA)**
- **Community Wildfire Protection Plan (DRED)**
- **Rural Water Fire Resource Plan (NCRC&D)**

June 16, 2014
Approved Pending Adoption (APA)

Prepared for New Hampshire Homeland Security & Emergency Management
By
The Brookfield Planning Team

With assistance from Mapping and Planning Solutions

Plans are worthless, but planning is everything. There is a very great distinction because when you are planning for an emergency you must start with this one thing: The very definition of "emergency" is that it is unexpected, therefore it is not going to happen the way you are planning.

-Dwight D. Eisenhower

HAZARD MITIGATION PLAN DEFINITIONS

*"A **natural hazard** is a source of harm or difficulty created by a meteorological, environmental, or geological event."*

*"**Hazard mitigation** is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards (44CFR 201.2). Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs."*

(Source: Local Mitigation Plan Review Guide, FEMA, October 1, 2011)

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Cover: Brookfield Town House; 2013 Annual Report
Photo Credit: http://www.brookfieldnh.org/Pages/BrookfieldNH_WebDocs/minag

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Acknowledgements

This plan was created through a grant from New Hampshire Homeland Security Emergency Management (HSEM). The following organizations have contributed invaluable assistance and support for this project:

- New Hampshire Homeland Security Emergency Management (HSEM)
- Federal Emergency Management Agency (FEMA)
- DRED-NH Forests & Lands
- North Country Resource Conservation & Development (NCRC&D)
- Mapping and Planning Solutions (MAPS)
- USDA-Forest Service
- NH Office of Energy & Planning

This Plan integrates elements to qualify it as a Community Wildfire Protection Plan (CWPP) according to the US Forest Service and the Department of Resources and Economic Development. In addition, the Plan integrates the hazard analysis conducted for the Brookfield Rural Fire Water Resource Plan developed for Brookfield in 2013 by North Country Resource Conservation and Development (NCRC&D).

This Plan is an update to the original Brookfield Hazard Mitigation Plan, Approved January 18, 2007

Approval Notification Dates for 2014 Update

Conditional Approval:	June 16, 2014
Date of Jurisdiction Adoption:	To be determined
Letter of Final Approval:	To be determined
Letter of CWPP Approval:	To be determined
Plan Approval Date (FEMA):	To be determined

Town of Brookfield Hazard Mitigation Planning Team

The Town of Brookfield would like to thank the following people for their time and the effort spent to complete Plan; the following people have attended meetings and/or been instrumental in completing this Plan:

Brad Williamson	Brookfield EMD	Dick Peckham	Brookfield Conservation Committee
Rich Zacher	Brookfield Select Board	Diana Peckham	Brookfield Tax Collector
Ken Fifield	Wakefield Police Chief	Janet Williamson	Brookfield Resident
Ed Nason	Brookfield Code Officer	Terry Jones	Brookfield Resident
Bill Nelson	Brookfield Select Board	Alice Jean Jones	Brookfield Resident
Brian Robischeau	Brookfield Select Board	Pat Tarpey	NCRC&D
Thomas Hill	Brookfield Conservation	Jennifer Gilbert	NH OEP
James Freeman	Brookfield Planning Board	Heidi Lawton	NH HSEM
Doug Vanderpool	Brookfield Retired Fire Warden	June Garneau	MAPS

Many thanks for the hard work and effort given by each and every one of you. This Plan would not exist without your knowledge and experience. The Town of Brookfield also thanks the Federal Emergency Management Agency and NH Homeland Security and Emergency Management as the primary funding sources for the Plan.

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Executive Summary

The Brookfield Hazard Mitigation Plan Update 2014 was compiled to assist the Town of Brookfield in reducing and mitigating future losses from natural or human-caused hazardous events. The Plan was developed by participants of the Town of Brookfield Hazard Mitigation Planning Team, interested stakeholders, the general public and Mapping and Planning Solutions (MAPS). The Plan contains the tools necessary to identify specific hazards and aspects of existing and future mitigation efforts.

Brookfield Logo
Photo Credit:
http://en.wikipedia.org/wiki/File:Brookfield,_NH_Town_Seal.png

This Plan is an **update** to the 2007 Brookfield Hazard Mitigation Plan. In an effort to produce an accurate and current planning document that is based on new development, progress in local mitigation efforts, changes in priorities, policies and regulations and expected growth in the community, the Planning Team used the 2007 Plan as a foundation, building upon that Plan to provide more timely information. It should be noted that the planning process for the 2007 Hazard Mitigation Plan began in 2007.

This plan addresses the following natural and human-caused hazards.

Natural Hazards

1) Road Flooding/Erosion (Heavy Rain & Snow Melt)
2) Severe Winter Weather (Snow Storms)
3) Severe Winter Weather (Ice Storms)
4) Severe Thunderstorms & Lightning
5) Wildfire/Structure Fire
6) Hurricane
7) Tornado or Downburst
8) Hailstorm
9) Extreme Temperatures
10) Drought
11) Flood (Dam Failure)
12) Earthquake

Human-Caused Hazards

1) Extended Power Failure (5-7 days)
2) Hazard Material - Transport
3) Terrorism
4) Epidemic & Pandemic

This plan also provides a list of Critical Infrastructure and Key Resources (CIKR) categorized as follows: Necessary for Emergency Response Facilities (ERF), Not Necessary for Emergency Response Facilities (NERF), Facilities and Populations to Protect (FPP), and Potential Resources (PR). In addition, this Pan addresses the Town's involvement in The National Flood Insurance Program (NFIP).

This hazard mitigation plan was designed to include a detailed study and analysis of wildfire and rural structure fire. The original goal was to produce separate plans but that concept produced excessive overlap and cost. To streamline the process, the Community Wildfire Protection Plan (CWPP) and Rural Fire Water Resource Plan were fully integrated into this hazard mitigation plan as were the risks from man-made hazards.

Although mitigation strategies are the main focus of this Plan, it is at times difficult to arrive at true mitigation

projects. Some communities, though faced with an array of natural hazards, are able to adequately cope with the impact of these hazards. For example, although Severe Winter Weather is often a common hazard in New Hampshire, and more often than not considered to be the most likely to occur, most New Hamshire communities handle two-three foot snow storms with little or no disruption of services. On the other hand, an unexpected ice storm can have disastrous effects on a community. Mitigation for this type of sudden storm is difficult to achieve; establishing warming and cooling centers, establishing notification systems, providing public outreach, tree trimming, opening shelters and perhaps burying overhead power lines are just a few of the strategies that may be put in place.

Many mitigation strategies, as per the example above, can be considered emergency perparedness or mitigation; often there is a fine line between the two. Tree trimming could be considered "mitigation" but it is often the responsibility of the public utility, not the Town. Tree trimming could also be considered "preparedness" as it would be done in preparation for a potential storm. Opening shelters during a severe ice storm is an emergency "preparedness" action; however, as a "mitigation" strategy, developing a shelter and training people to manage the shelter provides an opportunity to lessen the impact of the disaster on the residents of the community.

In summary, finding mitigation strategies for every hazard that effects a community is at times difficult. In addition, with today's economic constraints, cities and towns are less likely to have the financial ability to create some mitigation strategies, such as burying power lines. In preparing this Plan, the Brookfield Planning Team has considered a comprehensive list of mitigation strategies that could diminish the impact of hazards but has also decided to maintain a list of preparedness strategies for future reference and action.

To simplify the language in the Plan, the following abbreviations and acronyms will be used:

Brookfield Hazard Mitigation Plan Update 2014	the Plan or this Plan
Brookfield	the Town or the Community
Hazard Mitigation Planning Team	the Team
Hazard Mitigation Plan	HMP
Emergency Operations Plan	EOP
Community Wildfire Protection Plan	CWPP
Rural Water Fire Resource Plan	WRP
Mapping and Planning Solutions	MAPS
Mapping and Planning Solutions Planner	the Planner
NH Homeland Security & Emergency Management	HSEM
Federal Emergency Management Agency	FEMA

For more Acronyms, please refer to Appendix, Section F.

Mission Statement:
To make Brookfield less vulnerable to the effects of hazards through the effective administration of hazard mitigation planning, wildfire hazard assessments, and a coordinated approach to mitigation policy and planning activities.

Vision Statement:
The community of Brookfield will reduce the impacts of natural hazards and other potential disasters through implementing mitigation measures, public education and deliberate capital expenditures within the community. Homes and businesses will be safer and the community's ISO rating may be improved.

Chapter 1: Hazard Mitigation Planning Process

A. Authority & Funding

The Brookfield Hazard Mitigation Plan Update 2014 was prepared in accordance with the Disaster Mitigation Act of 2000 (DMA), Section 322; Mitigation Planning, signed into law by President Clinton on October 30, 2000. This hazard mitigation plan was prepared by the Brookfield Hazard Mitigation Planning Team under contract with New Hampshire Homeland Security & Emergency Management (HSEM) operating under the guidance of Section 206.405 of 44 CFR Chapter 1 (10-1-97 Edition) and with the assistance and professional services of Mapping and Planning Solutions. This plan was funded by HSEM through grants from FEMA (Federal Emergency Management Agency); matching funds for team member's time were also part of the funding formula.

B. Purpose & History of the FEMA Mitigation Planning Process

The ultimate purpose of Disaster Mitigation Act of 2000 (DMA) is to: "…establish a national disaster hazard mitigation program –

- *To reduce the loss of life and property, human suffering, economic disruption and disaster assistance costs resulting from natural disasters; and*
- *To provide a source of pre-disaster hazard mitigation funding that will assist States and local governments (including Indian tribes) in implementing effective hazard mitigation measures that are designed to ensure the continued functionality of critical services and facilities after a natural disaster".*[1]

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section "322 – Mitigation Planning" which states:

> *"As a condition of receipt of an increased Federal share for hazard mitigation measures under subsection (e), a State, local, or tribal government shall develop and submit for approval to the President a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government."*[2]

HSEM's goal is to have all New Hampshire communities complete a local hazard mitigation plan as a means to reduce future losses from natural or human-caused events before they occur. HSEM outlined a process whereby communities throughout the state may be eligible for grants and other assistance upon completion of this hazard mitigation plan.

The Brookfield Hazard Mitigation Plan Update 2014 is a planning tool to use to reduce future losses from natural and human-caused hazards as required by the Disaster Mitigation Act of 2000; this plan does **not** constitute a section of the Town's Master Plan, however mitigation strategies from this Plan may be incorporated into future Master Plan updates.

The DMA places new emphasis on local mitigation planning. It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition to receiving Hazard Mitigation Grant Program (HMGP) project grants. Local governments must review yearly and update this plan every five years to continue program eligibility.

[1] Disaster Mitigation Act (DMA) of 2000, Section 101, b1 & b2
[2] Disaster Mitigation Act (DMA) of 2000, Section 322a

C. Jurisdiction

This plan addresses one jurisdiction – the Town of Brookfield, NH.

D. Scope of the Plan & Federal & State Participation

A community's hazard mitigation plan often identifies a vast number of natural hazards and is somewhat broad in scope and outline. The scope and effects of this plan were assessed based on the impact of hazards and wildfire/structure fires on: Critical Infrastructure and Key Resources (CIKR); current residential buildings; other structures within the Town; future development; administrative, technical and physical capacity of emergency response services; and response coordination between federal, state and local entities.

In seeking approval as a Hazard Mitigation Plan and a Community Wildfire Protection Plan (CWPP), the planning effort included participation of Homeland Security and Emergency Management, the US Forest Service, the Department of Resources and Economic Development (DRED), NH Office of Energy & Planning (OEP) as well as routine notification of upcoming meetings to the state and federal entities above. Designation as a CWPP will allow a community to gain access to federal funding for hazardous fuels reduction and other mitigation projects supported by the US Forest Service. By merging the two federal planning processes (hazard and wildfire/structure fire), duplication is eliminated and the Town has access to a larger pool of resources for pre-disaster planning.

The Healthy Forest Restoration Act (HFRA) of 2003 includes statutory incentives for the US Forest Service to give consideration to local communities as they develop and implement forest management and hazardous fuel reduction projects. For a community to take advantage of this opportunity, it must first prepare a CWPP. This hazard mitigation planning process not only satisfies FEMA's criteria regarding wildfire/structure fires and all other hazards but also addresses the minimum requirements for a CWPP:

- ***Collaboration****: A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.*

- ***Prioritized Fuel Reduction:*** *A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure.*

- ***Treatment of Structural Ignitability:*** *A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.*[3]

Finally, as required under Code of Federal Regulations (CFR), Title 44, Part 201.6(c) (2) (ii) and 201.6(c) (3) (ii), the Plan must address the community's participation in the National Flood Insurance Program (NFIP), its continued compliance with the program, and, as part of vulnerability assessment, the Plan must address the NFIP insured structures that have been repetitively damaged due to floods.

[3] Healthy Forest Restoration Act; HR 1904, 2003; Section 101-3-a.b.c; http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_bills&docid=f:h1904enr.txt.pdf

E. Public & Stakeholder Involvement

Public and stakeholder involvement was stressed during the initial meeting and community officials were given a matrix of potential team members (page 17). Community officials were urged to contact as many people as they could to participate in the planning process.

It was noted that there are no public schools and no colleges in the Town of Brookfield; therefore stakeholders from academia were limited. However, by placing a Press Release (below) at the Town Hall, Stoneham Corners and on the Town's website many interested citizens and stakeholders had the opportunity to become aware of the hazard mitigation planning taking place in Brookfield. An email was also sent out to all citizens in the Town via the Town's email service.

The Planner sent an email to state, federal and local stakeholders including the Carroll County Public Health Network, Police Chiefs, Fire Chiefs and Emergency Management Directors from neighboring towns. Announcements of hazard mitigation meetings were also made on the Town's website.

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Twin Mountain, NH 03595

Press Release

FOR IMMEDIATE RELEASE

October 1, 2012
Contact: June Garneau
603.846.5720

TOWN OF BROOKFIELD COMMENCES
HAZARD MITIGATION PLANNING UPDATE

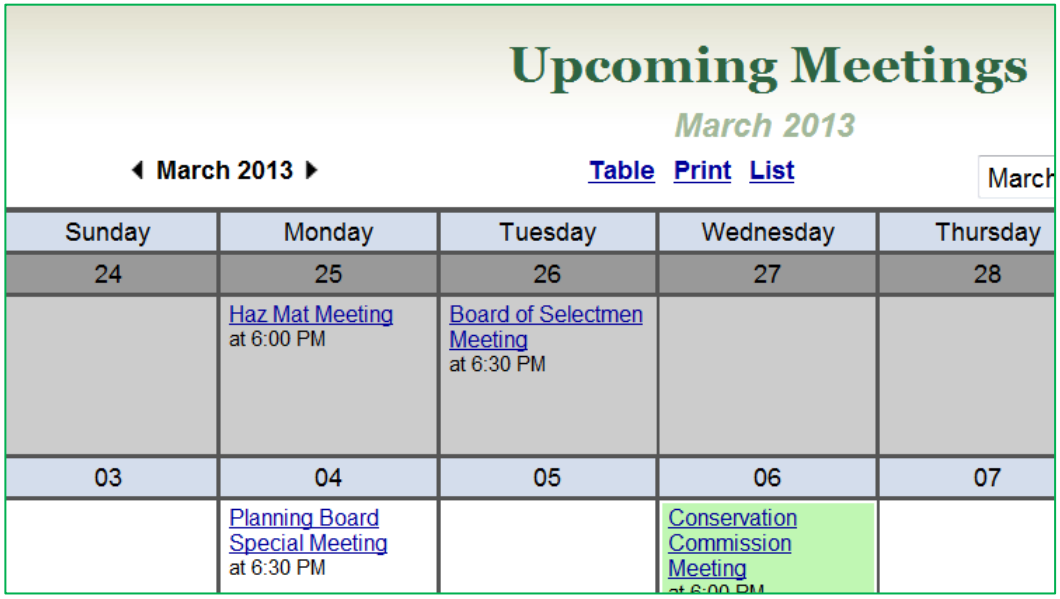
On August 21st and October 2nd, the Brookfield Hazard Mitigation Team met with June Garneau, Mapping and Planning Solutions, and Heidi Lawton, NH Homeland Security and Emergency Management, to discuss the required five-year update to the 2007 Brookfield Hazard Mitigation Plan. As a result of this meeting, the Town of Brookfield will hold a series of additional Hazard Mitigation Planning meetings over the next few months.

As mandated by the Disaster Mitigation Act of 2000, all communities are required to complete a local hazard mitigation plan in order to qualify for FEMA funding should a natural disaster occur. The hazard mitigation plan format will cover a variety of natural hazards and also address the history and likelihood of wildfire disasters, man-made hazards and the risks of building in flood zones.

Brookfield's Planning Team is currently being formed; all interested parties should Brad Williamson, Emergency Management Director, by phone at 651-3258, if they wish to be included in the process. Through a series of public meetings, the Planning Team will establish priorities, collaborate on activities, and increase public awareness and participation to reduce the impact of hazards. Discussion will address issues such as flooding, hurricanes, drought, landslides and wildfires; the planning processes are made possible through grants from the Federal Emergency Management Agency (FEMA).

The next scheduled meeting of the Planning Team will be held on Tuesday, October 30, 2012 at 6:00 PM at the Brookfield Town Hall; the general public is encouraged to attend all meetings and to assist the Team with firsthand knowledge of historic hazard events.

Hazard mitigation planning is a preparedness tool. In an effort to reduce the costs of suppression and the incidence of potential losses, FEMA and New Hampshire Homeland Security and Emergency Management award local communities funding to assist in developing these plans. If you wish to have your community participate in this process please contact June Garneau at Mapping and Planning Solutions, 603.846.5720.



Upcoming Meetings

March 2013

March 2013 | Table | Print | List | March

Sunday	Monday	Tuesday	Wednesday	Thursday
24	25	26	27	28
	Haz Mat Meeting at 6:00 PM	Board of Selectmen Meeting at 6:30 PM		
03	04	05	06	07
	Planning Board Special Meeting at 6:30 PM		Conservation Commission Meeting	

Above:

Posting on Brookfield's website

To the right:

Sample meeting list sent to NH EMD's, Police Chiefs, Fire Chiefs, Rangers and other State, Federal and Private Officials throughout the State on a monthly basis.

New or changed Emergency Operations or Hazard Mitigation meetings; highlighted by "Counties".

Status update: July 20, 2012

Day	Date	Time	Town/Location	Plan Type	HSEM Field Rep	County
Friday	Jul 27	8:00 AM	Lisbon Railroad Station	EOP	Paul Hatch	Grafton
Wednesday	Aug 1	8:00 AM	Colebrook Town Hall	Hazmit	Heidi Lawton	Coos
Wednesday	Aug 1	1:00 PM	Pittsburg Town Hall	Hazmit	Heidi Lawton	Coos
Monday	Aug 6	6:00 PM	Groton Town Hall	Hazmit	Paul Hatch	Grafton
Tuesday	Aug 7	1:00 PM	Holderness Public Safety Bldg.	EOP	Paul Hatch	Grafton
Wednesday	Aug 8	8:00 AM	Kingston Fire Station	Hazmit	Paul Hatch	Rockingham
Wednesday	Aug 8	3:00 PM	Milton Town Hall	EOP	Julia Chase	Strafford
Thursday	Aug 9	2:30 PM	Franconia Town Hall	Hazmit	Paul Hatch	Grafton
Monday	Aug 13	9:00 AM	Albany Town Hall	EOP	Heidi Lawton	Carroll
Monday	Aug 13	2:00 PM	Madison Fire Station	Hazmit	Heidi Lawton	Carroll
Tuesday	Aug 14	4:45 PM	Sandwich Fire Station	Hazmit	Heidi Lawton	Carroll
Wednesday	Aug 15	2:00 PM	Wakefield (TBD)	EOP	Heidi Lawton	Carroll
Wednesday	Aug 15	6:30 PM	Effingham Municipal Bldg.	Hazmit	Heidi Lawton	Carroll
Friday	Aug 17	10:00 AM	Jackson Town Hall	Hazmit	Heidi Lawton	Carroll
Monday	Aug 20	5:30 PM	Jefferson Town Hall	Hazmit	Heidi Lawton	Coos
Tuesday	Aug 21	2:30 PM	New Durham	EOP	Julia Chase	Strafford
Tuesday	Aug 21	6:30 PM	Brookfield (TBD & Tentative)	Hazmit	Heidi Lawton	Carroll
Wednesday	Aug 22	1:00 PM	Bath	Hazmit	Paul Hatch	Grafton
Wednesday	Aug 22	6:30 PM	Shelburne Town Hall	EOP	Heidi Lawton	Coos
Friday	Aug 24	10:00 AM	Waterville Valley (TBD)	Hazmit	Paul Hatch	Grafton
Monday	Aug 27	2:00 PM	Madison Fire Station	Hazmit	Heidi Lawton	Carroll
Wednesday	Aug 29	10:00 AM	Campton (TBD)	Hazmit	Paul Hatch	Grafton
Wednesday	Sep 5	8:00 AM	Kingston Fire Station	Hazmit	Paul Hatch	Rockingham
Tuesday	Sep 5	2:30 PM	New Durham	EOP	Julia Chase	Strafford
Friday	Sep 7	10:00 AM	Waterville Valley (TBD)	Hazmit	Paul Hatch	Grafton
Monday	Sep 10	2:00 PM	Madison Fire Station	Hazmit	Heidi Lawton	Carroll
Wednesday	Sep 12	10:00 AM	Campton (TBD)	Hazmit	Paul Hatch	Grafton
Wednesday	Sep 12	6:30 PM	Shelburne Town Offices	EOP	Heidi Lawton	Coos
Monday	Sep 24	2:30 PM	Woodstock (TBD)	Hazmit	Paul Hatch	Grafton
Monday	Sep 24	7:00 PM	Randolph Town Offices	Hazmit	Heidi Lawton	Coos
Friday	Oct 12	10:00 AM	Waterville Valley (TBD)	Hazmit	Paul Hatch	Grafton
Monday	Oct 15	6:00 PM	Woodstock (TBD)	Hazmit	Paul Hatch	Grafton
Wednesday	Oct 17	10:00 AM	Campton (TBD)	Hazmit	Paul Hatch	Grafton
Wednesday	Oct 24	6:30 PM	Shelburne Town Offices	EOP	Heidi Lawton	Coos
Monday	Nov 19	6:00 PM	Woodstock (TBD)	Hazmit	Paul Hatch	Grafton

Team composition is expected to be lower in smaller communities because of the small population base and the fact that many people "wear more than one hat". It is often very difficult to attract individual citizens to participate in town government and those that do generally hold full-time jobs and work as volunteers in a variety of town positions.

With very small populations, the percent of interested citizens in the rural towns' planning processes is extremely small. Due to the availability of jobs and other economic factors, the Town has a relatively high elderly population and a dwindling amount of young people with interest in politics.

Much effort was made to promote public participation in Brookfield; this effort paid off with several members of the general community attending meetings and adding their thoughts and comments. Comments made by general community members were incorporated into the narrative when and if applicable; however, it should be noted that no general public comments resulted in profound changes and/or an impact in the planning process and the mitigation concepts.

The town of Brookfield understands that natural hazards do not recognize corporate boundaries.

F. Incorporation of existing plans, studies, reports and technical information

The planning process included a complete review of the Brookfield Hazard Mitigation Plan of 2007 for updates, development changes and accomplishments. In addition, as noted in the Bibliography and in Footnotes located throughout the Plan many other documents were used to create this mitigation plan. Some, but not all, of those plans and documents are listed as follows:

The Brookfield Hazard Mitigation Plan of 2007	Compare & Contrast
The Brookfield Master Plan	Future Development
Area Hazard Mitigation Plans (Littleton, Jefferson, and Sandwich)	Formats & Mitigation Ideas
The Brookfield Zoning Ordinance	Building Regulations
The Brookfield Floodplain Management Ordinance	Floodplain Regulations
Census 2010 Data	Population Data
The NH DRA Summary of Inventory of Valuation MS-1 2011 for Brookfield	Structure Evaluation
The Economic & Labor Market Information Bureau Community Response	Population Trends
The American Community Survey (ACS 2007-2011)	Population Trends
NH Forest Forests & Lands (DRED)	District Fires
NH Office of Energy & Planning	Flood Losses
The NH Department of Revenue property tax valuation by property type	Property Information

Other technical manuals, federal and state laws as well as research data were combined with these elements to produce this integrated hazard mitigation plan. Please refer to the Bibliography in Appendix A and the Plan's footnotes.

§201.6(b) requires that there be an open public involvement process in the formation of a plan. This process shall provide an opportunity for the public to comment on the Plan during its formation as well as an opportunity for any neighboring communities, businesses, and others to review any existing plans, studies, reports, and technical information and incorporation of those in the Plan, to assist in the development of a comprehensive approach to reducing losses from natural disasters.

G. Hazard Mitigation Planning Process & Methodology

The planning process consisted of twelve specific steps; some steps were accomplished independently while other areas were interdependent. Many factors affected the ultimate sequence of the planning process: length of meetings, community preparation and attendance, and other community needs; the planning process resulted in significant cross-talk regarding all types of natural and human-caused hazards by team members.

All steps were included but not necessarily in the numerical sequence listed. The list of steps is as follows:

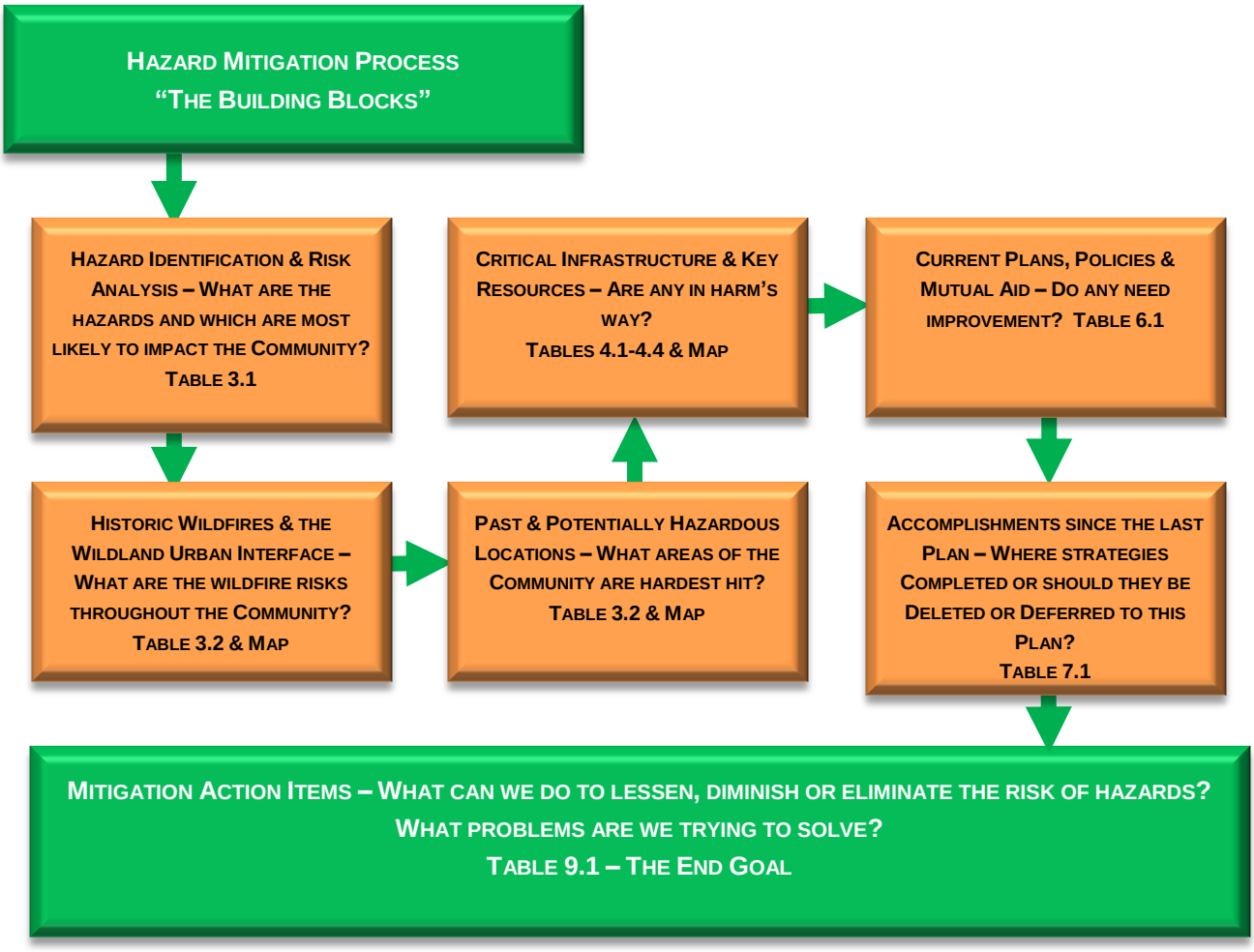
PLANNING STEPS

Step 01: Team Formation and Orientation, Goal Identification
Step 02: Formulate Hazards List, Hazards Description and Threat Matrix
Table 3.1 – Hazards Risk Analysis
Step 03: Profile, List and Map Historic and Potential Hazards, Wildfire, Natural and Human-Caused
Table 3.2 – Historic and Potential Hazards
Step 04: Profile, List and Map Critical Infrastructure and Key Resources
Tables 4.1 to 4.2 – Critical Infrastructure & Key Resources
Step 05: Assess Community's participation in National Flood Insurance Program
Chapter 3, Section C
Step 06: Gather Town History, Past Development Trends, Future Development Trends, Town Statistics
Chapter 2, Sections A, B & C and Table 2.1, Town Statistics
Step 07: List Existing Mitigation Strategies & Brainstorm to Identify Potential Mitigation Strategies
Table 6.1 – Current Plans, Policies and Mutual Aid
Step 08: Examine the mitigation strategies from the prior plan
Table 7.1 – Accomplishments since the last Plan
Step 09: Evaluate and Categorize Potential Mitigation Action Items
Tables 8.1 - Potential Mitigation Strategies & the STAPLEE
Step 10: Prioritize Mitigation Action Items to Determine Action Plan
Table 9.1 – The Mitigation Action Plan
Step 11: Team Review of Plan Contents for Submission to HSEM/FEMA
Step 12: Adopt and Monitor the Plan

Using a "building block" approach, the base, or foundation, for the mitigation plan update was the prior plan. Each table that was completed had its starting point with the last hazard mitigation plan completed by the community.

Ultimately, the "building blocks" lead to the final goal, the development of prioritized mitigation strategies that when put into an action plan, would lessen or diminish the impact of natural hazards on the Town.

H. Hazard Mitigation Building Blocks & Tables



I. Hazard Mitigation Goals

Before identifying new mitigation actions to be implemented, the Team established and adopted the following broad hazard mitigation goals. The goals that are in the 2013 State of New Hampshire Multi-Hazard Mitigation Plan were reviewed as were the goals that were in the 2007 Brookfield Hazard Mitigation Plan. After discussing these goals, the Brookfield Hazard Mitigation Team (2014) agreed to the following goals for this Plan.

Community & Resource Protection

- To improve upon the protection of the general population, the citizens of Brookfield and visitors, from all natural and man-made hazards.
- To reduce Brookfield's potential exposure to risk with respect to natural and man-made hazards.
- To maintain and further develop Brookfield's emergency response system to be able to assist those in need.
- To minimize the damage and public expense which might be caused to public and private buildings and infrastructure due to natural and manmade hazards.

Coordination & Communication

- To improve the Town of Brookfield's:
  - *Emergency preparedness and communication network.*
  - *Disaster response and recovery capability.*
- To identify, introduce and implement improvements to establish and maintain a reliable communication system.
- To improve communication capabilities so that the citizens of Brookfield can be notified in the most efficient manner as possible.
- To ensure that regular communication occurs between various departments and with local, regional, and state officials and have up to date plans in place to address various emergency situations and ensure that those involved are aware of their responsibilities.

Outreach & Education

- To build an awareness of public responsibility for hazard mitigation as well as steps that the town is taking.
- To raise the awareness and acceptance of hazard mitigation opportunities through public education and outreach programs.
- To increase public awareness of the fire risk and the Town's potential liability with respect to wildfires and structure fires.

Damage Prevention & Reduction

- To reduce the potential impact of natural and man-made disasters on the Town of Brookfield's:
  - *Emergency Response Capability*
  - *Critical Infrastructure & Key Resources*
  - *Private property*
  - *Economy*
  - *Natural environment*
  - *Historic treasures and interests, as well as other tangible and intangible characteristics that adds to the quality of life of the citizens and visitors to Brookfield.*
- To identify, introduce and implement cost effective hazard mitigation measures so as to accomplish the Town's Goals and Objectives.
- To reduce the occurrence of road closures and road erosion due to localized flooding within the Town of Brookfield.

J. Narrative Description of the Process

The Plan was developed with substantial local, state and federal coordination; completion of this new hazard mitigation plan required significant planning preparation. All meetings were geared to accommodate brainstorming, open discussion and an increased awareness of potential hazardous conditions in the Town.

Meeting 1, August 21, 2012

After waiting several months for the grant process to be complete, the first full meeting of the Brookfield Hazard Mitigation Team was held. Meeting attendance included Rich Zacher (Select Board), Brad Williamson (EMD), Ken Fifield (Wakefield Police Chief), Ed Nelson (Code Officer), Doug Vanderpool (Fire Warden-Retired), Dick Peckham (Chamber of Commerce & Conservation Committee), Diana Peckham (Tax Collector), Janet Williamson (Citizen), Heidi Lawton (HSEM) and June Garneau (MAPS).

To introduce the Team to the planning process, June reviewed the evolution of Hazard Mitigation Plans, the funding, the 12 Step Process (handout), the collaboration with other agencies and the Goals (handout). June also explained the need to sign-in, track time (handout) and to provide public notice to encourage community involvement. In addition, June provided the Team with a sample email that would be sent to "stakeholders" to invite them to take part in the planning process; the Team reviewed the email and suggested additional stakeholders to be added to the invitation list.

Work then began on *Table 2.1, Town Statistics*. Most of the work on this table was complete with the exception of a few items that June would either determine through GIS or get at a later date. In general the Team felt that the data that had been obtained from the Census Bureau and the Economic and Labor Department Bureau's Community Profile accurately represented the Town's population.

Next on the Agenda were hazard identification and the completion of Table 3.1. After the hazards had been identified, the Team then assessed the risk severity and probability by ranking each hazard on a scale of 1-5 (5 being catastrophic) based on the following:

The Human Impact .....Probability of Death or Injury
The Property Impact .....Physical Losses and Damages
The Business Impact .....Interruption of Service
The Probability.....Likelihood of this occurring within 25 years

HAZARD MITIGATION POTENTIAL TEAM MEMBERS

FEDERAL
US Forest Service
STATE
Department of Transportation
DRED
RC&D (Non-Profit)
LOCAL
Selectmen (Past/Present)
Town Manager/Administrator
Town Planner
Police Chief
Fire Chief
EMD
Emergency Services
Fire Warden
Health Services
Education/School
Recreation Directors
Public Works Director
Road Agent
Water Management
Public Utilities
Waste Management
Dam Operators
Major Employers
LOCAL - SPECIAL INTEREST
Land Owners
Home Owners
Forest Management
Timber Management
Tourism & Sportsman's Groups
Developers & Builders
EXPERTS
GIS Specialists
Watershed Oversight
Environmentalists
Media

The rankings were then calculated to reveal the hazards which pose the greatest risks to the community; twelve natural hazards and four man-made hazards were identified. After analyzing these hazards using Table 3.1, local flooding caused by heavy rain, heavy snow and ice storms were designated as the primary concerns.

Having completed Table 3.1, the Team went on to provide descriptions of each hazard and how they could, or do, impact the Town of Brookfield specifically. In order to gain more knowledge of the impact of these hazards, June asked the Team to describe each hazard as it relates to Brookfield. For example, some of the questions asked were:

- How often do these hazards occur?
- Do the hazards damage either the roads or structures?
- Have the hazards resulted in loss of life?
- Are the elderly and special needs populations particularly at risk?
- What has been done in the past to cope with the hazards?
- Was outside help requested?
- Are the hazards further affected by an extended power failure?

In addition to bringing more awareness to the hazards, these questions provided information to further analyze the impact of the hazards on the community. June noted that these descriptions would be used in Chapter 5.

Before adjourning the meeting, June thanked the Team for their work and assigned "homework" to the Team members. June also asked the Team to think about other hazardous events that have taken place since the last Plan and to begin thinking about Critical Infrastructure and Key Resources (CIKR).

The next meeting was set for October 2, 2012.

Meeting 2, October 30, 2012
(changed from October 2, 2012)

Meeting attendance included Rich Zacher, Brad Williamson, Doug Vanderpool, Dick Peckham, Diana Peckham, Janet Williamson, Bill Nelson (Select Board), Thomas Hill (Citizen) and June Garneau.

June reviewed the progress that was made at the last meeting and asked the Team to look at the Hazard Mitigation Goals again. After looking at the 2007 Plan and listening to the Team's discussions, June added several additional goals to the list and reviewed the changes with the Team. After the discussing the Goals, the Team reviewed the work done at the previous meeting on Table 2.1; a handout was provided.

The Team then reviewed Table 3.1, Hazard Identification & Analysis, to see if the ranking of the hazards that was done at the last meeting still appeared to be correct; the Team concurred that the ranking of the hazards represented the risk to Brookfield fairly accurately.

Next on the agenda were Tables 4.1–4.4, Critical Infrastructure and Key Resources (CIKR). The Emergency Response Facilities, the Non-Emergency Response Facilities, the Facilities & Populations to Protect, and the Potential Resources from the 2007 Plan were examined and a few minor adjustments were made for this Plan. In addition, the evacuation routes, helicopter landing zones and bridges on the evacuation routes were identified.

Finally, the Team worked on Table 7.1, Accomplishments since the Last Plan. Having pre-populated the table with the implementation strategies from the 2007 Plan, June lead the Team through each strategy to determine which of these were "Completed", should be "Deleted" or should be "Deferred" to this Plan as a new mitigation strategy. Many of the strategies from the 2007 Plan had been completed by the Town; several were deleted as they were felt to be no longer useful and/or emergency preparedness.

With time running out, the meeting was adjourned. The next meeting was scheduled for Wednesday, January 29, 2013.

Meeting 3, January 29, 2013

Meeting attendance included Brad Williamson, Doug Vanderpool, Dick Peckham, Diana Peckham, Janet Williamson, Bill Nelson, Heidi Lawton and June Garneau.

Before beginning new work, June brought the Team through Table 7.1 to insure that none of the Team's objectives from the last meeting were lost in the translation from June's notes to the table. With a few minor corrections, Table 7.1 was complete.

The next item on the Agenda was to look back at the Critical Infrastructure and Key Resources that had been identified in Tables 4.1-4.4, also during the last meeting. This step enabled the Team to think about each CIKR as it relates to hazards and to assign a risk level of 1-3 (3=high) depending on the likelihood of an event at that location. At this time, the Team also assisted June with the CIKR mapping.

Table 6.1, Current Plans, Policies & Mutual Aid, was next on agenda. Looking closely at the current mechanisms in place, the Team was able to determine whether the existing policies were effective or in "need of improvement". It was explained to the Team that those items that needed improvement would become "new strategies" for this Plan and be discussed again when we got to our final table, Table 9.1, The Mitigation Action Plan.

The Team then looked at Table 3.2, Historic Hazard Identification, a list of past and potentially hazardous locations and/or events. First, they looked at the hazards that were listed in the last Plan and determined which they would like to see kept in this Plan. It was noted that no wildfires had been listed in the prior plan but that in fact two had taken place in the past, one in 1987 and another in 1992 (See Table 3.2). No significant wildfires had taken place since 1992.

The Team also examined the record of Presidential Disaster Proclamations that have taken place in recent years, a record that shows substantial increase over past decades. For each Presidential Disaster Proclamation, the Team provided information on the affect the hazard event had in Brookfield. At this point, the Team assisted June in mapping the hazards that were identified in Table 3.2 for inclusion in Map 2, Past & Potential Areas of Concern.

While discussing past and potentially hazardous areas, June took the opportunity to explain the Wildland Urban Interface (WUI) and factors that contribute to a high risk for wildfire. June explained that slope, type of fuel (i.e., softwood or hardwood) and exposure (southwest being the most susceptible) were important criteria to consider when looking at wildfire risk in the Community. Other factors were also discussed such as water availability, defensible space, roofing and siding materials and the presence of campgrounds.

Next, June discussed the Wildland Urban Interface (WUI), and projected a map of the Wildland Urban Interface over the Brookfield base layer and topography. The WUI was determined using GIS analysis to create a 300 foot buffer from the center line of all Class I-V roads and then an additional 1320 foot buffer from the first buffer (see Map 1). This area is determined to be the area in which the urban environment interfaces with the wildland environment and the area that is most prone to the risk of wildfire/structure fires. Using GIS analysis and a 1-foot aerial imagery (2011), June explained how she would determine the number of structures in the defined WUI. It should be noted that although the "WUI" was defined for the purpose of this Plan, many rangers and firefighters believe that towns with substantial wooded land, such as Brookfield, are entirely within the Wildland Urban Interface.

Mitigation strategies were discussed to protect these structures and to educate the Town's citizens about the risk in the high risk and WUI areas. It was determined that the Town would acquire Firewise materials to have available at the Town Offices and to complete a Rural Fire Water Resource Plan with NCRC&D.

Once this was complete, June reviewed the steps for the next meeting which was set for February 25, 2013.

Meeting 4, February 25, 2013

Meeting attendance included Brad Williamson, Doug Vanderpool, Dick Peckham, Diana Peckham, Janet Williamson, Bill Nelson, James Freeman (Citizen) and June Garneau.

The meeting began with an overall recap of the work that had already been done. The recap included a brief look at each of the following completed tables:

- Table 2.1 – Town Statistics
- Table 3.1 – Hazard Threat Analysis
- Table 3.2 – Historic Hazard Identification
- Tables 4.1-4.4 – Critical Infrastructure & Key Resources
- Table 6.1 – Current Plans, Policies and Mutual Aid
- Table 7.1 – Accomplishments since the Last Plan

This review helped the Team to understand how each of these tables served as a building block for the final two tables, Table 8.1, Potential Mitigation Strategies & the STAPLEE and Table 9.1, The Mitigation Action Plan.

Before beginning new work, in order to be sure that June's notes accurately stated the Teams' concepts for Table 6.1, June reviewed the work that was done at the last meeting. Several minor changes were made during the review of Table 6.1 with the end resulting in several of the Town's current plans, policies and mutual aid programs "needing improvement" and being "deferred" to this Plan.

The Team then took another close look back at Table 3.2, Past & Potential Hazardous Areas. While much of the work had been done on this table at the last meeting, another look was in order as well as some additional mapping of the hazardous areas in Town. Using GIS projection, June and the Team were able to map the areas of Brookfield that were known to experience road flooding on a regular basis.

Before the meeting adjourned, June discussed current development trends with the Team and talked about mechanisms that are in place that prohibit development in hazard-prone areas. Fortunately, Brookfield is a relatively safe community with a very small flood zone, a low incidence of wildfires and the factors that create wildfires, no fixed hazardous materials facilities and no areas of Town that experience riverine flooding. Road washouts and the unpredictable occurrences of severe winter weather are the only significant hazards in the Town.

With time running out, June provided handouts to the Team that listed possible mitigation strategies by hazard. June asked the Team to review the handouts and think about any strategies they may want to include in Table 9.1, The Mitigation Action Plan. The next meeting was set for March 18, 2013.

Meeting 5, March 18, 2013

Meeting attendance included Rich Zacher, Brad Williamson, Thomas Hill, Doug Vanderpool, Dick Peckham, Diana Peckham, Janet Williamson, James Freeman, Brian Robischeau (Select Board), Terry Jones (Citizen), Alice Jean Jones (Citizen), Pat Tarpey (NCRC&D), Heidi Lawton and June Garneau.

To begin the meeting, June projected the final pre-populated table for the Town's review. This table, a combination of Table 8.1 and Table 9.1, enabled the Team to examine each strategy from Tables 6.1 and 7.1 that they had previously determined to be either in need of improvement or deferred for further action.

Using Table 9.1, the Team was now able to see and understand the "Action Items" for this hazard mitigation plan. Looking carefully at each "Action Item", the Team was able to assign responsibility, the timeframe for completion, the type of funding that would be required and the estimated cost of the action. After much discussion and a careful review, ultimately, the Team settled on 14 "Mitigation Action Items" they felt were achievable and that would help to diminish the impact of natural hazards in the future.

Next on the Agenda was the STAPLEE process, a systematic method used to gauge the quality of each of the Action Items. The Social (S), Technical (T), Administrative (A), Political (P), Legal (L), Economic (E) and Environmental (E) impact for each action item was discussed; this analysis then became Table 8.1. In the end, the range of scores for the strategies was from 20-21, with 21 being the highest score. The average of all scores was 20.8.

Next, June assisted the Team with the ranking of the strategies, roughly in order of timeframe, the Town's authority to get the strategy accomplished and the STAPLEE score. The "action items" were ranked from 0-3, with "0" representing a continuing action, "1" an action that the Team would try to accomplish within 12 months, "2" an action that the Team would try to accomplish in 12-24 months and "3" an action that the Team would try to accomplish in 24 months to 5 years.

Then within each rank, the Team assigned a priority; for example, if seven action items were ranked "1" then the priority rank was 1-7 (see explanation in Chapter 9). In this fashion, the Team was able to determine which action items were the most important within their rankings and in which order the action items would be accomplished.

With Tables 8.1 and 9.1 completed, the Team's work was complete, with the exception of the final review. June agreed to put the final plan together and email a copy for the Town's review. June explained the process from this point forward and thanked the Team for their hard work. No additional meeting was scheduled.

K. Meeting Agendas

Meeting 1 – August 21, 2012

1) Introduction
- a) Evolution of Multi-Hazard Plans & Community Wildfire Protection Plans
- b) Reason for Hazard Mitigation and Update
- c) Community involvement to educate emergency responders and citizens of the town about the dangers of hazards
- d) Devise a plan that: lessens, diminishes or completely eliminates the threat of Hazards to the Town of Brookfield

2) The Process
- a) Funding
- b) Review of 11 Step Process & The Team (handout)
- c) Collaboration with other Agencies (CWPP, NCRC &D)

3) Meetings
- a) Community Involvement - Public Notice, Press Release
- b) Stakeholders (handout)
- c) Signing In, Tracking Time, Agendas, Narrative (handout)

4) Today's Topics
- a) Town Information (handout)
- b) Hazard Identification & Analysis (handout)
- c) Hazard Descriptions (time allowing)

5) Next Meeting
- a) Homework – Critical Infrastructure & Key Resources
- b) Digital Photos – contributions welcome

6) Schedule Next 3 Meetings
- **a)** _____
- **b)** _____

Meeting 2 – October 30, 2012

1) Last Meeting
- a) Hazard Mitigation "housekeeping"
- b) Town Information, Table 2.1
- c) Hazard Identification & Analysis, Table 3.1
- d) Hazard Descriptions

2) Today's Topics
- a) Review Tables 3.1, 2.1 (new handouts)
- b) Press Release
- c) Critical Infrastructure & Key Resources (Tables. 4.1-4) – (projection)
- d) Table 7.1, Accomplishments since last Plan (projection)
- **e)** Table 6.1, Existing Plans, Policies & Mutual Aid (time allowing)

3) Next Meeting
- a) Past & Potential Hazard Identification, Table 3.2

4) Next Meeting (s)
- a) Tuesday, October 30 @ 6:00 PM
- **b)** _____
- **c)** _____

Meeting 3 – January 29, 2013

1) Last Meeting
- a) Reviewed Tables 3.1, 2.1
- b) Discussed Press Release
- c) Completed Critical Infrastructure & Key Resources (Tables. 4.1-4)
- d) Completed Table 7.1, Accomplishments since last Plan

2) Today's Topics
- a) Review from last meeting
- b) Review Critical Infrastructure & Key Resources (Tables. 4.1-4) (handout)
- c) Check Mapping
- d) Review Table 7.1, Accomplishments since last Plan (handout)

3) Today's Work
- a) Table 6.1, Current Plans, Policies & Mutual Aid (projection)
- b) Table 3.2, Past & Potential Hazards (projection)

4) Next Meeting
- a) Table 9.1, Mitigation Strategies
- b) STAPLEE Process (time allowing)

5) Next Meeting (s)
- a) February 25, 2013 @ 6:00 PM
- b) March 18, 2013 @ 6:00 PM

Meeting 4 – February 25, 2013

1) Last Meeting
- **a)** Reviewed Critical Infrastructure & Key Resources (Tables. 4.1-4)
- **b)** Reviewed Table 7.1, Accomplishments since last Plan
- **c)** Worked on Table 6.1, Current Plans, Policies & Mutual Aid
- **d)** Worked on Table 3.1, Past & Potential Hazards

2) Today's Topics
- a) Review Table 6.1, Current Plans, Policies & Mutual Aid (projection)
- b) Discuss development trends
- c) Review Table 3.2, Past & Potential Hazards (projection)
- d) Map the hazardous-prone areas
- e) Table 9.1, Mitigation Strategies New & Deferred
- f) STAPLEE Process

3) Next Meeting
- a) Ranking
- b) Prioritizing (time allowing)

4) Next Meeting
- a) March 18, 2013 @ 6:00 PM

Meeting 5 – March 18, 2013

1) Last Meeting
- a) Reviewed Table 6.1, Current Plans, Policies & Mutual Aid (projection)
- b) Discuss development trends
- c) Reviewed Table 3.2, Past & Potential Hazards (projection)
- d) Mapped the hazardous-prone areas
- e) Started Table 9.1

2) Today's Topics
- a) Review Plan
- b) Table 9.1, Mitigation Strategies New & Deferred
- c) Look through brochure
- d) STAPLEE Process
- e) Ranking
- f) Prioritizing

3) Next Meeting (to be determined)

Documentation for the Planning process, including public involvement, is required to meet DMA 2000 (44CFR§201. (c) (1) and §201.6 (c) (1)). The Plan must include a description of the Planning process used to develop the Plan, including how it was prepared, who was involved in the process, and how other agencies participated. A description of the Planning process should include how the Planning team or committee was formed, how input was sought from individuals or other agencies who did not participate on a regular basis, what the goals and objectives of the Planning process were, and how the Plan was prepared. The description can be in the Plan itself or contained in the cover memo or an appendix.

Chapter 2: Community Profile

A. Introduction

The town of Brookfield is located on the southern edge of Carroll County. It is bordered by New Durham and Middleton to the south, Wolfeboro to the west, Ossipee to the north and Wakefield to the east. All of Kingswood Lake is contained within Brookfield's borders.

Although Brookfield contains small mountains such as Copple Crown and Moose Mountain, no part of the White Mountain National Forest extends into the Community. The highest point in town, Copple Crown Mountain, rises 1,868 feet above sea level. Major waterways running through Brookfield include Hanson Brook, Warren Brook, Townsend Brook, Churchill Brook and Pike Brook.

The majority of the Town is forested with a combination of both hard and softwood forests. Relatively small wet and swampy areas can be found along Pike and Warren Brooks, but for the most part, the Town consists of gently rolling and dry terrain. The recreation area known as Moose Mountain Recreation is at the site of a former small ski area and is now used for snowmobiling, tubing, disc golf and other recreational activities.

A three-member Board of Selectmen governs the town of Brookfield. The Town has a small volunteer Fire Department but utilizes the emergency services of the neighboring town of Wakefield for fire equipment and law enforcement.

The major roads in Brookfield include NH Route 109 (aka Wentworth Road), Governor's Road and Lyford Road. The Town's Road Agent maintains roughly 100 culverts and 22 miles of town roads, 40% of which are gravel.

Incorporated: 1794

Origin: Settled in 1726 by Scotch-Irish immigrants while still under Massachusetts rule, this territory was part of a planned grant named Coleraine, after the Irish town of the same name. The grant was never authorized, and the settlement became part of Middleton. In 1785 residents of the northern portion of Middleton and part of Wolfeboro petitioned for a separately incorporated town. The petition was at first denied, but then was granted in 1794 as Brookfield, probably after a town of the same name in Massachusetts. The area was popular with farmers because of its fertile ground.

Villages and Place Names: unknown

Population, Year of the First Census Taken: 504 residents in 1800

Population Trends: Population change for Brookfield totaled 556 over 52 years, from 145 in 1960 to 701 in 2012. The largest decennial percent change was between 1970 and 1980, when the population increased by 94 percent, a numeric increase of 187. The 2012 Census estimate for Brookfield was 701 residents, which ranked 209th among New Hampshire's incorporated cities and towns.

Population Density and Land Area, 2010 (US Census Bureau): 31.2 persons per square mile of land area. Brookfield contains 22.8 square miles of land area and 0.4 square miles of inland water area.

Source: NH Community Profiles; 2013; http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/brookfield.htm

B. Brookfield's Historic Past

A Taken from the Town's website
"A Brief History of Brookfield, NH"

Craig F. Evans, Archivist
Carolyn Chase, Town Historian

"Brookfield began as part of Middleton, NH, which was granted by the Masonian proprietors on April 27, 1749, to Ebenezer Varney and others. The Charter was renewed on March 21, 1770, and Middleton was incorporated on March 4th, 1778. The inhabitants of the north or second division of Middleton attempted to incorporate as a separate township in 1785 without success. Finally, by act of the legislature, the town of Brookfield was incorporated on 30 December, 1794. In 1840, Brookfield became part of Carroll County, and Middleton stayed part of Strafford County. The county and town boundary lines, following the same co-ordinates, zig-zag through the Moose Mountains, separating the two towns.

The settlement of the area in the late 1700s was due in a great part to the building of the Governor John Wentworth Road from Portsmouth to his summer mansion on Lake Wentworth in Wolfeboro. Snaking through Rochester, Milton, Middleton and Wakefield into Brookfield, the route provided easy access to this undeveloped area by the mid-1760s. They came from Lee and Barrington, Newmarket and Portsmouth, Rochester and some of the border towns in Maine. They came to make a new life for themselves and their families. Without the benefit of carriages or wagons, families with names like Chamberlain, Wiggin, Lyford, Hutchins, Burley, Hanson and Robinson made their way to what was then wilderness, and established settlements initially along the Governor's Road. By the 1780s, settlements had spread along the northern side of the Moose Mountain range and up Tumbledown Dick, a mountain named for Oliver Cromwell's ill-fated son. The road past Tumbledown Dick was the main road to Wolfeboro and Woodman Hill Road connected Brookfield to New Durham on the west. The mountain area, which offers several dependable sources of water, and back then, the advantage of being less marshy and choked with vegetation, was initially most conducive to building. Similarly, the high ground in the north of Brookfield – Stoneham Road and Tibbetts Hill - also became fast growing communities.

The heavily forested landmass yielded marginal land for grazing, with steep and numerous hills, and the soil plagued with boulders. The many miles of stonewalls, bordering the town's roads and running through forestland, remind us of a time when the land was laid open as fields and pastures.

For most of the nineteenth century, the complexion of the town reflected most other agriculturally based economies throughout northern New England. Small farms provided the sustenance for the resident families, with additional crops to be bartered with the town's craftsmen for the various needs of the residents. Early Brookfield was home to grist, bobbin, cider and shingle mills, several saw-mills, tanneries, cobbler and shoemaker shops, blacksmiths, inns and stores.

Gone are Brookfield's Post Office, taverns and eight one-room schoolhouses. The historic Town House, built in the 1820s, is listed in the National Register of Public Buildings, and continues to be used for the annual Town Meeting and other community functions. In 2000, the town built a small town office building where the proceedings of the daily governmental process take place. Police, Fire and Sanitation services are purchased annually from the adjoining town of Wakefield. Schooling is provided through the Governor Wentworth Regional School system, with

Brookfield students attending all grades in Wolfeboro. Shopping needs are met in Wolfeboro, Wakefield, and Rochester to the south.

In the first forty years of Brookfield's existence as a community (1780-1820), the number of residents peaked at 690 residents in the 1820 census. The population then steadily dropped to an all-time low in the mid-20th century. In the last forty years, there has been another boom, and with the end of the first decade of the 21st century, it appears that the population will be once again number close to 700 residents.

Brookfield has long been a residential, rural community, resistant to the commercial development that has affected so many New Hampshire towns. It will long continue to be an agreeable hometown for a modest number of people of modest means, moderate politics, and middling disposition."[4]

C. Brookfield's Current & Future Development Trends

Like other communities in New Hampshire and in our nation, due to the economic strains of the past few years, development in Brookfield remains slow. The last subdivision was approved approximately eight years ago, and although a commercial resort campground had petitioned for approval as warrant article at the 2013 Town meeting, the warrant article was defeated by the voters. As shown by the City-Data chart to the right, new home construction peaked in the early to mid-2000s, and has remained very low since 2008.[5]

Single-family new house construction building permits:

- 1997: 3 buildings, average cost: $93,300
- 1998: 4 buildings, average cost: $87,500
- 1999: 10 buildings, average cost: $128,400
- 2000: 6 buildings, average cost: $115,300
- 2001: 8 buildings, average cost: $96,500
- 2002: 4 buildings, average cost: $151,300
- 2003: 5 buildings, average cost: $151,300
- 2004: 6 buildings, average cost: $151,300
- 2005: 5 buildings, average cost: $151,300
- 2006: 5 buildings, average cost: $151,300
- 2007: 4 buildings, average cost: $181,200
- 2008: 0 buildings
- 2009: 1 building, cost: $223,400
- 2010: 1 building, cost: $149,500
- 2011: 1 building, cost: $149,500
- 2012: 0 buildings

Brookfield is a "bedroom" community for larger towns within driving distance such as Portsmouth, Nashua, Boston, Rochester and other towns in NH's seacoast area. A few small farms still exist which notably raise goats and pigs and many home-based "cottage" industries flourish in the Community. Zoning regulations require a minimum lot size of two acres and restrict building to agricultural and residential building although there is a small "recreation" zone at Moose Mountain.

The Townspeople of Brookfield have expressed a desire to maintain the rural character and the agricultural integrity of the community. The Brookfield Master Plan, originally adopted in 1990 and revised in May 2006, states the vision for Brookfield to be "A small, historic, rural New Hampshire farming community committed to improving the quality of life for present and future generations."[6] Brookfield has no churches, gas stations, schools, restaurants (except seasonally at Moose Mountain Recreation Area), no fire station, no police station and no true "village center". The overall population density is low and homes are "spread out" in the Community. Moose Mountain Recreation is a privately owned recreation area that attracts winter enthusiasts for tubing and snowmobiling and summer enthusiasts for hiking and disc golf.

[4] http://www.brookfieldnh.org/Pages/BrookfieldNH_About/hist
[5] http://www.city-data.com/city/Brookfield-New-Hampshire.html
[6] Town of Brookfield, New Hampshire, Master Plan Toward the Year 2020, Adopted Revisions as of May 8, 2006

Brookfield's planning regulations are put in place not only to protect the rural nature of the Community, but also to protect its citizens from future hazardous events, such as flooding. Building permits are required and subdivision and floodplain regulations are part of the Town's Zoning Ordinance. In addition, the Town has a Master Plan which serves as the guiding document for development, will be updating their Emergency Operations Plan in the near future and has active and responsible conservation and heritage committees that help maintain smart growth in the Community. Reviews of all planning documents are done on an annual basis or more often if the need arises. Finally, the culvert maintenance program that is in place to manage over 100 culverts in Town continues to work well to limit the incidence of flooding. The mechanisms that have been put in place by the Town's elected and appointed officials are there to protect the citizens of Brookfield and the natural environment from further development in hazardous areas.

The Town recognizes the importance of growth, but also understands the impact that hazards can have on new facilities and homes if built within hazardous areas of the Community. Although the likelihood of substantial development in Brookfield is low, Town officials will continue to monitor any new growth and development, including new critical facilities, with regards to potentially hazardous events, particularly in the flood-prone areas of the Town.

Planning Board

During the past twelve months, the Planning Board has endeavored to fulfill its duty in maintaining the character of the town and to provide a public forum to address concerns. In an effort to meet its responsibilities the Planning Board has dedicated time to clarifying ordinances and addressing public hearings.

In an effort to clarify the language of town ordinances, requirements have been condensed for Site Plan Review and Subdivisions. Language concerning home-based businesses and farm setbacks is being introduced for voter approval at the Town Meeting. The Planning Board's guiding principle has been and always will be Brookfield's Master Plan.

There have been six public hearings this year: FEMA's proposal to amend floodplain ordinances; farm stand setbacks; and a citizen's proposal for a warrant article are just a few of the requests on which the Planning Board has deliberated. We, the members of the Planning Board, are grateful for the public response and participation that the hearings have provided.

For the foreseeable future the Planning Board will continue to conduct Site Plan Reviews, hearings for subdivisions, provide a Capital Improvement Program, and oversee the permitting process for the recreational area as needed.

Members of the public are always welcome to attend Planning Board meetings.

Respectfully submitted,
Geary Ciccarone
Chair

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Table 2.1 Statistics of Interest to Hazard Mitigation Planning

Table 2.1 - Town Statistics				
Population (US Census)	**2010**	**2000**	**1990**	**1980**
Brookfield	**712**	**609**	**520**	**385**
Carroll County	**47,818**	**43,918**	**35,526**	**27,929**
Growth Rate, 2000 to 2010	16.91%			
Elderly Population (% over 65-2010 Census)	18.7%			
Median Age (2010 Census)	48.2			
Median Household Income (ACS 2007-2011)	$66,875			
Change in Population-Summer Weekends (%)	12%			
Change in Population-Winter Weekends (%)	0%			
Regional Coordination				
County	Carroll			
Regional Planning Commission	Strafford Regional Planning Commission			
Tourism Region	Lakes			
Municipal Services & Government				
Town Manager or Administrator	No			
Select Board	Yes (elected)			
Planning Board	Yes (elected)			
School Board	School Board Member to Governor Wentworth School District; SAU 49			
Zoning Board of Adjustment	Yes (appointed)			
Conservation Committee	Yes (appointed)			
Master Plan	2006			
Emergency Operation Plan (EOP)	2002			
Zoning Ordinances	1961; 2010			
Subdivision Regulations	Yes; part of Zoning Regulations			
Capital Improvement Plan	Yes			
Building Permits Required	Yes			
Flood Ordinance	Yes; part of Zoning Regulations			
Percent of Local Assessed Valuation by Property Type (2012-NH Department of Revenue)				
Residential Buildings	96.6%			
Commercial Land & Buildings	.9%			
Other (including Utilities)	2.2%			
Emergency Services				
Emergency Warning System(s)	No			
Police Department	Wakefield PD			
Police Mutual Aid	All border towns			

Table 2.1 - Town Statistics	
Fire Department	Wakefield FD
Fire Mutual Aid	Ossipee Valley Mutual Aid
Fire Stations	No - Wakefield
Fire Warden	Yes
Emergency Medical Services	Wakefield FD
Established EMD	Yes
Nearest Hospital(s)	Huggins Hospital, Wolfeboro, 11 miles, 25 beds
Utilities	
Road Agent	Yes
Public Works Mutual Aid	No
Water Works Director	No
Water Supply	Private Wells
Waste Water Treatment Plant	No
Electric Supplier	PSNH, NH Electric Coop, Wolfeboro Electric
Natural Gas Supplier	None
Cellular Telephone Access	Yes
Public Access Television Station	Yes (Wakefield PEG Channel #3)
High Speed Internet	Yes (limited)
Telephone Company	Fairpoint
Transportation	
Primary Evacuation Routes	NH Route109; Governor's Road; Stoneham Road
Nearest Interstate	Spaulding Turnpike, Exit 18; I-95, Exit 5
Nearest Airport	Skyhaven Airport, Rochester, 4,001' asphalt; lights & nav aids
Nearest Commercial Airport(s)	Portsmouth International Airport (Pease), Portsmouth, 45 Miles
	Manchester-Boston Regional Airport, 63 miles
Public Transportation	No
Railroad	No
Housing Statistics (2010)*	
Total Housing Units	338
Occupied Units: 292	*Owner Occupied Units(269); Renter Occupied (23)*
Total Vacant Units: 46	*For Seasonal, Recreational or Occasional Use (33)*
	For Rent (1); Rented, Not Occupied (1); For Sale Only (2); Sold, Not Occupied (2); All Other Vacant (7)
Other	
School Administrative Unit	SAU 49 - Governor Wentworth School District
Elementary School	Carpenter Elementary School, Wolfeboro
	Crescent Lake Middle School, Wolfeboro

Table 2.1 - Town Statistics			
High School	Kingswood Region High School, Wolfeboro		
Town Web Site	www.brookfieldNH.org		
Emergency Page on Website	Yes		
Local Newspapers	Granite State News; Carroll County Independent; Foster's Daily Democrat		
Assessed structure value (2011)	$65,530,600		
Most recent Flood Maps	March 19, 2013		
National Flood Insurance Program	5/17/1977		
	Conserved Land	Square Miles	Percent in Town
	*Total Square Miles-Town Total	23.25	100.00%
	*Approximate Conserved Land %	3.88	16.67%
	*Approximate Municipal Conserved Land %	0.24	1.02%
	*Approximate Federal Conserved Land %	0.00	0.00%
	*Approximate State Conserved Land %	1.68	7.20%
	*Approximate Private Conserved Land %	1.96	8.44%
Fire Statistics			
Wildfire Fire Calls (12)	None		
***Carroll County Fire Statistics (12)*	25 Fires; 5.5 Acres Burned		
***State Forest Fires FY (12)*	318 Fires; 206 Acres Burned		
**Information derived using GIS Analysis*			
***Information derived from the NH Division of Forests and Lands, Fire Warden & State Forest Ranger Report, November 2012; http://www.nhdfl.org/fire-control-and-law-enforcement/fire-statistics.aspx and from Town of Brookfield*			
Information found in Table 2.1, unless otherwise noted, was derived from the Economic & Labor Market Information Bureau, NH Employment Security, 2013. Community Response Received 7/9/13; NH Community Profiles; 2013; http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/brookfield.html and from the Town of Brookfield.			

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Chapter 3: Hazard Identification

A. Description of the Hazards

The first step in hazard mitigation is to identify hazards; the Team determined that fifteen natural hazards have potential to affect the community. Based on estimates of the potential impact, these hazards were broken down to the following categories. The categories below and in Table 3.2 were designated based on a simple analysis of the data in Column F in Table 3.1 and relative "grouping" of the hazards according to the "Relative Threat". No other criteria was used except to see what data "breaks" made sense

Natural hazards ***most*** likely to affect Brookfield:

1) Road Flooding/Erosion (Heavy Rain & Snow Melt)
2) Severe Winter Weather (Snow Storms)
3) Severe Winter Weather (Ice Storms)
4) Severe Thunderstorms & Lightning

Natural hazards which ***may*** affect Brookfield:

5) Wildfire/Structure Fire
6) Hurricane
7) Tornado or Downburst

Natural hazards which are ***less likely*** to affect Brookfield are:

8) Hailstorm
9) Extreme Temperatures
10) Drought
11) Flood (Dam Failure)
12) Earthquake

Table 3.1 provides estimates of the level of impact each listed hazard could have on humans, property and business and averages them to establish an index of "severity". The estimate of "probability" for each hazard is multiplied by its severity to establish an overall "relative threat" factor. This matrix also shows the frequency of future occurrence (based on a 25-year window).

Based on this matrix, the most significant natural disaster threat to Brookfield is Flooding due to heavy rain. The second most likely threat is Severe Snow Storms and the third is Ice Storms. However, it should be noted that four human-caused hazards were discussed by the Team including Extended Power Failure, Hazardous Material-Transport, Terrorism and Epidemic & Pandemic.

In light of recent events (Hurricane Irene), it should be noted that hurricanes can cause significant damage in Brookfield as a result of both wind strength and flash flooding creating road closures and damage. The Team however, indicated hurricanes as "less likely to affect Brookfield" because the likelihood of high winds and heavy rains extending to central New Hampshire in most hurricane events is rare, as is the likelihood of high category hurricanes occurring in New England in general.

Table 3.1: Hazard Threat Analysis

Hazards that are likely to affect Brookfield						
Hazards that may affect Brookfield						
Hazards that are less likely to affect Brookfield						
Table 3.1 - Hazard Threat Analysis						
Column	A	B	C	D	E	F
Scoring 1 = Not Likely 2 = Low 3 = Moderate 4 = High 5 = Catastrophic	Probability of death or injury	Physical losses and damages	Interruption of service	Likelihood of this occurring within 25 years	Average of Human, Property & Business Impact	Relative Threat
Natural Hazard: A natural hazard is a source of harm or difficulty created by a meteorological, environmental, or geological event.					Columns A+B+C/3	Columns D x E
	Human Impact	Property Impact	Business Impact	Probability	Severity	Risk Severity x Probability
Natural Hazards						
1) Road Flooding/Erosion (Heavy Rain & Snow Melt)	1.00	3.00	4.00	4.00	5.33	21.33
2) Severe Winter Weather (Snow Storms)	2.00	1.00	3.00	4.00	4.00	16.00
3) Severe Winter Weather (Ice Storms)	2.00	1.00	3.00	4.00	4.00	16.00
4) Severe Thunderstorms & Lightning	1.00	2.00	1.00	4.00	3.33	13.33
5) Wildfire/Structure Fire	1.00	4.00	2.00	2.00	5.67	11.33
6) Hurricane	1.00	2.00	2.00	3.00	3.67	11.00
7) Tornado or Downburst	1.00	3.00	3.00	2.00	5.00	10.00
8) Hailstorm	1.00	2.00	1.00	2.00	3.33	6.67
9) Extreme Temperatures	1.00	1.00	1.00	2.00	2.33	4.67
10) Drought	1.00	1.00	3.00	1.50	3.00	4.50
11) Flood (Dam Failure)	1.00	1.00	1.00	1.00	2.33	2.33
12) Earthquake	1.00	1.00	1.00	1.00	2.33	2.33
Man-made Hazards						
1) Extended Power Failure (5-7 days)	1.00	2.00	1.00	4.00	3.33	13.33
2) Hazard Material - Transport	2.00	2.00	3.00	2.00	5.00	10.00
3) Terrorism	3.00	3.00	3.00	1.00	7.00	7.00
4) Epidemic & Pandemic	3.00	1.00	3.00	1.00	5.00	5.00

B. Risk Assessment

The next step in hazard mitigation planning was to identify the location of past hazard events and, if possible, what facilities or areas were impacted. The Team used Table 3.1, Hazard Threat Analysis, to identify potential threats and prioritize their threat potential. The Team then used a base map that included the 100-year floodplain, political boundaries, water bodies, the road network and aerial photos to locate all of the past hazard events on the base map. This step in the planning process serves as a stepping stone for predicting where future hazards could potentially occur. The Team identified past events in Brookfield, Grafton County and the State and listed them in Table 3.2, Historic Hazard Identification.

To assess the fire base risk, the Team discussed the factors that determine the fire risk in the community. Some of the factors discussed included:

- The degree of slope (greater the slope the more difficult to control and possibly faster burning)
- The type of fuel (softwood versus hardwood, in Brookfield, forests are "mixed")
- The aspect or facing direction (south and southwest being more susceptible; more arid terrain)
- The amount of defensible space around structures (30-40 feet recommended)
- The accessibility to water resources (Rural Fire Water Resource Plan combined with this Plan)
- The accessibility of the emergency responders (Fire Department in neighboring town of Wakefield)
- The age and/or siding of structures (vinyl siding versus wood, stone, brick)
- The age and/or type of roofing materials

These criteria were used to better understand the fire risk for Brookfield and to identify areas of the Town which would be more susceptible to wildfire/structure fires.

C. Brookfield National Flood Insurance Program (NFIP) Status

Brookfield has been a member of the National Flood Insurance Program since; May 17, 1977. Brookfield has a very small 100-year floodplain (approximately 71 acres) located near the Wakefield town line. Flood zones and/or riverine flooding have not been identified as major hazard concerns in Brookfield. According to the latest D-Firm dated March 19, 2013, there are no 50-year flood zones within Brookfield.

Severe Repetitive Loss (SRL) Properties--NFIP-insured buildings that, on the basis of paid flood losses since 1978, meet either of the loss criteria described on page SRL 1. SRL properties with policy effective dates of January 1, 2007, and later will be afforded coverage (new business or renewal) only through the NFIP Servicing Agent's Special Direct Facility so that they can be considered for possible mitigation activities.*Source: http://www.fema.gov/national-flood-insurance-program/definitions#R*

GIS analysis revealed that there are two structures located in the FEMA designated 100-year flood plain and no Critical Infrastructure or Key Resources. There have been no repetitive loss claims submitted to the Office of Energy and Planning.[7] The location of structures that lie within the floodplain as well as the floodplain itself can be seen on Map 2, Past & Potential Areas of Concern, located in Appendix G of this Plan.

"Article IX - Floodplain Development and Management Ordinance" as part of the Town's Zoning Ordinance addresses building within the FEMA floodplain.[8] The Ordinance states, *"The regulations in this ordinance shall*

[7] NH Office of Energy & Planning; Jennifer Gilbert; email dated November 15, 2012
[8] Zoning Ordinance for the Town of Brookfield, adopted revisions as of March 12, 2013

apply to all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its Flood Insurance Study for the County of Carroll, NH dated March 19, 2013, tougher with the associated Flood Insurance Rate Maps, dated March 19, 2013, or as amended which are declared to be part of this ordinance and are hereby incorporated by reference."

The Ordinance goes on to state*, "All proposed development in any special flood hazard area shall require a permit. The code enforcement officer shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is located in a special flood hazard area, all new construction or substantial improvements shall be:*

1. *designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;*

2. *constructed with materials resistant to flood damage;*

3. *constructed by methods and practices that minimize flood damages;*

4. *constructed with electrical heating, ventilation, plumbing, and air-conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding."*

In Section G.100-Year Flood Elevation Data, the Ordinance continues…

1. "In Zone A, the Board of Selectmen or its duly appointed agent shall obtain, review, and reasonably utilize any 100-year *flood elevation data available from any Federal, state or other source including data submitted to the community (i.e. subdivisions, site plan approvals).*

2. *The Board of Selectmen or its duly authorized agent's 100-year flood elevation determination will be used as criteria for requiring in Zone A that:*

    a. *all new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated to or above the 100-year flood level;*

    b. *all new construction and substantial improvements of non-residential structures have the lowest floor (including basement) elevated to or above the 100-year flood level; or together with attendant utility and sanitary facilities, shall:*

        i. *be flood-proofed so that below the 100-year flood elevation the structure is watertight with walls substantially impermeable to the passage of water;*

        ii. *have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and*

        iii. *be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section."*

This section of the ordinance goes on to detail the requirements for manufactured housing and recreational vehicles. Section 4-c. states that manufactured housing and recreational vehicles shall "*(c) Meet all standards of Section 60.3(b)(1) of the National Flood Insurance Program Regulations and the elevation and anchoring requirements for "manufactured homes" in Paragraph (c)(6) of Section 60.3 of said regulations."*

As a very small and close-knit community, the Brookfield Board of Selectmen and the Hazard Mitigation Planning Team are most always aware of new construction and/or substantial improvements that take place in town. Although Brookfield has a very small designated Special Flood Hazard Area, the Team felt that it is worthwhile to have NFIP brochures and information available at the Town Office for current homeowners and potential developers and to continue to offer public outreach on flood mitigation strategies (see Action Items #1 & #2, Tables 8.1 & 9.1).

The Town of Brookfield, through its Floodplain Management and other best practices, complies with the National Flood Insurance Program requirements. The Team also understands that the benefits of the NFIP also extend to structures that are not in the 100-year floodplain. The Town will continue to work with the Office of Energy and Planning and will carefully monitor its continued compliance with the NFIP.

In 1968, although well-intentioned government flood initiatives were already in place, Congress established the National Flood Insurance Program (NFIP) to address both the need for flood insurance and the need to lessen the devastating consequences of flooding. The goals of the program are twofold: to protect communities from potential flood damage through floodplain management, and to provide people with flood insurance.

For decades, the NFIP has been offering flood insurance to homeowners, renters and business owners, with the one condition that their communities adopt and enforce measures to help reduce the consequences of flooding. *Source: http://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp*

D. Profile of Past, Present & Potential Wildfire/Structure Fire Events in Brookfield

Historic fires can serve to help residents determine where future fires may occur, understand how the landscape and land use may have changed over time, and assist with determining priorities for future mitigation strategies.

The Brookfield Planning Team noted that very few significant wildfires have occurred in Brookfield in the recent past but that many of the community's residences are located in the Wildland Urban Interface (WUI). It was noted that if the right conditions were in place, a large wildfire could occur. Brookfield's forested lands include many of the factors associated with potential wildfire including steep terrain, a significant softwood forest and large areas where clear cuts and blow downs have occurred. In addition, there is no municipal water supply in Brookfield so the fire department must rely on static water sources to fight fires.

The Town reported no significant wildfires during the springs and summers of 2011-13. However, in 1987 and again in 1992, two wildfires occurred in the vicinity of Moose Mountain that were substantial enough to note. The 1987 fire, on Moose Mountain burned several acres and took five days to suppress. This deeply burning fire was very difficult to contain as it was on steep and rocky terrain. The cause of this fire was never determined.

The second major fire, in 1992, was in a "ledge" area of Moose Mountain. This fire, caused by a camp fire, burned 12 acres and became a serious concern because of accessibility issues and a wind speed measurement of 40 Knots. Helicopters were eventually brought in to help extinguish the fire from the air.

E. Probability of Future Potential Disasters

Due to Brookfield's geographic location, forested lands, steep hills, heavy snow pack and topography, there is always a possibility of future disasters in Brookfield. The Town of Brookfield has been impacted in the past by natural disasters, including flooding, lightning, severe winter storms, severe wind and hurricanes. In addition, the potential exists for tornado and earthquake damage although there is no record of these events striking the Town.

Local Flooding from heavy rain is a common occurrence along many of the Town's roadways; localized flooding is a concern in Brookfield. Heavy rains, saturated ground and rapid snowmelt create overburdened culverts, road washouts and road closures. It is likely that the future will bring more road flooding and erosion due to the large number of dirt roads and the number of culverts that are either undersized or aging.

Severe Winter Storms, particularly when combined with extended power failures, pose one of the greatest risks to the people of Brookfield. The population depends on electric power for their heating and water needs and power losses especially in the colder months, together with potential isolation caused by heavy snow or downed trees, can be a dangerous combination—especially for many elderly residents who live alone without the local support of an extended family.

Ice Storms as a separate category from Severe Winter Storms can have a dramatic effect in Brookfield. The elevation in Brookfield ranges from 656' at the Town Office to 1,868' at the top of Copple Crown Mountain. Most severe ice storms in NH are at their worst above 1,000', so Brookfield is likely to be impacted should another ice storm of the magnitude of the 1998 storm come to Brookfield again. Fortunately, the ice storm of 2008 stayed south of Brookfield, but the probability of future ice storms is good. Combined with a small number of access roads in and out of Town, ice storms create accessibility and isolation concerns for the citizens of Brookfield and make emergency response extremely difficult.

Any potential disaster in Brookfield is particularly impactful if combined with power failure, as would most likely be the case with severe winter storms, blizzards and ice storms. The food supply of individual citizens could become depleted quickly should a power failure last for a week or more. An outage during the winter months could result in frozen pipes and the lack of water and heat, a particular concern for the Town's elderly citizens (18.7% of the population). In addition, winter in New England commonly brings very low temperatures, while high temperatures can be experienced in the summer.

The road system which passes through Brookfield primarily consists of slow country roads and/or dirt roads. These dark, narrow, winding and bumpy roads are beautiful in the spring, fall and summer months, but when affected by flooding, winter snow conditions and ice they become treacherous. In these conditions, vehicular accidents, wildlife collisions and truck accidents involving hazardous materials are always a possibility.

Table 3.1, Table 3.2 and Chapter 5, Section B provide more information on past and potential hazards in Brookfield.

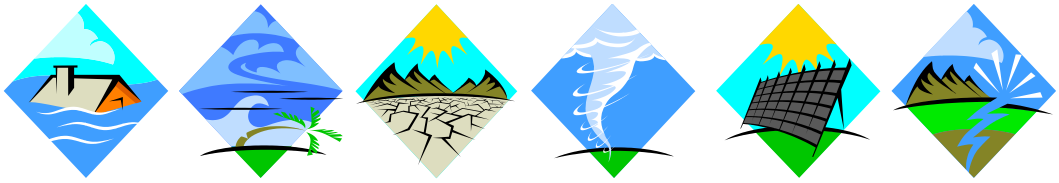


Table 3.2: Historic Hazard Identification

2014 HMP Team: The 2014 Hazard Mitigation Planning Team
2007 HMP Team: The 2007 Hazard Mitigation Planning Team

Table 3.2 - Historic Hazard Identification				
Type of Event	**Date**	**Location**	**Extent**	**Source**
Past Flooding Hazards: Riverine flooding is the most common disaster event in the State of New Hampshire (aside from frequent inconveniences from rather predictable moderate winter storms). Significant riverine flooding impacts upon some areas in the State in less than ten year intervals. The entire State of New Hampshire has a high flood risk. Areas prone to flooding and road erosion are indicated on **Map 3.**				
Specific flood record for the Community & Recent Presidential Proclamations & Emergency Declarations				
Flooding & Severe Storms	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	**Presidential Disaster Proclamation: DR-1643:** Flooding in most of southern NH, May 12-23, 2006; in Brookfield, this storm caused considerable road damage; caused closure of Sanborn, Tucker, Tumble Down Dick, Walker and Cottle Hill Roads.	FEMA & 2013 HMP Team
Flooding, Nor'easter & Severe Storms	April 15, 2007	All Ten NH Counties	**Presidential Disaster Proclamation: DR-1695**: flood damages; FEMA & SBA obligated more than $27.9 million in disaster aid following the April nor'easter; closed Tumble Down Dick road; culvert flooding.	FEMA & 2013 HMP Team
Flooding & Severe Storms	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	**Presidential Disaster Proclamation: DR-1787:** Severe storms, tornado, and flooding on July 24, 2008; no damage to Brookfield.	FEMA & 2013 HMP Team
Flooding; Tropical Storm Irene	August 26-September 6, 2011	Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	**Presidential Disaster Proclamation: DR-4026:** Tropical Storm Irene Aug 26th- Sept 6, 2011 Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan Counties; Brookfield had no notable damage; power failure for a short amount of time.	FEMA & 2013 HMP Team
Past or Potential Wildfire Hazards: New Hampshire is heavily forested and is therefore vulnerable to wildfire, particularly during periods of drought. The proximity of many populated areas to the state's forested lands exposes these areas and their populations to the potential impact of Wildfire. Wildfires were **not mapped.**				
Forest Fire	1953	NA	**Presidential Disaster Proclamation: DR-11:** This fire took place in the Pine Barrens region of east-central NH.	FEMA

Table 3.2 - Historic Hazard Identification				
Wildfire	1987	Moose Mountain	A wildfire on Moose Mountain took several acres and 5 days to suppress; fire was burning deep, the soil was rocky and the area was inaccessible; cause is unknown.	2013 HMP Team
Wildfire	1992	The Ledges on Moose Mountain	12 acres burned; caused by camp fires; caused serious concern as the wind was 40 knots and the area was inaccessible; helicopters were brought in to help put out the fire.	2013 HMP Team
Past or Potential Tornado, Downburst, Microburst & Hurricane Hazards: Tornados are spawned by thunderstorms and, occasionally by hurricanes, and may occur singularly or in multiples. A downburst is a severe localized wind blasting down from a thunderstorm. Downburst activity is very prevalent throughout the State, yet most go unrecognized unless significant damage occurs. Hurricanes develop from tropical depressions which form off the coast of Africa. New Hampshire's exposure to direct and indirect impacts from hurricanes is real, but modest, as compared to other states in New England. These hazards were **not mapped**.				
Specific high wind event record for the Community & Recent Presidential Proclamations & Emergency Declarations				
Tornado, Severe Storms & Flooding	July 24, 2008	Belknap, Carroll, Merrimack, Strafford & Rockingham	**Presidential Proclamation: DR-1782:** Tornado damage to several NH counties; no damage in Brookfield.	FEMA & 2013 HMP Team
Hurricane Katrina Evacuation	Aug-05	All Ten NH Counties	**Presidential Emergency Declaration: EM-3258:** Assistance to evacuees from the area struck by Hurricane Katrina and to provide emergency assistance to those areas beginning on August 29, 2005; no impact in Brookfield.	FEMA & 2013 HMP Team
Hurricane Irene	August 26-September 6, 2011	All Ten NH Counties	**Presidential Emergency Declaration: EM-3333:** Emergency Declaration for Tropical Storm Irene for in all ten counties; Brookfield had no notable damage; power failure for a short amount of time.	FEMA & 2013 HMP Team
Hurricane Sandy	October 26-31, 2012	All Ten NH Counties	**Presidential Emergency Declaration: EM-3360:** No damage but power failure in Brookfield for a few days.	FEMA & 2013 HMP Team
Hail, Severe Winds	Jul-96	Brookfield	Winds from a severe thunderstorm knocked over trees in the Brookfield area and produced ¾ inch hail.	2007 HMP

Table 3.2 - Historic Hazard Identification				
Past or Potential Severe Winter Weather Hazards: Severe winter weather in New Hampshire may include heavy snow storms, blizzards, Nor'easters, and ice storms (particularly at elevations over 1500 feet). Generally speaking, New Hampshire will experience at least one of these hazards during any winter season. Most New Hampshire communities are well prepared for such hazards. These hazards were **not mapped.**				
Specific ice and snow storm event record for the Community & Recent Presidential Proclamations & Emergency Declarations				
Ice Storm	Jan-98	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Strafford and Sullivan counties	**Presidential Proclamation: DR-1199:** Major tree damage, electric power interrupted for many days: schools were closed; extensive damage to trees; one area of Brookfield was without power for three weeks.	FEMA & 2013 HMP Team
Snow	December 6-7, 2006	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan	**Presidential Emergency Declaration: EM-3193:** The declaration covers jurisdictions with record and near-record snowfall that occurred over the period of December 6-7, 2006; no significant impact in Brookfield.	FEMA
Severe Winter Storm	11-Dec-08	All Ten NH Counties	**Presidential Emergency Declaration: EM-3297:** Severe winter storm beginning on December 11, 2008; no significant impact in Brookfield.	FEMA
Ice Storm	December 11-23, 2008	County & Town Wide	**Presidential Proclamation: DR-1812:** damaging ice storms to entire state including all ten NH counties; fallen trees and large scale power outages; five months after December's ice storm pummeled the region, nearly $15 million in federal aid had been obligated by May 2009; no significant impact in Brookfield.	FEMA
Severe Storm	October 29-30, 2011	All Ten NH Counties	**Presidential Emergency Declaration: EM-3344:** Severe storm during the period of October 29-30, 2011. - All ten counties in the State of New Hampshire (aka: Snowtober); no significant impact in Brookfield.	FEMA
Past or Potential Earthquake Hazards: According to the NH State Hazard Mitigation Plan, New Hampshire is considered to lie in an area of "Moderate" seismic activity when compare to other areas of the United States, and is bordered to the North and Southwest by areas of "Major" activity. Generally, earthquakes in NH cause little or no damage and have not exceeded a magnitude 5.5 since 1940. These hazards were **not mapped**.				
Earthquakes	December 1940 (2)	Ossipee, NH	Magnitude 5.5 felt in two separate earthquakes	See References Below
Earthquakes	1947, 1951, 1957, 1962, 1973, 1982, 2011	New England	Small earthquakes felt in New England measuring from 4.2 to 4.7 magnitude	See References Below

Table 3.2 - Historic Hazard Identification				
Earthquakes	October 2012	Northern New England	An earthquake measuring 4.6 on the Richter Scale with an epic center in Hollis, ME (just over the NH line) was felt throughout New Hampshire and as far south as Rhode Island; buildings shook for 10-30 seconds but no damage was reported; felt in Brookfield, but no reported damage.	2013 HMP Team
Past or Potential Drought Hazards: Droughts are generally not as damaging or disruptive as floods, but are more difficult to define. A drought is a natural hazard that evolves over months or even years and can last as long as several years to as short as a few months. These hazards were **not mapped**.				
Drought	1929-1936	Town & State Wide	Regional	See References Below
Drought	1939-1944	Town & State Wide	Most severe in southeast	
Drought	1947-1950	Town & State Wide	Moderate	
Drought	1960-1969	Town & State Wide	Regionally, longest recorded continuous spell of less than normal precipitation	
Drought	2001-2002	Town & State Wide	Third worst drought on record	
Other Past or Potential Hazards: Man-made hazards and other unusual hazardous events have been noted throughout NH. These hazards are **not mapped.**				
Extreme Temperatures	**Although the Team did not identify specific examples of past occurrences of these hazards, it was felt worthwhile to list them as potential hazards to the Town. See Hazard Threat Matrix (Table 3.1) and Chapter V for more details on these hazards.**			
Hazardous Material Transport				
Terrorism				
Epidemic & Pandemic				
Flood (Dam Failure)				

*Historic hazard events were derived from the following sources unless noted otherwise:

- Website for NH Disasters:http://www3.gendisasters.com/mainlist/newhampshire/Tornadoes
- FEMA Disaster Information: http://www.fema.gov/disasters
- The Tornado Project: http://www.tornadoproject.com/alltorns/nhtorn.htm
- The Tornado History Project: http://www.tornadohistoryproject.com/
- The Disaster Center (NH): http://www.disastercenter.com/newhamp/tornado.html

For more information on state & county-wide past events, see Presidential Disaster and Emergency Declarations Appendix C.

Chapter 4: Critical Infrastructure & Key Resources (CIKR)

With Team discussion and brainstorming, Critical Infrastructure and Key Resources (CIKR) within Brookfield were identified and mapped for this Plan. The "ID" number in the following lists is also represented as a CIKR in **Appendix G: Map Documents, *Map 3: Critical Infrastructure and Key Resources***. Facilities located in adjacent towns were not mapped (NM). The Hazard Susceptibility rating was based on a scale of 1-3 with 1 indicating little or no risk.

Table 4.1 - Emergency Response Facilities (ERF) & Evacuation

EMERGENCY REPONSE FACILITIES (ERF)				
ERF'S are primary facilities and resources that may be needed during an emergency response.				
Map ID#	**Facility**	**Type of Facility**	**Hazard Risk**	
1	Town Office Building, 267 Wentworth Road	Emergency Operations Center	All Hazards	1
2	Town House, 265 Wentworth Road	Primary Shelter	All Hazards	1
3	Maintenance Building, 265 Wentworth Road	Heavy Equipment, Forestry	All Hazards	1
4	Sand Shed, 283 Wentworth Road	Sand & Salt	All Hazards	1
NM	Wakefield Fire Station / EMS, 2017 Wakefield Road, Wakefield, NH	Fire & EMS	All Hazards & Flooding	2
NM	Wakefield Police Station, 2017 Wakefield Road, Wakefield, NH	Law Enforcement	All Hazards & Flooding	2
NM	NH DOT Highway Department (Wakefield)	Fuel & Equipment	All Hazards	1
NM	Huggins Hospital (Wolfeboro)	Medical Services	All Hazards	1
NM	Frisbie Memorial Hospital (Rochester)	Medical Services	All Hazards	1
NM	White Mountain Medical Center, Wakefield, NH	Medical Services	All Hazards	1
NM	Heli Zones - numerous throughout town; found as needed and includes NH Route 16			
Note: The Wakefield Fire/EMS Department & the Wakefield Police Department are the primary response agencies for the Town of Brookfield; depending on the situation, Wakefield would open an EOC at the Wakefield Public Safety Building.				
BRIDGES				
Map ID#	**Facility**	**Type of Facility**	**Hazard Risk**	
5	Churchill Brook Bridge, Governors Road	Bridge on Evacuation Route	All Hazards & Flooding	1
6	Pike Brook Bridge, Wentworth Road (NH Route 109)	Bridge on Evacuation Route	All Hazards & Flooding	1
DAMS				
Map ID#	**Facility**	**Type of Facility**	**Hazard Risk**	
8	Dam on Kingswood Lake, Meade Dam Road	Dam	All Hazards & Flooding	1
9	Mountain Lake Dam, Hanson Road	Dam	All Hazards	1
EVACUATION ROUTES				
NH Route 109 (Wentworth Road)			All Hazards	1
Governor's Road			All Hazards	1
Stoneham Road			All Hazards	1

EMERGENCY REPONSE FACILITIES (ERF)		
Pleasant Valley Road	All Hazards	1

Table 4.2 – Non- Emergency Response Facilities (NERF)

NON-EMERGENCY RESPONSE FACILITIES (NERF)				
NERF'S are facilities, that although they are critical, they are not necessary for the immediate emergency response efforts. This would include facilities to protect public health and safety and to provide backup emergency facilities.				
Map ID#	**Facility**	**Type of Facility**	**Hazard Risk**	
10	Hanson Brook Bridge, Moose Mountain Road	Bridge	All Hazards & Flooding	1
11	Tumble Down Dick Road	Culvert	All Hazards & Flooding	2
Note: There are no electric substations, cell towers, transfer stations or telephone facilities in Brookfield.				

Table 4.3 – Facilities & Populations to Protect (FPP)

FACILITIES & PEOPLE TO PROTECT (FPP)				
FPPs are facilities that need to be protected because of their importance to the town and to residents who may need help during a hazardous event.				
Map ID#	**Facility**	**Type of Facility**	**Hazard Risk**	
12	Moose Mountain Recreation Area	Gathering of People	All Hazards	1
2	Town House, 265 Wentworth Road	Historic	All Hazards	1
Note: Grades K-12 in Wolfeboro as part of the Governor Wentworth School District.				

Table 4.4 – Potential Resources (PR)

POTENTIAL RESOURCES (PR)	
PRs are potential resources that could be helpful for emergency response in the case of a hazardous event. (Not Mapped)	
Resource	**Type of Resource**
Brad Williamson	Fire Warden
Bob Sonricker	Electrician
Ten Construction (Ed Nason)	Sand, Gravel & Heavy Equipment
Smith's Gravel Pit	Sand, Gravel & Heavy Equipment
DOT State Shed	Emergency Fuel
Please refer to the Town's Emergency Operations Plan for additional resources.	

Chapter 5: Hazards Effects in Brookfield

A. Identifying Vulnerable Structures

Because damages from floods and wildfire/structure fires are more predictable than damages from other disasters, it is important to identify the critical facilities and other structures that are most likely to be damaged by these events. Using GIS analysis and aerial imagery, at-risk structures were identified throughout the Town.

Structures in the Floodplain	
Total Housing Units*	338
Total Assessed 2011**	$65,530,600
Average Value	$193,878
Number in 100-Year Floodplain***	2
Estimated Assessed Value	$387,755
Medium Risk at 28%	0.28
Potential Loss Value	$108,571
**Economic & Labor Market Information Bureau*	
***Provided by the Town*	
****GIS Analysis by MAPS*	

First, all structures falling within the FEMA flood map for the Town were identified in GIS; this list was then narrowed by those structures that were on the Town's CIKR list (Tables 4.1-4.4). No CIKR were found in the flood zone; however two non-CIKR structures were identified and assumed to be private residences. See chart to right for the estimated loss value at a medium risk of 28% for these two structures.

Using the same methodology that was used for flooding, structures falling within the Wildland Urban Interface (WUI) were reviewed. Identifying these structures assists the Team in creating mitigation strategies and prioritizing those strategies; it is important to determine which Critical Infrastructure and Key Resources are most vulnerable to wildfire/structure fires and to estimate their potential loss.

Although 61 structures were found in the WUI, only one CIKR was found, a building at the Moose Mountain Recreation area which has ample defensible space to protect them from wildfire/structure fires. The remaining 60 structures were assumed to be private residences. For all other hazards, besides flood and wildfire/structure fire, the HSEM matrix identified in Table 3.1 is used to evaluate likelihood and potential impact of each hazard.

B. Calculating the Potential Loss

It is difficult to ascertain the amount of damage that could be caused by a natural or human-caused hazard because the damage will depend on the hazard's extent and severity, making each hazard event somewhat unique. Therefore, we have used the assumption that hazards that impact structures could result in damage to either 0-1% or 1-5% of Brookfield's structures, depending on the nature of the hazard and whether or not the hazard is localized.

Assessed Value of All Structures (only)			
	2011	**1% damage**	**5% damage**
Residential	$62,513,322	$625,133	$3,125,666
Manufactured Housing	$38,100	$381	$1,905
Commercial	$954,600	$9,546	$47,730
Other Utilities	$0	$0	$0
Tax Exempt	$678,778	$6,788	$33,939
Utilities	$1,345,800	$13,458	$67,290
Total	$65,530,600	$655,306	$3,276,530

Based on this assumption, the potential loss from any of the identified hazards would range from **$0 to $655,306** or **$655,306 to $3,274,530** based on the 2011 Brookfield town valuations which lists the assessed value of all structures in Brookfield to be **$65,530,600.** (See chart above).

Human loss of life was not included in the potential loss estimates, but could be expected to occur, depending on the severity and type of the hazard.

Natural Hazards

(1) Road Flooding/Erosion (Heavy Rain & Snow Melt) ..... $0 to $655,306
(11) Flooding (Dam Failure) ..... $0 to $655,306

Extent

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 flood will occur once every 100 years. 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 flood". What this means is that there is a 1% chance of a flood of that size happening in any year.

Rapid Snow Pack Melt

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

River Ice Jams

Rising waters in early spring often breaks ice into chunks that float downstream and pile up, causing flooding behind them. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice in riverbeds and against structures presents a significant flooding threat 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.

Local Impact

Road Flooding

Heavy rain, rapid snowmelt and stream flooding often cause culverts to be overwhelmed and roads to wash out. Today, with changes in land use, aging roads, designs that are no longer effective and undersized culverts, the risk of flooding is a serious concern. Inadequate and aging storm water drainage systems create local flooding on many of Brookfield's roads. It is estimated that the Town experiences some sort of storm water problem whenever there is two or more inches of rain in a short period of time.

As a result of snow melt, heavy rain and culverts that are not properly draining, flooding occurs on Tumbledown Dick Road almost every year. Washouts have occurred on Tucker Road, Walker Road and Cottle Hill Road; NH Route 109 has also experience some flooding in the past due to underperforming culverts. Washouts of this type hinder travel for the commuting public and hamper emergency response.

Although no mitigation strategies call for the replacement and/or enlargement of culverts at this time, culvert upgrading will be needed in the future. For now, the Highway Department keeps a good handle on the drainage and ditching systems in Brookfield and is able to keep road flooding and erosion to a minimum.

The cost of road flooding is difficult to calculate as it is not based on the loss of structures. The expected loss value would be primarily on the loss of accessibility and the time and cost of road repair, which could be substantial. For the purpose of this Plan, the assessed loss value from road flooding is estimated to be between 0% and 1% of the total assessed value of structures within the Town.

Riverine Flooding

Flooding is often associated with hurricanes, heavy rains and rapid snowmelt in the spring. Based on the Carroll County Floodplain Map, Brookfield has a very small 100-year floodplain which encompasses two residents near the confluence of Churchill and Pike Brooks.

Nearly every spring, rapid snowmelt and heavy rain cause insignificant rise in Brookfield's brooks and streams, but no serious riverine flooding has been experienced. The Town maintains its membership in the NFIP and reviews its flood ordinance on a regular basis to insure no future development within the floodplain.

The table on page 43 shows the methodology used to determine the risk assessment for structures in the floodplain. By averaging the cost of all structures and multiplying it times the number found in the floodplain, the estimated assessed value for these structures becomes $387,755. Then, assuming a medium risk of 28%, the final potential loss value for structures in Brookfield's floodplain is $108,571.

Flooding (Dam Failure)

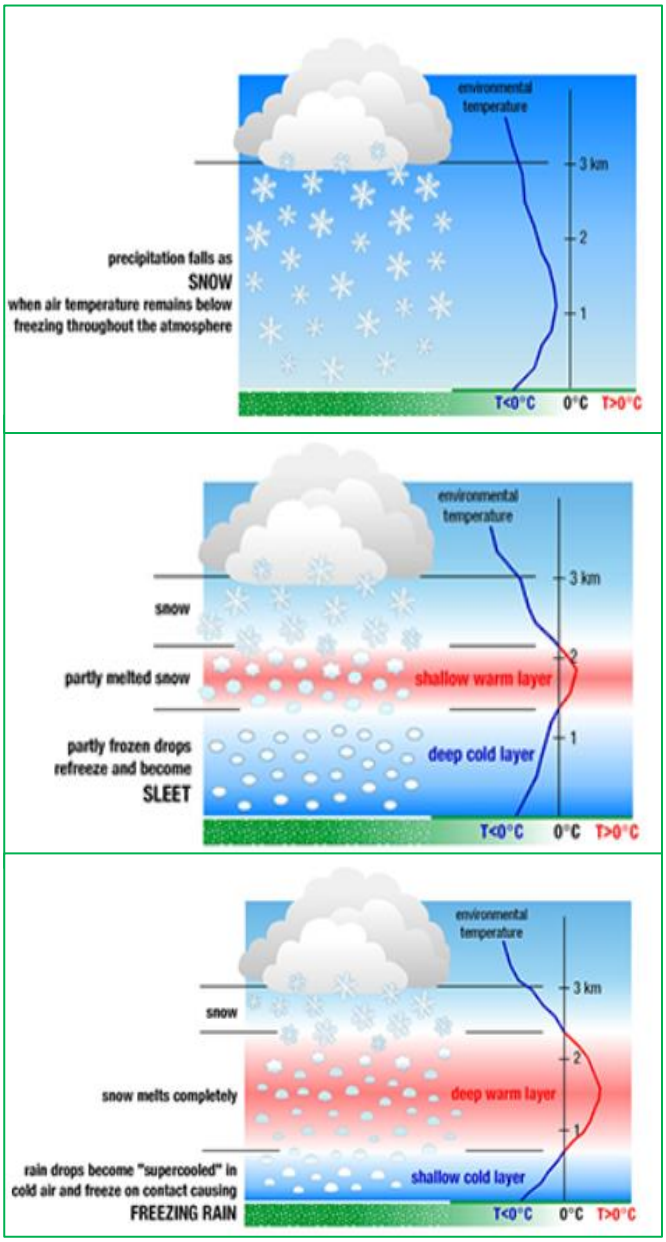
There are two dams located in Brookfield, the Mountain Lake Dam and Mead Dam. Failure of either of these dams could result in culvert failures and potential road washouts, but no structure damage would be expected. Both Mountain Lake Dam and Mead Dam are state-owned and on conservation land.

Due to the likelihood that any dam failure in Brookfield would be localized and would most likely cause damage only to roads, the assessed loss was estimated to be between 0 to 1% of the total assessed value of structures in Town.

(2) Severe Winter Weather (Snow Storms) ..... $0 to $655,306
(3) Severe Winter Weather (Ice Storms) ..... $655,306 to $3,274,530

Extent

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



Snow Storms

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

Sleet

Snowflakes melt as they fall through a small band of warm air and later refreeze when passing through a wider band of cold air. These frozen rain drops then fall to the ground as “sleet”.

Freezing Rain & Ice Storms

Snowflakes melt completely as they fall through a warm band of air then fall through a shallow band of cold air close to the ground to become “supercooled”. These supercooled raindrops instantly freeze upon contact with the ground and anything else that is below 32 degrees Fahrenheit. This freezing creates accumulations of ice on roads, trees, utility lines and other objects resulting in what we think of an “Ice Storm”. “Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects.”[9]

The Sperry-Piltz Ice Accumulation Index (SPIA) (next page) is designed to help utility companies better prepare for predicated ice storms.[10]

[9] NOAA, National Severe Storms Laboratory, https://www.nssl.noaa.gov/education/svrwx101/winter/types/
[10] The Weather Channel, http://www.weather.com/news/weather-winter/rating-ice-storms-damage-sperry-piltz-20131202

Local Impact

Heavy snowstorms typically occur from December through April. New England usually experiences at least one or two heavy snow storms with varying degrees of severity each year. Power outages, extreme cold and impacts to infrastructure are all effects of winter storms that have been felt in Brookfield in the past. All of these impacts are a risk to the community, including isolation, particularly of the elderly, and increased traffic accidents. Damage caused by severe winter snowstorms varies according to wind velocity, snow accumulation, duration and moisture content. Seasonal accumulation can also be as significant as an individual snowstorm. Heavy overall winter accumulations can impact the roof-load of some buildings.

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.)

Brookfield's roads are often impacted by poor weather conditions and this combined with the narrow and dark terrain can make travel difficult. Severe winter snow storms or blizzards, can shut all of Brookfield's roads down at least temporarily, and thus prevent many of the Town's commuting citizens from going to work and hamper emergency services.

Fortunately, in New England, most road crews are able to handle 2-3' snow storms with a little time on their side. Due to this factor and the small amount of businesses in Brookfield that would be impacted, the potential loss value is estimated to be between 0% and1% of the total assessed value of all structures in town.

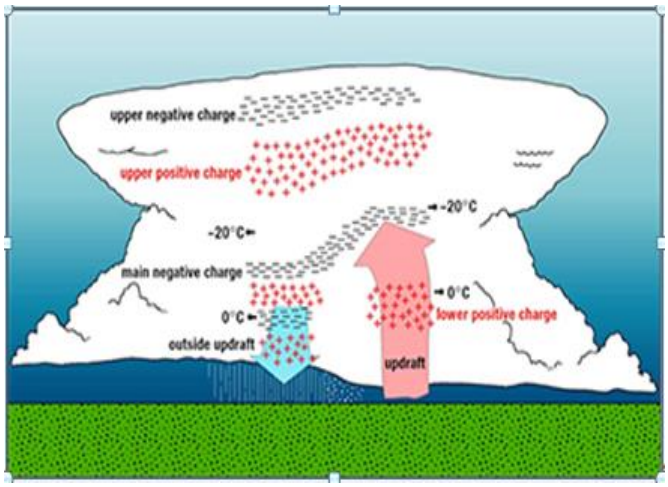
Of more concern in Brookfield than 2-4' snow storms are ice storms, though the probability of the occurrence of a major ice storm is lower. A significant ice storm can inflict several million dollars' worth of damage to forests and structures. The 1998 Ice Storm inflicted significant damage in northern New Hampshire and to a lesser degree, also in Brookfield causing ice on trees, downed power lines, closed roads, limited EMS access and power outages, for some residents up to three weeks. The 2008 Ice Storm did not cause significant damage in Brookfield, although some power outages were experienced.

Ice storms are difficult to predict, but, when they occur, there is generally widespread damaged, particularly at elevations greater than 1,000 feet above sea level. In Brookfield, the elevation at the Town Office is approximately 635 feet, but several roads and homes are located at the 1,000 foot mark or higher. The highest point in Town is 1,868 feet at the top of Copple Crown Mountain.

Because ice storms are likely to affect such broad areas of the Community, the potential loss value is estimated to be between 1% and 5% of the total assessed value of all structures in town.

(4) Severe Thunder & Lightning Storms ..... $0 to $655,306

Extent



According to the NOAA National Severe Storms Laboratory (NSSL), "Lightning is a giant spark of electricity in the atmosphere between clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When the opposite charges builds up enough, this insulating capacity of the air breaks down and there is a rapid discharge of electricity that we know as lightning. The flash of lightning temporarily equalizes the charged regions in the atmosphere until the opposite charges build up again."[11]

Thunder, a result of lightning, is created when the "lightning channel heats the air to around 18,000 degrees Fahrenheit..."[12] thus causing the rapid expansion of the air and the sounds we hear as thunder. Although thunder that is heard during a storm cannot hurt you, the lightning that is associated with the thunder can not only strike people but also strike homes, out-buildings, grass and trees sparking disaster. Wildfires and structure loss are at a high risk during severe lightning events.

Although thunderstorms and their associated lightning can occur any time of year, in New England they are most likely to occur in the summer months and during the later afternoon or early evening hours and may even occur during a winter snowstorm. Trees, tall buildings and mountains are often the targets of lightning because their tops are closer to the cloud; however, lightning is unpredictable and does not always strike the tallest thing in the area.

"Lightning strikes the ground somewhere in the U.S. nearly every day of the year. Thunderstorms and lightning occur most commonly in moist warm climates. Data from the National Lightning Detection Network shows that over the continental U.S. an average of 20,000,000 cloud-to-ground flashes occur every year. Around the world, lightning strikes the ground about 100 times each second, or 8 million times a day.

In general, lightning decreases across the U.S. mainland toward the northwest. Over the entire year, the highest frequency of cloud-to-ground lightning is in Florida between Tampa and Orlando. This is due to the presence, on many days during the year, of a large moisture content in the atmosphere at low levels (below 5,000 feet), as well as high surface temperatures that produce strong sea breezes along the Florida coasts. The western mountains of the U.S. also produce strong upward motions and contribute to frequent cloud-to-ground lightning. There are also high frequencies along the Gulf of Mexico coast, the Atlantic coast in the southeast U.S. Regions along the Pacific west coast have the least cloud-to-ground lightning."[13]

"A conceptual model (right) shows the electrical charge distribution inside deep convention (thunderstorms), developed by NSSL and university scientists. In the main updraft (in and above the red arrow), there are four main

[11]NOAA National Severe Storms Laboratory, https://www.nssl.noaa.gov/education/svrwx101/lightning
[12] NOAA National Severe Storms Laboratory, https://www.nssl.noaa.gov/education/svrwx101/lightning/
[13]Ibid

charge regions. In the convective region but outside the out draft (in and above the blue arrow), there are more than four charge regions." [14]

Local Impact

Severe lightning as a result of summer and mountain storms or as a residual effect from hurricanes and tornadoes has occurred in Brookfield. Some of the Town's structures are older buildings and many structures are surrounded by forest. Dry timber on the forest floor and the age of many buildings and out-buildings combined with lightning strikes can pose a significant disaster threat. Lightning could do damage to specific structures or injure or kill an individual, but the direct damage would not be widespread.

The Team noted that it appears that severe thunder and lightning storms are happening more often than in the past; several lightning strikes are documented each year. Lightning is a potential problem, but one who's affects would be localized. Based on the localized nature of lightning strikes, the potential loss value was determined to be 0-1% of the total assessed structure value in Town.

(5) Wildfire/Structure Fire.....$3,311,428

Extent

As stated by the National Wildfire Coordinating Group (NWCG), wildfires are designated in seven categories as follows:[15]

Class A: one-fourth acre or less
Class B: more than 1/4th 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.

For the purpose of statistical analysis, The US Forest Service recognizes the cause of fires according to the following chart:[16]

Code - Statistical Cause	
1 - Lightning	5 - Debris Burning
2 - Equipment Use	6 - Railroad
3 - Smoking	7 - Arson
4 - Campfire	8 - Children
	9 - Miscellaneous

The definition according to the International Wildland-Urban Interface Code of wildfire is "an uncontrolled fire spreading through vegetative fuels exposing and possibly consuming structures". In addition, the IWUIC goes to define the wildland urban interface area as "that geographical area where structures and other human development

[14] Ibid
[15] http://www.nwcg.gov/pms/pubs/glossary/s.htm
[16] http://www.fs.fed.us/im/directives/fsh/5109.14/5109.14,20.txt

meets or intermingles with wildland or vegetative fuels.[17] In Brookfield, the extent of the Wildland Urban Interface is clearly shown in the Appendix G, Map 1.

There are two main potential losses with a wildfire: the forest itself and the threat to the built-up human environment (the structures within the WUI). In many cases, the only time it is feasible for a community to control a forest fire is when it threatens the built-up human environment. Therefore, the loss to the forest itself will not be a factor in our loss calculation analysis.

The Wildland Urban Interface was determined in collaboration with the NH Division of Forests & Lands and the US Forest Service; the WUI represents the area in which the forest and human habitation intersect. It was defined to be a 1/4 mile buffer located 300 feet off the centerline of Class I-V roads. All structures within this WUI were assumed to be at some level of risk and, therefore, vulnerable to wildfire (see Map 1). It should be noted that in communities that are heavily forested, many Rangers feel that the entire community is in the WUI and therefore the extent of a wildfire could potentially be the entire community.

Local Impact

Due to the abundance of slash on the forest floor left by logging operations and blow downs, there is potential for fast burning fuels. Burn permits are required in Brookfield, as they are throughout the State, but often burning takes place without the proper permits. The steep terrain and heavily forested areas of town are difficult to monitor, therefore the occasional unauthorized burn will take place. Currently available documentation on fires in Brookfield indicates that the majority of fires are very small human-caused.

The Team noted that no significant wildfires have occurred in many years, however significant fires did occur in 1987 and 1992 in remote and inaccessible areas of Town (see Table 3.2). Due to accessibility issues (firefighting equipment comes from Wakefield), the mixed forest type and the high cost of fire suppression in some areas of Town, future wildfires cannot be ruled out.

Sixty-one structures were identified through GIS analysis as being located in the WUI. Evaluating the average value of structures in town and then multiplying that number by the estimated number of structures in the WUI resulted in a potential loss of $11,826,528. Then, assuming a 28% (medium) risk for wildfire/structure fires, the total potential loss value was estimated to be $3,311,428 (refer to chart to the right).

This GIS analysis represents an average potential loss value based on practices that have been used in the past. It should be noted that there are some forest fire rangers would feel that in reality virtually all of Brookfield is in the Wildland Urban Interface, thus identifying all structures to be at risk for wildfire.

Structures in the Wildland Urban Interface (WUI)	
Total Housing Units*	338
Total Assessed 2011**	$65,530,600
Average Value	$193,878
Number in WUI***	61
Estimated Assessed Value	$11,826,528
Medium Risk at 28%	0.28
Potential Loss Value	$3,311,428
**Economic & Labor Market Information Bureau*	
***Provided by the Town*	
****GIS Analysis by MAPS*	

[17] International Wildland-Urban Interface Code, 2012, International Code Council, Inc.

(6) Hurricane ..... $0 to $655,306

Extent

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 the storm may extend over 400 miles. High winds are a primary cause of hurricane-inflicted loss of life and property damage.

"The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating 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."[18]

Flooding is often caused from the coastal storm surge of the ocean and torrential rains, both of which may accompany a hurricane; these floods can result in loss of lives and property.

Local Impact

Wind damage due to hurricane is a consideration because of the forest and valley floors in Brookfield. Like the 1938 hurricane and hurricane Carol in 1954, major forest damage could occur. Although hurricanes could fit into several different categories (wind and flooding), the Team considered hurricanes to be separate events. Hurricanes are rare in New Hampshire, but they should not be ruled out as potential hazards. In most cases, Hurricanes have been down-graded to Tropical Storms by the time they reach northern New Hampshire.

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	**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.
2	96-110 mph 83-95 kt 154-177 km/h	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h 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.

Tropical Storm Irene, the remnants of Hurricane Irene, brought heavy rain and wind to Brookfield, but did not create any significant structure damage in the Community.

Due to the unlikelihood that hurricanes in this part of the start would remain Category 1 or greater, the potential loss value due to hurricanes was determined to be between 0% and 1% of the total assessed structure value.

Saffir-Simpson Hurricane Wind Scale; NOAA - National Weather Service - National Hurricane Center
http://www.nhc.noaa.gov/aboutsshws.php

[18] National Hurricane Center, NOAA; http://www.nhc.noaa.gov/aboutsshws.php

(7) Tornado or Downburst.....$0 to $655,306

Extent

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. Tornadoes 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.

A downburst is a strong downdraft which causes damaging winds on or near the ground according to NOAA. Not to be confused with downburst, the term "microburst" describes the size of the downburst. A comparison of a microburst and the larger macroburst shows that both can cause extreme winds.

A microburst is a downburst with winds extending 2 ½ miles or less, lasting 5 to 15 minutes and causing damaging winds as high as 168 MPH.

A macroburst is a downburst with winds extending more than 2 ½ miles lasting 5 to 30 minutes. Damaging winds, causing widespread, tornado-like damage, could be as high as 134 MPH.[19]

Tornadoes are relatively uncommon natural hazards in New Hampshire; on average, about six tornadoes touch down each year. Damage largely depends on where the tornado strikes. If it were to strike an inhabited area, the impact could be severe.

"Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale (F-Scale) to provide estimates of tornado strength based on damage surveys. Since it's practically impossible to make direct measurements of tornado winds, an estimate of the winds based on damage is the best way to classify a tornado. The new Enhanced Fujita Scale (EF-Scale) addresses some of the limitations identified by meteorologists and engineers since the introduction of the Fujita Scale in 1971. The new scale identifies 28 different free standing structures most affected by tornadoes taking into account construction quality and maintenance. The range of tornado intensities remains as before, zero to five, with 'EF-0' being the weakest, associated with very little damage and 'EF-5' representing complete destruction, which was the case in Greensburg, Kansas on May 4th, 2007, the first tornado classified as 'EF-5'. The EF scale was adopted on February 1, 2007." [20] The chart on the following page from wunderground.com shows a comparison of the Fujita Scale to the Enhanced Fujita Scale.

[19] NOAA - http://www.erh.noaa.gov/cae/svrwx/downburst.htm
[20] Enhance Fujita Scale, http://www.wunderground.com/resources/severe/fujita_scale.asp

EF-Scale:	Old F-Scale:	Typical Damage:
EF-0 (65-85 mph)	F0 (65-73 mph)	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1 (86-110 mph)	F1 (73-112 mph)	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2(111-135 mph)	F2 (113-157 mph)	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3 (136-165 mph)	F3 (158-206 mph)	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4 (166-200 mph)	F4 (207-260 mph)	Devastating damage. Whole frame houses Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF-5 (>200 mph)	F5 (261-318 mph)	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.
EF No rating	F6-F12 (319 mph to speed of sound)	Inconceivable damage. Should a tornado with the maximum wind speed in excess of EF-5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc.will create serious secondary damage on structures.

Local Impact

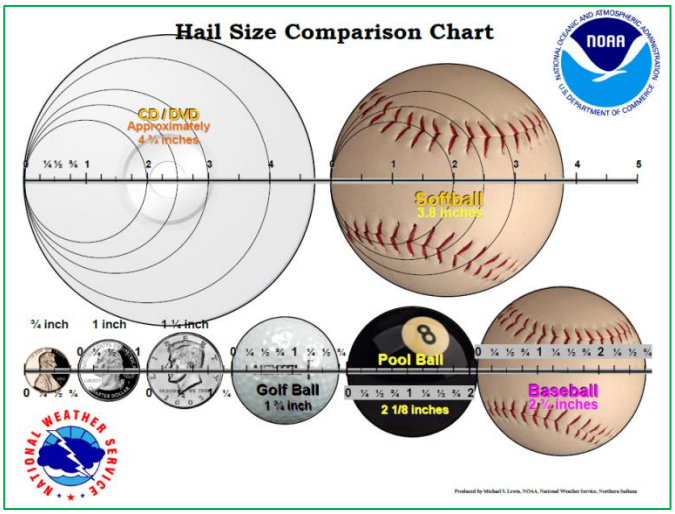
Although a tornado did touch down in Carroll County in July 2008, this tornado did not reach Brookfield. In the past however, Brookfield has experienced minor downbursts that resulted in isolated property damage. One specific downburst in recent memory was noted; however no significant damage was done and less than an acre of downed timber was felled along NH Route 109.

Like high winds, the affects would be primarily power outages and blow downs; however, if a tornado, microburst or macroburst were severe enough, property damage could also occur. Due to the rareness of these events in New Hampshire, the likelihood of an event of this type is low and the affects would be localized. Therefore, the potential loss value was determined to be between 0% and 1%.

(8) Hailstorm ..... $0 to $655,306

Extent

Hailstones are balls of ice that grow as they're held up by winds, known as updrafts that blow upwards in thunderstorms. The updrafts carry droplets of supercooled water – water at a below-freezing temperature that is not yet ice. The super cooled water droplets freeze into balls of ice and grow to become hailstones. The faster the updraft, the bigger the stones can grow. Most hailstones are smaller in diameter than a dime, but stones weighing more than a pound have been recorded. "The largest hailstone recovered in the US fell in Vivian, SD on June 23, 2010 with a diameter of 8 inches and a circumference of 18.62 includes. It weighed 1 lb. 15 oz."[21]



Details of how hailstones grow are complicated, but the results are irregular balls of ice that can be as large as baseballs. The chart above shows the relative size differences and a common way to "measure" the size of hail.[22]

Local Impact

Hailstorm events, although not common in Brookfield, can occur at any time. Damage from hail could result in failed crops and structure and vehicular damage, thus creating an economic impact for individual citizens. Overall it was felt that a significant hailstorm event would be unlikely and would cause minimal damage; therefore the potential loss value is estimated at 0% and 1% of the assessed value.

(9) Extreme Temperatures.....Structure loss value was not estimated

Extent

<u>Extreme Heat</u>

A Heat Wave is a "Prolonged period of excessive heat, often combined with excessive humidity." Heat kills by pushing the human body beyond its limits. In extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.

Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than

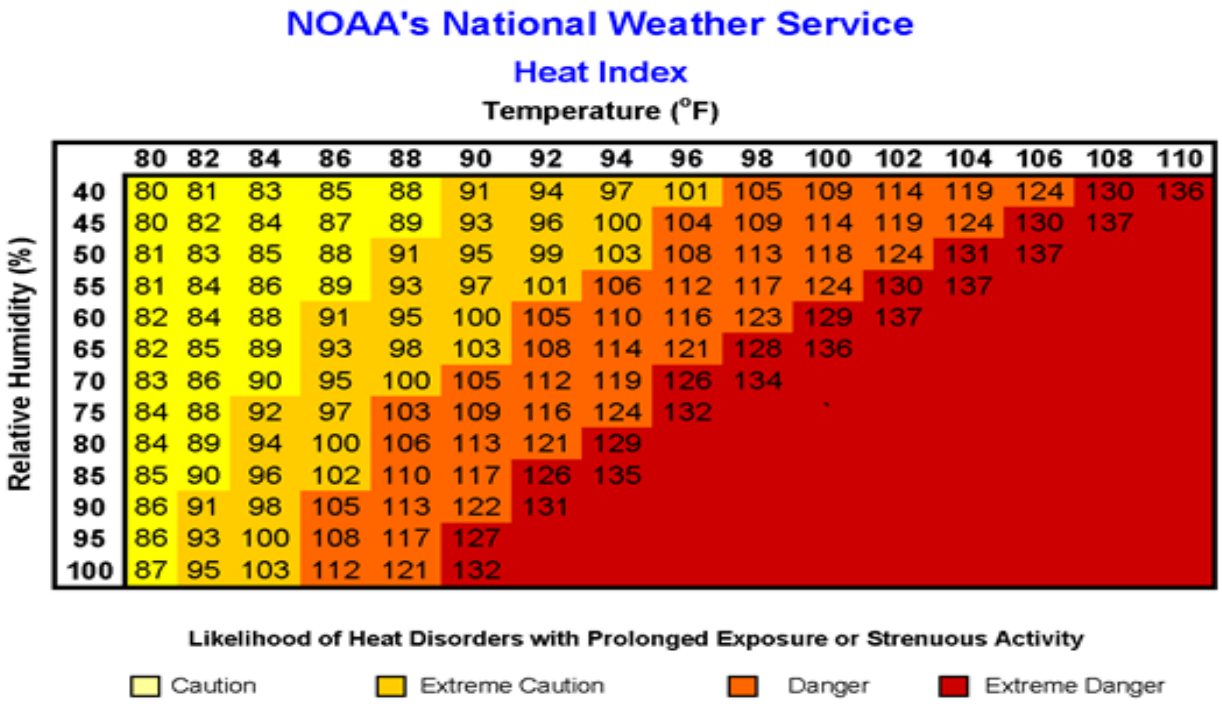
[21] NOAA National Severe Storms Laboratory; https://www.nssl.noaa.gov/education/svrwx101/hail/
[22] NOAA, http://www.crh.noaa.gov/images/iwx/publications/Hail_Chart.pdf

those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the "urban heat island effect."[23]

Extreme Cold

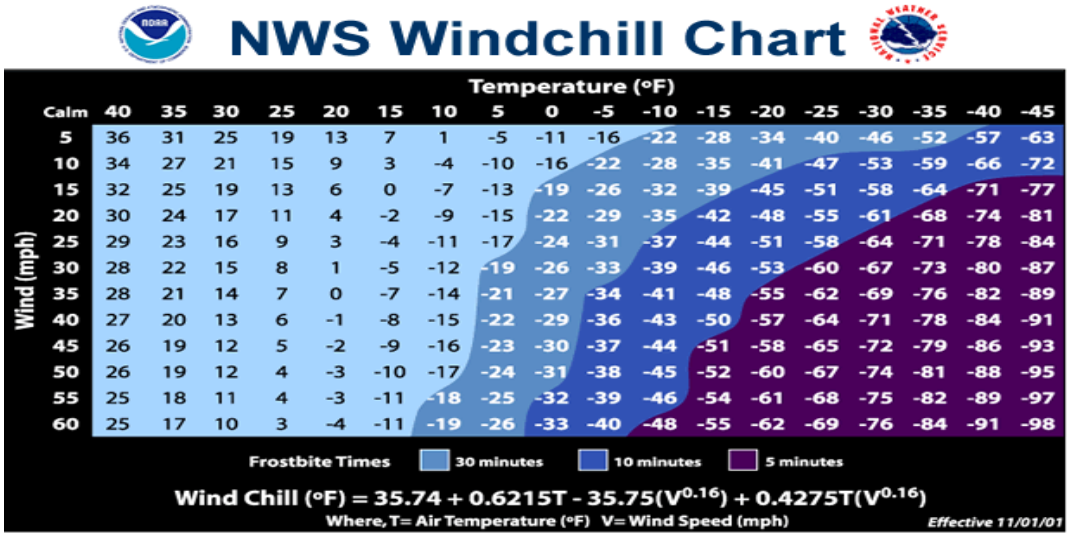
What constitutes extreme cold and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Whenever temperatures drop decidedly below normal and as wind speed increases, heat can leave your body more rapidly; these weather related conditions may lead to serious health problems. Extreme cold is a dangerous situation that can bring on health emergencies in susceptible people, without shelter or who are stranded, or who live in a home that is poorly insulated or without heat.[24]

The chart below explains possible health conditions that may result from high heat.[25]



[23] NOAA, Index/Heat Disorders; http://www.srh.noaa.gov/ssd/html/heatwv.htm
[24] CDC; http://www.bt.cdc.gov/disasters/winter/guide.asp f
[25] NOAA; http://www.nws.noaa.gov/os/heat/index.shtml

The National Weather Service Chart shows Windchill as a result of wind and temperature.[26]



For those who are familiar with Northern New England weather, it is obvious that temperature extremes are very common. Winter temperatures can fall below -30°F and summer temperatures, laden with high humidity can soar to nearly 100°F. In the past, there was more concern about extreme cold temperatures, but with improved heating systems and local communications, most New Hampshire residents are able to cope with extreme cold.

Also of concern today are extreme heat conditions, becoming more common with climate change. Few residents, particularly the elderly and vulnerable populations, have air conditioners and are less able to cope with extreme heat.

Local Impact

Extreme temperatures when combined with power failure are of the most concern for Brookfield; power failure would result in no water, heat and air conditioning for the Town's vulnerable population. Both town officials and the community as a whole should be concerned and should look after its citizens to ensure that extreme temperatures do not create a life or property threatening disaster.

(10) Drought.....Structure loss value was not estimated

Extent

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects the growing season or living conditions of plants and animals. 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 drought 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 groundwater levels or increasing stream flow. Low stream flow also correlates with low groundwater levels because groundwater discharge to streams and rivers maintains stream flow during extended dry periods. Low stream flow and low groundwater levels commonly cause diminished water supply.

[26] National Weather Service; http://www.nws.noaa.gov/om/windchill/

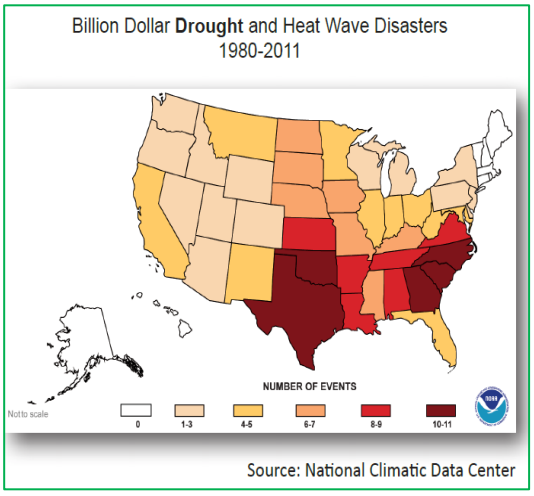
NEW HAMPSHIRE DROUGHT HISTORY

Dates	Area Affected	Recurrence Interval Yrs	Remarks
1929-1936	Statewide	10 to > 25	Regional
1939-1944	Statewide	10 to > 25	Severe in southeast and moderate elsewhere
1947-1950	Statewide	10 to 25	Moderate
1960-1969	Statewide	> 25	Regional longest recorded continuous spell of less than normal precipitation
2001-2002	Statewide	Not yet determined	Third worst drought on record, exceeded only by the drought of 1956-1966 and 1941-1942

NH DES; http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf

Local Impact

An extended period without precipitation could elevate the risk for wildfire/structure fire and blow-downs in the forest and with an extreme drought, the water supply and aquifer levels could be threatened. Fortunately, significant droughts rarely occur in New Hampshire or Brookfield. According to the NH Department of Environmental Services, five significant droughts have occurred since 1929.[27]



The cost of drought in Brookfield is difficult to calculate as any cost would primarily result from an associated fire risk, diminished water supply. However, based on the unlikelihood of a serious drought occurring in New Hampshire and because the hardship would be primarily economic, the structure loss value was not estimated.

(12) Earthquake ..... $0 to $655,306

Extent

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 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 widely determined by the use of two scales, the more commonly used Richter Scale (measures strength or magnitude) and the Mercalli Scale (measures intensity or severity). The chart to the right shows the two scales relative to one another. The Richter Scale measures earthquakes starting at 1 as the lowest with each successive unit being about 10 times stronger and more severe than the previous one.[28]

[27] NH DES; http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf
[28] Modified Mercalli Scale/Richter Scale Chart; MO DNR, http://www.dnr.mo.gov/geology/geosrv/geores/richt_mercali_relation.htm

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines and are often associated with landslides and flash floods. Four earthquakes occurred in New Hampshire between 1924-1989 having a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia, and one near the Quebec border. It is well documented that there are fault lines running throughout New Hampshire, but high magnitude earthquakes have not been frequent in New Hampshire history.

Modified Mercalli Scale		Richter Magnitude Scale
I	Detected only by sensitive instruments	1.5
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	2
III	Felt noticeably indoors, but not always recognized as earthquake; standing autos rock slightly, vibration like passing truck	2.5
IV	Felt indoors by many, outdoors by few, at night some may awaken; dishes, windows, doors disturbed; autos rock noticeably	3
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.5
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.5
VIII	Panel walls thrown out of frames; fall of walls, monuments, chimneys; sand and mud ejected; drivers of autos disturbed	5
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	5.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	6
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	6.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up in air	7
		7.5
		8

Local Impact

In October 2012, an earthquake with its epicenter in Hollis, ME and a magnitude of 4.6 on the Richter scale occurred. The tremor was felt through most of New England and in Brookfield, but no damage was reported.

Although historically earthquakes have been rare in New Hampshire, the potential does exist, and depending on the location, the impact could be significant. The potential structure loss value due to earthquakes was determined to be between 0% and 1% of the total assessed structure value.

Human Caused Hazards

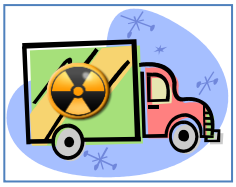
(1) Extended Power Failure..... $0 to $655,306

Extended power outages of five or more days have occurred in Brookfield, both as a result of local line damage from high winds and storms and problems with the power grid. Some electric poles are accessible only by foot, and because Brookfield is served by three different power companies, the entire town is not generally serviced at one time. If a major and/or extended power outage occurs and lasts for more than a week, a significant hardship on individual residents could result, particularly those citizens who are elderly, handicapped or poor. .

The Team felt that many residents were somewhat self-sufficient; many residences are equipped with generators and many others have woodstoves. The biggest impact from on expended power failure would be the inconvenience caused by the inability to pump water for residents, all of which rely on wells. It is also noted that Brookfield is a somewhat difficult place for senior citizens to live; not only is the driving difficult due to weather conditions, but all services including pharmacies and grocers are located out of town.

As a small close-knit community, town officials are aware of persons who may need help in emergency situations. Nonetheless, an extended power failure causing frozen pipes and a lack of heat and water is potentially a serious hazard for the community. Due to the localized and individual nature of the effects of an extended power failure, and the damage that could be expected to infrastructure and heat and water pipes, the potential loss value is estimated to be between 0% and 1% of the total assessed value of all structures in town.

(2) Hazardous Material – Transport..... $0 to $655,306



The possibility of vehicular accidents involving hazardous materials is identified as potentially significant in Brookfield. The Town has one major road, NH Route 109, a north-south corridor that crosses through the Town bringing traffic to/from NH Route 16 in Wakefield to NH Route 28 in Wolfeboro.

NH Route 109 carries a substantial volume of vehicular traffic traveling to and from other parts of NH, including automobiles, busses and trucks; this route is often used as a scenic by-way, and is well-travelled not only by tourists but by large commercial vehicles. Often trucks are loaded with chemicals, bulk petroleum products and other dangerous substances. In addition, large and small vehicles make deliveries to the Town's citizens often on dark and winding roads; the contents of some these vehicles are unknown while other vehicles, such as trucks hauling fuel and propane are common.

There is always a very real threat of a hazardous material transportation accident, but the effects of such an event would be localized by nature; the potential loss value is estimated at 0% and 1% of the assessed value.

(3) Terrorism..... Structure Loss Value was not estimated

Terrorism is a fear throughout our country and the world, but Brookfield is not host to any known soft-targets. The biggest fear would come from school incidents (however all schools are located in neighboring communities) or home-grown terrorism such as civil unrest.

Terrorism is identified as remote, although possible, hazard for Brookfield, but due to the localized and unpredictable nature of a terrorist event, the structure loss value was not estimated.

(4) Epidemic/Pandemic..... Structure Loss Value was not estimated

Brookfield's geography provides hikers and summer and winter recreation enthusiasts many opportunities to visit the Town; this small community's population shows a small increase on summer weekends. In addition, all of Brookfield's school children attend school in the neighboring town of Wolfeboro thus enabling infection and viruses to be transmitted from elsewhere.

Because of these factors, the Team decided that an epidemic or pandemic could present a possible threat to Brookfield. With the occurrence of world-wide pandemics such as SARS, H1N1 and Avian Flu, Brookfield could be susceptible to an epidemic and subsequent quarantine. However, because there would be no direct impact to structures within the Town, structure loss value was not estimated.

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Chapter 6: Current Town Policies, Plans and Mutual Aid

After researching historic hazards, identifying CIKR and determining potential hazards, the Team determined what is already being done in Town to protect its citizens and structures.

Once identified, the Team addressed each current policy or plan to determine its effectiveness and to determine whether or not improvements were needed. This analysis became one of the tools the Team used to identify mitigation action items for this plan.

With the knowledge of what regulations Brookfield currently had in place, creating new strategies was less difficult. This process was helpful in identifying current plans and policies that were working well and those that should be addressed as a new "action item" as well as the responsible departments. The table that follows, Table 6.1, Policies, Plans & Mutual Aid, shows the analysis that resulted from discussion with the Team.

Table 6.1: Current Policies, Plans & Mutual Aid

Key to Effectiveness:

- **Excellent** – The existing program works as intended and is exceeding its goals.
- **Good** – The existing program works as intended and meets its goals.
- **Average** – The existing program does not work as intended and/or does not meet its goals.
- **Poor** – The existing program does not work as intended, often falls short of its goals, and/or may present unintended consequences.

Action Items noted here are shown in Tables 8.1 and 9.1.

Existing Program	Description	Area of Town Covered	Responsible Department	Effectiveness	Improvements or Changes Needed
NIMS & ICS Training for Town Officials & EOC Staff	Ensure effective command, control, and communications during emergencies	Town Wide	Emergency Management Director	Good	**Improvements Needed:** Some of Brookfield's town officials have received NIMS & ICS training, although some have not; EMD should encourage all town officials to take NIMS 700 and ICS 100 and 200. **Action Item #7**

Existing Program	Description	Area of Town Covered	Responsible Department	Effectiveness	Improvements or Changes Needed
Emergency Operation Plan (2002)	This plan offers all members of the emergency management team a better understanding of procedures in case of a disasters; recently held table talk to determine effectiveness	Town Wide	EMD	Good	**Improvements Needed:** The last EOP in Brookfield was completed in 2002; the EOP is due to for a complete rewrite to comply with the 16 ESF format. **Action Item #5**
E-911	Entire Town has 911 markers at driveway entrances.	Town Wide	Fire & Police	Poor	**Improvements Needed:** There are currently too many driveways (approximately 35%) that still do not have the appropriate 911 markers; the Select Board should consider reviewing the ordinance requiring 911 markers and should consider additional ways to enforce the ordinance, perhaps through fines; public outreach should be made on the Town's website to educate and encourage homeowners to insure accurate emergency response. **Action Item #8**
Local Road Design Standards for Subdivisions	Standards and specifications for construction of roads.	Brookfield	Planning Board	Good	**No Improvements Needed**: Subdivision road specs are in place; the Town will not assume ownership of substandard roads within new subdivisions; any new subdivision road must go before the Town at Town meeting in order to seek acceptance by the Town as a town-maintained road; curb cut standards and driveway permits are in place that outline specifications for the entrance to and from driveways from town and state roads.

Existing Program	Description	Area of Town Covered	Responsible Department	Effectiveness	Improvements or Changes Needed
Land Subdivision Regulations (2010)	Includes fire and emergency access, drainage, street and road standards and other subdivision requirements	Brookfield	Planning Board	Good	**Improvements Needed:** Brookfield's Subdivision Regulations are reviewed periodically by the Planning Board and necessary changes are made; the Team felt that these regulations could be improved upon by adding requirements for fire suppression, such as the establishment of cisterns, fire breaks or fire ponds by developers. **Action Item #4**
Master Plan (2006)	Includes goals, objectives and expectations for future development of the town	Town Wide	Planning Board	Good	**Improvements Needed:** Gets reviewed periodically by the Planning Board and necessary changes are made; Master Plan will be have a total review in 2013 by the Planning Board; however the Master Plan will be due for a rewrite by 2016. **Action Item #10**
Life safety and fire codes	Provides guidance for all buildings for life safety and fire codes; state codes are adopted	Brookfield	Wakefield FD	Good	**No Improvements Needed:** Brookfield and the Wakefield FD use the State Fire Codes; the Wakefield FD inspects all commercial and multi-family buildings and will call upon the State Fire Marshall to assist in inspections if the need arises; no improvements are needed.
Capital Reserve Funds	Capital Reserve Funds are set aside for the town buildings and road improvement.	Brookfield	Select Board	Good	**No Improvements Needed:** Brookfield does not have a Capital Improvement Plan, although the development of one is in process, but does have Capital Reserve Funds which are reviewed annually at budget time; through the Capital Reserve Funds the town has laid out projected capital improvement needs for the Town; the Team feels these funds work well and are not in need of improvement.

Existing Program	Description	Area of Town Covered	Responsible Department	Effectiveness	Improvements or Changes Needed
Flood Ordinance (2009 incorporate into Zoning Ordinance)	Ordinance regulating building new structures or making substantial improvements in the FEMA special flood hazard areas.	Floodplain	Select Board	Good	**No Improvements Needed:** Brookfield's small flood zone contains two properties; the Town's flood ordinance was incorporated into the Zoning Ordinance in 2009; the Town requires building permits and no new building or substantial improvements are allowed in the flood zone. Warrant on file for Town Meeting 2013 to accept changes in zoning to comply with FEMA's new zoning requirements.
Culvert Replacement Program	Effort to assess culvert capabilities and to replace culverts as deemed necessary	Brookfield	Road Agent	Good	**No Improvements Needed:** Culvert replacement and maintenance program is in place that protects the Town from flooding; culverts are replace as needed; the Town's culverts are currently in good shape and none are in need of immediate replacement.
State Health Department Public Health Plan	State plan, "Influenza, Pandemic, Public Health Preparedness and Response Plan" written by state health department to be prepared for any public health emergency; the Town is part of the Carroll County Public Health Network.	Brookfield	Public Health Network Coordinator	Good	**No Improvements Needed:** Public Health Plan does what it is meant to do.
National Flood Insurance Program	Member since May 17, 1977.	Floodplain	Select Board	Good	**No Improvements Needed:** The Town and its Planning Board are well educated on the NFIP; the Town is fully compliant with the NFIP and has adjusted their Flood Ordinance as needed; the ordinance does not allow building in the floodplain and any substantial improvements must be reviewed and comply with strict regulations.

Existing Program	Description	Area of Town Covered	Responsible Department	Effectiveness	Improvements or Changes Needed
Hazardous Materials Response Team	Carroll County Hazmat in conjunction with Wakefield Fire/EMS	Brookfield	Wakefield Fire/EMS	Good	**No Improvements Needed**: The Town of Brookfield is contracted with the Wakefield Fire Department; as such, is part of Ossipee Valley Fire Mutual Aid and has access to and service from the Carroll County Hazmat Team; the Team sees no need to change their arrangement with Wakefield Fire/EMS that includes this access to a regional hazardous materials response team.
Fire/EMS	Brookfield is contracted with the Wakefield, NH Fire/EMS Department	Brookfield	Wakefield Fire/EMS	Good	**No Improvements Needed**: The Town of Brookfield is contracted with the Wakefield Fire Department; as such, is part of Ossipee Valley Fire Mutual Aid; the Team sees no need to change their arrangement with Wakefield Fire/EMS.
Law Enforcement Services	Brookfield is contracted with the Wakefield, NH Police Department	Brookfield	Wakefield PD	Good	**No Improvements Needed**: The Town of Brookfield is contracted with the Wakefield Police Department; the Team sees no need to change their arrangement with Wakefield PD.
Steep Slopes	Building on slopes of more than 25% not allowed according to the Town's Zoning Ordinance	Steep Slope Areas	Code Enforcement Officer	Good	**No Improvements Needed**: Zoning Ordinance states that no building can take place on slope of 25% grade or more; no changes are needed.
Emergency Generators	Located at Town Office Building	Brookfield	Emergency Management Director	Good	**No Improvements Needed:** A generator is located at the Town Office Building; no other generators are needed.

Existing Program	Description	Area of Town Covered	Responsible Department	Effectiveness	Improvements or Changes Needed
Shore land Protection Act	The State of NH's Shoreland Protection Act provides regulations regarding building near the State's rivers, ponds and lakes.	Town-wide/all new development	Planning Board, Zoning Board of Adjustment, Code Enforcement Officer.	Good	**No Improvements Needed:** Brookfield's Planning Board and permitting procedures refer to the State's Shoreland Protection Act and require compliance with the regulations provided therein.
Zoning Ordinances (2010)	Constantly updated, they are considered current. Include drainage and infrastructure provisions.	Brookfield	Select Board & Planning Board	Good	**No Improvements Needed:** Brookfield's Zoning Ordinances are reviewed periodically by the Planning Board and necessary changes are recommended on a case-by-case basis and presented at Town Meeting.
State Division of Forest and Lands/Fire Permits	State regulations for open burning and permits	Brookfield	NH Forests & Lands permit but local fire wardens issue	Good	**No Improvements Needed:** The system that is in place with NHFL and the local fire warden works well; the public is aware of the need for burning permit and complies to some degree; about 100 permits are issued each year.

Chapter 7: Prior Mitigation Plan(s)

A. Date(s) of Prior Plan(s)

Brookfield has participated in the development of a prior Hazard Mitigation Plan, which received Final Approval by FEMA January 2007. This Plan, the "Brookfield Hazard Mitigation Plan Update 2014" is an update to the first plan to be developed based on the Disaster Mitigation Act (DMA) of 2000.

Below are the strategies that were identified in the 2007 Plan. The Team identified the current status of each strategy based on three questions:

- Has the strategy been completed?
- Has (or should) the strategy be deleted?
- Has (or should) the strategy be deferred for consideration in this Plan?

Table 7.1: Accomplishments since Prior Plan(s) Approval

NOTE: Items in red were extracted word-for-word from the 2007 Hazard Mitigation Plan and do not represent a timeframe for this plan. Action Items noted here are shown in Tables 8.1 and 9.1.

Priority Score	Action	Description of Potential Strategy	Who is Responsible?	How will it be funded?	When will it be implemented?	Completed, Deleted, Deferred
33	Adopt FEMA approved Hazard Mitigation Plan	Adopt FEMA approved Hazard Mitigation Plan at Public Hearing	Board of Selectmen	N/A	Feb-06	**Completed:** Plan was approved by FEMA on January 18, 2007
33	Transportation hazards/Road Safety Improvements	Work with Department of Transportation regarding safety improvements to state roads	Board of Selectmen, NH Department of Transportation	NH Department of Transportation	1 year	**Deleted:** This strategy was determined not to be needed at this time.
32	Dry hydrants in existing developments	Install dry hydrants throughout town and require installation in new developments	Board of Selectmen	Town funds and t	Ongoing	**Deferred:** This strategy was not completed due to funding; the Team felt however that there are locations in Town that could benefit from dry hydrants and a maintenance schedule. **Action Item #6**

Priority Score	Action	Description of Potential Strategy	Who is Responsible?	How will it be funded?	When will it be implemented?	Completed, Deleted, Deferred
32	Dry hydrants in new developments	Install dry hydrants throughout town and require installation in new developments	Planning Board	Developer contribution	Ongoing	**Deferred:** This was not put into the Town's Subdivision Regulations, but the Team felt that cisterns and dry hydrants for new developments should be discussed again with the Planning Board. **Action Item #4**
31	Adopt updated building codes	Adopt updated building code standards in compliance with FEMA and state regarding wind standards	Board of Selectmen	N/A	1 year	**Completed:** The Town has recently adopted the 2009 International Building Codes which have also been adopted by the State.
31	Education of regulations for municipal officials and residents	Town meeting, Planning Board, Zoning Board of Adjustment, Code Enforcement Officer, Emergency Management Director as appropriate	Town meeting, Planning Board, Zoning Board of Adjustment, Code Enforcement Officer, Emergency Management Director as appropriate	N/A	Ongoing	**Deleted:** This is not a mitigation strategy.
31	Enforcement of regulations and ordinances	Board of Selectmen, Code Enforcement Officer	Board of Selectmen, Code Enforcement Officer	N/A	Ongoing	**Deleted:** This is not a mitigation strategy; this is a normal Town function.
31	Revision of FEMA maps	Update the flood maps of the Town to accurately display where potential flooding is located.	Planning Board, Board of Selectmen, Code Enforcement Officer	N/A	1 year	**Deleted:** New flood maps were recently received but it is felt that no changes were made; although the team felt that "updated" flood maps were needed, they also realize that updating these maps is done according to FEMA's schedule, not the Town's.

Priority Score	Action	Description of Potential Strategy	Who is Responsible?	How will it be funded?	When will it be implemented?	Completed, Deleted, Deferred
30	Review Hazard Mitigation and Emergency Action Plan	Emergency Action Plan needs to be reviewed and updated; Review and update Hazard Mitigation Plan	Emergency Management Director	N/A	Annually	**Deferred:** The last EOP in Brookfield was completed in 2002; the EOP is due to for a complete rewrite to comply with the 16 ESF format. **Action Item #5**
28	Critical Facilities Inventory	Review and update the inventory of critical facilities including bridges, dams, and analyze the ability to withstand natural disasters and capacity for emergency use	Board of Selectmen, Emergency Management Director	N/A	Annually	**Completed:** A critical facilities inventory and the hazard risk have been done for this Plan (Hazard Mitigation Plan, 2014).
25	NFIP/Community Assisted Visit	Educate citizens about the Community Rating System and the National Flood Insurance Program and the Community Assisted Visit program.	Code Enforcement Officer, Board of Selectmen	N/A	Annually	**Completed & Deferred:** Although the citizens of Brookfield have been made aware of the NFIP, the Team agreed that more public outreach can be done. **Action Items #1 & 2**
24	Watershed Management	Adopt a local water resource management and protection plan cooperatively with Wakefield	Planning Board, Board of Selectmen, Conservation Commission	N/A	1 year	**Completed:** Protected areas were identified; the Conservation Commission works on watershed issues as needed.
24	Establish Town Website	Establish town website to educate and alert residents of emergency preparations and information	Board of Selectmen	Town funds	To be determined	**Completed & Deferred:** Town's website became active in 2009 and has recently been enhanced; deferred to add an emergency page to the website. **Action Item #3**

Priority Score	Action	Description of Potential Strategy	Who is Responsible?	How will it be funded?	When will it be implemented?	Completed, Deleted, Deferred
24	Posters	Create and distribute posters containing emergency information such as contacts, shelters, evacuation procedures and emergency alerts.	Board of Selectmen, Emergency Management Director	Town funds	1 year	**Completed & Deferred:** The Town sends newsletters to all taxpayers that include emergency information and other pertinent information for the community; this type of information will also be included on the website. **Action Item #3**
24	Library information	Library of emergency information located in one facility (EOC). Information would include maps, evacuation routes, contacts, etc.	Board of Selectmen, Emergency Management Director	Town funds	1 year	**Completed & Deferred:** Some of the information that is mentioned in this strategy is now part of this Hazard Mitigation Plan; other information will become part of the Town's new EOP. **Action Item #5**

Chapter 8: New & Potential Mitigation Strategies & the STAPLEE

A. Types of Mitigation Strategies

The following list of mitigation categories and possible strategy ideas was compiled from a number of sources including the USFS, FEMA, other Planners and past hazard mitigation plans. This list was used during a brainstorming session to discuss what issues there may be in Town. Team involvement and the brainstorming sessions proved helpful in bringing new ideas, better relationships and a more in depth knowledge of the community.

Prevention

- Forest fire fuel reduction programs
- Special management regulations
- Fire Protection Codes NFPA 1
- Firewise Landscaping
- Culvert and hydrant maintenance
- Planning and zoning regulations
- Building Codes
- Density controls
- Driveway standards
- Slope development regulations
- Master Plan
- Capital improvement program
- Rural Fire Water Resource Plan
- NFIP Compliance

Public Education and Awareness

- Hazard information centers
- Public education and outreach programs
- Emergency website creation
- "Firewise" training
- NFIP awareness
- Public hazard notification
- Defensible space brochures

Emergency Service Protection

- Critical facilities protection
- Critical infrastructure protection
- Emergency training for Town officials
- Ongoing training for first responders

Property Protection

- Current use or other conservation measures
- Transfer of development rights
- Firewise Landscaping
- Water Drafting Facilities
- High risk notification for homeowners
- Structure elevation
- Real estate disclosures
- Flood proofing
- Building Codes
- Development regulations

Natural Resource Protection

- Best management practices within the forest
- Forest and vegetation management
- Forestry and landscape management
- Wetlands development regulations
- Watershed management
- Erosion Control
- Soil Stabilization
- Open space preservation initiatives

Structural Projects

- Structure acquisition and demolition
- Structure acquisition and relocation
- Bridge replacement
- Dam Removal
- Culvert up-size and/or realignment

B. More Potential Mitigation Strategies

In order to further promote the concept of mitigation, the Town was provided with a flier that was developed by Mapping and Planning Solutions and used to determine what additional mitigation action items might be appropriate for the Town. The mitigation strategies from that flier are listed on the following two pages; each item from this comprehensive list of possible mitigation strategies was considered by the Planning Team to determine if any of these strategies could be put in place for Brookfield with special emphasis on new and existing buildings and infrastructure.

Strategies that may apply to more than one hazard	**Type of Project**
Community Outreach and Education	*Public Awareness*
Changes to Zoning Regulations	*Prevention*
Changes to Subdivision Regulations	*Prevention*
Steep Slopes Ordinance	*Prevention*
Density Controls	*Prevention*
Driveway Standards	*Prevention*
Emergency Website Creation	*Public Awareness*
Critical Infrastructure & Key Resources	*Emergency Service Protection*
Emergency Training for Town Officials	*Emergency Service Protection*
High Risk Notification to Homeowners	*Property Protection*
Master Plan Update or Development	*Prevention*
Capital Improvement Plan	*Prevention*

Flood Mitigation Ideas	**Type of Project**
Storm Water Management Ordinances	*Prevention*
Floodplain Ordinances	*Prevention*
Updated Floodplain Mapping	*Prevention*
Watershed Management	*Natural Resource Protection*
Drainage Easements	*Prevention*
Purchase of Easements	*Prevention*
Wetland Protection	*Natural Resource Protection*
Structural Flood Control Measures	*Prevention*
Bridge Replacement	*Structural Project*
Dam Removal	*Structural Project*
NFIP Compliance	*Prevention*
Acquisition, Demolition & Relocation	*Structural Project*
Structure Elevation	*Structural Project*
Flood Proofing	*Property Protection*
Erosion Control	*Natural Resource Protection*
Floodplain/Coastal Zone Management	*Prevention*
Building Codes Adoption or Amendments	*Prevention*
Culvert & Hydrant Maintenance	*Prevention*
Culvert & Drainage Improvements	*Structural Protection*
Transfer of Development Rights	*Property Protection*

Natural Hazard Mitigation Ideas	Type of Project
Landslide	
Slide-Prone Area Ordinance	*Prevention*
Drainage Control Regulations	*Prevention*
Grading Ordinances	*Prevention*
Hillside Development Ordinances	*Prevention*
Open Space Initiatives	*Prevention*
Acquisition, Demolition & Relocation	*Structural Project*
Vegetation Placement and Management	*Natural Resource Protection*
Soil Stabilization	*Natural Resource Protection*
Thunderstorms & Lightning	
Building construction	*Property Protection*
Tornado & Severe Wind	
Construction Standards and Techniques	*Property Protection*
Safe Rooms	*Prevention*
Manufactured Home Tie Downs	*Property Protection*
Building Codes	*Property Protection*
Wildfire	
Building Codes	*Property Protection*
Defensible Space	*Prevention*
Forest fire fuel reduction	*Prevention*
Burning Restriction	*Property Protection*
Water Resource Plan	*Prevention*
Firewise Training & Brochures	*Public Awareness*
Woods Roads Mapping	*Prevention*
Extreme Temperatures	
Warming & Cooling Stations	*Prevention*
Winter Weather Snowstorms	
Snow load design standards	*Property Protection*
Subsidence	
Open Space	*Natural Resource Protection*
Acquisition, Demolition & Relocation	*Structural Project*
Earthquake	
Construction Standards and Techniques	*Property Protection*
Building Codes	*Property Protection*
Bridge Strengthening	*Structural Project*
Infrastructure Hardening	*Structural Project*
Drought	
Water Use Ordinances	*Prevention*

C. STAPLEE Methodology

Table 8.1 reflects the newly identified potential hazard and wildfire/structure fire mitigation action items as well as the results of the STAPLEE Evaluation as explained below. It should also be noted that although some areas are identified as "All Hazards", many of these would apply indirectly to wildfire/structure fire response and capabilities. Many of these potential mitigation action items overlap.

The goal of each proposed mitigation action item is the "reduction or prevention of damage from a natural or human-caused event". To determine the effectiveness of each mitigation action item in accomplishing this goal, a set of criteria that was developed by FEMA known as the STAPLEE Method, was applied to each proposed action item.

The STAPLEE method analyzes the **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic and **E**nvironmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation action items discussed in Table 8.1.

Social: ..... Is the proposed action item socially acceptable to the community? Is there an equity issue involved that would result in one segment of the community being treated unfairly?

Technical: ..... Will the proposed action item work? Will it create more problems than it solves?

Administrative: ..... Can the community implement the action item? Is there someone to coordinate and lead the effort?

Political: ..... Is the action item politically acceptable? Is there public support both to implement and to maintain the project?

Legal: ..... Is the community authorized to implement the proposed action item? Is there a clear legal basis or precedent for this activity?

Economic: ..... What are the costs and benefits of this action item? Does the cost seem reasonable for the size of the problem and the likely benefits?

Environmental: ..... How will the action item impact the environment? Will it need environmental regulatory approvals?

Each proposed mitigation action item was then evaluated and assigned a score based on the above criteria. Each of the STAPLEE categories was discussed and was awarded the following scores:

Good: 3 **Average: 2** **Poor: 1**

An evaluation chart with total scores for each new action item is shown in Table 8.1.

The STAPLEE methodolgy also detailed the estimated cost of the proposed action item and the type of action item according to the following criteria:

- The Action Item cost was estimated to be:
    - **Low** ($0-$1,000 or staff time only)
    - **Medium** ($1,000-$10,000)
    - **High** ($10,000 or more)

- The "Type" of Action Item was considered to be (see page 71 for more information):
    - **Prevention**
    - **Public Education & Awareness**
    - **Emergency Service Protection**
    - **Property Protection**
    - **Natural Resource Protection**
    - **Structural Projects**

Please note that in addition to these strategies, the Mitigation Recommendations from the Rural Water Fire Resource Plan are included by reference and can be found on page 121 of this Plan.

D. Team's Understanding of Hazard Mitigation Action Items

The Team determined that any strategy designed to reduce personal injury or damage to property that could be done prior to an actual disaster would be listed as a potential mitigation strategy. This decision was made even though not all projects listed in Tables 8.1 and 9.1 (Implementation Table) are fundable under FEMA pre-mitigation guidelines. The Team determined that this Plan was in large part a management document designed to assist the Board of Selectmen and other town officials in all aspects of managing and tracking potential emergency planning strategies. For instance, the Team was aware that some of these strategies are more properly identified as readiness issues. The Team did not want to "lose" any of the ideas discussed during these planning sessions and thought this method was the best way to achieve that objective.

Also, it should be noted that the Town understands that the "Mitigation Action Items" for a town of 200 are not the same as the "Mitigaiton Action Items" for a town of 30,000. In addition, the "Mitigation Action Items" for a town in the middle of predominantly hardword forests, are not the same as the "Mitigation Action Items" for a town on the Jersey Shore. Therefore the Town of Brookfield has accepted the "Mitigation Action Items" in Tables 8.1 and 9.1 as the complete list of "Mitigation Action Items" for this Town and only this Town and hereby indicates that having carefully discussed other possible mitigation strategies (see pages 71-73 and Appendix D) for this Plan, there are no additional "Mitigation Action Items" to add at this time.

Table 8.1: Potential Mitigation Action Items & STAPLEE

- *Potential mitigation action items are listed in numerical order and indicate if they were derived from prior tables in this Plan.*
- *Items in green such as (MU14) represent mitigation strategies taken from Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013; see Appendix D for more information.*

New Mitigation Project	Affected Location	STAPLEE TTL	S	T	A	P	L	E	E
(1) Advise the public about the local flood hazard, flood insurance and flood protection measures (F10) by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Offices; give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether or not they are in the flood zone. **(Table 7.1)**	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(2) Through Public Outreach and the Town's website, educate homeowners regarding the risks of building in the flood zone and measures that can be taken to reduce the chance of flooding, and the need to secure debris, propane tanks, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard if picked up and washed away by floodwaters (F23); establish an interactive website for educating the public on flood hazard mitigation and preparedness measures (MU14). **(Table 7.1)**	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(3) Establish an interactive website for educating the public on hazard mitigation and preparedness measures (MU14) by adding a page to the Town's recently enhanced website that will include such information as emergency contacts, shelter locations, evacuation routes (SW7, WF11 & T3), methods of emergency alerting, 911 compliance, water saving techniques (D9), earthquake risk and mitigation activities that can be taken in residents' homes (EQ7), steps homeowners can take to protect themselves and their properties when extreme temperatures occur (ET1 & ET4), safety measures that can be taken during hail (HA3) and lightning storms (L2), mitigation techniques for property protection and links to available sources; educate homeowners regarding the risks of building in hazard zones and encourage homeowners to install carbon monoxide monitors and alarms (WW5). **(Tables 6.1 & 7.1)**	Town Offices	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(4) Review the Town's Subdivision Regulations to insure that the need for dry hydrants, cisterns and/or fire breaks is adequately addressed for new subdivisions; address density and quantity of development, as well as emergency access, landscaping and water supply (WF3). **(Table 7.1)**	Town Wide	20	3	3	3	2	3	3	3
			Political: Developers may not want to deal with costs and maintenance issues						
(5)) Include this Hazard Mitigation Plan as stand-alone Annex to an updated Emergency Operations Plan; include the 16 ESF format and hazard annexes for hurricanes, ice storms, flooding and other hazards determined at the time of the update so that a knowledgeable response team can better mitigate the effects of hazards prior to and during an event. **(Tables 6.1 & 7.1)**	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						

New Mitigation Project	Affected Location	STAPLEE TTL	S	T	A	P	L	E	E
(6) Review the Town's firefighting water resources, establish a hydrant maintenance program to routinely inspect the functionality of fire hydrants (WF8) and consider locations for dry hydrants and fire breaks in existing developments. **(Table 7.1)**	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(7) NIMS & ICS Training for Town Officials in order to have better trained individuals handling disaster events so that the effects of the event can be mitigated. (Table 6.1)	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(8) Review E-911 system to determine compliance with regards to signage, community participation and enforcement of 911 ordinances in order to mitigate losses at the time of a hazardous event. **(Table 6.1)**	Town Wide	20	3	3	3	2	3	3	3
			Political: Some may not want to comply						
(9) Require and maintain safe access for fire apparatus to wildland-urban interface neighborhoods and properties (WF8) by advising residents who live on private roads of the importance of maintaining their roads for first responders; add to website.	Class VI & Private Roads	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(10) Update the Master Plan; incorporate risk assessment and hazard mitigation principles into the development of the Master Plan. (MU6) **(Table 6.1)**	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(11) Complete the Capital Improvement Plan and review mitigation action items from this Plan for inclusion; prohibit or limit public expenditures for capital improvements. (MU3)	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(12) Complete a Rural Fire Water Resource Plan and include it as an addendum to this Plan.	EMD	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(13) Obtain and have available "Firewise" brochures to educate homeowners on methods to reduce fire risk around their homes (WF10); provide "Firewise" brochures to those residents seeking burn permits; advise residents of the importance of maintaining defensible space, the safe disposal of yard and household water and the removal of deal or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches and yards. (WF12)	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						
(14) Join the NH Public Works Mutual Aid so that access to more and perhaps better equipment and resources will be available to mitigate the effects of hazards.	Town Wide	21	3	3	3	3	3	3	3
			No apparent difficulties with this action item.						

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Chapter 9: Action Plan for Prioritized Mitigation Action Items

A. Priority Methodology

After reviewing the finalized STAPLEE numerical ratings, the Team prepared to develop Table 9.1, The Mitigation Action Plan (Table 9.1). To do this, team members created four categories into which they would place all the potential mitigation action items.

- **Category 0** was to include those items which are being done and will continue to be done in the future.
- **Category 1** was to include those items under the direct control of town officials, within the financial capability of the Town using only town funding, those already being done or planned, and those that could generally be completed within one year.
- **Category 2** was to include those items that the Town did not have sole authority to act upon, those for which funding might be beyond the Town's capability, and those that would generally take between 13—24 months.
- **Category 3** was to include those items that would take a major funding effort, those that the Town had little control over the final decision, and those that would take in excess of 24 months to complete.

Each potential mitigation action item was placed in one of these four categories and then those strategies were prioritized within each category according to cost-benefit, time frame and capability. Actual cost estimates were unavailable during the planning process, although using the STAPLEE process along with the methodology detailed above and a Low-High estimate (see page 80) the Team was able to come up with a general consensus on cost-benefit for each proposed action item.

The Team also considered the following criteria while ranking and prioritizing each action item:

- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Does the action keep in mind future development?
- Can the action be implemented quickly?

The prioritization exercise helped the committee seriously evaluate the new hazard mitigation strategies that they had brainstormed throughout the hazard mitigation planning process. While all actions would help improve the Town's hazard and wildfire/structure fire responsiveness capability, funding availability will be a driving factor in determining what and when new mitigation action items are implemented.

B. Who, When, How?

Once this was completed, the Team developed an Action Plan that outlined who is responsible for implementing each action item, as well as when and how the actions will be implemented. The following questions were asked in order to develop a schedule for the identified 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?

In addition to the prioritized mitigation action items, Table 9.1, The Mitigation Action Plan, includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN).

Some projects, including most training and education of residents on emergency and evacuation procedures, could be tied into the emergency operation plan and implemented through that planning effort.

C. Table 9.1

Table 9.1 list Mitigation Action Items preceded by Problem Statements that were expressed by the Planning Team. These strategies are listed in order of priority and indicate if they were derived from prior tables in this Plan.

The Estimated Cost was determined using the following criteria:

- **Low ($0 - $1,000 or staff time only)**
- **Medium ($1,000-$10,000)**
- **High ($10,000 or more)**

Items in green such as (MU14) represent mitigation strategies taken from Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013; see Appendix D for more information.

Table 9.1: The Mitigation Action Plan

Rank	Problem Statement	Mitigation Action Item	Type of Hazard	Responsible Department	Funding or Support	Timeframe	Est. Cost
0-1	Not all Town Officials (those who would respond at the time of an emergency) have been trained in ICS 100 & 200 and NIMS 700.	**(7)** NIMS & ICS Training for Town Officials in order to have better trained individuals handling disaster events so that the effects of the event can be mitigated. (Table 6.1)	All Hazards	Emergency Management Director	Local	As there are new hires between 2014-2019	Low
1-1	Residents are not aware of emergency procedures or preventative techniques that can be done to protect their lives and property. Public Outreach in communities where broadband is readily available is one method of communicating with the many of the Town's residents.	**(3)** Establish an interactive website for educating the public on hazard mitigation and preparedness measures (MU14) by adding a page to the Town's recently enhanced website that will include such information as emergency contacts, shelter locations, evacuation routes (SW7, WF11 & T3), methods of emergency alerting, 911 compliance, water saving techniques (D9), earthquake risk and mitigation activities that can be taken in residents' homes (EQ7), steps homeowners can take to protect themselves and their properties when extreme temperatures occur (ET1 & ET4), safety measures that can be taken during hail (HA3) and lightning storms (L2), mitigation techniques for property protection and links to available sources; educate homeowners regarding the risks of building in hazard zones and encourage homeowners to install carbon monoxide monitors and alarms (WW5). **(Tables 6.1 & 7.1)**	All Hazards including: Severe Wind, Drought, Earthquake, Extreme Temperatures, Hail, Lightning, Severe Winter Weather, Tornado & Wildfire	Select Board & Emergency Management Director	Local	09/27/14	Low

Rank	Problem Statement	Mitigation Action Item	Type of Hazard	Responsible Department	Funding or Support	Timeframe	Est. Cost
1-2	The Town's Highway Department may not have sufficient equipment to handle hazard events; the Town does not belong to the NH Municipal Mutual Aid for Public Works; this association will help the Highway Department get additional equipment if needed.	**(14)** Join the NH Public Works Mutual Aid so that access to more and perhaps better equipment and resources will be available to mitigate the effects of hazards.	All Hazards	Select Board & Road Agent	Local	09/27/14	Low
1-3	The Town of Brookfield has not completed a Rural Fire Water Resource Plan; completion will assist the Town in understanding limitations of fire suppression water resources.	**(12)** Complete a Rural Fire Water Resource Plan and include it as an addendum to this Plan.	Wildfire / Structure Fire	Emergency Management Director	Local & Grants	06/27/14	Low
1-4	There are not enough water sources in existing developments to offer the best fire suppression; locations for water resources are limited.	**(6)** Review the Town's firefighting water resources, establish a hydrant maintenance program to routinely inspect the functionality of fire hydrants (WF8) and consider locations for dry hydrants and fire breaks in existing developments. **(Table 7.1)**	Wildfire / Structure Fire	Emergency Management Director	Local	09/27/14	Low

Rank	Problem Statement	Mitigation Action Item	Type of Hazard	Responsible Department	Funding or Support	Timeframe	Est. Cost
1-5	Residents may not be aware of the factors that impede emergency response.	(9) Require and maintain safe access for fire apparatus to wildland-urban interface neighborhoods and properties (WF8) by advising residents who live on private roads of the importance of maintaining their roads for first responders; add to website.	Wildfire & All Hazards	Select Board	Local	09/27/14	Low
1-6	Residents may not be aware of the steps they can take to reduce the risk of wildfire at their homes.	**(13)** Obtain and have available "Firewise" brochures to educate homeowners on methods to reduce fire risk around their homes (WF10); provide "Firewise" brochures to those residents seeking burn permits; advise residents of the importance of maintaining defensible space, the safe disposal of yard and household water and the removal of deal or dry leaves, needles, twigs, and combustible materials from roofs, decks, eaves, porches and yards. (WF12)	Wildfire / Structure Fire	Forest Fire Warden	Local	09/27/14	Low
1-7	Residents may not be aware of the risk of building in the floodplain and the steps they can take to reduce flooding.	**(2)** Through Public Outreach and the Town's website, educate homeowners regarding the risks of building in the flood zone and measures that can be taken to reduce the chance of flooding, and the need to secure debris, propane tanks, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard if picked up and washed away by floodwaters (F23); establish an interactive website for educating the public on flood hazard Mitigation and preparedness measures (MU14). **(Table 7.1)**	Flooding	Select Board	Local	09/27/14	Low
1-8	Residents and Builders may not be aware of flood regulations & the availability of flood insurance through the NFIP.	**(1)** Advise the public about the local flood hazard, flood insurance and flood protection measures (F10) by obtaining and keeping on hand a supply of NFIP brochures to have available in the Town Offices; give NFIP materials to homeowners and builders when proposing new development or substantial improvements; encourage property owners to purchase flood insurance (F22), whether or not they are in the flood zone. **(Table 7.1)**	Flooding	Code Enforcement Officer	Local	09/27/14	Low

Rank	Problem Statement	Mitigation Action Item	Type of Hazard	Responsible Department	Funding or Support	Timeframe	Est. Cost
2-1	There are currently too many driveways (approximately 35%) that still do not have the appropriate 911 markers; the Select Board should consider reviewing the ordinance requiring 911 markers and should consider additional ways to enforce the ordinance, perhaps through fines.	**(8)** Review E-911 system to determine compliance with regards to signage, community participation and enforcement of 911 ordinances in order to mitigate losses at the time of a hazardous event. **(Table 6.1)**	All Hazards	Select Board	Local	11/25/14	Low
2-2	New Town Employees and Emergency Responders may not be familiar with the emergency procedures that are outlined in the Town's EOP and the current EOP (2002) is not written in the 16 ESF format.	**(5)**) Include this Hazard Mitigation Plan as stand-alone Annex to an updated Emergency Operations Plan; include the 16 ESF format and hazard annexes for hurricanes, ice storms, flooding and other hazards determined at the time of the update so that a knowledgeable response team can better mitigate the effects of hazards prior to and during an event. **(Tables 6.1 & 7.1)**	All Hazards	Emergency Management Director	Local & Grants	03/27/15	Medium
2-3	The Town of Brookfield does not have a completed Capital Improvement Plan.	**(11)** Complete the Capital Improvement Plan and review mitigation action items from this Plan for inclusion; prohibit or limit public expenditures for capital improvements. (MU3)	All Hazards	Select Board, Planning Board & Department Heads	Local	11/25/14	Low

Rank	Problem Statement	Mitigation Action Item	Type of Hazard	Responsible Department	Funding or Support	Timeframe	Est. Cost
2-4	Regulations for fire suppression capabilities in new subdivisions may not be adequate.	**(4)** Review the Town's Subdivision Regulations to insure that the need for dry hydrants, cisterns and/or fire breaks is adequately addressed for new subdivisions; address density and quantity of development, as well as emergency access, landscaping and water supply (WF3). **(Table 7.1)**	Wildfire / Structure Fire	Planning Board	Local	03/27/15	Low
3-1	The current Master Plan makes no reference to the projects that are in the Hazard Mitigation Plan and will be in need of an update by 2016	**(10)** Update the Master Plan; incorporate risk assessment and hazard mitigation principles into the development of the Master Plan. (MU6) **(Table 6.1)**	All Hazards	Planning Board	Local	09/27/17	Medium

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Chapter 10: Adopting, Monitoring, Evaluating and Updating the Plan

A. Hazard Mitigation Plan Monitoring, Evaluation and Updates

A good mitigation plan must allow for updates where and when necessary, particularly since communities may suffer budget cuts or experience personnel turnover during both the planning and implementation states. A good plan will incorporate periodic monitoring and evaluation mechanisms to allow for review of successes and failures or even just simple updates. The Emergency Management Director is responsible for initiating Plan reviews and will consult with members of the hazard mitigation planning team identified in this plan.

The Brookfield Hazard Mitigation Plan Update 2014 is considered a work in progress. There are three situations which will prompt revisiting this plan:

- *First, as a minimum, it **will** be **reviewed annually or after any emergency event** to assess whether the existing and suggested mitigation strategies were successful. This review will focus on the assessment of the Plan's effectiveness, accuracy and completeness in monitoring of the implementation strategy. The review will also address recommended improvements to the Plan as contained in the FEMA plan review checklist, and address any weaknesses the Town identified that the Plan did not adequately address.*
- *Second, the Plan will be thoroughly **updated** every **five years.***
- *Third, if the Town adopts any major modifications to its land use planning documents, the jurisdiction will conduct a Plan review and make changes as applicable.*

In keeping with the process of adopting this hazard mitigation plan, the public and stakeholders will have the opportunity for future involvement as they will be invited to participate in any and all future reviews or updates of this Plan. Public notice before any review or update will be given by such means as: *press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state, and local organizations impacted by the Plan, and posting notices in public places in the Town.* This will ensure that all comments and revisions from the public and stakeholders will be considered. The Emergency Management Director insures that these actions will be done.

Concurrence forms to be used for post-hazard or annual reviews are available in Chapter 11 of this plan. The Town is encouraged to use these forms to document any changes and accomplishments since the development of this Plan. Forms are available for years 1-4, with expectation that the five-year annual update will be in process during the fifth year.

B. Integration with Other Plans

This plan will only enhance mitigation if balanced with all other town plans. Brookfield completed its first Hazard Mitigation Plan in 2007 and has completed many projects from that Plan. The Town was able to integrate these actions into other town activities, plans and mechanisms such as the adoption in 2009 of the International Building Codes, the development of a newly enhanced Town website and the protection of watershed issues by the Conservation Committee. Brookfield will continue to take the necessary steps to incorporate the mitigation strategies and other information contained in this Plan with other town activities, plans and mechanisms, when appropriate. The Town will incorporate elements from this Plan into the following documents:

Master Plan:

Traditionally, Master Plans are updated every 5 to 10 years and detail the use of capital reserves funds and capital improvements within the Town. Brookfield's Master Plan was updated (2006); following the recommended 10-year plan, Brookfield will update their Master Plan by 2016. The next update of the Master Plan will integrate concepts from this Hazard Mitigation Plan and any future updates. **(Action Item #10)**

Brookfield Emergency Operations Plan 2002 (EOP):

The EOP is designed to allow the Town to respond more effectively to disasters as well as mitigate the risk to people and property; EOPs are generally reviewed after each hazardous event and updated on a five-year basis. The Brookfield EOP is in need of a complete rewrite to the State's recommended 16 ESF format. The EOP rewrite which is scheduled for 2014 will include elements from this hazard mitigation plan. **(Action Item #5)**

Town Budget:

During the annual budget planning process, specific mitigation actions identified in this Plan that require Town fiscal support will be reviewed for incorporation into the budget. **(Strategies that require funding from the Town, for example, Action Items #6 and #10)**

Capital Reserve Fund / Capital Improvement Plan:

Brookfield's Capital Reserve Fund program is reviewed periodically as a working document to guide the Town's long term spending. At each annual review of the Capital Reserve Funds, the Town will look at this Plan to incorporate the long terms needs that are identified to keep the community safe from natural and human-caused hazards. In addition, the Town will use elements from this Plan to complete the development of the Town's Capital Improvement Plan **(Action Item #11).**

Subdivision Regulations & Land Use Ordinances:

As time goes by and the needs of the Town change, these ordinances will be reviewed and updated. In coordination with these actions, the Planning Board will review this Hazard Mitigation Plan and incorporate any changes that help mitigate the susceptibility of the community and its citizens to the dangers of natural or human-caused disasters. **(Action Items #4 & #8)**

The local governments will modify other plans and actions as necessary to incorporate hazard and/or wildfire/structure fire issues; the Board of Selectmen ensures this process will be followed in the future. In addition, the Town will review and make note of instances when this has been done and include it as part of their annual review of the Plan.

C. Plan Approval & Adoption

This Plan was completed in a series of open meetings beginning on June 11, 2013. The Plan was presented to the Town for review, submitted to FEMA for Conditional Approval *(APA, Approved Pending Adoption)*, formally adopted by the Board of Selectmen and resubmitted to FEMA for Final Approval. Once Final Approval from FEMA was met, copies of the Plan were distributed to the Town, HESM, FEMA, DRED and the USDA-FS; the Plan was then distributed as these entities saw fit. Copies of the Plan remain on file with the Town and at Mapping and Planning Solutions (MAPS) in both digital and paper format.

Chapter 11: Signed Community Documents and Approval Letters

A. Scope and Agreement

PLANNING AGREEMENT

HAZARD MITIGATION PLAN UPDATE

Parties to the Agreement

The Town of Brookfield, NH
Mapping and Planning Solutions

Date of the Agreement

February 3, 2011

This Agreement between the Town of Brookfield (the Town) or its official designee and Mapping and Planning Solutions (MAPS) outlines the Town's desire to engage the services of MAPS to assist in planning and technical services in order to produce the 2012 Hazard Mitigation Plan Update (the Plan).

Agreement

This Agreement outlines the responsibilities that will ensure that the Plan is developed in a manner that involves community members and local, federal and state emergency responders and organizations. The Agreement identifies the work to be done by detailing the specific tasks, schedules and finished products that are the result of the planning process.

The goal of this Agreement is that the Plan and planning process be consistent with Town policies and that it accurately reflects the values and individuality of the community. This is accomplished by forming a working relationship between the Town's citizens, the planning team and MAPS.

The Plan created as a result of this Agreement will be presented to the Town for adoption once conditional approval is received from FEMA. When adopted, the Plan provides guidance to the Town, commissions, and departments; adopted plans serve as a guide and do not include any financial commitments by the Town. Additionally, all adopted plans should address mitigation strategies for reducing the risk of natural, man-made, and wildfire disasters on life and property and written so that they may be integrated within other community planning initiatives.

Scope of Work

MAPPING AND PLANNING SOLUTIONS' RESPONSIBILITIES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

- MAPS will collect data that is necessary to complete the Plan and meet the requirements of the FEMA Crosswalk by working with the planning team and taking public input from community members.
- With the assistance of the planning team, MAPS will coordinate and facilitate meetings and provide any materials, handouts and maps necessary to provide a full understanding of each step in the planning process.
- MAPS will assist the Team in the development of goals, objectives and implementation strategies and clearly define the processes needed for future Plan monitoring, educating the public and integrating the Plan with other Town plans and activities.
- MAPS will coordinate and collaborate with other federal, state and local agencies throughout the process.
- MAPS will explain and delineate the community's Wildland Urban Interface (WUI) and, working with the Team, will establish a list of potential hazards and analyze the risk severity of each.
- MAPS will author, edit and prepare the Plan for review by the Team prior to submitting the Plan to FEMA for conditional approval. Upon conditional approval by FEMA, MAPS will assist the planning team as needed with presentation of the Plan to the Town Select Board and/or Planning Board and continue to work with the Town until final approval and distribution of the Plan is complete, unless extraordinary circumstances prevail.
- MAPS shall provide, at its office, all supplies and space necessary to complete the Town's Hazard Mitigation Plan.

- After final approval is received from FEMA, MAPS will provide the Town with one copy of the Plan containing all signed documents, approvals and GIS maps along with a CD containing these same documents in digital form, for distribution by the Town as it sees fit. Additional copies of the Plan will be distributed by MAPS to collaborating agencies including, but not limited to, NH Homeland Security (HSEM) and FEMA.

- MAPS will provide Plan maintenance assistance on an annual basis leading up to the next five-year Plan update at no cost to the Town.

THE TOWN'S RESPONSIBILITIES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

- The Town shall insure that the planning team includes members who are able to support the planning process by identifying available community resources including people who will have access to and can provide pertinent data. The planning team should include, but not be limited to, such community members as the local Emergency Management Director, the Fire and Police Chiefs, representatives from the relative federal and state organizations, other local officials, property owners, and relevant businesses or organizations.

- The Town shall determine a lead contact to work with Mapping and Planning Solutions. This contact shall assist with recruiting participants for planning meetings, including the development of mailing lists when and if necessary, distribution of flyers, and placement of meeting announcements in the community. In addition, this contact shall assist Mapping and Planning Solutions with organizing public meetings to develop the plan and offer assistance to Mapping and Planning Solutions in developing the work program which will produce the Plan.

- The Town shall gain the support of stakeholders for the recommendations found within the Plan.

- The Town shall provide public access for all meetings and provide public notice at the start of the planning process and at the time of adoption, as required by FEMA.

- The proposed Plan shall be submitted to the Town Select Board and/or Planning Board for consideration and adoption.

- After adoption and final approval from FEMA is received, the Town will:
  - *Distribute copies of the Plan as it sees fit throughout the local community.*
  - *Develop a team to monitor and work toward plan implementation.*
  - *Publicize the Plan to the Town and insure community awareness.*
  - *Urge the Planning Board to incorporate priority projects into the community's Capital Improvement Plan (if available).*
  - *Integrate mitigation strategies and priorities from the Plan into other town plans.*

Terms

- **Fees and Payment Schedule**: The contract price is limited to $4,995. Payments shall be made according to the following schedule after acknowledgement from HSEM that funding is in place.

  - 1. Initial payment upon signing of this contract and receipt of first invoice $2,400
  - 2. Second payment upon Plan submittal to FEMA for Conditional Approval $2,400
  - 3. Final payment upon project completion and receipt of final Plan copy $195

  Total Fees..... $4,995

- **Required Matching Funds:** The Town of Brookfield will be responsible to provide and document any and all resources to be used to meet the FEMA required matching funds. Matching funds are the responsibility of the Town of Brookfield, not MAPS. Mapping and Planning Solutions will however assist the Town with attendance tracking by asking meeting attendees to "sign in" at all meetings and to "log" any time spent outside of the meetings working on this project. MAPS will provide the Town with final attendance records in spreadsheet form at project's end for the Town to use in its match fulfillment.
- **Project Period:** This project shall begin upon signing this Agreement by both parties and continue through June 30, 2013, at which time the planning process should be complete. The project period may be extended by mutual written Agreement between the Town and MAPS. The actual project end date is dependent upon timely adoptions and approvals which are outside of the control of Mapping and Planning Solutions and the Town in general.

- **Ownership of Material:** All maps, reports, documents and other materials produced during the project period shall be owned by the Town; each party may keep file copies of any generated work. MAPS shall have the right to use work

products collected during the planning process; however, MAPS shall not use any data in such a way as to reveal personal or public information about individuals or groups which could reasonably be considered confidential.

- **Termination:** This Agreement may be terminated if both parties agree in writing. In the event of termination, MAPS shall forward all information prepared to date to the Town. MAPS shall be entitled to recover its costs for any work that was completed.

- **Limit of Liability:** MAPS agrees to perform all work in a diligent and efficient manner according to the terms of this Agreement. MAPS' responsibilities under this Agreement depend upon the cooperation of the Town of Brookfield. MAPS and its employees, if any, shall not be liable for opinions rendered, advice, or errors resulting from the quality of data that is supplied. Adoption of the Plan by the Town and final approval of the Plan by FEMA, relieve MAPS of content liability.

- **Amendments**: Changes, alterations or additions to this Agreement may be made if agreed to in writing between both the Town of Brookfield and Mapping and Planning Solutions.

- **Contacts:**

Mapping and Planning Solutions
June Garneau
Mapping and Planning Solutions
P.O. Box 283, 91 Cherry Mountain Place
Twin Mountain, NH 03595-0283
jgarneau@mappingandplanning.com
(603) 846-5720; (603) 991-9664

Town of Brookfield
Brad Williamson
Emergency Management Director
2 Lyford Road
Brookfield, NH 03872
email: janbrad@roadrunner.com
(603) 522-6018

FOR THE TOWN OF BROOKFIELD, NH

Signature
Brad Williamson
Brookfield, NH

5/15/2011
Date

FOR MAPPING AND PLANNING SOLUTIONS

Signature
June Garneau, Owner
Mapping and Planning Solutions, Carroll, NH

Date

Signatures are scanned facsimile; original signatures are on file

B. Approved Pending Adoption (APA) Notification from FEMA

Brookfield, NH Approval Pending Adoption

Hilliard, Marilyn <Marilyn.Hilliard@fema.dhs.gov>

Sent: Mon 6/16/2014 1:43 PM
To: selectmen@brookfieldnh.org; janbrad@roadrunner.com; jgarneau@mappingandplanning.com
Cc: Peck, Elizabeth; Moore, Parker; NH MIT Plans; Ndikum-Nyada, Brigitte; Johnson, Nan; Lavallee, Denise

Congratulations!

FEMA Region I has completed its review of the Brookfield, NH Multi-Hazard Mitigation Plan and found it approvable pending adoption. With this approval, the jurisdiction meets the local mitigation planning requirements under 44 CFR 201 **pending FEMA's receipt of electronic copies of the adoption documentation and the final plan**. These items should be provided to your state's mitigation planning point of contact who will ensure they are forwarded to FEMA. Acceptable electronic formats include Word or PDF files and must be submitted to us via email at ***fema-r1-mitigationplans@fema.dhs.gov***. Upon FEMA's receipt of these documents, a formal letter of approval will be issued, along with the final FEMA Checklist and Assessment.

The FEMA letter of formal approval will confirm the jurisdiction's eligibility to apply for Mitigation grants administered by FEMA and identify related issues affecting eligibility, if any. If the plan is not adopted within one calendar year of FEMA's Approval Pending Adoption, the jurisdiction must update the entire plan and resubmit it for FEMA review. If you have questions or wish to discuss this determination further, please contact me at marilyn.hilliard@fema.gov or 617-956-7536.

Thank you for submitting Brookfield's Multi-Hazard Mitigation Plan and congratulations again on your successful community planning efforts.

marilyn.hilliard@fema.dhs.gov
Mitigation Division, FEMA Region I
99 High St., 6th fl., Boston, MA 02110
617-956-7536 phone
617-956-7574 fax

Signatures are scanned facsimile; original signatures are on file

C. Signed Certificate of Adoption

CERTIFICATE OF ADOPTION

BROOKFIELD, NH

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE TOWN OF BROOKFIELD,

AZARD MITIGATION PLAN UPDATE 2014

WHEREAS, the Town of Brookfield has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in this plan, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Brookfield has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2014 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between August 21, 2012 and March 18, 2013 regarding the development and review of the Hazard Mitigation Plan Update 2014 and

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

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

Brookfield, Hazard Mitigation Plan Certificate of Adoption, page two

3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution;

4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by the Emergency Management Director.

Adopted this day, the _____ of _____, 2014

_____
Rich Zacher
Chairman of the Board of Selectmen

_____
Brian Robischeau
Vice Chairman of the Board of Selectmen

_____
William Nelson
Member of the Board of Selectmen

_____
Brad Williamson
Emergency Management Director

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Brookfield on this day, _____, 2014

_____
Notary

_____
Expiration

_____
Date

Signatures are scanned facsimile; original signatures are on file.

D. Final Approval Letter from FEMA

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APPROVAL LETTER FROM
FEMA WHEN RECEIVED.

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APPROVAL LETTER FROM

FEMA WHEN RECEIVED.

Signatures are scanned facsimile; original signatures are on file

E. CWPP Approval Letter from DRED

Brookfield, NH
A Resolution Approving the
Brookfield Hazard Mitigation Plan Update 2014
As a Community Wildfire Protection Plan

Several public meetings and committee meetings were held between August 21, 2012 and March 18, 2013 regarding the development and review of the Brookfield Hazard Mitigation Plan Update 2014. The Brookfield Hazard Mitigation Plan Update 2014 contains potential future projects to mitigate hazard and wildfire/structure fire damage in the Town of Brookfield.

The Fire Chief along with the Select Board and EMD desire that this Plan and be accepted by the Department of Resources and Economic Development (DRED) as a Community Wildfire Protection Plan, having adhered to the requirements of said Plan.

The Select Board, EMD and the Brookfield Fire Chief approve the Brookfield Hazard Mitigation Plan Update 2014 and understand that with approval by DRED, this Plan will also serve as a Community Wildfire Protection Plan.

For the Town of Brookfield

APPROVED and SIGNED this day, _____, 2014.

_____
Chairman Select Board

_____
Emergency Management Director

_____
Fire Chief

For the Department of Resources and Economic Development

APPROVED and SIGNED this day, _____, 2014.

_____
Forest Ranger – NH Division of Forest and Lands, DRED

APPROVED and SIGNED this day, _____, 2014.

_____
Director – NH Division of Forest and Lands, DRED

Signatures are scanned facsimile; original signatures are on file

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F. Annual Review or Post Hazard Concurrence Forms

YEAR ONE

Check all that apply

☐ Annual Review & Concurrence - **Year One**: _____ (Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Brookfield, NH shall execute this page annually by the members of the Town's governing body and the Town's designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state, and local organizations impacted by the Plan, and posting notices in public places in the Town.

Brookfield Hazard Mitigation Plan Update 2014

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Select Board Chair

Changes and notes regarding the 2014 Hazard Mitigation Plan

_____

_____

_____

_____

_____

Please use reverse side for additional notes ➡

Additional Notes – Year One:

YEAR TWO

Check all that apply

☐ Annual Review & Concurrence - **Year Two**: _____ (Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Brookfield, NH shall execute this page annually by the members of the Town's governing body and the Town's designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state, and local organizations impacted by the Plan, and posting notices in public places in the Town.

Brookfield Hazard Mitigation Plan Update 2014

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Select Board Chair

Changes and notes regarding the 2014 Hazard Mitigation Plan

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Please use reverse side for additional notes 

Additional Notes – Year Two:

YEAR THREE

Check all that apply

☐ Annual Review & Concurrence - **Year Three**: _____ (Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Brookfield, NH shall execute this page annually by the members of the Town's governing body and the Town's designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state, and local organizations impacted by the Plan, and posting notices in public places in the Town.

Brookfield Hazard Mitigation Plan Update 2014

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Select Board Chair

Changes and notes regarding the 2014 Hazard Mitigation Plan

_____

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Please use reverse side for additional notes 

Additional Notes – Year Three:

YEAR FOUR

Check all that apply

☐ Annual Review & Concurrence - **Year Four**: _____ (Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

☐ Annual Review & Concurrence – Post Hazardous Event: _____ (Event/Date)

The Town of Brookfield, NH shall execute this page annually by the members of the Town's governing body and the Town's designated Emergency Management Director after inviting the public to attend any and all hearings that pertain to this annual and/or post hazard review and/or update by means such as press releases in local papers, posting meeting information on the Town website and at the Town Hall, sending letters to federal, state, and local organizations impacted by the Plan, and posting notices in public places in the Town.

Brookfield Hazard Mitigation Plan Update 2014

REVIEWED AND APPROVED

DATE: _____

SIGNATURE: _____

PRINTED NAME: _____

Emergency Management Director

CONCURRENCE OF APPROVAL

SIGNATURE: _____

PRINTED NAME: _____

Select Board Chair

Changes and notes regarding the 2014 Hazard Mitigation Plan

_____

_____

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Please use reverse side for additional notes 

Additional Notes – Year Four:

Chapter 12: Appendices

- APPENDIX A: BIBLIOGRAPHY
- APPENDIX B: TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION
    - *Hazard Mitigation Grant Program (HMGP)*
    - *Pre-Disaster Mitigation (PDM)*
    - *Flood Mitigation Assistance (FMA)*
    - *Repetitive Flood Claims (RFC)*
    - *Severe Repetitive Loss (SRL)*
- APPENDIX C: PRESIDENTIAL DISASTER & EMERGENCY DECLARATIONS
- APPENDIX D: POTENTIAL MITIGATION IDEAS
- APPENDIX E: RURAL FIRE WATER RESOURCE PLAN
- APPENDIX F: ACRONYMS
- APPENDIX G: MAP DOCUMENTS
    - *Map 1 – & Historic Fires & The Wildland Urban Interface (WUI)*
    - *Map 2 – Past & Potential Areas of Concern*
    - *Map 3 – Critical Infrastructure & Key Resources*
    - *WRP Map 4 – Water Resource Sites (Rural Fire Water Resource Plan)*
    - *WRP Map 5 – Potential Protection from 2,000 foot hose lay (Rural Fire Water Resource Plan)*
    - *WRP Map 6 –Selected Sites for Improvement or Development (Rural Fire Water Resource Plan)*

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Appendix A: Bibliography

Documents

- **Local Hazard Mitigation Planning Review Guide**, FEMA, October 2011
- **Local Hazard Mitigation Planning Handbook**, FEMA, March 2013
- **Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards**, FEMA, January 2013
- **Brookfield Subdivision Regulations; Flood Ordinance Section**
- **Brookfield Master Plan, 2006**
- **Hazards Mitigation Plans**
    - Brookfield Hazard Mitigation Plan, 2007
    - Littleton All Hazards Mitigation Plan Update, 2012
    - Jefferson Hazard Mitigation Plan, 2013
    - Sandwich Hazard Mitigation Plan, 2013
- **NH State Multi-Hazard Mitigation Plan**, 2013
    - *http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf*
- **NH Division of Forests and Lands Quarterly Update**
    - *http://www.nhdfl.org/fire-control-and-law-enforcement/fire-statistics.aspx*
- **Disaster Mitigation Act (DMA) of 2000,** Section 101, b1 & b2 and Section 322a
    - *http://www.fema.gov/library/viewRecord.do?id=1935*
- **Economic & Labor Market Information Bureau**, NH Employment Security, 2013; Community Response for Brookfield, Received, 7/9/13, *http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Brookfield.htm*
- **Photos:** Photos taken by June Garneau unless otherwise noted.

Additional Websites

- US Forest Service; *http://www.fs.fed.us*
- US Fire Administration; *http://www.usfa.dhs.gov/*
- US Department of Agriculture Wildfire Programs: *http://www.wildfireprograms.usda.gov/*
- Firewise; *http://www.firewise.org/*
- NH Homeland Security & Emergency Management; *http://www.nh.gov/safety/divisions/hsem/*
- US Geological Society; http://water.usgs.gov/ogw/subsidence.html
- Department Environmental Services; *http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf*
- The Disaster Center (NH); http://www.disastercenter.com/newhamp/tornado.html
- Floodsmart, about the NFIP; *http://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp*
- NOAA, National Weather Service; *http://www.nws.noaa.gov/glossary/index.php?letter=w*
- NOAA, Storm Prediction Center; *http://www.spc.noaa.gov/faq/tornado/beaufort.html*
- NOAA, Index/Heat Disorders; http://www.srh.noaa.gov/ssd/html/heatwv.htm
- National Weather Service; http://www.nws.noaa.gov/om/windchill/
- Center for Disease Control; http://www.bt.cdc.gov/disasters/winter/guide.asp f
- FEMA; *http://www.fema.gov/hazard/hazmat/index.shtm*
- Slate; http://www.slate.com/id/2092969/
- Home Pro Inspections; How Radon Enters a House; *www.homeprocanada.ca/radon/HP_radon.htm*
- NH Office of Energy and Planning; http://www.nh.gov/oep/planning/programs/fmp/join-nfip.htm
- Code of Federal Regulations; Title 14, Aeronautics and Space; Part 1, Definitions and Abbreviations; http://ecfr.gpoaccess.gov
- Federal Aviation Administration; http://faa.custhelp.com
- US Legal, Inc.; http://definitions.uslegal.com/v/violent-crimes/

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Appendix B: Technical and Financial Assistance for Hazard Mitigation

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. Currently, FEMA administers the following HMA grant programs[29]:

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

FEMA's HMA grants are provided to eligible Applicants (States/Tribes/Territories) that, in turn, provide sub-grants to local governments and communities. The Applicant selects and prioritizes subapplications developed and submitted to them by subapplicants. These subapplications are submitted to FEMA for consideration of funding. Prospective subapplicants should consult the office designated as their Applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers is available on the FEMA website, www.fema.gov.

Table 2: Eligible Subapplicants

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

Eligibility Chart taken from the FY 2010 Hazard Mitigation Assistance (HMA) Unified Guidance[30]

HMA Grant Programs

The HMA grant programs provide funding opportunities for pre- and post-disaster mitigation. 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. Brief descriptions of the HMA grant programs can be found below. For more information on the individual programs, or to see information related to a specific Fiscal Year, please click on one of the program links.

A. Hazard Mitigation Grant Program (HMGP)

HMGP assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.

[29] Information in Appendix B is taken from the following website and links to specific programs unless otherwise noted; http://www.fema.gov/government/grant/hma/index.shtm

[30] FY 2010 Hazard Mitigation Assistance (HMA) Unified Guidance; http://www.fema.gov/library/viewRecord.do?id=3649

What is the 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. Authorized under Section 404 of the Stafford Act and administered by FEMA, HMGP was created to reduce the loss of life and property due to natural disasters. The program enables mitigation measures to be implemented during the immediate recovery from a disaster.

Who is eligible to apply?

Hazard Mitigation Grant Program funding is only available to applicants that reside within a presidentially declared disaster area. Eligible applicants are

- State and local governments
- Indian tribes or other tribal organizations
- Certain non-profit organizations

Individual homeowners and businesses may not apply directly to the program; however a community may apply on their behalf.

How are potential projects selected and identified?

The State's administrative plan governs how projects are selected for funding. However, proposed projects must meet certain minimum criteria. These criteria are designed to ensure that the most cost-effective and appropriate projects are selected for funding. Both the law and the regulations require that the projects are part of an overall mitigation strategy for the disaster area.

The State prioritizes and selects project applications developed and submitted by local jurisdictions. The State forwards applications consistent with State mitigation planning objectives to FEMA for eligibility review. Funding for this grant program is limited and States and local communities must make difficult decisions as to the most effective use of grant funds.

For more information on the **Hazard Mitigation Grant Program (HMGP),** go to:
http://www.fema.gov/government/grant/hmgp/index.shtm

B. Pre-Disaster Mitigation (PDM)

PDM provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. The goal of the PDM program is to reduce overall risk to the population and structures, while at the same time, also reducing reliance on Federal funding from actual disaster declarations.

Program Overview

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.

C. Flood Mitigation Assistance (FMA)

FMA provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program.

Program Overview

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.

Types of FMA Grants

Three types of FMA grants are available to States and communities:

- **Planning Grants** to prepare Flood Mitigation Plans. Only NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project grants
- **Project Grants** to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
- **Technical Assistance Grants** for the State to help administer the FMA program and activities. Up to ten percent (10%) of Project grants may be awarded to States for Technical Assistance Grants

D. Repetitive Flood Claims (RFC)

RFC provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% federal funding for projects in communities that meet the reduced capacity requirements.

Program Overview

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).

Federal / Non-Federal Cost Share

FEMA may contribute up to 100 percent of the total amount approved under the RFC grant award to implement approved activities, if the Applicant has demonstrated that the proposed activities cannot be funded under the Flood Mitigation Assistance (FMA) program.

E. Severe Repetitive Loss (SRL)

SRL provides funds on an annual basis to reduce the risk of flood damage to residential structures insured under the NFIP that are qualified as severe repetitive loss structures. SRL provides up to 90% federal funding for eligible projects.

Program Overview

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).

Definition

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.

Purpose

To reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the National Flood Insurance Fund (NFIF).

Federal / Non-Federal cost share

75 / 25 %; up to 90 % Federal cost-share funding for projects approved in States, Territories, and Federally-recognized Indian tribes with FEMA-approved Standard or Enhanced Mitigation Plans or Indian tribal plans that include a strategy for mitigating existing and future SRL properties.

Appendix C: NH Presidential Disaster & Emergency Declarations

NH Presidential Disaster Declarations (DR) since 1953				
Number	**Description**	**Date of Event**	**Counties**	**Description**
DR-4139	Severe Storms, Flooding	July 9-10, 2013	Cheshire, Sullivan & Grafton	**Presidential Emergency Declaration DR-4139:** Severe storms, flooding, and landslides during the period of June 26 to July 3, 2013 in Cheshire, Sullivan and southern Grafton Counties.
DR-4105	Severe Winter Storm	February 8, 2013	All Ten NH Counties	**Presidential Emergency Declaration DR-4105:** Nemo; heavy snow in February 2013.
DR-4095	Hurricane Sandy	October 26-November 8, 2012	Belknap, Carroll, Coos, Grafton & Sullivan	**Presidential Disaster Declaration DR-4095:** The declaration covers damage to property from the storm that spawned heavy rains, high winds, high tides and flooding over the period of October 26-November 8, 2012.
DR-4065	Severe Storm & Flooding	May 29-31, 2012	Cheshire	**Presidential Disaster Declaration DR-4065:** Severe Storm and Flood Event May 29-31, 2012 Cheshire County.
DR-4049	Severe Storm & Snowstorm	October 29-30, 2011	Hillsborough & Rockingham	**Presidential Disaster Declaration DR-4049:** Severe Storm and Snowstorm Event October 29-30, 2011 Hillsborough and Rockingham Counties.
DR-4026	Tropical Storm Irene	August 26-September 6, 2011	Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan	**Presidential Disaster Declaration DR-4026:** Tropical Storm Irene Aug 26th- Sept 6, 2011 Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, & Sullivan Counties.
DR-4006	Severe Storms & Flooding	May 26-30, 2011	Coos & Grafton County	**Presidential Disaster Declaration DR-4006:** May Flooding Event, May 26th-30th 2011 Coos & Grafton County. (aka: Memorial Day Weekend Storm)
DR-1913	Severe Storms & Flooding	March 14-31, 2010	Hillsborough & Rockingham	**Presidential Disaster Declaration DR-1913:** Flooding to two NH counties including Hillsborough and Rockingham counties.
DR-1892	Severe Winter Storm, Rain & Flooding	February 23 - March 3, 2010	Grafton, Hillsborough, Merrimack, Rockingham, Strafford & Sullivan	**Presidential Disaster Declaration: DR-1892:** Flood and wind damage to most southern NH including six counties; 330,000 homes without power; more than $2 million obligated by June 2010.
DR-1812	Severe Winter Storm & Ice Storm	December 11-23, 2008	All Ten NH Counties	**Presidential Declaration DR-1812:** Damaging ice storms to entire state including all ten NH counties; fallen trees and large scale power outages; five months after December's ice storm pummeled the region, nearly $15 million in federal aid had been obligated by May 2009.
DR-1799	Severe Storms & Flooding	September 6-7, 2008	Hillsborough	**Presidential Declaration: DR-1799:** Severe storms and flooding beginning on September 6-7, 2008.
DR-1787	Severe Storms & Flooding	July 24-August 14, 2008	Belknap, Carroll & Grafton & Coos	**Presidential Declaration DR-1787:** Severe storms, tornado, and flooding on July 24, 2008.
DR-1782	Severe Storms, Tornado, & Flooding	July 24, 2008	Belknap, Carroll, Merrimack, Strafford & Rockingham	**Presidential Declaration DR-1782:** Tornado damage to several NH counties.

NH Presidential Disaster Declarations (DR) since 1953				
DR-1695	Nor'easter, Severe Storms & Flooding	April 15-23, 2007	All Ten NH Counties	**Presidential Disaster Declaration DR-1695:** Flood damages; FEMA & SBA obligated more than $27.9 million in disaster aid following the April nor'easter. (aka: Tax Day Storm)
DR-1643	Severe Storms & Flooding	May 12-23, 2006	Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham & Strafford	**Presidential Disaster Declaration DR-1643:** Flooding in most of southern NH, May 12-23, 2006. (aka: Mother's Day Storm)
DR-1610	Severe Storms & Flooding	October 7-18, 2005	Belknap, Cheshire, Grafton, Hillsborough, Merrimack & Sullivan	**Presidential Disaster Declaration DR-1610:** To date, state and federal disaster assistance has reached more than $3 million to help residents and business owners in New Hampshire recover from losses resulting from the severe storms and flooding in October.
DR-1489	Severe Storms & Flooding	July 21-August 18, 2003	Cheshire & Sullivan	**Presidential Disaster Declaration DR-1489:** Floods stemming from persistent rainfall and severe storms that caused damage to public property occurring over the period of July 21 through August 18, 2003.
DR-1305	Tropical Storm Floyd	September 16-18,1999	Belknap, Cheshire & Grafton	**Presidential Disaster Declaration DR-1305:** The declaration covers damage to public property from the storm that spawned heavy rains, high winds and flooding over the period of September 16-18.
DR-1231	Severe Storms & Flooding	June 12-July 2, 1998	NA	**Presidential Disaster Declaration DR-1231:**
DR-1199	Ice Storms	January 7-25, 1998	NA	**Presidential Disaster Declaration DR-1199:**
DR-1144	Severe Storms/Flooding	October 20-23, 1996	NA	**Presidential Disaster Declaration DR-1144:**
DR-1077	Storms/Floods	October 20-November 15, 1995	NA	**Presidential Disaster Declaration DR-1077:**
DR-923	Severe Coastal Storm	October 30-31, 1991	NA	**Presidential Disaster Declaration DR-923:**
DR-917	Hurricane Bob, Severe Storm	August 18-20, 1991	NA	**Presidential Disaster Declaration DR-917:**
DR-876	Flooding, Severe Storm	August 7-11, 1990	NA	**Presidential Disaster Declaration DR-876:**
DR-789	Severe Storms & Flooding	March 30-April 11, 1987	NA	**Presidential Disaster Declaration DR-789**
DR-771	Severe Storms & Flooding	July 29-August 10, 1986	NA	**Presidential Disaster Declaration DR-771:**
DR-549	High Winds, Tidal Surge, Coastal Flooding & Snow	February 16, 1978	NA	**Presidential Disaster Declaration DR-549:** Blizzard of 1978
DR-411	Heavy Rains, Flooding	January 21, 1974	NA	**Presidential Disaster Declaration DR-411:**
DR-399	Severe Storms & Flooding	July 11, 1973	NA	**Presidential Disaster Declaration DR-399:**
DR-327	Coastal Storms	March 18, 1972	NA	**Presidential Disaster Declaration DR-327:**
DR-11	Forest Fire	July 2, 1953	NA	**Presidential Disaster Declaration DR-11:**

Emergency Declarations (EM) since 1953				
Number	**Description**	**Date of Event**	**Counties**	**Description**
EM-3360	Hurricane Sandy	October 26-31, 2012	All Ten	**Presidential Emergency Declaration EM-3360:** Hurricane Sandy came ashore in NJ and brought high winds, power outages and heavy rain to NH- All ten counties in the State of New Hampshire.
EM-3344	Severe Snow Storm	October 29-30, 2011	All Ten	**Presidential Emergency Declaration EM-3344:** Severe storm during the period of October 29-30, 2011; all ten counties in the State of New Hampshire. (aka: Snowtober)
EM-3333	Hurricane Irene	August 26-September 6, 2011	All Ten	**Presidential Emergency Declaration EM-3333:** Emergency Declaration for Tropical Storm Irene for in all ten counties.
EM-3297	Severe Winter Storm	December 11, 2008	All Ten	**Presidential Emergency Declaration EM-3297:** Severe winter storm beginning on December 11, 2008.
EM-3258	Hurricane Katrina Evacuation	August 29-October 1, 2005	All Ten	**Presidential Emergency Declaration EM-3258:** Assistance to evacuees from the area struck by Hurricane Katrina and to provide emergency assistance to those areas beginning on August 29, 2005, and continuing; The President's action makes Federal funding available to the State and all 10 counties of the State of New Hampshire.
EM-3211	Snow	March 11-12, 2005	Carroll, Cheshire, Hillsborough, Rockingham & Sullivan	**Presidential Emergency Declaration EM-3211**: March snowstorm; more than $2 million has been approved to help pay for costs of the snow removal; Total aid for the March storm is **$2,112,182.01** (Carroll: $73,964.57; Cheshire: $118,902.51; Hillsborough: $710,836; Rockingham: $445,888.99; Sullivan: $65,088.53; State of NH: $697,501.41)
EM-3208	Snow	February 10-11, 2005	Carroll, Cheshire, Coos, Grafton & Sullivan	**Presidential Emergency Declaration EM-3208:** FEMA had obligated more than $1 million by March 2005 to help pay for costs of the heavy snow and high winds; Total aid for the February storm is **$1,121,727.20** (Carroll: $91,832.72; Cheshire: $11,0021.18; Coos: $11,6508.10; Grafton: $213,539.52; Sullivan: $68,288.90; State of NH: $521,536.78) **EM 3208-002:**The Federal Emergency Management Agency (FEMA) has obligated more than $6.5 million to reimburse state and local governments in New Hampshire for costs incurred in three snow storms that hit the state earlier this year, according to disaster recovery officials. Total aid for all three storms is $6,892,023.87 (January: $3,658,114.66; February: $1,121,727.20; March: $2,113,182.01)
EM-3207	Snow	January, 22-23, 2005	Belknap, Carroll, Cheshire, Grafton, Hillsborough, Rockingham, Merrimack, Strafford & Sullivan	**Presidential Emergency Declaration EM-3207:** JANUARY STORM DAMAGE: More than $3.5 million has been approved to help pay for costs of the heavy snow and high winds; Total aid for the January storm is **$3,658,114.66** (Belknap: $125,668.09; Carroll: $52,864.23; Cheshire: $134,830.95; Grafton: $137,118.71; Hillsborough: $848,606.68; Merrimack: $315,936.55; Rockingham: $679,628.10; Strafford: $207,198.96; Sullivan: $48,835.80; State of NH: $1,107,426.59)

Emergency Declarations (EM) since 1953				
EM-3193	Snow	December 6-7, 2003	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan	**Presidential Emergency Declaration EM-3193:** The declaration covers jurisdictions with record and near-record snowfall that occurred over the period of December 6-7, 2003
EM-3177	Snowstorm	February 17-18, 2003	Cheshire, Hillsborough, Merrimack, Rockingham & Strafford	**Presidential Emergency Declaration EM-3177:** Declaration covers jurisdictions with record and near-record snowfall from the snowstorm that occurred February 17-18, 2003
EM-3166	Snowstorm	March 5-7, 2001	Cheshire, Coos, Grafton, Hillsborough, Merrimack, & Strafford	**Presidential Emergency Declaration EM-3166:** Declaration covers jurisdictions with record and near-record snowfall from the late winter storm that occurred March 2001
EM-3101	High Winds & Record Snowfall	March 13-17, 1994	NA	**Presidential Emergency Declaration EM-3101:**
EM-3073	Flooding	March 15, 1979	NA	**Presidential Emergency Declaration EM-3073:**

Source:
Disaster Declarations for New Hampshire
http://www.fema.gov/disasters/grid/state-tribal-government/33?field_disaster_type_term_tid_1=All

Appendix D: Potential Mitigation Ideas[31]

Drought

D1 ..... Assess Vulnerability to Drought Risk
D2 ..... Monitoring Drought Conditions
D3 ..... Monitor Water Supply
D4 ..... Plan for Drought
D5 ..... Require Water Conservation During Drought Conditions
D6 ..... Prevent Overgrazing
D7 ..... Retrofit Water Supply Systems
D8 ..... Enhance Landscaping & Design Measures
D9 ..... Educate Residents on Water Saving Techniques
D10 .... Educate Farmers on Soil & Water Conservation Practices
D11 .... Purchase Crop Insurance

Earthquake

EQ1.... Adopt & Enforce Building Codes
EQ2.... Incorporate Earthquake Mitigation into Local Planning
EQ3.... Map & Assess Community Vulnerability to Seismic Hazards
EQ4.... Conduct Inspections of Building Safety
EQ5.... Protect Critical Facilities & Infrastructure
EQ6.... Implement Structural Mitigation Techniques
EQ7.... Increase Earthquake Risk Awareness
EQ8.... Conduct Outreach to Builders, Architects, Engineers, and Inspectors
EQ9.... Provide Information on Structural & Non-Structural Retrofitting

Erosion

ER1.... Map & Assess Vulnerability to Erosion
ER2.... Manage Development in Erosion Hazard Areas
ER3.... Promote or Require Site & Building Design Standards to Minimize Erosion Risk
ER4.... Remove Existing Buildings & Infrastructure from Erosion Hazard Areas
ER5.... Stabilize Erosion Hazard Areas
ER6.... Increase Awareness of Erosion Hazards

Extreme Temperatures

ET1 .... Reduce Urban Heat Island Effect
ET2 .... Increase Awareness of Extreme Temperature Risk & Safety
ET3 .... Assist Vulnerable Populations
ET4 .... Educate Property Owners about Freezing Pipes

Hailstorm

HA1 .... Locate Safe Rooms to Minimize Damage
HA2 .... Protect Buildings from Hail Damage
HA3 .... Increase Hail Risk Awareness

Landslide

LS1..... Map & Assess Vulnerability to Landslides
LS2..... Manage Development in Landslide Hazard Areas
LS3..... Prevent Impacts to Roadways
LS4 .... Remove Existing Buildings & Infrastructure from Landslide

Lightning

L1..... Protect Critical Facilities
L2..... Conduct Lightning Awareness Programs

Flood

FT1 .... Incorporate Flood Mitigation in Local Planning
FT2 .... Form Partnerships to Support Floodplain Management
FT3 .... Limit or Restrict Development in Floodplain Areas
FT4 .... Adopt & Enforce Building Colds and Development Standards
FT5 .... Improve Stormwater Management Planning
FT6 .... Adopt Policies to Reduce Stormwater Runoff
FT7 .... Improve Flood Risk Assessment
FT8 .... Join or Improve Compliance with NFIP
FT9 .... Manage the Floodplain Beyond Minimum Requirements
FT10 .. Participate in the CRS
FT11 .. Establish Local Funding Mechanism for Flood Mitigation
FT12 .. Remove Existing Structures from Flood Hazard Areas
FT13 .. Improve Stormwater Drainage System Capacity
FT14 .. Conduct Regular Maintenance for Drainage Systems & Flood Control Structures
FT15 .. Elevate of Retrofit Structures & Utilities
FT16 .. Floodproof Residential & Non-Residential Structures
FT17 .. Protect Infrastructure
FT18 .. Protect Critical Facilities
FT19 .. Construct Flood Control Measures
FT20 .. Protect & Restore Natural Flood Mitigation Features
FT21 .. Preserve Floodplains as Open Space
FT22 .. Increase Awareness of Flood Risk & Safety
FT23 .. Educate Property Owners about Flood Mitigation Techniques

Severe Wind

SW1... Adopt & Enforce Building Codes
SW2... Promote or Require Site & Building Design Standards to Minimize Wind Damage
SW3... Assess Vulnerability to Severe Wind
SW4... Protect Power Lines & Infrastructure
SW5... Retrofit Residential Buildings
SW6... Retrofit Public Buildings & Critical Facilities
SW7... Increase Severe Wind Awareness

Severe Winter Weather

WW1.. Adopt & Enforce Building Codes
WW2.. Protect Buildings & Infrastructure
WW3.. Protect Power Lines
WW4.. Reduce Impacts to Roadways
WW5.. Conduct Winter Weather Risk Awareness Activities
WW6.. Assist Vulnerable Populations

Tornado

T1 ..... Encourage Construction of Safe Rooms
T2 ..... Require Wind-Resistant Building Techniques
T2 ..... Conduct Tornado Awareness Activities

[31] Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards, FEMA, January 2013

Wildfire

WF1 ... Map & Assess Vulnerability to Wildfire
WF2 ... Incorporate Wildfire Mitigation in the Comprehensive Plan
WF3 ... Reduce Risk through Land Use Planning
WF4 ... Develop a Wildland Urban Interface Code
WF5 ... Require or Encourage Fire-Resistant Construction Techniques
WF6 ... Retrofit At-Risk Structure with Ignition-Resistant Materials
WF7 ... Create Defensible Space Around Structures & Infrastructure
WF8 ... Conduct Maintenance to Reduce Risk
WF9 ... Implement a Fuels Management Program
WF10 . Participate in the Firewise Program
WF11 . Increase Wildfire Awareness
WF12 . Educate Property Owners about Wildfire Mitigation Techniques

Multi-Hazards

MU1 ... Assess Community Risk
MU2 ... Map Community Risk
MU3 ... Prevent Development in Hazard Areas
MU4 ... Adopt Regulations in Hazard Areas
MU5 ... Limit Density in Hazard Areas
MU6 ... Integrate Mitigation into Local Planning
MU7 ... Strengthen Land Use Regulations
MU8 ... Adopt & Enforce Building Codes
MU9 ... Create Local Mechanisms for Hazard Mitigation
MU10 . Incentivize Hazard Mitigation
MU11 . Monitor Mitigation Plan Implementation
MU12 . Protect Structures
MU13 . Protect Infrastructure & Critical Facilities
MU14 . Increase Hazard Education & Risk Awareness
MU15 . Improve Household Disaster Preparedness
MU16 . Promote Private Mitigation Efforts

Appendix E: Rural Fire Water Resource Plan Mitigation Recommendations (NCRC&D)

Chapter VII Mitigation Recommendations taken from the Brookfield Rural Fire Water Resource Plan

Executive Summary

The following recommendations were developed by the Rural Fire Protection Planning Team as a result of the Community Fire Protection Capability Assessment and field work site evaluations. The recommendations have been provided to the community to be incorporated into the Hazard Mitigation Plan, where they will be prioritized and an implementation strategy developed. The foundational information was gathered from the community's Master Plan, hazard mitigation information, assessment of fire issues/needs survey, zoning regulations, fire dept. incident list and input from community officials and stakeholders.

Proposed Community Mitigation Actions - Prepared by North Country Conservation Resource & Development (NCRC&D), November 2013; www.nhrcd.net; (603) 527-2093

Name of Potential Action	Description of Potential Action	Affected Location	Rationale
Flow test all current dry and municipal hydrants	Flow test and evaluate function of all existing hydrants	Town wide	Establish base-line data for existing fire flow.
Determine needed fire flow	Using currently accepted standards, determine **Needed Fire Flow (NFF)** for certain target buildings; examples: Health Care Facilities, Municipal Buildings including Schools, Places of Assembly	Town-Wide	To pre-plan certain target hazards town-wide
Remove/repair existing dry hydrant(s)	Remove or repair the following hydrants: **BR05:** 85 Lyford Road **BR09:** Stoneham Corner	Lyford Road Stoneham Road	Repair or remove non-functioning hydrants to reconcile public expectation
Install dry hydrants	Construct new dry hydrant system(s) at: **BR03:** Sanborn Rd. at Churchill Brook **BR04:** 15 Lyford Road at fire pond	Sanborn Rd. Lyford Rd.	Reduce response time and manpower requirements to establish needed fire flow.
Investigate the possibility of constructing dry hydrants	Gather information for construction of dry hydrants: **BR06:** Clarke Rd. at Pike Brook **BR07:** Garney Rd. draft site at town line		These sites represent more of a challenge to construct a dry hydrant due to various reasons, such as access, grade; homeowner compliance, etc.
Installation of cisterns	Identify areas that can best be served by cisterns or other means: *no sites were determined*		Due to road grade, distance, and lack of available water, cisterns may be necessary in certain areas.
Dry Hydrant and Fire Pond Maintenance Program	Establish a dry hydrant/fire pond maintenance program that will include records kept of semi–annual or annual flow tests on each hydrant and cleaning or maintenance dredging of fire ponds	Town wide	Reference NFPA 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting; 2007 edition

Name of Potential Action	Description of Potential Action	Affected Location	Rationale
Capital Improvement Plan	Amend or include money in the Capital Improvement Plan for water drafting site development, fire equipment, and training	Town wide	
Steep Slopes Ordinance	Consider establishment of a Steep Slopes Ordinance to restrict and/or prohibit development in difficult to reach areas.	Steep Slopes District	Limit the increase of the Wildland/Urban Interface area
Subdivision Regulations for Fire Protection	Amendment of subdivision regulations to require onsite water storage, minimum fire flow, fire breaks in wildland/urban interface areas.	Town wide	International Wildland/Urban Interface Code 2006. i.e. Ch. 4 Wildland/Urban Interface Area Requirements
Incorporate the Rural Fire Water Resource Plan into the Master Plan	Encourage referral to Rural Fire Water Resource Plan and maps by Planning Board when reviewing subdivision proposals	Town wide	The Master Plan is a guide and public record of the development principles for the town. The Rural Fire Water Resource Plan addresses strategies to be implemented that reflect changes in population or land use, which may affect fire department strategy, particularly in regards to the wildland/urban interface (WUI)
Class VI roads	Assess and maintain condition of Class VI roads – access, turnarounds, seasonal issues	Class VI roads	Improve and maintain ability to access as emergency lanes (RSA 231:59,a)
Mapping of wood roads	Map and assess water sites and other resources along woods roads and trails for wildland firefighting.	Remote forested areas	Mapping of access points and roads would be helpful in improving emergency response to these remote areas
Fire Department Training	Implement program to provide training to fire personnel on wildland fire suppression, dry hydrant design, site evaluations of water resources, etc.	Town wide	Improved Emergency Response
Driveway Standards	Consider establishing driveway standards that address access by emergency vehicles. Driveway width, slope and overhead clearance are examples of concern which can impede emergency response to residential homes in remote and difficult access areas.	Town wide	Reference NFPA 1: Uniform Fire Code and NFPA 1144: Standard for Protection of Life and Property from Wildfire; 2002 edition
Homeowner Education	Educate homeowners on “Firewise Communities” program, promote installation of fire ponds in remote areas and use of easements to Fire Dept. for access	Town wide	

Appendix F: Acronyms

Hazard Mitigation Planning
List of Acronyms

BFE .....Base Flood Elevation
BOCA.....Building Officials and Code Administrators International
CIKR .....Critical Infrastructure & Key Resources
CIP .....Capital Improvements Program
CWPP .....Community Wildfire Protection Plan
DRED.....Department of Resources & Economic Development
EMD .....Emergency Management Director
EMS .....Emergency Medical Services
EOC .....Emergency Operations Center
ERF.....Emergency Response Facility
FEMA.....Federal Emergency Management Agency
FIRM .....Flood Insurance Rate Map
FPP .....Facilities & Populations to Protect
GIS.....Geographic Information System
HFRA .....Healthy Forest Restoration Act
HMGP .....Hazard Mitigation Grant Program
HSEM.....Homeland Security & Emergency Management (NH)
ICS .....Incident Command System
LEOP .....Local Emergency Operations Plan
MOU.....Memorandum of Understanding
NCRC&D.....North Country Resource Conservation & Development Council
MAPS.....Mapping and Planning Solutions
NFIP.....National Flood Insurance Program
NGVD.....National Geodetic Vertical Datum of 1929
NHDOT .....NH Department of Transportation
NIMS .....National Incident Management System
NOAA.....National Oceanic & Atmospheric Administration
NSSL.....National Severe Storms Laboratory
PR .....Potential Resources
SPNHF.....Society for the Protection of New Hampshire Forests
USDA .....US Department of Agriculture
USDA-FS .....USDA-Forest Service
USGS.....United States Geological Society
WMNF.....White Mountain National Forest
WUI .....Wildland Urban Interface

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Appendix G: Map Documents

Hazard Mitigation Maps by Mapping & Planning Solutions (MAPS)

(The following are provided as 11" x 17" maps in the hard copy of the Plan.)

- Map 1 – & Historic Fires & The Wildland Urban Interface (WUI)
- Map 2 – Past & Potential Areas of Concern
- Map 3 – Critical Infrastructure & Key Resources

Water Resource Plan Maps by NCRC & D

- WRP Map 4 – Water Resource Sites (Rural Fire Water Resource Plan)
- WRP Map 5 – Potential Protection from 2,000 foot hose lay (Rural Fire Water Resource Plan)
- WRP Map 6 –Selected Sites for Improvement or Development (Rural Fire Water Resource Plan)

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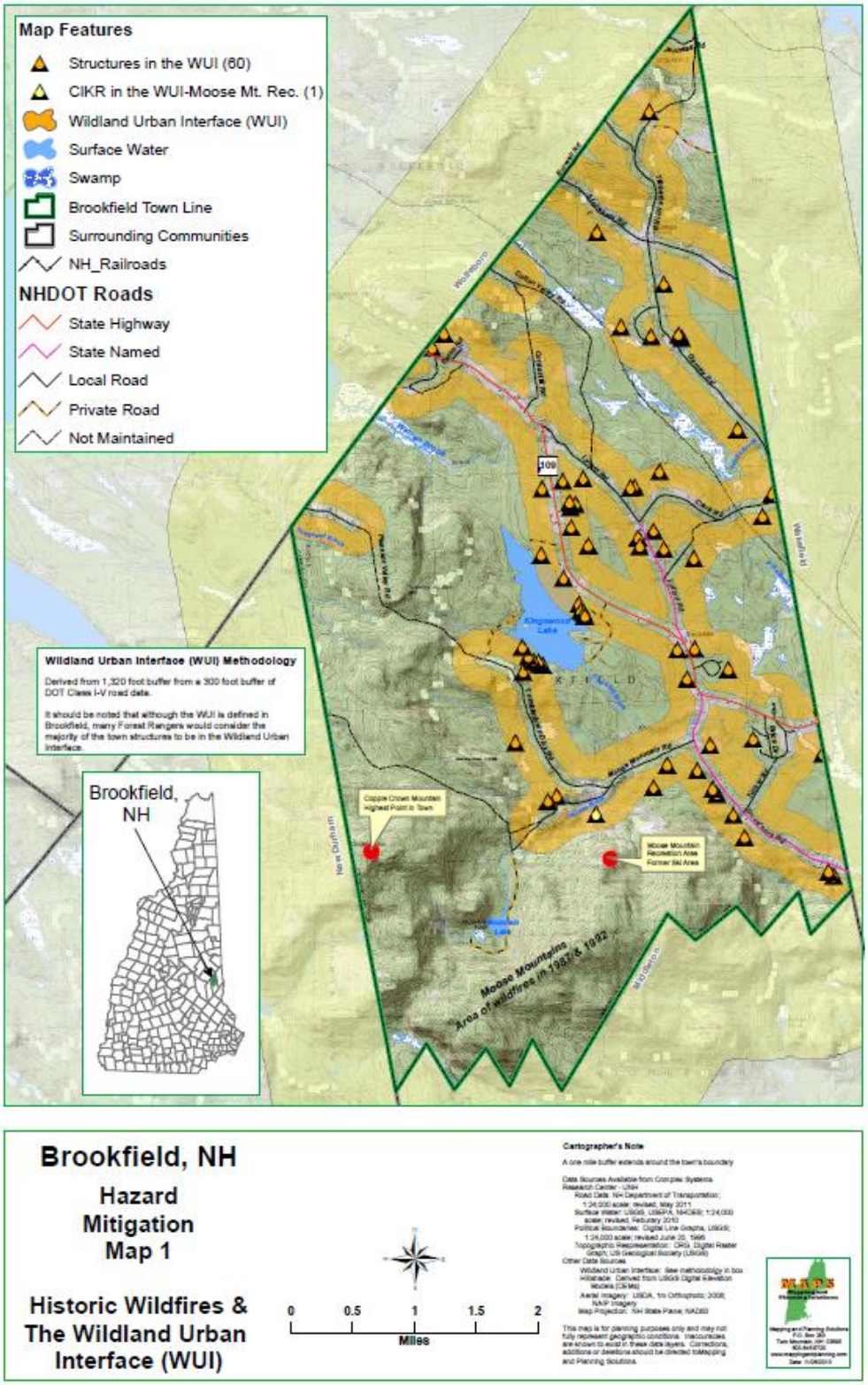
Map 1– Historic Fires & the Wildland Urban Interface (WUI)

Prepared by MAPS - to be replace with 11" x 17" map in final hard copy



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Map 2 – Past & Potential Areas of Concern

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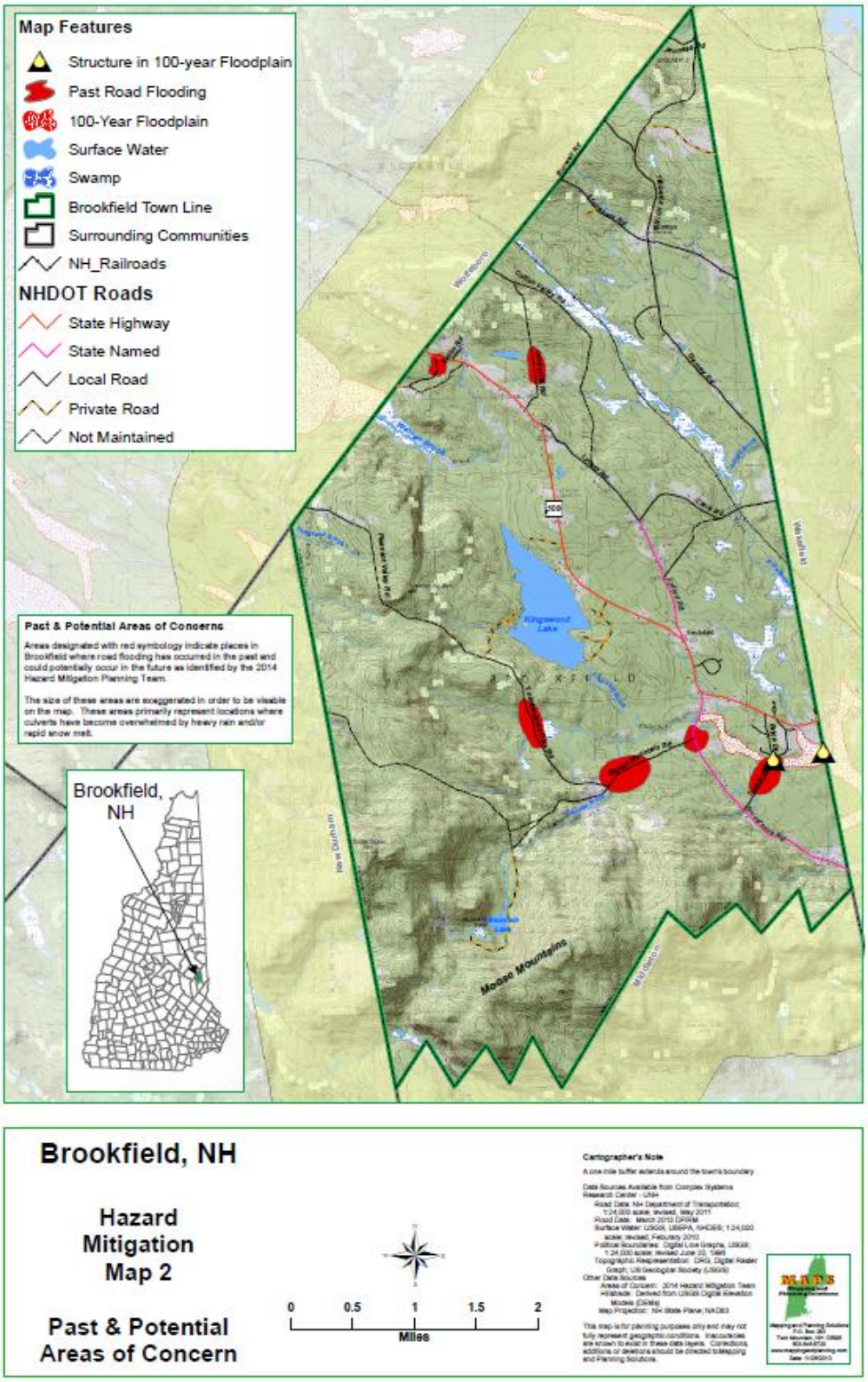

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Map 3 – Critical Infrastructure & Key Resources

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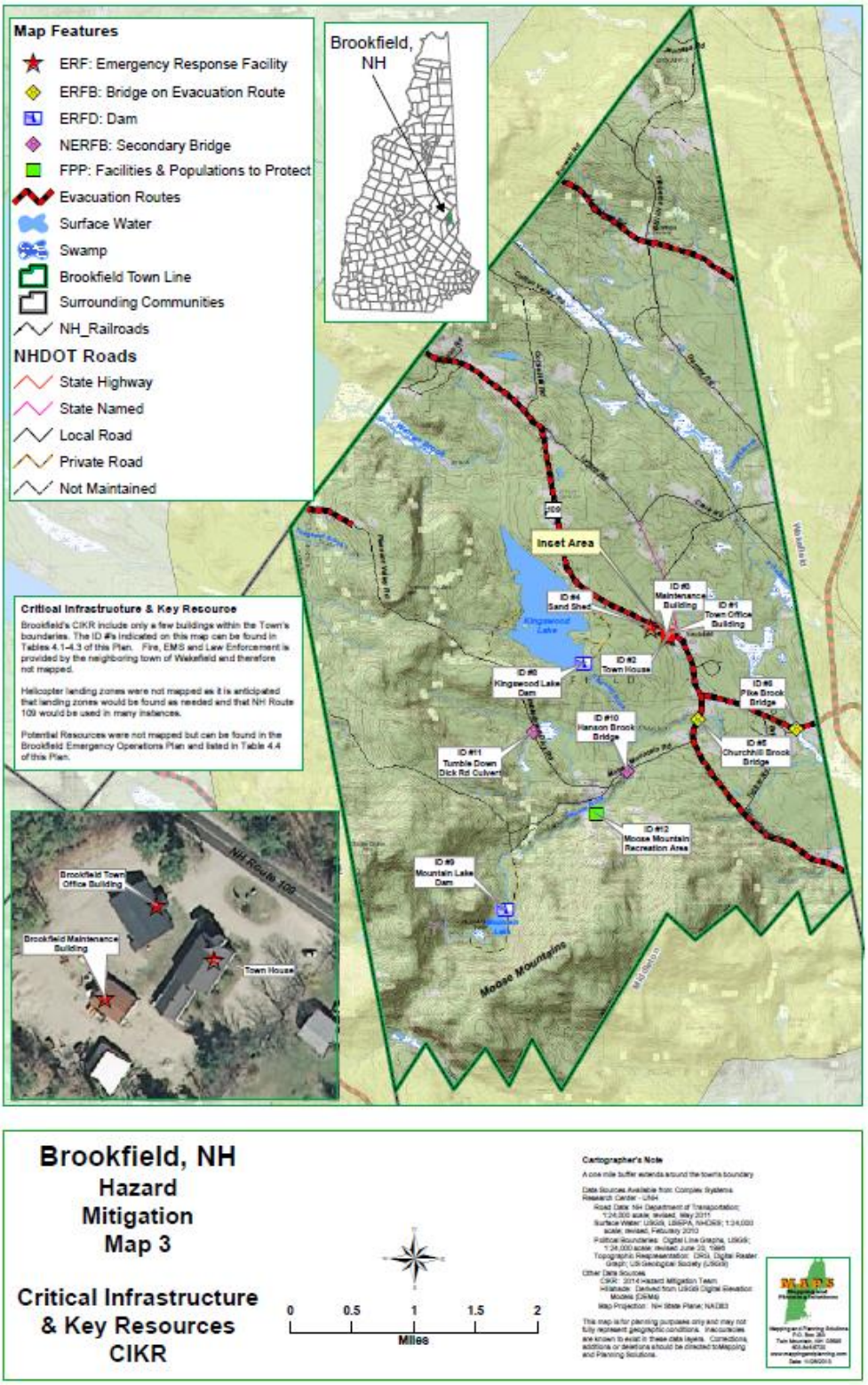

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WRP Map 4 – Water Resource Sites (Rural Fire Water Resource Plan)

Map prepared by NCRD&C

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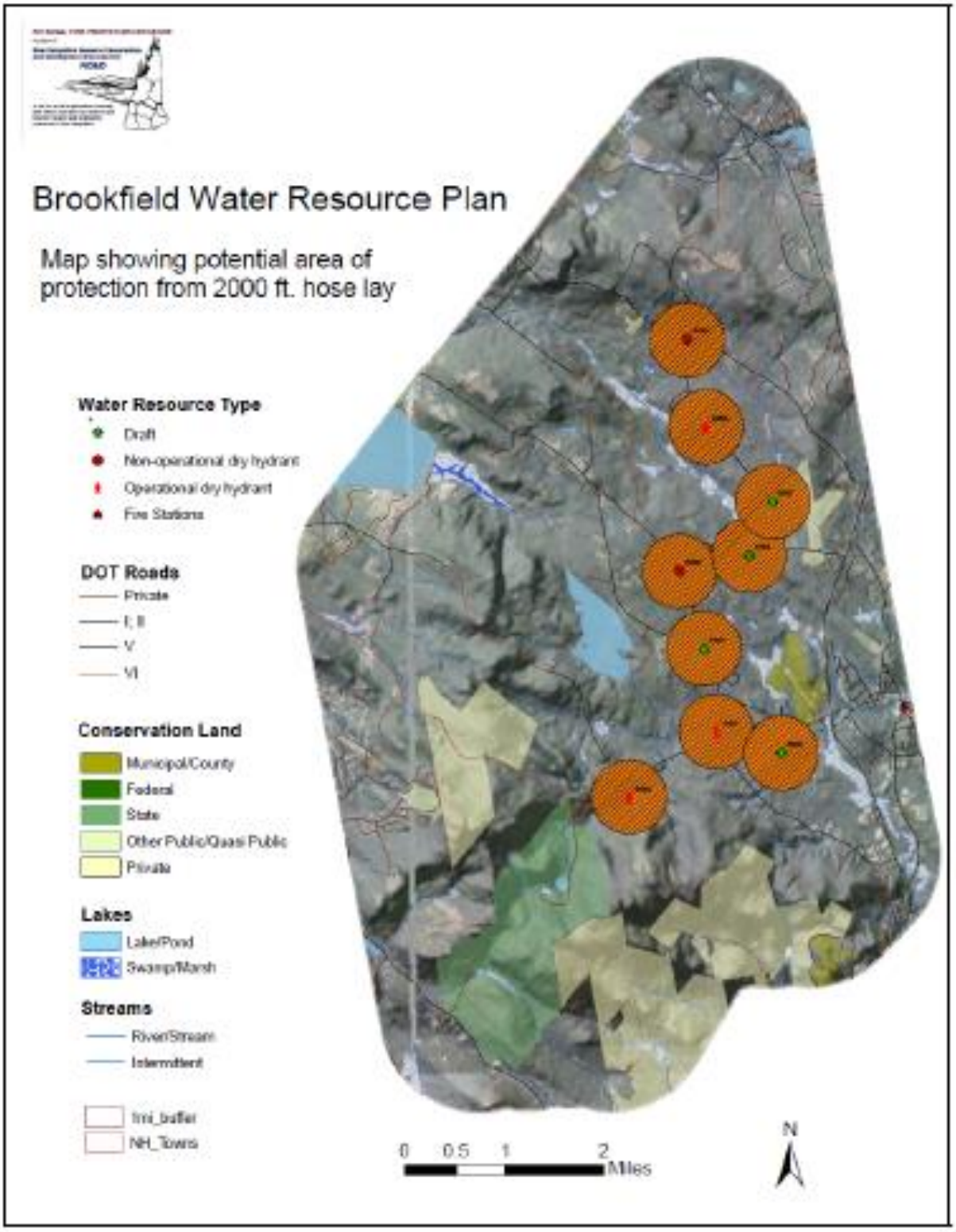
WRP Map 5 – Potential Protection from 2,000 foot hose lay (Rural Fire Water Resource Plan)

Map prepared by NCRD&C



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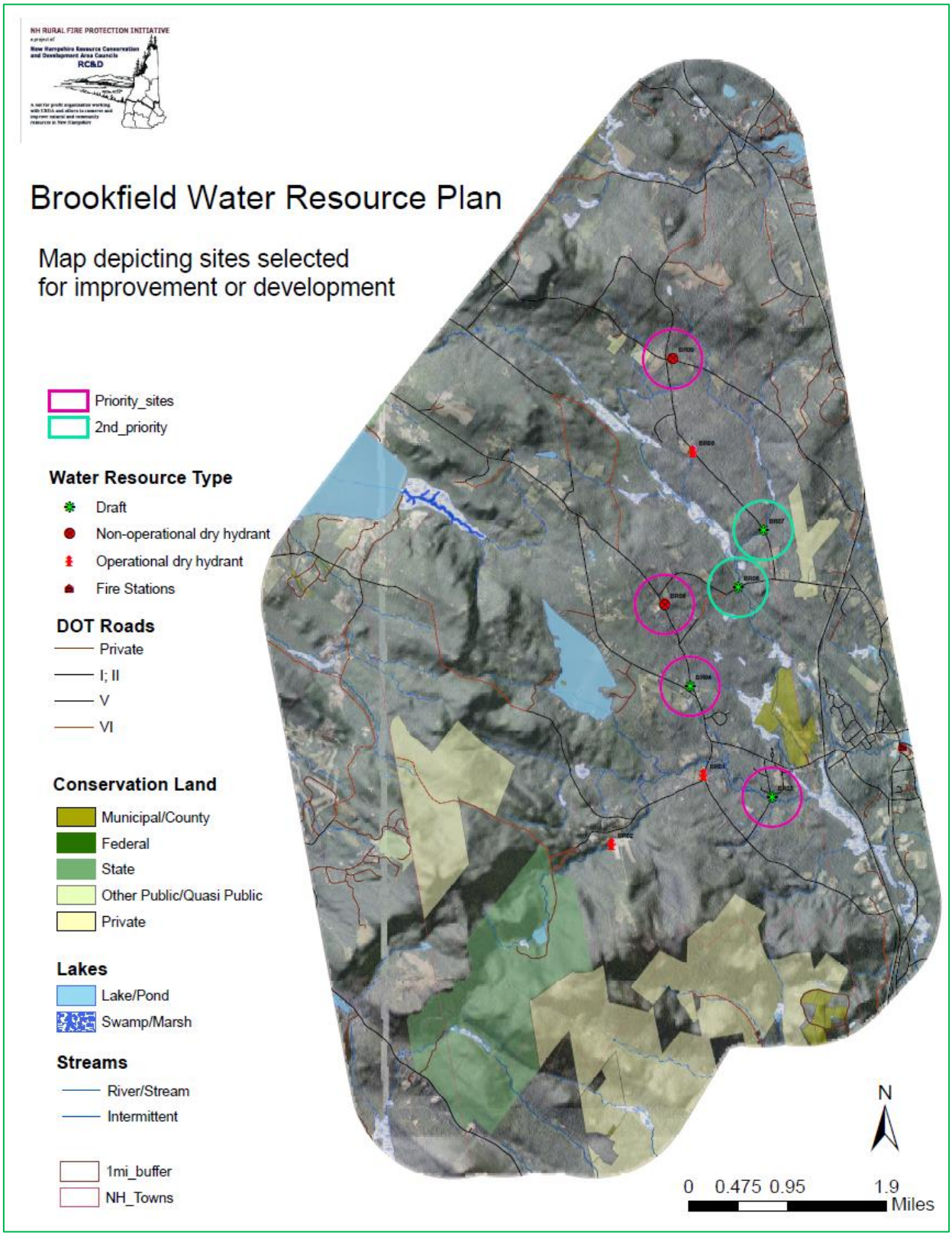
WRP Map 6 – Selected Sites for Improvement or Development (Rural Fire Water Resource Plan)

Map prepared by NCRD&C



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Scenic View in Brookfield
Photo Credit: http://www.brookfieldnh.org/Pages/BrookfieldNH_WebDocs/minag

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