# DRAFT

# Town of Exeter, NH

# Natural Hazard Mitigation Plan Update 2024

**Adopted by the**

**Exeter Select Board**

**_____date_____**

**Prepared with the Assistance of the**

ROCKINGHAM PLANNING COMMISSION
theRPC.org

**This project was partially funded by**

**NH Homeland Security and Emergency Management**

## Certificate of Adoption

WHEREAS, the Town of Exeter received funding from the NH Office of Homeland Security and Emergency Management under a Pre-Disaster Mitigation Grant and assistance from Rockingham Planning Commission in the preparation of the Exeter Hazard Mitigation Plan Update 2024; and

WHEREAS, several public planning meetings were held between May 2023 and _____ regarding the development and review of the Exeter Hazard Mitigation Plan Update 2024; and

WHEREAS, the Exeter Hazard Mitigation Plan Update 2024 contains several potential future projects to mitigate hazard damage in the Town of Exeter; and

WHEREAS, a duly-noticed public hearing was held by the Exeter Select Board on _____ to formally approve and adopt the Exeter Hazard Mitigation Plan Update 2024.

NOW, THEREFORE BE IT RESOLVED that the Exeter Select Board:

- The Plan is hereby adopted as the official plan of the Town of Exeter:
- The respective individuals identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
- Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution;
- An annual report of the progress of the implementation elements of the Plan shall be presented to the Select Board by the Town's Emergency Management Director or Town Manager.

NOW, THEREFORE BE IT RESOLVED that the Exeter Select Board adopts the Exeter Hazard Mitigation Plan Update 2018.

IN WITNESS THEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Exeter on this _____ day of _____.

_____ Select Board

_____ Select Board

_____ Select Board

_____ Select Board

_____ Select Board

ATTEST

_____
Public Notary

## TABLE OF CONTENTS

LIST OF MAPS



LIST OF FIGURES



LIST OF TABLES

## EXECUTIVE SUMMARY

The *Exeter Hazard Mitigation Plan* (herein also referred to as the *Plan*) was compiled to assist the Town of Exeter in reducing and mitigating future losses from natural hazard events. The *Plan* was developed by the Rockingham Planning Commission and participants from the Town of Exeter *Natural Hazard Mitigation Committee* and contains the tools necessary to identify specific hazards, and aspects of existing and future mitigation efforts.

The following *natural* hazards are addressed:

- Flooding
- Hurricane-High Wind Event
- Severe Winter Weather
- Wildfire
- Earthquake
- Drought
- Extreme Temperatures
- Climate Change
- Infectious Disease

The list of *critical facilities* includes:

- Municipal facilities
- Communication facilities
- Fire stations and law enforcement facilities
- Exeter Hospital
- Schools
- Shelters
- Evacuation routes
- Vulnerable Populations

The Exeter Hazard Mitigation Plan Update 2024 is considered a work in progress and should be revisited after every natural event to assess whether the existing and suggested mitigation strategies are successful. Copies have been distributed to the Town Office and the Emergency Operations Center. A copy of the Plan is also on file at The Rockingham Planning Commission, New Hampshire Homeland Security and Emergency Management (NHHSEM) and the Federal Emergency Management Agency (FEMA). This Document was approved by both agencies prior to adoption at the local level.

# CHAPTER I – INTRODUCTION

## Background

The New Hampshire Homeland Security and Emergency Management (NHHSEM) has a goal for all communities within the State of New Hampshire to establish local hazard mitigation plans to reduce and mitigate future losses from natural hazard events. The NHHSEM outlines a process whereby communities throughout the State may be eligible for grants and other assistance upon completion of a local hazard mitigation plan. A handbook entitled *Hazard Mitigation Planning for New Hampshire Communities* was created by NHHSEM to assist communities in developing local plans. The State's Regional Planning Commissions are charged with providing assistance to selected communities to develop local plans.

The Exeter Hazard Mitigation Plan Update 2024 was prepared by the Exeter Hazard Mitigation Committee with the assistance and professional services of the Rockingham Planning Commission (RPC) under contract with the New Hampshire Homeland Security and Emergency Management operating under the guidance of Section 44 CFR 201.6. The Town's Hazard Mitigation Committee included representatives from all town departments and Exeter Hospital. Academia, including public schools and Phillips Exeter Academy, local businesses and organizations assisting socially vulnerable and underserved members of the community were also invited to participate in the Plan Update. The Plan serves as a strategic planning tool for use by the Town of Exeter in its efforts to identify and mitigate the future impacts of natural hazard events.

## Methodology

The Rockingham Planning Commission (RPC) organized the first meeting with emergency management officials from the Town of North Hampton on May 23, 2023, to begin the initial planning stages of the Plan Update. This meeting precipitated the development of the Natural Hazards Mitigation Committee (herein after, the Committee). RPC and participants from the Town developed the content of the Plan using the ten-step process set forth in the Hazard Mitigation Planning for New Hampshire Communities. Publicly noticed work session meetings were also held on July 20, 2023, September 14, 2023 and _____. All work session meetings were open to the public, but members of the public did not attend any of the meetings. The Select Board held a duly noticed public hearing on the draft Plan Update on _____. Members of the public were in attendance at the meeting but did not request changes to the draft Plan. The Selectmen initiated a 30-day public comment period at the _____ meeting. The Town of Exeter Emergency Management Director and staff from the Rockingham Planning Commission solicited input on the Plan from academia, businesses, local officials, agencies supporting socially disadvantaged community members and vulnerable populations, abutting municipalities, and residents throughout the Plan development.

The Town's 2018 Plan served as the starting point for discussion on hazards impacting the Town, as well as discussions on mitigation strategies. The 2018 Plan served as a reference for local land use regulations and policies, development of the Town's Capital Improvement Plan and department budgets, and has been referenced in several reports, including the 2016 NH Coastal Risks and Hazards Commission Final Report, the RPC's 2015 Regional Master Plan, the Town's

2017 Sea Level Rise and Coastal Storm Surge Vulnerability Assessment, the 2022 Exeter's Path to Resilience Rep and other adaptation planning initiatives.

**Step 1- Form the Committee**

The Emergency Management Director invited Department Heads from all the Town's departments to participate in the Plan Update process, as well as staff from Exeter Hospital and SAU 16. As a result, the Plan Update Committee included the Emergency Management Director/Fire Chief, Town Administrator, Select Board Members, Assistant Fire Chief, Public Works Director, Health Office, Recreation Director, Water and Sewer Managing Engineer, DPW Director, Town Planner, Town Natural Resource Planner, Building Inspector/Code Enforcement Officer, Exeter Hospital's Emergency Management Director, and SAU 16's Facilities Manager. Public notices about the Plan Update process were posted on the Town website and the Rockingham Planning Commission's website and monthly newsletter. All meetings were open to the public, and RPC staff kept municipalities in the region informed of the Plan Update. In addition, RPC staff working on Plan Updates in the abutting towns of North Hampton and Hampton Falls kept local officials in these communities informed of the update to Exeter's Plan Update and the opportunity to comment on regional mitigation strategies.

**Step 2 – Public Outreach and Stakeholder Involvement**

RPC staff worked with the Town Administrator and Emergency Management Director to coordinate public outreach about the Plan Update process to residents, local businesses, academia, organizations supporting socially vulnerable populations, and Emergency Management Directors in the abutting municipalities of Brentwood, NH, Epping, NH, East Kingston, NH, Kensington, NH, Hampton Falls, NH, Hampton, NH, and Stratham, NH. All these stakeholders were provided with an opportunity to comment on the Plan and contribute updated information.

Public notices about the Plan Update meetings were posted on the Town website to inform viewers and followers about meetings and opportunities to comment on the Plan. Notice about the Plan Update process was also posted on the Rockingham Planning Commission's website and published in the RPC's monthly newsletter. The newsletter is distributed to local officials in the 27-town RPC region.

All Plan Update meetings were open to the public. RPC staff facilitated the Plan Update Committee meetings, guided the plan update process, and prepared the Plan Update. Appendix O documents the individuals and organizations invited to participate in the Plan Update as well as the public outreach materials distributed by the Town of Exeter and the Rockingham Planning Commission.

**Step 3 – Identify Natural Hazard Impacting Exeter**

The Committee reviewed the list of natural hazards impacting Exeter that were included in the 2018 Plan and added Climate Change and Infectious Disease to the list of hazards impacting the community.

**Step 4 – Identify Critical Facilities and Areas of Concern**
The Committee identified facilities and areas considered to be important to the Town for emergency management purposes, for provision of utilities and community services, evacuation routes, and for recreational, historical, cultural, and social value. Participants in the Committee identified areas where damage from historic natural disasters have occurred and areas where critical man-made facilities and other features may be at risk in the future for loss of life, property damage, environmental pollution, and other risk factors. RPC generated a set of base maps with GIS (Geographic Information Systems) that were used in the process of identifying past and future hazards.

**Step 5 – Identify Existing Mitigation Strategies**
After collecting detailed information on each critical facility in Exeter, the Committee and RPC staff identified existing Town mitigation strategies relative to flooding, hurricane and wind events, severe winter weather, wildfire, earthquake, drought, extreme temperatures, climate change, and infectious disease. This process involved reviewing the Town's 2018 Hazard Mitigation Plan, the State of New Hampshire Hazard Mitigation Plan 2023 Update, the Town's Master Plan and Capital Improvements Program, Zoning Ordinance, Subdivision Regulations, Site Plan Review Regulations, 2017 Climate Change Vulnerability Assessment, 2018 Project WISE Report, the Town's Emergency Operations Plan, and the Town's participation in the National Flood Insurance Program (NFIP).

**Step 6 – Identify the Gaps in Existing Mitigation Strategies**
The existing strategies were then reviewed by the RPC and the Committee for coverage and effectiveness, degree of completion as well as the need for improvement.

**Step 7 – Identify Potential Mitigation Strategies**
A list of additional hazard mitigation actions and strategies for the Town of Exeter was developed. The recently updated Hazard Mitigation Plans of Rye, Raymond, and Sandown were just a few towns that were utilized to identify new mitigation strategies as well as the Town's Master Plan and Zoning Ordinance, 2017 Climate Vulnerability Assessment, and the 2022 Exeter's Path to Resilience Report.

**Step 8 – Develop the Action Plan**
The proposed hazard mitigation actions and strategies were reviewed, and each strategy was rated (good, average, or poor) for its effectiveness according to several factors (*e.g.*, technical, and administrative applicability, political and social acceptability, legal authority, environmental impact, financial feasibility). Each factor was then scored, and all scores were totaled for each strategy. Strategies were ranked by overall score for preliminary prioritization then reviewed again under Step 9.

**Step 9 – Determine Priorities**
The preliminary prioritization list was reviewed to make changes and determine a final prioritization for new hazard mitigation actions and improvements to existing protection strategies. RPC staff also presented recommendations to be reviewed and prioritized by the Plan Update Committee.

**Step 10 – Develop Implementation Strategy**
Using the chart provided under Step 9 in the handbook, an implementation strategy was created which included person(s) responsible for implementation (who), a timeline for completion (when), and a funding source and/or technical assistance source (how) for each identified hazard mitigation actions. Also, whenever the Master Plan or Capital Improvement Plan (CIP) are updated the Newington Hazard Mitigation Plan Update 2024 shall be consulted to determine if strategies or actions suggested in the Plan can be incorporated into the Town's future land use recommendations and capital expenditures.

**Step 11 - Adopt and Monitor the Plan**
RPC staff compiled the results of Steps 1 to 11 into a draft document. This draft Plan was reviewed by members of the Committee and by staff members at the RPC. The draft Plan was also placed on the Town of Exeter website for review by the public. Stakeholders (listed in Appendix O) were emailed the draft Plan and invited to comment. Stakeholders included Emergency Management Directors in neighboring communities, local businesses, and agencies serving socially vulnerable and underrepresented communities. A duly noticed public meeting was held by the Exeter Select Board on _____. The meeting allowed all stakeholders to provide comments and suggestions for the Plan in person, prior to the document being finalized. After the meeting the Selectmen instituted a 30-day comment period, ending on (date). The draft Plan was revised to incorporate comments from the Select Board and Town staff and then submitted to the NH HSEM and FEMA Region I for their review and comments. Any changes required by NH HSEM and FEMA were made and a revised draft document was then submitted to the Exeter Select Board for their final review. A public meeting was then held by the Select Board on _____ to approve and adopt the Plan. The formal letter of approval from FEMA Region 1 can be found in the Appendix. The Town will post the approved Plan Update on the Town website to facilitate continued public participation in hazard mitigation activities.

To track progress and update the Mitigation Strategies identified in the Action Plan, the Hazard Mitigation Committee will remain active and will revisit the Plan annually and after each natural hazard event. These reviews will assess the Plan's effectiveness, accuracy, and completeness in achieving its stated purpose and goals. Plan reviews will also address the recommended improvements to the Plan as contained in the FEMA plan review checklist and any weaknesses the Town identified that the Plan did not adequately address. The Plan will also be thoroughly updated every five years.

**Hazard Mitigation Goals and Objectives of the Town of Exeter, New Hampshire**

The Town of Exeter sets forth the following hazard mitigation goals and objectives:

- Reduce or avoid long-term vulnerabilities posed by natural hazards impacting Exeter, including the impacts from flooding, hurricanes and high wind events, severe winter weather, wildfire and conflagration, earthquakes, drought, extreme temperatures, and climate change, including sea-level rise and coastal storm surge, and infectious disease.
- Improve upon the protection of the Town of Exeter's general population, the citizens of the State and guests, from all natural and man-made hazards.
- Reduce the potential impact of natural and man-made disasters on Exeter and the State's Critical Support Services.
- Reduce the potential impact of natural and man-made disasters on Exeter's Critical Facilities in the State.
- Reduce the potential impact of natural and man-made disaster on Exeter's and the State's infrastructure.
- Improve Exeter's Emergency Preparedness.
- Improve Exeter's Disaster Response and Recovery Capability.
- Reduce the potential impact of natural and man-made disasters on private property in Exeter.
- Reduce the potential impact of natural and man-made disasters on Exeter's and the State's economy.
- Reduce the potential impact of natural and man-made disasters on Exeter's and the State's natural environment.
- Reduce Exeter's and the State's liability with respect to natural and man-made hazards generally.
- Reduce the potential impact of natural and man-made disasters on Exeter's and the State's specific historic treasures and interests as well as other tangible and intangible characteristics that add to the quality of life to the citizens and guests of the State and the Town.
- Identify, introduce, and implement cost effective Hazard Mitigation measures to accomplish Exeter's and the States' goals and objectives to raise the awareness and acceptance of hazard mitigation planning.

Through the adoption of this Plan the Town of Exeter concurs and adopts these goals and objectives.

## Acknowledgements

The Exeter Select Board extends special thanks to those that assisted in the development of this Plan Update by serving as member of Natural Hazards Mitigation Committee:

Greg Bisson, Parks and Recreation Director, Town of Exeter
Stephen Dalton, Interim Water and Sewer Manager, Town of Exeter
Russell Dean, Town Manager, Town of Exeter
Doug Eastman, Building Inspector, Town of Exeter
Rich Kane, Coordinator of School Safety and Security, SAU 16
Ray Leblanc, Exeter Hospital Emergency Management
Josh McCain, Deputy Police Chief, Town of Exeter
Kristen Murphy, Natural Resource Planner, Town of Exeter
James Murray, Health Office, Town of Exeter
Justin Pizon, Assistant Fire Chief/Assistant EMD, Town of Exeter
Stephen Poulin, Police Chief, Town of Exeter
Dave Sharples, Town Planner, Town of Exeter
Paul Vlasich, Interim Director, Public Works, Town of Exeter
Eric Wilking, Fire Chief/EMD, Town of Exeter

Appendix O lists additional people that participated in the Plan Update process.

The Exeter Select Board offers thanks to the NHHSEM which provided funding and assistance with the development of this Plan Update.

In addition, thanks are extended to the staff of the Rockingham Planning Commission for professional services, process facilitation and preparation of this document.

## CHAPTER II – COMMUNITY PROFILE

The Town of Exeter is located in Rockingham County, New Hampshire. Exeter is bordered by the towns of Kingston, East Kingston, Hampton Falls, Hampton, and Kensington to the south, Stratham to the east, Newfields to the north, and Brentwood and Epping to the west, as seen below in Figure 1. The Town's population was 16,049 at the 2020 U.S. Census. The median age of Exeter residents was 46.5 years, and the median household income was $77,298, lower than the statewide median household income of $88,235. The population density was 818 people per square mile of land. The town encompasses 19.8 square miles of land area and 0.3 square miles of inland water area.

**Figure 1: Location Map of Exeter, New Hampshire**

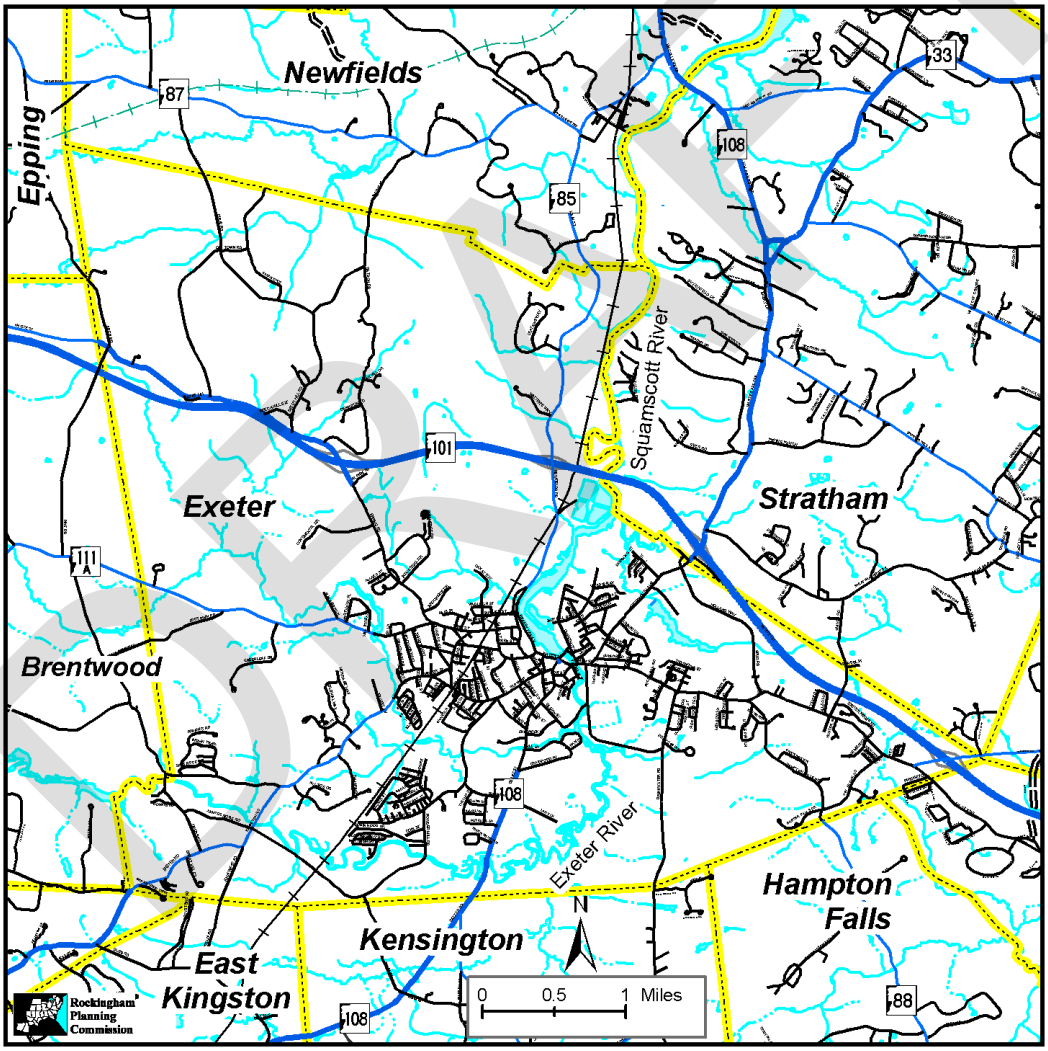
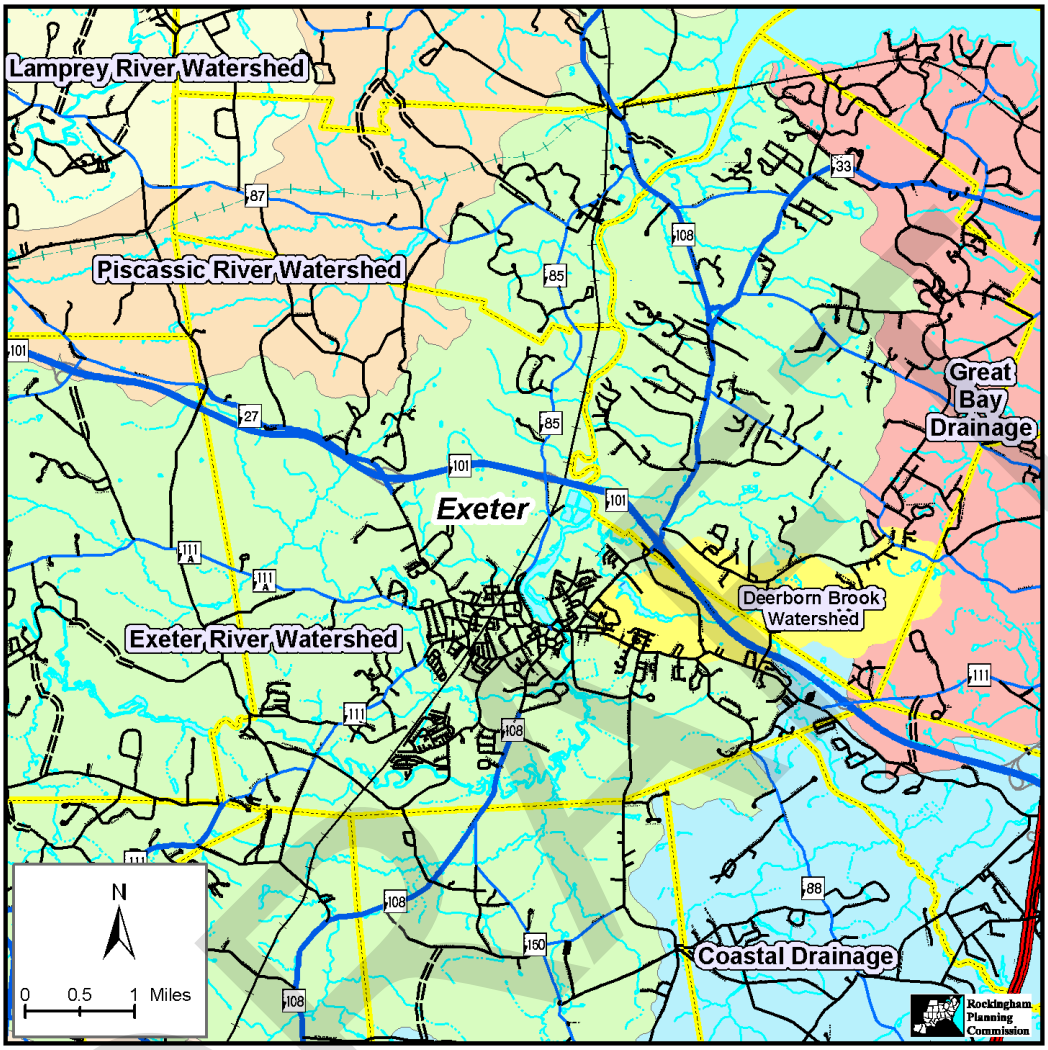


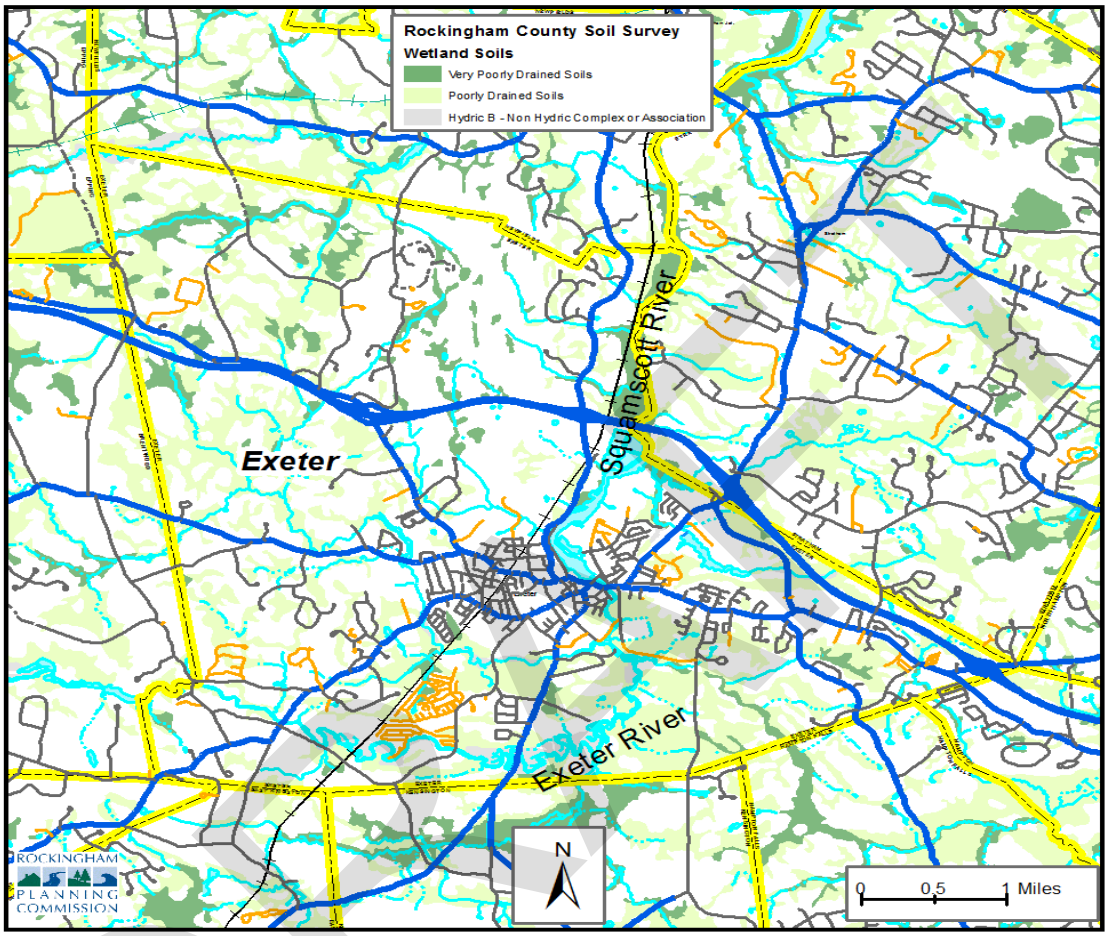

**Figure 2: Watershed Map of Exeter, New Hampshire.**




Exeter has portions of four regional watersheds: the Piscassic River, Exeter River, the tidal Squamscott River, and the Coastal Watershed. The first three watersheds are part of the larger Piscataqua River Basin, while the Coastal Watershed is part of the larger Coastal River Basin. To delineate meaningful drainage patterns, two sub-watersheds were identified in the 1994 Exeter Master Plan. The first is the Dearborn Brook Sub-Watershed which forms a portion of the Squamscott River Watershed, and the second is the Little River Sub-Watershed which forms a portion of the Exeter River Watershed. Figure 2 shows the Watershed Boundaries in the Town of Exeter.

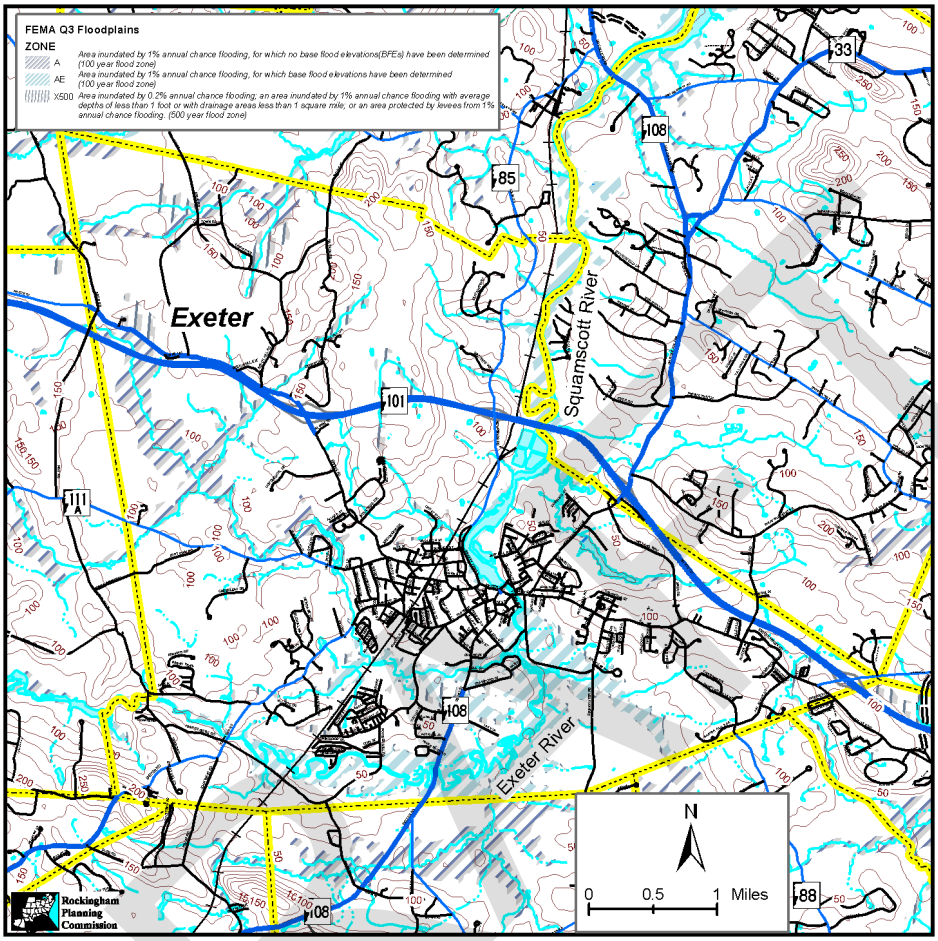
Wetlands are an important part of the Town of Exeter's surface water. Wetland, or hydric, soils include poorly and very poorly drained soils. These soil types are often associated with marine silts and clays where the water table is at or near the surface for five to nine months of the year. Exeter has mapped and identified Prime Wetlands in the community and has adopted stricter land use regulations for work adjacent to prime wetlands.

**Figure 3: Wetlands Map of Exeter, New Hampshire. Wetland delineated as poorly and very poorly drained soils, and Wetlands from the National Wetland Inventory.**




Floodplains for this *Plan* are defined as the 100-year and 500-year flood hazard zones, as depicted on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Floodplains in the Town of Exeter are shown below in Figure 4. Exeter maintains participation in the National Flood Insurance Program administered by FEMA. Development should be located away from wetlands and floodplains whenever possible. The filling of wetlands for building construction not only destroys wetlands and their numerous benefits but may also lead to groundwater contamination. Building within a flood zone may also reduce the floodplain's capacity to absorb and retain water during periods of excessive precipitation and runoff. Moreover, in regard to building within floodplains, contamination may result from flood damage to septic systems.

**Figure 4: Floodplains of Exeter, New Hampshire**




## Current and Future Development Trends

Current Development is predicated on the Town of Exeter's Zoning Ordinance. The Town is divided into 24 zoning districts encompassing residential, commercial, corporate/technology, industrial, and healthcare zones, as well as overlays zones for the historic district, aquifer protection, shoreland protection, flood hazard and wetland conservation. For more information on these specific zones see the Exeter Zoning Ordinance. Map 1 – Existing Land Use shows current land use as defined by Exeter's current Existing Land Use chapter of the Master Plan. Commercial growth is expected to continue to be concentrated along Routes 27 and 108 and to include the renovation and replacement of some businesses in the downtown historic district. The Town is served by several major roads, including State Routes 101, 108, 150, 111 and 27, with easy access to Interstate 95. The Town is also served by the Amtrak Downeaster train. Land development in Exeter is primarily single family residential surrounded by undeveloped forest land and open space. Exeter has a vibrant downtown located along the Exeter-Squamscott River, and a commercial corridor which serves as a regional economic and retail hub.

The Town has adopted and enforces land use regulations designed to mitigate hazards, including shoreland buffer protection, wetlands protection, stormwater management, and prevention of development on steep slopes. Despite these efforts, the Town's vulnerability may increase due to climate change and an increasing number of hazard events. Natural hazards identified in this Plan, as well as mitigation strategies discussed in this Plan, will be considered during local review of development proposals, especially as they relate to development in flood prone areas of town.

Map 1: Existing Land Use

## CHAPTER III. – NATURAL HAZARDS IN THE TOWN OF EXETER

### What are the Hazards?

The first step in planning for natural hazard mitigation is to identify hazards that may affect the town. Some communities are more susceptible to certain hazards (i.e., flooding near rivers, hurricanes on the seacoast, etc.). The town of Exeter is prone to several types of natural hazards. These hazards include flooding, including sea level rise, storm surge, and extreme precipitation events; hurricanes or other high-wind events; severe winter weather; earthquakes; drought; wildfire; extreme temperatures; climate change; and infectious disease. Other natural hazards can and do affect the Town, but these were the hazards prioritized by the Committee for mitigation planning because they occur with regularity and/or were considered to have high damage potential.

Natural hazards that are included in the State's Hazard Mitigation Plan 2023 Update that are not included in this Plan Update include: landslide, subsidence, radon, avalanche, solar storm, and space weather. Subsidence and avalanche are rated by the State as having Low and No risk in Rockingham County, respectively; due to this they were left out of the Plan. Exeter has no record of landslides and little chance of one occurring that could possibly damage property or cause injury and so landslides were not included in this Plan. The State's Plan indicates that Rockingham County is at Moderate risk to radon; this hazard was not included in the Plan. When compared with natural hazards that could be potentially devastating to the town, such as flooding and severe winter weather, it was not considered an effective use of the Committee's time to include radon in the Plan at this time. Solar storms and space weather are rated as a low risk for all of New Hampshire. There are no significant past occurrences of impact from space weather or solar storms in the state per the State Plan, so the Committee did not include this hazard in the Plan Update.

The hazard profiles below include a description of the natural hazard, the geographic location of each natural hazard (if applicable), the extent of the natural hazard (e.g. magnitude or severity), probability, past occurrences, and community vulnerability. Past occurrences of natural hazards were mapped on Map 2: Past and Future Hazards. Community vulnerability identifies the specific areas, general type of structures, specific structures, or general vulnerability of the Town of North Hampton to each natural hazard. Probability was defined as high, a roughly 66-100% chance of reoccurrence; medium, roughly a 33-66% chance of reoccurrence; and low, roughly a 0-33% chance of reoccurrence.

### Flooding

**Description** - 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.

- *Erosion and Mudslides* - Erosion is the process of wind and water wearing away soil. Typically, in New Hampshire, the land along rivers is relatively heavily developed. Mudslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Erosion and mudslides become significant threats to development during floods. Floods speed up the process of erosion and increase the risk of mudslides.

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

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

- *Dam Breach and Failure* - Dam failure results in rapid loss of water that is normally held by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property. Table 2 describes active dams in town. After much research and expense, the Town of Exeter removed the Great Dam along the Exeter River in downtown Exeter in 2016 to reduce the risk of flooding and improve water quality and wildlife habitat. An analysis to determine future management of the dam at Pickpocket Road, partially located in Brentwood, which is owned and operated by the Town of Exeter, is underway.

- *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.

- *Sea Level Rise, Coastal Flooding, Storm Surge, and Compound Flooding* - Exeter's tidal coastline along the Squamscott River means homes and businesses, roadways and infrastructure, and critical natural habitats such as salt marsh and mud flats are at risk due to coastal flooding caused by storm surges and rising water levels in Great Bay. A storm surge, especially when coupled with astronomical high tides and sea level rise, presents a threat to all land areas adjacent to the marine environment. Compound flooding can occur when storm surge and heavy precipitation happen concurrently. High

tide or surge water levels can impede stormwater draining into the sea, causing flooding inland. The risks of flood impacts from compound flooding in low-lying coastal areas is often much greater than from either coastal flooding or inland flooding in isolation. The Town's 2017 Vulnerability Assessment Report of Sea Level Rise and Coastal Storm Surge Flooding, completed by the Rockingham Planning Commission, identifies areas in town at risk of flooding from expected increases in storm surge and rates of sea level rise. https://www.therpc.org/application/files/1214/9400/9302/Exeter_Assessment_Report_Final.pdf

Research shows the climate of New Hampshire, and the Seacoast region has changed over the past century and predicts the future climate of the region will be affected by human activities that are warming the planet. Overall, New England has been getting warmer and wetter over the last century, and the rate of change has increased over the last four decades. The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding, and higher sea levels could significantly alter the types and magnitudes of hazards faced by Exeter.

**Location -** Exeter is vulnerable to flooding in several locations. Generally, the Town is at risk within the Flood Zones identified by FEMA on Flood Insurance Rate Maps (FIRM). Exeter has two major flood zones: A and X. These flood zones correspond to the Special Flood Hazard Area (100-year flood zone) and the 500-year flood zone respectively. There are also several areas susceptible to flooding that are not within these flood zones. These areas are listed below and displayed on Map 2: Past and Future Hazards.

- Franklin and River Street neighborhoods
- Court Street (NH Route 108) at the intersection of Bell Avenue and at the Exeter/Kensington town line
- Kingston Road (NH Route 111) at Brickyard Pond to West Side Drive
- Portsmouth Avenue (NH Route 108) abutting the Town of Exeter's Surface Water Treatment Plant, which lies in the 100-year floodplain
- Swasey Parkway is vulnerable to tidal storm surges
- Powder Mill Road at the railroad crossing the Exeter River
- Lary Lane, Gary Lane, and Court Street neighborhoods
- Brentwood Road (NH Route 111A) at the intersection of Greenleaf Drive and west of the intersection of Greenleaf Drive, and west of the intersection with Dogtown Road.
- Exeter River Landing at Little John Drive
- Exeter River Coop at Hilton Avenue
- Industrial Drive near the Rinks at Exeter and Stockbridge Funeral Home
- Gilman Lane, which accesses the Exeter River pump station and Stadium well
- Drinkwater Road at Prentiss Way
- Court Street at Exeter River
- Brentwood Road at Little River

**Table 1: FEMA Flood Zones in Exeter and Structures in each Zone**
**Source: NH Office of Planning and Development**
**July 2023**

| FEMA Special Flood Hazard Area | Description of FEMA Zone | Number of Structures in North Hampton in Zone |
|---|---|---|
| Zone A | Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. | 4 |
| Zone AE | Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within this zone. | 0 |
| Zone AO | Areas subject to inundation by 1-percent-annual-chance shall flooding where average depts are 1-3 feet. Average flood depth derived from detailed hydraulic analyses are shown within this zone. | 0 |
| Zone VE | Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. BFEs derived from detailed hydraulic coastal analyses are shown within this zone. | 0 |
| Zone X | Areas of minimal flood hazard, usually depicted on FIRMs as outside the 500-year flood level. | 8 |

**Extent -** The extent of the flood zones can be seen in Map 2: Past and Future Hazards. This area includes FIRM Zones A and X, as well as areas of locally chronic flood problems. The Town of Exeter actively manages six dams, listed above. Failure of the two low hazard dams could result in flooding of roadways and abutting forests and fields. Failure of the two significant hazard dams could result in the discharge of stormwater and treated wastewater into adjacent Squamscott River. Failure of the two high hazard dams could result is flooding of roadways, homes, and businesses.

**Dams** – The State of New Hampshire places every dam into one of four classifications, which are differentiated by the degree of potential damage that a failure of the dam is expected to cause. The classifications are as follows:

- Non-Menace structure – not a menace because it is in a location and of a size that failure or mis-operation of the dam would not result in probable loss of life or loss to property, less than six feet in height if it has a storage capacity greater than 50-acre feet, or less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.

- Low Hazard structure – has a low hazard potential because it is in a location and of a size that failure or mis-operation of the dam would result in no possible loss of life, low economic loss to structures or property, structural damage to local or private roads that could render roads impassable, the release of liquid industrial, agricultural or commercial wastes, septage or contaminated sediment if the storage capacity is less than two-acre feet and is located more than 250 feet from a water body, reversible environmental losses to environmentally sensitive areas.

- Significant Hazard structure – has a significant hazard potential because it is in a location and of a size that failure or mis-operation of the dam would result in no probable loss of lives, major economic loss to structures or property, structural damage to a Class I or II road that could render the road impassable, major environmental or public health losses.

- High Hazard structure – has a high hazard potential because it is in a location and of a size that failure or mis-operation of the dam would result in probable loss of human life, structural damage to an interstate highway which could rend the road impassable, the release of a quantity and concentration of hazardous waste, and any other circumstance that would more likely cause one or more deaths.

Additional information is available online, https://www.fema.gov/media-library-data/20130726-1516-20490-7951/fema-333.pdf

**Table 2: Active Dams in Exeter or Owned by Exeter**
**Source: NH Dam Bureau, July 2023**

| Dam Name | Dam Owner | Hazard Classification | River | Height/ Impoundment Area |
|---|---|---|---|---|
| Exeter Reservoir Dam | Town of Exeter | High | Dearborn Brook | 15 feet/26 acres |
| Pickpocket Dam in Brentwood | Town of Exeter | High | Exeter River | 15 ft/75 acres |
| Exeter Sewage Holding Pond Dam | Town of Exeter | Significant | NA | 10 feet/7acres |
| Exeter Sewage Lagoon Dam | Town of Exeter | Significant | NA | 12 feet/8.5 acres |
| Sloans Brook Dam | Town of Exeter | Low | Sloans Brook | 10 feet/0.02 acres |
| Dellacroce | R. Macomber | Low | Runoff | 14 feet/0 acres |

| | | | | |
|---|---|---|---|---|
| Detention Pond Dam | | | | |
| Colcord Pond Dam | Town of Exeter | Non-Menace | Little River | 7 feet/8 acres |
| Fort Rock Farm Pond Dam | P. Carey | Non-Menace | Norris Brook | 8 feet/0.63 acres |
| Raynes Farm Pond Dam | B. Norton | Non-Menace | Unnamed stream | 13 feet/0.5 acres |
| Exeter Country Club Dam | Exeter Country Club | Non-Menace | Wheelwright Creek | 11 feet/0.38 acres |
| Exeter Falls Estates Detention Pond Dam | Exeter Falls Association | Non-menace | Runoff | 6.5 feet/0.87 acres |
| Stone Recreation Pond Dam | H. Stone | Non-menace | Unnamed stream | 9.8 feet/1.67 acres |
| Apollo Comp Detention Pond Dam | Unknown | Non-menace | Runoff | 6.1 feet/1.6 acres |
| Farmington Estates Detention Pond Dam | M. Ryan Realty Trust | Non-menace | Runoff | 10 feet/0.14 acres |
| Forest Ridge Detention Pond 51 Dam | Oaklands Forest Ridge Homeowners Association | Non-menace | Runoff | 12 feet/0.25 acres |
| Exeter Backwash Ponds Dam | Town of Exeter | Non-menace | NA | 10 feet/0.09 acres |

**Probability -** The probability of flooding roadways and properties from heavy rain, rapid snow melting, and compound flooding is high, especially in the areas listed above. The NH Dam Bureau classifies two dams owned by the Town as High Hazard and two dams owned by the Town as Significant Hazard, as described in Table 2. The Town works with dam owners and abutters to monitor dam integrity and manage water levels. The Town also regularly assesses culverts to ensure integrity and the ability to pass stormwater.

**Past Occurrence -** Flooding is a common hazard for the Town of Exeter. Several locations were identified by the Committee as areas of chronic reoccurring flooding or high potential for future flooding, as listed above and identified on Map 2 and listed above. The Town has not experienced a dam failure and maintains pro-active dam management program.

**Community Vulnerability -** Flooding is most likely to occur in the 100-year flood zones adjacent to the Exeter River, Little River, Dudley Brook and tidal Squamscott River.

**National Flood Insurance Program (NFIP) -** In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods. The Federal Insurance and Mitigation Administration (FIMA), a component of the Federal Emergency Management Agency (FEMA) manages the NFIP and oversees the floodplain management and mapping components of the program.

Communities participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce flood damage. In exchange, the NFIP makes federally subsidized flood insurance available to homeowners, renters, and business owners in these communities. Flood insurance, Federal Grants and loans, Federal disaster assistance and federal mortgage insurance is unavailable for the acquisition or construction of structures located in the floodplain shown on the NFIP maps for those communities that do not participate in the program.

To get secure financing to buy, build or improve structures in the Special Flood Hazard areas, it is legally required by federal law to purchase flood insurance. Lending institutions that are federally regulated or federally insured must determine if the structure is in the SFHA and must provide written notice requiring flood insurance. Flood insurance is available to any property owner located in a community participating in NFIP.

**Repetitive Loss Properties -** A specific target group of repetitive loss properties is identified and serviced separately from other NFIP policies by the Special Direct Facility (SDF). The target group includes every NFIP insured property that, since 1978 and regardless of any change(s) of ownership during that period, has experienced four or more paid losses, two paid flood losses within a 10-year period that equal or exceed the current value of the insured property, or three or more paid losses that equal or exceed the current value of the insured property, regardless of any changes of ownership, since the buildings construction or back to 1978. Target group policies are afforded coverage, whether new or renewal, only through the SDF.

The FEMA Regional Office provides information about repetitive loss properties to State and local floodplain management officials. The FEMA Regional Office may also offer property owners building inspection and financial incentives for undertaking measures to mitigate future flood losses. These measures include elevating buildings from the flood area, and in some cases drainage improvement projects. If the property owners agree to mitigation measures, their property may be removed from the target list and would no longer be serviced by the SDF.

**Table 1: Exeter NFIP Policy and Loss Statistics**

| Policies in force | Insurance in Force | Number of Paid Losses (since 1978) | Total Losses Paid (since 1978) |
|---|---|---|---|
| 45<br>24 Pre-FIRM policies and 21 Post-Firm Policies<br>27 single-family residential, 4 multi-family, 7 other residential, 7 non-residential | $12,941,000 | 92 | $1,225,038 |

Source: NH Office of Planning and Development, July 2023

**Exeter NFIP Repetitive Flooding Losses -** Exeter joined the Regular Program of the NFIP on May 17, 1982. As of July 2023, Exeter has 17 repetitive loss buildings with payments totaling $1,066,565. Twelve buildings were residential, one building was commercial, and four were classified as non-residential with two of these buildings classified as Severe Repetitive Losses.

**Floodplain Management Goals/Reducing Flood Risks -** A major objective to floodplain management is to continue participation in the NFIP. Communities that agree to manage Special Flood hazard Areas shown on NFIP maps participate in the NFIP by adopting minimum standards. The minimum requirements are the adoption of the floodplain Ordinances and Subdivision/Site Plan Review requirements for land designated as Special Flood hazard Areas. Under Federal Law, any structure located in a floodplain is required to have flood insurance. Federally subsidized flood insurance is available to any property owner located in a community participating in the NFIP. Communities that fail to comply with the NFIP will be put on probation and/or suspended. Probation is a first warning where all policy holders receive a letter notifying them of a $50 increase in their insurance. In the event of suspension, the policyholders lose their NFIP insurance and are left to purchase insurance in the private sector, which is of significantly higher cost. If a community is having difficulty complying with NFIP policies, FEMA is available to meet with staff and volunteers to work through the difficulties and clear up any confusion before placing the community on probation or suspension.

**Potential Administrative Techniques to Minimize Flood Losses in Exeter -** A potential step in mitigating flood damage is participating in NFIP. Exeter continues to consistently enforce NFIP compliant policies to continue its participation in this program and has effectively worked within the provisions of NFIP. Below is a list of actions Exeter should consider, or continue to perform, to comply with NFIP:

- Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.
- Establish Mutual Aid Agreements with neighboring communities to address administering the NFIP following a major storm event.
- Address NFIP monitoring and compliance activities.
- Revise/adopt subdivision regulations, erosion control regulations, board of health regulations to improve floodplain management in the community.

- Prepare, distribute, or make available NFIP insurance and building codes explanatory pamphlets or booklet.
- Identify and become knowledgeable of non-compliant structures in the community.
- Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE) if they are in the floodplain.
- Require the use of elevation certificates.
- Enhance local officials, builders, developers, local citizens, and other stakeholders' knowledge of how to read and interpret the FIRM.
- Work with elected officials, the state and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through continuous communications, training, and education.
- Prohibit septic systems in floodplains.

**Hurricane-High Wind Events**

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

- *Hurricanes* - A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and may extend over 400 miles. High winds are a primary cause of hurricane-inflicted loss of life and property damage. Hurricanes can also include coastal storm surges. The Saffir–Simpson hurricane wind scale (SSHWS), or the Saffir–Simpson hurricane scale (SSHS) for short, classifies hurricanes into five categories distinguished by the intensities of their sustained winds. To be classified as a hurricane, a tropical cyclone must have maximum sustained winds of at least 74 mph, Category 1. The highest classification in the scale, Category 5, is reserved for storms with winds exceeding 156 mph. The Saffir/Simpson Hurricane Scale is included in Appendix C.

- *Tornadoes* - A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down, they become a force of destruction. Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage. The Enhanced Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison with a hurricane, a tornado covers a much smaller area but can be more violent and destructive.

- *Severe Thunderstorms* - All thunderstorms contain lightning. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, which can damage building walls and break glass.

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

- *Hail* - Hailstones are balls of ice that grow as they're held up by winds, known as updrafts, which blow upwards in thunderstorms. The updrafts carry droplets of supercooled water – water at a below freezing temperature – but not yet ice. The supercooled water droplets hit the balls of ice and freeze instantly, making the hailstones grow. 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. Details of how hailstones grow are complicated, but the results are irregular balls of ice that can be as large as baseballs, sometimes even bigger. While crops are the major victims, hail is also a hazard to vehicles and windows.

**Location -** Hurricane events are more potentially damaging with increasing proximity to the coast. Exeter's proximity to the Atlantic Coast makes hurricanes and high wind events severe threats. For this Plan, high-wind and lightning events were considered to have an equal chance of affecting any part of the Town of Exeter, however Pickpocket Road and Pickpocket Ridge were identified by the committee as an area of town at risk of high wind events.

**Extent –** Hurricane strength is measured using the Saffir-Simpson scale, located in the appendix of this Plan. Exeter is located within Zone II hurricane-susceptible region (indicating a design wind speed of 160 mph). From 1950 to 2018 Rockingham County was subject to 9 tornado events, these included 2 type F0 (Tornado, 40-72 mph), 2 type F1 (Moderate Tornado, 73-112 mph), 4 type F2 (Significant Tornado, 113-157 mph) and 1 type F3 (Severe Tornado, 158-206 mph). Type 3 tornados can cause severe damage including tearing the roofs and walls from well-constructed homes, trees can be uprooted, trains over-turned, and cars lifted off the ground and thrown. Between 1900 and 2018 2 hurricanes have made landfall in New Hampshire, category 1 and category 2. Measurement scales for thunderstorms, lightning risk, and hail are in the appendix of this Plan.

**Probability** -High. The State of New Hampshire's Multi-Hazard Mitigation Plan Update 2023 rates Rockingham County with high likelihood of hurricane, tornado, and "Nor'-Easters" events. Also, it rates the risk of downbursts, lightning, and hail events as moderate.

**Past Occurrence –** Between 1635 and 2018 14 hurricanes have impacted the State of New Hampshire. The worst of these occurred on September 21, 1938, with wind speeds of up to 186 mph in MA and 138 mph elsewhere. Thirteen of 494 people killed by this storm were residents

of New Hampshire. The Storm caused $12,337,643 in damages (1938 dollars), timber not included. Hurricanes Sandy and Irene created areas of localized flooding in Exeter and power loss. High wind events in 2010, 2014, 2018, 2023, and 2024 resulted in extensive power outages, downed wires and trees. Neither lightning nor tornadoes have impacted Exeter in recent memory.

**Community Vulnerability –** The Committee determined that lightning and high wind and heavy rain associated with hurricanes can impact every neighborhood in Exeter before, during and after the storm, resulting in downed trees, flooding of ponds, rivers, streams, roads and basements, and damage to home, businesses, and infrastructure.

**Severe Winter Weather**

**Description** – Severe winter weather in the form of heavy snowstorms, ice storms and Nor'easters are a threat to the community with subzero temperatures from extreme wind chill and storms causing low visibility for commuters. Heavy snow loads from storms are known to collapse buildings. Ice storms disrupt power and communication services. Extreme cold affects vulnerable populations, including the elderly.

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

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

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

**Location** - Severe winter weather events have an equal chance of affecting any part of the Town of Exeter.

**Extent -** Large snow events in Southeastern New Hampshire can produce 30 inches of snow. Portions of central New Hampshire recorded snowfalls of 98" during one slow moving storm in February of 1969. Ice storms occur regularly in New England. The Sperry-Piltz ice accumulation scale is found in the Appendix of this Plan. Seven severe ice storms have been recorded that have affected New Hampshire since 1929. These events caused disruption of transportation, loss of power and millions of dollars in damage.

**Probability -** High. The State of New Hampshire's Multi-Hazard Mitigation Plan Update 2023 rates Rockingham County with high likelihood of heavy snows and ice storms.

**Past Occurrence** – Exeter has been impacted by six severe winter storms in the past five years. Two Nor'easters in 2018, a heavy snowstorm in December 2022 resulted in power outages and damage to the town docks, and two Nor'Easters in March 2023 and March 2024 required extensive snow removal, removal of fallen trees, and utility repairs.

**Community Vulnerability -** Severe winter weather has struck Exeter and every other community in the region on an annual basis in recent memory. The Committee determined that heavy snow, strong and gusty winds, and frigid temperatures can impact all parts of town equally, resulting in downed trees and power lines, extended power outages, and unsafe driving condition. Extended power outages and the resulting loss of heat in homes of elderly residents are of concern. Rapid snow melting after severe winter weather can result in flooding of rivers and streams, posing risk to roads and structures. The Committee identified the elderly and vulnerable populations, utility lines and towers, and trees at greatest risk from severe winter weather.

**Wildfire**

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

**Location -** The Committee identified the following areas of Town at-risk to wildfires, which are also located on Map 2 Past and Future Hazards:

- The Oakland's Town Forest
- Marsh land abutting the Squamscott River
- Marsh land abutting the CSX rail line
- Front Street to the Town line
- Newfields Road to the Town line

**Extent -** A wildfire in the Town of Exeter is unlikely, but if a crown fire were to occur it could be very damaging to several small sections of Town, such as the Town Forest. A large grass fire could damage structures and neighborhood buildings near large open areas. The Wildland-Urban Interface Scale, a tool to quantify the expected severity of wildfire events in developed areas, is included in Appendix K.

**Probability** - Moderate. The State of New Hampshire's Multi-Hazard Mitigation Plan Update 2023 rates Rockingham County with moderate risk to wildfires.

**Past Occurrence** - The majority of wildfires in Exeter are minor brush fires. No Large fires have occurred within recent memory.

**Community Vulnerability -** The Committee determined that all forested and open areas in Exeter are prone to wildfires, with the threat increasing during periods of drought. The Committee summarized the threat as follows:

- Structures located near large open vegetated areas are prone to lightning strikes.
- Vulnerability increases during drought events.
- Tree debris created by high wind and winter storm events.

**Earthquakes**

**Description** – Seismic activity including landslides and other geologic events. Geologic events are often associated with California, but New England is considered a moderate risk earthquake zone. An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined using scales such as the Richter Magnitude Scale, located in the Appendix of this Plan.

**Location** – An earthquake has an equal chance of affecting all areas on Exeter.

**Extent -** New England is particularly vulnerable to the injury of its inhabitants and structural damage because of our built environment. Few New England States currently include seismic design in their building codes. Massachusetts introduced earthquake design requirements into their building code in 1975 and Connecticut very recently did so. However, these specifications are for new buildings, or very significantly modified existing buildings only. Existing buildings, bridges, water supply lines, electrical power lines and facilities, etc. have rarely been designed for earthquake forces (New Hampshire has no such code specifications).

**Probability -** Moderate. The State of New Hampshire's Multi-Hazard Mitigation Plan 2023 ranks all the Counties in the State with at moderate risk to earthquakes.

**Past Occurrence** - Large earthquakes have not affected the Town of Exeter within recent memory.

**Community Vulnerability** - The Committee determined that earthquakes do not pose a frequent threat to Exeter, but if one were to occur the most vulnerable structures include dams, bridges, brick structures, infrastructure, and utility lines, as well as secondary hazards such as fire, power outages or a hazardous material leak or spill.

**Drought**

**Description** - Drought is a period of unusually constant dry weather that persists long enough to cause deficiencies in water supply (surface or underground). Droughts are slow-onset hazards that can severely affect municipal water supplies, crops, recreation resources, and wildlife. If drought conditions extend over several years, the direct and indirect economic impacts can be significant. High temperatures, high winds, and low humidity can worsen drought conditions and make areas more susceptible to wildfire. In addition, human actions and demands for water resources can accelerate drought-related impacts.

**Location** – The Committee determined that drought poses risks to water supplies throughout Town, both private and municipal. The risks of wildfire associated with drought conditions are greatest in forested and open grassland areas.

**Extent -** Although New Hampshire is typically thought of as a water-rich state, there are times the demand for water can be difficult to meet. A combination of increased population and extended periods of low precipitation can cause reduced water supplies. Drought can impact Exeter after extended periods with limited rain and snowfall, often for several months, and is a town-wide hazard, impacting both private wells and the Town's municipal water system surface water and groundwater supplies. The Town of Exeter monitors the information provided by NH DES Drought Management Program. The U.S. Drought Monitor Scale is in the appendix of this Plan.

**Probability -** Low.

**Past Occurrence** - The State of New Hampshire Multi-Hazard Mitigation Plan Update 2023 rates Rockingham Count at low risk for drought. However, drought conditions persisted across southern New Hampshire for two of the last five years, resulting in the Town of Exeter issuing both voluntary and mandatory outdoor watering bans. The town is aware of private wells going dry during periods of drought.

**Community Vulnerability -** The Committee determined that water supply and fire flow are the most at risk due to drought conditions:

**Extreme Temperatures**

**Description -** Extreme temperatures are typically recognized as conditions where temperatures consistently stay ten degrees or more above a region's average high temperature for 24-72 hours (extreme heat) or stay ten degrees or more below a region's average low temperature for a 24-72-hour period (extreme cold). Fatalities can result from extreme temperatures, as they can push the human body beyond its limits.

**Location** – Extreme temperatures can affect all areas of Exeter.

**Extent** - Extreme heat events impact Exeter for 2-3 days each summer, and extreme cold events impact the Town 5-7 days each winter. Heat Index measures a number in degrees Farenheit that tells how hot it feels when relative humidity is added to the air temperature. The National Weather Service Heat Index is included in this Plan as Appendix K, and the Wind Chill Chart is included as Appendix L.

**Probablility** – High.

**Past Occurrence** - Annually

**Community Vulnerability -** The Committee determined that all parts of Exeter are at risk of impacts associated with extreme temperatures. The young, elderly and vulnerable populations are especially vulnerable to heat stroke. The EMD maintains a list of these populations, including addresses for homes, day care centers, and congregate care facilities.

Table 2: State of New Hampshire
Presidentially Declared Disasters (DR) and Emergency Declarations (EM) 1982-2018
Source: *State of NH Multi-Hazard Mitigation Plan, 2013 Update and FEMA*

| Date Declared | Event | FEMA DR | Program | Amount | Counties Declared |
|---|---|---|---|---|---|
| 08/27/86 | Severe storms/flooding | FEMA-771-DR | PA | $1,005,000 | Cheshire and Hillsborough |
| 04/16/87 | Severe storms/flooding | FEMA-789-DR | PA/IA | $4,888,889 | Carroll, Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, and Sullivan |
| 08/29/90 | Severe storms/winds | FEMA-876-DR | PA | $2,297,777 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, and Sullivan |
| 09/09/91 | Hurricane | FEMA-917-DR | PA | $2,293,449 | Statewide |
| 11/13/91 | Coastal storm/flooding | FEMA-923-DR | PA/IA | $1,500,000 | Rockingham |
| 03/16/93 | Heavy snow | FEMA-3101-DR | PA | $832,396 | Statewide |
| 01/03/96 | Storms/floods | FEMA-1077-DR | PA | $2,220,384 | Carroll, Cheshire, Coos, Grafton, Merrimack, and Sullivan |
| 10/29/96 | Severe storms/flooding | FEMA-1144-DR | PA | $2,341,273 | Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan |
| 01/15/98 | Ice storm | FEMA-1199-DR | PA/IA | $12,446,202 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Strafford, and Sullivan |
| 07/02/98 | Severe storms | FEMA-1231-DR | PA/IA | $3,420,120 | Belknap, Carroll, Grafton, Merrimack, Rockingham, and Sullivan |
| 10/18/99 | Hurricane/tropical storm Floyd | FEMA-1305-DR | PA | $750,133 | Belknap, Cheshire, and Grafton |
| 3/2001 | Snow emergency | FEMA-3166-EM | PA | $4,500,000 | Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, and Strafford |
| 2/17/2003 - 2/18/2003 | Snow emergency | FEMA-3177-EM | PA | $3,000,000 | Cheshire, Hillsborough, Merrimack, Rockingham, and Strafford |
| 09/12/03 | Severe storms/flooding | FEMA-1489-DR | PA | $1,300,000 | Cheshire and Sullivan |
| 03/11/03 | Snow emergency | FEMA-3177-EM | PA | $3,000,000 | Cheshire, Hillsborough, Merrimack, Rockingham, and Strafford |

| | | | | | |
|---|---|---|---|---|---|
| 01/15/04 | Snow emergency | FEMA-3193-EM | PA | $3,200,000 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, and Sullivan |
| 03/30/05 | Snow emergency | FEMA-3207-EM | PA | $4,654,738 | Belknap, Carroll, Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan |
| 03/30/05 | Snow emergency | FEMA-3208-EM | PA | $1,417,129 | Carroll, Cheshire, Coos, Grafton, and Sullivan |
| 04/28/05 | Snow emergency | FEMA-3211-EM | PA | $2,677,536 | Carroll, Cheshire, Hillsborough, Rockingham, and Sullivan |
| 10/26/05 | Severe storm/flooding | FEMA-1610-DR | PA/IA | $14,996,626 | Belknap, Cheshire, Grafton, Hillsborough, Merrimack, and Sullivan |
| 05/31/06 | Severe storm/flooding | FEMA-1643-DR | PA/IA | $17,691,586 | Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, and Strafford |
| 4/15/2007 - 4/23/2007 | Severe storm/flooding | FEMA-1695-DR | PA/IA | $27,000,000 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan |
| 08/11/08 | Severe storms/tornado/flooding | FEMA-1782-DR | PA | $1,691,240 | Belknap, Carroll, Merrimack, Rockingham, and Strafford |
| 09/05/08 | Severe storms/flooding | FEMA-1787-DR | PA | $4,967,595 | Belknap, Coos, and Grafton |
| 10/03/08 | Severe storms/flooding | FEMA-1799-DR | PA | $1,050,147 | Hillsborough and Merrimack |
| 12/11/08 | Severe winter storm | FEMA-3297-EM | DF A/P A | $900,000 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan |
| 01/02/09 | Severe winter storm | FEMA-1812-DR | DF A/P A | $19,789,657 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan |
| 03/29/10 | Severe winter storm | FEMA-1892-DR | PA | $9,103,138 | Merrimack, Rockingham, Strafford, and Sullivan |
| 05/12/10 | Severe winter storm | FEMA-1913-DR | PA | $3,057,473 | Hillsborough and Rockingham |
| 07/22/11 | Severe storms/flooding | FEMA-4006-DR | PA | $1,664,140 | Coos and Grafton |

| | | | | | |
|---|---|---|---|---|---|
| 09/03/11 | Tropical storm Irene | FEMA-4026-DR | PA/IA | $11,101,752 | Belknap, Carroll, Coos, Grafton, Merrimack, Strafford, and Sullivan |
| 12/07/11 | October Nor'easter | FEMA-4049-DR | PA | $4,411,457 | Hillsborough and Rockingham |
| 06/18/12 | Severe storms/flooding | FEMA-4065-DR | PA | $3,046,189 | Cheshire |
| 10/30/12 | Hurricane Sandy | DR-4095 EM-3360 | PA DFA | $2,132,376 | Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan |
| 2/8/2013 - 2/10/2013 | Severe storm/blizzard | DR-4105 | PA | $6,127,598 | Belknap, Carroll, Cheshire, Hillsborough, Merrimack, Strafford, and Rockingham |
| 6/26/2013 – 7/3/2013 | Severe storms/flooding | DR-4139 | PA | $6,389,705 | Cheshire, Sullivan, and Grafton |
| 1/26/2015 – 1/29/2015 | Severe winter storm/snowstorm | DR-4209 | PA | $4,607,527 | Strafford, Rockingham, and Hillsborough |
| 3/14/2017 – 3/15/2017 | Severe winter storm/snowstorm | DR-4316 | PA | $80,306.55 | Belknap and Carroll |
| 1/1/2017 – 1/2/2017 | Severe storms/flooding | DR-4329 | PA | NA | Grafton and Coos |
| 10/29/2017 - 11/1/2017 | Severe Storm/flooding | DR-4355 | PA | NA | Sullivan, Merrimack, Belknap, Carroll, Grafton, Coos |
| 3/2/2018 – 3/8/2018 | Severe Storm/flooding | DR-4370 | PA, IA | NA | Rockingham |
| 3/13/2018 – 3/14/2018 | Severe Winter Storm/snowstorm | DR-4371 | PA. IA | NA | Carroll, Strafford, Rockingham |
| 7/11/2019- 7/12/2019 | Severe Storm/flooding | DR-4457 | PA | $675,907,70 | Grafton |
| 7/17/2021- 7/19/2021 | Severe Storm/flooding | DR-4622 | PA | $1,195,832 | Cheshire |
| 3/13/2020 – 5/11/2023 | COVID-19 Pandemic | EM-3445 | PA, IA | NA | New Hampshire |
| 1/20/2020- 5/11/2023 | COVID-19 Pandemic | DR-4516 | PA, IA | $284,982,234 | New Hampshire |
| 7/29/2021- 8/2/2021 | Severe Storm/flooding | DR-4624 | PA | $3,530,071 | Cheshire, Sullivan |
| 12/22/2022- 12/25/2022 | Severe Storm/flooding | DR-4693 | PA | $1,251,386 | Belknap, Carroll, Grafton, Coos |
| 7/9/2023- 7/13/2023 | Severe Storm/flooding | DR-4740 | PA | $170,675 | Rockingham, Cheshire, Sullivan, Grafton, Belknap, Carroll, Coos |
| Program Key: PA: Public Assistance IA: Individual Assistance DFA: Direct Federal Assistance | | | | | Severe Sto |

**Map 2**: Past and Future Hazards

## CHAPTER IV – CRITICAL FACILITIES

The Critical Facilities List for the Town of Exeter has been identified by Exeter's Hazard Mitigation Committee. The Critical Facilities List has been broken up into four categories. The first category contains facilities needed for Emergency Response in the event of a disaster. The second category contains Non-Emergency Response Facilities that have been identified by the committee as non-essential. These are not required in an emergency response event but are considered essential for the everyday operation of Exeter. The third category contains Facilities/Populations that the committee wishes to protect in the event of a disaster. The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster. Map 3: Critical Facilities at the end of this Chapter identifies the location of the facilities and the evacuation routes. A detailed description of critical facilities can be found in Table 3 through Table 6.

**Table 3: Category 1 - Emergency Response Services and Facilities**

| Critical Facility Name | Address | Description |
|---|---|---|
| Exeter Safety Complex | 20 Court Street | EOC, fuel, back-up power |
| Exeter Town Offices | 10 Front Street | Back-up Power |
| Exeter Public Works | 13 Newfields Road | Fuel |
| Exeter Recreation Center | 10 Hampton Road | |
| Exeter Hospital | 5 Alumni Drive | Back-up Power, Helipad |
| Electric Substation | River Street | Power supply |
| Cell Tower | Guinea Road | Communication Infrastructure |
| Cell Tower | Watson Road | Communication Infrastructure |
| Cell Tower | Commerce Way | Communication Infrastructure |
| Cell Tower | 115 Epping Road | Communication Infrastructure |
| Cell Tower | Continental Drive | Communication Infrastructure |
| Cell Tower | 10 Chestnut Street | Communication Infrastructure |
| Cell Tower | 21 Front Street | Communication Infrastructure |
| Cell Tower | 8 Kingston Road | Communication Infrastructure |
| Cell Tower | 20 Meeting Place Dr. | Communication Infrastructure |

**Table 4: Category 2 - Non-Emergency Response Facilities:**

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

| Critical Facility Name | Address | Description |
|---|---|---|
| Sewer Pump Station | Colcord Pond Drive | Back-up generator |
| Sewer Pump Station | Court Street | Back-up generator |
| Sewer Pump Station | Folsom Way | Back-up generator |

| | | |
|---|---|---|
| Sewer Pump Station | Front Street | Back-up generator |
| Water Pump Station | Kingston Road | Back-up generator |
| Sewer Pump Station | Langdon Avenue | Back-up generator |
| PEA Power Station | Marston Street | Power supply |
| Electric Substation | Portsmouth Avenue | Power supply |
| Wastewater Treatment Plant | 13 Newfields Road | Sewage treatment |
| Sewer Pump Station | Webster Avenue | Back-up generator |
| Sewer Pump Station | Riverbend Circle | Back-up generator |
| Sewer Pump Station | Riverwoods Drive | Back-up generator |
| Surface Water Treatment Plant | 109 Portsmouth Avenue | Water treatment |
| Water Supply Reservoir | 109 Portsmouth Avenue | Water supply |
| Water Supply Well | 50 Lary Lane | Water supply |
| Water Pump Station | 33 Gilman Lane | Water supply |
| Surface Water Supply Intake | Gilman Lane | Water supply |
| Water Tower | 9 Cross Road | Water supply |
| Water Tower | 13 Fuller Way | Water supply |
| Water Tower | Meeting Place Drive | Water supply |
| Telephone Building | Center Street | Communications |
| Water Supply Well | 33 Gilman Lane | Water Supply |
| Water Supply Well | 45 Bell Avenue | Water Supply |
| Groundwater Treatment Plant | 48 Lary Lane | Water Supply |
| Sewer Pump Station | 279 Water Street | Back-up generator |
| Sewer Pump Station | Winslow Way | Back-up generator |

**Table 5: Category 3 - Facilities/Populations to Protect:**

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

| Critical Facility Name | Address | Description |
|---|---|---|
| Exeter High School | Blue Hawk Drive | School |
| Lincoln Street School | 25 Lincoln Street | School |
| Main Street School | 40 Main Street | School |
| Seacoast School of Technology | 40 Linden Street | School |
| Former High School Fields | Linden Street | Recreation |
| Appleseeds Day School | 15 Hampton Road | Childcare |
| Building Blocks School | 125 Kingston Road | Childcare |
| Primrose School | 5 McKay Drive | Childcare |
| Exeter Day School | 11 Marlboro Street | School |

| | | |
|---|---|---|
| Great Bay Kids Company | 64 Epping Road | Childcare |
| Phillips Exeter Academy (PEA) | 20 Main Street | School |
| PEA Harris Family Children's Center | 20 Water Street | Childcare |
| PEA Stadium | Gilman Street | Recreation |
| PEA Fields | Gilman Street | Recreation |
| PEA Love Gym | Court Street | Recreation |
| Winding River Campground | 188 Court Street | Recreation |
| Green Gate Campground | 185 Court Street | Recreation |
| Rinks at Exeter | 40 Industrial Drive | Recreation |
| Town Pool and Fields | 4 Hampton Road | Recreation |
| Brickyard Pond Fields | Kingston Road | Recreation |
| American Independence Museum | Center Street | Historic resource |
| Exeter Bandstand | Front Street | Attraction |
| Exeter Historical Society | 47 Front Street | Historic resource |
| Gilmore Garrison House | 12 Water Street | Historic resource |
| Genesis | 8 Hampton Road | Elderly housing |
| Squamscott View | 277 Water Street | Elderly housing |
| Genesis | 17 Hampton Road | Elderly housing |
| The Woods at Riverwoods | Riverwoods Drive | Elderly housing |
| The Boulders at Riverwoods | 5 Timber Lane | Elderly housing |
| The Ridge at Riverwoods | 10 White Oak Drive | Elderly housing |
| Christs Church Episcopal | 43 Pine Street | Religious facility |
| Church of Jesus Christ Latter Day Saints | 55 Hampton Falls Road | Religious facility |
| Community Church of Exeter | 134 Front Street | Religious facility |
| Congregational Church | 21 Front Street | Religious facility |
| Exeter Assembly of God | 47A Hampton Falls Road | Religious facility |
| Exeter Presbyterian Church | 73 Winter Street | Religious facility |
| Faith Lutheran Church | 4 Elm Street | Religious facility |
| First Unitarian Church of Exeter | 12 Elm Street | Religious facility |
| Phillips Church | Tan Lane | Religious facility |
| St. Michael's Catholic Church | 9 Lincoln Street | Religious facility |
| St. Vincent de Paul Assistance Center | 53 Lincoln Street | Food pantry |
| United Methodist Church | 307 Epping Road | Religious facility |

## Table 6: Category 4 - Potential Resources:

This category contains facilities that provide potential resources for services or supplies in the event of a natural disaster.

| Critical Facility Name | Address | Description |
|---|---|---|
| AMTRAK Rail Station | Lincoln Street | Transportation |
| Arjay's Hardware | Lincoln Street | Building supplies |
| Exeter Lumber | 120 Portsmouth Avenue | Building supplies |
| First Student Transportation | Epping Road | Transportation |
| Market Basket Supermarket | Portsmouth Ave, Stratham, NH | Food and water |
| Shaw's Supermarket | Portsmouth Ave, Stratham, NH | Food and water |
| Simpson Gravel Pit | Kingston Road | Sand and gravel |
| Hannaford's Supermarket | Portsmouth Avenue | Food, water, supplies |
| Walmart | Route 125, Epping, NH | Food, water, supplies |
| Lowe's | Rt. 125, Epping, NH | Building, construction supplies |
| Buxton | 49 Shirking Road, Epping, NH | Fuel |
| Convenient MD | 1 Portsmouth Avenue, Stratham, NH | Urgent medical care |
| Clear Choice MD | 1 Beehive Drive, Epping, NH | Urgent medical care |
| Access Sports Medicine | 1 Hampton Road | Medical facility |

Map 3: Critical Facilities Map

## CHAPTER V. – POTENTIAL HAZARD DAMAGE

### Identifying Vulnerable Facilities

It is important to determine which critical facilities are the most vulnerable and to estimate their potential loss. The first step is to identify the facilities most likely to be damaged in a hazard event. To do this, the location of critical facilities illustrated on Map 3 was compared to the location of various topographical elements, floodplains, roads, and water bodies using GIS (Geographic Information Systems). Vulnerable facilities were identified by comparing their location to possible hazard events.

### Calculating the Potential Loss

The next step in completing the loss estimation involved assessing the level of damage from a hazard event on structures in Exeter. To estimate general losses, the total value for all structures in Exeter in 2023, $1,612,128,233, was used, to estimate potential damages.

The damage estimates are divided into two categories based on hazard types: hazards that are location specific (e.g. flooding), and hazards that could affect all areas of Exeter equally, such as extreme temperatures. Damage estimates from hazards that could affect all of Exeter equally are much rougher estimates, based on percentages of the total assessed value of all structures in the community. Damage estimates from hazards with a specific location are derived from the estimated values of the parcels within the hazard area. Assessing and tax map data were used to determine buildings at risk. After identifying the parcels and buildings that are at risk, the next step was to calculate a damage estimate for each potential hazard area. The following discussion summarizes the potential loss estimates due to natural hazard events.

### Flooding

In addition to the potential of flood damage and high wind damage discussed in Chapter III, sea-level rise and coastal storm surge could damage buildings and infrastructure in Hampton Falls, primarily in neighborhoods along and east of Route 1. The average replacement value of structures damaged by flooding was calculated using FEMA's process for calculating potential loss, which involves multiplying the replacement value by the percent of damage expected from the hazard event. Residential and non-residential structures were combined. The costs for repairing roadways, utilities, and other infrastructure are not included in this estimate but were estimated in the 2017 Vulnerability Assessment and discussed under Climate Change.

Potential Structure Damage: 49%, based on eight-foot flooding:
Approximately 443 structures with an average assessment of $600,000 = $130,242,000 potential damage

Potential Structure Damage 28%, based on four-foot flooding:
Approximately 443 structures assessed with an average assessment of $600,000 = $74,424,000 potential damage

Potential Structure Damage 20%, based on two-foot flooding:

Approximately 443 structures with an average assessment of $600,000 = %53,160,000 potential damage

Exeter has sixteen active dams. Two dams are classified as High Hazard dams, two are classified as Significant Hazard dams, two as Low Hazard dams, and ten as Non-menace dams. Potential losses will depend on the extent of the breach and impacts on residential and non-residential structures as well as infrastructure.

**Sea Level Rise, Coastal Storm Surge, and Compound Flooding**

Sea level rise, storm surge, and compound flooding could damage buildings and infrastructure along the Squamscott River and its tributaries. In 2017, the Rockingham Planning Commission completed a Vulnerability Assessment for the Town of Exeter of impacts associated with projected sea level rise and coastal storm surge. The Assessment estimated the value of structures and infrastructure impacted by a 6.3-foot sea level rise scenario, plus storm surge, would be $32,480, 100.

**Hurricane/ High Wind Events**

**Hurricane -** Hurricanes do affect the Northeast coast periodically. Since 1900, 2 hurricanes have made landfall in the State of New Hampshire. Due to the coastal location of the Town of Exeter, hurricanes and storm surges present a real hazard to the community. Even degraded hurricanes or tropical storms could still cause significant damage to the structures and infrastructure of the Town of Exeter. The assessed value of all residential and commercial structures in the Town of Exeter in 2023 was $1,613,128,233. Assuming 1% to 5% damage, a hurricane could result in $16,131,22 to $80,656,412 of structure damage.

**Tornado -** 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 is strikes an inhabited area, the impact could be severe. The assessed value of all residential and commercial structures in the Town of Exeter in 2023 was $1,613,128,233. Assuming 1% to 5% damage, a tornado could result in $16,131,22 to $80,656,412 of structure damage.

**Severe Lightning -** The amount of damage caused by lightning will vary according to the type of structure hit and the type of contents inside. There is no record of monetary damages inflicted in the Town of Exeter from lightning strikes.

**Severe Winter Weather**

**Heavy Snowstorms -** Heavy snowstorms typically occur during January and February. New England usually experiences at least one or two heavy snowstorms 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 Exeter in the past. All these impacts are a risk to the community, including isolation, especially of the elderly, and increased traffic accidents. Damage caused because of this type of hazard varies according to wind velocity, snow accumulation and duration. The assessed value of all residential and commercial structures in the Town of Exeter

in 2023 was $1,613,128,233. Assuming 1% to 5% damage, a heavy snowstorm could result in $16,131,22 to $80,656,412 of structure damage.

**Ice Storms -** Ice storms often cause widespread power outages by downing power lines, making power lines at risk in Exeter. They can also cause severe damage to trees. Ice storms in Exeter could be expected to cause damage ranging from a few thousand dollars to millions of dollars, depending on the severity of the storm.

**Wildfire**

The risk of fire is difficult to predict based on location. Forest fires are more likely to occur during years of drought. The area identified as at risk to wildfire (Map 2: Past and Future Hazards) by the Hazard Mitigation Committee is in the northern section of Town and includes the Town Forest. The assessed value of all residential and commercial structures in the Town of Exeter in 2023 was $1,613,128,233. Assuming 1% to 5% damage, a wildfire could result in $16,131,22 to $80,656,412 of structure damage.

**Earthquakes**

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electricity and phone lines and are often associated with landslides and flash floods. Four earthquakes in New Hampshire between 1924-1989 had a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia, and one near the Quebec border. If an earthquake were to impact the Town of Exeter, underground utilities would also be susceptible. In addition, buildings that are not built to a high seismic design level would be susceptible to structural damage. The assessed value of all residential and commercial structures in the Town of Exeter in 2023 was $1,613,128,233. Assuming 1% to 5% damage, an earthquake could result in $16,131,22 to $80,656,412 of structure damage.

**Drought**

Extended drought can impact municipal water supplies, private drinking wells, and make vegetated areas more susceptible to wildfire (see above). The Town has no record of monetary damage related to drought. The Town advises residents to limit water use during periods of drought. The EMD maintains a list of vulnerable residents and checks in on these people as needed.

**Extreme Temperatures**

The Committee determined that all parts of town are at risk of impacts associated with extreme heat and cold. Young and elderly populations are particularly vulnerable and the EMD can direct vulnerable residents to heating and cooling stations.

**Climate Change**

The potential hazard damage from climate change is described above under flooding, sea-level rise, storm surge, compound flooding, and extreme temperatures.

**Infectious Disease**

Epidemics have the potential to cause a significant loss of life and/or widespread illness throughout the State, as well as cause disruptions to economies at all levels. The threat of a pandemic influenza, such as COVID-19, exemplifies a devastating situation where there may be an extreme shortage of essential service workers, a rapid transmission of disease from person-to-person, and no effective vaccination to prevent the illness. The monetary value of this impact cannot be determined.

## CHAPTER VI – EXISTING HAZARD MITIGATION PROGRAMS

The next step involves identifying existing mitigation strategies for the hazards likely to affect the town and evaluate their effectiveness. This section outlines those programs and recommends improvements and changes to these programs to ensure the highest quality emergency service possible.

**Table 8: Existing Hazard Mitigation Programs for the Town of Exeter**

| Existing Protection | Description-Area Covered | Responsible Local Agent | Effectiveness (Poor, Average, Good) | Recommended Changes-Actions-Comments |
|---|---|---|---|---|
| 2015 Town of Exeter Local Emergency Operations Plan | Town-wide | EMD, Police and Fire Departments, DPW | Good | Plan is updated every five years |
| 2024 Zoning Ordinance | Town-wide | Code Enforcement Officer | Good | Reviewed annually and amended as needed |
| 2015 Town Building Code | Town-wide | Building Inspector | Good | Updated as needed |
| 2022 NFIP Floodplain Ordinance | Development restriction in Special Flood Hazard Areas | Building Inspector and Planning Board | Good | Includes an advisory area for sea-level rise |
| 2018 Town Master Plan | Town-wide | Town Planner, Planning Board | Good | Updates occur annually |
| 2024 Town Capital Improvements Plan | Town-wide | Town Administrator/Department Heads | Good | Updated annually |
| 2017 Elevation Certificates | Component of building permit | Building Inspector | Good | Reviewed annually |
| 2018 Fire Code | Town-wide | Building Inspector | Good | Reviewed annually |
| Emergency Services | Town-wide | EMD, Police Chief, Fire Chief | Good | Emergency Personnel training occurs regularly for effective emergency response. |
| CEMPS (Comprehensive Emergency Management Planning for Schools) | Schools | SAU 16 Superintendent, EMD | Good | Reviewed annually |

| Existing Protection | Description-Area Covered | Responsible Local Agent | Effectiveness (Poor, Average, Good) | Recommended Changes-Actions-Comments |
|---|---|---|---|---|
| Emergency Water Plan | Town Water System | Water and Sewer Department | Good | Reviewed annually |
| Wellhead Protection | Specific areas of town | Code Enforcement Officer | Good | Regularly reviewed for use violations and compliance |
| Wetlands Protection | Specific areas of town | Code Enforcement Officer | Good | Town has designated Prime Wetlands |
| Shoreland Protection | Specific areas of town | Code Enforcement Officer and Building Inspector | Good | Town follows state and local regulations pertinent to the zoning district |
| Aquifer Protection | Specific areas of town | Code Enforcement Officer | Good | Ordinance should be monitored to ensure latest BMP's are being utilized for development uses |
| Stormwater Management Regulations | Town-wide | Code Enforcement Officer | Good | Designed to enable on-site infiltration of stormwater |
| 2017 Sea Level Rise and Coastal Storm Surge Vulnerability Assessment | Exeter/ Squamscott River Watershed | | Good | Identified land and infrastructure at risk from rising sea levels and storm surge |
| 2023 Exeter River Corridor and Watershed Management Plan | Exeter/ Squamscott River watershed | Exeter River Local Advisory Committee and Exeter Conservation Commission | Good | Plan is reviewed annually |
| Exeter River Study | Exeter River watershed in Exeter | Exeter River Study Committee | Good | Conducting studies on use and management of the Exeter River and its tributaries |
| Tree Inventory and Maintenance Program | Town-wide | Department of Public Works | Good | Updated as needed |

| Existing Protection | Description-Area Covered | Responsible Local Agent | Effectiveness (Poor, Average, Good) | Recommended Changes-Actions-Comments |
|---|---|---|---|---|
| Local Road Design Standards | Town-wide | Planning Board, Code Enforcement Officer, DPW | Good | Updated as needed |
| Bridge Design and Inspection | Town-wide | State DOT and Town DPW | Good | Bi-annual engineering review |
| Storm Drain/Culvert Maintenance Program | Town-wide | DPW | Good | Annual engineering review |
| Great Dam Study | NHDES/Town/ Private Owners | DPW | Good | Resulted in removal of Great Dam |
| Pickpocket Dam Study | Exeter River | DPW | Good | In progress |
| Stormwater Asset Management Plan | Town-wide | DPW | Good | Updated as needed |
| Emergency Backup Power | Exeter Safety Complex, Exeter Town Office, High School, DPW, portable generators | Emergency Management Director | Average | Elementary Schools need of back-up power<br>New recreation center needs generator |
| Hazard Mitigation Grants | Town-wide | EMD, DPW | Good | Reviewed as needed |
| Geographic Information Systems (GIS) | Town-wide | Planning and Building Department, Assessor's Office, DPW | Good | Updated as needed |
| Land Conservation Program | Town-wide | Planning Department, Conservation Commission, Select Board | Good | On-going |
| 2022 Exeter's Path to Resilience | Town-wide | Planning Department, DPW, Conservation Commission, Select Board | Good | Report provides an overview of the Town's climate resilience accomplishments |
| 2017 Seacoast Public Health Community Health Improvement Plan | Multi-town | Seacoast Public Health Network | Good | Includes public health emergency preparedness |

## CHAPTER VII – MITIGATION ACTIONS

The Action Plan was developed by analyzing the existing Town programs, the proposed improvements and changes to these programs. Additional programs were also identified as potential mitigation strategies. These potential mitigation strategies were ranked in five categories according to how they accomplished each item:

- Prevention
- Property Protection
- Structural Protection
- Emergency Services
- Public Information and Involvement

**Table 9: List of Hazard Mitigation Strategies or Actions Developed by the Hazard Mitigation Committee**

| Mitigation Strategies or Action | Mitigation Category | Hazard(s) Mitigated | Status 2024: New/Completed/Deferred/ Removed |
|---|---|---|---|
| Construct Northside Fire Station | Emergency Services | All Hazards | Deferred |
| Portable Lights (2) | Emergency Services | All Hazards | Deferred, one purchased, another needed |
| Modifications to Pickpocket Dam | Structural Project | Flooding | Deferred, study in process |
| Modifications to Colcord Pond Dam | Structural Project | Flooding | Completed |
| Move and or upgrade (Modified flood proofing) Exeter Surface Water Treatment Plant | Structural | Flooding | Deferred |
| Powder Mill Road Flood Analysis/Capacity assessment | Prevention | Flooding | Removed |
| Acquisition of development rights/conservation of Exeter Elms | Prevention/Property Protection | Flooding | Removed |
| Replace undersized water lines | Property protection, Emergency Services | Drought, Wildfire | Completed |
| Acquire additional groundwater resources | Prevention | Drought, Wildfire, Extreme Temperatures | Deferred |
| Implement recommendations in Vulnerability Assessment and other climate change plans | Prevention, Property Protection | Sea Level Rise and Coastal Storm Surge, Hurricane | Completed |

| Mitigation Strategies or Action | Mitigation Category | Hazard(s) Mitigated | Status 2024: New/Completed/Deferred/ Removed |
|---|---|---|---|
| Develop and implement a deliberate public outreach campaign using the Town social media platforms – website, Facebook, Twitter, cable access TV, roadside electronic signs – to inform and educate residents about hazards impacting Exeter and ways in which they can prepare for hazards and prevent/mitigate damage | Public Outreach, Prevention, Property Protection | All Hazards | Completed and ongoing |
| Develop a pandemic response plan documenting best practices for every Town department | Emergency Services | Infectious Disease | New |
| Purchase supplies to restock emergency response trailer with traffic cones, barricades, signs, and traffic and crowd control barriers | Emergency Services | All Hazards | New |
| Purchase communications equipment for the emergency operations and public safety center, including a dispatch console, and communications tower and transmitter | Emergency Services | All Hazards | New |
| Purchase and install a generator at the new Recreation Center to enable the center to be used as a shelter and heating and cooling center | Emergency Services | All Hazards | New |

| Mitigation Strategies or Action | Mitigation Category | Hazard(s) Mitigated | Status 2024: New/Completed/Deferred/ Removed |
|---|---|---|---|
| Purchase and install a generator for the Fuller Lane water tower to enable water distribution and emergency communications. There is communications repeater on the tower | Emergency Services | All Hazards | New |

## CHAPTER VIII. FEASIBILITY AND PRIORITIZATION OF PROPOSED MITIGATION STRATEGIES

The goal of each strategy or action is reduction or prevention of damage from a hazard event. To determine their effectiveness in accomplishing this goal, a set of criteria was applied to each proposed strategy. A set of questions developed by the Committee that included the STAPLEE method was developed to rank the proposed mitigation actions. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation strategies identified in Table 10 a – 10h:

- Does it reduce disaster damage?
- Does it contribute to other goals?
- Does it benefit the environment?
- Does it meet regulations?
- Will historic structures be saved or protected?
- Does it help achieve other community goals?
- Could it be implemented quickly?

**STAPLEE criteria:**

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

Each proposed mitigation strategy was evaluated using the above criteria and assigned a score (Good = 3, Average = 2, Poor = 1) based on the above criteria. An evaluation chart with total scores for each strategy can be found in the collection of individual tables under Table 10.

**Table 10a: Construct Northside Fire Station**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 2 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 3 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 2 |
| **S**: Is it Socially acceptable? | 2 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 2 |
| **P**: Is it Politically acceptable? | 2 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 2 |
| **E**: Are other Environmental approvals required? | 2 |
| Score | **34** |

**Table 10b: Purchase Portable Light**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 2 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 1 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 2 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 3 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **38** |

**Table 10c: Modifications to Pickpocket Dam**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 3 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 1 |
| Does it help achieve other community goals? | 2 |
| Could it be implemented quickly? | 1 |
| **S**: Is it Socially acceptable? | 2 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 2 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 2 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **33** |

**Table 10d: Move or Upgrade Surface Water Treatment Plan**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 3 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 3 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 2 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **41** |

**Table 10e: Acquire Additional Groundwater Resources**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 2 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 1 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 2 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **38** |

**Table 10f: Develop a Pandemic Response Plan Documenting Best Practices for Every Town Department**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 2 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 3 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 2 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 3 |
| **S**: Is it Socially acceptable? | 2 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 2 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **39** |

**Table 10g: Purchase Supplies to Restock Emergency Response Trailer**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 3 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 2 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 3 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **41** |

**Table 10h: Purchase Emergency Communications Equipment for the Emergency Operations Center and Public Safety Complex**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 3 |
| Does it meet regulations? | 3 |
| Will historic structures be saved or protected? | 3 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 3 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **42** |

**Table 10i: Purchase and Install a Generator for the New Recreation Center**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 1 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 1 |
| Does it meet regulations? | 1 |
| Will historic structures be saved or protected? | 1 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 3 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **34** |

**Table 10j: Purchase and Install a Generator for the Fuller Lane Water Tower**

| Criteria | Evaluation Rating (1-3) |
|---|---|
| Does it reduce disaster damage? | 3 |
| Does it contribute to other goals? | 3 |
| Does it benefit the environment? | 1 |
| Does it meet regulations? | 1 |
| Will historic structures be saved or protected? | 1 |
| Does it help achieve other community goals? | 3 |
| Could it be implemented quickly? | 3 |
| **S**: Is it Socially acceptable? | 3 |
| **T**: Is it Technically feasible and potentially successful? | 3 |
| **A**: Is it Administratively workable? | 3 |
| **P**: Is it Politically acceptable? | 3 |
| **L**: Is there Legal authority to implement? | 3 |
| **E**: Is it Economically beneficial? | 3 |
| **E**: Are other Environmental approvals required? | 3 |
| Score | **36** |

## CHAPTER IX - IMPLEMENTATION SCHEDULE FOR PRIORITY MITIGATION STRATEGIES

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

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

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

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

Table 12 is the Action Plan. In addition to the prioritized mitigation projects, Table 11 includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN). Also included is a cost estimate for each project if available.

**Table 11: Action Plan for Proposed Mitigation Actions**

| STAPLEE Score | Project | Responsibility/ Oversight | Funding/ Support | Estimated Cost | Time frame |
|---|---|---|---|---|---|
| 42 | Construct Northside Fire Station | Town Manager/Select Board | Town/HMPG | $17.5M | Medium Term 2-3 years |
| 42 | Purchase communications equipment for emergency operations and public safety center | Fire Chief/Police Chief | Town/HMPG | $300,000 | Short Term 1 year |
| 41 | Purchase supplies to restock emergency response trailer | EMD | Town/HMPG | $10,000 | Short Term 1 year |
| 41 | Move or upgrade surface water treatment plant | DPW | Town/DES/ EPA | $28M | Medium Term 2-3 years |
| 39 | Develop a pandemic response plan | EMD/Town Manager | Town | $2,000 | Short Term 1 year |
| 38 | Purchase portable light | EMD | Town/HMPG | $20,000 | Short Term 1 year |
| 38 | Acquire additional groundwater resources | DPW/Select Board | Town/HMPG | $6M | Short Term 1 year |

| STAPLEE Score | Project | Responsibility/ Oversight | Funding/ Support | Estimated Cost | Time frame |
|---|---|---|---|---|---|
| 36 | Purchase and install a generator at Fuller Lane water tower | EMD/DPW | Town/EMPG | $50,000 | Medium Term 3-5 years |
| 34 | Purchase and install a generator at new Recreation Center | Recreation Director | Town/EMPG | $50,000 | Medium Term 3-5 years |
| 33 | Modifications to Pickpocket Dam | DPW | Town/EMPG | $2M | Long Term 3-5 years |
| 27 | Modifications to Colcord Pond Dam | DPW | Town/EMPG | $500,000 | Long Term 3-5 years |

## CHAPTER X - MONITORING, EVALUATING AND UPDATING THE PLAN

### Incorporating the Plan into Existing Planning Mechanisms

Upon review and approval by FEMA and the State of New Hampshire, the Plan will be adopted as a standalone document of the Town and as an appendix of the Town's Emergency Operations Plan (EOP). The Plan will also be consulted when the Town updates its Capital Improvement Program (CIP). The Planning Board is responsible for updating the CIP annually, and will review the Action Plan during each update. The Planning Board in conjunction with Emergency Management Director will determine what items can and should be added to the CIP based on the Town's annual budget and possible sources of other funding. Considerations about future land use and proximity to current and potential hazard areas need to be inherently part of the planning process. NH RSA 674:2 III (e) gives cities the authority to include a natural hazards section, which documents the physical characteristics, severity, and extent of any potential natural hazards to the community, within the framework of a Master Plan.

### Monitoring, Evaluating and Updating the Plan

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

To track progress and update the Mitigation Strategies identified in the Action Plan, the Hazard Mitigation Committee shall remain active and will revisit the Plan annually and after each natural hazard event. These reviews will assess the Plan's effectiveness, accuracy, and completeness in achieving its stated purpose and goals. Plan reviews will also address the recommended improvements to the Plan as contained in the FEMA plan review checklist and any weaknesses the Town identified that the Plan did not adequately address. The Plan will also be thoroughly updated every five years. This review will incorporate any new information based on changing conditions in land use, hazard types, and climate change. The Emergency Management Director is responsible for initiating these reviews and will involve appropriate stakeholders. In keeping with the process of adopting the 2024 Plan Update, a public hearing to receive public comment on Plan maintenance and updating will be held during any review of the Plan. This publicly noticed meeting will allow for members of the community not involved in developing the Plan to provide input and comments each time the Plan is revised. The final revised Plan will be adopted by the Select Board appropriately, at a second publicly noticed meeting, and posted on the Town website to enable public review.

Changes should be made to the Plan to accommodate for projects that have failed or are not considered feasible after a review of their consistency with STAPLEE, the timeframe, the community's priorities, and funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, should be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation.

# APPENDIX A:
# SUMMARY OF HAZARD MITIGATION STRATEGIES

## I. RIVERINE MITIGATION

**A. PREVENTION -** Prevention measures are intended to keep the problem from occurring in the first place, and/or keep it from getting worse. Future development should not increase flood damage. Building, zoning, planning, and/or code enforcement officials usually administer preventative measures.

**1. Planning and Zoning -** Land use plans are put in place to guide future development, recommending where - and where not - development should occur. Sensitive and vulnerable lands can be designated for uses that would not be incompatible with occasional flood events - such as parks or wildlife refuges. A Capital Improvements Program can recommend the setting aside of funds for public acquisition of these designated lands. The zoning ordinance can regulate development in these sensitive areas by limiting or preventing some or all development - for example, by designating floodplain overlay, conservation, or agricultural districts.

**2. Open Space Preservation -** Preserving open space is the best way to prevent flooding and flood damage. Open space preservation should not, however, be limited to the flood plain, since other areas within the watershed may contribute to controlling the runoff that exacerbates flooding. Land Use and Capital Improvement Plans should identify areas to be preserved by acquisition and other means, such as purchasing easements. Aside from outright purchase, open space can also be protected through maintenance agreements with the landowners, or by requiring developers to dedicate land for flood flow, drainage and storage.

**3. Floodplain Development Regulations -** Floodplain development regulations typically do not prohibit development in the special flood hazard area, but they do impose construction standards on what is built there. The intent is to protect roads and structures from flood damage and to prevent the development from aggravating the flood potential. Floodplain development regulations are generally incorporated into subdivision regulations, building codes, and floodplain ordinances, which either stand-alone or are contained within a zoning ordinance.

Subdivision Regulations: These regulations govern how land will be divided into separate lots or sites. They should require that any flood hazard areas be shown on the plat, and that every lot has a buildable area that is above the base flood elevation.

Building Codes: Standards can be incorporated into building codes that address flood proofing for all new and improved or repaired buildings.

Floodplain Ordinances: Communities that participate in the National Flood Insurance Program are required to adopt the minimum floodplain management regulations, as developed by FEMA. The regulations set minimum standards for subdivision regulations and

building codes. Communities may adopt more stringent standards than those set forth by FEMA.

**4. Stormwater Management -** Development outside of a floodplain can contribute significantly to flooding by covering impervious surfaces, which increases storm water runoff. Storm water management is usually addressed in subdivision regulations. Developers are typically required to build retention or detention basins to minimize any increase in runoff caused by new or expanded impervious surfaces, or new drainage systems. Generally, there is a prohibition against storm water leaving the site at a rate higher than it did before the development. One technique is to use wet basins as part of the landscaping plan of a development. It might even be possible to site these basins based on a watershed analysis. Since detention only controls the runoff rates and not volumes, other measures must be employed for storm water infiltration - for example, swales, infiltration trenches, vegetative filter strips, and permeable paving blocks.

**5. Drainage System Maintenance -** Ongoing maintenance of channel and detention basins is necessary if these facilities are to function effectively and efficiently over time. A maintenance program should include regulations that prevent dumping in or altering watercourses or storage basins; regrading and filling should also be regulated. Any maintenance program should include a public education component, so that the public becomes aware of the reasons for the regulations. Many people do not realize the consequences of filling in a ditch or wetland or regrading their yard without concern for runoff patterns.

**B. PROPERTY PROTECTION -** Property protection measures are used to modify buildings subject to flood damage, rather than to keep floodwaters away. These may be less expensive to implement, as they are often carried out on a cost-sharing basis. In addition, many of these measures do not affect a building's appearance or use, which makes them particularly suitable for historical sites and landmarks.

**1. Relocation -** Moving structures out of the floodplain is the surest and safest way to protect against damage. Relocation is expensive, however, so this approach will probably not be used except in extreme circumstances. Communities that have areas subject to severe storm surges, ice jams, etc. might want to consider establishing a relocation program, incorporating available assistance.

**2. Acquisition -** Acquisition by a governmental entity of land in a floodplain serves two main purposes: (1) it ensures that the problem of structures in the floodplain will be addressed; and (2) it has the potential to convert problem areas into community assets, with accompanying environmental benefits. Acquisition is more cost effective than relocation in those areas that are subject to storm surges, ice jams, or flash flooding. Acquisition, followed by demolition, is the most appropriate strategy for those buildings that are simply too expensive to move, as well as for dilapidated structures that are not worth saving or protecting. Relocation can be expensive; however, there are government grants and loans that can be applied toward such efforts.

**3. Building Elevation -** Elevating a building above the base flood elevation is the best on-site protection strategy. The building could be raised to allow water to run underneath it, or fill could be brought in to elevate the site on which the building sits. This approach is cheaper than relocation and tends to be less disruptive to a neighborhood. Elevation is required by law for new and substantially improved residences in a floodplain and is commonly practiced in flood hazard areas nationwide.

**4. Floodproofing -** If a building cannot be relocated or elevated, it may be floodproofed. This approach works well in areas of low flood threat. Flood proofing can be accomplished through barriers to flooding, or by treatment to the structure itself.

Barriers: Levees, floodwalls, and berms can keep floodwaters from reaching a building. These are useful, however, only in areas subject to shallow flooding.

Dry Flood proofing: This method seals a building against the water by coating the walls with waterproofing compounds or plastic sheeting. Openings, such doors, windows, etc. are closed either permanently with removable shields or with sandbags.

Wet Flood proofing: This technique is usually considered a last resort measure since water is intentionally allowed into the building to minimize pressure on the structure. Approaches range from moving valuable items to higher floors to rebuilding the floodable area. An advantage over other approaches is that simply by moving household goods out of the range of floodwaters, thousands of dollars can be saved in damages.

**5. Sewer Backup Protection -** Storm water overloads can cause backup into basements through sanitary sewer lines. Houses that have any kind of connection to a sanitary sewer system - whether it is downspouts, footing drain tile, and/or sump pumps, can be flooded during a heavy rain event. To prevent this, there should be no such connections to the system, and all rain and ground water should be directed onto the ground, away from the building. Other protections include:

- Floor drain plugs and floor drain standpipe, which keep water from flowing out of the lowest opening in the house.
- Overhead sewer - keeps water in the sewer line during a backup.
- Backup valve - allows sewage to flow out while preventing backups from flowing into the house.

**6. Insurance -** Above and beyond standard homeowner insurance, there is other coverage a homeowner can purchase to protect against flood hazard. Two of the most common are National Flood Insurance and basement backup insurance.

National Flood Insurance: When a community participates in the National Flood Insurance Program, any local insurance agent can sell separate flood insurance policies under rules

and rates set by FEMA. Rates do not change after claims are paid because they are set on a national basis.

Basement Backup Insurance: National Flood Insurance offers an additional deductible for seepage and sewer backup, provided there is a general condition of flooding in the area that was the proximate cause of the basement getting wet. Most exclude damage from surface flooding that would be covered by the NFIP.

**C. NATURAL RESOURCE PROTECTION -** Preserving or restoring natural areas or the natural functions of floodplain and watershed areas provide the benefits of eliminating or minimizing losses from floods, as well as improve water quality and wildlife habitats. Parks, recreation, or conservation agencies usually implement such activities. Protection can also be provided through various zoning measures that are specifically designed to protect natural resources.

**1. Wetlands Protection -** Wetlands can store large amounts of floodwaters, slowing and reducing downstream flows, and filtering the water. Any development that is proposed in a wetland is regulated by either federal and/or state agencies. Depending on the location, the project might fall under the jurisdiction of the U.S. Army Corps of Engineers, which in turn, calls upon several other agencies to review the proposal. In New Hampshire, the N.H. Wetlands Board must approve any project that impacts a wetland. And, many communities in New Hampshire also have local wetland ordinances. Generally, the goal is to protect wetlands by preventing development that would adversely affect them. Mitigation techniques are often employed, which might consist of creating a wetland on another site to replace what would be lost through the development. This is not an ideal practice, however, since it takes many years for a new wetland to achieve the same level of quality as an existing one.

**2. Erosion and Sedimentation Control -** Controlling erosion and sediment runoff during construction and on farmland is important, since eroding soil will typically end up in downstream waterways. And, because sediment tends to settle where the water flow is slower, it will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters. Practices to reduce erosion and sedimentation have two principal components: (1) minimize erosion with vegetation and; (2) capture sediment before it leaves the site. Slowing the runoff increases infiltration into the soil, thereby controlling the loss of topsoil from erosion and the resulting sedimentation. Runoff can be slowed by vegetation, terraces, contour strip farming, no-till farm practices, and impoundments (such as sediment basins, farm ponds, and wetlands).

**3. Best Management Practices -** Best Management Practices (BMPs) are measures that reduce nonpoint source pollutants that enter waterways. Nonpoint source pollutants are carried by storm water to waterways, and include such things as lawn fertilizers, pesticides, farm chemicals, and oils from street surfaces and industrial sites. BMPs can be incorporated into many aspects of new developments and ongoing land use practices. In New Hampshire, the Department of Environmental Services has developed best management practices for a range of activities, from farming to earth excavations.

**D. EMERGENCY SERVICES -** Emergency services protect people during and after a flood. Many communities in New Hampshire have emergency management programs in place, administered by an emergency management director (very often the local police or fire chief).

**1. Flood Warning -** On large rivers, the National Weather Service handles early recognition. Communities on smaller rivers must develop their own warning systems. Warnings may be disseminated in a variety of ways, such as sirens, radio, television, mobile public-address systems, or door-to-door contact. It seems that multiple or redundant systems are the most effective, giving people more than one opportunity to be warned.

**2. Flood Response -** Flood response refers to actions that are designed to prevent or reduce damage or injury, once a flood threat is recognized. Such actions and the appropriate parties include:

- activating the emergency operations center (emergency director)
- sandbagging designated areas (public works department)
- closing streets and bridges (police department)
- shutting off power to threatened areas (public service)
- releasing children from school (school district)
- ordering an evacuation (selectmen/city council/emergency director)
- opening evacuation shelters (churches, schools, Red Cross, municipal facilities)

These actions should be part of a flood response plan, which should be developed in coordination with the persons and agencies that share the responsibilities. Drills and exercises should be conducted so that the key participants know what they are supposed to do.

**3. Critical Facilities Protection -** Protecting critical facilities is vital, since expending efforts on these facilities can draw workers and resources away from protecting other parts of the community. Buildings or locations vital to the flood response effort:

- emergency operations centers
- police and fire stations
- hospitals
- highway garage
- selected roads and bridges
- evacuation routes
- buildings or locations that, if flooded, would create secondary disasters
- hazardous materials facilities
- water/wastewater treatment plants
- schools
- nursing homes

All such facilities should have their own flood response plan that is coordinated with the community's plan. Nursing homes, other public health facilities, and schools will typically be required by the state to have emergency response plans in place.

**4. Health and Safety Maintenance -** The flood response plan should identify appropriate measures to prevent danger to health and safety. Such measures include:

- patrolling evacuated areas to prevent looting
- providing safe drinking water
- vaccinating residents for tetanus
- clearing streets
- cleaning up debris

The plan should also identify which agencies will be responsible for carrying out the identified measures. A public information program can be helpful to educate residents on the benefits of taking health and safety precautions.

**Structural Projects -** Structural projects are used to prevent floodwaters from reaching properties. These are all man-made structures and can be grouped into the six types of discussed below. The shortcomings of structural approaches are that:

- they can be very expensive
- they disturb the land, disrupt natural water flows, and destroy natural habitats
- they are built to an anticipated flood event, and may be exceeded by a greater-than-expected flood
- they can create a false sense of security

**Reservoirs -** Reservoirs control flooding by holding water behind dams or in storage basins. After a flood peaks, water is released or pumped out slowly at a rate the river downstream can handle.

Reservoirs are suitable for protecting existing development, and they may be the only flood control measure that can protect development close to a watercourse. They are most efficient in deeper valleys or on smaller rivers where there is less water to store. Reservoirs might consist of man-made holes dug to hold the approximate amount of floodwaters, or even abandoned quarries. As with other structural projects, reservoirs:

- are expensive
- occupy a lot of land
- require periodic maintenance
- may fail to prevent damage from floods that exceed their design levels
- may eliminate the natural and beneficial functions of the floodplain

Reservoirs should only be used after a thorough watershed analysis that identifies the most appropriate location and ensures that they would not cause flooding somewhere else. Because they are so expensive and usually involve more than one community, they are typically implemented with the help of state or federal agencies, such as the Army Corps of Engineers.

**Levees/Floodwalls -** Probably the best know structural flood control measure is either a levee (a barrier of earth) or a floodwall made of steel or concrete erected between the watercourse and the land. If space is a consideration, floodwalls are typically used, since levees need more space. Levees and floodwalls should be set back out of the floodway, so that they will not divert floodwater onto other properties.

**Diversions -** A diversion is simply a new channel that sends floodwater to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During flood flows, the stream spills over the diversion channel or tunnel, which carries the excess water to the receiving lake or river.

Diversions are limited by topography; they won't work everywhere. Unless the receiving water body is relatively close to the flood prone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive. Where topography and land use are not favorable, a more expensive tunnel is needed. In either case, care must be taken to ensure that the diversion does not create a flooding problem somewhere else.

**Channel Modifications -** Channel modifications include making a channel wider, deeper, smoother, or straighter. These techniques will result in more water being carried away, but, as with other techniques mentioned, it is important to ensure that the modifications do not create or increase a flooding problem downstream.

Dredging: Dredging is often cost-prohibitive because the dredged material must be disposed of somewhere else, and the stream will usually fill back in with sediment. Dredging is usually undertaken only on larger rivers, and then only to maintain a navigation channel.

Drainage modifications: These include man-made ditches and storm sewers that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive. These approaches are usually designed to carry the runoff from smaller, more frequent storms.

**Storm Sewers -** Mitigation techniques for storm sewers include installing new sewers, enlarging small pipes, street improvements, and preventing back flow. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving body of water can absorb the increased flows without increased flooding.

In many developments, streets are used as part of the drainage system, to carry or hold water from larger, less frequent storms. The streets collect runoff and convey it to a receiving sewer, ditch, or stream. Allowing water to stand in the streets and then draining it slowly can be a more effective and less expensive measure than enlarging sewers and ditches.

**Public Information -** Public information activities are intended to advise property owners, potential property owners, and visitors about the hazards associated with a property, ways to

protect people and property from these hazards, and the natural and beneficial functions of a floodplain.

1. **Map Information -** Flood maps developed by FEMA outline the boundaries of the flood hazard areas. These maps can be used by anyone interested in a property to determine if it is flood-prone. These maps are available from FEMA, the NH Office of Emergency Management, the NH Office of State Planning, or your regional planning commission.

**Outreach Projects -** Outreach projects are proactive; they give the public information even if they have not asked for it. Outreach projects are designed to encourage people to seek out more information and take steps to protect themselves and their properties. Examples of outreach activities include:

- Mass mailings or newsletters and e-newsletters to all residents
- Posting resource information on town website and social media accounts
- Notices directed to floodplain residents
- Displays in public buildings, malls, etc.
- Newspaper articles and special sections
- Radio and TV news releases and interview shows
- A local flood proofing video for cable TV programs and to loan to organizations
- A detailed property owner handbook tailored for local conditions
- Presentations at meetings of neighborhood groups

Research has shown that outreach programs work, although awareness is not enough. People need to know what they can do about the hazards, so projects should include information on protection measures. Research also shows that locally designed and run programs are much more effective than national advertising.

**Real Estate Disclosure -** Disclosure of information regarding flood-prone properties is important if potential buyers are to be able to mitigate damage. Federally regulated lending institutions are required to advise applicants that a property is in the floodplain. However, this requirement needs to be met only five days prior to closing, and by that time, the applicant is typically committed to the purchase. State laws and local real estate practice can help by making this information available to prospective buyers early in the process.

**Library -** Your local library can serve as a repository for pertinent information on flooding and flood protection. Some libraries also maintain their own public information campaigns, augmenting the activities of the various governmental agencies involved in flood mitigation.

**Technical Assistance -** Certain types of technical assistance are available from the NFIP Coordinator, FEMA, and the Natural Resources Conservation District. Community officials can also set up a service delivery program to provide one-on-one sessions with property owners. An example of technical assistance is the flood audit, in which a specialist visits a property. Following the visit, the owner is provided with a written report, detailing the past and potential flood depths, and recommending alternative protection measures.

**Environmental Education -** Education can be a great mitigating tool, if people can learn what not to do before damage occurs. And the sooner the education begins, the better. Environmental education programs for children can be taught in the schools, park and recreation departments, conservation associations, or youth organizations. An activity can be as involved as course curriculum development or as simple as an explanatory sign near a river. Education programs do not have to be limited to children. Adults can benefit from knowledge of flooding and mitigation measures. And decision-makers, armed with this knowledge, can make a difference in their communities.

## II. EARTHQUAKES

**A. PREVENTIVE -** Planning/zoning to keep critical facilities away from fault lines.
Planning, zoning and building codes to avoid areas below steep slopes or soils subject to liquefaction.
Building codes to prohibit loose masonry, overhangs, etc.

**B. PROPERTY PROTECTION:**
Acquire and clear hazard areas.
Retrofitting to add braces, remove overhangs.
Apply mylar to windows and glass surfaces to protect from shattering glass.
Tie down major appliances provide flexible utility connections.
Earthquake insurance riders.

**C. EMERGENCY SERVICES -** Earthquake response plans to account for secondary problems, such as fires and hazardous materials spills.

**D. EMERGENCY SERVICES -** Slope stabilization.

## III. DAM FAILURE

**A. PREVENTIVE:**
Dam failure inundation maps.
Planning/zoning/open space preservation to keep area clear.
Building codes with flood elevation based on dam failure.
Dam safety inspections.
Draining the reservoir when conditions appear unsafe.

**B. PROPERTY PROTECTION -** Acquisition of buildings in the path of a dam breach flood. Flood insurance.

**C. EMERGENCY SERVICES -** Dam conditioning monitoring; warning and evacuation plans based on dam failure.

**D. EMERGENCY SERVICES -** Dam improvements, spillway enlargements. Remove unsafe dams.

## IV. WILDFIRES

**A. PREVENTIVE:**
Zoning districts to reflect fire risk zones.
Planning and zoning to restrict development in areas near fire protection and water resources.
Requiring new subdivisions to space buildings, provide firebreaks, on-site water storage, wide roads multiple accesses.
Building code standards for roof materials, spark arrestors.

Maintenance programs to clear dead and dry bush, trees.
Regulation on open fires.

**B. PROPERTY PROTECTION:**

Retrofitting of roofs and adding spark arrestors.
Landscaping to keep bushes and trees away from structures.
Insurance rates based on distance from fire protection.

**C. NATURAL RESOURCE PROTECTION -** Prohibit development in high-risk areas.

**D. EMERGENCY SERVICES -** Fire Fighting

**V. WINTER STORMS**

**A. PREVENTIVE -** Building code standards for light frame construction, especially for wind-resistant roofs.

**B. PROPERTY PROTECTION:**

Storm shutters and windows
Hurricane straps on roofs and overhangs
Seal outside and inside of storm windows and check steals in spring and fall.
Family and/or company severe weather action plan & drills:
include a NOAA weather radio
designate a shelter area or location
keep a disaster supply kit, including stored food and water
keep snow removal equipment in good repair; have extra shovels, sand, rock, salt and gas
know how to turn off water, gas, and electricity at home or work

**C. NATURAL RESOURCE PROTECTION -** Maintenance program for trimming tree and shrubs

**D. EMERGENCY SERVICES -** Early warning systems/NOAA Weather Radio Evacuation Plans

## APPENDIX B:
## TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION

Local Municipalities must have a FEMA-approved Hazard Mitigation Plan to be eligible for Hazard Mitigation Assistance Grants. Information on these grants may be found at:
http://www.fema.gov/media-library-data/1424983165449-38f5dfc69c0bd4ea8a161e8bb7b79553/HMA_Guidance_022715_508.pdf

**HAZARD MITIGATION GRANT PROGRAM (HMGP) -** Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.
Hazard Mitigation Grant Program funding is only available in States following a Presidential disaster declaration. Eligible applicants are:

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

Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf. HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage.

**PRE-DISASTER MITIGATION GRANTS PROGRAM -** The Pre-Disaster Mitigation (PDM) program provides technical and financial assistance to States and local governments for cost-effective pre-disaster hazard mitigation activities that complement a comprehensive mitigation program, and reduce injuries, loss of life, and damage and destruction of property. FEMA provides grants to States and Federally recognized Indian tribal governments that, in turn, provide sub-grants to local governments (to include Indian Tribal governments) for mitigation activities such as planning, and the implementation of projects identified through the evaluation of natural hazards.

**FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM -** FEMA provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses. Ten percent of the Project Grant is made available to States as a Technical Assistance Grant. These funds may be used by the State to help administer the program. Communities receiving FMA Planning and Project Grants must participate in the NFIP.

**EMERGENCY MANAGEMENT PERFORMANCE GRANT**
**GUIDELINES -** Emergency Management Performance Grant (EMPG Program) funding is available to local communities and eligible Agencies for projects that fall in FOUR general areas of Emergency Management: Planning activities; Training activities; Drills and Exercises; and Emergency Management Administration. Contact Heather Dunkerley at NHHSEM,
The following list of possible projects and activities is meant to guide you in selecting projects for an EMA Grant Submission. This list of suggested projects is not intended to be all-inclusive. Local communities or agencies may have other specific projects and activities that reflect local needs based on local capability assessments and local hazards.

**Planning Activities may include:**

- Develop a Hazard Mitigation Plan for your community.
- Prepare a hazard mitigation project proposal for submission to NHHSEM.
- Create, revise, or update Dam Emergency Action plans.
- Update your local Emergency Operations Plan (EOP). Consider updating a number of specific annexes each year to ensure that the entire plan is updated at least every four years.
- If applicable, develop or incorporate a regional HazMat Team Annex into your EOP.
- Develop an Anti-Terrorism Annex into your EOP.
- Develop a local/regional Debris Management Annex into your EOP.
- Develop and maintain pre-scripted requests for additional assistance (from local area public works, regional mutual aid, State resources, etc.) and local declarations of emergency.
- Develop and maintain written duties and responsibilities for EOC staff positions and agency representatives.
- Develop and maintain a list of private non-profit organizations within your local jurisdiction to ensure that these organizations are included in requests for public assistance funds.
- Prepare a submission for nomination as a "Project Impact" Community.

**Training Activities may include:**

- Staff members attend training courses at the Emergency Management Institute.
- Staff members attend a "field delivered" training course conducted by NHHSEM.
- Staff members attend other local, State, or nationally sponsored training event, which provides skills or knowledge relevant to emergency management.
- Staff members complete one or more FEMA Independent Study Courses.
- Identify and train a pre-identified local damage assessment team.

**Drills and Exercises might include:**

- Conduct multi-agency EOC Exercise (Tabletop or Functional) and forward an Exercise Evaluation Report, including after action reports, to NHHSEM (external evaluation of exercises is strongly encouraged). Drills or Exercises might involve any of the following scenarios:
    - Hurricane Exercise
    - Terrorism Exercise
    - Severe Storm Exercise
    - Communications Exercise
    - Mass Causality Exercise involving air, rail, or ship transportation accident
- Participate in multi-State or multi-Jurisdictional Exercise and forward Exercise Report to NHHSEM.
- HazMat Exercise with Regional HazMat Teams
- NHHSEM Communications Exercises
- Observe or evaluate State or local exercise outside your local jurisdiction.
- Assist local agencies and commercial enterprises (nursing homes, dams, prisons, schools, etc.) in developing, executing, and evaluating their exercise.
- Assist local hospitals in developing, executing and evaluating Mass Care, HazMat, Terrorism, and Special Events Exercises.

- Administrative Projects and Activities may include:
- Maintain an Emergency Operations Center (EOC) and alternate EOC capable of accommodating staff to respond to local emergencies.
- Establish and maintain a Call-Down List for EOC staff.
- Establish and maintain Emergency Response/Recovery Resource Lists.
- Develop or Update Emergency Management Mutual Aid Agreements with a focus on Damage Assessment, Debris Removal, and Resource Management.
- Develop and maintain written duties and responsibilities for EOC staff positions and agency representatives.
- Develop or Update Procedures for tracking of disaster-related expenses by local agencies.

**FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM -** FMA 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). FMA regulations can be found in 44 CFR Part 78. Funding for the program is provided through the National Flood Insurance Fund. FMA is funded at $20 million nationally. FMA provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP).

There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses. Ten percent of the Project Grant is made available to States as a Technical Assistance Grant. These funds may be used by the State to help administer the program. Communities receiving FMA Planning and Project Grants must be participating in the NFIP. A few examples of eligible FMA projects include: the elevation, acquisition, and relocation of NFIP-insured structures.

States are encouraged to prioritize FMA project grant applications that include repetitive loss properties. The FY 2001 FMA emphasis encourages States and communities to address target repetitive loss properties identified in the Agency's Repetitive Loss Strategy. These include structures with four or more losses, and structures with 2 or more losses where cumulative payments have exceeded the property value. State and communities are also encouraged to develop Plans that address the mitigation of these target repetitive loss properties.



## APPENDIX C:
## SAFFIR/SIMPSON HURRICANE SCALE

**Courtesy of National Hurricane Center**

This can be used to give an estimate of the potential property damage and flooding expected along the coast with a hurricane.

| Category | Definition | Effects |
|---|---|---|
| One | Winds 74-95 mph | No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal road flooding and minor pier damage |
| Two | Winds 96-110 mph | Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of center. Small craft in unprotected anchorages break moorings. |
| Three | Winds 111-130 mph | Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain continuously lower than 5 feet ASL may be flooded inland 8 miles or more. |
| Four | Winds 131-155 mph | More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach. Major damage to lower floors of structures near the shore. Terrain continuously lower than 10 feet ASL may be flooded requiring massive evacuation of residential areas inland as far as 6 miles. |
| Five | Winds greater than 155 mph | Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located less than 15 feet ASL and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5 to 10 miles of the shoreline may be required. |

Additional information: http://www.nhc.noaa.gov/aboutsshws.php

## APPENDIX D:
## ENHANCED FUJITA TORNADO DAMAGE SCALE

| The Enhanced Fujita Scale | | | |
|---|---|---|---|
| F-Scale Number | Potential Damage | Wind Speed | Type of Damage |
| F0 | Light | 65 – 85 mph | Little to no damage to man-made structures. Breaks branches off trees; pushes over shallow-rooted trees; damages signs |
| F1 | Moderate | 86 – 110 mph | Beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads; Moderate damage. |
| F2 | Considerable | 111 – 135 mph | Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars from trains pushed over; large trees snapped or uprooted; light object missiles generated. |
| F3 | Severe | 136 – 165 mph | Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cards lifted and thrown. |
| F4 | Devastating | 166 – 200 mph | Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated. |
| F5 | Incredible | Over 200 mph | Strong frame houses leveled off foundations and carried considerable distances; automobile-sized missiles fly through the air in excess of 109 yards; trees debarked; steel reinforced concrete structures badly damaged. Complete devastation. |

Additional Information:
http://www.spc.noaa.gov/faq/tornado/ef-scale.html

## APPENDIX E:
## THE RICHTER MAGNITUDE SCALE

**Earthquake Severity**

| Magnitudes | Earthquake Effects |
|---|---|
| Less than 3.5 | Generally not felt but recorded. |
| 3.5-5.4 | Often felt, but rarely causes damage. |
| Under 6.0 | At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions. |
| 6.1-6.9 | Can be destructive in areas up to about 100 kilometers across where people live. |
| 7.0-7.9 | Major earthquake. Can cause serious damage over larger areas. |
| 8 or greater | Great earthquake. Can cause serious damage in areas several hundred kilometers across. |

Additional information: https://earthquake.usgs.gov/learn/topics/mercalli.php
https://earthquake.usgs.gov/learn/topics/measure.php
https://earthquake.usgs.gov/data/shakemap/

**The Richter Magnitude Scale** - Seismic waves are the vibrations from earthquakes that travel through the Earth; they are recorded on instruments called seismographs. Seismographs record a zig-zag trace that shows the varying amplitude of ground oscillations beneath the instrument. Sensitive seismographs, which greatly magnify these ground motions, can detect strong earthquakes from sources anywhere in the world. The time, locations, and magnitude of an earthquake can be determined from the data recorded by seismograph stations.

Earthquakes with magnitude of about 2.0 or less are usually call microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. Events with magnitudes of about 4.5 or greater - there are several thousand such shocks annually - are strong enough to be recorded by sensitive seismographs all over the world. Great earthquakes, such as the 1964 Good Friday earthquake in Alaska, have magnitudes of 8.0 or higher. On the average, one earthquake of such size occurs somewhere in the world each year. The Richter Scale has no upper limit. Recently, another scale called the moment magnitude scale has been devised for more precise study of great earthquakes. The Richter Scale is not used to express damage. An earthquake in a densely populated area which results in many deaths and considerable damage may have the same magnitude as a shock in a remote area that does nothing more than frightens wildlife. Large-magnitude earthquakes that occur beneath the oceans may not even be felt by humans.

## Appendix F

### Extreme Weather Madness
### Thunderstorm Criteria

| THUNDERSTORM TYPES | Rainfall Rate/hr | MAX WIND GUST | HAIL SIZE | PEAK TORNADO Possibility | LIGHTNING FREQUENCY (5 min Intervals) | Darkness Factor | STORM IMPACT |
|---|---|---|---|---|---|---|---|
| T-1 – Weak thunderstorms or Thundershowers | .03-.10 | < 25 MPH | None | None | Only a few strikes during the storm. | Slightly Dark. Sunlight may be seen under the storm. | 1. No damage.<br>2. Gusty winds at times. |
| T-2 – Moderate Thunderstorms. | .10"-.25" | 25-40 MPH | None | None | Occasional<br>1-10 | Moderately Dark. Heavy downpours may cause the need for car lights. | 1. Heavy downpours.<br>2. Occasional lightning.<br>3. Gusty winds.<br>4. Very little damage.<br>5. Small tree branches may break<br>6. Lawn furniture moved around |
| T-3 – Heavy Thunderstorms<br>1. Singular or lines of storms. | .25"-.55" | 40-57 MPH | 1/4 " to ¾" | EF0 | Occasional to Frequent<br>10-20 | Dark. Car lights used. Visibility low in heavy rains. Cars may pull off the road. | 1. Minor Damage.<br>2. Downpours that produce some flooding on streets.<br>3. Frequent lightning could cause house fires.<br>4. Hail occurs within the downpours.<br>5. Small branches are broken.<br>6. Shingles are blown off roofs. |
| T-4 – Intense Thunderstorms<br><br>1. Weaker supercells<br>2. Bow Echos or lines of Storms | .55" – 1.25" | 58 to 70 MPH | 1" to 1.5" | EF0 to EF2 | Frequent<br>20-30 | Very Dark. Car lights used. Some street lights come on.. | 1. Moderate Damage.<br>2. Heavy rains can cause flooding to streams and creeks. Roadway flooding. 3. Hail can cause dents on cars and cause crop damage.<br>3. Wind damage to trees and buildings.<br>4. Tornado damage.<br>5. Power outages |
| T-5 – Extreme Thunderstorms<br>1. Supercells with familty of tornadoes.<br>2. Derecho Windstorms | 1.25" – 4" | Over 70 Mph | Over 1.5" to 4" | EF3 to EF5 | Frequent to Continuous.<br>> 30 | Pitch Black, Street Lights come on. House lights maybe used | 1. Severe Damage to Trees and Property. Damage is widespread.<br>2. Flooding rains.<br>3. Damaging hail.<br>4. Damaging wind gusts to trees and buildings.<br>5. Tornadoes F3-F5 or family of tornadoes can occur. Tornadoes can cause total devastation.<br>6. Widespread power outages. |

## Appendix G
## Lightning Risk Definitions

| Lightning Risk Definitions | |
|---|---|
| **Low Risk** | Thunderstorms are only expected to be isolated or widely scattered in coverage (20 Percent Chance). Atmospheric conditions do not support frequent cloud-to-ground lightning strikes. |
| **Moderate Risk** | Thunderstorms are forecast to be scattered in coverage (30-50 Percent Chance). Atmospheric conditions support frequent cloud-to-ground lightning strikes. |
| **High Risk** | Thunderstorms are forecast to be numerous or widespread in coverage (60-100 Percent Chance). Atmospheric conditions support continuous and intense cloud-to-ground lightning strikes. |

## Appendix H
## Hail Size Description Chart

**Hail Size Description Chart**

| Hailstone size | Measurement | |
|---|---|---|
| | in. | cm. |
| bb | < 1/4 | < 0.64 |
| pea | 1/4 | 0.64 |
| dime | 7/10 | 1.8 |
| penny | 3/4 | 1.9 |
| nickel | 7/8 | 2.2 |
| quarter | 1 | 2.5 |
| half dollar | 1 1/4 | 3.2 |
| golf ball | 1 3/4 | 4.4 |
| billiard ball | 2 1/8 | 5.4 |
| tennis ball | 2 1/2 | 6.4 |
| baseball | 2 3/4 | 7.0 |
| softball | 3.8 | 9.7 |
| Compact disc / DVD | 4 3/4 | 12.1 |

Note: Hail size refers to the diameter of the hailstone.

## Appendix I

## Sperry-Pitz Ice Accumulation Index

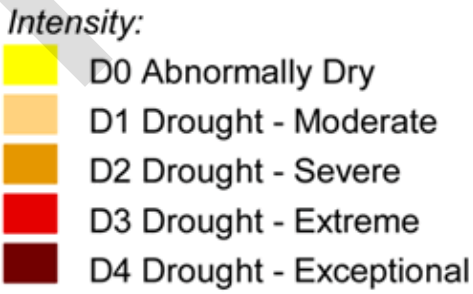
**The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009**

| ICE DAMAGE INDEX | DAMAGE AND IMPACT DESCRIPTIONS |
|---|---|
| 0 | Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages. |
| 1 | Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous. |
| 2 | Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation. |
| 3 | Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days. |
| 4 | Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days. |
| 5 | Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed. |

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

## Appendix J

## NOAA U.S. Drought Monitor Scale



**Appendix K**
**Glossary Size Class of Wildfire**

# Size Class of Fire

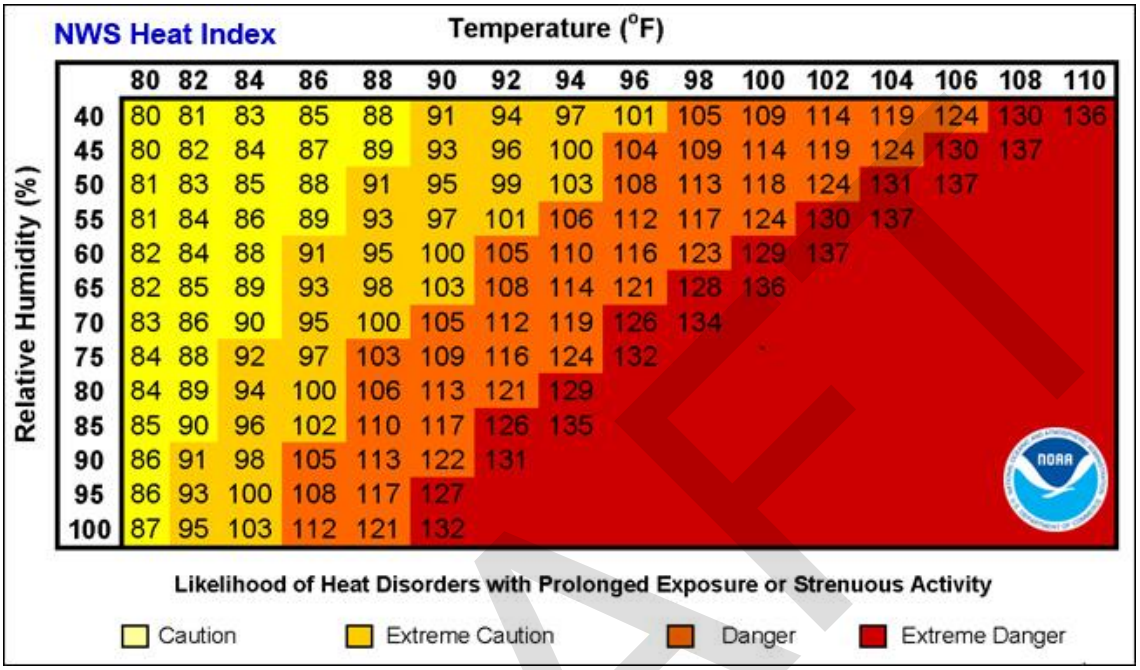
As to size of wildfire:

- Class A - one-fourth acre or less;
- Class B - more than one-fourth acre, but less than 10 acres;
- Class C - 10 acres or more, but less than 100 acres;
- Class D - 100 acres or more, but less than 300 acres;
- Class E - 300 acres or more, but less than 1,000 acres;
- Class F - 1,000 acres or more, but less than 5,000 acres;
- Class G - 5,000 acres or more.

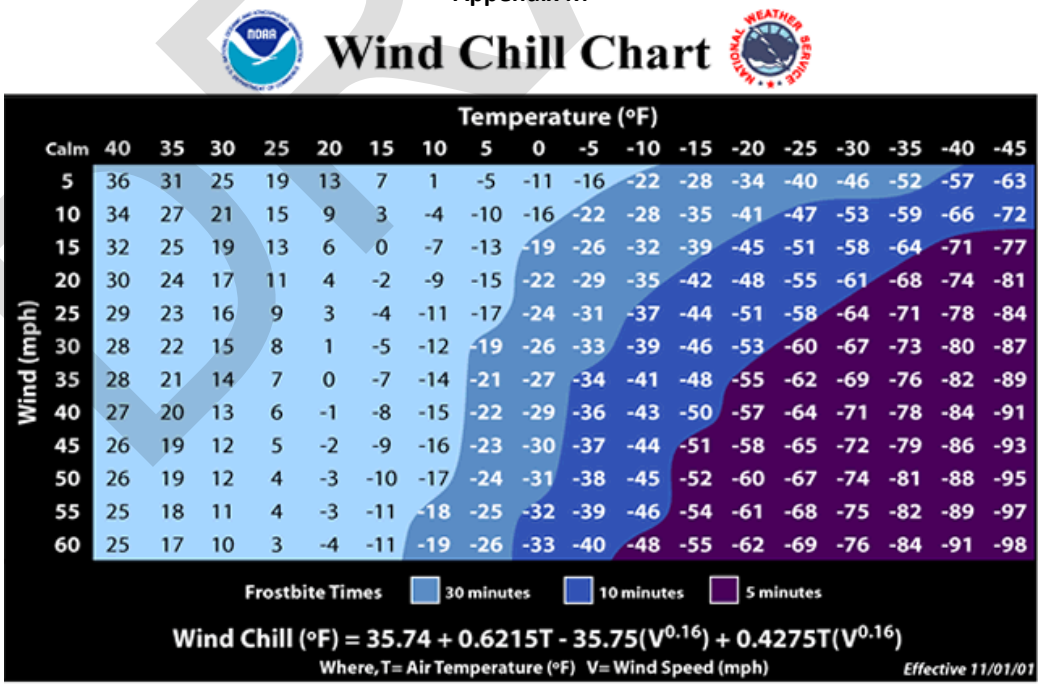
**Table 4: E-Scale Building Construction Classes and Attributes**

| WUI scale | Building Construction Class | Ignition Vulnerabilities from Embers and Fire | Building Construction and Landscaping Attributes for Protection against Embers |
|---|---|---|---|
| E1 or F1 | WUI 1 | None | Normal Construction Requirements:<br>- Maintained Landscaping<br>- Local AHJ-Approved Access for firefighting equipment |
| E2 or F2 | WUI 2 | In this area, highly volatile fuels could be ignited by embers. Weathered, dry combustibles with large surface areas can become targets for ignition fro m embers. | Low Construction Hardening Requirements:<br>- Treated combustibles allowed on structure<br>- Attached treated combustibles allowed<br>- Treated combustibles allowed around structure<br>- Low flammability plants<br>- Irrigated and well maintained Landscaping<br>- Local AHJ-Approved Access for firefighting equipment |
| E3 or F3 | WUI 3 | Exposed combustibles are likely to ignite in this area from high ember flux or high heat flux | Intermediate Construction Hardening Requirements:<br>- No exposed combustibles on structure<br>- Combustibles placed well away from structure<br>- Low flammability plants<br>- Irrigated and well maintained landscaping<br>- Local AHJ-Approved Access for firefighting equipment |
| E4 or F4 | WUI 4 | Ignition of combustibles from direct flame contact is likely. | High Construction Hardening Requirements:<br>- No exposed combustibles<br>- All vents, opening must be closed<br>- Windows and doors must be covered with insulated non-combustible coverings.<br>- Irrigated and well maintained low flammability landscaping<br>- Local AHJ-Approved Access for firefighting equipment |

## Appendix L
## Extreme Temperatures Heat Index




## Appendix M



## Appendix N
## Definition of Infectious Diseases – Mayo Clinic

Infectious diseases are disorders caused by organisms — such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful. But under certain conditions, some organisms may cause disease.

Some infectious diseases can be passed from person to person. Some are transmitted by insects or other animals. And you may get others by consuming contaminated food or water or being exposed to organisms in the environment.

Signs and symptoms vary depending on the organism causing the infection, but often include fever and fatigue. Mild infections may respond to rest and home remedies, while some life-threatening infections may need hospitalization.

Many infectious diseases, such as measles and chickenpox, can be prevented by vaccines. Frequent and thorough hand-washing also helps protect you from most infectious diseases.

## Appendix O
## Documentation of Planning Process

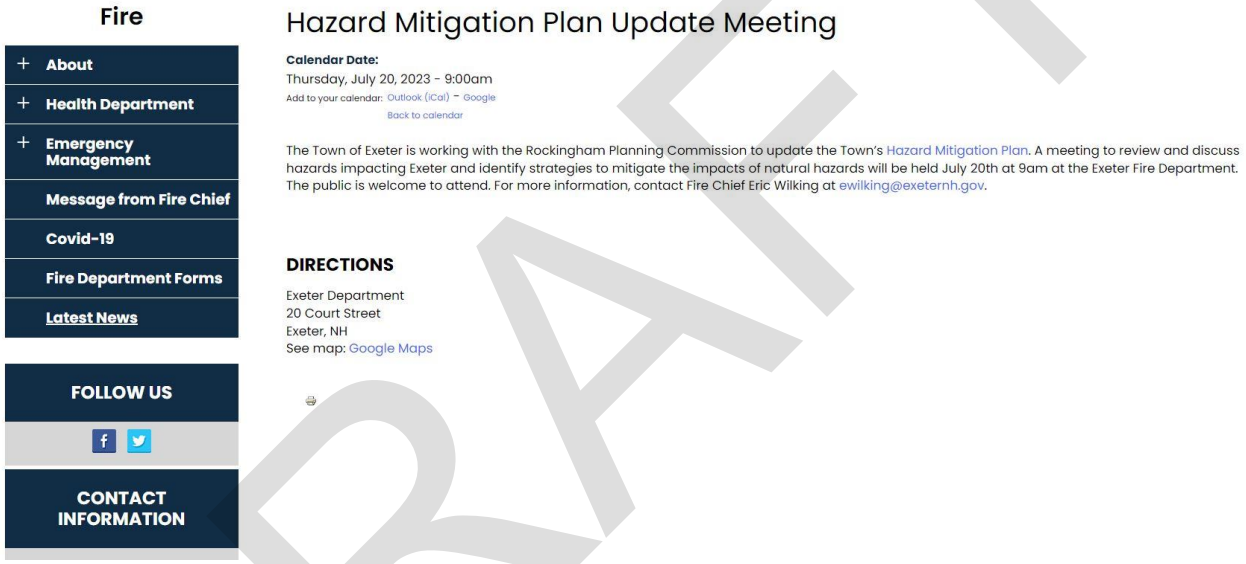
The Emergency Management Director and Town Administrator invited Department Heads from all the Town's departments to participate in the Plan Update process. As a result, the Plan Update Committee included the individuals listed below.

| Plan Update Committee Member Name | Plan Update Committee Member Title |
|---|---|
| Greg Bisson | Parks and Recreation Director, Town of Exeter |
| Stephen Dalton | Interim Water and Sewer Manager, Town of Exeter |
| Russell Dean | Town Manager, Town of Exeter |
| Doug Eastman | Building Inspector, Town of Exeter |
| Rich Kane | Coordinator of School Safety and Security, SAU 16 |
| Ray Leblanc | Exeter Hospital Emergency Management |
| Josh McCain | Deputy Police Chief, Town of Exeter |
| Kristen Murphy | Natural Resource Planner, Town of Exeter |
| James Murray | Health Officer, Town of Exeter |
| Justin Pizon | Assistant Fire Chief/Assistant EMD, Town of Exeter |
| Stephen Poulin | Police Chief, Town of Exeter |
| Dave Sharples | Town Planner, Town of Exeter |
| Paul Vlasich | Interim Director, Public Works, Town of Exeter |
| Eric Wilking | Fire Chief/EMD, Town of Exeter |

Rockingham Planning Commission (RPC) staff worked with the Emergency Management Director and Town Manager to coordinate public outreach about the Plan Update process to, residents, local businesses, Phillips Exeter Academy, organizations supporting socially vulnerable populations, and Emergency Management Directors in the abutting municipalities of Hampton, NH, Hampton Falls, NH, Kensington, NH, East Kingston, NH, Kingston, NH, Brentwood, NH, Epping, NH, Newfields, NH, and Stratham, NH. The Town maintains a list of businesses in Exeter and a list of human resource organizations serving socially vulnerable and underrepresented residents. The Town and RPC sent emails to these businesses and organizations informing them of the Plan Update, sharing a draft of the Plan, and inviting them to review and comment on the Plan and meet with the Plan Update Committee. Emergency Management Directors in the abutting communities received a similar email.

| **Social Service Organization** | **Contact Person** |
|---|---|
| Southern New Hampshire Services - Provides social service programs for economically disadvantaged elderly, youth, and other vulnerable populations in Rockingham and Hillsborough County. | Ryan Clouthier, Chief Operating Officer |
| Greater Seacoast Community Health/Families First Health and Support Center – Not-for-profit community health and family resource center | Jessica Garlough, Director of Family and Social Services |
| Seacoast Regional Public Health Network – Provides multiple public health services, including public health emergency preparedness | Julia Meuse, Public Health Network Manager<br>Public Health Emergency Preparedness Coordinator |
| Exeter Housing Authority | Tony Texiera, Executive Director |
| **Academia** | **Contact Person** |
| Phillips Exeter Academy | Paul Gravel, Director Campus Safety Services and Risk Management |
| **Abutting Communities** | **Contact Person** |
| Town of Hampton, NH | Michael McMahon, Fire Chief/EMD |
| Town of Hampton Falls, NH | Jay Lord, Fire Chief/ EMD |
| Town of Kensington, NH | Jonathon True, Fire Chief/EMD |
| Town of East Kingston, NH | Ed Warren, Fire Chief/EMD |
| Town of Kingston, NH | Graham Pellerin. Fire Chief/EMD |
| Town of Brentwood, NH | Rick Murphy, EMD |
| Town of Epping, NH | Don DeAngelis, Fire Chief/EMD |
| Town of Newfields, NH | Thomas Conner, EMD |
| Town of Stratham, NH | David Barr, EMD |
| **Business Community** | **Contact Person** |
| Darren Winham | Economic Development Director, Town of Exeter |

Public notices about the Plan Update meetings were posted on the Town website and social media accounts to inform viewers and followers about meetings and opportunities to comment on the Plan. Notice about the Plan Update process was also posted on the Rockingham Planning Commission's website and published in the RPC's monthly newsletter. The newsletter is distributed to local officials in the 27-town RPC region. All Plan Update meetings were open to the public. RPC staff facilitated the Plan Update Committee meetings, guided the plan update process, and prepared the Plan Update.



## RPC Begins Updates to Hazard Mitigation Plans in Four Communities

NH Homeland Security and Emergency Management has awarded FEMA grant funds to the RPC to work with the towns of Exeter, Newington, Hampton Falls, and North Hampton on updates to their Hazard Mitigation Plans. These Plans will include actions to mitigate and reduce the risks and impacts of natural hazards on people and property. Residents, landowners, business owners, municipal officials and other members of the public are welcome to attend plan update meetings. Please contact Theresa Walker, RPC Consulting Planner, for information on meeting dates, or to share comments or questions, theresawalker@comcast.net.

| Meeting Date | Meeting Agenda | Meeting Participants |
|---|---|---|
| May 23, 2023<br>Plan Update Committee | Review Plan Update process with Town Department heads and other stakeholders | Plan Update Committee:<br>Greg Bisson, Parks and Recreation Director, Town of Exeter<br>Stephen Dalton, Interim Water and Sewer Manager, Town of Exeter<br>Russell Dean, Town Manager, Town of Exeter<br>Doug Eastman, Building Inspector, Town of Exeter<br>Rich Kane, Coordinator of School Safety and Security, SAU 16<br>Ray Leblanc, Exeter Hospital Emergency Management<br>Josh McCain, Deputy Police Chief, Town of Exeter<br>Kristen Murphy, Natural Resource Planner, Town of Exeter<br>James Murray, Health Office, Town of Exeter<br>Justin Pizon, Assistant Fire Chief/Assistant EMD, Town of Exeter<br>Stephen Poulin, Police Chief, Town of Exeter<br>Dave Sharples, Town Planner, Town of Exeter<br>Paul Vlasich, Interim Director, Public Works, Town of Exeter |

| | | |
|---|---|---|
| | | Eric Wilking, Fire Chief/EMD, Town of Exeter |
| July 20, 2023<br>Plan Update Committee | Review 2018 Plan; discuss and update community profile and natural hazards impacting town; update past and future hazards map; review and update list of critical facilities and existing hazard mitigation programs | Plan Update Committee |
| September 14, 2023<br>Plan Update Committee | Review and update newly identified mitigation strategies and actions; prioritize proposed mitigation strategies; complete implementation schedule for priority mitigation strategies; discuss monitoring, evaluating and update the Plan | Plan Update Committee |
| April 17, 2024 | Review draft Plan Update | Eric Wilking, EMD/Fire Chief<br>Justin Pizon, Asst. Fire Chief/Asst. EMD |
| | | |

## Appendix P
## Approval Letter from FEMA