

TOWN OF RYE, NH

HAZARD MITIGATION PLAN UPDATE 2022



**Approved by the
RYE, NH
SELECT BOARD**



This project was partially funded by

NEW HAMPSHIRE HOMELAND SECURITY AND EMERGENCY MANAGEMENT

CERTIFICATE OF ADOPTION

WHEREAS, the Town of Rye received funding from the NH Division of Homeland Security and Emergency Management under a Pre-Disaster Mitigation Grant and assistance from Rockingham Planning Commission in the preparation of the Rye Hazard Mitigation Plan Update 2022; and

WHEREAS, several planning meetings were held between September 2021 and March 2022 regarding the development and review of the Rye Hazard Mitigation Plan Update 2022; and

WHEREAS, the Rye Hazard Mitigation Plan Update 2022 contains several potential future projects to mitigate hazard damage in the Town of Rye; and

WHEREAS, a duly-noticed public hearing was held by the Rye Select Board on (date to be added) to formally approve and adopt the Rye Hazard Mitigation Plan Update 2022.

RESOLVED by the Rye Select Board:

- The Plan is hereby adopted as an official plan of the Town of Rye;
- 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 Administrator.

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

IN WITNESS THEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Rye on this (date to be added).

_____ Select Board

_____ Select Board

_____ Select Board

ATTEST

Public Notary

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EXECUTIVE SUMMARY

The Rye Hazard Mitigation Plan Update 2022 (herein after, the *Plan*) was compiled to assist the Town of Rye 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 Rye and contains the tools necessary to identify specific hazards and aspects of existing and future mitigation efforts.

The following hazards are addressed:

- Flooding, including Sea Level Rise, Coastal Storm Surge and Extreme Precipitation Events
- Hurricane
- Tornado
- Severe Winter Weather
- Wildfire
- Earthquake
- Extreme Temperatures
- Drought
- Climate Change
- Infectious Disease

The Critical Facilities include but are not limited to:

- Town Hall
- Public Safety Building
- Town Highway Shed
- Library
- Rye Junior High School
- Water and Sewer Infrastructure

The *Plan* is considered a work in progress and should be revisited frequently to assess whether the existing and suggested mitigation strategies are successful. Copies have been distributed to the Town of Rye, and a copy will remain on file at the Rockingham Planning Commission. A copy of this Plan will be on file at New Hampshire Homeland Security and Emergency Management (NHHSEM) and the Federal Emergency Management Agency (FEMA). Upon approval by both agencies the town shall adopt the plan update.

CHAPTER 1 – 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 as a means to reduce and mitigate future losses from natural hazard events. The NHHSEM outlined 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 Rye Hazard Mitigation Plan Update 2022 was prepared by participants from the Town of Rye Emergency Management Team with the assistance and professional services of the Rockingham Planning Commission (RPC) under contract with the New Hampshire Homeland Security and Emergency Management (NHHSEM) operating under the guidance of Section 44 CFR 201.6. The Plan serves as a strategic planning tool for use by the Town of Rye in its efforts to identify and mitigate the future impacts of natural and/or man-made hazard events.

METHODOLOGY

The Rockingham Planning Commission (RPC) organized the first meeting with emergency management officials from the Town of Rye on September 28, 2021 to begin the initial planning stages of the Plan. 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*. The following is a summary of the ten-step process conducted to compile the Plan. Work session meetings were open to the public and held September 28, 2021, October 27, 2021, December 1, 2021, January 18, 2022, and March 9, 2022. The Town of Rye's Emergency Management Director and staff from the Rockingham Planning Commission solicited input on the Plan from local officials, abutting communities, and residents throughout the Plan development process. Documentation of meeting agendas and meeting attendance is in Appendix O.

The Town's 2016 Plan Update served as a starting point for discussions on hazards impacting the town and mitigation strategies. The 2016 Plan has served as a reference for local land use regulations and policies, development of the CIP and department budgets, the Rockingham Planning Commission's 2015 Regional Master Plan chapter on Natural Hazards, and the Town of Rye's 2015 Vulnerability Assessment regarding Sea Level Rise and Storm Surge.

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. The Plan Update Committee included Kevin Walsh, EMD and Police Chief; Mark Cotreau, Fire Chief; Kimberly Reed; Planning and Zoning Administrator; Dennis McCarthy Public Works Department Administrator; Dan Barron, Highway Foreman; Chuck Marsden, Code Enforcement Office/Building Inspector; Arik Jones, Rye Water Department; Lee Arthur, Sewer

Department Administrator; Jason Rucker, DPW Administrator; Rebecca Bergeron, Town Administrator.
Information about the Plan Update

process was shared with elected officials and Town staff via Department Head reports to the Select Board and town staff meetings. All meetings were open to the public. RPC staff kept municipalities in the region informed of the Plan Update via monthly RPC Commissioner meetings. In addition, RPC staff working in abutting towns kept local officials in these communities informed of the update to Rye's Plan Update and the opportunity to comment on regional mitigation strategies.

Step 2 – Map the Hazards

The Committee identified areas where damage from past 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 3 – Identify Critical Facilities and Areas of Concern

The Committee then identified facilities and areas that are important to the Town for emergency management purposes, for provision of utilities and community services, evacuation routes, and for recreational and historical, cultural, and social value. These facilities and area are identified on the Critical Facilities Map.

Step 4 – Identify Existing Mitigation Strategies

After collecting detailed information on each critical facility in Rye, the Committee and RPC staff identified existing town mitigation strategies relative to flooding, including sea level rise and coastal storm surge, hurricane, tornado, severe winter weather, wildfire, earthquake, extreme temperatures, drought, infectious disease, and climate change. This process involved reviewing the 2016 Hazard Mitigation Plan, the Town's Master Plan and Capital Improvements Program (CIP), Zoning Ordinance, Subdivision Regulations, Site Plan Review Regulations, and participation in the National Flood Insurance Program (NFIP). The Committee also reviewed the 2015 Vulnerability Assessment for Sea Level Rise and Storm Surge completed for the Town of Rye by the Rockingham Planning Commission. This information allowed the Committee to review existing and new mitigation strategies.

Step 5 – Identify the Gaps in Existing Mitigation Strategies

The existing strategies were then reviewed by the RPC and the Committee for coverage and effectiveness, as well as the need for improvement.

Step 6 – Identify Potential Mitigation Strategies

A list was developed of additional hazard mitigation actions and strategies for the Town of Rye. Natural Hazard Mitigation Plans for other communities in the region were utilized to identify new mitigation strategies as well as FEMA recommended hazard mitigation examples. The Vulnerability Assessment, Master Plan, Emergency Operation Plan, and Capital Improvements Plan were also reviewed to generate ideas.

Step 7 – Prioritize and 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 8.

Step 8 - Determine Priorities

The preliminary prioritization list was reviewed to make changes and determine a final prioritization for new hazard mitigation actions and existing protection strategy improvements identified in previous steps. RPC also presented recommendations to be reviewed and prioritized by the Plan Update Committee.

Step 9 - 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, when the Master Plan or Capital Improvement Plan (CIP) is updated the Rye Hazard Mitigation Plan Update 2022 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 or capital expenditures.

Step 10 - Adopt and Monitor the *Plan*

RPC staff compiled the results of Steps 1 to 9 in 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 and RPC website for review by the public, neighboring communities, agencies, businesses, and other interested parties to review and make comments via email. A duly noticed public meeting was held by the Rye Select Board on March 28, 2022. The meeting was posted on the Town's website and allowed the community and neighboring towns to provide comments and suggestions for the Plan in person, prior to the document being finalized. This review also allowed board and committee members to review other planning documents in town such as the Master Plan and CIP to consider and incorporate pertinent information that may be included within the Hazard Mitigation Plan. After public comment was accepted, the draft was revised to incorporate comments from the Select Board, Planning Board, and general public; then submitted to the NHHSEM and FEMA Region I for their review and comments. Any changes required by NHHSEM and FEMA were made and a revised draft document was then submitted to the Rye Select Board for their final review. A duly noticed public meeting was then held by the Rye Select Board on (date to be added). At this duly noticed public meeting the Plan update was approved and adopted by the Select Board.

The Town, led by the Emergency Management Director, will continue to monitor the Plan, for effectiveness and accuracy, consulting with Town departments, boards, and commissions, and with local officials in abutting communities, as well as soliciting comments from the public about the Plan. The approved Plan Update will be posted on the Town website to facilitate on-going review of hazard mitigation activities and the Plan Update Action Plan will be incorporated into the Town's Master Plan, Capital Improvements Plan, Emergency Operations Plan, and other planning mechanisms.

HAZARD MITIGATION GOALS AND OBJECTIVES OF THE TOWN OF RYE, NEW HAMPSHIRE

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

- Reduce or avoid long-term vulnerabilities posed by natural hazards impacting Rye, including the impacts from flooding, tornadoes, downbursts, severe winter weather, wildfire, earthquakes, extreme temperatures, drought, climate change, and infectious disease.
- Improve upon the protection of the Town of Rye'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 Rye and the State's Critical Support Services.
- Reduce the potential impact of natural and man-made disasters on Rye's Critical Facilities in the State.
- Reduce the potential impact of natural and man-made disaster on Rye's and the State's infrastructure.
- Improve Rye's Emergency Preparedness.
- Improve Rye's Disaster Response and Recovery Capability.
- Reduce the potential impact of natural and man-made disasters on private property in Rye.
- Reduce the potential impact of natural and man-made disasters on Rye's and the State's economy.
- Reduce the potential impact of natural and man-made disasters on Rye's and the State's natural environment.
- Reduce Rye'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 Rye'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 so as to accomplish Rye's and the states goals and objectives in order to raise the awareness and acceptance of hazard mitigation planning.

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

ACKNOWLEDGEMENTS

The Rye 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:

Kevin Walsh, EMD and Police Chief

Mark Cotreau, Fire Chief

Kimberly Reed, Planning and Zoning Administrator

Dennis McCarthy, Public Works Department Administrator

Dan Barron, Highway Foreman

Chuck Marsden, Code Enforcement Office/Building Inspector

Lee Arthur, Sewer Department Administrator

Arik Jones, Rye Water

Rebecca Bergeron, Town Administrator

Jason Rucker, Public Works Department Administrator

The Rye Select Board offers thanks to NHHSEM which provided the model and funding for this Plan.

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

NATURAL FEATURES

Rye is a semi-rural community in southeastern New Hampshire along the Atlantic Ocean. According to the US Census the population in 2020 was 5,543. Rye has an area of 36.7 square miles; 12.6 square miles of land and 24.1 square miles of water. The town includes four of the nine islands known as the Isles of Shoals, which are located approximately 10 miles offshore. The Town is characterized by residential development, including seasonal beach homes, and commercial businesses along NH Route 1. The highest point in Rye is Breakfast Hill with an elevation of 151 feet above sea level.

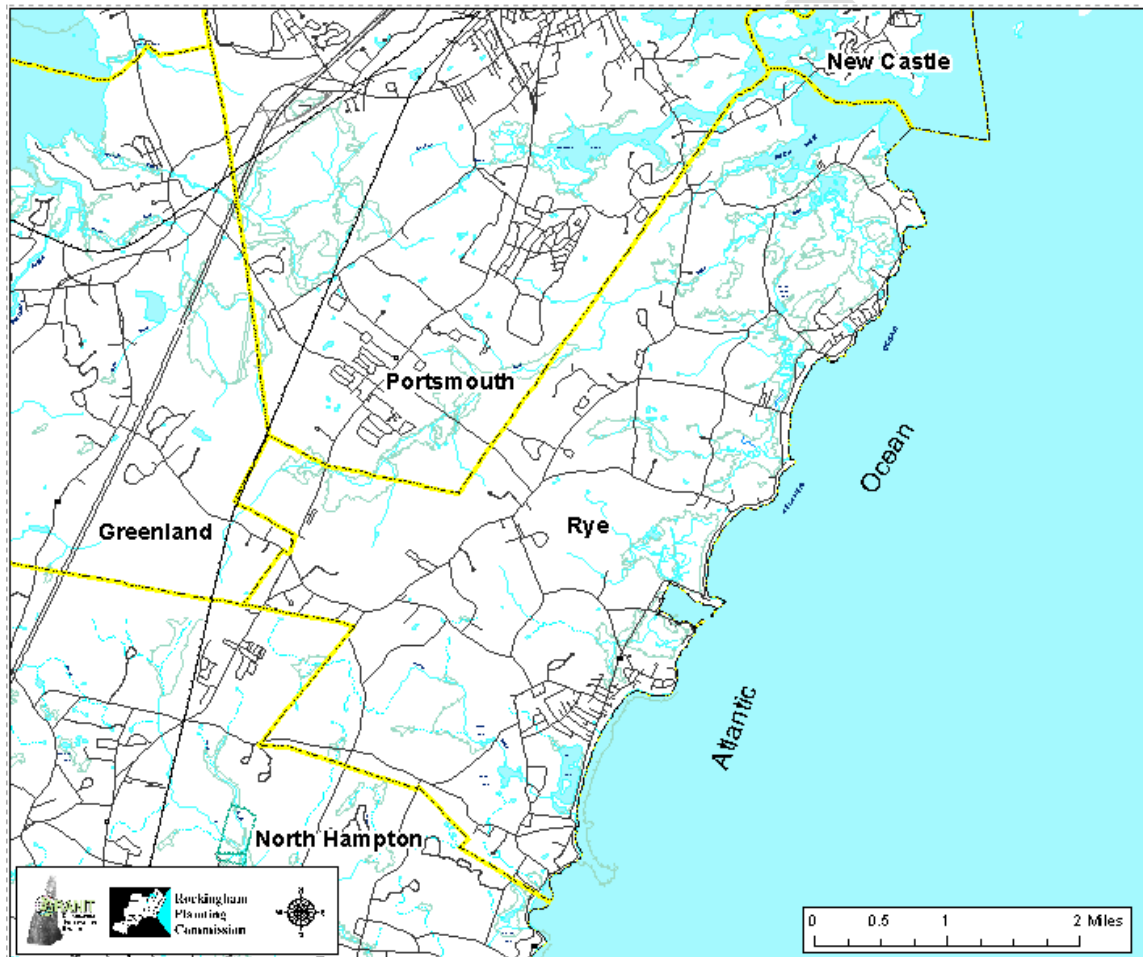


Figure 1: Location Map of Rye, New Hampshire

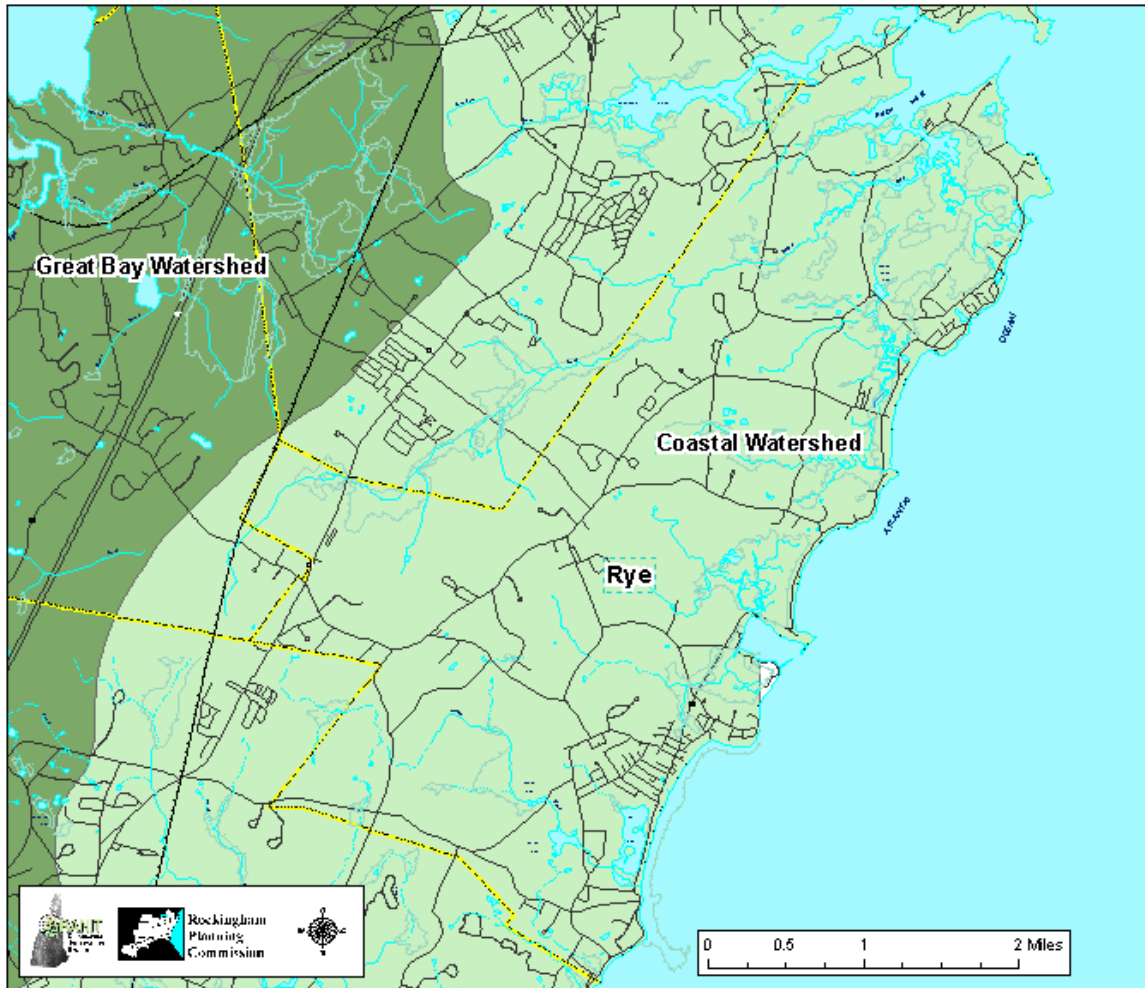


Figure 2: Watershed Map of Rye, New Hampshire

Rye lies within the New Hampshire's Coastal Watershed, with several brooks, streams, wetland complexes and salt marsh complexes draining into the Atlantic Ocean. Sub-watersheds include Berry's Brook, which flows towards the Ocean at Odiorne State Park, and Bailey's Brook, which flows into Burke Pond and Eel Pond.

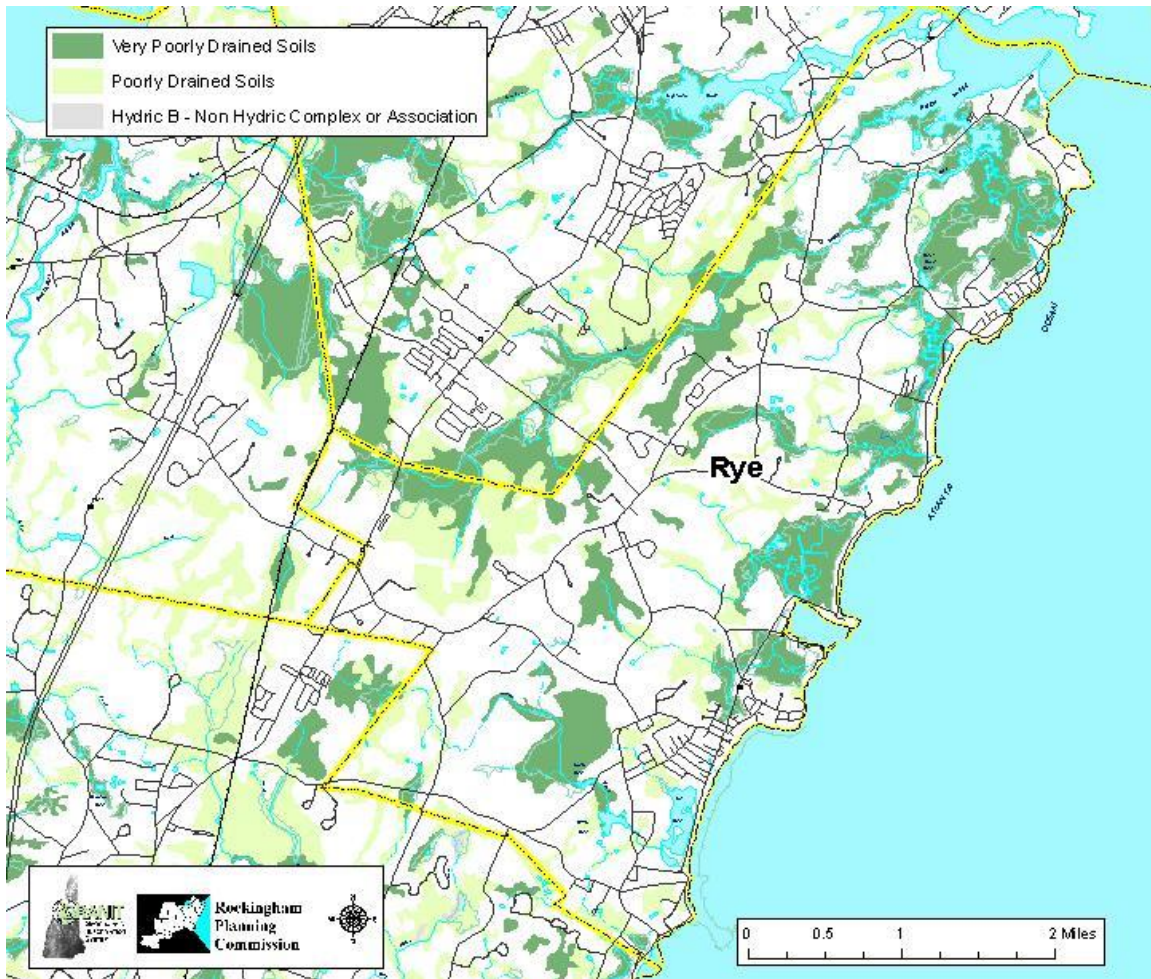


Figure 3: Wetland Map of Rye, New Hampshire

Wetlands soils in Rye are delineated on the basis of hydrophytic vegetation, hydric soils and wetlands hydrology in accordance with the techniques outlined in the Corps of Engineers Wetlands Delineation Manual, January 1987. Large wetland complexes are associated with the Bailey’s Brook and Berry Brook sub-watersheds. Rye has established a Wetlands Conservation Overlay District to protect wetlands from development and to sustain critical flood storage capacity.

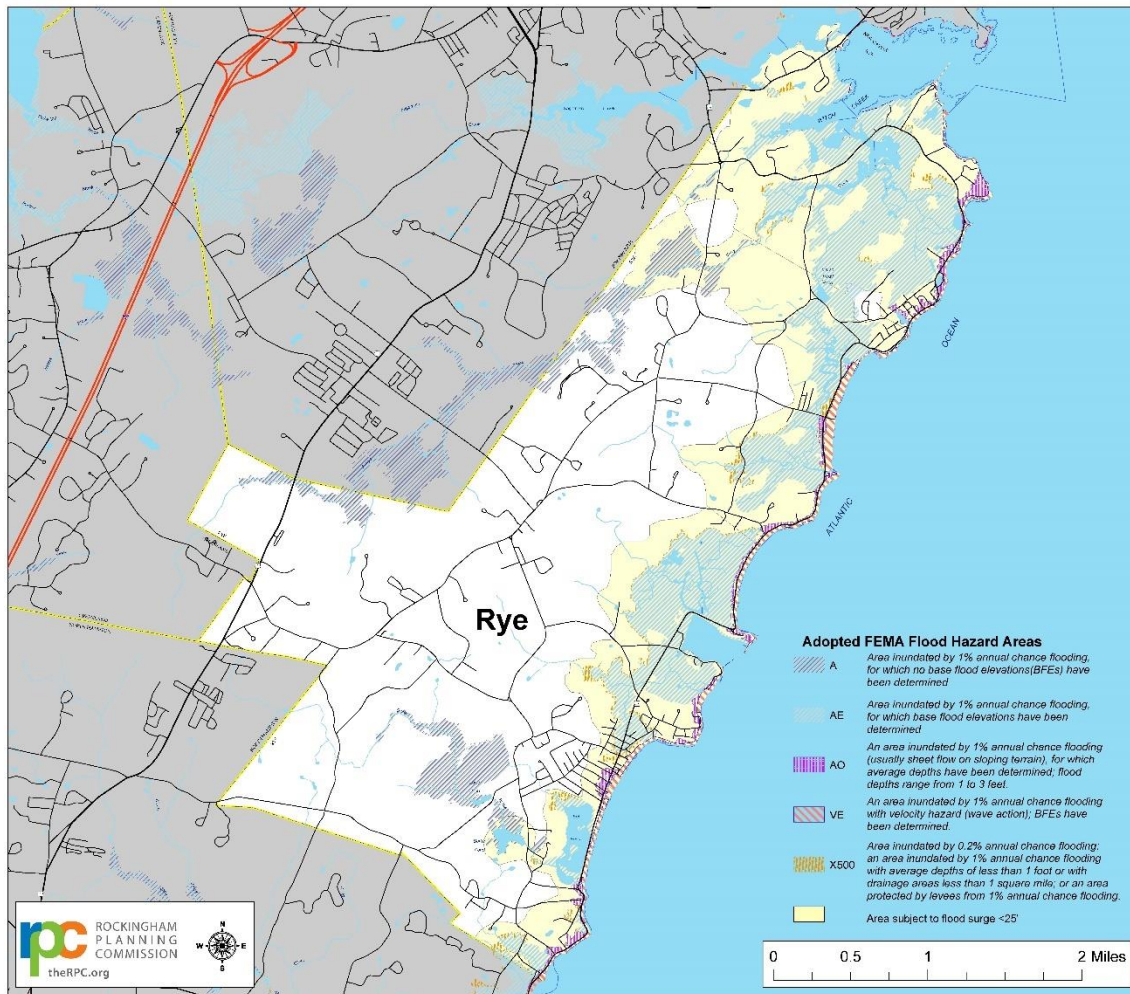


Figure 4: Floodplain Map of Rye, New Hampshire

Floodplains in Rye are depicted in Figure 4, above, and are defined by FEMA’s Flood Insurance Rate Maps as the 100-year and 500-year flood hazard zones. Rye participates in the National Flood Insurance Program administered by FEMA. The Town has adopted regulations to limit, and in some cases, prevent develop in wetlands and floodplains, including an updated Floodplain Development and Building Ordinance, adopted in March 1988, and was amended in January 2021 to addresses Coastal High Hazard Area Design Requirements.

LAND USE AND DEVELOPMENT

Rye is located in Rockingham County in southeastern New Hampshire, along the Atlantic Ocean. Population growth and corresponding residential development have increased the Town's vulnerability to damage from natural hazards and climate change, resulting in increased costs associated with repair and improvements to road infrastructure and increased demand for emergency services. The Town's proximity to the Atlantic Ocean also makes it vulnerable to hazards posed by sea-level rise and coastal storm surge. The mitigation action plan described in Chapter IX of this Plan Update reflects the increasing demands on municipal resources to mitigate natural hazards impacting Rye.

Current and future development is predicated in the Town of Rye's Zoning Ordinance. The Town is divided into zoning districts encompassing residential, business, commercial, public recreation, historic, coastal area, wetlands, flood hazards, conservation, and the Rye Beach Precinct.

Commercial growth is expected to continue to be concentrated along Route 1, and new residential development is anticipated throughout town as development pressure remains high in the region. As with existing development, this new development may take place in areas prone to hazards identifies in this Plan, including inland and coastal flooding. The Town has adopted and enforces land use regulations designed to mitigate hazards, including stormwater management and flood hazards.

There has been no increase in development in hazard prone areas since the last Plan update due to deliberate Town efforts to regulate development in these areas. Despite these efforts, the Town's vulnerability to natural hazards will increase due to climate change and an increasing number of precipitation and other 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, updates to the Master Plan, CIP and EOP, especially as they relate to development in areas of town prone to flooding and at risk of storm surge.

MAP 1: LAND USE MAP

DRAFT

CHAPTER III – NATURAL HAZARDS IN THE TOWN OF RYE

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 Rye is prone to several types of natural hazards. These hazards include: **flooding, including flooding from coastal storms and sea level rise, hurricanes, tornadoes, severe winter weather, wildfires, earthquakes, extreme temperatures, drought, infectious disease, and climate change.** Other natural hazards can and do affect the Town of Rye, but these were the hazards prioritized by the Committee for mitigation planning. These were the hazards that were considered to occur with regularity and/or were considered to have high damage potential and are discussed below.

Natural hazards that are included in the State’s Hazard Mitigation Plan that are not included in the Plan include: landslide, subsidence, radon, and avalanche. 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. Rye has no record of landslides and little chance of one occurring that could possibly damage property or cause injury and so landslides are not included in this Plan. The State’s Plan indicates that Rockingham County is at Moderate risk to radon but when compared to natural hazards that could be potentially devastating to the Town, such as hurricanes and coastal storms, or natural hazards that occur with regularity, such as flooding or severe winter weather, radon was not considered a threat 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.

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. Coastal flooding can be caused by rising sea levels, storm surge associated with high wind events hurricanes or Nor’easters.

- **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.
- **Sea Level Rise, Coastal Flooding and Storm Surge** - Rye’s Atlantic Ocean coastline means homes and businesses, roadways and infrastructure, including state parks and harbors, are at risk due to flooding caused by storm surges and by rising sea levels.

- **Rapid Snowpack 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 collecting in river bends and against structures presents significant flooding threats to bridges, roads, and the surrounding lands.
- **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.
- **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. The NH DES Dam Bureau lists two active dams in Rye - Eel Pond dam is classified as a Low Hazard structure with a dam height of 15 feet and an impoundment area of 30 acres, and the Locke Pond Dam is classified as a Non-menace structure with a dam height of six feet and an impoundment areas of 2.4 acres. Five dams are listed by the State as Exempt – Burke Pond Dam, Hunters Run Detention Pond A dam, Hunters Run Detention Pond B dam, Whitehorse Farm Pond Dam, and the Rye Public Safety Detention Pond dam. A description of dam classifications is included on the following page.

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 Rye.

Location - Rye 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). Rye has four major flood zones: A, AE, AO, and VE, as highlighted in Table 1. With the exception of Locke’s Neck, the area protected by the Wallis Sands seawall, Fairhill Manor, and parts of Odiorne Point, most of Rye’s developed coastline, including approximately half of the densely developed Jenness Beach area, is located in Flood Hazard Zones V, AE, or AO. In addition, along Ocean Boulevard, the VE Zone includes an area of LIMWA – Limit of Moderate Wave Action – where the areas of limited wave action are 1.5’ to 3’ in height.

Table 1: FEMA Flood Zones in Rye and Structures in each Zone

Sources: FEMA and Town of Rye

FEMA Special Flood Hazard Area	Description of FEMA Zone	Number of Structures in Rye 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.	3
Zone AE	Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within this zone.	249
Zone AO	Areas subject to inundation by 1-percent-annual-chance shall flooding where average depths are 1-3 feet. Average flood depth derived from detailed hydraulic analyses are shown within this zone.	196
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.	198

There are also several locally identified areas susceptible to flooding that are not within these flood zones, these areas are described below and displayed on Map 2: Past and Future Hazards.

- Wallis Road between Appledore and Ocean Boulevard
- Ocean Boulevard at Church Street
- The Breakers
- Jenness Road
- Atlantic Avenue
- Kenphill Avenue
- Sagamore Road
- Harbor Road at Ocean Boulevard
- Locke Road at Harbor Road
- Long John Road

Extent - The extent of flooding in Rye can range from minimal to severe. Minimal flooding can result in high water alongside roads and in yards and fields; severe flooding can, and has in Rye’s case, resulted in washed out roads and bridges, stranded motorists, and homes isolated by high and fast-moving water, including tidal storm surges.

The State of New Hampshire places every dam into one of four classifications, which are differentiated by the degree of potential damages that a failure of the dam is expected to cause, <https://www.des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf>.

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 render 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.

Probability – The probability of the flooding of roadways and properties from rain, coastal storm surge, rising sea levels, and snow melt is high in Rye, especially in the areas listed above. The probability of dam failure in Rye is low as the NH DES Dam Bureau has classified only one dam in town, the Eel Pond Dam, as a Low Hazard structure.

Past Occurrence - Flooding is a common hazard for the Town of Rye. Several locations were identified as areas of chronic reoccurring flooding or high potential for future flooding. These areas include Wallis Road between Appledore and Ocean Boulevard; Ocean Boulevard at Church Street; The Breakers; Jenness Road; Atlantic Avenue; Kenphill Avenue; Harbor Road at Ocean Boulevard; Locke Road at Harbor Road; Long John Road; Sagamore Road. Road closures at these locations can occur during periods of heavy rainfall, and rapid snowmelt and are temporary in nature, with road surfaces covered with water. Coastal storm surges have caused damage to shale piles along Ocean Boulevard, causing the rock to be pushed back into the roadway.

Community Vulnerability - The Committee identified several areas in Rye as being vulnerable to flooding caused by heavy rains, coastal high tides and storm surge, snow melt and ice jams. These areas are depicted on Map 2: Past and Potential Hazards and are as follows: Wallis Road between Appledore and Ocean Boulevard; Ocean Boulevard at Church Street; The Breakers; Jenness Road; Atlantic Avenue; Kenphill Avenue; Harbor Road at Ocean Boulevard; Locke Road at Harbor Road; Long John Road; the undersized culvert at Sagamore Road and Pioneer Road. Mitigation and prevention of roadway flooding is taking place in a variety of ways in Rye, including the adoption and enforcement of stormwater

management regulations to increase the on-site treatment of runoff and working with homeowners and developers on site plan design that takes into account areas prone to flooding and identifies long-term management of run-off and flood storage. Closure of these roads due to high water and/or unsafe driving conditions can prevent residents from reaching homes and businesses, restrict emergency response vehicles and school bus routes. High water levels and swiftly moving water can also cause culvert failure and erosion, undermining road safety.

A summary of Rye's greatest vulnerabilities to flooding are as follows:

- Structures, primarily residential homes, and roads located in the flood zone and in neighborhoods prone to flooding, as identified on Map 2, Past and Potential Hazards, including: Wallis Road between Appledore and Ocean Boulevard; Ocean Boulevard at Church Street; The Breakers; Jenness Road; Atlantic Avenue; Kenphil Avenue; Harbor Road at Ocean Boulevard; Locke Road at Harbor Road; Long John Road; the undersized culvert at Sagamore Road and Pioneer Road.
- Dam breach and failure could impact Rye through flooding. Potential losses will depend on the extent of the breach and would mostly affect roadway infrastructure. Areas at risk include the causeway at the North Hampton town line.
- Planning for long term sea-level rise can be integrated with existing regulatory and management frameworks for the current 100-year floodplain (1% chance).
- Sewer and water pump stations and associated infrastructure due to stormwater and seawater intrusion.

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 victim 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 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 2: Rye NFIP Policy and Loss Statistics

Policies in force	Insurance in Force	Number of Paid Losses (since 1978)	Total Losses Paid (Since 1978)
296	\$87,711,100	170	\$1,798,440
Source: FEMA Policy and claims database, as of October 25, 2021			

Rye NFIP Repetitive Flooding Losses

Rye joined the Regular Program of the NFIP on June 17, 1986. Rye is part of the Rockingham County DFIRMs and FIS, which are both dated May 17, 2005. As reported by the NH Office of Strategic Initiatives, as of October 2021, Rye has 296 policies in force, 287 policies on residential properties and nine on non-residential properties. There have been 15 repetitive loss residential properties. This is determined by any repetitive damage claims on those properties that hold flood insurance through the NFIP.

Floodplain Management Goals/Reducing Flood Risks

A major objective to floodplain management is to continue participation in the NFIP and evaluate continued required compliance criteria within the program. 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 the 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 Rye

A potential step in mitigating flood damage is participating in NFIP. Rye continues to consistently enforce NFIP compliant policies in order to continue its participation in this program and has effectively worked within the provisions of NFIP by ensuring buildings, if built in the floodplain, comply with NFIP building standards and practices.

Since joining the NFIP in 1986, the Town has amended its zoning ordinance and regulations to protect wetlands and shoreland buffers, completed a climate change vulnerability assessment, and adopted a climate resilience Master Plan chapter. The Town is actively enrolled in the NFIP Community Rating Systems. Below is a list of actions Rye will consider, or continue to perform, in order 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;
- Continue with Mutual Aid Agreements with neighboring communities to address administering the NFIP following a major storm event;
- Address NFIP monitoring and compliance activities;
- Incorporate recommendations from the 2015 Vulnerability Assessment for sea-level rise and storm surge into town regulations and policies;
- 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 booklets;
- 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.

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 surge. 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. Rye’s location along the Atlantic Ocean makes hurricanes and high wind events severe threats. For this Plan, high-wind, hurricanes, thunderstorms, hail, and lightning events were considered to have an equal chance of affecting any part of Rye.

Extent – Hurricane strength is measured using the Saffir-Simpson scale, located in the appendix of this Plan. Rye 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 overturned, and cars lifted off the ground and thrown. Between 1900 and 2018 2 hurricanes have made landfall in New Hampshire, a category 1 and a category 2. Measurement scales for high wind events, thunderstorms, lightning risk, and hail are in the appendix of this Plan.

Probability - The Committee concurs with the State of New Hampshire’s Multi-Hazard Mitigation Plan Update 2018, which rates the high likelihood of high wind events such as hurricane, tornado and “Nor’-Easters” to be high in Rye and 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 Rye and power loss. High wind events in 2010, 2014 and 2016 resulted in extensive power outages, downed wires, and trees. Neither lightning nor tornadoes have impacted Rye in recent memory. Heavy rain associated with tropical storms impacted Rye in 2017, 2018, and 2020, resulting in flooding along roads, low lying areas, and floodplains.

Community Vulnerability – The Committee determined that lightning, hail, high wind, and heavy rain associated with hurricanes and thunderstorms can impact every neighborhood in Rye during and after the storm, resulting in downed trees, flooding of ponds, rivers, streams, marshes, 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 Rye 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 Rye.

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 with regularity 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 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 2018 rates Rockingham County with high likelihood of heavy snow, ice storms, and Nor'easters, and the Committee agrees with this assessment as the Town has experienced severe winter weather since the last Plan Update.

Past Occurrence – Rye has been impacted by six severe winter storms in the past five years. A storm on January 2, 2009 resulted in the removal of tree debris and wind-blown debris. A storm on March 29, 2010 caused flooding that damaged roads and culverts. The "Halloween storm" on October 31, 2011 resulted in widespread power outages, fallen trees, and closed roads. A severe winter storm struck the region on March 19, 2013 with heavy snow fall resulting in 48 hours of snow removal. A severe winter storm in 2015 and two Nor'easters in 2018 required extensive snow removal, removal of fallen trees, road closures, and extensive damage to sidewalks, seawalls, and shale piles.

Community Vulnerability - Severe winter weather has struck Rye 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 melt 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 water and sewer infrastructure, 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 determined that all forested and open areas in Rye are prone to wildfires, especially after periods of drought.

Extent - A wildfire in Rye is unlikely, but if a crown fire were to occur it could be very damaging to residential neighborhoods. A large grass fire could damage structures and neighborhood buildings near

large open areas. A Wildfire Size Classification, used to categorize wildfire based on the number of acres, and the Wildland-Urban Interface Scale, a tool to quantify the expected severity of wildfire events in developed areas, are included in Appendix J.

Probability - Moderate. The Committee rates the probability of wildfire as moderate given the increase in periods of drought since the last Plan Update. Offshore winds may also increase threat from wildfire. The State of New Hampshire's Multi-Hazard Mitigation Plan Update 2018 rates Rockingham County with moderate risk to wildfires.

Past Occurrence - No large fires have occurred within recent memory.

Community Vulnerability - The Committee determined that all forested and open areas in Sandown are prone to wildfires, with the threat increasing during periods of drought. The Committee summarized the threat posed by wildfire is to structures located near large open vegetated areas prone to lightning strikes, and 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 of Rye.

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 and New Hampshire has no such code specifications.

Probability – The Committee determined the probability of Rye being impacted by an earthquake as moderate. The State of New Hampshire's Multi-Hazard Mitigation Plan 2018 ranks all the Counties in the State with at moderate risk to earthquakes.

Past Occurrence - Large earthquakes have not affected Rye within recent memory.

Community Vulnerability - The Committee determined that earthquakes do not pose a frequent threat, but if one were to occur the most vulnerable structures include older, historic residences and municipal

buildings, roads, bridges, brick structures, infrastructure and utility lines along Ocean Boulevard, as well as secondary hazards such as fire, power outages or a hazardous material leak or spill.

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 Rye.

Extent - Extreme heat events impact Rye for 3-4 days each summer, and extreme cold events impact the Town 2-3 days each winter. Heat Index measures a number in degrees Fahrenheit 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 – The Committee ranked the probability of extreme temperatures as high.

Past Occurrence – Annually. Since the last Plan Update, Rye has experienced an increase in days with a high heat index. Winter days with below average temperatures have remained the same but do occur each year.

Community Vulnerability - The Committee determined that all parts of Rye 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.

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 area more susceptible to wildfire. In addition, human actions and demands for water resources can accelerate drought-related impacts. Potable water is supplied to Rye residents and businesses from the Rye Water District, Aquarion Water Company, and the City of Portsmouth. Efforts are underway to strengthen interconnections between these systems to provide greater resilience during periods of drought.

Location – The Committee determined that drought poses risks to water supplies throughout Rye. Risks of wildfire associate 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 wells and aquifers in Rye after extended periods with limited rain and snowfall, often for several months, and is a town-wide

hazard. The Town monitors the information provided by NH DES Drought Management Program. The U.S. Drought Monitor Scale is in the appendix of this Plan.

Probability – The Committee determined that Rye is at moderate risk for drought.

Past Occurrence - The State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 rates Rockingham County at low risk for drought. However, drought conditions persisted across southern New Hampshire since the last Plan Update, in 2016, 2020, and into July 2021. During these periods the Town advised residents to conserve water but did not record any specific impacts. The Town does not operate a public water system; residents and businesses are served by private wells or by the Hampstead Area Water Company. Hampstead Area Water Company does advise customers during drought about water conservation measures.

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

Climate Change

Description - Climate is defined as the long-term, prevailing pattern of temperature, precipitation, and other weather variables at a given location as described by statistics, such as means and extremes. Climate differs from weather in that weather is the current state or short-term variation of these variables at a given location. Climate change is the observed change in atmospheric variables over time that are the result of natural and anthropogenic, or human-caused, influences. Climate change is directly related to the ongoing increase in global temperature, a rise that is influenced by the steady increase in the concentration of atmospheric greenhouse gases that has been occurring and continues to occur across the globe.

Location – Climate change can affect all areas of Rye, in the form of increased temperatures, extreme precipitation events, sea-level rise, and coastal storm surge.

Extent – Extreme heat events impact Rye for 3-4 days each summer and the number of days may increase as the result of climate change. The average annual temperature in New Hampshire has increase three degrees since the early 20th century. Winter warming has been larger than any other season. Future winter warming will have large effects on snowfall and snow cover. Flooding from extreme precipitation events, sea-level rise, and coastal storm surge increasingly impact Rye. Mean precipitation and precipitation extremes are projected to increase in the future, with associated increases in flooding.

Probability – The Committee determined the probability of climate change impacting Rye as high given the increase in hazard events since the last Plan Update.

Past Occurrence – Annually

Community Vulnerability - The Committee determined that all parts of Rye are at risk of impacts associated with climate change and the effects of climate change pose real and significant threats to community safety, resilience, and quality of life.

Infectious Disease

Description – Infectious diseases are illnesses caused by organisms – such as bacteria, viruses, fungi, or parasites. Many organisms live in and on our bodies. They are 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 bites from insects or animals, and others are acquired by ingesting 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 get better on their own without treatment, while some life-threatening infections may require hospitalization. A definition of infectious diseases by the Mayo Clinic is in the Appendix.

According to the United States Centers for Disease Control and Prevention (CDC), the number of people with a disease that is usually present in a community is referred to as the baseline or endemic level of the disease. This number of infections is not necessarily the desired level, which may in fact be zero, but rather is the typical or normal number of people infected. In the absence of intervention and if the number of infections is not high enough to deplete the pool of susceptible persons, the disease may continue to occur at this level indefinitely. Thus, the baseline level is often regarded as the expected level of the disease. While some diseases are so rare in each population that a single case warrants an epidemiologic investigation (e.g., rabies, plague, polio), there are other diseases that occur more commonly so that only deviations from the norm (i.e. seeing more cases than expected) warrants investigation.

Epidemics occur when an agent (the organism) and susceptible hosts are present in adequate numbers, and the agent can be effectively conveyed from a source to the susceptible people. More specifically, an epidemic may result from a recent increase in amount or virulence of the agent, the recent introduction of the agent into a setting where it has not been before, an enhanced mode of transmission so that more susceptible persons are exposed, a change in the susceptibility of people's response to the agent, and/or factors that increase exposure or involve introduction through new portals of entry.

Epidemics may be caused by infectious diseases, which can be transmitted through food, water, the environment, or person-to-person or animal-to-person, and noninfectious diseases, such as chemical exposure, that causes increased rates of illness. Infectious diseases that may cause an epidemic can be broadly categorized into the following groups: foodborne (E.Coli), water (Giardiasis), vaccine preventable (Measles), sexually transmitted (HIV), person-to-person (TB), arthropod borne (Lyme), zoonotic (Rabies), and opportunistic fungal and fungal infections (Candidiasis). An epidemic may also result from a bioterrorist event in which an infectious agent is released into a susceptible population, often through an enhanced mode of transmission, such as aerosolizing.

Location – Infectious disease can affect all areas of Rye.

Extent – The magnitude and severity of infectious disease is described by its speed of onset (how quickly people become sick or cases are reported) and how widespread the infection is. Some infectious diseases are inherently more dangerous and deadly than others, but the best way to describe the extent of infectious diseases relates to the disease occurrence:

- Endemic – Constant presence and/or usual prevalence of a disease or infection agent in a population within a geographic area
- Hyperendemic – There persistent, high levels of disease occurrence
- Cluster – Aggregation of cases grouped in place and time that are suspected to be greater than the number expected even though the expected number may not be known
- Epidemic – An increase, usually sudden, in the number of cases of a disease above what is normally expected
- Outbreak – The same as epidemic, but over a much smaller geographical area
- Pandemic – Epidemic that has spread over several countries or continents, usually affecting many people

Probability – The probability of infectious disease is moderate.

Past Occurrence – Infectious disease, such as COVID-19, seasonal influenza, and gastrointestinal illness occur annually in Rye. The 2020 COVID-19 Pandemic is ongoing as of this Plan Update and Rye continues to experience cases of COVID-19 and community transmission.

Community Vulnerability – The Committee determined that all parts of Rye are at risk of impacts associated with infectious disease. Rates of illness, duration of disease, and the ability to treat or prevent illness once the causative agent is identified are just a few factors that will further determine the vulnerability of the population. In response to the COVID-19 pandemic, Rye designated the Fire Chief to oversee information sharing and coordination of the Town’s pandemic response.

**Table 3: 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	\$6,218,291	Grafton and Coos
10/29/2017 - 11/1/2017	Severe Storm/flooding	DR-4355	PA	\$4,710,744	Sullivan, Merrimack, Belknap, Carroll, Grafton, Coos
3/2/2018 – 3/8/2018	Severe Storm/flooding	DR-4370	PA, IA	\$3,344,036	Rockingham
3/13/2018 – 3/14/2018	Severe Winter Storm/snowstorm	DR-4371	PA, IA	\$1,981,453	Carroll, Strafford, Rockingham
7/11/2019- 7/12/2019	Severe Storm/flooding	DR-4457	PA	\$675,907.70	Grafton
3/13/2020- ongoing	Covid-19 Pandemic	EM-3445	PA, IA	NA	New Hampshire
1/20/2020 - ongoing	Covid-19 Pandemic	DR-4516	PA, IA	NA	New Hampshire

Program Key: PA: Public Assistance IA: Individual Assistance DFA: Direct Federal Assistance

MAP 2: PAST AND FUTURE HAZARDS

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CHAPTER IV – CRITICAL FACILITIES

The Critical Facilities List for the Town of Rye has been identified by Rye’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 Rye. 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.

Table 4: Category 1 - Emergency Response Services and Facilities:

The first category contains facilities needed for Emergency Response in the event of a disaster.

Critical Facility	Address	Description
Town Hall	10 Central Road	Public Building
Public Safety Complex	555 Washington Road	Public Building
Highway Garage	309 Grove Road	Public Building
Rye Junior High School	501 Washington Road	Public Building
Water Tanks – 3 Rye Water, 1 Aquarion	865 Washington Road (2), 271 Lafayette Road, Johnson Lane	Infrastructure
Water Supply Wells - 3	71 Garland Road, 90 Garland Road (2)	Infrastructure
Water Dept. Office	60 Sagamore Road	Infrastructure
Cell Towers - 3	271 Lafayette Road, 24 Port Way, Johnson Lane	Infrastructure
Electric Substations - 3	271 Lafayette Road, Aquarion Road, Central Road, Sagamore Road	Infrastructure
Sewage Pump Stations - 3	289 Church Street, 118 Old Beach Road, 737 Central Road	Infrastructure

Table 5: 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 Rye.

Critical Facility	Address	Description
Sea Wall/Shale Piles	Ocean Boulevard at North Hampton line, Ocean Boulevard at Sea Road, Ocean Boulevard at Odiorne State Park	Infrastructure
Emergency Fuel	Travel Center 108 Ocean Road,	Supplies

Critical Facility	Address	Description
	Greenland	

Table 6: Category 3 - Facilities/Populations to Protect:

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

Critical Facility	Address	Facility Type
Public Library	581 Washington Road	Congregation Facility
Recreation Center	55 Recreation Road	Congregation Facility
Post Offices	301 Central Road	Congregation Facility
St. Andrews by the Sea Church	30 Church Road	Congregation Facility
St. Theresa Church	820 Central Road	Congregation Facility
Rye Congregational Church	580 Washington Road	Congregation Facility
Oceanic Hotel	Star Island	Congregation Facility
Benchmark at Rye	295 Lafayette Road	Congregation Facility
Seacoast Science Center	570 Ocean Boulevard	Congregation Facility
Wallis Sands State Beach	1050 Ocean Road	Recreation
Rye Harbor State Park	1730 Ocean Boulevard	Recreation
Rye Town Museum	10 Old Parish Road	Historic Resource
Rye Country Day School	1245 Washington Road	School
Learning Skills Academy	1247 Washington Road	School
Rye Elementary School	461 Sagamore Road	School

Table 7: 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	Address	Facility Type
Home Depot	35 Lafayette Road, North Hampton	Supplies
Lowe's	1440 Greenland Road, Greenland	Supplies
Travel Center	108 Ocean Road, Greenland	Food and Fuel
Sun Belt Rental	170 Lafayette Road, North Hampton	Heavy Equipment
Rite Aid	72 Lafayette Road, North Hampton	Pharmacy and Supplies

MAP 3: CRITICAL FACILITIES MAP

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CHAPTER V – POTENTIAL HAZARD AFFECTS

IDENTIFYING VULNERABLE FACILITIES

It is important to determine what the most vulnerable areas of the Town of Rye are and to estimate their potential loss. The first step is to identify the areas most likely to be damaged in a hazard event. To do this, the locations of buildings and other structures were compared to the location of potential hazard areas identified by the Hazard Mitigation Committee using GIS (Geographic Information Systems). Vulnerable buildings were identified by comparing their location to possible hazard events. For example, all of the structures within the 100-year floodplain were identified and used in conducting the potential loss analysis for flooding.

CALCULATING THE POTENTIAL LOSS

The next step in completing the loss estimation involved assessing the level of damage from a hazard event as a percentage of the buildings' assessed value. For the purposes of estimating losses and average values per residential structure was determined. The average assessed value of a structure in Rye in 2021, not including land, was \$359,000.

The damage estimates are divided into two categories based on hazard types: hazards that are location specific, such as flooding, and hazards that could affect all areas of Rye equally, such as extreme heat. Damage estimates from hazards with a specific location were calculated by determining how many structures were in the identified hazard area using 2015 digital aerial images of Rye, and then making the damage estimates based on the average value of a structure. Damage estimates from hazards that could affect all of Rye equally are much rougher estimates, based on percentages of the total assessed value of the structures and utilities in Rye.

After identifying the parcels and buildings that are at risk, the next step was to calculate a damage estimate for each potential hazard area. FEMA provides a model for estimating damage for various flooding events, so the flood damage estimates provide information including damage estimates for structures, contents of buildings, functional downtime and replacement time. For wildfire and urban conflagration, damage estimates were determined for the buildings in the potential hazard areas as well as estimates of the building content value, based on the same estimates from the flood model. The following discussion summarizes the potential loss estimates due to natural hazard events.

Flooding – Special Flood Hazard Zones - The average replacement value was calculated by adding up the average assessed values of all structures in the 100 and 500-year floodplains. Because of the scale and resolution of the FIRM maps and imagery this is only an approximation of the total structures located within the 100 and 500-year floodplains. The Federal Emergency Management Agency (FEMA) has developed a process to calculate potential loss for structures during flood. The potential loss was calculated by 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 or replacing bridges, railroads, power lines, telephone lines, and contents of structures are not included in this estimate. In addition, the figures used were based on buildings which are one or two stories high with basements. The following calculation is based on eight-foot flooding

and assumes that, on average, one or two-story buildings with basements receive 49% damage (Understanding Your Risks, Identifying Hazards and Estimating Losses, FEMA page 4-13):

Potential Structure Damage: 49%

Approximately 640 structures in the AE, AO, and VE Zones assessed at \$229,760,000 = \$112,582,400 potential damage

The following calculation is based on four-foot flooding and assumes that, on average, one or two-story buildings with basements receive 28% damage (Understanding Your Risks, Identifying Hazards and Estimating Losses, FEMA page 4-13):

Potential Structure Damage: 28%

Approximately 640 structures in the AE, AO, and VE Zones assessed at \$229,776,000 = \$64,337,280 potential damage

The following calculation is based on two-foot flooding and assumes that, on average, one or two-story buildings with basements receive 20% damage (Understanding Your Risks, Identifying Hazards and Estimating Losses, FEMA page 4-13):

Potential Structure Damage: 20%

Approximately 640 in the AE, AO, and VE Zones structures assessed at \$229,776,000 = \$45,955,200 potential damage

Table 8: Percentages of structural and content damage, based on the assessed value of a flooded parcel. Also shows the functional downtime and displacement time for each flood event.

Flood Depth	One-foot	Two-foot	Four-foot
% Structural Damage: Buildings	15%	20%	28%
% Structural Damage: Mobile Homes	44%	63%	78%
% Contents Damage: Buildings	22.5%	30%	42%
% Contents Damage: Mobile Homes	30%	90%	90%
Flood Functional Downtime: Buildings	15 days	20 days	28 days
Flood Functional Downtime: Mobile Homes	30 days	30 days	30 days
Flood Displacement Time: Buildings	70 days	110 days	174 days
Flood Displacement Time: Mobile Homes	302 days	365 days	365 days

~Dam Breach and Failure

Dam breach and failure could impact Rye through flooding. Potential losses will depend on the extent of the breach and would mostly affect roadway infrastructure. There are three man-made dams that could cause flooding if breached: Locke Pond Dam (also known as Brown's Pond off Love Lane), Burke Pond Dam and Eel Pond Dam. These dams are along the same watercourse.

In addition, there are known to be beaver dams located in Rye on private land that could cause road and field flooding if breached. The Committee determined that an approximate dollar value of potential damage is not known without conducting a detailed engineering study on the specific dam sites, as well as measuring the potential downstream impacts. Appendix J provides information on the NH Department of Environmental Services Dam Classification System.

Hurricane/ High Wind Events

Hurricane - Hurricanes do affect the Northeast coast periodically. Since 1900, two hurricanes have made landfall in the State of New Hampshire. Due to Rye's location along the Atlantic coast, hurricanes present a real hazard to the community. Even degraded hurricanes or tropical storms could still cause significant damage to the structures and infrastructure. The assessed value of all residential and commercial structures in the Town of Rye in 2021 was \$990,069,000. Assuming 1% to 5% damage, a hurricane could result in \$9,900,690 to \$49,503,450 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 it strikes an inhabited area, the impact could be severe. The assessed value of all residential and commercial structures in the Town of Rye in 2021 was \$990,069,000. Assuming 1% to 5% damage, a tornado could result in \$9,900,690 to \$49,503,450 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 Rye 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 Sandown 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 Rye in 2021 was \$990,069,000. Assuming 1% to 5% damage, a hurricane could result in \$9,900,690 to \$49,503,450 of structure damage.

Ice Storms - Ice storms often cause widespread power outages by downing trees and power lines. They can also cause severe damage to trees. Ice storms in Rye 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 assessed value of all residential and commercial structures in the Town of Rye in 2021 was \$990,069,000. Assuming 1% to 5% damage, a wildfire could result in \$9,900,690 to \$49,503,450 of structure damage.

Earthquakes

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines and are often associated with landslides and flash floods. Four earthquakes 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 Rye, 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 Rye in 2021 was \$990,069,000. Assuming 1% to 5% damage, an earthquake could result in \$9,900,690 to \$49,503,450 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 in related to drought.

Extreme Temperatures

The Committee determined that all parts Rye 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 and extreme temperatures. In addition, the NH Coastal Program estimated the potential monetary value of damage to structures in Rye for a variety of sea level rise and storm surge scenarios.

Table 9: Estimates of Hazard Damage from Sea Level Rise and Storm Surge
Source: NH Coastal Program, 2018

Scenario	Number of Parcels Affected	Percentage of All Parcels in Rye	Value of Parcels 2018
1.7' Sea Level Rise	414	18.12%	\$341,751,000
4.0' Sea Level Rise	620	28.50%	\$537,524,800
6.3' Sea Level Rise	780	35.41%	\$667,904,700
1.7' Sea Level Rise plus Storm Surge	770	35.64%	\$672,270,200
4.0' Sea Level Rise plus Storm Surge	934	41.62%	\$784,898,700
6.3' Sea Level Rise plus Storm Surge	1,048	45.45%	\$857,138,800

Infectious Disease

Epidemics have the potential to cause a significant loss of life and/or widespread illness throughout the State. 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.

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CHAPTER VI – EXISTING HAZARD MITIGATION ACTIONS

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. Poor is defined as an action in need of improvement; Average is defined as an action that is fair but could use some improvement in order to be effective; and Good is defined as an action that does not need further improvements and is effective.

Table 10: Existing Hazard Mitigation Actions

Existing Protection	Area Covered	Responsible Local Agent	Effectiveness (Poor, Average, Good)	Recommended Changes-Actions-Comments
2021 Zoning Ordinance	Town-wide	Code Enforcement Officer	Good	Contains shoreland, wetland, stormwater management, and floodplain provisions that are effective at mitigating negative impacts from development such as but not limited to stormwater runoff. The zoning ordinance is reviewed annually to ensure consistency with the Master Plan. The Ordinance is reviewed on an on-going bases and updated as needed
2021 Subdivision Regulations	Town-wide	Planning Board	Good	Evaluated annually updated as needed. Regulations are effective at mitigating the stormwater and erosion impacts of subdivision development. The Regulations are reviewed on an on-going bases and updated as needed.
2021 Site Plan Review Regulations	Town-wide	Planning Board	Good	Regulation meets effective targets for mitigating impacts from snow and rain events. Regulations are reviewed on an on-going bases and updated as needed.

Existing Protection	Area Covered	Responsible Local Agent	Effectiveness (Poor, Average, Good)	Recommended Changes-Actions-Comments
2021 Road Design Standards	Town-wide	Planning Board/Select Board/DPW	Good	Flexible road width standards reduce impervious cover. Evaluated annually and updated as needed to ensure an effective strategy for safe road access and design. Standards are reviewed on an on-going bases and updated as needed.
2021 Culvert Inspection and Maintenance Program	Town-wide	Public Works Director	Good	Culverts are inspected annually and problems are addressed quickly.
2015 Sea Level Rise and Coastal Storm Surge Vulnerability Assessment	Town-Wide	Planning Board	Good	Assessment recommendations being incorporated into land use regulations, CIP, and emergency response planning
2013 Master Plan	Town-wide	Planning Board	Good	Updated on a regular basis. Includes directives for future land use changes in town; includes Climate Resilience Chapter and Transportation Chapter that address hazard mitigation
2021 Capital Improvements Plan	Town-wide	Select Board	Good	Updated annually to enable Town to budget for equipment and programs efficiently.
2021 Building Codes	Town-wide	Building Inspector	Good	The code is in line with the most recent state and federal standards and is effective at ensuring meeting safety standards to hazard events. It will continue to be reviewed annually.
2018 Emergency Operations Plan	Town-wide	EMD	Good	Plan is reviewed annually and updated as needed.
NH Emergency Notification System	Town-wide	EMD	Good	Town encourages residents to signup for NH-ENS alerts
Town Website	Town-wide	Town Administration	Good	Emergency preparedness information is posted on the website

Existing Protection	Area Covered	Responsible Local Agent	Effectiveness (Poor, Average, Good)	Recommended Changes-Actions-Comments
HazMat Training	Town-wide	EMD	Good	Training is done periodically to ensure proper emergency response.
2021 Seabrook Station Emergency Drill	Town-wide	EMD	Good	Town participates in all drills
2021 Pandemic Response Plan	Town-wide	Health Officer	Good	Reviewed annually and updated as needed
Rye Water District 2021 Risk and Resiliency Plan	Service Area	Rye Water District	Good	Reviewed annually and updated as needed
Rye Water District 2021 Emergency Response Plan	Service Area	Rye Water District	Good	Reviewed annually and updated as needed
Emergency Response Training	Town-wide	EMD and Fire Dept	Good	Monthly training held for all personnel
School Emergency Response Plan	Town-wide	SAU 50 -Regional School District	Good	Plan is reviewed by SAU and Town annually.
Emergency Service: Police Department	Town-wide	Police Chief	Good	Training needs are reviewed annually based on town needs.
Emergency Services: Fire Department	Town-wide	Fire Chief	Good	Training needs are reviewed annually based on town needs. Department maintains a list of vulnerable populations.
Public Works Department	Town-wide	Highway Dept.	Good	Storm drain, catch basin and culvert maintenance, snow removal, road-side mowing, Tree maintenance within Town Right-of-Way. The highway department is effective at ensuring the above maintenance is done annually to mitigate hazard events in town.

Existing Protection	Area Covered	Responsible Local Agent	Effectiveness (Poor, Average, Good)	Recommended Changes-Actions-Comments
Police, Fire and DPW Mutual Agreements Mutual Aid	Town-wide/Region	Police Chief/Fire Chief/EMD/DPW Director	Good	The town and regional partners continue to evaluate and uphold effective regional emergency response, including the State Task Force, Regional Tactical Team, Regional Incident Management Team, Seacoast Chiefs, Regional Mobile Command Post, Southeast Hazardous Mitigation and Mutual Aid, DPW Mutual Aid. Mutual aid agreements are reviewed annually.
Roadside tree trimming program	Town-wide	Public Works Director and Planning Board	Good	Rye works with Eversource annually to review and ensure trees are cleared away from power lines on municipal roadways. This program is effective at eliminating damage and power outage from ice storms and severe wind storms.
NFIP	Town-wide	Building Inspector	Good	Rye maintains status as a participating NFIP community and has an effective history of compliance with FEMA and NFIP building standards. Compliance requirements are reviewed annually by the code enforcement officer to ensure continued compliance with program directives.
Land Conservation Program	Town-wide	Select Board/Conservation Commission	Good	The Town works regularly with landowners and land conservation organizations to permanently protect land from development.
Seacoast Transportation Corridor Vulnerability Assessment and Plan	Coastal roads	NHDOT/Select Board/DPW	Good	Regional plan identifies roads at risk of flooding and washout from sea level rise and storm surge.

CHAPTER VII – POTENTIAL MITIGATION ACTIONS

POTENTIAL MITIGATION STRATEGIES

The Action Plan was developed by the Committee by analyzing the existing Town programs and identifying proposed improvements and changes to these programs. Additional programs were also identified as potential mitigation strategies. The hazards that were defined in this plan were analyzed for potential mitigation opportunities using the New Hampshire's Hazard Mitigation Plan, other abutting community's hazard mitigation plans, and FEMA's Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards. Following this review and evaluation of potential mitigation strategies, the following hazards were identified as being critical for mitigation and therefore the committee included strategies pertinent to those listed below that the community will attempt to implement in a timely manner. These potential mitigation strategies were ranked in five categories according to how they accomplished each item: These potential mitigation strategies (Table 8) were ranked in five categories according to how they accomplished each item:

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

Table 11: Potential Mitigation Actions

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2022: New/Completed/Deferred/ Removed
Establish local cable television channel to provide pre-hazard mitigation information and outreach	Public Information and Involvement, Preparedness, Emergency Services	All Hazards	Establish a local cable television channel for broadcast of municipal alerts, messages, meetings	Deferred
Purchase and install a generator for Junior High School	Emergency Services	All Hazards	Acquire a backup generator for the school so it may be used as an emergency shelter	Deferred
4 x 4 vehicle for Evacuation	Emergency Services	All Hazards	Acquire a 4 x 4 vehicle for evacuation situations	Completed
Update Master Plan to incorporate Hazard Mitigation Recommendations	Prevention	All Hazards	Include Hazard Mitigation Plan recommendations in Master Plan	Completed
Earthquake proof Junior High School (primary shelter)	Emergency Services	Earthquake	Retrofit Junior School to prevent damage to the shelter from an earthquake	Deferred
Participate in the Community Rating System program	Property Protection	Flooding/Coastal Storm Surge/Sea Level Rise	Reapply to participate in the CRS	Deferred
Review building codes to ensure adequate compliance for wind speed	Prevention/Property Protection	High Wind Events	Building codes designed to prevent damage from high wind events	Deferred
Drainage improvements on Red Mill and Love Lane	Emergency Services	Flooding	Improvements to drainage to alleviate road flooding	Completed
Communicate with State Police regarding Ocean Boulevard to address Town	Emergency Services	All Hazards	Improve management of Ocean Boulevard during hazard events	Deferred

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2022: New/Completed/Deferred/Removed
concerns regarding spectators driving, biking, and walking the road during storm events				
Purchase and install new HVAC in Library and establish building as cooling and heating station for vulnerable populations	Emergency Services	All Hazards	Open Library to vulnerable populations	Deferred
Research land and building regulations designed to reduce damage caused by seismic activity and earthquakes	Prevention/Property Protection	Earthquake	There are several historic structures in Rye valued by the community, including the Town Hall	Deferred
Fire Department and EMD identify areas in town prone to wildfire	Emergency Services	Wildfire	Drought conditions can create wildfire situations	Completed
Purchase and install a generator for Town Hall	Emergency Services	All Hazards	Installing a generator in Town Hall would enable use of the facility during hazard events	Deferred
Provide more education and outreach to residents and visitors, especially storm watchers, about natural hazard risks, preparation, and pre-hazard mitigation	Prevention/Public Information/Involvement	All Hazards	Post information on Town website, provide information through Library and Schools	Completed and ongoing
Incorporate recommendations from the Vulnerability Assessment into town regulations and policies	Prevention	Flooding/Coastal Storm Surge/Sea Level Rise	Planning for sea-level rise can include improvements to local and state roads, bridges and culverts, changes to building codes	Completed

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2022: New/Completed/ Deferred/ Removed
Maintain Harbor Road Bridge Deck	Emergency Services	Flooding/Coastal Storm Surge/Sea Level Rise	45-yearl old bridge deck in dis-repair and needs replacement	Completed
Conduct annual review of culvert inventory and town-wide drainage analysis to identify vulnerabilities	Prevention/Property Protection/ Emergency Services	Flooding/Coastal Storm Surge/Sea Level Rise	Annual review will enable DPW to prioritize repairs to make town more resilient to impacts of natural hazards	Completed and ongoing
Work with Rye Water District and Aquarion on water use guidelines designed to strengthen resiliency of water supply system	Emergency Services/Public Information/Property Protection	Drought Wildfire	Water use guidelines will strengthen communication between Town, residents, and water suppliers especially during periods of drought and high demand on water system	New
Develop a pandemic preparedness plan focused on planning and communication	Emergency Services/Public Information	Infectious Disease	A pandemic preparedness plan will define the roles and responsibilities of Town staff and identify resources in the community	New
Work with NHDOT, Town of North Hampton, and Rockingham Planning Commission on a long-range plan for flood hazards areas along Ocean Boulevard, including replacing shale piles with permanent sea walls	Emergency Services/Prevention/ Property Protection	Flooding	Flooding from coastal storm surge, sea level rise, and extreme precipitation events impacts several locations along Ocean Boulevard	New
Complete risk assessment of water and sewer infrastructure to identify mitigation measures to increase system resilience	Prevention/ Structural Protection/ Emergency Services	Flooding/Coastal Storm Surge/Sea Level Rise	Flooding from coastal storm surge, sea level rise, and extreme precipitation events threatens water and sewer system infrastructure	New

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2022: New/Completed/ Deferred/ Removed
Purchase and install external plugs for mobile generators for three sewer pump stations	Prevention/ Structural Protection/ Emergency Services	All Hazards	External plugs for mobile generators would provide manual connection to power during electricity outages	New
Purchase and install two generators for two sewer pump stations	Prevention/ Structural Protection/ Emergency Services	All Hazards	Generators would provide backup power for sewer pump stations during power outages	New
Purchase and install accessible isolation valves for water system to prevent floodwater intrusion	Prevention/ Structural Protection/ Emergency Services	Flooding/Coastal Storm Surge/Sea Level Rise	Isolation valves in strategic locations in the water system will prevent intrusion of floodwater	New
Purchase and install reinforced manhole covers to prevent floodwaters from entering water system	Prevention/ Structural Protection/ Emergency Services	Flooding/Coastal Storm Surge/Sea Level Rise	Reinforce manhole covers can prevent floodwaters from entering water system	New

CHAPTER VIII – PRIORITIZATION OF MITIGATION ACTIONS

The goal of each strategy or action is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each 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 12:

- 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?
- 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 Tables 12a through 12q.

Table 12a: Establish local cable television channel for pre-disaster mitigation
Information and outreach

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?	1
Will historic structures be saved or protected?	2
Does it help achieve other community goals?	3
Could it be implemented quickly?	1
S: Is it Socially acceptable?	2
T: Is it Technically feasible and potentially successful?	2
A: Is it Administratively workable?	1
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	29

Table 12b: Purchase and install a generator for Junior High School

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?	1
Will historic structures be saved or protected?	1
Does it help achieve other community goals?	3
Could it be implemented quickly?	1
S: Is it Socially acceptable?	3
T: Is it Technically feasible and potentially successful?	2
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?	3
E: Are other Environmental approvals required?	3
Score	32

Table 12c: Earthquake proof Junior High School

Criteria	Evaluation Rating (1-3)
Does it reduce disaster damage?	3
Does it contribute to other goals?	1
Does it benefit the environment?	2
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?	1
S: Is it Socially acceptable?	1
T: Is it Technically feasible and potentially successful?	1
A: Is it Administratively workable?	1
P: Is it Politically acceptable?	2
L: Is there Legal authority to implement?	3
E: Is it Economically beneficial?	1
E: Are other Environmental approvals required?	3
Score	24

Table 12d: Participate in the Community Rating Program

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?	1
S: Is it Socially acceptable?	1
T: Is it Technically feasible and potentially successful?	2
A: Is it Administratively workable?	1
P: Is it Politically acceptable?	1
L: Is there Legal authority to implement?	3
E: Is it Economically beneficial?	3
E: Are other Environmental approvals required?	3
Score	33

Table 12e: Review building codes to ensure adequate compliance for wind speed

Criteria	Evaluation Rating (1-3)
Does it reduce disaster damage?	2
Does it contribute to other goals?	2
Does it benefit the environment?	1
Does it meet regulations?	3
Will historic structures be saved or protected?	3
Does it help achieve other community goals?	2
Could it be implemented quickly?	3
S: Is it Socially acceptable?	3
T: Is it Technically feasible and potentially successful?	2
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?	3
Score	33

Table 12f: Communicate with State Police regarding Ocean Boulevard to address Town concerns regarding spectators driving, biking, and walking the road during storm events

Criteria	Evaluation Rating (1-3)
Does it reduce disaster damage?	1
Does it contribute to other goals?	2
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?	2
Could it be implemented quickly?	1
S: Is it Socially acceptable?	1
T: Is it Technically feasible and potentially successful?	1
A: Is it Administratively workable?	1
P: Is it Politically acceptable?	1
L: Is there Legal authority to implement?	2
E: Is it Economically beneficial?	1
E: Are other Environmental approvals required?	2
Score	18

Table 12g: Install new HVAC in Library and establish building as a cooling and heating station for vulnerable populations

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?	1
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?	2
T: Is it Technically feasible and potentially successful?	2
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?	3
Score	31

Table 12h: Research land and building regulations designed to reduce damage caused by seismic activity and earthquakes

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?	1
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?	1
A: Is it Administratively workable?	1
P: Is it Politically acceptable?	1
L: Is there Legal authority to implement?	3
E: Is it Economically beneficial?	2
E: Are other Environmental approvals required?	3
Score	31

Table 12i: Purchase and install a generator for Town Hall

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?	1
Will historic structures be saved or protected?	2
Does it help achieve other community goals?	2
Could it be implemented quickly?	1
S: Is it Socially acceptable?	1
T: Is it Technically feasible and potentially successful?	1
A: Is it Administratively workable?	1
P: Is it Politically acceptable?	1
L: Is there Legal authority to implement?	3
E: Is it Economically beneficial?	1
E: Are other Environmental approvals required?	3
Score	25

Table 12j: Work with Rye Water District and Aquarion on water use guidelines designed to strengthen resiliency of water supply system

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?	3
Could it be implemented quickly?	2
S: Is it Socially acceptable?	1
T: Is it Technically feasible and potentially successful?	2
A: Is it Administratively workable?	2
P: Is it Politically acceptable?	2
L: Is there Legal authority to implement?	1
E: Is it Economically beneficial?	3
E: Are other Environmental approvals required?	3
Score	32

Table 12k: Develop a pandemic preparedness plan focused on planning and communication

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?	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?	2
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

Table 12l: Work with NHDOT, Towns of Rye and North Hampton, and Rockingham Planning Commission on a long-range plan for flood hazards areas along Ocean Boulevard

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?	3
Could it be implemented quickly?	2
S: Is it Socially acceptable?	2
T: Is it Technically feasible and potentially successful?	2
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?	3
E: Are other Environmental approvals required?	3
Score	35

Table 12m: Complete risk assessment of water and sewer infrastructure to identify mitigation measures to increase system resilience

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?	2
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?	2
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?	3
E: Are other Environmental approvals required?	3
Score	36

Table 12n: Purchase and install external plugs for mobile generators for three sewer pump stations

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?	1
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?	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?	3
Score	36

Table 12o: Replace and install two generators for two sewer pump stations

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?	2
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	40

Table 12p: Purchase and install accessible isolation valves in water system to prevent floodwater intrusion

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?	3
Could it be implemented quickly?	2
S: Is it Socially acceptable?	3
T: Is it Technically feasible and potentially successful?	2
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?	3
E: Are other Environmental approvals required?	2
Score	35

Table 12q: Purchase and install manhole improvements to prevent floodwater from entering water system

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?	2
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	40

CHAPTER IX – ACTION PLAN

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 13 is the Action Plan. In addition to the prioritized mitigation projects, the Action Plan includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN).

Table 13: Action Plan for proposed mitigation actions

Score	Project	Responsibility/ Oversight	Funding/ Support	Estimated Cost	Timeframe
40	Replace and install two generators for two sewer pump stations	Sewer Director/Sewer Commissioners	Utility users/ Grants	\$70,000	Medium Term 2-3 years
40	Purchase and install manhole improvements to prevent floodwater from entering sewer system	Sewer Director/Sewer Commissioners	Utility users/ Grants	\$30,000	Long Term 5 years
36	Develop a pandemic preparedness plan focused on planning and communication	EMD	Town/ Grants	\$2,500	Medium Term 2-3 years

Score	Project	Responsibility/ Oversight	Funding/ Support	Estimated Cost	Timeframe
36	Complete risk assessment of water and sewer infrastructure to identify mitigation measures to increase system resilience	Rye Water District (RWD) Superintendent/RWD Commissioners/Sewer Director/Sewer Commissioners	Utility users/ Grants	\$10,000	Short Term 1 year
36	Purchase and install external plugs for mobile generators for three sewer pump stations	Sewer Director/Sewer Commissioners	Utility users/ Grants	\$9,500	Long Term 5 years
35	Work with NH DOT, Town of North Hampton, and Rockingham Planning Commission on a long-range plan for flood hazard areas along Ocean Boulevard	DPW/EMD	DOT	Unknown	Long Term 5 years
35	Purchase and install accessible isolation valves in water system to prevent floodwater intrusion	RWD Superintendent/RWD Commissioners	Utility users/ Grants	\$75,000	Long Term 5 years
33	Participate in the Community Rating System	Town Planner/Select Board	Grant	\$5,000	Medium Term 2-3 years
33	Review building codes to ensure adequate compliance for wind speed	Building Inspector	Town	No cost	Short Term 1 year

Score	Project	Responsibility/ Oversight	Funding/ Support	Estimated Cost	Timeframe
32	Work with Rye Water District and Aquarion on water use guidelines designed to strengthen resiliency of water supply system	RWD Superintendent/RWD Commissioners/Aquarion	Utility users/ Grants	\$5,000- \$25,000	Medium Term 2-3 years
32	Purchase and install a generator for Junior High School	EMD	Grants	\$100,000	Long Term 5 years
31	Purchase and install new HVAC in Library and establish building as a cooling and heating station for vulnerable populations	EMD/Library Director/ Library Trustees	Grants	Unknown	Long Term 5 years
31	Research land and building regulations designed to reduce damage caused by seismic activity and earthquakes	Town Planner/ Building Inspector	Grants	\$10,000	Medium Term 2-3 years
29	Establish local cable television channel for pre-disaster mitigation information and outreach	Select Board	Grants	\$10,000	Long Term 5 years
25	Purchase and install a generator for Town Hall	Select Board	Grants	Unknown	Long Term 5 years
24	Earthquake proof Junior High School	EMD/School Board	Grants	Unknown	Long Term 5 years

Score	Project	Responsibility/ Oversight	Funding/ Support	Estimated Cost	Timeframe
18	Communicate with State Police regarding Ocean Boulevard to address Town concerns regarding spectators driving, biking, and walking along the road during storms	EMD	None	None	Short Term 1 year

DRAFT

CHAPTER X – INCORPORATING, MONITORING, EVALUATING AND UPDATING THE PLAN

Incorporating the Plan into Existing Planning Mechanisms

Upon review by FEMA and the State of New Hampshire, the Plan will be adopted by the Town and become an appendix to the Town's Emergency Operations Plan (EOP) when that plan is completed.

In the future, the Hazard Mitigation Plan Update 2022 will be consulted when the Town updates its Capital Improvement Program (CIP) and Master Plan. The Capital Improvements Committee is responsible for updating the CIP annually, and will review the Action Plan, as it has done before, during each update. This committee in conjunction with the Planning Board and Rye Emergency Management 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. Portions of this plan should be referred to when updates to the towns Master Plan takes place. 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 towns 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 continual, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the Plan where necessary.

In order to track progress and update the Mitigation Strategies identified in the Action Plan (Table 10), it is recommended that the Town revisit the Plan annually, or after a hazard event. If it is not realistic or appropriate to revise the Plan every year, then the Plan will be revisited no less than every five years per FEMA requirements. The Emergency Management Director is responsible for initiating this review with members of the Town that are appropriate including members of the public. In keeping with the process of adopting the 2022 Plan Update and per NH RSA 91-A:2 (II) and pursuant to CFR 201.6(b)(1) regarding notice requirements, a public meeting to receive public comment on Plan maintenance and updating will be held during any review of the Plan. This publicly noticed meeting (via town website, and postings in the town office, library, or local newspaper) 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.

Changes should be made to the Plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with STAPLEE, the timeframe, the community's priorities, and funding resources. Priorities that 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 in order 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 is able to 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 are capable of storing 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 (select board/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 town. Buildings or locations vital to the flood response effort:

- emergency operations centers
- police and fire stations
- hospitals
- highway garages
- 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; and
- 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 known 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 particular 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 particular 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 to all residents.
- 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 in a position 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 seals 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 in order 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 be participating 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, heather.dunkerley@dos.nh.gov, 603-223-3614 for assistance.

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.

Above information can be found at: <http://www.fema.gov/hazards/hurricanes/saffir.shtm>

**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.



**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.

Information above found at: <http://www.seismo.unr.edu/ftp/pub/louie/class/100/magnitude.html>

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.

The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

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 frighten 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. 2. Gusty winds at times.
T-2 – Moderate Thunderstorms.	.10”-.25”	25-40 MPH	None	None	Occasional 1-10	Moderately Dark. Heavy downpours may cause the need for car lights.	1. Heavy downpours. 2. Occasional lightning. 3. Gusty winds. 4. Very little damage. 5. Small tree branches may break 6. Lawn furniture moved around
T-3 – Heavy Thunderstorms 1. Singular or lines of storms.	.25”-.55”	40-57 MPH	1/4 “ to 1/2”	EF0	Occasional to Frequent 10-20	Dark. Car lights used. Visibility low in heavy rains. Cars may pull off the road.	1. Minor Damage. 2. Downpours that produce some flooding on streets. 3. Frequent lightning could cause house fires. 4. Hail occurs within the downpours. 5. Small branches are broken. 6. Shingles are blown off roofs.
T-4 – Intense Thunderstorms 1. Weaker supercells 2. Bow Echos or lines of Storms	.55” – 1.25”	58 to 70 MPH	1” to 1.5”	EF0 to EF2	Frequent 20-30	Very Dark. Car lights used. Some street lights come on.	1. Moderate Damage. 2. Heavy rains can cause flooding to streams and creeks. Roadway flooding. 3. Hail can cause dents on cars and cause crop damage. 3. Wind damage to trees and buildings. 4. Tornado damage. 5. Power outages
T-5 – Extreme Thunderstorms 1. Supercells with family of tornadoes. 2. Derecho Windstorms	1.25” – 4”	Over 70 Mph	Over 1.5” to 4”	EF3 to EF5	Frequent to Continuous. > 30	Pitch Black. Street Lights come on. House lights maybe used	1. Severe Damage to Trees and Property. Damage is widespread. 2. Flooding rains. 3. Damaging hail. 4. Damaging wind gusts to trees and buildings. 5. Tornadoes F3-F5 or family of tornadoes can occur. Tornadoes can cause total devastation. 6. Widespread power outages.

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Appendix G Lightning Risk Definitions

<i>Lightning Risk Definitions</i>	
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-Pitz 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

Wildland Urban Interface (WUI) Exposure Zones – NIST Technical Note 1748, January 2013

Source: National Institute of Standards and Technology (NIST), US Dept. of Commerce

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: <ul style="list-style-type: none"> - Maintained Landscaping - 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 from embers.	Low Construction Hardening Requirements: <ul style="list-style-type: none"> - Treated combustibles allowed on structure - Attached treated combustibles allowed - Treated combustibles allowed around structure - Low flammability plants - Irrigated and well maintained Landscaping - 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: <ul style="list-style-type: none"> - No exposed combustibles on structure - Combustibles placed well away from structure - Low flammability plants - Irrigated and well maintained landscaping - 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: <ul style="list-style-type: none"> - No exposed combustibles - All vents, opening must be closed - Windows and doors must be covered with insulated non-combustible coverings. - Irrigated and well maintained low flammability landscaping - Local AHJ-Approved Access for firefighting equipment

Size Class of Fire

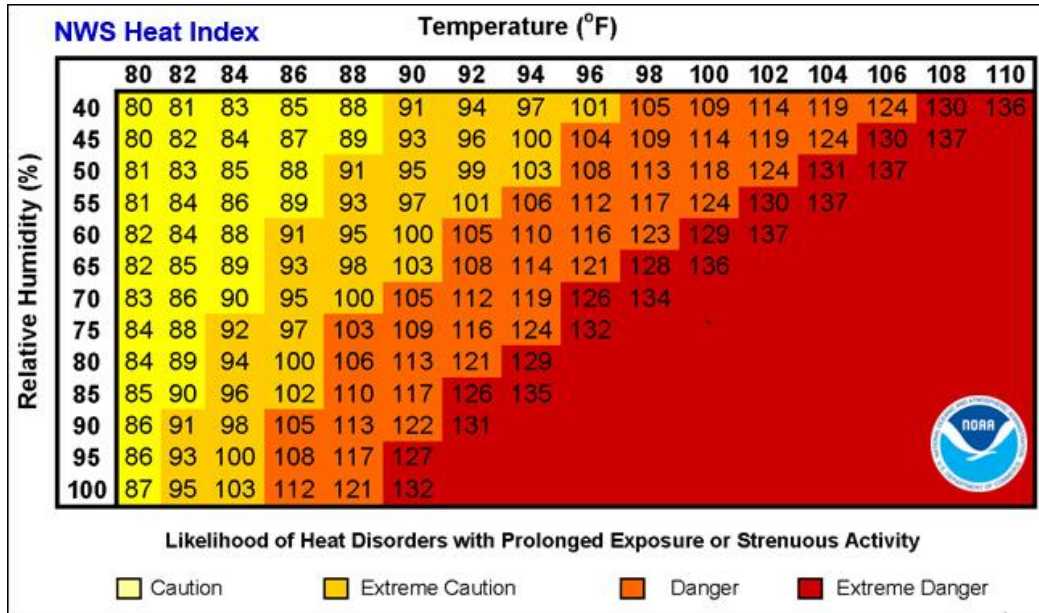
- As to size of wildfire:
 - Class A - one-fourth acre or less;
 - Class B - more than one-fourth acre, but less than 10 acres;
 - Class C - 10 acres or more, but less than 100 acres;
 - Class D - 100 acres or more, but less than 300 acres;
 - Class E - 300 acres or more, but less than 1,000 acres;
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

Appendix K
NOAA U.S. Drought Monitor Scale

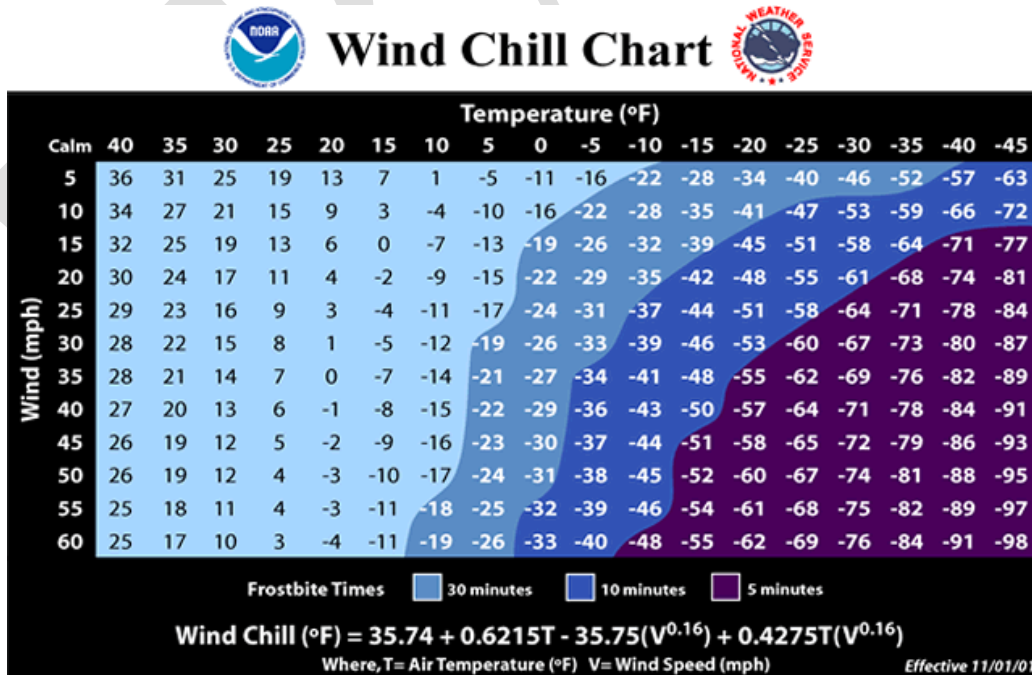
Intensity:

	D0 Abnormally Dry
	D1 Drought - Moderate
	D2 Drought - Severe
	D3 Drought - Extreme
	D4 Drought - Exceptional

**Appendix L
National Weather Service Heat Index**



**Appendix M
National Wind Chill Chart**



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

2022 Plan Update Meeting #1

Meeting Date: 9/28/21

Meeting Agenda: Review Plan Update Process and Timeline; Review Hazard Types

Meeting Participants: Kimberly Reed, Planning and Zoning Administrator; Mark Cotureau, Fire Chief; Kevin Walsh, Police Chief/EMD; Theresa Walker, Rockingham Planning Commission

2022 Plan Update Meeting #2

Meeting Date 10/27/21

Meeting Agenda: Update Hazard Types and Locations; Update Critical Facilities

Meeting Participants: Kimberly Reed, Planning and Zoning Administrator; Kevin Walsh, Police Chief/EMD; Dennis McCarthy, DPW Director; Arik Jones, Rye Water District; Mark Cotureau, Fire Chief; Maddie Dilonno, Rockingham Planning Commission; Theresa Walker, Rockingham Planning Commission

2022 Plan Update Meeting #3

Meeting Date:12/1/21

Meeting Agenda: Review and Update Existing Mitigation Programs; Update Mitigation Actions; Review and Update Maps

Meeting Participants: Kimberly Reed, Planning and Zoning Administrator; Kevin Walsh, Police Chief/EMD; Daniel Barron, Highway Foreman; Arik Jones, Rye Water District; Mark Cotureau, Fire Chief; Lee Arthur, Rye Sewer Dept.; Maddie Dilonno, Rockingham Planning Commission; Theresa Walker, Rockingham Planning Commission

2022 Plan Update Meeting #4

Meeting Date: 1/19/22

Meeting Agenda: Review and Rank Mitigation Actions; Update Action Plan; Review Draft Plan

Meeting Participants: Kimberly Reed, Planning and Zoning Administrator; Kevin Walsh, Police Chief/EMD; Daniel Barron, Highway Foreman; Arik Jones, Rye Water District; Mark Cotureau, Fire Chief; Chuck Marden, Building Inspector; Lee Arthur, Rye Sewer Dept.; Nathalie Morison, NH Coastal Program; David Walker, Rockingham Planning Commission; Theresa Walker, Rockingham Planning Commission

Meeting Date: 3/9/22

Meeting Agenda: Finalize Action Plan; Finalize edits to draft Plan; Select date for Public Hearing on Draft Plan Update

Meeting Participants: Kimberly Reed, Planning and Zoning Administrator; Kevin Walsh, Police Chief/EMD; Daniel Barron, Highway Foreman; Mark Cotureau, Fire Chief; Chuck Marden, Building Inspector; Lee Arthur, Rye Sewer Dept.; Jason Rucker, DPE Administrator; Maddie Dilonno, Rockingham Planning Commission; Theresa Walker, Rockingham Planning Commission

Notice of Public Hearing on Draft Plan

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Appendix P
Plan Approval Letter from FEMA

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